THE AFRICAN SPECIES OF OLDENLANDIA L SENSU HIERN ET K. SCHUMANN

BY

C. E. B. BREMEKAMP

VERHANDELINGEN DER KONINKLIJKE NEDERLANDSE AKADEMIE VAN WETENSCHAPPEN, AFD. NATUURKUNDE

TWEEDE REEKS, DEEL XLVIII, No. 2

1952
NORTH-HOLLAND PUBLISHING COMPANY
(N.V. Noord-Hollandsche Uitgevers Mij.)
AMSTERDAM

INTRODUCTION

This work deals with those African *Rubiaceae* that at one time or another have been referred to Linné's genus *Oldenlandia* [1]), and also with a number of undescribed species that would have been included in this genus if they had been treated in the same way as their longer known allies.

In the more recent literature on the African flora the name *Oldenlandia* is everywhere used in the same way as in Hiern's treatment of the family in the "Flora of Tropical Africa" (1877), in K. Schumann's monograph of the Rubiaceous genera in Engler and Prantl's "Natürliche Pflanzenfamilien" (1891) and in the same author's survey of the African *Rubiaceae* in Engler's "Pflanzenwelt Ost-Afrikas, Teil C" (1895). In these works the genus is given a wider delimitation than in De Candolle's "Prodromus" (1830), in Meisner's "Plantarum Vascularum Genera, Vol. I" (1838), in Korthals' survey of the Malaysian *Rubiaceae* in Ned. Kruidk. Arch. **2**, 135—136 and 145—161 (1851), in Asa Gray's "Notes upon some Rubiaceae" in Proc. Am. Acad. of Arts and Sciences **4**, 312 (1860) and in Bentham and Hooker's "Genera Plantarum" (1873). The authors of these works recognize within this circle of affinity a larger number of genera, among whom *Hedyotis* L always occupies a prominent place.

Hiern was not the first by whom the differences within this group were considered insufficient for the recognition of more than one genus. Schreber had already as early as 1789 (in the 8th edition of Linné's "Genera Plantarum") expressed doubts with regard to the generic value of the differences between *Oldenlandia* L and *Hedyotis* L, and two years later the fusion between these genera was carried through by Lamarck in his "Illustration des Genres" (**1**, 269). Lamarck used the name *Hedyotis* for the resulting unit, and during the next seventy-five years he was followed in this choice by all authors by whom the fundamental identity of the two genera was accepted (see e.g. Smith in Rees' Cyclopaedia

---

[1]) There is also a genus *Oldenlandia* defined by Smith in Rees' Cyclopaedia ed. **1**, **28** (circ. 1813). This was based on *O. pentandra* Retz., a *Saxifragacea* that had wrongly been referred to Linné's genus. As Smith had accepted (op. cit. **17**, 1811) Lamarck's reduction of *Oldenlandia* L to *Hedyotis* L, it was, according to the then prevailing view, his good right to use the name *Oldenlandia* for another genus. According to the present "International Rules of Botanical Nomenclature" *Oldenlandia* Sm. is an illegitimate name, but this is here of minor importance, for even if it had been legitimate, it would have been discarded, as the genus of the *Saxifragaceae* for which it was used, already possessed a valid name, viz. *Vahlia* Thunb.

ed. 1, **17**, 1811; Sprengel, Pugillus **2**, 28, 1815; Steudel, Nomencl. ed. 1, 390, 1821; Blume, Bijdr. Fl. Ned. Ind. 970, 1826; A. Richard, Tent. Fl. Abyss. **1**, 360, 1847; Walp., Ann. **2**, 770, 1851/2; Sonder in Fl. Cap. **3**, 11, 1865).

Lamarck's preference for the name *Hedyotis* strikes us as somewhat arbitrary, for *Oldenlandia* had far older rights. This genus was created in 1703 by Plumier (Nov. Pl. Am. Gen. 42, t. 36), and was taken up by Linné in the first edition of his "Genera Plantarum" (1737), whereas the name *Hedyotis* appeared for the first time in the dissertation "Nova Genera Plantarum Zeylanicarum" defended in 1757 at Uppsala by Dassow, and reprinted in the following year as an appendix to Linné's "Flora Zeylanica". For this reason Hiern replaced the name *Hedyotis* by *Oldenlandia*, and Baillon in his "Histoire des Plantes" (**7**, 325, 1880), K. Schumann in the "Flora Brasiliensis" (VI, **6**, 1889) and in Engler and Prantl's "Natürliche Pflanzenfamilien" (1891) and O. Kuntze in his "Revisio Generum Plantarum" (**1**, 291, 1891) followed his example. However, when the Vienna Botanical Congress (1905) decreed that names published before the year 1753 have no right of priority, Hiern's decision became illegal, and the name *Hedyotis* had to be reinstated. This was done e.g. by Alston in the Supplement to Trimen's "Flora of Ceylon" (142, 1913), and by Fosberg in Bulletin 174 of the Bernice P. Bishop Museum (1943). As in the present work the genera *Oldenlandia* L and *Hedyotis* L are kept apart, the issue of this nomenclatural question is here of no importance.

Schumann's delimitation of the genus *Oldenlandia* differs slightly from that of Hiern, for it does not include the plant recorded by the latter under the name *O. macrophylla* DC. With regard to this species Schumann followed Hooker f. in Bentham and Hooker's "Genera Plantarum" (1873) and Vatke in Oesterr. Bot. Zeitschr. **25**, 231, 1875, who referred it to Hochstetter's genus *Pentodon*. This genus was kept up on account of its pentamerous flowers, which in itself is an insufficient ground. It is, moreover, worth noting that neither Hooker nor Schumann were consistent in their attitude, for the first transferred Bentham's *Peltospermum paniculatum* notwithstanding its pentamerous flowers to *Hedyotis*, and the second included in *Oldenlandia* not only this species of Bentham but also two other ones with pentamerous flowers described by himself, viz. *O. silvatica* K.Sch. and *O. geminiflora* K.Sch. The name of the latter is illegitimate, for there was already an *O. geminiflora* (Sond.) O.Ktze dating from 1891, whereas Schumann's species was described in 1900.

A more detailed study of *Pentodon* and its nearest allies — the latter proved to form the group of species for which in this work the name *Oldenlandia* is retained — has shown that the difference is not confined to the number of parts in the perianth and in the androecium, but that *Pentodon* reveals its independent character also in the succulent stems and leaves, in the comparatively large size and in the rather supple wall

of the capsule, and above all in the peculiar structure of the testa, a character to which I will return hereafter. This means that there is sufficient reason to keep the genus up. It can, on the other hand, not be denied that it is a very close ally of *Oldenlandia* sensu meo, a closer ally, in fact, than several of the species that were included in *Oldenlandia* by Hiern and by Schumann himself.

The other species mentioned above on account of their pentamerous flowers belong to those that are farther removed from the type of the genus than *Pentodon* is. *O. peltospermum* Hiern is the species for whose reception Bentham had proposed the genus *Peltospermum*, which has recently been revived by G. Taylor (in Exell, Cat. Vasc. Pl. S. Tomé, 218, 1944) under the name *Sacosperma* G. Tayl. It differs from *Oldenlandia* sensu meo and the latter's nearest allies i.a. in the free stipules. The name *Peltospermum* Bth. could not be retained because it is a later homonym of *Peltospermum* DC, a genus belonging to the *Apocynaceae*. *O. silvatica* K. Sch. shows, as I will expound hereafter, a greater resemblance to the representatives of the genus *Pentas* Bth. than to those of *Oldenlandia* sensu meo. The exact position of *O. geminiflora* K.Sch. non (Sond.) O.Ktze could not be determined as the type has been destroyed and as no plants were available that answered the description, but it seems improbable that this plant should be a near ally of *Oldenlandia*: it is not even certain that it is a *Rubiacea*. Another species that shows but a distant relation with the representatives of *Oldenlandia* s.m. is *O. wauensis* Schweinf. ex Hiern. Its flowers are partly tetramerous and partly pentamerous, and in its general aspect it comes nearer to *Otomeria* Bth. than to *Oldenlandia*.

Groups with a rather aberrant character are also found among the species with exclusively tetramerous flowers. Two of these groups were recognized already long ago. The first comprises the species which De Candolle referred to the genus *Kohautia* Cham. et Schlecht., viz. *O. senegalensis* (C. et S.) Hiern and its allies, and the second the species for which Klotzsch created the genus *Agathisanthemum*; the latter are in aspect not unlike the Indian *Hedyotis fruticosa* L and its nearest allies (*Hedyotis* L sect. *Diplophragma* W. et A.). A third group comprises species with rather showy, long-tubed flowers. Stapf (in Journ. Linn. Soc. Bot. **37**, 518, 1899) introduced for one of the species of this group the subgenus *Conostomium*, which Cufodontis recently (in Nuovo Giornale Bot. Ital. **55**, 85, 1948) raised to generic rank.

Subsequent authors remained on the whole within the limits set by Hiern and Schumann. In fact, among the species whose identity could be made out with certainty, there are but two exceptions, and both are obvious mistakes. The first is *O. Junodii* Schinz in Mém. Herb. Boiss. n° 10, 65, 1900. This species should not be confused with its later homonym, the *O. Junodii* described by Schinz in Vierteljahrsschr. Naturf. Ges. Zürich **52**, 431, 1907, which proved to be identical with one of the varieties

of *O. rupicola* (Sond.) O.Ktze. The original *O. Junodii* of the year 1900 was found to be a *Borreria*, but could not with certainty be referred to any of the species with which I am acquainted. The second exception is *O. rufescens* Schinz in Vierteljahrsschr. Naturf. Ges. Zürich **68**, 430, 1923, which proved to be identical with *Virecta multiflora* Sm. The *Borrerieae*, whose ovary cells contain but a single ovule and whose seeds are well characterized by their oblong shape and by the linear hilum, belong to a different, although in all probability nearly related tribe (*Spermacoceae*), but the genus *Virecta* auct. non L.f., which up to now has been included in the *Hedyotideae* (*Oldenlandieae* K.Sch.) themselves, is in reality a more distant relation. In order to prove this we will have to subject the delimitation and the interrelationship of the various tribes to a somewhat detailed examination, but for this I refer to the first and second chapter of the General Part.

Of most of the African species that have been referred to *Oldenlandia* I have seen either the type itself or else a duplicate of the latter. The species of which I did not see authentic specimens, are listed below. Several were identifiable from the description.

alpestris K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 375, 1895 (Fischer I 282, Massai Hochl.). Possibly *O. caespitosa* Hiern var. *subpedunculata* (O. Ktze) Brem., but the description is too incomplete to allow a fully reliable identification.

cicendioides K.Sch. in Bot. Jahrb. **33**, 333, 1903 (coll. ign., Angola, Pallanca). The description leaves no reasonable doubt as to the identity of this species, cf. *Kohautia cicendioides* (K. Sch.) Brem.

cyanea Dinter in Fedde, Repert. **19**, 308, 1924, nomen (Dinter 866, S. W. Africa, Bulus). A note attached to a South African specimen of *Kohautia aspera* (Heyne ex Roth) Brem. states that it had been compared with the *O. cyanea* of the Berlin Herbarium, and that the two were found conspecific.

delicatula K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 375, 1895 (Stuhlmann 3278, Seeengeb., Bu.). This seems to be *O. linearis* DC.

Dinteri K.Krause in Bot. Jahrb. **39**, 518, 1907 (Dinter 943, S. W. Africa, Inachab). This is apparently a *Kohautia*, possibly *K. raphidophylla* Brem. (*O. filifolia* K.Krause non Elm.), but the description is not sufficiently detailed to exclude all doubt.

garuensis K.Krause in Bot. Jahrb. **48**, 404, 1912 (Ledermann 4975, Cameroons, Garuu). The description suggests *Kohautia grandiflora* DC, but the calyx is said to be 5-partite. It is possible that the description was based on an abnormal flower or that the figure 5 is merely a typographical error, and in that case the identification of *O. garuensis* with *Kohautia grandiflora* would offer no further difficulties. It is rather curious that in the same part of the Bot. Jahrb. the calyx of two more species, viz. *O. Ledermannii* K. Krause and *O. omahekensis* K. Krause, is described as 5-merous (v. infra).

geminiflora K. Sch. in Bot. Jahrb. **28**, 485, 1900, nom. illeg. nam non (Sond.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891 (Goetze 171, Tanganyika, South Uluguru). This is a rosulate plant with fairly large leaves and 5-merous flowers arranged in pairs along the monochasial branches of a long-pedunculate dichasium. Among the African plants known to me there is not a single one that answers this description; the nearest approach to it is found perhaps in the Brasilian *Leptoscela ruellioides* Hook.f.

golungensis Hiern in Cat. Welw. Afr. Pl. **2**, 451, 1898 (Welwitsch 3083 BM, Angola, Golungo Alto). The type of this species is apparently a unicum, and no specimens were seen which could be identified with it. It is evidently a species belonging to my subgenus *Hymenophyllum*, but easily distinguishable from the other members. In its capitate inflorescences it resembles *O. pellucida* Hiern. and *O. echinulosa* K. Sch. The corolla is unknown, and as the characters of the latter are of great importance in this subgenus, I did not deem it necessary to study this specimen.

graminifolia Chiov. in Bull. Soc. Bot. Ital. 1924, 39, nom. illeg. nam non (L.f.) DC, Prodr. **4**, 425, 1830 (Mazocchi–Alemanni s.n., Angola, Lobito). The description leaves no doubt that this is *Kohautia rigida* Bth.

hymenocapsa K.Sch. in Engler, Pflanzenw. Ost-Afrikas C, 375, 1895 (Stuhlmann 1142, 1539, 3729, 4076, Tanganyika, Bukoba). The words "capsula .... membranacea ad dissepimentum et secus medium usque ad basin dehiscente" suggest a genus belonging to another circle of affinity, but the description is too incomplete to allow a decision.

inconstans Pomel. ex Batt. et Trab., Fl. de l'Algérie 388, 1889. The description leaves no doubt that this is *O. capensis* L.f. var. *pleiosepala* Brem.

lasiocarpa (Klotzsch) Hiern in Fl. Trop. Afr. **3**, 55, 1877; *Kohautia lasiocarpa* Klotzsch in Peters, Reise Mossambique, Bot. 297, 1862 (Peters s.n., Port. East Africa, Rios de Sena). Peters' *Rubiaceae* are destroyed, but the identity of this one does not seem dubious (cf. *Kohautia lasiocarpa*).

Leclercii A.Chev. in Bull. Mus. Hist. Nat. Paris sér. 2, **5**, 162, 1933 (Leclercq in Herb. Chevalier 42738, South Sahara, Oued Sadibene). The description shows that this is a *Kohautia* nearly related to *K. aspera* (Heyne ex Roth) Brem.

Ledermannii K.Krause in Bot. Jahrb. **48**, 403, 1912 (Ledermann 2077, Cameroons, Esob). The description suggests *Kohautia cuspidata* (K. Sch.) Brem., but the calyx is said to be 5-partite (see my remarks on *O. garuensis*).

longifolia (Klotzsch) K.Sch. in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895, comb. illeg. nam non (Schum.) DC, Prodr. **4**, 426, 1830; *Kohautia longifolia* Klotzsch in Peters, Reise Mossambique, Bot. 297, 1862 (Peters

s.n., Port. East Africa, Rios de Sena). Although the type is lost, the identity of this species does not seem dubious. The identity of *K. macrophylla* Klotzsch l.c. (Peters s.n., Cabaceira) is less certain, but on the authority of Hiern (in Fl. Trop. Afr. 3, 58, 1877) it is considered conspecific with *K. longifolia*.

malacophyton K.Sch. in Bot. Jahrb. **33**, 333, 1903 (Dinklage 566, Gaboon, Sibange Farm). This is probably *O. nervosa* Hiern.

megistosiphon K. Sch. in Bot. Jahrb. **28**, 56, 1899 (Fischer 234, East Africa s.l.). The description leaves no doubt that this is *Conostomium quadrangulare* (Rendle) Cuf.

micrantha Chiov. in Bull. Soc. Bot. Ital. 1924, 39 (Mazocchi-Alemanni s.n., Angola, Mossamedes). The description leaves no doubt with regard to its identity, cf. *Amphiasma micranthum* (Chiov.) Brem.

microcoryne K.Sch. in Bot. Jahrb. **32**, 144, 1902 (Antunes s.n., Angola, Huilla). The description does not allow an identification. It may be conspecific with *O. angolensis* K. Sch., but even a so totally different species as *O. echinulosa* K.Sch. seems to answer the description.

Neumanni K. Sch. ex Engler in Sitzungsber. Preuss. Akad.d. Wiss. 1906, 736, nomen. As this species has never been described, it seems probable that it was identified afterwards with one of the earlier described species.

omahekensis K.Krause in Bot. Jahrb **48**, 406, 1912 (Seiner III 477, Kalahari, Omaheke). The identification was simplified by the existence of another specimen collected in the same locality and identified by Krause himself (Dinter 1874), cf. *Kohautia omahekensis* (K. Krause) Brem. The calyx has been described as 5-partite, but in this case it is quite clearly a mistake (see my remarks on *O. garuensis*).

paludosa K.Krause in Bot. Jahrb. **48**, 414, 1912 (Dinter 1782, S. W. Africa, Okosongomingo). This is probably *Kohautia amboensis* (Schinz) Brem., but as there is no certainty, I have retained the epithet chosen by Schinz.

parva J. Troch. in Bull. Mus. Hist. Nat. Paris sér. 2, **4**, 604, 1932 (Trochain 1536, Senegambia, R. Casamance). The description, which is accompanied by a good figure, makes it probable that this is a dwarf form of *O. caespitosa* Hiern. var. *caespitosa*.

procurrens K. Sch. in Bot. Jahrb. **34**, 329, 1904 (Engler 1403, Tanganyika, W. Usambara). This is evidently either *Parapentas silvatica* (K.Sch.) Brem. or else a very near ally of the latter.

rhodesiana S.Moore in Journ. of Bot. **40**, 250, 1902 (Rand 122 BM, S. Rhodesia, Salisbury). This seems to be *Kohautia lasiocarpa* Klotzsch var. *subverticillata* (K. Sch.) Brem.

Schaeferi K. Krause in Bot. Jahrb. **48**, 405, 1912 (Schaefer 335, Namaqualand, Little Karas). This is either *Kohautia caespitosa* Schnizlein var. *delagoensis* (Schinz) Brem. or else one of the varieties of *K. lasiocarpa* Klotzsch, but the description is not sufficiently detailed to allow a decision.

Seineri K. Krause in Bot. Jahrb. **43,** 131, 1909 (Seiner III 257, Bechuanaland, Matschabing). The description suggests *Kohautia virgata* (Willd.) Brem.; the only difficulty is that the stigmata are said to remain below the anthers.

silvatica K.Sch. in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895 (Holst 511, Usambaras, Mlalo). Other specimens identified by Schumann himself leave no doubt as to the identity of this species, cf. *Parapentas silvatica* (K.Sch.) Brem.

tenella (Hochst.) O.Ktze, Rev. Gen. Pl. **1,** 293, 1891; *Hedyotis tenella* Hochst. in Flora **27,** 553, 1844 (Krauss, Natal, Table Mountains). Recently specimens were collected in the same locality (McClean 193) which answer the description quite well (cf. *O. tenella*).

Trothae K.Krause in Bot. Jahrb. **43,** 133, 1909 (v. Trotha 119a, S. W. Africa, Windhoek). This is very probably *Kohautia aspera* (Heyne ex Roth) Brem.

Wiedemannii K.Sch. in Bot. Jahrb. **28,** 57, 1899 (Wiedemann s.n., Kilimanjaro, Mosji). This is evidently the same species as *O. Kaessneri* K.Sch. et K.Krause in Bot. Jahrb. **39,** 520, 1907, nom. illeg. nam non S. Moore in Journ. of Bot. **43,** 249, 1905, and as *O. Uhligii* K.Sch. et K.Krause in Bot. Jahrb. **39,** 518, 1907, of which the types were available. The name *O. Wiedemannii* therefore has been retained; my own description is based on the type of *O. Uhligii*.

zanguebariae Lour., Fl. Cochinch. 78, 1793 (Loureiro, Zanzibar). This is either *Kohautia obtusiloba* (Hiern) Brem. or *K. longifolia* Klotzsch. The description is not sufficiently detailed to allow a decision, and the name therefore has been dropped.

The two following species, although never referred as distinct species to *Oldenlandia*, deserve our attention.

Agathisanthemum Petersii Klotzsch in Peters, Reise Mossambique, Bot. **1,** 295, 1862 (Peters s.n., Port. East Africa, Querimba). This species was identified by Hiern (in Fl. Trop. Afr. **3,** 53, 1877) and by K. Schumann (in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895) with *A. Bojeri* Klotzsch, and as the description does not reveal important points of difference, this decision will have to be accepted.

Kohautia macrophylla Klotzsch l.c. 297 (Peters s.n., Port. East Africa, *Cabaceira*). This species was identified by Hiern. with *K. longifolia* (v. supra sub *O. longifolia*).

The material on which this study was based, was obtained from the herbarium of the Royal Botanic Gardens, Kew, the East African Herbarium, Nairobi, the National Herbarium, Pretoria, the herbarium of the Jardin Botanique de l'Etat, Bruxelles, the herbarium of the Muséum d'Histoire Naturelle, Paris, the herbarium of the Jardin Botanique de Genève, the herbarium of the Botanical Institute, Florence, the her-

barium of the Riksmuseet, Stockholm, the herbarium of the Botanical Garden, Copenhague and the herbarium of the Wiener Hofmuseum. Smaller collections were received from the Rijksherbarium, Leiden, the herbarium of the National History Museum, South Kensington, the herbarium of the Royal Botanic Garden, Edinburgh, the herbarium of the Department of Botany of the University of Cambridge and the herbarium of the Botanical Institute, Zürich. To the Directors and Keepers of these Institutes I tender my most hearty thanks. To Mr E. Milne-Redhead, Kew, and to Mr P. J. Greenway, Nairobi, I am moreover greatly indebted for the readiness with which they supplied me with information.

In the special part of this work I have quoted nearly all the specimens I have seen, but only in case of types, or when the latter were not available to me, of duplicates of the types, I have indicated the herbarium in which they are kept. To this end I have made use of the standard abbreviations given in Dr Lanjouw's list.

As the great majority of the specimens proved to be unica, I have refrained from giving a list of collectors' numbers.

GENERAL PART

The position of the *Hedyotideae*

The tribes over which the genera of the *Rubiaceae* have been divided, are in many instances badly defined, and their arrangement in larger groups is as yet unsatisfactory. This disappointing situation is due to the fact that the characters on which these tribes have been founded, prove to be of little or no morphological value. Morphologically of little importance is the number of ovules in the ovary cells, and of no value at all are the distinction between dry and fleshy fruits and that between winged and wingless seeds. A more thorough analysis reveals 1° that the ovary cells of nearly related *Rubiaceae* (species of *Tarenna* Gaertn. and of *Anotis* sensu Hook.f.) may contain either one or more than one ovule, and that the way in which the ovules are attached to the wall of the ovary, viz. either directly or through the intermediary of a placenta, and the part of the wall to which they are attached, are of far greater importance than their number, 2° that instead of the morphologically indefensible distinction between dry and fleshy fruits histological differences in the structure of the pericarp may sometimes be used for the characterization of the groups (*Gardenieae* sensu meo, *Guettardeae*), and 3° that the presence or absence of a wing round the seeds or at one or both of their ends is of much less importance than the structure of the cells of which the testa consists: whereas the latter is in all really natural groups remarkably constant, there is hardly any regularity at all in the occurrence of winged and wingless seeds. Among the African *Rubiaceae* that have been referred to the genus *Oldenlandia*, *O. crepiniana* K. Sch. is provided with distinctly marginate seeds, and among the Asiatic representatives of this group the species of *Dimetia* Meisn. ex. Korth. (*Hedyotis* L subgen. *Dimetia* W. et A.) possess seeds that are as distinctly winged as those of the genus *Danais* Commerç. ex Vent., which on account of the winged seeds was referred to the *Cinchoneae*.

A character to which so far no sufficient attention has been paid, is the presence or absence of raphide cells. It is true that the distribution of the various forms in which Ca-oxalate crystals appear, has been investigated in this family by Solereder (in Bull. Herb. Boiss. **1**, 310, 1893; see also his "Systematische Anatomie der Dicotyledones, Stuttgart 1899"), but this did not lead to proposals for a reform of the classification. As the presence or absence of crystal powder is somewhat difficult to ascertain, and as even the far more conspicuous styloids and stellate crystals are not always easily detected, we will confine ourselves to the

presence or absence of raphides. The study of the latter too offers some difficulties, for the raphide cells are not always so easily observable as in the majority of the *Hedyotideae, Spermacoceae* and *Psychotrieae*, where they appear in dried material on the surface of the leaves in the form of numerous short, slightly raised, white striae. When they are less plentiful, or when the leaves are coriaceous and therefore less apt to reveal their presence, they may usually be found in the split dissepiments of the fruits, where they appear in the guise of minute glistening paillettes. In this case, however, it is necessary to control our findings by the aid of the microscope, for it is always possible that the glistening cells do not contain raphides but crystal powder or a large number of rod-like crystals: it seems that Solereder did not always escape from this pitfall, for in some of the genera for which he records the presence of raphides (*Coptosapelta* Korth., *Urophyllum* Wall., *Lecananthus* Jacq.), they appear to be entirely wanting. Suitable objects for microscopical study are the more or less transparent stipules and various parts of the flower. Dried material is, as a rule, not easily sectioned, but when it has been boiled, small fragments can be crushed under the cover-glass, and when raphides are present, they will, almost always, appear in enormous numbers in the surrounding fluid.

Raphides are always present in the *Morindeae, Coussareae, Psychotrieae, Paederieae, Anthospermeae* and *Spermacoceae*, which on account of the valvate aestivation of the corolla lobes and of the solitary ovules not embedded in a fleshy placenta are regarded as nearly related. They are also found in the *Knoxieae*, who differ from this group of tribes in one point only, viz. in the pendulous ovules. The importance of this difference, however, should not be overrated, for the insertion of the ovules in the other tribes is not everywhere of exactly the same kind: in the *Morindeae, Coussareae, Psychotrieae, Paederieae* and *Anthospermeae* they are attached either to the base or at least to the basal part of the septum, but in the *Spermacoceae* they spring from the latter's centre. Raphides are present also in the *Rubieae* or *Galieae*, as they are usually called; the latter name, however, is to be dropped because the tribe contains the genus *Rubia* after which the family was called, and according to the "International Rules of Botanical Nomenclature" all subdivisions of the family of which this genus forms part, will have to derive their name from the latter. The position of the *Rubieae* in the group of tribes enumerated above, may seem somewhat dubious. It is true that they agree with the *Morindeae, Coussareae, Psychotrieae, Paederieae, Anthospermeae* and *Spermacoceae* in the valvate aestivation of the corolla lobes and in the presence of solitary ovules arising directly from the basal part or from the centre of the septum, but the fact that their leaves are usually verticillate and not accompanied by well-developed stipules seems to place them in opposition not only to this group of tribes but to all other *Rubiaceae*. The absence of stipules referable to one of the types found elsewhere in the family is doubtless

an unexpected feature: it has led to the supposition that this absence is but spurious and that the stipules are in reality not only present but even strongly developed; that they are not at once recognized, would be due to the circumstance that they have assumed the same form as the leaves. This interpretation is not fully convincing. The fact that in a species like *Galium sinaicum* Boiss. where no supernumerary leaves are present, the leaves are united by a similar narrow ridge as in the other species, as well as the circumstance that in the inflorescence the opposite bracts are never accompanied by clearly recognizable stipules, are difficult to reconcile with it. However, no matter what the morphological value of the supernumerary leaves may be, it can not be denied that they are a very peculiar feature. Their taxonomic importance, on the other hand, is markedly reduced by the fact that they are not present in all the representatives of this tribe. The difference between a plant like *Galium sinaicum* with its simply decussate leaves and one of the *Spermacoceae* remains confined to the degree of development of the stipular sheath and to the nature of the fruit, and is therefore hardly more important than that found between any other couple of plants taken from the tribes mentioned above. Some words, however, remain to be said on the kind of pollen found in these tribes. It is well-known that the pollen grains of the *Rubieae* are of the pluricolpate type, but it appears that this kind of pollen is not confined to them but returns in the *Spermacoceae*, where its presence was first noted by Fagerlind (in Act. Hort. Berg. **11**, 250, 1937) in the genus *Richardia* [Houst.] L. Fagerlind gives the grooves the form of pores provided with a thickened rim, but this is probably a mistake. I myself studied the pollen of *Richardia* [Houst.] L, *Diodia* [Gronov.] L, *Spermacoce* Gaertn., *Mitracarpus* Bth., *Staëlia* Cham. et Schlecht. and *Borreria* G. F. W. Mey. (cf. Plate I), but in all the species investigated by me the grains proved to be provided with distinct, though short, grooves, and a thickened rim was nowhere to be seen. In the first five genera the number of grooves varied between 9 and 13, but in *Borreria* I sometimes found a much smaller number. The very small pollen grains of *B. ocimifolia* (Burm.) DC possess but 3 or 4 grooves, those of *B. suaveolens* G. F. W. Mey. 7, those of *B. latifolia* (Aubl.) K. Sch. 9 and those of *B. xanthophylla* Brem. 11[1]). In the other tribes enumerated above I have so

[1]) In this respect it is noteworthy that *Perama* Aubl., a genus that by Hooker in the "Genera Plantarum" and by K. Schumann in Engler & Prantl's "Natürliche Pflanzenfamilien" was included in the *Spermacoceae*, but that was regarded by me (in Rec. d. trav. bot. Néerl. 31, 248, 1934) as a "genus incertae sedis", possesses tricolporate pollen grains and that the latter are not only of a much larger size than the tricolpate ones of *Borreria ocimoides* (Burm.) DC, but that they are also provided with longer grooves (Tab. I. fig. k). Although I am no longer of opinion that *Perama* should be excluded from the *Rubiaceae*, I still am convinced that it does not belong to the *Spermacoceae*, from which it differs in the rudimentary stipules, in the ascending ovules, in the entirely different seeds and, as we now know, in the structure of the pollen grains. The genus agrees with the

far seen no pollen grains of this type, but their occurrence in the *Spermacoceae* makes it impossible to exclude the *Rubieae* from this circle of affinity on account of the pollen structure.

The last large group in which raphides have been found, are the *Hedyotideae*. In their general aspect the representatives of this tribe are often strikingly similar to the *Spermacoceae*, from which they differ in the presence of a more or less considerable number of ovules per ovary cell, and, as a rule, by the presence of a more or less fleshy placenta. Hutchinson (in Hutch. and Dalz., Fl. West Trop. Afr. **2**, 69, 1931) places this tribe in the immediate vicinity of the *Psychotrieae* and the *Spermacoceae*, and in this I fully agree with him, but that he includes the *Knoxieae* in the *Hedyotideae*, is in my opinion a mistake: solitary pendulous ovules like those of the *Knoxieae* are never met with in the *Hedyotideae*, and the fleshy placenta of the latter is in the *Knoxieae* entirely unknown.

Raphides have also been found in a number of genera that so far have been included in tribes in which otherwise no raphides occur. They are *Bouvardia* Salisb., *Heterophyllaea* Hook.f., *Hindsia* Bth., *Hymenopogon* Wall., *Manettia* L, *Danais* Commerç. ex Vent., *Coursiana* Homolle and *Hillia* Jacq., which either on account of their winged seeds or else because of their adnate placentas have been referred to the *Cinchoneae*, *Deppea* Cham. et Schlecht., which on account of the contorted corolla has been included in the *Rondeletieae*, *Schradera* Vahl, *Lucinaea* DC, *Mycetia* Reinw., *Myrioneurum* R.Br. and *Coccocypselum* [P.Br.] Sw., which because of their fleshy fruits have been referred to the entirely artificial tribe *Mussaendeae*, and *Hamelia* Jacq. and *Hoffmania* Sw., which in Bentham and Hooker's "Genera Plantarum" were referred to a tribe *Hamelieae* and in Engler & Prantl's "Natürliche Pflanzenfamilien" to the *Gardenieae*.

The inclusion of the three nearly related genera *Bouvardia*, *Heterophyllaea* and *Hindsia*, and of *Manettia*, *Danais*, *Coursiana* and *Hymenopogon* in the *Cinchoneae* on account of the winged seeds is entirely arbitrary, for the testa, of which the wing is a mere outgrowth, is in all these genera entirely different from that of *Cinchona* and its nearest allies (cf. Tab. II, fig. a and Tab. VI, fig. d). They differ from the true *Cinchoneae* also in the nature of their placentas, which are short and fleshy and just as in the *Hedyotideae* attached by means of a short stalk to the basal part of the septum [1]), whereas in the true *Cinchoneae* they are always elongated

---

Spermacoceae in the solitary ovules, the absence of a fleshy placenta and the presence of raphides, but on account of the ascending ovules it comes nearer to the *Morindeae*, the *Coussareae*, the *Psychotrieae*, the *Paederieae*, the *Anthospermeae* and the *Rubieae*. However, as there seems to be no place for it in any one of them, it will have to be referred to a tribe of its own, the *Perameae*.

[1]) The figure of the longitudinal section through the ovary of *Heterophyllaea pustulata* Hook.f. given by K. Schumann in Engler & Prantl's "Natürliche Pflanzenfamilien" (IV, **4**, 48, fig. 18 G) is incorrect: the placentas are no mere swellings of the septum but they are, just as in *Bouvardia* and *Hindsia*, discoid structures attached by means of a short stalk to the basal part of the latter.

and united along their whole length with the septum. In fact, these genera agree in their main characters so completely with the *Hedyotideae* that I can see no reason why they should not be included in this tribe, a conclusion to which Baillon had come already long ago (see his "Histoire des Plantes").

The seeds of the *Hillia* species (Tab. V, fig. a.) are not winged but provided with a tuft of hairlike appendages, and they are therefore quite different from those of the true *Cinchoneae*, but their placentas are of the same kind as those of the latter. In general aspect, however, these plants show no resemblance at all to the *Cinchoneae*. *Hillia* is in my opinion an entirely isolated genus whose real affinities will be difficult to ascertain. The genera brought together by Hooker f. in the subtribe *Hillieae* have, apart from the contorted aestivation of the corolla lobes, hardly anything in common, and this subtribe therefore is to be regarded as entirely artificial.

Of the genus *Deppea* no fruiting material was available to me, and as without a study of the fruits and seeds the position of a Rubiaceous genus can not be accurately determined, I am unable to express as yet a definite opinion on it. Its habit suggests a place in the neighbourhood of *Hamelia*.

Schradera and the nearly allied *Lucinaea*, *Mycetia*, *Myrioneurum* and *Coccocypselum* have been referred to the *Mussaendeae* because of their fleshy fruits, but those of *Myrioneurum* divide into two cocci which themselves finally dehisce by a fissure beginning at the top and extending from there downwards along the ventral side, i.e. in a way that is usually met with in the *Hedyotideae*, and a similar kind of dehiscence is said to be present in some species of *Mycetia*, so that there seems to be no serious objection against a transfer of these two genera to the *Hedyotideae*. The position of *Schradera* and *Lucinaea*, however, is more difficult to determine.

In my "Notes on the Rubiaceae of Surinam" (in Rec. d. trav. bot. Néerl. **31**, 253, 1934) I have already pointed out that the *Mussaendeae* form in their present delimitation a very heterogeneous mixture, and that several of the genera that are at present included in this tribe, will have to be removed to separate ones. As examples of such genera I mentioned i.a. *Schradera* as type of a new tribe *Schradereae*, and *Coccocypselum* as type of a tribe *Coccocypseleae*. The position of the *Schradereae* with their peculiar habit, large deciduous stipules and thick-walled testa cells (Tab. III, fig. h and i) remains rather isolated, but the striking resemblance between *Coccocypselum* and *Lipostoma* D. Don, a genus that on account of its dehiscent fruits has been referred to the *Hedyotideae*, make it probable that the *Coccocypseleae* will have to be placed in the near vicinity of the latter, from which they differ mainly in the thick-walled testa cells (Tab. III, fig. g).

In more recent papers (in Rec. d. trav. bot. Néerl. **37**, 171, 1940 and in Journ. Arn. Arbor. **28**, 188 and 271, 1948) I suggested as a way out

of the difficulty a union of the *Mussaendeae* with the *Hedyotideae*, but as it appears now that the majority of the genera for which so far a place was claimed in the *Mussaendeae*, do not even belong to the same circle of affinity as the *Hedyotideae*, this would be a step in the wrong direction. As I have pointed out above, the *Hedyotideae*, *Coccocypseleae* and *Schradereae* belong to the same taxonomic group as the *Morindeae*, the *Coussareae*, the *Psychotrieae*, the *Paederieae*, the *Anthospermeae*, the *Spermacoceae*, the *Perameae*, the *Rubieae* and the *Knoxieae*, a group that may be set apart as the subfamily *Rubioideae*. The genus *Mussaenda* L and its nearest allies (*Aphaenandra* Miq., *Asemanthis* Ridl.) and also a number of more distantly related genera (*Sabicea* Aubl., *Isertia* Schreb., *Gonzalagunia* Ruiz et Pav. (cf. Tab. III, fig. c, d and e) possess seeds that are provided with a testa whose cells show in the bottom wall enormous circular or oval "pits", and for this reason this group of genera is to be placed in the same group as the *Rondeletieae* [1]), the *Condamineae* and the *Cinchoneae* (cf. Tab. II and Tab. III, fig. a and b). Raphides are in this circle of affinity always wanting. Other genera and groups of genera that have so far found a place in the *Mussaendeae* are provided with a testa that shows an entirely different structure, and can therefore not belong to the same circle of affinity as the true *Mussaendeae*. Thick walls traversed by an enormous number of very narrow pit-canals are characteristic for the testa cells of the following three groups: 1° the genus *Acranthera* Arn. ex Meisn., whose rather isolated position was discussed by me in Journ. Arnold Arbor. 28, 261, 1948, 2° the group formed by the Asiatic genera *Urophyllum* Wall., *Antherostele* Brem., *Didymopogon* Brem., *Maschalocorymbus* Brem., *Pravinaria* Brem., *Praravinia* Korth., *Raphidura* Brem., *Leucolophus* Brem., *Lepidostoma* Brem., *Crobylanthus* Brem., *Pleiocarpidia* K.Sch., and *Stichianthus* Val. (cf. Tab. IV, fig. d, e and g) and 3° the group which comprises the African genera *Pauridiantha* Hook. f., (Tab. IV, fig. h) *Pampletantha* Brem., (Tab. IV, fig. f), *Stelechantha* Brem., *Commitheca* Brem., *Poecilocalyx* Brem. and *Rhipidantha* Brem. and possibly also *Temnopteryx* Hook. f. and *Pentaloncha* Hook. f. Testa cells with thin walls that are either minutely dotted or more or less coarsely tuberculate are characteristic for the group of genera formed by *Pomazota* Ridl. (Tab. IV, fig. i), *Klossia* Ridl., *Siderobombyx* Brem., *Xanthophytum* Reinw. ex. Bl (Tab. VI, fig. f), *Lerchea* L (Tab. IV, fig. j), to which *Paedicalyx* Pierre ex Pitard, *Keenania*

[1]) Genera that will have to be excluded from this tribe are *Sickingia* Willd., whose seeds are winged and whose testa cells lack the characteristic large pits (cf. Tab. V, fig. b) and *Gleasonia* Standley, which on account of the large and flat exalbuminous seeds and also because of the very peculiar structure of the testa is to be referred to the *Henriqueziеae*, a tribe that will have to be removed as a separate family to the *Tubiflorae* (cf. Tab. V., fig. e-f). The two *Gleasonia* species of which the testa is figured in Tab. V differ so strikingly in the structure of the latter that they can hardly be left in the same genus. The structure of the testa of the type species unfortunately is unknown.

Hook. f., *Campanocalyx* Val., *Polysolenia* Hook.f. and *Leptomischus* Drake may perhaps also be referred. The three groups with thick-walled, densely and finely striate testa cells may be united into a tribe *Urophylleae*, and the group of genera with thin-walled, granulate or coarsely tuberculate testa cells to a tribe *Pomazoteae*. As the plants belonging to these two tribes are not provided with raphides, these tribes can not be included in the *Rubioideae*, and as their testa cells lack the large circular or oval pits of the *Cinchonoideae*, they can not be referred to that subfamily either.

Entirely different is the group of tribes that was discussed by me in the introduction to my "Monograph of the genus Pavetta" (in Fedde's Repert. **37**, 1934, pp. 11—12). I regard it as a subfamily for which I propose the name *Ixoroideae*. It is characterized by a style whose upper portion functions as a "receptaculum pollinis", which means that it serves as a temporary depository for the pollen; other important characters are the simple interpetiolar stipules, the insertion of the stamens in the mouth of the corolla tube and the absence of raphides. This subfamily comprises the *Ixoreae*, the genera *Crossopteryx* Fenzl and *Coptosapelta* Korth., which are sufficiently akin to be united in a tribe *Coptosapelteae*, the *Gardenieae* sensu meo, the *Cremasporeae* [1]) and the *Vanguerieae*. The position of the *Naucleae* and of the genus *Cephalanthus*, which agree with the *Ixoroideae* in the floral mechanism, remains uncertain. The *Naucleae* themselves are perhaps no natural group; the genera provided with dry fruits and winged seeds agree in the structure of the testa cells with the *Cinchonoideae*, and are probably better referred to that subfamily.

The *Guettardeae* form another quite distinct group which deserves the rank of a subfamily. This subfamily *Guettardoideae* differs from the rest of the *Rubiaceae* by the thinness of the endosperm layer and the comparatively large size of the embryo and also by the very peculiar kind of drupe. Anatomically they are characterized by the absence of raphides and, as a rule, by the presence of hairs in whose walls fairly large crystals of Ca-oxalate are embedded. The genus *Machaonia* H. B. K. lacks these hairs and has also a somewhat different kind of drupe.

---

[1]) In my "Monograph of the genus Pavetta" I used for this tribe the name *Alberteae*, but as in the genus *Alberta* E. Mey. itself the upper part of the style does not act as a "receptaculum pollinis" it can not be retained in this group. The same applies to the genus *Nematostylis* Hook. f., which agrees in its floral characters with *Alberta*, and to *Belonophora* Hook., whose style is included. The position of the genera *Alberta* and *Nematostylis* will be discussed in the next chapter in connection with that of *Jackia* Wall. The genus *Belonophora* is as yet but imperfectly known, and with regard to its real position I can offer no suggestions.

The delimitation and the subdivision of the *Hedyotideae*.

In most of the plants that are provided with raphide cells the aestivation of the corolla lobes is valvate. Exceptions to this rule are the genera *Deppea* Cham. et Schlecht. and *Hillia* Jacq. with a contorted, and *Hamelia* Jacq. and *Hoffmannia* Sw. with an imbricate aestivation of the corolla lobes. It is noteworthy that all these plants agree with each other in the presence of numerous ovules in the ovary cells. The genus *Deppea* has not sufficiently been studied, and its position therefore remains a matter of conjecture, but *Hillia*, which is comparatively well known, seems to be a very isolated genus. *Hamelia* and *Hoffmannia* may be united into a separate tribe, which, however, in contradistinction to Hooker's isonymous group, will be confined to genera provided with raphide cells. Nothwithstanding the aestivation of the corolla lobes is imbricate, it might in my opinion be referred to the subfamily *Rubioideae*, where it would have to find a place in the vicinity of the *Hedyotideae*, with which it agrees in the large number of ovules and in the structure of the testa cells.

Among the tribes with valvate aestivation of the corolla lobes by far the greater part possess uni-ovular ovary cells and ovules that are not embedded in a fleshy placenta. Pluri-ovular ovary cells and peltate, more or less distinctly swollen placentas are confined to the *Hedyotideae*, the *Coccocypseleae*, the *Argostemmeae* and the *Schradereae*.

Of the four tribes mentioned in the preceding paragraph the *Schradereae* occupy the most isolated position. It are glabrous epiphytic shrublets provided with rather thick shoots and fleshy leaves, and usually climbing by means of adhesive rootlets; the inflorescences are capituliform, and the flowers are provided with a cupular calyx; the fruits are baccate, and the seeds possess a testa consisting of elongated cells filled with a reddish gum and provided with thick, distinctly although not densely pitted walls (cf. Tab. III, fig. h and i).

The three other tribes with pluri-ovular ovary cells are more closely allied. The *Argostemmeae* are ombrophilous herbs differing from the *Hedyotideae* in the connivent anthers, which open by means of pores, and in the peculiar structure of the testa cells, whose outer wall bears a large semi-globose excrescence (Tab. VI, fig. a). The third tribe, the *Coccocypseleae*, consists of creeping herbs with simple stipules and granulate seeds, which possess a testa consisting of thick-walled cells (Tab. III, fig. g): in the *Hedyotideae* the testa cells are always thinwalled.

The tribe *Hedyotideae* as delimited by me differs considerably from the isonymous group distinguished by Hooker f. in Bentham and Hooker's "Genera Plantarum" and from the corresponding *Oldenlandieae* of K. Schumann in Engler and Prantl's "Natürliche Pflanzenfamilien". Quite

a number of genera that in these works were included, have been transferred to other tribes, whereas some other genera have been shifted to this one.

To the last group of genera belong *Bouvardia* Salisb., *Heterophyllaea* Hook. f., *Hindsia* Bth., *Manettia* Mutis ex L., *Danais* Commerç. ex Vent., *Coursiana* Homolle, *Hymenogogon* Wall., *Myrioneurum* R. Br. and *Mycetia* Reinw. *Bouvardia*, *Heterophyllaea*, *Hindsia*, *Manettia*, *Danais*, *Coursiana* and *Hymenopogon* were on account of the winged seeds included in the *Cinchoneae*, but differ from the latter, as I have pointed out in the preceding chapter, by the peltate placentas, the absence of the large pits in the basal wall of the testa cells and the presence of raphides. In fact, the presence of a wing round the seed appears to be a character of so little importance that it can not even be used for a subdivision of the *Hedyotideae* themselves.

Myrioneurum and *Mycetia* were on account of their fleshy fruits included in the *Mussaendeae*, but they differ from *Mussaenda* L and its nearest allies by the presence of raphides and by the absence of the large pits in the basal wall of the testa cells (cf. Tab. VI, fig. e). The fruits of *Myrioneurum*, moreover, contain but little mesocarp and split into two cocci, which finally open by means of a fissure starting from the top and extending downwards along the median side. In general aspect the *Myrioneurum* species show a striking resemblance to some of the representatives of *Hedyotis* L subg. *Diplophragma* W. et A. The fruits of some of the *Mycetia* species are said to open in the end, but this statement should be received with some reserve; the fruits of the species that I could study, certainly were indehiscent. The genus occupies a somewhat isolated position in the *Hedyotideae*, not only because of the fleshy fruits, but also on account of the simple, triangular stipules.

The list of genera that are to be excluded from the *Hedyotideae* comprises e.g. *Lerchea* L, *Pomazota* Ridl., *Xanthophytum* Reinw., *Argostemma* L, *Neurocalyx* Hook. (either partly or entirely, v. infra), *Virecta* auct. non L.f., *Spiradiclis* Bl., *Ophiorrhiza* L, *Carlemannia* Bth. and *Sylvianthus* Hook. f.; and from those included in the corresponding tribe by Schumann another one has to be added to this list, viz. *Jackia* Wall. With the exception of *Argostemma*, which on account of the syngenesious anthers with their apical dehiscence and of the peculiar structure of the testa was referred to a separate, although nearly related tribe, none of them possess raphides, and for this reason they can not even be referred to the same subfamily as the *Hedyotideae*. A closer inspection reveals that they differ from the latter in important points.

Carlemannia and *Sylvianthus* are provided with dentate leaves and their flowers possess but two stamens. They are therefore to be excluded from the family: as Solereder already indicated, they belong in the vicinity of the *Caprifoliaceae*.

The monotypic genus *Jackia* shows according to Hooker no definite

relation to any other genus or group of genera within the family, and our knowledge of this genus has not made enough progress to justify another opinion. Why Schumann referred it to the *Hedyotideae* is unknown. He may have been somewhat overawed by *Jackia's* fringed stipular sheath, which is a rather common character in this tribe, but it is perhaps more probable that the inequality of the calyx lobes and their persistence on the fruit reminded him of the genera *Cruckshankia* Hook. et Arn. and *Dirichletia* Klotzsch, with which *Jackia* also agrees in the small number of ovules and in the attachment of the latter by means of a stalk to the base of the septum. This stalk, however, is in *Jackia* much shorter and less robust, and the small number of ovules as well as the inequality of the calyx lobes are characters that return in several tribes. The indehiscent fruit with its spreading calyx, which serves as a parachute, might suggest affinity with *Alberta* E.Mey. and *Nematostylis* Hook.f. It agrees with these genera also in the included anthers and the long-exserted style, but it differs from them in the ascending instead of pendulous, and collateral instead of solitary ovules, in the valvate instead of contorted aestivation of the corolla lobes, in the forked inflorescence with its monochasial branchlets and comparatively large bracts, and in the fringed stipular sheath. It is noteworthy that the position of the genera *Alberta* and *Nematostylis* themselves is also uncertain (see the note on the *Cremasporeae* at the foot of p. 17). A nearer affinity between the genus *Jackia* and the genera *Alberta* and *Nematostylis* nevertheless does not seem excluded. It is a possibility that certainly deserves a serious consideration.

Of the genus *Neurocalyx* I could investigate only some of the Bornean species which Airy-Shaw (in Kew Bull. 1937, 281) referred to a special section *Thyrsoideae*. In these plants the structure of the testa cells (cf. Tab. II, fig. f) appeared to be similar to that found in various *Condamineae* and *Rondeletieae*, e.g. in *Chimarrhis* Jacq., *Bathysa* Presl, *Wendlandia* Bartl., *Eleagia* Wedd. and *Limnosipanea* Hook.f. (cf. Tab. II and III, fig. a and b), which means that the large circular or oval "pits" by which the subfamily *Cinchonoideae* is characterized, are so numerous that they occupy the greater part of the basal wall. The aestivation of the corolla lobes, moreover, proved to be contorted, and it is clear therefore that these species are to be referred to the *Rondeletieae*. However, as Airy-Shaw describes and figures the testa cells of the type species and of some of its allies as "non-punctate", it is not impossible that this part of the genus will have to be retained in the *Hedyotideae*. In that case Airy-Shaw's section *Thyrsoideae* will have to be raised to generic rank.

In the genera *Lerchea* and *Pomazota* the testa cells are provided with comparatively thin walls, of which the basal one proves to be decorated with a large number of subglobose warts (cf. Tab. IV, fig. i and j), and as these genera also agree in several other important characters, e.g. in

the large size of the leaves and stipules and in the structure of the inflorescence and of the flower, it can not be doubted that they are nearly related. The testa cells of *Xanthophytum* too are thin-walled, but the basal wall is not coarsely tuberculate but minutely granulate (cf. Tab. VI, fig. f). However, as this genus agrees with the two other ones in the character of its leaves and stipules, in the included anthers and the exserted style, there seems to be good reason to regard it as a near ally. In the preceding chapter they have already been referred to a new tribe *Pomazoteae*.

The genera *Ophiorrhiza* and *Spiradiclis* differ from each other in the shape of the capsule and in its mode of dehiscence. The short capsule of *Ophiorrhiza* is drawn out in a direction perpendicular to the septum, and the dehiscence takes place inside the calyx by means of a loculicidal fissure, whereas the capsule of *Spiradiclis* is more or less cylindrical and splits loculicidally as well as septicidally to the very base. In other respects, however, these genera show a striking similarity: their representatives are comparatively large-leaved herbs with the same kind of stipules and the same kind of inflorescences and flowers. Particularly striking is the close agreement in the structure of the testa cells, which possess thick walls ornamented with strongly reflecting warts (cf. Tab. IV, fig. b and c).

A very similar kind of testa is found in the genus *Virecta* auct. non L. f., (cf. Tab. IV, fig. a) for which I propose the new name *Virectaria* [1]). The only difference of any importance is found in the somewhat larger size of the cells. Although it can not be said that this genus shows a very striking resemblance to *Ophiorrhiza* and *Spiradiclis*, there are in reality no important differences between them: the most weighty one is found in the shape of the capsule and in the latter's mode of dehiscence. The capsule of *Virectaria* is subglobose and splits loculicidally to the

---

[1]) The name *Virecta* can not be maintained for this genus, because the type species, *V. biflora* L.f., has been transferred to another genus, viz. to *Sipanea* Aubl. It is not impossible that the subgenus of *Sipanea* in which this species has found a place, will one day be raised to generic rank, and in that case the name *Virecta* will have to be restored to it. The African group of species for which the name was used by Smith and others, will have to be rechristened, and as no old name seems to be available, a new one has to be provided. I propose *Virectaria*. Six species of *Virecta* will have to be referred to it. They become: *Virectaria angustifolia* (Hiern) Brem., *V. heteromera* (K. Sch.) Brem., *V. Kaessneri* (S. Moore) Brem., *V. multiflora* (Smith) Brem., *V. procumbens* (Smith) Brem., and *V. salicoides* (C. H. Wright) Brem. *Virecta major* K. Sch. has been reduced by the author himself (in Bot. Jahrb. 23, 422, 1897) to *V. multiflora*, but according to Mr B. Verdcourt (in litt.) it is conspecific with *V. Kaessneri*; *V. lutea* G. Don and *V. paniculata* G. Don are insufficiently known, and *V.? obscura* K. Sch. is, judged from the description, conspecific with or at least nearly allied to *Oldenlandia silvatica* K. Sch., which is my *Parapentas silvatica* (v. infra). The position of *V. setifera* Hiern remains dubious. Mr Verdcourt informs me that it contains numerous raphide cells. This species too will therefore have to find a place in the *Hedyotideae*.

base. Its mode of dehiscence is therefore more or less intermediary between that of *Ophiorrhiza*, where the fissure does not extend beyond the area included within the calyx, and that of *Spiradiclis*, where it reaches the base of the capsule, but where the valves themselves split once more. In my opinion these three genera are to be referred to a new tribe, for which I propose the name *Ophiorrhizeae*.

At first sight the testa cells of *Virectaria* are not unlike those of *Sipanea pratensis* Aubl. and its nearest allies (cf. Tab. II, fig. g), and this is the more remarkable as these genera were confused by the earlier authors on account of a habitual similarity. A closer scrutiny, however, reveals that the agreement in the structure of the testa too is spurious. It appears to be due to the circumstance that the circular or oval "pits", which form the characteristic feature of the testa cells of the *Cinchonoideae*, are in these *Sipanea* species but few in number and comparatively small. However, in the subgenus based on *Sipanea biflora* (L. f.) Cham. et Schlecht. (*Virecta biflora* L. f.) the "pits" are far more conspicuous (Tab. II, fig. h), and the testa cells of these species show, in fact, a striking resemblance to those found in some species of *Rondeletia* [Plum.] L (cf. Tab. III, fig. a and b). This means that there is no reason to assume a real affinity between *Virectaria* and *Sipanea* (incl. *Virecta*).

The classification of the genera that are included by me in the reformed tribe *Hedyotideae*, offers considerable difficulties. It is true that some of the genera differ in a very marked way from the rest, but in their case it is not always fully certain that they really belong to this tribe. This applies e.g. to the genus *Cruckshankia* Hook. et Arn. Hook. f. referred it in Bentham and Hooker's "Genera Plantarum" to a tribe of its own, but the character upon which the latter was based, the presence of collateral ovules in the ovary cells, has proved to be less general than originally was assumed, for in some species the ovary cells were found to contain three ovules. The taxonomical value of the character, moreover, has been overrated; in some genera collateral ovules are found side by side with solitary ones (*Pavetta* L, *Tarenna* Gaertn.) or with a larger number arranged in a different pattern (*Tarenna* Gaertn.). As the foundation of Hooker's tribe therefore proved deficient, Schumann felt himself compelled to reject it, but this meant that he had to find another place for the genus. As the ovules of *Cruckshankia* are attached to a rod-like placenta springing from the base of the septum, a comparison with the genera *Carphalea* Juss., *Dirichletia* Klotzsch and *Anotis* DC, in which a similar kind of placentation is found, seemed plausible, and this led to its inclusion in the *Hedyotideae* (in Schumann's nomenclature the *Oldenlandieae*). The assumption of a closer affinity with these genera finds support in the very small number of ovules found in the ovary cells. However, if the figure of the longitudinal section through the seed given by Schumann in the "Natürliche Pflanzenfamilien" (IV, **4**, 32, fig. 8 R) is to be trusted, the structure if the latter with its thick testa,

which seems to consist of a kind of palissade cells, is so entirely different from that which I regard as characteristic for the *Hedyotideae*, that it seems impossible to retain it in this tribe. The position of *Carphalea* and *Dirichletia* is not so very certain either, but as I had no opportunity to study these genera myself, I will not enter into details. The position of *Mycetia* seems better assured, although it must be admitted that it differs from the other genera in important points, e.g. in the simple stipules and in the baccate fruits.

The rest of the genera form a rather uniform group, and although the differences are on the whole sufficiently clear to allow the construction of an artificial key, our knowledge of several of them is as yet too incomplete to allow the distinction of well-defined subtribes. For the construction of a key use can be made of the tetramery or pentamery of the flowers, of the monomorphism or dimorphism of the latter and in the case of the monomorphic ones of the position the anthers occupy with regard to the mouth of the tube and with regard to the stigma or stigmata, of the equal or unequal development of the calyx lobes, of the baccate, drupaceous, dicoccous or capsular fruit and, in case the fruit is of the latter type, of the mode of dehiscence, of the more or less isodiametrical or dorsiventrally flattened and, eventually, marginate or winged seeds, of the fleshy or corneous endosperm, of the nature of the stipules, of the presence or absence of the faculty to wind round a support, of the presence or absence of septate hairs, etc., but so far it seems to be of little importance with what set of characters we begin, for hardly any one of the subdivisions obtained in this way proves to be a really natural group.

That the division of the *Hedyotideae* into two main groups according to the tetramery or pentamery of the flower must be regarded as artificial, becomes clear when we see that in the monotypic genus *Thecorchus*, of which a description is given in the special part of this paper, tetramerous and pentamerous flowers are found in about equal numbers on the same specimen, and when we realize that the genus *Pentodon* Hochst., which owes its name to the number of its calyx teeth and whose corolla and androecium too are always pentamerous, must be regarded as a very near ally of the species with tetramerous flowers that are left by me in the genus *Oldenlandia*.

Differences in the floral mechanism can not be used either for the distinction of natural groups, for even among the nearest allies of *Oldenlandia* and *Hedyotis* all sorts of flower types prove to be represented. Unisexual flowers occur in *Nesohedyotis arborea* (Roxb.) Brem. n. comb. (*Hedyotis* Roxb.), the small tree that represents this group of genera in St Helena, and species provided with heterostylous flowers with either the style or the stamens protruding beyond the mouth of the corolla tube occur in several genera side by side with species provided with isostylous flowers; in the genus *Kohautia* Cham. et Schlecht., both the

stamens and the style are included, and the stigmata, moreover, remain always at a lower level than the anthers, whereas in *Conostomium* Cuf. the stamens are included but the style exserted.

Inequality of the calyx lobes too proves to be a character of secundary importance, which recurs in several unrelated tribes. When *Cruckshankia*, *Dirichletia* and *Carphalea* are left in the *Hedyotideae*, it occurs in this tribe in three unrelated or but distantly related groups, viz. in the first place in the genera *Pentas* Bth. and *Otomeria* Bth., next in *Carphalea* and *Dirichletia*, and finally in *Cruckshankia*. The near affinity between *Pentas* and *Otomeria* can not be doubted, and in my new genera *Chamaepentas* and *Tapinopentas*, of which descriptions are to be found further on and which are to be regarded as near allies of *Pentas*, the calyx lobes are also unequal, but in *Parapentas* Brem., another very near ally of *Pentas*, they are either subequal or fully equal, so that even in this comparatively restricted group the inequality of the calyx lobes can not be regarded as a general character.

The structure of the fruit does not seem to be of much value either. Baccate fruits are confined to *Mycetia*, which indeed occupies a somewhat isolated position within the tribe, and dipyrenous drupes are found in all the species but one of Blume's genus *Metabolos*, the exception being *M. rugosa* Bl., which is but distantly related with the other species and can not be regarded as congeneric. In the remaining genera the fruits are either dicoccous or capsular. Capsular fruits are most often met with, and the most common mode of dehiscence is that by means of a loculicidal split that does not extend beyond the area included in the calyx, but a combination of septicidal and loculicidal dehiscence is not rare either. However, apart from the baccate fruits none of these fruit types seem to be restricted to well-defined groups.

The form of the seeds does not help us either. Even the winged seeds are not always an indication of affinity. It is true that the genera *Bouvardia*, *Heterophyllaea*, *Lecanosperma* and *Hindsia* must be regarded as nearly related, but *Manettia* with its winding shoots and corneous endosperm occupies a rather isolated position, and *Danais* and *Coursiana* belong with *Dimetia* to the entirely different *Hedyotis* group; *Hymenopogon* too does not show any well marked affinity with the other groups.

Corneous endosperm occurs in *Houstonia* (cf. Tab. VI, fig. g) and in some other, apparently nearly related, American genera, and also in *Manettia*, which is certainly no very near ally. By far the great majority of the *Hedyotideae* possess fleshy endosperm.

The size and shape of the stipules and the way in which they are connected with the leaves as well as the presence or absence of colleters may be used for the characterization of definite genera and even of small groups of genera, but I hardly think that these characters are sufficiently stable to be used on a larger scale.

The faculty to wind recurs in such widely divergent genera as *Manettia*

and *Stephanococcus* Brem. v. infra, and can certainly not be regarded as an indication of affinity.

Septate hairs are characteristic for the genera *Pentas*, *Chamaepentas*, *Parapentas* and *Tapinopentas*, which are all very nearly allied, and for *Otomeria*, which is also to be regarded as a near ally.

Apart from a few small groups like the one just mentioned and that formed by the genera *Bouvardia*, *Heterophyllaea*, *Lecanosperma* and *Hindsia*, and a number of more or less isolated genera like *Mycetia*, *Manettia* and *Hymenopogon*, the great majority of the genera seem to form a single group, and with a few exceptions the genera dealt with in this work belong to the latter. The exceptions are formed by the genus *Sarcosperma*, which occupies a rather isolated position, by *Parapentas*, *Chamaepentas* and *Tapinopentas*, all nearly related to *Pentas*, by *Thecorchus*, an ally perhaps of *Otomeria*, and perhaps by the genus *Exallage* Brem. n. nom. The latter corresponds with the more important part of Blume's genus *Metabolos*, but as this part does not include *M. rugosus* Bl., the species that was designated by Hochreutiner as the generic type, it had to receive a new name [1]). The genus *Exallage* is well characterized by the axillary inflorescences and especially by the very small fruits, which are usually described as dicoccus, but which in reality are dipyrenous drupes. It is true that in herbarium specimens the fruits can be split by pressure into two halves which look more or less like cocci, but I do not think that this ever happens in nature. The outer layer of the pericarp, moreover, is somewhat fleshy, and the mature fruit is white, which suggests a dispersal by fructivorous animals. For further particulars I refer to the next chapter.

Generic Differences among the African *Oldenlandiae* of Hiern e.a.

In the preceding chapter I have drawn the attention to the fact that the number of flower parts is remarkably constant in the genera of the *Hedyotideae*: their flowers are either 4-merous or, in other genera, 5-merous. This does not mean that 5-merous flowers are never met with in specimens belonging to species whose flowers on account of their generic position are supposed to be 4-merous, but except in *Thecorchus* Brem. this remains an exception, and where it occurs, the percentage of flowers with the aberrant number of parts is usually very small (see, however, *O. goreënsis* (DC) Summerh. var. *trichocaula* Brem.). Therefore, if we select from the list of species all those of which the flowers are known to be 5-merous, there is a good chance that these species will prove to belong to distinct

[1]) The only representative of this genus in Africa is a species that up to now has been known as *Hedyotis auricularia* L, but as the generic name *Hedyotis* is reserved by me for *H. fruticosa* L and its nearest allies, a new generic name had to be found for this *H. auricularia*. See my remarks on this question in the next chapter and in the Special Part.

genera. I will not enter at this place into details with regard to those species of which the types are lost: apart, perhaps, of the enigmatic *O. geminiflora* K. Sch. there are no species among them of which it is sufficiently certain that their flowers really are 5-merous (see my remarks on *O. garuensis* K. Krause, *O. Ledermannii* K. Krause and *O. omahekensis* K. Krause in the introduction to this work). *O. geminiflora* might belong to another family; if it really is a *Rubiacea*, it will probably have to be referred to a genus that is entirely new or at least new for Africa.

Apart from *Pentodon pentander* (Schum.) Vatke (*O. macrophylla* DC) the two following species with 5-merous flowers were investigated: *O. peltospermum* Hiern and *O. silvatica* K. Sch.

O. peltospermum Hiern was a new name for the plant described by Bentham as *Peltospermum paniculatum*. Bentham's genus was revived by G. Taylor (in Exell, Cat. Vasc. Pl. S. Tomé, 218, 1944), but as the name *Peltospermum* Bth. is a later homonym of *Peltospermum* DC, which was used for a genus belonging to the *Apocynaceae*, Taylor gave it a new name, viz. *Sacosperma*. Because of the free stipules and the peculiar structure of the inflorescence this genus occupies a somewhat isolated position among the *Hedyotideae*. The inflorescence is a terminal panicle whose branchlets are either once dichasial with monochasial prongs or entirely monochasial, and whose flowers are arranged in pairs at the nodes. This arrangement of the flowers is also found in the Brasilian genus *Leptoscela* Hook. f. and in the plant described by Schumann under the illegitimate name *O. geminiflora* (v. supra). In these plants too the flowers are 5-merous. Further particulars on the genus *Sacosperma* are given in the Special Part.

O. silvatica K. Sch. shows a greater affinity to *Pentas* than to *Oldenlandia* and *Hedyotis*. It resembles the *Pentas* species not only in the 5-merous corolla but also in the nature of the stipules with their fringe of setae crowned by colleters, and in the character of the indumentum, which consists of septate hairs. It differs from the typical representatives of this genus in its procumbent habit, the sympodial structure of the shoots, the much smaller number of nerves in the leaves, the pseudo-axillary, few-flowered inflorescences, the equality or subequality of the calyx lobes, the nearly or entirely glabrous inside of the corolla tube, the monomorphous flowers with the stamens as well as the style exserted, and the nearly flat top of the capsule. On account of these differences I refer this species to a new genus *Parapentas*, of which a detailed description will be given in the Special Part. Among the unnamed material I received from the Kew Herbarium, from the Muséum d'Histoire Naturelle, Paris, and from the East African Herbarium, Nairobi, I found some other species which proved to be referable to the same circle of affinity: two of them could be included in *Parapentas*, and for the other ones two new genera, *Chamaepentas* and *Tapinopentas*, were created. They too are described in the Special Part.

The flowers of *O. wauensis* Schweinf. ex Hiern are partly 4-merous and partly 5-merous, and some are provided with a 5-merous calyx and a 4-merous corolla. In the case of this species the number of flower parts is therefore of no help. In general aspect this plant is not unlike the *Otomeria* species, for it has the same kind of spike-like monochasial inflorescence, the same elongated ovary and the same elongated placenta, but it differs conspicuously from the latter in the very small size of the flowers, in the equality of the calyx lobes and in the structure of the testa with its much smaller cells. I refer it to a new genus *Thecorchus*, which is to be placed in the vicinity of *Otomeria*.

Among the species with 4-merous flowers *O. senegalensis* (Cham. et Schlecht.) Hiern and its allies form the largest and most easily recognizable group. It is the old genus *Kohautia* created by Chamisso and Schlechtendahl and accepted by De Candolle in his "Prodromus", by Meisner in "Plantarum Vascularum Genera I" and by Klotzsch in Peters, "Reise nach Mossambique". The description drawn up by De Candolle gives a good picture of this genus: it mentions the long cylindrical corolla tube, the sessile anthers included in the latter's upper part, and the short style whose stigmata do not attain the level of the anthers. Hooker in Bentham and Hooker's "Genera Plantarum" and K. Schumann in the "Natürliche Pflanzenfamilien" reduced this genus to a section of *Oldenlandia*. The delimitation of this section by Schumann is unsatisfactory, for it includes a number of American species that in reality belong to an entirely different circle of affinity. In Engler's "Pflanzenwelt Ost-Afrikas C" (p. 376, 1895) too his delimitation is unacceptable, for here he refers to it i.a. *O. decumbens* (Hochst.) Hiern and *O. Holstii* K. Sch., which in reality belong to *Oldenlandia* s.s., and *O. silvatica* K. Sch., which is the type of my new genus *Parapentas* (v. supra). The remark with which he ends the description of *O. Holstii* "erinnert in den aufrechten Formen an *O. Heynii* (R. Br.) Oliv., ist aber durch die viel grösseren Bl., die sehr auffallend heterostyl sind, als echte *Kohautia* zu erkennen" proves that he had an entirely wrong idea of *Kohautia*, for the flowers of the latter are never heterostylous.

The genus *Kohautia*, as was already recognized by De Candolle, is well characterized by the cylindrical corolla tube with its slightly widened upper part, which contains the sessile anthers, and by the short style, which is, as a rule, entirely included in the narrow lower part of the tube; in a few species, however, the stigmata are with their top in touch with the basal parts of the anthers. Another characteristic feature is found in the structure and in the size of the pollen grains. The latter are provided with three to seven pores situated in grooves, and although their size varies with the number of pores, it is always rather small, the tricolporate grains being smaller than those found in most of the other genera of this group.

The type of floral mechanism found in the genus *Kohautia* deserves

our special attention. It acts in this way that the proboscis of the visiting insect comes in touch with the stigmata, and receives from the latter a little of the viscid substance with which they are coated. When the proboscis is withdrawn, the pollen grains are caught in this deposit of sticky stuff. In the next flower part of the pollen grains will be deposited on the stigmata. This kind of floral mechanism, which was observed for the first time by Fritz Müller in the genus *Vinca*, occurs in several *Rubiaceae*, but the latter do not all of them belong to the same taxonomic group. I observed it in the section *Eusipanea* K. Sch. of *Sipanea* Aubl., in my own genus *Cladoceras*, in *Posoqueria* Aubl. and in part of the *Guettardeae*, viz. in *Guettarda* L, *Antirrhoea* Commerç. and *Laugeria* Vahl.

Another group of species with long cylindrical corolla tube and included anthers but with an exserted instead of included style is formed by *O. megistosiphon* K. Sch. (syn. *O. dolichantha* Stapf), *O. longituba* Beck (syn.: *O. rotata* Baker, *O. fasciculata* Hiern, *O. rhynchotheca* K. Sch.), *O. natalensis* (Hochst.) O.Ktze and *O. zoutpansbergensis* Brem. *O. dolichantha* was referred by its author to a section *Conostomium*, which Cufodontis recently (in Nuovo Giorn. Bot. Ital. **55,** 85, 1948) raised to generic rank. In my delimitation it comprises three well-defined sections: the first is represented by *Conostomium longitubum* (Beck) Cuf. and its allies, a group of xerophytic shrublets from Somaliland, Abyssinia and Kenya with either terminal or subspicate, and in that case always bibracteolate, flowers; the second by *C. quadrangulare* (Rendle) Cuf. (*Pentas* Rendle), which is the correct name for *O. megistosiphon* K. Sch. and *O. dolichantha* Stapf, a herbaceous plant with a spiciform inflorescence consisting of flowers with a white corolla of uncommonly large size; whereas the last group comprises two mesophytic herbs from Southern Africa, viz. *C. natalense* (Hochst.) Brem. and *C. zoutpansbergense* (Brem.) Brem., both with terminal corymbs of blue, lilac or pink flowers.

Conostomium has much larger flowers than *Kohautia*, and its capsules too reach a larger size. The generic name was derived from the beak on top of the latter, but this is no general feature: in one of the species of the first section there is hardly any beak. A more important character is found in the exserted stigmata. However, in some of the species occasionally specimens are found in which the stigmata are included. According to a note appended to one of these specimens in the Kew Herbarium Stapf was of opinion that this indicated the presence of a floral dimorphism, but I am inclined to regard these aberrant specimens as teratological, in the first place because they are less common than plants with exserted style, and in the second place because the stigmata of brachystylous flowers are always found at the same level as the anthers of the dolichostylous ones, and vice versa, whereas the anthers of the short-styled *Conostomium* flowers are found at a much lower level than the stigmata of the long-styled flowers, and their stigmata at a much lower level than the anthers of the latter. In the only known specimen of *C. zoutpansbergense* of which the flowers have been preserved, the anthers

proved to be completely sterile, so that this specimen is to be regarded as female. It is possible, of course, that in this case too we have to deal with an abnormality. So far we have in this circle of affinity but one paleotropic species of which we know with certainty that its flowers are unisexual. This is *O. arborea* Roxb., the arborescent representative of the group in the island St Helena. It is referred by Hooker f. in Bentham and Hooker's "Genera Plantarum" to a section *Nesohedyotis*, which I raise to generic rank; its name therefore becomes *N. arborea* (Roxb.) Brem. In the section *Wiegmannia* (Meyen) of the Polynesian genus *Kadua* Cham. et Schlecht., which belongs to the same circle of affinity, the flowers have been described as gynodioecious (cf. Fosberg in Bull. Bernice P. Bishop Museum **174**, 29, 1944), but there is good reason to assume that here too they are in reality unisexual (cf. Skottsberg in Archiv f. Bot. **31**, (4), 2—11 et 24, 1944). The short-styled flowers observed in some species belonging to the first section of *Conostomium* can certainly not be regarded as male ones, for the ovary is normally developed and fruits are regularly produced. Other important characters of the genus *Conostomium* are the large pollen grains provided with pores not situated in grooves, and the finely punctate testa cells.

Long-tubed flowers are also met with in a plant that has never been referred to *Oldenlandia*, but which nevertheless belongs without any doubt to this circle of affinity. This is *Pentanopsis fragrans* Rendle. The genus *Pentanopsis* Rendle shows no near affinity to *Pentas*, but is to be regarded as an ally of *Conostomium*, from which it differs in the induplicate-valvate instead of simply valvate aestivation of the corolla lobes, the clavate hairs by which the latter are covered, the colporate pollen grains, the dorsiventrally flattened seeds and the non-punctate testa cells.

Among the remaining species with 4-merous flowers the most aberrant ones are those with indehiscent fruits. This group is represented in Africa by one species only, the *O. leopoldvillensis* de Wild. found in the Belgian Congo in the neighbourhood of some of the European settlements. It proved to be conspecific with *Exallage auricularia* (L) Brem. n. comb. (*Hedyotis* L), a species found in India, Indo-China and Malesia. It is in Africa probably a recent introduction.

Hedyotis auricularia L is one of the species that are mentioned by Linné in the first edition of the "Species Plantarum". By several authors, first of all by Chamisso and Schlechtendahl (in Linnaea **4**, 160, 1829), it was accepted as the type of the genus, but as Linné described the fruit of the latter as dehiscent, and as the fruits of this species are indehiscent, it seems clear that their preference was misplaced. For this reason I have made already at an earlier occasion (in Rec. d. trav. bot. Néerl. **36**, 438, 1939) a proposal to replace *H. auricularia* L as type of the genus by *H. fruticosa* L [1]).

[1]) An argument in favour of the selection of *H. auricularia* L as the type of the genus might be found in the generic name itself. Various authors have interpreted "*Hedyotis*" as "provided with nice ears", and they were of opinion that these

Another argument against the choice of *H. auricularia* is found in the circumstance that Blume had already in 1826 created a new genus for the reception of the group of species to which the latter belongs, viz. *Metabolos*. It is true that Blume did not mention *H. auricularia*, but as the latter is conspecific with his own *Metabolos venosus*, there can be no doubt that he would have included this species in his genus when he had been able to study it in the herbarium. This means, in my opinion, that the question had already been decided in 1826, so that the choice made in 1829 by Chamisso and Schlechtendahl was illegitimate.

The name *Metabolos*, unfortunately, can not be retained for the group of species round *H. auricularia*, because its use has been restricted by Hochreutiner (in *Candollea* **5**, 277, 1934) to M. *rugosus* Bl., a species that is either identical or at least very nearly related with the Ceylon plant described by Thwaites under the name *Allaeophania decipiens*. The description of the genus *Metabolos* allows this, for it has been drawn up in such a way that it covers *M. venosus* and its allies as well as the totally different *M. rugosus*. This means that we will have to find a new name for *M. venosus* and its allies. As such I propose *Exallage*, which conveys the same idea as Blume in my opinion wished to express with the name *Metabolos*, viz. a group of species standing beside another one, with which in this case, of course, the genus *Hedyotis* is meant. That Blume should have chosen the name *Metabolos* to express the variable character of the genus, as has been suggested by others, does not seem likely, for habitually Blume's *Metabolos* species are all very similar, and the difference in the structure of the ovary on account of which the genus had to be split, would in Blume's time hardly have been regarded as an example of a noteworthy variability.

A description of the genus *Exallage* and a preliminary list of the species that are to be included, will be given in the special part of this work. In Africa it is, as we now know, represented by one species, viz. *E. auricularia* (L) Brem., and, as stated above, there is good reason to assume that it is in this part of the world a recent introduction: this species, in fact, is an anthropochorous weed.

O. crepiniana K. Sch. shows in its axillary inflorescences and in the small size of its fruits some resemblance to the *Exallage* species, but in other respects the fruits are entirely different: they are dicoccous, and the cocci themselves finally open by a fissure beginning at the top and extending along the median side. The seeds too are quite different, for

"ears" might be found either in the stipules or in the calyx lobes, but it seems to me that they overlooked the more plausible explanation that it is merely a Greek translation of the name "*Auricularia*" (Dale, Pharm. 160, cf. Dassow, Nova Gen. Pl. Zeyl. 1747, in Amoen. Acad. 1, 391), which was given to the plant because it is used as a medecine against ear ache. In this case "*Hedyotis*" would mean "softening to the ear", and this, of course, would not apply to the other *Hedyotis* species described by Linné. However, arguments of this nature can not be regarded as decisive in questions of botanical nomenclature.

they are dorsiventrally flattened and marginate, and the testa cells of the dorsal side are each provided with a minute spinule. Other noteworthy features of this species are the petiolate, ovate-lanceolate leaves, the very short stipular sheath and the winding shoots. It must be regarded as sufficiently distinct to be referred to a genus of its own, for which I have chosen the name *Stephanococcus*.

Axillary inflorescences are found also in *O. staelioides* K.Sch. and *O. juncoides* K. Sch., but here they are often reduced to a single bracteolate flower, and they run out into spike-like inflorescences. I refer them to a new genus *Manostachya*. Other noteworthy characters are the small and narrow leaves, the shortness of the stipular sheath, the subglobose capsule with its superior upper half, the dorsiventrally flattened seeds, and the curiously thickened outer wall of the testa cells: in the other genera of this tribe in which the testa cells show a relief, the latter is found on the basal wall.

Among the remaining species a few strike us by the mode of dehiscence of their distinctly rostrate capsules, the beak splitting into four valves. In the other species a beak may be present or absent, but the dehiscence takes place by means of a loculicidal fissure across the top, sometimes followed by a splitting into two mericarps (cf. *Agathisanthemum* Klotzsch). The splitting of the beak into four valves is observed in *O. thamnoidea* K. Sch. and *O. spermacocina* K. Sch., two nearly related species which I refer to a new genus *Hedythyrsus*, and in a new species, which I will describe in the special part of this work, and which I refer to a genus of its own, for which I propose the name *Diotocranus*.

The two species of *Hedythyrsus* are shrubby plants from the mountains of Central Africa and of Angola, which in the herbarium assume a very dark colour. Their flowers are arranged in comparatively large terminal corymbs or panicles, and their capsules contain but a very small number of seeds. The latter are dorsiventrally flattened and oblong in outline. The testa cells are separated from each other by strongly undulating walls (Tab. VIII, fig. c). In habit these plants show some resemblance with the curious *Nesohedyotis arborea* (Roxb.) Brem. of St Helena, but this is probably to be interpreted as a case of parallel development, for in reality they differ considerably from the latter, i.a. in the bisexual flowers and in the structure of the testa.

Diotocranus is so far a monotypic genus, whose area extends from Angola through the Belgian Congo to Tanganyika. Its only species is a rather frail annual herb, whose small flowers are arranged in cymous inflorescences at the end of the stem and its branches. Its most striking feature is the curious form of the capsule, whose fertile part is very short and two-lobed at the base. The number of seeds is small, and the testa cells show the same wavy contour as those of the *Hedythyrsus* seeds, but the seeds themselves are subglobose.

The genus *Agathisanthemum* Klotzsch comprises a small number of

species that are habitually not unlike the Indian species of *Hedyotis* L s.s. (i.e. *Hedyotis* sect. *Diplophragma* W. et A.), from which they differ in the much larger number of seeds in the capsule, the smaller size and angulate form of the seeds and the shortness of the stigmata. The capsules, however, are very similar to those of their Indian allies, for they are provided with a dissepimentum consisting of two easily separable layers of sclerenchyma, so that the loculicidal dehiscence across the top is usually followed by a division into two schizocarps. This genus comprises *O. Bojeri* (Klotzsch) Hiern, *O. globosa* (Hochst. ex A. Rich.) Hiern, *O. chlorophylla* (Hochst.) O. Ktze, and a few new ones.

The nearly related *O. Kaessneri* S. Moore is referred by me to a genus of its own, for which I propose the name *Dibrachionostylus*, because its style is divided into two branches. Other points of difference between this plant and the *Agathisanthemum* species are found in the inside glabrous corolla tube, the entirely glabrous style and the non-punctate testa cells (Tab. VIII, fig. f). When the seeds are moistened, they become slightly slimy.

On account of its dorsiventrally flattened seeds *O. trichotoma* Schinz was transferred by J. Bär (in Vierteljahrsschr. Naturf. Gesellsch. Zürich **68**, 432, 1923) to *Houstonia* L, but it differs from that genus in the absence of the wide excavation on the ventral side of the seed and in the fleshy, not horny, endosperm. Dorsiventrally flattened seeds, moreover, are not confined to this species and its nearest allies, but return in several other African genera (*Stephanococcus* Brem., *Manostachya* Brem., *Hedythyrsus* Brem., *Eionitis* Brem. v. infra). It can, however, not be denied that *O. trichotoma* Schinz, which appears to be conspecific with *O. divaricata* Engl., forms together with *O. luzuloides* K. Sch., *O. benguellensis* Hiern and some new species that I will describe in the special part, a well-defined group that deserves generic rank. On account of the cylindrical stipular sheath, which in most of the species forms a rather conspicuous feature, I will call it *Amphiasma*. The genus is well characterized by the cylindrical stipular sheath, whose truncate top sometimes bears on each side a pair of minute teeth, the suberect filiform leaves, the terminal corymbs, the farinose disk, the thin septum between the two cells of the capsule, and the small number of dorsiventrally flattened seeds.

Seeds of a similar shape are found in *O. littoralis* Chiov. (1916) non Mohr (1897) and in *O. psammophila* Chiov., two species growing on the sandy seashore of Somaliland. Apart from the dorsiventrally flattened seeds and the succulent leaves these plants do not seem to differ very markedly from the general type of *Oldenlandia* as defined below, and it is therefore with some hesitation that I refer these strand plants to a genus of their own, for which I propose the name *Eionitis*.

Another species that comes very near to the general type of the genus *Oldenlandia*, was found by me in the Kew Herbarium as "*Oldenlandia* (sectio *Lelya* Milne-Redhead) spec.". I have raised this undescribed

section to generic rank, but must admit that the distinction of this new genus rests almost entirely on the aberrant structure of the capsule, which possesses a very thick wall and a solid conical beak. Fruits of this kind are found nowhere else in this circle of affinity. The number of seeds is small, but they are of a similar shape as those found in *Oldenlandia* s.m. Another somewhat unusual feature are the decurrent filaments. In general habit, this species shows some resemblance to *O. goreënsis* (DC) Summerhayes and its nearest allies.

The remaining African species have been left in the genus *Oldenlandia*, which, however, even in this narrowed delimitation remains a group with a very wide range of diversity. The most important common characters are found in the capsule and in the seed. The capsule always opens inside the calyx with a split directed perpendicularly to the septum, and the latter itself remains always intact. The seeds are never dorsiventrally depressed or flattened, but angular to subglobose; they are, moreover, always fairly numerous, and they become, as a rule, more or less slimy when moistened. The testa cells are always thin-walled, and the tangential wall is either smooth, finely punctate, coarsely granulate or ornamented with a coarse reticulation. However, as nearly all these characters return in the genera *Kohautia* and *Conostomium*, it is desirable to lay special emphasis on the characters by which the *Oldenlandia* species differ from the representatives of these genera. These characters are mainly found in the floral mechanism and in the structure of the pollen grains. The latter are in *Oldenlandia* usually larger than in *Kohautia* (cf. Tab. XI, fig. f—m), and if they are of nearly the same size, they are always provided with a smaller number of grooves (3 or 4); they are, on the other hand, smaller than those of *Conostomium*, from which they differ, moreover, in the presence of grooves. The peculiar floral mechanism of *Kohautia* with the anthers as well as the style included, and the stigmata usually at a lower level than the anthers and never exceeding them, is never met with in *Oldenlandia*, where the flowers are either heterostylous or homostylous, and in the last-named case always with the stigmata at the same level as the anthers. The corolla tube of *Oldenlandia*, moreover, does not show the campanulate widening of the upper part which is such a characteristic feature of that of *Kohautia* and *Conostomium*. The flowers and fruits of *Oldenlandia* differ from those of *Conostomium* in their much smaller size.

The considerable degree of diversity of the species that are still left in *Oldenlandia* makes it desirable to divide the latter into a number of subgenera. To this end we may make use of the form of the leaves, the presence or absence of hairs on the style, the shape of the stigmata, the presence or absence of hairs in the corolla throat, the form of these hairs, etc.

The leaves are either distinctly petiolate, and then the lamina varies between ovate or ovate-oblong to lanceolate, or they are sessile or

subsessile, and then they are usually found to be linear or filiform, although occasionally they may become linear-lanceolate or even lanceolate.

Among the African species with distinctly petiolate leaves I distinguish two subgenera, for which I propose the names *Hymenophyllum* and *Orophilum*.

The species of the subgenus *Hymenophyllum* are usually annuals, and they are provided either with a single erect stem or with a small number of erect stems, with rather large and thin leaves, a short, fimbriate stipular sheath, terminal inflorescences, a glabrous style, seeds that do not become slimy when moistened, and testa cells separated from each other by undulating walls (cf. Tab. IX, fig. n). To this subgenus belong *O. pellucida* Hiern, *O. echinulosa* K. Sch. (syn. *O. nesaeoides* Hiern), *O. nervosa* Hiern and *O. sipaneoides* K. Sch. (syn. *O. huillensis* Hiern).

The subgenus *Orophilum* comprises a number of perennials that are branched already from the base, and whose shoots sink down when the flowering period is over. The leaves are smaller than in the subgenus *Hymenophyllum*, and often more or less leathery, and the stipular sheath is drawn out on each side of the shoot into a fimbriate triangular lobe. The flowers are either solitary or arranged in triads, cymes or capitula, which are at first always terminal, but which afterwards may be forced into a pseudo-axillary position. The flowers themselves are always heterostylous, and the style is always hirtellous. In this subgenus too the seeds do not become slimy when they are moistened, but their testa nevertheless differs from that found in *Hymenophyllum*, for the cells are separated from each other by straight walls (cf. Tab. IX, fig. g—m); the tangential walls are sometimes punctate, granulate (cf. Tab. IX, fig. l) or reticulate (cf. Tab. IX, fig. m). To this subgenus belong *O. monanthos* (Hochst. ex A. Rich.) Hiern, *O. Hockii* de Wild., *O. Johnstonii* (Oliv.) K.Sch., *O. rupicola* (Sond.) O.Ktze and *O. tenella* (Hochst.) O.Ktze.

Among the far more numerous species with sessile leaves there are some whose capsules are produced above the insertion of the calyx into a distinct beak, and others whose capsules are hardly produced. Among the first I find three distinct groups, that are apparently but distantly related.

The first group comprises a number of marsh plants with capitate or fascicled flowers, an inside glabrous corolla tube and subglobose stigmata. This is the subgenus *Anotidopsis* with the species *O. cephalotes* (Hochst.) O. Ktze (syn. *O. sphaerocephala* Schinz), *O. angolensis* K. Sch. (syn. *O. congensis* de Wild. et Durand), *O. goreensis* (DC) Summerhayes and a few new ones. This subgenus is represented also in Asia (*O. trinervia* Retz.) and, probably, in North America (*O. uniflora* L).

The second group is endemic in Socotra, and consists of four species of which one is new. They are *O. bicornuta* (Balf. f.) Brem., *O. ocellata* Brem., *O. pulvinata* (Balf. f.) Vierh. and *O. aretioides* Vierh. The first-named species is a small, rosulate herb, but the other ones are subpulvinate or pulvinate plants. Their main distinguishing characters are found in

the hyaline margin of the calyx lobes, the rather long corolla tube, the carunculate and usually clavate hairs in the corolla throat, the elongated stigmas and the flattened beak of the capsule. This subgenus, for which I have chosen the name *Platyrrhynchus*, might perhaps be raised to generic rank.

The third subgenus with sessile leaves and a distinctly rostrate capsule is a monotypic one. Its only species, *O. saxifragoides* Chiov. was collected in Somaliland, and shows the same pulvinate growth form as *O. pulvinata* and *O. aretioides*, but the calyx lobes lack the hyaline margin, the corolla is provided with a short tube, the hairs in the throat are neither carunculate nor clavate, and the beak of the capsule is not strongly flattened. Notwithstanding the striking resemblance in habit, which is all the more remarkable as this growth form is not met with in any other subgenus, there is apparently no near affinity between this subgenus, for which I will use the name *Hemicephalum*, and *Platyrrhynchus*.

Subglobose stigmata like those of the subgenus *Anotidopsis*, are also met with in two of the African species whose capsules are not distinctly rostrate. These two species do not show much resemblance with each other.

The first is a plant collected in Socotra and described by Balfour under the name *Hedyotis stellarioides*. As the specific epithet has already been used in *Oldenlandia* for another species, it has to be changed: I will call this plant *O. Balfourii*. Habitually it shows a rather striking resemblance to *O. Sieberi* Baker, a species collected in Mauritius, but it differs considerably from the latter in the inside pilose corolla tube, the hirtellous style, the subglobose stigmata, the 4- or 5-colporate pollen grains, and the much larger testa cells with straight instead of wavy walls. I bring *O. Balfourii* to a subgenus of its own, for which, on account of the peculiar habit of the plant, the name *Alsinastrum* seems appropriate. Its main characters are the broadly triangular lobes of the stipular sheath, the solitary, long-pedicellate flowers, the hirtellous style with its didymous stigma, the ovoid capsule, the seeds that do not become slimy when they are moistened, and the large testa cells with their straight walls (cf. Tab. VIII, fig. 1).

The other species with short stigmata is *O. cryptocarpa* Chiov. In habit it reminds one more or less of the Asiatic *Scleromitrion* species, but it differs fundamentally from the latter in the structure of the stipules and in the arrangement of the flowers. The stipular sheath is produced into simple lobes, and the flowers are terminal; the majority, however, are borne by axillary short-shoots arising from the axils of the crowded upper leaves. It is doubtless a very isolated species. The corolla tube is inside glabrous, and the style too is glabrous. The capsule remains hidden between the leaves, and its wall is remarkably thin. The seeds do not become slimy when moistened. The testa is very thin. *Cryptocarpum* seems a suitable name for this subgenus.

Among the species with sessile leaves, non-rostrate capsules and elon-

gated stigmata two main groups can be distinguished, one in which the inflorescences retain their terminal position and another one in which the inflorescences or the solitary flowers to which the latter sometimes are reduced, although originally also terminal, are pushed aside by a branch springing from the axil of one of the uppermost leaves, and are shifted in this way into a pseudo-axillary position. In the first group the stems, therefore, are monopodial and show a restricted growth, in the second they are sympodial and they continue their growth for a considerable time.

In the first main group we meet in the first place a small number of annuals provided with a single erect stem and sessile or subsessile, involucrate inflorescences. This is the subgenus *Tardavelinum*, which comprises *O. tardavelina* Hiern, *O. gregaria* K. Sch. and *O. nematocaulis* Brem., a new species to be described in the special part. The style proves to be glabrous, and the seeds do not become slimy when moistened.

Another batch consists of perennials with several stems and with inflorescences which, although sometimes sessile or subsessile, are never so distinctly involucrate as those of the subgenus *Tardavelinum*. The style, moreover, proves to be hirtellous, and the seeds become slimy when wetted. This is the subgenus *Cephalanthium*. It comprises *O. scopulorum* Bullock, *O. Wiedemannii* K.Sch. and *O. ichthyoderma* Cuf.

Besides these two subgenera in which the flowers are more or less distinctly capitate the group with terminal inflorescences comprises also a number of species in which the flowers are paniculate, racemose or spicate.

A rather isolated position is taken in by *O. patula*, a new species from Tanganyika. This is a fairly large annual provided with patent branches which end in racemiform inflorescences. The latter are monochasia with an elongated sympodial axis, along which the distinctly pedicellate flowers are arranged in pairs. The style proves to be hirtellous, and the walls of the testa cells are wavy. *O. patula* shows a superficial resemblance to *O. affinis* (R. et S.) DC v. infra, especially in the form of the rather lax inflorescences, but there is certainly no near affinity between these species. I bring it to a subgenus of its own, for which I propose the name *Euryanthus*.

In the two other subgenera with sessile leaves, elongated stigmata and monopodial stems provided with terminal but not capituliform inflorescences, the lateral walls of the testa cells are straight, and the branches are never patent. The first of these two subgenera comprises three perennials provided with ample panicles consisting of numerous flowers arranged in glomerules, cymes or triads. Other noteworthy characters are the hirtellous style, the small capsules, the slimyness of the moistened seeds and the coarsely punctate testa cells (cf. Tab. X, fig. f). The type of this subgenus, for which I propose the name *Polycarpum*, is *O. Duemmeri* S. Moore; the two other species are new ones.

The other subgenus of the pair with straight-walled testa cells and non-patent branches contains but a single species, *O. flosculosa* Hiern. This is also a perennial with the flowers arranged in glomerules, a hirtellous style and seeds that become slimy when moistened, but it differs from *Polycarpum* in the spiciform, not paniculiform inflorescence and in the non-punctate testa cells (cf. Tab. X, fig. e). For this subgenus I propose the name *Stachyanthus*.

The remaining *Oldenlandia* species are provided with sympodial stems and a comparatively large number of lateral (pseudo-axillary) flowers or inflorescences. I group them in four subgenera.

The first of these four subgenera is *Trichopodium*. It comprises *O. rosulata* K. Sch. and *O. microcalyx* K. Sch. These plants differ rather conspicuously from the representatives of the three other subgenera, because they stop their growth very soon after the first flowers have been produced, which for this reason seem to form a terminal raceme or panicle. In reality the flowers are, with the exception of the one at the top, all pseudo-axillary. The seeds of these plants do not become slimy when moistened, and the rather large testa cells are provided with straight lateral walls (cf. Tab. X, fig. a), but they are neither pitted nor provided with a relief. The flowers resemble those of *O. herbacea* (L) Roxb. Other noteworthy features are the 4 or 5 grooves of the pollen grains (Tab. XIII, fig. e and f) and the glabrous style.

In the second subgenus, for which I use the name *Octoneurum*, the inflorescences are also rather lax and the seeds do not become slimy when moistened, but the seeds are not alveolate but smooth, the testa cells being very low and thin-walled. Its most important species is *O. affinis* (R. et S.) DC; synonyms are *O. dichotoma* (Koen. ex Roth) Hook. f. non Spreng., *O. decumbens* (Hochst.) Hiern non Spreng. and *O. prostrata* P. Lima non (Bl.) O. Ktze. *O. affinis* is widely distributed, for its area extends over the whole of tropical Africa, including Madagascar, a part of subtropical Africa and Western Asia, where it reaches its most eastern limit in the Malay Peninsula. It is a perennial with at first suberect, afterwards decumbent stems, ovate-lanceolate to linear leaves, a stipular sheath crowned by a few colleters and terminal as well as pseudo-axillary, laxly dichasial inflorescences consisting of slenderly pedicellate, blue, violet or purple flowers. Other noteworthy characters are the glabrous style and the subglobose, 8-ribbed capsule. *O. Laurentii* de Wild. is a very similar plant. It is known in one specimen only, which is teratological and may prove to be a mere form of *O. affinis*; this possibility is discussed in the special part.

The third subgenus comprises species in which the flowers are either solitary or arranged in fascicles, and in which the testa cells are minutely but very densely punctate (cf. Tab. X, fig. c and d). This is the subgenus *Aneurum*. It is represented in Africa by *O. lancifolia* (Schum.) DC. This species, which is known also from tropical America, where, however, it

occurs as an introduced weed only, is a very near ally of the Asiatic *O. diffusa* (Willd.) Roxb. and of the North-American *O. Boscii* (DC) Chapm., which comes very near to the Asiatic species and may be a post-Columbian introduction. It are all three decumbent herbs with linear-lanceolate leaves and pseudo-axillary flowers, which are sometimes replaced by groups, but in that case they are all but one inserted on axillary brachyblasts. The corolla tube is inside glabrous, and the style too is glabrous. The seeds do not become slimy when they are moistened, and the testa cells are surrounded by straight walls that are somewhat thicker than in the other species of this genus.

The fourth and by far the largest subgenus with sympodial stems and pseudo-axillary flowers or inflorescences comprises *O. corymbosa* L. the type species of the genus, and for this reason we will call it *Eu-oldenlandia*. It differs from *Trichopodium* in the greater number of flowers, which are either pseudo-axillary or arranged in pseudo-axillary inflorescences, and the smaller size of the testa cells, from *Octoneurum* in the distinctly alveolate seeds and from *Aneurum* in the absence of pits in the basal wall of the testa cells.

O. herbacea (L) Roxb. (syn. *O. Heynii* G. Don) differs somewhat from the rest of the species by the coarsely granulated walls of the testa cells (Tab. X, fig. i and j), by the rather large size of the flowers and the slender corolla tube. The style is glabrous. *O. Holstii* K. Sch. is apparently a mere variety of this species: it has uncommonly large flowers (corolla tube 7—8 mm), and is, moreover, heterostylous.

The other species of *Eu-oldenlandia* have much smaller flowers; their corolla tube rarely exceeds a length of 1.5 mm.

O. pumila (L.f.) DC is an Asiatic species that recently has been collected in Tanganyika, where it is probably a recent introduction. It agrees with *O. herbacea* in the solitary, long-pedicellate flowers and in the structure of the testa, but the style is hirtellous.

O. umbellata L is mentioned here because it has been recorded in de Candolle's "Prodromus" from Senegal. I have seen among the *Oldenlandias* of the Paris Herbarium a specimen which, according to the label, was collected in 1829 by Perrottet at Kounoum, Cape Verde. This may have been the specimen seen by De Candolle or else a duplicate of the latter. The species has never again been collected in this part of the world. It is possible that round 1829, or earlier, experiments have been made with the cultivation of this plant in Senegal, because it produces the formerly highly-valued alizarin and is grown for this reason in India, but it is also possible that the specimen in the Paris Herbarium is wrongly labelled, and that it was in reality collected in India. Its pedunculate cymes remind one of *O. corymbosa* L and of *O. somala* Chiov. ex. Brem. With the latter it agrees also in the heterostylous flowers and the hirtellous style, but its leaves are much shorter and the lateral walls of the testa cells are wavy. The seeds become very slimy when moistened, much more slimy in fact than those of any other species I know.

The last species on which I wish to make some remarks, is *O. ramosissima* Spreng. (syn. *Karamyschewia hedyotoides* Fisch. ex Mey.; *O. hedyotoides* (Fisch. ex Mey.) Boiss.; *Theyodis octodon* A. Rich.; *O. inconstans* Pomel. ex Batt. et Trab.). I refer this plant as var. *pleiosepala* to *O. capensis* L.f., from which it differs merely in the presence of 1—4 supernumerary calyx lobes. As there appear to be no other differences, there is no reason to regard it as a distinct species, and to refer it to another genus is, of course, entirely out of the question. I might have used for this variety the epithet *ramosissima*, but as the Nomenclature Rules allow the choice of a new varietal epithet, it seemed better to drop this one, for in the ramification there is no difference at all between the variety and the type.

Below a key is given to the genera that have been discussed in this chapter: it may be regarded as a summary of the latter's main contents. The genera that are mentioned in the key, are, with the exception of *Pentanopsis*, those of which at one time or another species have been included in the genus *Oldenlandia*; only those that do not belong to the *Hedyotideae* as defined in this work, have been omitted. For this reason no mention is made of the genus *Virectaria* Brem. (*Virecta* Smith non L.f.) to which *O. rufescens* Schinz proved to belong, nor of *Borreria* G. F. W. Mey. to which *O. Junodii* Schinz (1900) had to be referred: *Borreria* is a member of the *Spermacoceae*, and *Virectaria* was transferred by me because of the thick-walled testa cells and of the absence of raphides to a new tribe *Ophiorrhizeae*.

The key is not throughout a natural one, for the number of flower parts on which the first division is based, can not be regarded as a character of such importance that it is likely to lead to a natural arrangement. The genus *Pentodon* is doubtless more nearly related to *Oldenlandia* sensu meo than to the genera in whose vicinity it appears in the key. In the arrangement of the genera with 4–merous flowers I have done my best to make the key as natural as possible.

Key to the Genera represented among Hiern and Schumann's African *Oldenlandiae*.

1. Flowers either all or at least for a large part pentamerous.
   2. Flowers all pentamerous.
      3. Winding shrubs with comparatively large, petiolate leaves, free interpetiolar stipules and flowers arranged in pairs along the branchlets of a terminal inflorescence. Fruit globose, 10–ribbed, tardily splitting into two cocci that open at the top . . . . . 1. *Sacosperma*
      3: Decumbent herbs. Stipules united with the basal part of the leaves. Flowers either solitary or combined into inflorescences, but in the latter case never in pairs along the branchlets. Fruit neither globose nor 10–ribbed, opening within the enclosure of the calyx with a loculicidal fissure.

4. Indumentum (sometimes reduced to a few cilia along the margin of the leaf and of the calyx lobes) consisting of septate hairs. Leaves distinctly petiolate, ovate or ovate-lanceolate, thin. Stipular sheath on each side of the stem with a trifid or tripartite lobe; the lobes usually gland-tipped; the central lobe always longer than the lateral ones. Flowers in a small number in terminal and, eventually, pseudo-axillary cymes or solitary, sessile or shortly pedicellate.
   5. Flowers ebracteolate. Calyx lobes spatulate. Corolla tube 4—4.5 cm long. Capsule distinctly beaked . . . . . 2. *Chamaepentas*
   5: Flowers bracteolate. Calyx lobes ovate to linear. Corolla tube less than 2 cm long. Capsule never beaked.
      6. Calyx lobes ovate to narrowly triangular, very unequal. Corolla tube bearded. Pollen grains 4–colporate . . . . . 3. *Tapinopentas*
      6: Calyx lobes linear to linear-oblong, equal or subequal. Corolla tube inside glabrous or subglabrous. Pollen grains 3–colporate . . . . . 4. *Parapentas*
4: Entirely glabrous. Leaves sessile or subsessile, linear-lanceolate or, more rarely, lanceolate, succulent. Stipular sheath not produced into interpetiolar lobes, on each side of the stem with 2 or 4 teeth. Inflorescences solitary at the nodes, rather long-pedunculate, laxly dichasial or more or less paniculiform; flowers with a rather long pedicel . . . . . 18. *Pentodon*

2: Flowers partly tetramerous and partly pentamerous, pseudo-axillary or in pseudo-axillary clusters, together forming a spiciform inflorescence. Ovary and placentas slightly and capsules distinctly elongated. — Stem erect, usually unbranched, occasionally forked and then with a flower or a cluster of flowers in the fork . . . . . 5. *Thecorchus*

1: Flowers either all or nearly all tetramerous.
   7. Aestivation of the corolla lobes induplicate-valvate; the lobes on the inside covered with clavate hairs. — Desert shrublet with comparatively large and showy flowers, borne singly or in groups of three at the end of axillary short-shoots. Seeds dorsiventrally flattened . . . . . 8. *Pentanopsis*
   7: Aestivation of the corolla lobes valvate; the lobes on the inside smooth or papillate.
      8. Corolla tube cylindrical; anthers and stigma or stigmata included [1]) and the latter always overtopped by the anthers.

---

[1]) A cylindrical corolla tube and included anthers and style are occasionally met with in some *Conostomium* species: these specimens are probably teratological. They are distinguishable from *Kohautia* by the position of the flowers, which

Pollen grains 3- to 7-colporate, never more than 20 μ in diam.; the larger ones always with 4 or more colpae . . . . . 6. *Kohautia*

8: Corolla tube cylindrical or infundibuliform, but if cylindrical, then either the anthers or the stigmata exserted or else the anthers overtopped by the stigmata. Pollen grains usually with 3, rarely with 4 or 5 pores, usually more than 20 μ in diam.

9. Corolla tube cylindrical, at least 2 cm long; anthers included and the style exserted. Pollen grains 3– or 4–porate . . . . . 7. *Conostomium*

9: Corolla tube cylindrical or, more often, infundibuliform, always less than 2 cm long; sometimes with included anthers and exserted style, but in that case always heterostylous. Pollen grains 3– to 5–colporate.

10. Inflorescences or flowers axillary and opposite, sometimes united in a spiciform inflorescence. Flowers always very small.

11. Stipular sheath on each side of the shoot with a fairly long awn. Fruit a small, globose, dipyrenous drupe. Seeds angular. — Erect or subscandent herb with subsessile, ovate-lanceolate leaves and fairly numerous flowers in axillary bundles. . . . . 9. *Exallage*

11: Stipular sheath very short and truncate. Fruit dehiscent. Seeds dorsiventrally flattened.

12. Winding herb with petiolate, ovate-lanceolate leaves and fairly numerous flowers in axillary bundles. Fruit splitting into two cocci which finally open at the top. Seeds marginate . . . 10. *Stephanococcus*

12: Erect herbs with several stems. Leaves sessile, linear-subulate or linear-filiform. Flowers solitary or fascicled at the nodes of a spiciform inflorescence. Fruit opening by a loculicidal fissure inside the enclosure of the calyx. Seeds not marginate . . . . . 11. *Manostachya*

10: Inflorescences or flowers either all terminal or terminal and pseudo-axillary, i.e. solitary at the nodes; sometimes with more than one flower or inflorescence at the nodes, but in that case the supernumerary ones with rudimentary leaves at the base.

13. Capsules opening loculicidally as well as septicidally.

14. Capsule provided with a beak as long as or longer

---

are found either in the fork of dichasially branched shoots or on axillary brachyblasts, and by the large, porate, not colporate, pollen grains.

than the rest of the capsule. Testa cells with strongly undulating walls.

15. Rather frail annual herb. Stipular sheath on each side of the stem with a triangular lobe ending in two ciliate fimbriae. Capsule emarginate at the base; the beak longer than the rest of the capsule. Seeds subglobose; testa cells with a central boss . . . . . 12. *Diotocranus*

15: Robust suffrutices. Stipular sheath on each side of the stem with 3—7 gland-tipped fimbriae. Capsule rounded or slightly contracted at the base; the beak as long as the rest of the capsule. Seeds distinctly flattened; testa cells without central boss . . . . . 13. *Hedythyrsus*

14: Capsule not distinctly beaked or with a beak that is much shorter than the rest of the capsule. Testa cells with straight or but slightly wavy walls.

16. Corolla tube densely bearded. Style entire; stigmata subglobose or ovoid . . . 14. *Agathisanthemum*

16: Corolla tube inside glabrous. Style bifid; stigmata linear . . . . . 15. *Dibrachionostylus*

13: Capsule opening loculicidally only, the septum never splitting.

17. Seeds dorsiventrally flattened.

18. Leaves lanceolate to elliptic, succulent. Stipular sheath either fimbriate or on each side of the stem with 3 lobules; the central appendix always longer than the lateral ones. Moistened seeds slimy . . . . . 16. *Eionitis*

18: Leaves linear to filiform. Stipular sheath usually tubular, truncate or on each side of the stem with two minute teeth. Moistened seeds not slimy . . . . . 17. *Amphiasma*

17: Seeds angular or subglobose, never dorsiventrally flattened.

19. Capsule with a thick, woody wall and a solid conical beak, tardily dehiscent . . . 19. *Lelya*

19: Capsule with a horny wall, with or without a beak, but never with a solid beak, early dehiscent . . . . . 20. *Oldenlandia*.

SPECIAL PART

1. **SACOSPERMA** G. TAYL.

Sacosperma G. Tayl. in Exell, Cat. Vasc. Pl. S. Tomé 218, 1944, n. nom.: *Peltospermum* Bth. in Hooker, Niger Fl. 400, 1849; id. in Walp. Ann. **2**, 775, 1852; nom. illeg. nam non DC in Bibl. Univ. Genève **17**, 133, 1838, quod est genus *Apocynacearum*; quoad typum: *Hedyotis* L sect. *Diplophragma* W. et A. species Hook.f. in Bth. et Hook.f., Gen. Pl. **2**, 57, 1873; *Oldenlandia* L spec. Hiern in Fl. Trop. Afr. **3**. 53, 1877; *Oldenlandia* L sect. *Diplophragma* (W. et A.) K. Sch. spec. K. Schumann in Engl. & Prantl, Nat. Pflanzenfam. IV, **4**, 26, 1891; *Oldenlandia* L spec. Hutch. et Dalz., Fl. West Trop. Afr. **2**, 132, 1931; — quoad speciem secundam: *Pentas* Bth. spec. Bth. in Bot. Mag. in nota ad Tab. 4086, 1844; Hiern in Fl. Trop. Afr. **3**, 47, 1877; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 129, 1931.

Frutices sarmentosi. Folia opposita, petiolata; lamina ovato-lanceolata, ovata vel elliptica, satis magna, utroque latere costae nervis circ. 8 instructa. Stipulae interpetiolares, non vaginatae, nunc ovatae vel late triangulares et in cuspidem longam, interdum fissam exeuntes, nunc bifidae vel bipartitae, lobis filiformibus plus minusve patentibus. Inflorescentia terminalis, laxe paniculiformis vel plus minusve contracta; ramuli inferiores interdum foliis magnitudine redactis, ceteri semper bracteis angustis suffulti; ramuli inferiores semel dichasiales, ceteri toti monochasiales, floribus eis in furca dichasiorum insertis exceptis ad nodos plerumque geminis, florum paribus in spiralem dispositis; bracteae florales minutae vel nullae; bracteolae nullae. Flores pentameri, heterostyli. Ovarium biloculare; placenta peltata medio septo affixa; ovula numerosa. Calyx usque ad basin in lobos ovato-triangulares vel lineares, aequilongos vel paulum inaequales partitus. Corolla tubulosa, calyce multo longior, rubra vel coerulea, rarius albida, extus glabra, tubo intus dimidio superiore barbato, lobis tubo multo brevioribus, triangularibus, aestivatione valvata. Stamina dimidio superiore tubi inserta, in flore dolichostylo subsessilia, inclusa, in flore brachystylo filamentis longitudine antheras excedentibus subexserta. Granula pollinis globosa, 3-colporata, parva (cf. Tab. XI, fig. a). Discus pulvinatus. Stylus glaber in stigmata dua cohaerentia, stylo paulo crassiora exeuns. Fructus globosus, 10-costatus, tarde in coccos duos apice loculicidos dehiscens. Semina parva et numerosa, angulosa, paulum dorsiventraliter applanata, subcarunculata, non alata, rubro-brunnea, madefacta non glutinosa; testae cellulae pariete tenui, ubique poris numerosis perforata instructae, gummo luteo-rubro repletae (cf. Tab. VII, fig. a).

Habitat speciebus adhuc notis duabus Africam Occidentalem Tropicalem. Species typica: *S. paniculatum* (Bth.) G. Tayl. l.c. (*Peltospermum* Bth.).

Bentham (l.c. 401) made the following remarks on the position of this genus: "The affinity of this genus with *Lerchea* is evident, but independently of the great difference in habit and inflorescence, the fruit of *Lerchea* consists rather of the indehiscent cocci of *Metabolos* and *Gonzalea* than of the dehiscent capsules of the majority of the *Rondeletieae*, and the included stamens, the seeds and the placentation will supply sufficient distinctive characters between the two genera; while those indicated by Bennett as separating *Lerchea* from *Wendlandia* and other *Rondeletieae*, will also serve to separate *Peltospermum* from them. The margin of the seed shows (at least in the dry state) an approach to the wings of some *Cinchoneous* seeds, but less distinctly than in several plants retained among *Rondeletieae*. The inflorescence of our genus is that of *Bertiera*, but the carpological, as well as the floral characters, are very different."

Bentham placed the genus in the *Rondeletieae*, but this mistake was corrected by Hooker f. in Bentham and Hooker's "Genera Plantarum", where it was transferred to the *Hedyotideae*, but as Taylor l.c. realized, Hooker went too far when he included the genus in *Hedyotis* L sect. *Diplophragma* W. et A. That the genus belongs to the *Hedyotideae* and not to the *Rondeletieae* follows from the presence of raphides and from the absence of the large circular or oval "pits" in the basal wall of the testa cells that are such a characteristic feature of the *Rondeletieae* and their nearest allies. That it can be no near ally of *Hedyotis* follows from the structure of the stipules, which are not united with the petioles or the basal part of the leaves into an amplexicaul sheath. For the same reason, and also because of the absence of the glandtipped fringes along the margin of the stipules, it can not be regarded as a near ally of *Pentas* Bth.

Lerchea L does not belong to the *Rondeletieae*, but as it has no raphides, it is no member of the *Hedyotideae* either, and a nearer affinity between *Lerchea* and *Sacosperma* is therefore out of the question. The similarity in structure between the inflorescence of the latter and that of *Bertiera* Aubl. is apparently an example of parallel development, for as Bentham already pointed out, there is no agreement in the more important taxonomical characters; to those mentioned by Bentham may be added the absence of raphides in *Bertiera* and the thick-walled testa cells of the latter (cf. Tab. VII, fig. b). The arrangement of the flowers in pairs along the monochasial branchlets of a more or less paniculiform inflorescence returns in some species of the genus *Kohautia*, but is also found in *Streblosa* Khs, one of the genera of the *Psychotrieae*: taxonomically it is therefore to be regarded as a character of minor importance.

Bentham knew only the dolichostylous form of *Sacosperma paniculatum*, and he was therefore unaware of the fact that the stamens may also be exserted. His description of the seeds, moreover, is incorrect, because it

was based on immature material. The mature seeds are not marginate but angular and only very slightly depressed.

The two species which Taylor l.c. referred to *Sacosperma*, show marked differences in the structure of the stipules, in the aspect of the inflorescence and in the calyx lobes. The second species, *S. parviflora* (Bth.) G. Tayl., was originally referred to *Pentas*, from which it differs in habit, in the nature of the stipules, in the absence of the septate hairs and in the small size of the flowers. Another scandent species from West Africa described by K. Schumann under the name *Pentas volubilis*, proved to be quite different. Although it is not provided with septate hairs, and might therefore better be excluded from *Pentas*, it is doubtless a near ally of the latter, and shows no affinity to *Sacosperma*.

Key to the Species.

1. Stipules ovate or broadly triangular, ending in a simple or, occasionally bifid awn. Inflorescence laxly paniculiform. Calyx lobes subequal, ovate . . . . . 1. *S. paniculatum*
1: Stipules bifid or bipartite. Inflorescence contracted. Calyx lobes unequal, linear . . . . . 2. *S. parviflorum*

1. **Sacosperma paniculatum** (Bth.) G. Tayl. in Exell, Cat. Vasc. Pl. S. Tomé 218, 1944; *Peltospermum paniculatum* Bth. in Hooker, Niger Fl. 400, 1849; id. in Walp. Ann. **2**, 775, 1852; *Oldenlandia peltospermum* Hiern in Fl. Trop. Afr. **3**, 53, 1877; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 132, 1931.

Frutex scandens, usque ad 5 m altus. Rami novelli teretes, subglabri vel in var. *pubescente* primum pubescentes. Folia petiolo 0.6—1.2 cm longo instructa; lamina ovata vel elliptica, 6—10 cm longa et 2—4 cm lata, acuta, basi attenuata, glabra sed, nervis subtus interdum puberulo-pubescens vel in var. *pubescente* supra sparsissime, subtus praesertim costa nervisque dense pubescens, nervis utroque latere costae circ. 8. Stipulae ovatae vel late triangulares in lobum subulatum, interdum bifidum exeuntes, mox deciduae. Inflorescentia paniculiformis 13—15 cm longa et 5—13 cm diam.; ramuli infimi interdum foliis redactis, ceteri bracteis minutis suffulti; bracteae florales minutissimae, vix conspicuae. Calycis lobi subaequales, ovatae, 0.7 mm longi. Corolla rubra vel coerulea, rarius albida, tubo tereti circ. 5 mm longo, 5-costato, lobis 2 mm longis. Fructus 4.5 mm diam.

Habitat Africam Occidentalem Tropicalem.

var. *paniculatum*; rami novelli subglabri; folia glabra vel nervis subtus puberulo-pubescentia.

Senegal: Heudelot 628.

Sierra Leone: Thomas 2860, 4214, 6457; Scott Elliot 4176; Lane Poole 378.

Liberia: Dinklage 2060; Linder 648; Whyte s.n.

Ubangi-Chari: Waha, Tisserant 1607; Bambari, id. 2667; country of the Senussi, Chevalier 6886, 6986.
Fernando Po: Vogel 2059, type (K).
San Tomé: Barter 1971.
Nigeria: Mr and Mrs Talbot s.n.; Kennedy 1768; Barter 3292; Mann 5.
Cameroons: Maitland 240; Deistel 624; Bates 575.
Gaboon: Klaine 1064, 2378; Thollon 4051.
Port. Congo: Gossweiler 8643.
Belg. Congo: Bavicchi 488; Reygarte 1171; Bequaert 7104; Louis 90.

var. *pubescens* Brem. n. var. ramis novellis pubescentibus, foliis supra sparsissime, subtus praesertim costa nervisque densius pubescentibus, nervis supra impressis a typo recedens.
French Guinea: Fouta Djallon, Pobéguin 1930, type of the variety (P).

2. **Sacosperma parviflorum** (Bth.) G. Tayl, in Exell, Cat. Vasc. Pl. S. Tomé 218, 1944; *Pentas parviflora* Bth. in Bot. Mag. in nota ad Tab. 4086, 1844; Hiern in Fl. Trop. Afr. 3, 47, 1877; Hutch. et Dalz., Fl. West Trop. Afr. 2, 129, 1931.

Frutex parvus, scandens. Rami novelli ferrugineo-pilosi, mox glabrescentes. Folia petiolo 0.4—1.2 cm longo instructa; lamina ovata-lanceolata, 5—7 cm longa et 2—2.5 cm lata, utroque extremo acuta, supra glabra, subtus nervis pubescens, nervis utroque latere costae circ. 8. Stipulae bifidae vel bipartitae, lobis filiformibus plus minusve patentibus. Panicula contracta, usque ad 2.5 cm diam. Calycis lobi paulum inaequales, lineares, circ. 3 mm longi. Corolla subcaerulea, tubo tereti 6 mm longo, lobis 2 mm longis.

Habitat Guineam.
Gold Coast: Accra, Vogel s.n., type (K).

2. CHAMAEPENTAS Brem. n. gen.

Chamaepentas Brem. n. gen. *Hedyotidearum* praesentia pilorum valvulatorum, foliis petiolatis, lamina latiore, vagina stipulari in lobulos subulatos colletris coronatos exeunte, floribus in inflorescentiam terminalem dispositis, pentameris, ovario biloculari, placenta peltata stipite brevi e parte basali septi oriente, ovulis numerosissimis, calycis lobis inaequalibus, corolla fauce barbata, staminibus in flore dolichostylo inclusis, capsula rostrata, seminibus numerosis angulatis, alveolatis, madefactis non glutinosis, testa e cellulis satis magnis, parietibus undulatis instructis, basi densissime punctatis generi *Pentadi* Bth. similius, habitu decumbente, foliis parvis et paucinerviis, inflorescentia pauciflora, calycis lobis omnibus viridibus, corolla alba ab eo recedens et ad genera *Tapinopentada* Brem. v. infra et *Parapentada* Brem. v. infra accedens, sed floribus omnibus ebracteolatis, corollae tubo multo longiore, capsula rostrata ab eis diversum, a *Parapentadi* insuper corolla dense barbata, a *Tapinopentadi* floribus multo majoribus distinguendum.

Genus adhuc monotypicum in Africa Orientali endemicum.

1. **Chamaepentas Greenwayi** Brem. n. spec.

Herba perennis, ramosa. Caules subteretes, e basi decumbente ascendentes, 1—1.2 mm diam., nunc indumento griseo et molli, e pilis valvulatis composito vestiti, nunc (var. *glabra*) glabri, internodiis 0.5—3 cm longis. Folia opposita, basi in petiolum 3—9 mm longum contracta; lamina ovato-lanceolata, 2—4.5 cm longa et 1.0—3.2 cm lata, apice acuta et mucronata, tenuissima, nunc utrimque pilis valvulatis dense et molliter griseo-pubescens, nunc (var. *glabra*) margine sola pilis valvulatis ciliolata, paucinervia. Vagina stipularis utroque latere caulis in processum tripartitum producta, lobis in colletros magnos exeuntibus, lobo mediano lateralibus longiore, intus glabra. Flores in triades terminales dispositi; triades tamen haud raro ad flores duos vel ad florem singulum redactae; flos centralis triadis pedicello usque ad 1.5 mm longo, flores laterales pedicellis usque ad 6 mm longis elati, omnes ebracteati et ebracteolati, pentameri, probabiliter heterostyli. Ovarium subglobosum, basi contractum, biloculare, 2.7 mm diam.; placenta peltata stipite brevi e parte basali septi oriens; ovula numerosissima. Calyx ovario aliquoties altior, usque ad basin partitus; lobi spatulati, valde inaequales, omnes virides tamen, sinibus latis colletris instructis separati; lobi minores 7—10 mm longi et 1.5—2 mm lati, intermedii 11—13 mm longi et 2.5—3.5 mm lati, major 13—17 mm longus et 3.8—4.5 mm latus, nunc molliter pubescentes, nunc (var. *glabra*) margine sola ciliolati. Corolla hypocrateriformis, alba, sicc. nigrescens, extus pilis valvulatis dense et molliter pubescens vel in var. *glabra* glabra, tubo 4—4.5 cm longo, diametro orem versus usque ad 2.5 mm dilatato, fauce dense barbato, pilis fauce insertis ad medium maculatis, ceterum albis, lobis ovato-lanceolatis 8 mm longis et 3—4 mm latis, intus glabris. Stamina in speciminibus examinatis quae probabiliter ad formam dolichostylam pertinent circ. 8 mm in fraincisuras corollae inserta, tota in barba inclusa; filamenta glabra 1 mm longa; antherae lineares 4 mm longae, dorsifixae, apice basique obtusae. Granula pollinis globosa, 3-colporata, 30 μ diam. (cf. Tab. XI, fig. b). Discus conicus. Stylus apicem versus puberulo-hirtellus, in flore dolichostylo corollae tubum circ. 3 mm excedens; stigmata linearia 3 mm longa. Capsula rostro conico 2.5 mm longo instructa, 8 mm alta et 6 mm diam., apice septicide et loculicide dehiscens. Semina numerosa, angulata, alveolata, brunnea, madefacta non glutinosa. Cellulae testae satis magnae, parietibus undulatis instructae, basi densissime punctatae.

Habitat Tanganyikam.

var. *Greenwayi*; caulibus foliisque griseo-pubescentibus, calyce corollaque extus pubescentibus.

Tanganyika: Usambara, S. Pare Mnts, Vidani Mnt, alt. 1650 m, Greenway 6570 p.p., type (K, Nairobi), "local and rare, growing with *Crassula* spec. in rock crevices in the shade of large boulders on a rocky mountain peak."

var. *glabra* Brem. n. var.; caulibus, foliis, calycis lobis margine sola excepta, corollae facie externa glabris a typo recedens.
Collected by Greenway in the same locality as the type and under the same number (K, Nairobi).

As the presence of an indumentum consisting of septate hairs is one of the most characteristic features of *Pentas* Bth. and its nearest allies, its total absence in specimens of a species belonging to one of the genera of this group, would be rather surprising. The septate hairs, however, are not entirely wanting, for a small number of them are found along the margin of the leaves and of the calyx lobes: the character, therefore, retains its diagnostic value.

The flowers of the specimens on which this species and its variety were based, possess included anthers and an exserted style. That I regard them as dolichostylous, rests on the reflection that they agree entirely with the dolichostylous flowers observed in the *Pentas* species, and not at all with the flowers of the monomorphic *Parapentas* species, whose anthers are as far exserted as the stigmas. However, it must be admitted that this argument is not fully convincing, for in the group of genera formed by *Oldenlandia* and its nearest allies, in which a much greater diversity of floral structures is met with, a structure like that described above is found also in monomorphic flowers, viz. in those of the genus *Conostomium* Cuf.

Chamaepentas Brem., *Tapinopentas* Brem. and *Parapentas* Brem. are nearly related. Their affinity with *Pentas* Bth., although less striking, is nevertheless easily recognizable. It manifests itself in the presence of septate hairs, in the petiolate leaves, in the gland-tipped lobes of the stipular sheath, in the terminal inflorescences, in the pentamerous flowers and in the rather large size of the testa cells with their wavy lateral walls and a minutely but very densely punctate basal wall (the seeds of *Tapinopentas* are as yet unknown). They differ from *Pentas* in the decumbent shoots, the small size of the leaves, the few-flowered inflorescences, the absence of the enlarged and showy calyx lobes, and the white corolla. *Chamaepentas* shows the closest resemblance to *Pentas*, for it agrees with the latter also in the very unequal development of the calyx lobes, in the large size of the flowers and in the rostrate capsule, but the differences between these two genera are nevertheless of greater importance than those between *Chamaepentas* and the two other genera. The differences between *Chamaepentas* and these two genera remain confined to the total absence of bracteoles, the spatulate calyx lobes, the larger size of the corolla and of the capsule, and the presence of a beak on top of the latter. *Tapinopentas* and *Parapentas* differ from each other in the distinctly unequal, respectively subequal calyx lobes, in the bearded, respectively glabrous corolla throat and in the 4- respectively 3-colporate pollen grains.

3. TAPINOPENTAS Brem. n. gen.

Tapinopentas Brem. n. gen. *Hedyotidearum* praesentia pilorum valvulatorum, foliis ovato-lanceolatis, vagina stipulari in lobulos subulatos colletris coronatos exeunte, floribus in inflorescentiam terminalem dispositis, pentameris, ovario biloculari, placenta peltata stipite brevi ad medium septum affixa, ovulis numerosis, calycis lobis inaequalibus, corolla fauce barbata, staminibus in flore dolichostylo inclusis generi *Pentadi* Bth. similius, habitu decumbente, foliis parvis et paucinerviis, inflorescentia pauciflora, calycis lobis omnibus viridibus, corolla alba ab eo recedens et ad genera *Chamaepentada* Brem. v. supra et *Parapentada* Brem. v. infra accedens, sed a *Chamaepentadi* foliis brevius petiolatis et minoribus, floribus lateralibus bracteolatis, calycis lobis non spatulatis, corollae tubo multo breviore, granulis pollinis 4-colporatis, capsula non rostrata, a *Parapentadi* floribus in paria terminalia dispositis, calycis lobis valde inaequalibus, corolla fauce dense barbata, granulis pollinis 4-colporatis distinguendum.

Genus adhuc monotypicum in Africa Occidentali Tropicali endemicum.

1. **Tapinopentas cameronica** Brem. n. spec.

Herba perennis, ramosa. Caules subteretes, e basi decumbente ascendentes, ubique pilis valvulatis ferrugineo-hirtelli, parte florifera circ. 0.8 mm diam., post anthesin probabiliter decumbente, internodiis 0.5—1.3 cm longis. Folia opposita, haud raro ramulos abbreviatos suffulcientia, in petiolum anguste alatum, ferrugineo-hirtellum, 1—2 mm longum contracta; lamina ovato-lanceolata, 9—11 mm longa et 4—6 mm lata, apice acuta et mucronata, basi subito contracta, tenuis, margine ciliata, costa utrimque et nervis subtus densius pilosa, ceterum subtus sparse pilosa, concolor, sicc. haud conspicue discolorata, nervis utroque latere costae 3—4, subtus ut costa prominulis, reticulatione inconspicua. Vagina stipularis utroque latere caulis in processum tripartitum producta, processu infra divisionem utroque latere plerumque colletris duobus magnis instructo, lobis filiformibus in colletros exeuntibus, mediano 3 mm, lateralibus 2 mm longis, intus glabra. Inflorescentiae terminales, e flore terminali et e flore singulo laterali constantes, post anthesin a ramulo axillari, flori laterali opposito in positionem lateralem coactae; flos lateralis ut ramulus axillaris ei oppositus bractea filiformi, usque ad 2.5 mm longa suffultus, insuper bibracteolatus; bracteolae bracteis similiores, breviores tamen. Pedicelli usque ad 1 mm longi. Flores 5-meri, probabiliter heterostyli. Ovarium turbinatum, biloculare, 1.2 mm altum, pilis valvulatis hirsutum, carinis a calycis lobis descendentibus costatum; placenta peltata stipite brevi fere ad medium septum affixa; ovula numerosa. Calyx fere ad basin partitus; lobi cum colletris alternantes, inaequales sed omnes virides; duo majores ovati, usque ad 4 mm longi et 2.2 mm lati, 3-nervii; duo intermedii lineari-lanceolati, 3 mm longi et 0.8 mm lati; minor linearis-triangularis, 2 mm longus et 0.4 mm latus; omnes sed praesertim majores

fortiter carinati, costa et margine ciliati, ceterum glabri. Corolla hypocrateriformis, alba, sicc. haud conspicue discolorata, extus sparse hirtella, tubo 5 mm longo et 0.5 mm diam., intus dimidio superiore pilis sericeis barbato, lobis lineari-lanceolatis, intus pilis longis parce pubescentibus. Stamina in specimine solo noto quod probabiliter ad formam dolichostylam pertinet dimidio superiore tubi inclusa, subsessilia; antherae lineares, 1.6 mm longae, dorsifixae, utroque extremo obtusae. Granula pollinis ellipsoidea, 4-colporata, granulata, 22 μ alta et 18 μ diam. (cf. Tab. XI, fig. c). Discus pulvinatus, farinosus. Stylus basi glaber, ceterum papillosus, tubo paulo longior; stigmata filiformia 2 mm longa, mox spiraliter torta. Capsula non rostrata, matura nondum nota.

Habitat Cameroniam.

Cameroons: above Bavenda, alt. 1800 m, Migeod 354, type (K).

Although but a single specimen could be examined, I have little doubt that this species is to be regarded as dimorphic: here too the position of the stamens and stigmata agrees completely with that found in the dolichostylous specimens of the *Pentas* species.

Fully ripe fruits were not available, but there is no reason to expect that the latter would be rostrate: in those genera where a beak is found, it shows itself already on very young fruits.

Tapinopentas is doubtless nearly related to *Parapentas* Brem. v. infra. It differs from the latter in the far more pronounced inequality of the calyx lobes, the bearded corolla tube and the 4-colporate pollen grains. The difference in the position of the inflorescences is of little importance: those of *Parapentas* are at first also terminal; they owe their pseudo-axillary position to the circumstance that the branch by which the growth of the flowering shoot is continued, develops already at a very early stage. *Tapinopentas* differs from *Chamaepentas* in the much smaller size of the flowers and in the presence of bracteoles at the base of the lateral one, in the entirely different shape of the calyx lobes, in the 4-colporate pollen grains and in the absence of a beak on the capsule. From *Pentas* it differs in the decumbent habit, the small and few-nerved leaves, the few-flowered inflorescences, the green colour of the enlarged calyx lobes, the white corolla and the non-rostrate capsule.

4. PARAPENTAS BREM. N. GEN.

Parapentas Brem. n. gen. *Hedyotidearum* praesentia pilorum valvulatorum, foliis petiolatis ovato-oblongis, ovatis vel ovato-lanceolatis, vagina stipulari in lobulos subulatos colletris coronatos exeunte, floribus pentameris, ovario biloculari, placenta peltata stipite brevi e parte inferiore septi oriente, ovulis numerosis generi *Pentadi* Bth. similius, habitu decumbente, foliis parvis et paucinerviis ad *Chamaepentada* Brem. et *Tapinopentada* Brem. accedens, floribus pseudo-axillaribus, calycis lobis aequalibus vel subaequalibus, corollae tubo intus subglabro ab eis diversum, a *Chamae-*

pentadi insuper floribus minoribus, capsula non rostrata, a *Tapinopentadi* granulis pollinis 3-colporatis distinguendum; — *Oldenlandia* spec. K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895.

Herbae ramosae. Caules subteretes, e basi decumbente ascendentes, ubique primum dense, deinde sparsius a pilis valvulatis crispatis vestiti. Folia opposita, petiolata; petiolus longiusculus, indumento denso rufo vel fusco vestitus; lamina ovato-lanceolata, ovata vel ovato-oblonga, apice acuta vel acuminata, calloso-mucronata, basi subito in petiolum contracta, tenuis, utrimque pilis valvulatis strigosa, raphium fasciculis dense lineolata, nervis utroque latere costae 3—7. Vagina stipularis utroque latere caulis in processum trifidum vel tripartitum, infra divisionem utroque latere uno vel duobus colletris ovoideis instructum producta, lobulis subulatis in colletros interdum vix distinguendos exeuntibus, lateralibus mediano paulo brevioribus, extus rufo- vel fusco-pilosa, intus glabra. Inflorescentiae pauciflorae, cymosae, saepe ad triades vel diades redactae. Flores sessiles, pentameri, isostyli vel heterostyli. Ovarium turbinatum, dense pubescens vel hirsutum, biloculare; placenta peltata stipite brevi parte inferiore septi affixa; ovula numerosa. Calyx usque ad basin partitus, lobis aequalibus vel paulum inaequalibus, linearibus vel lineari-oblongis, ovario multo longioribus. Corolla hypocrateriformis, alba, tubo tereti angustissimo, calyce multo longiore, extus pubescente, intus glabro vel ad insertionem staminum vix conspicue piloso, lobis intus minute papillosis. Stamina paulo infra incisuras corollae inserta, in floribus isostylis et in forma brachystyla florum heterostylorum longius exserta; filamenta glabra; antherae dorsifixae, lineares, utroque extremo obtusae. Granula pollinis breviter ellipsoidea vel globosa, 3-colporata. Discus pulvinatus, farinosus. Stylus glaber, in floribus isostylis exsertus, in forma brachystyla florum heterostylorum inclusus; stigmata filiformia. Fructus capsula obconica vel subglobosa, calyce accrescente coronata, haud rostrata, intra calycem rima loculicida dehiscens. Semina numerosa, angulosa, alveolata, brunnea; cellulae testae parietibus undulatis instructae, minute punctatae (cf. Tab. VII, fig. c).

Speciebus adhuc notis tribus in Africa Tropicali endemicum.

Species typica: *P. silvatica* (K. Sch.) Brem. (*Oldenlandia* K. Sch.).

In the decumbent habit of its species, in the small size of their leaves and in the small number of the latters' lateral nerves, in their few-flowered inflorescences, in the always entirely green calyx and in the white colour of the corolla *Parapentas* resembles *Chamaepentas* Brem. and *Tapinopentas* Brem., but it differs from both genera in the pseudo-axillary position of the inflorescences and the sympodial structure of the shoots, in the equality or subequality of the calyx lobes and in the inside nearly or entirely glabrous corolla tube, from *Chamaepentas*, moreover, in the flat-topped capsule, and from *Tapinopentas* in the linear or linear-oblong calyx lobes and in the 3- instead of 4-colporate pollen grains. The affinity

of these genera with *Pentas* Bth. reveals itself in the presence of an indumentum consisting of septate hairs, in the gland-tipped lobules of the stipular sheath, in the pentamerous flowers and in the wavy outline and the dense punctation of the rather large testa cells.

Key to the Species.

1. Flowers in groups of two or three; the groups separated from each other by internodes of normal length. Calyx lobes of equal length. Anthers and stigmata at the same height; all exserted.
   2. Calyx lobes 4—6 mm, corolla tube 12—16 mm, corolla lobes 5—6 mm long; the latter nearly glabrous at the back . . . . . 1. *P. silvatica*
   2: Calyx lobes 1.5 mm, corolla tube 8 mm, corolla lobes 1.7 mm long; the latter conspicuously ciliate at the back. 2. *P. parviflora*
1: Flowers in cymes that are grouped in pairs and therefore surrounded by two leaf pairs. Calyx lobes more or less unequal. Anthers and stigmata at different height and either the anthers or the stigmata included . . . . . 3. *P. gabonica*.

1. **Parapentas silvatica** (K. Sch.) Brem. n. comb.; *Oldenlandia silvatica* K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895; — anne *O. procurrens* K. Sch. in Bot. Jahrb. **34**, 324, 1904, incertum sed haud improbabile; — anne *Virecta*? *obscura* K. Sch. op cit. 331, etiam incertum.

Caules 1—1.5 mm diam., internodiis 3—12 cm longis. Folia petiolo 0.4—2 cm longo instructa; lamina ovata vel ovato-oblonga, 1.0—6 cm longa et 0.7—3.2 cm lata, sicc. supra saturate, subtus dilute fusca, nervis utroque latere costae 3—6. Vagina stipularis utroque latere caulis in processum tripartitum 3.5—5 mm longum producta, lobulis aliquibus in colletros exeuntibus. Flores isostyli, plerumque duo vel tres in axilla eiusdem folii inserti, axilla opposita vida; flos unus ebracteolatus et inde probabiliter origine terminalis, flores alii bibracteolati; bracteolae foliaceae vel filiformes. Ovarium dense hirsutum, 1.2 mm altum. Calycis lobi lineares, 4—6 mm longi et 0.5 mm lati, vix carinati, subglabri, fructu usque ad 8 mm accrescentes et basi usque ad 1.2 mm dilatati. Corolla tubo 12—16 mm longo et 0.3 mm diam., extus densius piloso, intus ad insertionem staminum parce piloso, ceterum glabro, lobis lineari-oblongis 5—6 mm longis et 1.8 mm latis, extus subglabris. Stamina 1 mm infra incisuras corollae inserta; filamenta 4 mm longa; antherae 2.6 mm longae. Granula pollinis globosa, 21 μ diam. (cf. Tab. XI, fig. d). Stylus 1.4—1.8 cm longus, tubo semper paulo longior; stigmata 2.5 mm longa. Capsula obconica 2.6 mm alta, parce pilosa.

Habitat Tanganyikam.

Tanganyika: Usambara, Mlalo, Holst 511, type, n.v.; ibidem, Engler 1403, type of *Oldenlandia procurrens* K. Sch. n.v.; Amani, Warnecke 34; Mt Bomole, Don Carlos 5965, Verdcourt 181; s.l. Buchwald 632, neotype (K).

The type of this species is lost, but as the specimina collected by Warnecke and Buchwald were identified by Schumann himself, and as their characters fully agree with the description, there can be no doubt with regard to its identity.

The flowers of *Oldenlandia procurrens* were described by Schumann as tetramerous, but as there is in every other respect a nearly complete agreement between the description of this species and that of *O. silvatica*, I have no doubt that this is a mistake. Afterwards specimens of *O. Friesiorum* Brem. v. infra (Kyimbila, Stolz 1129) were distributed by the Berlin Herbarium under the name *O. procurrens* K. Sch., but this is either an illegitimate homonym or else a wrong identification.

The description of Schumann's *Virecta? obscura* does not deviate either in any essential point from that of his *O. silvatica*, and although my conclusion that the two must be conspecific could not be verified by an examination of the type of *Virecta? obscura*, I think that it is acceptable.

2. **Parapentas parviflora** Brem. n. spec.; maxime ut *P. silvatica* (K. Sch.) Brem. sed statura multo minore et praesertim calycis et corollae lobis multo brevioribus ab ea recedens.

Caulis 0.7—1.1 mm diam., internodiis 0.8—6 cm longis. Folia petiolo 0.3—1.3 cm longo instructa; lamina ovata, 1.0—4 cm longa et 0.5—2.5 cm lata, sicc. supra fusca et subtus grisea, nervis utroque latere costae 3—5. Vagina stipularis utroque latere caulis in processum trifidum 2 mm longum producta, lobulis aliquibus in colletros exeuntibus. Flores isostyli, plerumque in paria in axilla eiusdem folii inserti, axilla opposita vida; flos alter semper ebracteolatus et inde evidenter origine terminali, alter bibracteolatus; bracteolae foliaceae vel filiformes. Ovarium dense hirsutum, 1.2 mm altum. Calycis lobi lineari-oblongi, 1.5 mm longi et 0.4 mm lati, subcarinati, margine et costa iisdem pilis ut ovarium ciliati, fructu usque ad 2.2 mm accrescentes et basi usque ad 1 mm dilatati. Corolla tubo 8 mm longo et 0.3 mm diam., extus sparse piloso, intus glabro, lobis oblongis 1.7 mm longis et 0.6 mm latis, extus costa ciliatis. Stamina 0.5 mm infra incisuras corollae inserta; filamenta 2 mm longa; antherae 1.1 mm longae. Granula pollinis globosa, 21 μ diam. Stylus tubo aequilongus; stigmata 1.6 mm longa. Capsula obconica 2.2 mm alta.

Habitat Tanganyikam.

Tanganyika: Usambara, Pare Mnts, Hotulwa, alt. 2000 m, Mr and Mrs Luchman 21, type (Nairobi), "found chiefly on the forest floor"; Mahenge District, Sale, 35 Km south of Mahenge, alt. 1050 m, Schlieben 1925.

P. parviflora is obviously a very near ally of *P. silvatica*, but the differences are of sufficient importance to regard it as specifically distinct. It is not only in all its parts distinctly smaller than *P. silvatica*, but the calyx and corolla lobes are comparatively wider, and the calyx lobes are, moreover, distinctly keeled and ciliate along the margin and on the keel.

3. **Parapentas gabonica** Brem. n. spec.; a congeneribus adhuc notis inflorescentiis in paria approximata et inde foliis quattuor circumdatis, stigmatibus et antheris ad altitudines inaequales elatis, capsula parva distinguenda.

Caulis 0.8—1.4 mm diam., internodiis 0.4—8 cm longis. Folia petiolo 0.4—2.0 cm longo instructa; lamina ovato-lanceolata vel ovata, 1.0—5 cm longa et 0.7—2.4 cm lata, sicc. supra olivaceo-fusca, subtus grisea, nervis utroque latere costae 4—7, a venulis transversis tenuibus et permultis conjunctis. Vagina stipularis utroque latere caulis in processum trifidum 2—3 mm longum producta, processu infra divisionem utroque latere colletris duobus instructo, colletris apicalibus lobulorum indistinctis. Inflorescentiae cymosae, in paria approximatae et inde foliis quattuor circumdatae. Flores probabiliter heterostyli sed una forma sola noti. Ovarium dense pubescens, 1.2 mm altum. Calycis lobi lineari-oblongi, interdum inaequales, casu quo major usque ad 2.2 mm longus et 0.8 mm latus, ceteri 1.5 mm longi et 0.4 mm lati, omnes acuti, haud distincte carinati, margine et costa setulosi, fructu vix accrescentes. Corolla tubo 6 mm longo et 0.4 mm diam., apicem versus usque ad 1.5 mm ampliato, extus pubescente, intus glabro, lobis ovatis 1.2 mm longis et basi 0.9 mm latis, extus ut tubus pubescentibus. Stamina in forma adhuc sola nota 1.2 mm infra incisuras corollae inserta; filamenta 2.2 mm longa; antherae 1.0 mm longae. Granula pollinis breviter ellipsoidea, 22 μ alta et 20 μ diam. Stylus 3 mm longus; stigmata 1.1 mm longa, inclusa. Capsula subglobosa 1.5 mm alta.

Habitat Gaboniam.

Gaboon: Ogoué, Schwäbisch & Thollon 348, type (P).

The collection consists of several specimens, and all of them are provided with an included style and exserted anthers. This seems to be in contradiction with my supposition that this species is to be regarded as heterostylous, but as these plants spread vegetatively by means of the decumbent shoots, the axillary buds developing into new individuals which in the end are separated from the mother plant, it is quite possible that all the individuals of which this collection consists, are after all but parts of one plant.

P. gabonica differs far more from the two other species than the latter differ from each other. The main differences are found in the arrangement of the inflorescences in pairs, in the larger number of flowers per inflorescence, in the presumably heterostylous flowers and in the small size of the capsules.

5. THECORCHUS BREM. N. GEN.

Thecorchus Brem. n. gen. *Hedyotidearum* floribus singulis vel in triades singulas ad nodos inflorescentiae spiciformis, basi interdum semel furcatae dispositis necnon capsulis elongatis ad *Otomeriam* Bth. accedens, foliis parvis, floribus pro parte tetrameris, multo minoribus et isostylis, calycis

lobis aequalibus ab eo recedens; *Oldenlandia* species Hiern in Fl. Trop. Afr. 3, 64, 1877.

Genus adhuc monotypicum in Sudania Occidentali et Centrali endemicum.

1. **Thecorchus wauensis** (Schweinf. ex Hiern) Brem. n. comb.; *Oldenlandia wauensis* Schweinf. ex Hiern in Fl. Trop. Afr. 3, 64, 1877.

Herba annua, erecta, simplex vel e basi ramosa, interdum ad insertionem floris infimi furcata, 15—25 cm alta. Caulis quadricostatus, glaber, basi usque ad 1.5 mm, apice circ. 0.8 mm diam., internodiis 1—3 cm longis, in axillis foliorum haud raro ramulis abbreviatis instructus. Folia opposita, sessilia, linearia, 1—3 cm longa et 1.2—3 mm lata, apice calloso-mucronata, margine plerumque recurvata, subtus margine et costa scabridula, ceterum utrimque glabra vel (var. *scrabida*) marginem versus scabrida. Vagina stipularis nunc extus intusque glabra, nunc (var. *scabrida*) extus scabridula, utroque latere caulis cuspidibus duabus vel pluribus instructa. Flores infimi interdum in furca inter ramos duos inserti, alii semper solitarii vel in triades solitarias ad nodos monochasiorum spiciformium dispositi; bracteae inferiores foliis similiores, ceteri apicem inflorescentiae versus gradatim magnitudine decrescentes; pedicelli usque ad 1 mm longi, interdum ad nihilum redacti. Flores partim tetrameri, partim pentameri, aliqui interdum calyce pentamero et corolla tetramera instructi, semper isostyli. Ovarium ellipsoideum, glabrum, biloculare; placenta peltata ad medium septum affixa, elongata; ovula numerosa in placentam immersa. Calycis lobi aequales, oblongi, 1—1.2 mm longi, acutissime exeuntes, carinati, margine cartilaginea instructi et ibi scabriduli, ceterum glabri. Corolla alba, tubo tereti 1—1.5 mm longo et 0.8 mm diam., intus dimidio superiore pilis robustioribus barbato, lobis ovato-triangularibus 0.5—0.7 mm longis, basi 0.5—0.6 mm latis, supra papillosis. Stamina sessilia, medio tubo affixa; antherae basifixae 0.5 mm longae. Granula pollinis ellipsoidea, 3-colporata, 22 μ alta et 18 μ diam. (Tab. XI, fig. e). Stylus glaber 0.6 mm longus; stigmata stylo paulo crassiora, 0.5 mm longa. Capsula elongata 5 mm alta et 2 mm diam., calycis lobis usque ad 4 mm elongatis coronata, intra calycem haud producta et ibi rima loculicida tarde aperiens, valvulis cartilagineis. Semina subglobosa, parva, brunnea, vix conspicue alveolata, madefacta non glutinosa. Testa tenuis; cellulae parietibus subrectis, non punctatis instructae (cf. Tab. VII, fig. d).

Habitat Sudaniam Occidentalem et Centralem.

var. *wauensis*; foliis totis glabris, vagina stipulari extus glabra.

Central Sudan: Country of the Djur, along the river Wau, Schweinfurth 1648, type (K); Chari, Chevalier 8491, Foureau 3029, "plante des grèves."

Dahomey: along the river Ouémé, Chevalier 23598.

Western Sudan: Upper Senegal, Lac Debo, Hagerup 155.

var. *scabrida* Brem. n. var. a typo foliis marginem versus scabridis, vagina stipulari extus scabridula recedens.

Western Sudan: along the river Bani, Chevalier 1068, type of the variety (P).

The most important features of this new genus are the pseudo-axillary flowers or flower triads, which together form a monochasial spike, the small size of the flowers and the rather unusual variability in the number of their parts, the basifixed anthers and the fact that the latter as well as the stigmata are included, the elongated placentas and the elongated capsules. The pseudo-axillary position of the flowers and the monochasial character of the spiciform inflorescence are put beyond doubt by the occasional occurrence of forked stems with a flower or a flower triad in the fork.

In most of its characters *Thecorchus wauensis* reminds us of *Otomeria* Bth., but it differs from the representatives of that genus in its small size, in the narrow leaves, in the very small and partly tetramerous flowers, in the equality of the calyx lobes and in the structure of the testa.

6. **KOHAUTIA** Cham. et Schlecht.

Kohautia Cham. et Schlecht. in Linnaea **4,** 156, 1829; DC, Prodr. **4,** 430, 1830; Endlicher, Atakt. t. 23, 1833; Meisner, Pl. Vasc. Gen. **1,** 160, 1838; Royle, Ill. Bot. Himal. 241, t. 53, fig. 1, 1839; Schnizlein in Flora **25,** Beibl. 145, 1842; Bentham in Hooker, Niger Flora 403, 1849; Klotzsch in Peters, Reise Mossambique Bot. 296, 1862; *Hedyotis* L sect. *Kohautia* W. et A., Prodr. 1, 417, 1834, Walp., Repert. **2,** 501, 1843; Sonder in Fl. Cap. **3,** 10, 1864; *Oldenlandia* L subgen. *Kohautia* Hook. f. in Benth. et Hook., Gen. Pl. **2,** 59, 1877; Hook. f. in Fl. Brit. Ind. **3,** 67, 1882; K. Schumann in Engler & Prantl, Nat. Pflanzenfam. IV, **4,** 26, 1891 p.p.; id. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895 p.p.; Cufodontis in Nuovo Giorn. Bot. Ital. **55,** 82, 1948.

Herbae annuae vel perennes, rarius fruticuli ramosiores. Radix palaris, cortice sicc. haud raro pigmentum purpureum vel violaceum continens, in speciebus perennibus multiceps. Caulis ramique subteretes vel obtuse quadrangulares, erecti vel ascendentes, semper monopodiales. Folia sessilia, plerumque filiformia vel linearia, rarius lineari-lanceolata vel lanceolata, rarissime ovato-lanceolata, apice calloso-mucronata, plerumque 1-nervia, interdum indistincte penninervia, rarissime 3- vel 5-nervia. Vagina stipularis plerumque utroque latere caulis in cuspides vel fimbrias 2 vel plures, raro in lobum simplicem vel subsimplicem producta. Inflorescentiae semper terminales, plerumque corymbiformes vel paniculiformes, interdum capituliformes, raro ad triadem, diadem vel florem singulum redactae; ramuli ultimi inflorescentiarum uberiorum plerumque monochasiales. Bracteae inferiores plerumque filiformes vel subulatae, aliae plerumque anguste triangulares, basi rudimentis stipularum fimbriatae; ulteriores setaceae, haud raro vix conspicuae. Flores 4-meri, raro aliqui 5-meri. Ovarium biloculare; placenta peltata stipite brevi dimidio inferiore septi

affixa; ovula numerosa in placentam carnosam immersa. Calyx fere ad basin partitus, lobis ovato-triangularibus, triangularibus vel subulatis. Corolla hypocrateriformis, tubo tereti gracili parte superiore dilatato, ad orem interdum pilis applanatis obtusis barbato, limbo patente vel suberecto, segmentis basi interdum breviter connatis, supra plerumque papillosis. Stamina parte dilatata tubi inclusa vel apicibus solis exsertis; antherae basi vel dorso paulo supra basin affixae, sessiles vel filamentis brevissimis instructae. Granula pollinis ellipsoidea vel subglobosa, parva, colpis et poris 3—8 instructa (cf. Tab. XI, fig. f—m). Stylus semper glaber, nunc in stigma singulum teres stylo crassius, nunc in stigmata dua filiformia exeuns, plerumque in dimidio inferiore tubi inclusus, rarius stigmate vel stigmatibus antheras attingens. Capsula globosa vel ellipsoidea, calyce coronata, bilocularis, intra calycem interdum paulum producta et ibi semper rima loculicida aperiens. Semina lutea vel brunnea in placentam immersa, angulosa, madefacta haud raro glutinosa, haud profunde alveolata; cellulae testae parietibus plerumque rectis, rarius undulatis instructae (cf. Tab. VII, fig. e—h).

Genus speciebus circ. 60 per totam Africam insula Madagascar inclusa et in parte occidentali Asiae Tropicalis distributum.

Species typica: *K. senegalensis* Cham. et Schlecht.

The genus *Kohautia* Cham. et Schlecht. is well characterized by the structure of its flowers. The latter are always monomorphic, with the anthers as well as the stigmata included, and the stigmata at a lower level than the anthers or, occasionally, just touching them. In the *Hedyotideae* this type of flower is confined to this genus and to a few species of *Conostomium*, where, however, it occurs in company of another type of flower and is probably teratological. Elsewhere in the family it is also but rarely met with. I found it in the section *Eusipanea* K. Sch. of *Sipanea* Aubl., in the monotypical genus *Cladoceras* Brem. (cf. Hooker's Icones Plantarum t. 3411, 1940), in *Posoqueria* Aubl. and in some of the genera of the *Guettardeae*, viz. in *Guettarda* L, *Antirrhoea* Commerç. and *Laugeria* Vahl. Outside the *Rubiaceae* this type of flower structure is met with in some *Apocynaceae*, e.g. in the genus *Vinca* L, where it was first observed by Fritz Mueller. In this plant the stigma proved to be very sticky, so that the proboscis of a visiting insect covers itself up to a certain distance from the top with this sticky substance. When the proboscis is withdrawn, it slides, of course, along the anthers, and the sticky part becomes covered with pollen, part of which is rubbed off in the next flower to the stigma. As I had no living plants of *Kohautia* at my disposition, I asked my friend, Dr H. G. Schweickerdt of the University of Pretoria, to investigate the mechanism for me. He studied it in *K. amatymbica* Eckl. et Zeyh. and found that the stigmata as well as the upper part of the style were covered with a viscid fluid that could easily be drawn out in threads. It need not be doubted, therefore, that

in *Kohautia* too the proboscis of the visiting insect becomes covered with this sticky mass and catches in this way the pollen grains by the aid of which in the next flower pollination may be effected.

The anthers are, as a rule, entirely included in the campanulate or, very rarely, infundibuliform widening of the tube. They are usually much shorter than this widened part, and as they are inserted near the latter's base, they remain some distance below the mouth of the tube. In the very rare cases in which they are slightly longer than the widened part, they protrude with the sterile tips beyond the mouth. The style is, as a rule, so short that the stigmata remain some distance below the anthers. In some species, however, the upper part of the stigma or of the stigmata are at the same level as the lower part of the anthers, and in these cases it can hardly be doubted that selfing may take place.

Another noteworthy feature of *Kohautia* are the very small or, if somewhat larger, then always pluricolporate pollen grains. In the other genera belonging to this group the pollen grains are usually provided with three or four colpae and pores, and they are always much larger than the tri- or quadricolporate grains found in some of the *Kohautia* species. Pollen grains with 5 colpae and pores are in this group extremely rare, and 6- to 8-colporate ones seem to be confined to this genus; they are always somewhat larger than the 3- or 4-colporate ones, the size increasing more or less regularly with the number of colpae. Very small pollengrains are also met with in *Danais* Commerç. and in *Sacosperma* G. Tayl., but although I include these genera in the *Hedyotideae*, they are but distant allies of *Kohautia*.

The last character to which I wish to draw the attention, is the presence of a purple or violet dye in the dried roots of these plants, and sometimes also in other parts. The dye may well be alizarin or a nearly related product. There is one other member of this group from which such a dye is obtained. This is *Oldenlandia umbellata* L, which is grown to this end in India on a commercial scale. So far, however, this species and perhaps some of its nearest allies were the only representatives of the *Hedyotideae* from which such a substance has been recorded.

The seeds of the *Kohautia* species are very similar to those of *Oldenlandia* sensu meo, and this might indicate a nearer affinity between these two genera than one would otherwise be inclined to assume.

For the subdivision of this comparatively large genus use can be made of the presence of a single, slightly swollen, cylindrical stigma or of two thin filiform ones. In most of the species with a single stigma the corolla throat proves to be bearded with flattened obtuse hairs of the same kind as those found in several other genera of this group, but in *K. virgata* (Willd.) Brem. the latter are wanting, and this species differs from the other members of this group also in the production of the connective beyond the anther cells and in the wavy outline of the testa cells. It resembles them, however, in the presence of star-shaped crystals of Ca-

oxalate in the connective. The significance of this character is not fully clear, for it recurs in species belonging to related genera but not, so far as I know, in the group of *Kohautia* species with filiform stigmata.

Another important character are the intrusions at the entrance of the tube and eventually also at the base of the widened part, but as they are easily overlooked, I have not used them in my key. The presence of the intrusions at the entrance to the tube is correlated with the spreading of the limb: in those species where they are absent, the corolla lobes do not curve so far backwards as in those in which they are present. A perpendicularly spreading limb is found in the bright red or violet flowers of the species belonging to the group with the single stigma and in part of the species of the other group. All these plants open their flowers during day time. In the remaining species the flowers are either white, or but faintly tinted, and fragrant, and they are open at night, and in none of these plants the flowers open so widely as in those where they are open during the day.

The key to the species contains also, in smaller print, keys to the varieties. I have included the latter in the main key, because several of the forms to which varietal rank has been assigned, may have to be raised to specific rank when they become better known. This applies e.g. to the varieties of *K. longifolia* Klotzsch. The difference between some of the species is, on the other hand, so slight that they might perhaps better be united. This applies e.g. to *K. caespitosa* Schnizlein and *K. lasiocarpa* Klotzsch, which seem to differ mainly in the arrangement of the flowers singly or in pairs along the branchlets of the inflorescence. In the delimitation proposed by me the var. *Schimperi* (Presl) Brem. of *K. caespitosa* might at first sight, because of its fruticulose habit, be taken for a distinct species, but as further study failed to reveal any other important differences with the other varieties of *K. caespitosa*, it did not seem to deserve a higher rank than the latter. That I did not sink *K lasiocarpa* in *K. caespitosa* rests on the reflection that the arrangement of the flowers in pairs is, as a rule, correlated with the presence of other important characters, so that it seems plausible to assume that such characters will be present in this case also, even though I did not succeed in finding them. I admit, however, that this argument is not a very strong one. The species preceding *K. caespitosa* and *K. lasiocarpa* are also almost all very nearly related.

Key to the Species.

1. Style ending in a single, ovoid or cylindrical stigma. Corolla limb usually red or violet . . . . . Subgenus **Pachystigma**
   2. Corolla throat with a more or less dense, yellowish or white beard consisting of flattened, obtuse hairs . Series *Barbatae*

3. Style very short: stigma and anthers therefore some distance apart. Corolla limb red or violet.
   4. Widened part of the corolla tube funnel-shaped, not narrowed at the mouth; the ribs descending from the stamens glabrous . . . . . 1. *K. obtusiloba*
   4: Widened part of the corolla tube either barrel-shaped or cylindrical, at both ends narrowed; the ribs descending from the stamens in their upper part hirtellous.
      5. Flowers all distinctly pedicellate.
         6. Peduncle slender, much longer than the preceding internode. Inflorescence usually consisting of five flowers only . . . . . 2. *K. prolixipes*
         6: Peduncle not much longer than the preceding internode. Inflorescence with more than five flowers.
            7. Leaves linear to linear-lanceolate; the majority more than 4 mm wide. Calyx lobes at least 2.5 mm long . . . . . 3. *K. longifolia*
               a. Calyx lobes 2.5—3.5 mm long.
                  b. Stems and branches glabrous or towards the top puberulous . . . . . var. *longifolia*
                  b: Stems and branches hirtellous.
                     c. Ovary glabrous . . . . . var. *psilogyna*
                     c: Ovary hirtellous . . . . . var. *vestita*
               a: Calyx lobes 5—6 mm long . . . . . var. *macrocalyx*
            7: Leaves linear to filiform, rarely a few up to 4 mm wide. Calyx lobes less than 2 mm long.
               8. Corolla lobes less than 3 mm long and 2.2 mm wide. Stipular sheath on each side of the stem with more than two appendages.
                  9. Stem consisting of a small number of internodes, 9—11 cm high. Pedicels 1.5—5 mm long. Capsule depressed globose . . . . . 4. *K. Sennii*
                  9: Stems consisting of several internodes, at least 20 cm high. Pedicels 3—25 mm long. Capsule globose . . . . . 5. *K. effusa*
                     a. Stem at least towards the top glabrous. Leaves subglabrous or scabridulous above, glabrous below . . . . . var. *effusa*
                     a: Stem sparsely hirtellous. Leaves on both sides rather densely scabrido-hirtellous . . . . var. *hirtella*
               8: Corolla lobes more than 4 mm long and wide. Stipular sheath on each side of the stem with two appendages only.
                  10. Leaves narrowly linear to filiform, less than 1 mm wide. Calyx lobes 1.5 mm long, not accrescent on the fruit . . . . . 6. *K. microcala*

10: Leaves linear, at least 1 mm wide. Calyx lobes on the fruit up to 2 mm long . . . . . 7. *K. leucostoma*

5: Flowers at least for the greater part sessile or subsessile.

11. Rather stout perennial herb; stems branched from the base. Flowers capitate. Corolla 15 mm long . . . . . 8. *K. cuspidata*

11: Slender annual herb with an unbranched stem, not more than 6 cm high. Flowers solitary or in pairs, more rarely in few-flowered monochasia. Corolla 6 mm long . . . . . 9. *K. cicendioides*

3: Stigma with its top in contact with the anthers. Corolla white.

12. Flowers solitary in the forks of a dichasial inflorescence; the lower ones distinctly pedicellate; the ramifications subtended by leaves . . . . . 10. *K. stellarioides*

12: Flowers in terminal and axillary fascicles, the former 3-flowered, the latter 2-flowered; pedicels short; the fascicles forming together a spiciform inflorescence . . . . . 11. *K. amboensis*

2: Corolla throat inside glabrous. Stigma with its top in contact with the anthers . . . . . Series *Imberbae*

Only species . . . . . 12. *K. virgata*

a. Leaves linear, mucronulate . . . . . var. *virgata*

a: Leaves oblanceolate, shortly aristate . . . . . var. *oblanceolata*

1: Style ending in two filiform stigmas. Corolla limb coloured or white . . . . . Subgenus **Eu-kohautia**

13. Corolla limb red, violet or blue . . . . . Series *Diurnae*

14. Stigmas remaining some distance below the anthers. Flowers usually subsessile, sometimes provided with a 3—10 mm long pedicel, but then the flowers in terminal and axillary triads.

15. Calyx lobes at least one third and usually more than one half as long as the corolla tube.

16. Leaves lanceolate or ovate-lanceolate, 3- or, more rarely, 5-nerved. . . . . 13. *K. platyphylla*

16: Leaves linear-lanceolate or linear, with a single main nerve.

17. Annual herb with a single stem . . . 14. *K. coccinea*

17: Perennial herb with several stems 15. *K. pleiocaulis*

15: Calyx lobes not more than one third the length of the corolla tube, usually much shorter.

18. Inflorescence consisting either of a terminal and some axillary triads or of few-flowered, more or less racemiform terminal and axillary monochasia; in the latter case the upper monochasia sometimes reduced to a single flower. Corolla violet.

19. The majority of the flowers in terminal and axillary triads; the central flower of the triad sometimes subsessile, the lateral ones provided with a 3—10 mm long pedicel. Pollen grains 3-colporate 16. *K. angolensis*
a. Calyx lobes circ. 1.2 mm long. . . . . var. *angolensis*
a: Calyx lobes circ. 2.4 mm long. . . . . var. *macrocalyx*

19: The majority of the flowers in pairs along the axis of few-flowered terminal and axillary monochasia, all subsessile. Pollen grains 4-colporate . . . . . 17. *K. huillensis*

18: Flowers in numerous terminal and axillary cymes which together form a large corymb. Corolla red. . . . . 18. *K. grandiflora*

14: Stigmas either with their top or with their whole length in touch with the anthers. Flowers always long-pedicellate.

20. Inflorescence a lax, many-flowered panicle. Bracts all minute. Pedicels at least 1 cm long. Corolla red.

21. Leaves subglabrous. Ovary papillose. Corolla lobes less than 1 mm wide, suberect. Stigmas with their top only in touch with the anthers . . . . . 19. *K. confusa*

21. Leaves scabridulous. Ovary scabrido-papillose. Corolla lobes more than 2 mm wide, patent. Stigmas with their whole length in contact with the anthers . . . . . 20. *K. ubangensis*

20: Inflorescence either once dichasial with monochasial branchlets or entirely monochasial, few-flowered. The lower flowers usually subtended by ordinary leaves. Pedicels 3—16 mm long. Corolla blue. . . . . 21. *K. azurea*

13: Corolla white, yellowish or buff, rarely (*K. aspera*) light blue or violet . . . . . Series *Noctiflorae*

22. Pollen grains provided with 4 or more colpae and pores.

23. Corolla lobes acuminate. Inflorescence always paniculiform.

24. Calyx lobes circ. 4 mm long. Corolla lobes circ. 4 mm wide. Anthers half as long as the widened part of the tube . . . . . 22. *K. quartiniana*

24: Calyx lobes not more than 2 mm long. Corolla lobes not more than 2.5 mm wide, usually circ. 1 mm wide. Anthers as long as the widened part of the tube . . . . . 23. *K. senegalensis*

23: Corolla lobes obtuse or subacute. Inflorescences various.

25. Flowers never in capitula nor in diads, triads or few-flowered cymes at the end of slender erect stems and erect branches. Stipular sheath sometimes on each side of the stem produced in a triangular lobe, but if so, the lobe always ending in two filiform appendages.

26. Flowers distinctly pedicellate.
  27. Pedicels 2—4 cm long. Corolla tube below the widened part 0.7 mm diam.; corolla lobes 1.2 mm wide . . . . . 24. *K. euryantha*
  27: Pedicels 0.5—1 cm long. Corolla tube below the widened part 0.4 mm diam.; corolla lobes 0.4 mm wide. . . . . 25. *K. socotrana*
26: Flowers either all sessile or subsessile or the lower ones with an up to 3 mm long pedicel; if in pairs, at least one of the pair sessile or subsessile.
  28. Anthers about half as long as the widened part of the tube.
    29. Inflorescence very large, laxly paniculiform; the lower internodes long, slender and more or less patent; flowers usually in pairs but then always one of them with a rather slender pedicel . . . . . 26. *K. latibrachiata*
    29: Inflorescences few-flowered, monochasial or in more robust specimens once trichotomous with the branchlets sometimes once dichasial, or once or twice dichasial; flowers with the exception of those in the forks of the dichasia all subsessile or sessile.
      30. Stem simple and erect; leaves shorter than the internodes . . . . . 27. *K. stenosiphon*
      30: Usually branched at the base; the lower part of the stems with short internodes and the leaves in this part of the stem always longer than the internodes.
        31. Leaves subrosulate. Stems suberect, usually several. . . . . 28. *K. brachyloba*
        31: Leaves separated from each other by short but nevertheless clearly visible internodes. Stems ascending . . . . 29. *K. longiscapa*
          a. Stems, leaves and ovaries glabrous . . . . . var. *longiscapa*
          a: Stems and leaves scabridulous; ovary hirtellous . . . . . var. *scabridula*
  28: Anthers about as long as the widened part of the tube.
    32. Flowers along the branchlets of the inflorescence for the greater part solitary.
      33. Leaves succulent. Inflorescence with 6 to 9 flowers. . . . . 30. *K. sarcophylla*
      33: Leaves not succulent. Inflorescences with a larger number of flowers.

34. The basal part of the stem and both sides of the leaf hirtellous. . . . 31. *K. somaliensis*
34: Stems and leaves scabrido-papillose or glabrous.
35. Stems at medium height usually less than 1 mm in diam. The narrow part of the corolla tube circ. 0.3 mm in diam.
36. Branches fastigiate. Corolla tube 9.5 mm long. Capsule 2 mm high.
37. Stigmas included in the narrow part of the tube . . . 32. *K. obbiadensis*
37: Stigmas touching the base of the anthers . . . . 33. *K. dolichostyla*
36: Branches more or less patent. Corolla tube 14 mm long. Capsule 3.5 mm high . . . . . 34. *K. gracillima*
35: Stems at medium height at least 1 mm in diam. The narrow part of the corolla tube at least 0.5 mm in diam.
38. Corolla lobes less than 2 mm long. Capsule less than 2.5 mm in diam.
39. Basal leaves narrowly oblong and much larger and wider than the cauline ones. Stems branched at the base. . . . . 35. *K. baddadensis*
39: All leaves linear; branches produced from the axils of all leaves, more or less patent . . . . . 36. *K. Pappii*
38: Corolla lobes at least 2 mm long. Capsule more than 2.5 mm in diam . . . . . 37. *K. caespitosa*
a. Ovary verruculose or hispido-verruculose.
b. Ovary verruculose. Corolla outside papillose.
c. Herbs.
d. Leaves narrowly linear, rarely more than 2 mm wide; in very vigorous specimens sometimes slightly wider.
e. Rather slender plants; the pole root usually less than 2 mm in diam., in strongly branched specimens sometimes slightly thicker. . . . . var. *caespitosa*
e: Stout plants; the pole root, as a rule, more than 4 mm in diam., stems strongly ramified . . . . . var. *ramosior*

d: Leaves broadly linear, usually more than 2 mm wide. Corolla lobes always more than 1 mm wide . . . . . var. *eritreënsis*

c: Shrublets . . . . var. *Schimperi*

b: Ovary hispidulo-verruculose. Corolla outside glabrous.

f. Style as long as the narrow part of the corolla tube. Corolla lobes 2 mm long . . . . . var. *dolichostyla*

f: Style less than half as long as the narrow part of the corolla tube. Corolla lobes 3 mm long . . . . . var. *delagoensis*

a: Ovary glabrous. . . . . var. *amaniensis*.

32: Flowers along the branchlets of the inflorescence for the greater part in pairs; both flowers subsessile or one subsessile and the other sessile.

40. Corolla white, yellowish or buff; the tube usually slender and the stigmas widely separated from the anthers, sometimes less slender and then the stigmas with their top in touch with the anthers, but even in these flowers the narrow part of the tube distinctly longer than the widened part; limb divided to the base . 38. *K. lasiocarpa*

a. Corolla tube 9—15 mm long.

b. Corolla lobes at least 2.5 mm long.

c. Ovary hispidulous . . . . var. *lasiocarpa*

c: Ovary verruculose. . . . var. *thymifolia*

b: Corolla lobes less than 2.5 mm long . . . . . var. *breviloba*

a: Corolla tube 5—7 mm long.

d. Stem and branches papillose.

e. Ovary hispidulous . . var. *subverticillata*

e: Ovary verruculose. . . . var. *eritreënsis*

d: Stem and branches tomentellous . . . . . var. *xerophylla*.

40: Corolla limb light blue or violet; tube very short and the stigmas in touch with the anthers; narrow part of the tube not or but slightly longer than the widened part; limb not divided to the base. . . . . 39. *K. aspera*

25: Flowers either in capitula or shortly pedicellate and then in diads or in triads of which one flower may be replaced by a pedunculate diad, but the inflorescences always at the end of slender erect stems and eventually of erect branches. Stipular sheath of the lower leaf pairs on either side of the stem with an entire triangular lobe.

41. Flowers shortly pedicellate and arranged in triads, or in triads of which one flower is substituted by a pedunculate diad, or exclusively in diads . . . 40. *K. kimuenzae*
41: Flowers capitate . . . . . 41. *K. amatymbica*

22: Pollen grains 3-colporate, rarely mixed with a few 4-colporate ones.

42. Herbs. Corolla 11—20 mm long.

43. Lower internodes not much shorter than the upper ones.

44. Leaves shorter than the internodes.

45. Ovary glabrous. Calyx lobes 0.5 mm long. Corolla lobes circ. 4 mm long. Style with the stigmas 3 mm long . . . . . 42. *K. rigida*
45: Ovary finely papillose. Calyx lobes 1.5 mm long. Corolla lobes circ. 2 mm long. Style with the stigmas 1.7 mm long. . . . . 43. *K graciliſolia*

44: Leaves longer than the internodes . . . . . 44. *K. omahekensis*

43: Lower internodes much shorter than the upper ones. Herbs branched from the base.

46. Stems ascending from a decumbent base . . . . . 45. *K. cynanchica*
46: Stems fastigiate . . . . . 46. *K. raphiophylla*

42: Shrublets with very small and narrow leaves. Corolla less than 11 mm long.

47. Anthers half as long as the widened part of the corolla tube. A broomlike, very strongly ramified shrublet. Stems and branches partly covered with a papyraceous cork. Pedicels 3—4 mm long . . . . . 47. *K. ramosissima*
47: Anthers slightly longer than the widened part of the corolla tube. Divaricately branched shrublet. Cork not papyraceous. Pedicels circ. 1 mm long . 48. *K. aphylla.*

Subgenus **Pachystigma** Brem. stylo in stigma singulum, ovoideum vel cylindricum exeunte distinctum. Typus: *K. longiſolia* Klotzsch.

Speciebus adhuc notis 12 per totam Africam insula Madagascar inclusa distributum.

Series *Barbatae* Brem. corolla fauce pilis vel papillis applanatis obtusis plus minusve distincte barbata, antheris connectivo vix vel non producto, cellulis testae parietibus rectis vel subrectis instructis distinguenda.

Speciebus adhuc notis 11 in Africa Orientali et Austro-occidentali et in insula Madagascar distributa.

1. **Kohautia obtusiloba** (Hiern) Brem. n. comb.; *Oldenlandia obtusiloba* Hiern in Fl. Trop. Afr. 3, 56, 1877; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895; — anne *O. zanguebariae* Lour., Fl. Cochinch. 78,

1790; DC, Prodr. **4**, 429, 1830; *Hedyotis zanguebariae* (Lour.) R. et S., Syst. **3**, 192, 1818 absentia typi et brevitate descriptionis non certe determinandum, cf. *K. longifolia* Klotzsch.

Herba annua, e basi ramosa, 25—35 cm alta. Caules ascendentes, quadricostati, costis interdum scabriduli. Folia linearia, 1.5—6 cm longa et 1—3.5 mm lata, utrimque scabridula. Vagina stipularis utroque latere caulis in fimbrias 2 circ. 2.5 mm longas exeuns. Inflorescentia corymbiformis, e cyma terminali 5- vel 7-flora et cymis duabus 3-floris ex axillis foliorum supremorum orientibus composita. Pedicelli 2.5—15 mm longi, post anthesin interdum usque ad 3 cm elongati. Ovarium glabrum. Calycis lobi 3.2 mm longi, carinati, margine scabriduli. Corolla rubra, extus glabra, tubo 10 mm longo, parte angusta 0.7 mm diam., parte dilatata e basi campanulata infundibuliformi 3 mm longa et ad medium 1.5 mm diam., ad orem barbata sed sine intrusionibus, limbo patente fisso-partito, lobis 4.5 mm longis et 3.5 mm latis, acutis. Stamina costis glabris in tubo decurrentia; antherae 1.8 mm longae, apice mucronulatae. Granula pollinis 5-colporata, 16 μ diam. (Tab. XI, fig. h). Stylus 3.5 mm longus; stigma 1.8 mm longum. Capsula glabra 2 mm alta et 4 mm diam. Semina madefacta non glutinosa (Tab. VII, fig. e).

Habitat Keniam, Tanganiicam, Africam Orientalem Lusitanicam.
Kenya: Mombasa District, Changanwe, Miss Napier 6291, Kaessner 258, Mearns 2193; between Mombasa and Lamu, Whyte s.n.; Kilifi, Jeffery K. 250; Mombasa, Hildebrandt 1968 et 2031, Sacleux 1439, Boivin s.n., Taylor s.n.; Nyika, Wakefield s.n.; Kilimanjaro, alt. 1500 m, Johnston s.n.
Tanganyika: Amboni, Geilinger 151; Tanga, Heinsen 123; between Tanga and Mtangati, Braun 1821; Duga, Holst 3184; Usaramo, Stuhlmann 6756; Kwala, Swynnerton 206; Zanzibar, Kingani, Kirk s.n., type (K); Pangani District, Bushiri Estate, Mrs Faulkner K 610.
Portuguese East Africa: s.l. Forbes s.n.

This seems to be a species of the lowlands; the locality Kilimanjaro, alt. 1500 m, where according to the label K. H. Johnston's specimen was collected, is exptionally high; I doubt whether the locality is correct.

K. obtusiloba is probably the most aberrant member of the series *Barbatae*: the widened part of the corolla tube is infundibuliform instead of cylindrical or barrel-shaped and it lacks the intrusions by which in the other members of this series this part is narrowed at its ends, the ribs descending from the stamens are glabrous, and the anthers are mucronulate.

Loureiro's *Oldenlandia zanguebariae* is a red-flowered *Kohautia* collected at "Zanzibar", but as in this region two red-flowered species are found, viz. *K. obtusiloba* and *K. longifolia* Klotzsch, which answer the description equally well, the name had to be dropped.

2. **Kohautia prolixipes** (S. Moore) Brem. n. comb.; *Oldenlandia prolixipes* S. Moore in Journ. of Bot. **43**, 351, 1905; id. op. cit. **45**, 115, 1907; *O. pedunculata* K. Sch. et K. Krause in Bot. Jahrb. **39**, 519, 1907.

Herba perennis, e basi lignescente ramosa, 15—20 cm alta. Caules breviter hirtelli, e basi decumbente et ibi interdum internodiis satis longis composita ascendentes, internodiis partis ascendentis maxime 2 cm longis. Folia lineari-lanceolata, 1.5—3 cm longa et 3—5 mm lata, basi subobtusa, nervis lateralibus haud conspicuis. Vagina stipularis utroque latere caulis in lobum triangularem apice in cuspides 2 circ. 1.5 mm longas exeuntem producta. Inflorescentia pedunculo glabro, gracili, usque ad 12 cm longo elata, floribus plerumque 5. Pedicelli 0.5 —2 cm longi. Ovarium glabrum. Calycis lobi 2.4 mm longi, carinati, glabri. Corolla dilute violacea, extus glabra, tubo 5 mm longo, parte angusta 0.8 mm diam., parte dilatata cylindrica 2 mm longa et 1.1 mm diam., utroque extremo intrusionibus cum staminibus alternantibus angustata, ore brevissime barbata, limbo patente fisso-partito, lobis 3.2 mm longis et 1.8 mm latis. Stamina costis hirtellis in tubo decurrentia; antherae 1.4 mm longae, apice acutae. Granula pollinis 4-colporata, 15 μ alta et 12 μ diam. Stylus 1 mm longus; stigma 1.2 mm longum. Capsula glabra 2.5 mm alta et 3 mm diam. Semina madefacta non glutinosa.

Habitat Keniam.

Kenya: Daruma District, nr Avisana, alt. 120 m, Kaessner 442, type (BM, dupl. K), also type of *Oldenlandia pedunculata* K. Sch. et K. Krause; Mariakani, Graham 1720; Sagalla Hills, Edith Skene 203; between Mombasa and Lamu, Whyte s.n.; Giryama & Tsimba Mts, Taylor s.n.; Seriama Country, east of Mangea, Gregory s.n.; Mt Nyero, southern end of Lake Rudolph, alt. 2000 m, Lady M. Jex-Blake 16; towards Galla Country, Wakefield s.n.

This species is easily distinguishable from the other representatives of the subgenus *Pachystigma* by its long-pedunculate inflorescence and rather wide leaves. The hairs in the throat of the corolla are very short and therefore easily overlooked. The acute anthers are also a noteworthy feature. The colour of the corolla has been described as "light mauve".

3. **Kohautia longifolia** Klotzsch in Peters, Reise Mossambique, Bot. 297, 1862; *Oldenlandia longifolia* (Klotzsch) K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895, comb. illeg. nam non (Schum.) DC, Prodr. 4, 426, 1830; — anne *Kohautia macrophylla* Klotzsch l.c. adhuc incertum; — *Oldenlandia caffra* Eckl. et Zeyh. apud Hiern in Fl. Trop. Afr. 3, 58, 1877, quoad specimina a Kirk et Peters lecta, haud quoad typum; — anne *O. zanguebariae* Lour., Fl. Cochinch 78, 1790, non certe determinandum, cf. *Kohautia obtusiloba*.

Herba perennis, plerumque monocaulis, 15—60 cm alta. Caulis glaber vel apicem versus puberulus, in var. *vestita* et var. *psilogyna* hirtellus, internodiis usque ad 12 cm longis. Folia linearia vel lineari-lanceolata, 2—7.5 cm longa et 1.2—10 mm lata, supra plerumque scabridula et subtus laevia, rarius utrimque laevia, in var. *vestita* et var. *psilogyna* utrimque scabridula et in var. *macrocalyci* scabrida. Vagina stipularis

utroque latere caulis in lobum late triangularem producta; lobi fimbriis 2—6 interdum usque ad 7 mm longis instructi. Inflorescentia basi interdum semel vel bis trichotoma, ceterum dichasialis, ramulis ultimis tamen monochasialibus; internodia infima usque ad 7.5 cm longa, alia gradatim breviora. Pedicelli 0.5—3 cm longi, glabri, in var. *vestita*, var. *psilogyna* et var. *macrocalyci* hirtelli. Ovarium glabrum, in var. *vestita* et var. *macrocalyci* hirtellum. Calycis lobi 2.6—3.2 mm, in var. *macrocalyci* 5—6 mm longi, carinati, margine et costa vix notabile scabriduli, in var. *psilogyna* margine et in var. *vestita* et var. *macrocalyci* margine et costa hirtelli. Corolla violacea, in var. *vestita*, var. *psilogyna* et var. *macrocalyci* rubra, extus glabra vel ad faucem hirtella, tubo 5—6.5 mm longo, parte angusta 0.5—1.0 mm diam., parte dilatata cylindrica 2—3 mm longa et 0.8—1.5 mm diam., utroque extremo intrusionibus cum staminibus alternantibus angustata, ore barbata, limbo patente fisso-partito, lobis 3.0—4.5 mm longis et 2.0—4.0 mm latis, apice acutis vel subobtusis, in var. *macrocalyci* 5.5 mm longis et 4 mm latis, apice acutis et mucronulatis. Stamina costis hirtellis in tubo decurrentia; antherae 1.2—1.5 mm longae, obtusae. Granula pollinis 4- usque ad 8-colporata, 14—20 μ diam. (Tab. XI, fig. f et g). Stylus 1.4—1.7 mm longus; stigma 0.9—1.3 mm longum. Capsula glabra, in var. *vestita* pubescens et in var. *macrocalyci* hirtella, 2—3 mm alta et 2.5—4 mm diam. Semina madefacta subglutinosa.

Habitat Tanganiicam, Nyasiam, Rhodesiam, Africam Orientalem Lusitanicam, partem borealem Nataliae.

var. *longifolia*; caulis glaber vel apicem versus puberulus; folia supra scabridula et subtus laevia vel rarius utrimque laevia; pedicelli glabri; ovarium glabrum; calycis lobi 2.6—3.2 mm longi, margine et costa vix notabile scabriduli; corolla violacea, extus glabra vel ad faucem hirtella; capsula glabra.

Tanganyika: Zanzibar, Boivin s.n., Vaughan 1189, Sacleux 1119, Duparquet s.n.; Mbeya District, nr Mbeleyi, alt. 1500 m, St Clair-Thomson 1251; Myombo Mbeya, Geilinger s.n.; Mporolo, alt. 500 m., id. 2424; Wasni, Swynnerton 718; Ungoni, nr Njupiro, Busse 955 (*Oldenlandia trichosiphon* K. Sch. ined.); Rungwe, alt. 1450 m, Stolz 330; s.l. Busse 2496.

Nyasaland: Mt Mlanji, alt. 900—1200 m, Forbes 97 et 164; Mt Zomba, alt. 1100 m, Brass 16335; ibid. alt. 1500—1800 m, Whyte s.n.; Blantyre, Last s.n.; Chaoni, alt. 600 m, Lawrence 367; Kota-kota Distr., Mt Nchiri, Brass 16976; s.l. Buchanan 878, Smuts 2103, Capt Descamps s.n.

Northern Rhodesia: Abercorn, Hutchinson & Gillett 3840; ibid. alt. 1600 m, Harger 16; between Abercorn and Karama, Pole Evans 2951; Lutanda River, 56 miles north of Broken Hill, Allen 452.

Southern Rhodesia: nr Salisbury, Daphne King in herb. Eyles 5226; Concession, Jack 3897.

Port. East Africa: Mamganja Hills, Kirk s.n.; Distr. Massingiri, nr

Morrumbala, id. s.n., Pedro 467; Shamvara, Kirk s.n.; Shupanga, Meller 23.2.62; nr Beira, Mrs Evelyn Cecil 7 et 251; Gorongoza Prov., Vasse 360; Distr. Mocuba, Nanagoa Plantations, alt. 600 m, Mrs Faulkner G. H. 15024; Gonubi Hill, alt. 600 m, Schlechter 12181, neotype (K). Natal: Zululand, Umgibira, Wylie s.n.

var. *vestita* Brem. n. var. caule breviter sed densius hirtello, foliis utrimque scabrido-hirtellis, ovario hirtello, calycis lobis margine et costa hirtello-ciliatis, corolla rubra extus ad faucem pilosa a typo recedens.
Tanganyika: Mafia Islands, Sir B. Frere s.n.; Morogoro Distr., nr Mikese, alt. 450 m, Wallace 681.
Northern Rhodesia: Upper Loangwa River, Nicholson s.n.; 34 miles N.E. of Livingstone, Hutchinson & Gillett 3496, type of variety (K). Southern Rhodesia: Mazoe, Flanagan s.n.; Distr. Salisbury, alt. 1350 m, Wild 1121, 1629, 2532 p.p. (cf. var. *psilogyna*).

var. *psilogyna* Brem. n. var. maxime ut var. *vestita* sed ovario glabro, calycis lobis margine sola hirtello-ciliatis, corolla extus glabra ab ea recedens.
Tanganyika: Dar-es-Salaam, Stuhlmann 7775 p.p.
Nyasaland: Mt Zomba, Sharpe 132 p.p.; Mlanji, alt. 600 m, Mrs Shinn s.n. Southern Rhodesia: Distr. Salisbury, Rumani, alt. 1350 m, Wild 2532 p.p. (cf. var. *vestita*); Mumbwa, Mrs Macaulay 1003; Lower Sabi, Mrs Videw in herb. Eyles 8108; Umvukwe Mnts, nr Dawson, Rodin 4374. Port. East Africa: Moribane, Dawe 490, type of variety (K); valley of the Révoué, Vasse 171.

var. *macrocalyx* Brem. n. var. caule apicem versus puberulo, foliis margine scabridis, ovario densius hirtello, calycis lobis 5—6 mm longis, corolla rubra, lobis mucronatis 5.5 mm longis a typo et varietatibus aliis distinguenda.
Tanganyika: nr Dodoma, Derhain s.n., type of variety (K).

Klotzsch's type was collected at Rios de Sena in Portuguese East Africa. He describes it as an annual and the anthers as protruding with their tips beyond the mouth of the tube, but this are probably mistakes. In all other points his description agrees well with that given above, which was based in the first place on Schlechter 12181. The latter was collected in the same region, and examples of it are found in almost all the larger herbaria.

Klotzsch's description of *K. macrophylla* is based on a specimen collected at Cabaceira. It differs from *K. longifolia* in the somewhat greater width of the leaves and in the shape of the corolla tube, which is said to be infundibuliform. However, the dimensions and the shape of the leaves show a wide range of variability in *K. longifolia*, even on the same specimen, and differences of this kind therefore would not prove the specific diversity of *K. macrophylla*. An infundibuliform corolla tube is never met with in this genus, but it is possible that Klotzsch did not mean the

whole tube but merely the widened upper part, and the latter indeed may be funnel-shaped. This is seen in *K. obtusifolia* and also to some extent in *K. leucostoma*, but these two species have entirely different leaves. The identity of *K. macrophylla*, therefore, remains uncertain.

K. longifolia is easily distinguishable from the other species of this subgenus by its long stems, its large and wide leaves, its rather lax inflorescence and long-pedicellate flowers and by its long calyx lobes. The fringed stipular sheath is a character that recurs in several species of this subgenus, but it is seldom so well developed as here and in *K. effusa* and *K. virgata*.

The var. *vestita* and the var. *psilogyna* are very similar to each other, but both differ in general aspect rather strongly from the type. Whether the difference in the colour of the corolla really is trustworthy, I do not know, as the flower colour of most specimens is unknown.

The var. *macrocalyx* might perhaps better be regarded as a distinct species, but as the material consists merely of the upper part of a shoot with flowers and fruits, it did not give a good impression of the habit of the plant, and for this reason it seemed better to regard it provisionally as a variety of *K. longifolia*, with which it is doubtless nearly related.

4. **Kohautia Sennii** Brem. n. spec. inter species subgeneris *Pachystigmatis* series *Barbatarum* inflorescentia laxa et floribus parvis ad *K. effusam* (Oliv.) Brem. accedens sed statura multo minore, pedicellis brevibus, corollae lobis majoribus ab ea recedens.

Herba annua, haplocaulis, 3—11 cm alta. Caulis simplex vel apicem versus ramificatus, parte basali ubique vel costis solis hirtellus, ceterum subglaber, ex internodiis paucis 0.5—2.5 cm longis compositus. Folia linearia 1.5—3 cm longa et 2—4 mm lata, utrimque glabra et laevia. Vagina stipularis utroque latere caulis breviter producta et ibi in appendices aliquas filiformes usque ad 3 mm longas exeuns. Inflorescentia basi semel vel bis dichasialis, ramulis monochasialibus. Pedicelli 1.5—5 mm longi. Ovarium glabrum. Calycis lobi 1.5 mm longi, vix carinati, glabri. Corolla colore ignoto, extus glabra, tubo 4.2 mm longo, parte angusta 0.8 mm diam., parte dilatata cylindrica 1.6 mm longa et 1.2 mm diam., utroque extremo intrusionibus cum staminibus alternantibus angustata, ore brevissime barbata, limbo patente fisso-partito, lobis 2.3 mm longis et 2.2 mm latis, mucronatis. Stamina costis apice sparse hirtellis in tubo decurrentia; antherae 1.1 mm longae, obtusae. Granula pollinis 4-colporata, 15 μ alta et 12 μ diam. Stylus 0.7 mm longus; stigma 0.9 mm longum. Capsula glabra 1.7 mm alta et 2.7 mm diam. Semina madefacta glutinosa.

Habitat Somaliam.

Somaliland: Chismais, Senni 522, type (Fl); Lichitore, id. 361.

Easily distinguishable by its small size from the other species of this subgenus that are provided with lax inflorescences.

5. **Kohautia effusa** (Oliv.) Brem. n. comb.; *Oldenlandia effusa* Oliv. in Transact. Linn. Soc. **29**, 84, t. 48, 1873; Hiern in Fl. Trop. Afr. **3**, 59, 1877, specimine in Senegambia lecto excluso (cf. *K. confusa*).

Herba annua vel perennis, erecta vel in typo e basi plus minusve decumbente ascendens, plerumque 20—30 cm, in typo circ. 70 cm alta. Caulis plerumque subsimplex, nunc totus glaber vel ad basin costis solis scabridulus, nunc (var. *hirtella*) ubique sparse hirtellus, internodiis ad medium caulem plerumque 3—5 cm, in typo ad 8 cm longis. Folia anguste linearia, plerumque 2—4 cm longa et 0.5—1.5 mm lata, in typo ad 6 cm longa et 4 mm lata, nunc utrimque subglabra vel supra scabrida, nunc (var. *hirtella*) utrimque densius hirtella. Vagina stipularis utroque latere caulis in appendices plures filiformes 3—6 mm longas producta. Inflorescentia basi plerumque bis trichotoma et in triades dissoluta vel ramulis aliquibus monochasialibus. Pedicelli plerumque 3—9 mm, in typo ad 2 cm longi. Ovarium glabrum. Calycis lobi 1—1.6 mm longi, subglabri. Corolla violacea, extus glabra, tubo 3.8—5.0 mm longo, parte angusta 0.6 mm diam., parte dilatata 1.5—2 mm longa et 0.8 mm diam., utroque extremo intrusionibus cum antheris alternantibus angustata, ore breviter barbata, limbo patente fisso-partito, lobis 1.9 mm longis et 1.3—1.6 mm latis, acutis. Stamina costis apice sparse hirtellis in tubo decurrentia; antherae 1 mm longae, obtusae. Granula pollinis plerumque 4- vel 5-colporata et 14—15 μ alta, 11—15 μ diam., interdum 6-colporata et 23 μ alta, 17—20 μ diam. Stylus 1.1—1.8 mm longus; stigma 0.8 mm longum. Capsula globosa 3 mm diam., glabra. Semina madefacta non glutinosa.

Habitat Tanganiicam Australem, Africam Orientalem Lusitanicam, Nyasiam, Rhodesiam Borealem.

var. *effusa*; caulis glaber vel ad basin costis scabridulus; folia utrimque subglabra vel supra scabrida.

Tanganyika: Bank of Mgeta River, Speke & Grant s.n., type (K); Ufipa, alt. 600 m, Lea L.R. 45.

Port. East Africa: Massangula, alt. 1100 m, Sousa 1340; Nampulo, id. 3337.

Nyasaland: Sikoma Island (Lake Nyasa), Johnson 36 et 382; Uvera, Miss Kenyon 36; Blantyre, Last s.n.; Nyika Plateau, McClounie 23, Henderson s.n., Buchanan 421.

Northern Rhodesia: Broken Hill, alt. 1000 m, Rogers 7749 et 8146 p.p.

var. *hirtella* Brem. n. var. caule sparse hirtello, foliis utrimque densius hirtellis a typo recedens.

Port. East Africa: Western Zone s.l., Mrs Hornby 3564, type of variety (PRE).

The type of this species is a somewhat abnormal plant. It was collected at the edge of a stream, probably in the midst of a rather rank vegetation, and has more or less straggling shoots consisting of very long internodes. Its anthers contain no pollen and fruits are absent. This makes it difficult

to decide whether it really is conspecific with the other specimens enumerated above. It might have been better to discard Oliver's *Oldenlandia effusa* and to refer the other specimens to a new species. In the latter the pollen grains are usually 4- or 5-colporate and 14—15 μ high and 11—15 μ in diam., but in those collected in Portuguese East Africa they are 6-colporate and 23 μ high and 17—20 μ in diam. However, in other respects all these specimens are very similar. It is rather remarkable that the same kind of variability has been observed in the pollen of *K. longifolia*.

As interpreted here *K. effusa* comes nearest to *K. longifolia* and to *K. Sennii*, but can be distinguished from the first by its smaller dimensions and narrower leaves, and from the second by its larger size, somewhat longer pedicels and somewhat smaller corolla lobes.

6. **Kohautia microcala** Brem. n. spec. inter species subgeneris *Pachystigmatis* inflorescentia laxa, pedunculo internodiis precedentibus non longiore, parte dilatata tubi utroque extremo intrusionibus angustata ad *K. longifoliam* Klotzsch, *K. Sennii* Brem., *K. effusam* (Oliv.) Brem. et *K. leucostomam* Brem. accedens, a *K. longifolia*, *K. Sennii* et *K. effusa* vagina stipulari utroque latere caulis in appendices filiformes duas exeunte, a *K. leucostoma* foliis angustioribus, corolla fauce minus dense barbata distinguenda.

Herba annua, erecta, aliquoties ramificata, 20—25 cm alta. Caulis scabridulus, internodiis ad 6 cm longis. Folia anguste linearia vel filiformia, 1—2.5 cm longa et 0.5—1.0 mm lata, supra scabridula. Vagina stipularis utroque latere caulis in appendices filiformes duas circ. 1.5 mm longas exeuns. Inflorescentia cymosa. Pedicelli 1—2 cm longi, post anthesin ad 4 cm elongati, scabriduli. Ovarium papillosum. Calycis lobi 1.2—1.5 mm longi, carinati, margine et costa scabriduli, fructu non accrescentes. Corolla rubra, extus glabra vel ad faucem sparse et vix conspicue scabridula, tubo 5.0—5.7 mm longo, parte superiore 2—2.2 mm longa vix conspicue dilatata, utroque extremo intrusionibus cum staminibus alternantibus angustata, ore sparse barbata, limbo patente fisso-partito, lobis 4.5—5 mm longis et 4.2—4.6 mm latis, acuminatis et mucronulatis. Stamina costis supra hirtellis in tubo decurrentia; antherae 1.3 mm longae, obtusae. Granula pollinis 5-colporata, 16 μ diam. Stylus 1.5 mm longus; stigma 0.7 mm longum. Capsula glabra 2.2 mm alta et 3.2 mm diam. Semina madefacta non glutinosa.

Habitat Rhodesiam Borealem et Africam Orientalem Lusitanicam. Northern Rhodesia: nr Kalungwishi River, alt. 750—1000 m, Walter 5, type (K), "fairly common in grassland"; Broken Hill, Rogers 8146 p.p. Portuguese East Africa: Namuli, Last s.n.

This species and the next one are very similar plants. They differ from the other species with more or less lax, but not long-pedunculate inflorescences and with intrusions at both ends of the widened part of the corolla tube by the nature of their stipular sheath, which has on each side of the shoot but two short appendages.

7. **Kohautia leucostoma** Brem. n. spec., maxime ut *K. microcala* Brem. sed corolla fauce densius barbata, foliis latioribus ab ea recedens.

Herba annua, erecta, aliquoties ramificata, 15—18 cm alta. Caulis scabridus, internodiis usque ad 5 cm longis. Folia linearia, 1.5—4 cm longa et 1.2—2 mm lata, supra glabra vel scabridula, subtus costa scabrida. Vagina stipularis utroque latere caulis in appendices filiformes 2 usque ad 2 mm longas exeuns. Inflorescentia cymosa. Pedicelli 0.8—2.4 cm longi, post anthesin usque ad 3 cm elongati. Ovarium vix conspicue carunculatum. Calycis lobi 1.2—1 8 mm longi, carinati, margine et costa scabridi, fructu usque ad 2 mm elongati. Corolla rubra, extus ad faucem scabrida, tubo 5.3—6.3 mm longa, parte angustata 0.5 mm diam., parte dilatata 2.3 mm longa, subinfundibuliformi, ad medium 1.5 mm diam., utroque extremo intrusionibus 4 angustata, ore dense albo-barbata, limbo patente fisso-partito, lobis 3—4 mm longis et 3—5 mm latis, acuminatis et mucronulatis. Stamina costis ad apicem hirtellis in tubo decurrentia; antherae 1.8 mm longae, obtusae. Granula pollinis 5-colporata, 12—20 μ diam. Stylus 2.2 mm longus; stigma 1 mm longum. Capsula glabra 2.2 mm alta et 3.0 mm diam. Semina madefacta non glutinosa.

Habitat ditionem Congensem.

Belgian Congo: Urua, Kiambi, de Witte 219, type (BR); ibidem, alt. 800 m, Dubois 1309, "weed in the fields".

This species is doubtless a very near ally of the preceding one, from which it differs mainly in the more conspicuously bearded corolla tube, somewhat wider leaves and, at least on the fruit, slightly longer calyx lobes.

8. **Kohautia cuspidata** (K. Sch.) Brem.; *Oldenlandia cuspidata* K. Sch. in Bot. Jahrb. **23,** 413, 1897; — *O. acutidentata* C. H. Wright in Kew Bull. 1898, 145; — *O. capituliflora* K. Krause in Bot. Jahrb. **39,** 517, 1907; — anne *O. Ledermannii* K. Krause in Bot. Jahrb. **48,** 403, 1912 absentia typi incertum.

Herba perennis, 20—40 cm alta, e basi ramosa. Caules erecti simplices vel parce ramosi, subglabri, costis interdum scabridi, internodiis gradatim longitudine increscentibus, supremis plerumque usque ad 6 cm et interdum usque ad 12 cm longis. Folia linearia, 2—5 cm longa, plerumque 1—2.5 mm, in locis humidis usque ad 5 mm lata, cuspidata. Vagina stipularis utroque latere caulis in appendices filiformes 2—4 usque ad 5 mm longas exeuns. Inflorescentiae terminales ab inflorescentiis lateralibus partim subsessilibus praecessae, omnes subcapituliformes, re vera dichasia contracta, ramulis a vaginis stipularibus suffultis. Pedicelli 1—1.5 mm longi, densius hirsuti. Ovarium hirsutum. Calycis lobi 5 mm longi, carinati, margine et costa ciliati. Corolla rubra, raro alba, extus hirtella, tubo 8.5 mm longo, parte angusta 1.2 mm diam., parte dilatata 2.5 mm longa et 1.6 mm diam., utroque extremo intrusionibus cum staminibus alternantibus angustata, ore parce et breviter barbata, limbo patente fisso-partito,

lobis 5 mm longis et 4 mm latis, acutis. Stamina costis ad apicem hirtellis in tubo decurrentia; antherae 2 mm longae, subacutae. Granula pollinis 4-colporata, 12—20 μ alta et 12—18 μ diam. Stylus 3.5 mm longus; stigma 1.2 mm longum. Capsula 2.8 mm alta et 3.2 mm diam., hirtella. Semina madefacta non glutinosa.

Habitat Angolam, Africam Austro-occidentalem, Bechuaniam, Nyasiam, Rhodesiam. Forsitan etiam in Cameronia (*Oldenlandia Ledermannii* K.Krause).

Angola: District Benguella, Cuchi, Munongue, Gossweiler 2446 et 4131; Hypopolla, id. 2879; Cassungo, Cuiriri, id. 3438; District Mossamedes, Chitindc, alt. 1250 m, Baum 58; Habungu, alt. 1250 m, id. 478; Ungombekiki, alt. 1200 m, id. 478 a; Humpata, Fritsche 139 (type of *O. capituliformis* K. Krause); Huilla, Berthelot 340, Welwitsch 5341; Lopollo, id. 5342, type (BM, K); between Huilla and Humpata, Johnston s.n.; between Humpata and Lobango, Pearson 2621; s.l. Gossweiler 3509.

South West Africa: Amboland, Otjiheke, Schinz 452; Uukuambi, Rautanen 815; Olukonda, id. 817; Grootfontein, Boss 8436.

Bechuanaland: Caprivi Strip, Mrs Kruger 4; Kalahari, Karakobis, Schinz 448; Bakwene Territory, Tamasetse, alt. 1000 m, Holub March 76; Eastern Bamangwato Territory, Limpopo, id. May 75; Ngamiland, Curson 453.

Southern Rhodesia: Victoria Falls, Gwaai Forest, Allen 241.

Northern Rhodesia: Barotseland, Sesheke, alt. 900 m, Mrs Borlé 55; Upper Zambesi, M^{elle} Kiener s.n.

Nyasaland: Mt Zomba, 1200—1800 m, Whyte s.n. (type of *O. acutidentata* C. H. Wright), Sharpe 132 p.p., alt. 1800 m, Brass 16131.

K. cuspidata is easily distinguishable from the other species of this subgenus by its subcapitate flowers.

The specimens collected in Nyasaland have somewhat larger pollen grains than those found in the western part of the area, but as there seem to be no other differences of any importance, it seems appropriate to bring them to the same species.

9. **Kohautia cicendioides** (K. Sch.) Brem. n. comb.; *Oldenlandia cicendioides* K. Sch. in Bot. Jahrb. 33, 333, 1903.

Herba annua, haplocaulis, erecta, 2—6 cm alta. Caulis simplex gracillimus, foliorum paribus 2 vel 3 instructus, scabridulus. Folia linearia, majora circ. 1 cm longa et 1 mm lata, supra scabridula, subtus glabra. Vagina stipularis utroque latere caulis in appendices filiformes 1—3 usque ad 1.5 mm longas exeuns. Flores terminales, singuli vel flore secundo comitati, flore laterali interdum internodio usque ad 4 mm longo elato, casu quo basi foliis duobus instructus et ipse flore secundo comitatus. Pedicelli breves vel brevissimi. Ovarium hispidulum. Calycis lobi 2.5 mm longi, longe mucronati, margine hispiduli. Corolla colore ignoto, extus sparse hirtella, tubo 3.8 mm longo, parte angusta 0.6 mm diam., parte

dilatata 1.5 mm longa et 0.9 mm diam., utroque extremo intrusionibus angustata, ore breviter barbata, limbo patente fisso-partito, lobis 1.5 mm longis et 2 mm latis, subobtusis. Stamina antheris 1 mm longis, obtusis. Granula pollinis 4-colporata, 14 μ diam. Stylus 1.5 mm longus; stigma 0.4 mm longum. Capsula globosa 1.5 mm diam., hirtella.

Habitat Angolam.

Angola: between Sambos Mission Station and Cabama, Pearson 2492, neotype (K).

The type of this species was collected at Pallanca. It consisted apparently of a single fruiting specimen, and the description therefore is very incomplete. The fruit is described as surrounded by an involucre consisting of 4 up to 5 mm long leaves, but if we assume that this is an abnormality caused by the failure of the uppermost internode to grow out, there is nothing which forbids us to accept Pearson 2492 as representing the same species.

K. cicendioides reminds us of *K. stellarioides* (Hiern) Brem. and of *K. amboensis* (Schinz) Brem., from which it differs in the somewhat wider leaves, the shortness of the style, the top of the stigma remaining some distance below the anthers, and in its smaller size.

10. **Kohautia stellarioides** (Hiern) Brem. n. comb.; *Oldenlandia stellarioides* Hiern, Cat. Welw. Afr. Pl. **2**, 447, 1898.

Herba annua, haplocaulis, erecta, 15—23 cm alta, sparse ramosa, ramis suberectis. Caulis gracilis, costis hirtellus, internodiis 1.5—2 cm longis. Folia filiformia, 1—1.5 cm longa et 0.3—0.4 mm lata, supra sparse hirtella, margine basin versus conspicue ciliolata, suberecta. Vagina stipularis margine ciliata. Inflorescentia dichasialis, floribus pedicellis usque ad 3 mm longis sed plerumque multo brevioribus instructis, bracteis foliaceis suffultis, ramulis infimis 1.5 cm longis. Ovarium subglabrum. Calycis lobi 1.1 mm longi, margine vix notabile scabriduli. Corolla parva, alba, tubo ore constricto et ibi barbato. Antherae parti dilatatae tubi aequilongae. Stylus tubi parti angustae aequilongus; stigma ad antheras adjiciens. Capsula mihi ignota.

Habitat Angolam.

Angola: Pungo Andongo, Welwitsch, 3052 type (BM, dupl. K).

The material of the Kew Herbarium consists of a single shoot without fully developed flowers, so that the pollen could not be studied. The position of this species is not fully certain, but because of its resemblance to *K. cicendioides* (K. Sch.) Brem. I have put it here. From this species it differs by its larger size, by its far more numerous flowers and by the shorter calyx lobes, from *K. amboensis* (Schinz) Brem. by its thinner shoots and the laxly dichasial inflorescence.

11. **Kohautia amboensis** (Schinz) Brem. n. comb.; *Oldenlandia amboensis* Schinz in Vierteljahrsschr. Nat. Ges. Zürich **68**, 429, 1923; — anne *O.*

paludosa K. Krause in Bot. Jahrb. **48**, 404, 1912, absentia typi incertum.

Herba annua, haplocaulis, erecta, 12—35 cm alta, apicem versus parce ramosa. Caulis gracilis, scabridulus, internodiis usque ad 6 cm longis. Folia linearia, 2.5—5 cm longa et 1—2.5 mm lata, utrimque scabrida. Vagina stipularis utroque latere caulis appendicibus filiformibus plerumque 5, quarum 2 usque ad 5 mm longis instructa. Flores in faciculos terminales et axillares dispositi; fasciculus terminalis plerumque 3-florus; fasciculi laterales 2-flori, flore tertio a ramulo caulem continuendo substituto, re vera ergo origine terminales. Pedicelli 0.5—1 mm longi. Ovarium hirtellum. Calycis lobi 2 mm longi, longe mucronati, carinati, margine scabrido-ciliati. Corolla alba, extus brevissime hirtella, tubo 2.3 mm longo, parte angusta 0.5 mm diam., parte dilatata 1.3 mm longa, anguste urceolata, utroque extremo intrusionibus angustata, ore barbata, limbo patente fisso-partito, lobis 0.7 mm longis et 0.8 mm latis, subacutis. Stamina antheris 0.7 mm longis, apiculatis. Granula pollinis 4-colporata, 12 μ alta, 10—11 μ diam. Stylus tubi parti angustae aequilongus; stigma 0.5 mm longum. Capsula hirtella, 2.5 mm alta et 3 mm diam. Semina madefacta non glutinosa.

Habitat Africam Austro-occidentalem.

South-west Africa: Amboland, Olukonda, Ondonga, Rautanen 824, type (Z), id. s.n. anno 1887; Distr. Grootfontein, farm Keibeb, Schweickerdt 2182.

The type of *Oldenlandia paludosa* K. Krause (Dinter 1782, Okosongomingo) was not available, but it is very probably conspecific with that of *K. amboensis*. It is not impossible that examples of Dinter 1782 are still existent, and when a study of the latter should lead to the conclusion that the two species are identical, the epithet *amboensis* will have to be replaced by *paludosa*.

K. amboensis is easily distinguishable from the other *Barbatae* by the arrangement of the flowers in pairs or in groups of three.

Series *Imberbae* Brem., corolla fauce glabra, antheris connectivo distincte producto instructis, cellulis testae parietibus undulatis instructis distinguenda.

Species adhuc unica per totam Africam insula Madagascar inclusa distributa.

12. **Kohautia virgata** (Willd.) Brem. n. comb.; *Hedyotis virgata* Willd., Sp. Pl. **1**, 567, 1797; *Oldenlandia virgata* (Willd.) DC, Prodr. **4**, 426, 1830; Hiern in Fl. Trop. Afr. **3**, 59, 1877; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 132, 1931; — *Kohautia setifera* DC, Prodr. **4**, 430, 1830; *Hedyotis setifera* (DC) Steud., Nomencl. ed. 2, 728, 1840; Sond. in Fl. Cap. **3**, 10, 1865; Schinz in Mém. Herb. Boiss. **1**, 65, 1900; — *O. caffra* Eckl. et Zeyh., Enum. Pl. Afr. 360, 1837; Hiern in Cat. Welw. Afr. Pl. **2**, 444, 1898; non Hiern in Fl. Trop. Afr. **3**, 58, 1877, quae est *Kohautia longifolia*

Klotzsch; — *Kohautia parviflora* Bth. in Hooker, Niger Flora 403, 1849; *Oldenlandia parviflora* (Bth.) Oliv. in Trans. Linn. Soc. **29**, 84, 1873, quoad typum, haud quoad specimen citatum quod ad *O. taborensem* Brem. v. infra pertinet; eodem modo Hiern in Fl. Trop. Afr. **3**, 60, 1877; — *Hedyotis Gerrardi* Harvey ex Sond. in Fl. Cap. **3**. 11, 1864, forma monstrosa; — *Oldenlandia moandaensis* de Wild. in Ann. Mus. Congo, Sér. 5, **2**, 180, 1907; — anne *O. Seineri* K. Krause in Bot. Jahrb. **43**, 131, 1909 absentia typi incertum; — *Kohautia thymifolia* Presl c in sched.

Herba perennis, plerumque plesiocaulis, caulibus ascendentibus, raro monocaulis casu quo semper ramosa, 12—35 cm alta. Caules plerumque parte basali scabrido-hirtelli, interdum toti subglabri vel hirtelli; internodia inferiora foliis breviora, superiora eis multo longiora. Folia plerumque linearia, 1.5—4 cm longa et 0.5—2.5 mm, rarius ad 3.5 mm lata, in var. *oblanceolata* oblanceolata, 1—3 cm longa et 3—5 mm lata, ubique glabra vel scabrido-hirtella, in var. *oblanceolata* in setam usque ad 1 mm longam exeuntia. Vagina stipularis utroque latere caulis in appendices filiformes 4—6, usque ad 5 mm longas producta. Inflorescentia plerumque e triadi terminali et e diadibus axillaribus composita. Pedicelli 2—6 mm longi, post anthesin interdum accrescentes. Ovarium semper glabrum et laeve. Calycis lobi 1.2—2.4 mm longi, apice in setam exeuntes, glabri vel margine vix conspicue scabrido-papillosi. Corolla tubo albo, lobis plerumque roseis, dilute violaceis vel coccineis, raro tota alba, extus glabra, tubo 4.5—5.5 mm longo, parte angusta 0.7—0.8 mm diam., parte dilatata 1.0—1.3 mm longa et 0.9—1.2 mm diam., sine intrusionibus et haud barbata, limbo usque ad basin partito, lobis 1.3—1.8 mm longis et 0.8—1.2 mm latis, subacutis. Stamina non decurrentia; antherae parti dilatatae tubi aequilongae vel ea paulo longiores casu quo apicibus vix notabile exsertis, connectivo dorso crystallis stellatis sparso et in apiculam triangularem 0.2—0.4 mm longam producto. Granula pollinis 4-colporata, 16—20 μ alta et 12—15 μ diam. (Tab. XI, fig. j). Stylus 2.5—3.5 mm longus; stigma 1.2—1.4 mm longum. Capsula glabra 1—2 mm alta et 1.5—3 mm diam. Semina madefacta non glutinosa. Cellulae testae parietibus undulatis instructae (Tab. VII, fig. h).

Habitat Africam Tropicalem et Australem, insulas Comorenses et Madagascar.

var. *virgata*; folia linearia, 1.5—4 cm longa et 0.5—2.5 mm, rarius ad 3.5 mm lata, apice non in setam usque ad 1 mm longam producta.
Guinea: s.l. Thonning s.n. (S). I suppose that this is the collection on which Willdenow based his *Hedyotis virgata*, for this is the earliest finding of which, so far as I know, records exist. Willdenow himself does not mention the name of the collector.
Gold Coast: Accra, Vogel s.n. (type of *K. parviflora* Bth.), Ansell s.n., Deighton 569, Irvine 694 et 947, Moloney s.n.
Togo: nr Lome, Warnecke 174; Talerni, Mahout 529.

Southern Nigeria: Lagos, Dalziel 1048; Idah, Vogel s.n.
Belgian Congo: Distr. Banana, Moanda, Gillet 3180 (type of *O. moandaensis* de Wild.), id. 3216 et 4051, Vanderijst 27582, 27687, 27782, 27862, Bequaert 737; Lower Congo, s.l., Claessens s n., Chr. Smith s.n.
Angola: Pungo Andongo, Welwitsch 3036; Loanda District, Coastal Region, Gossweiler 155 et 404; Ambriz, Welwitsch 3037 (with monstrous flowers), Monteiro s.n.; between Humpata and Lubango, alt. 1800—1900 m, Pearson 2597 p.p.; Huilla, Welwitsch 3038; Chitanda River nr Goudkopje, alt. 1150 m, Baum 162.
South-west Africa: Amboland, between Ondonga and Uukwambi, Rautanen 819; Tsumeb, Dinter 7443; Otavi Valley, id. 5307; Grootfontein, Schweickerdt 2201, Schoenfelder 800, 831; Nosib, id. 966; Odjiwarongo, Okahandja, Bradfield 380; Walvis Bay, Duparquet s.n.; Great Karasberg, Pearson 8554.
Bechuanaland: Mochudi, Rogers 6456.
Cape Province: Griqualand West, Hebron, Flanagan 1457; Hay Division, Klipfontein, Burchell 2148; Moshowing River, id. 2322 (type of *K. setifera* DC); Vrijburg, Armoedsvlakte, Mogg 8804; Uitenhage, Zwartkops River, Zeyher 2705 (type of *O. caffra* Eckl. et Zeyh.), Ecklon 2291 (this is the number given in the "Enumeration", but it has probably been added after the publication of the latter; the specimens probably belong to Zeyher 2705); Pondoland, Port St Johns, Wager s.n.
Natal: District Alexandra, Dumisa, alt. 850 m, Rudatis 771; Springfield, Wood 13153; Durban, Krauss 419; Grantleigh, King 66, Sanderson 138; Klip-River District, Wesselsbron, Acocks 12491; Wesselsnek, Pentz & Acocks 10258; Boston, Wood 9894; Inanda, id. 759 et 996; Isipingo, id. 9204; Umzinyati, id. 11399; Colenso, Kuntze s.n., Krook in herb. Penther 2068; Zululand, Inkamana nr White Umfolosi, Gerstner 4356; N. Tondweni, Wood 9241; s.l. Drège s.n. ("*Kohautia thymifolia* Presl c"), Sanderson 400, Gerrard 361 et 1366 (type of *Hedyotis Gerrardi* Harv. ex Sond., a monstrous form, but not all the specimens distributed under this number show the monstrosity, which consists of a more or less calycinous corolla, stamens inserted by means of filaments on the receptacle and provided with indehiscent anthers, and a style with a capitate stigma; the ovary looks normal, but fruits are apparently not produced).
Orange Free-State: Kroonstad, Pont 518.
Swaziland: Distr. Hluti, nr Hluti, Acocks 15341; Stegi, Rodin 4541.
Transvaal: Barberton, alt. 800 m, Galpin 361; Kaapsche Hoop, Rogers 20871; Lijdenburg, Wilms 580, 580 a (p.p.); between Spitskop and Komati River, id. 1033; Kruger National Parc, Pretorius Kop, Codd & de Winter 4962; Erasmus Drift, Mogg 11693; Ellison nr Premier Mine, Repton 1274; Pretoria, Kirk 20, Liebenberg 3254, Pole Evans 228, Smith 6060; Silikaatsnek, Cock 735; Rustenburg, Olive Nation 166; Wolmaransstad, Sutton 2670; Marico Distr., road to Mafeking, Thode A 1429; Lekkerlach, Louw 243; Zeerust, Rogers 20372; Hamanskraal, Hutchinson 2873;

Rooikop, Smuts & Gillett 2064; Boschveld, Klippan, Rehmann 5276; Distr. Waterberg, Warmbad, Bolus 11081, Thode A 1714; Nooitgedacht, Acocks & Naudé 699; Nijlstroom, Hafström & Acocks 1437; Naboomspruit, Galpin M 162 et M 486; Potgietersrust, Thode A 1713; Pyramid Estate, Galpin 8986; Houtbosch, Rehmann 5967, 6045, 6046; Zoekmekaar, Rogers 19914, 22589; Louis Trichardt, Hutchinson & Gillett 4150; Zoutpansberg, Smuts & Gillett 4091; Mt Maravounge, Junod 2082; Shilouvane, alt. 650 m, id. 1038, 2271, 2272.
Portuguese East Africa: Lourenço Marques, Junod 110, Mrs Hornby 3815, Schlechter 11567, 11641, Forbes 42, Sousa 3411; Beira, Mrs Craster 108; Quelimane Distr., Mocuba, Mrs Faulkner 173, 210, 296; Zambesi delta nr Mambachy, Scott s.n.; nr Senna, Kirk s.n.; between Lupata and Tetté, id. s.n.; Lower Shire Valley, id. s.n.
Southern Rhodesia: Umtali, Rogers 4034; Darlington, alt. 1150 m, Chase 1912; Marandellas, alt. 1500 m, Dehn 566; Distr. Salisbury, Ardbennie, alt. 1500 m, Wild 687; ibid., Makabusi River, alt. 1500 m, id. 2286; Cranborne, id 2287; Lower Sabi, Devuli River, alt. 500 m, Wild 2466.
Northern Rhodesia: Sesheke Distr., Miss Gairdner 121 a; Abercorn, Hutchinson & Gillett 3853.
Nyasaland: Mt Zomba, Whyte s.n.; nr Sandama Station, alt. 400 m, coll. ign. 571.
Tanganyika: Pangani Distr., Msubugwe, 18 miles S.W. of Pangani, Verdcourt 126; Muoa, Holst 2996 ("*O. caffra* var. *subsetosa* K. Sch. inedit."); Dahr-es-Salaam, Stuhlmann 7775 p.p., Hildebrandt 1206; Tanga, Sacleux 1438; Zanzibar, Vaughan 1672, Boivin s.n.; between Orero and Kilwa Kivindji, Warnecke 1312; s.l. Busse 2279, Marshall 32.
Kenya: Mombasa, Boivin s.n., Whyte s.n.; Lamu, Hildebrandt 1905 p.p.; Ruiru, alt. 1600 m, Miss Napier 380; Kwale, alt. 300 m, Mrs McCraig 9281.
Uganda: Sesere, Teso, alt. 1000 m, Chandler 1129.
Sudan: Bahr-el-Gebel, Bor, Mr and Mrs Broun 289; Mongalla, Sheikh Tombe, id. 104; between Nimube and Gondokoro, Mearns 2966; Gimeyza, Douglas Simpson 7499.

var. *oblanceolata* Brem. n. var.; foliis oblanceolatis, 1—3 cm longis et 3—5 mm latis, in setam usque ad 1 mm longam exeuntibus a typo recedens.
Transvaal: Kruger Parc, Ikukusa, Cholmondeley s.n., type of variety (PRE); Pretorius Kcp, Codd & De Winter 4961.

K. virgata is a rather variable species with a somewhat anomalous distribution. The variability shows itself especially in the shape and size of the leaves and in the indumentum. The types of *Kohautia setifera* and *Oldenlandia caffra*, however, agree well with the specimens from the coast of Guinea, where the type of *Hedyotis virgata* was collected, but on the whole the South African material is rather variable, and Sonder

already distinguished a var. *pubescens*, which proves to be wide-spread in Natal and Transvaal: in fact, the great majority of the specimens found in this area would have to be referred to this variety. The density of the indumentum, however, varies considerably, and when we wished to do justice to these differences, probably more than one variety would have to be split off from the type. As the establishment of these varieties would require the study of a larger amount of material than I had at my disposition, it seemed advisable to neglect these differences, and for this reason Sonder's variety was dropped. It is rather remarkable that the hairy specimens have on the whole the widest leaves. This is well exemplified by the two collections made by Schlechter near Lourenço Marques: 11567 is the broad-leaved hairy form, 12641 the narrow-leaved glabrous one. It is, however, no rule without exceptions, for the broad-leaved specimen collected near Sandama in Nyasaland (coll. ign. 571) is glabrous. The variability of the flowers shows itself in slight differences in size and more striking ones in the colour of the limb; these differences in colour are met with throughout the whole area.

In the north-western part of its area *K. virgata* has apparently been collected at low altitudes only, but in Angola this changes, and throughout South and East Africa there is apparently no preference for a definite altitudinal zone. In Central Africa the species seems to be absent.

K. virgata is well characterized by the long stipular fringe, the small, pedicellate flowers, the naked corolla throat, the single stigma whose top just reaches the anthers, the latter's distinctly produced connective, and the wavy walls of the testa cells. In nearly all other species these walls are straight or nearly straight. The only other species in which they are more or less wavy, is *K. cicendioides* (K. Sch.) Brem., but in other respects these two species do not show much resemblance.

Subgenus **Eu-kohautia** Brem. stylo in stigmata dua filiformia exeunte, corolla fauce semper glabra, staminibus numquam in tubo decurrentibus, cellularum testae parietibus rectis distinguendum.

Speciebus circ. 50 per totam Africam et insuper in parte occidentali Asiae Tropicalis distributum. Typus: *K. senegalensis* C. et S.

Series Diurnae Brem. corollae limbo rubro, violaceo vel coeruleo, ore plerumque intrusionibus cum lobis alternantibus instructo distinctae.

Speciebus circ. 10 per totam Africam et in parte occidentali Asiae Tropicalis distributae. Typus: *K. coccinea* Royle.

13. **Kohautia platyphylla** (K. Sch.) Brem. n. comb.; *Oldenlandia platyphylla* K. Sch. in Bot. Jahrb. 33, 334, 1903.

Herba perennis, erecta, haplo- vel oligocaulis, 12—60 cm alta. Caulis simplex, papillis albis scabridulus, internodiis 1.5—8.5 cm longis. Folia ovata, ovato-lanceolata vel lineari-lanceolata, 2.5—5.5 cm longa et 0.5—1.5 cm lata, apice acuta, basi rotundata, supra scabridula, subtus

costa basin versus papillosa, fere e basi 3- vel, rarius, 5-nervia; superiora interdum linearia. Vagina stipularis utroque latere caulis in appendices filiformes duas 1—3 mm longas producta. Inflorescentiae corymbiformes; bracteae inferiores interdum foliaceae, semper satis magnae. Pedicelli subnulli vel usque ad 2 mm longi. Ovarium minute verruculosum. Calycis lobi 3—3.5 mm longi, carinati, extus scabriduli. Corolla rubra, tubo extus papilloso 6—7 mm longo, parte angusta 0.9 mm diam,. parte dilatata 3 mm longa et 1.3 mm diam., limbo patente fere ad basin partito, lobis 4—10 mm longis et 2—5 mm latis, acutis et mucronatis. Antherae 1.4 mm longae, obtusae. Granula pollinis 4-colporata, 12 μ alta et 9 μ diam. Stylus 0.9 mm longus; stigmata 1.8 mm longa. Capsula 4—5 mm alta et 3.5—4.5 mm diam. Semina madefacta non glutinosa.

Habitat Somaliam et Abyssiniam.

Somaliland: Galla Plateau, between Biddume and Alghe, Ruspoli & Riva 1290, type (F) (not Robecchi & Bricchetti as quoted by Schumann). Abyssinia: Socora, Vasova 427, 484, 526; Wola, id. 597; between Dorfe and Lake Margherita, id. 1769 (flowers small: corolla tube 6 mm, lobes 4 mm long, i.e. the limb half as large as in the other specimens); Gughe Highlands, alt. 1800—3000 m, Hugh Scott 152 et 182.

This species is easily recognizable by the three (or five) nerves springing from the rounded leaf base, but it is rather variable in the shape and size of the leaves. In Vatova 1769 the size of the corolla limb is only half as large as in the other specimens, and this collection therefore might represent a distinct variety.

14. **Kohautia coccinea** Royle, Ill. Himal. 241, t. 53 fig. 1, 1839; *Oldenlandia coccinea* (Royle) Hook. f. in Fl. Brit. Ind. **3**, 69, 1880; — *Hedyotis* (*Kohautia*) *abyssinica* Hochst. ex Rich., Tent. Fl. Abyss. **1**, 363, 1847; Walp., Ann. **2**, 771, 1851/52; *Oldenlandia abyssinica* (Hochst. ex Rich.) Hiern in Fl. Trop. Afr. **3**, 57, 1877; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1905; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 131, 1931; — *Hedyotis* (*Kohautia*) *senegalensis* (C. et S.) A. Rich. l.c. 362 quoad specimen citatum, non quoad typum, cf. *K. senegalensis* C. et S.; — *Oldenlandia macrodonta* Baker in Kew Bull. 1895, 67; — *Pentas modesta* Baker op. cit. 290; — *Oldenlandia Debeerstii* de Wild. et Th. Dur. in Ann. Mus. Cong. Sér. 2, **1**, 27, 1900.

Herba annua, erecta, haplocaulis, 7—45 cm alta, simplex vel apicem versus ramificata, in speciminibus robustioribus ex axillis omnibus ramos emittens. Caulis papillis albidis scabridulus, subteres vel in speciminibus robustioribus obtuse quadrangularis, internodiis usque ad 9 cm longis, plerumque tamen multo brevioribus. Folia linearia vel lineari-lanceolata, 1.0—6.5 cm longa et 1—8 mm lata, supra plerumque scabridula, raro utrimque sublaevia. Vagina stipularis utroque latere caulis in appendices filiformes 2—6 usque ad 3 mm longas producta, appendicibus longioribus ad folia approximatis. Inflorescentia in speciminibus parvis spici- vel

racemiformis, in speciminibus aliis tota distincte monochasialis vel basi dichasialis, floribus haud raro duobus ad quemque nodum, flore altero pedicello usque ad 3 mm longo, altero pedicello multo longiore (re vera ramulo unifloro dichasii) elato. Ovarium papillis conicis dense obtectum. Calycis lobi subulati, 2—4.5 mm longi, fortiter carinati, margine et carina scabridi, basi interdum appendicibus filiformibus breviter fimbriati, fructu praesertim in speciminibus robustioribus usque ad 6 mm elongati. Corolla rubra, rosea vel purpurea, extus scabridula, rarius glabra, tubo 4.0—5.7 mm longo, parte angusta 0.6—0.8 mm diam., parte dilatata 2.0—2.7 mm longa et 0.7—1.3 mm diam., limbo patente fisso-partito, lobis 1.5—3.8 mm longis et 0.8—2.1 mm latis, acutis. Antherae 0.8—1.0 mm longae, obtusae. Granula pollinis 4-colporata, 15—17 μ alta et 12—14 μ diam. Stylus 1.2—1.5 mm longus; stigmata 1—1.2 mm longa. Capsula ovoidea 3—5 mm alta et 2.5—4.0 mm diam., scabridula. Semina madefacta non glutinosa, cellularum testae areola centrali madefacta tamen tumescente.

Habitat montes Africae Tropicalis praesertim Orientalis et Rhodesiae et insuper partem austro-occidentalem montium Indiae Septemtrionalis ad altitudines inter 1000 et 2200 m.

Northern Nigeria: Prov. Cameroons, District Bamenda, Benso, Tamajong F. H. I. 23456; Bauchi Plateau, Vom, alt. 900—1200 m, Dent Young 116.

Abyssinia: Adoa, Schimper 1902 (type of *Hedyotis abyssinica* Hochst. ex Rich.), id. 75 et 419, Petit 246, Quartin Dillon 619; between Amhara and Dembia, Chiovenda 1721, 1941, 2057[bis]; Chiré, banks of Takhara, herb. Franqueville; Ouedjerate, Quartin Dillon et Petit s.n.; Tschessa Hechequinué, id. s.n.; Skoloda, id. s.n.; Mennis, Schimper 820; between Harrar and Addis Abeba, Welby s.n.; Guder, Piavano 282; between Ambo and Guder, alt. 2100 m, Senni 1752; Doukan, alt. 2000 m, id. 1029, 1401, 1481; Country of the Arussi, Drake Brockman 169; Arussi Province, Shashamanue, Scott 45; Western Abyssinia, Buré, alt. 1800 m, Erskine s.n.; Madara, Vatova 408; Socora, id. 465; Wola, id. 596; between Atura and Irka Moda, id. 765; Galla Arussi, alt. 1500 m, Negri 754, 888; Scioa, id. 675[bis], Benedetto 646; Galla Sidama, id. 586; s.l. A. Richard s.n. ("*Hedyotis senegalensis* A. Rich.").

Eritrea: Mt Koubé, east of Mt Bizen, alt. 1850 m, Schweinfurth & Riva 1541; Girbascha in Bogos, Steuden 908; Hamasen, alt. 1700—2300 m, Pappi 18[bis], 33; Addiche, Baldrati 3596, 3704; Asmara, id. 3363, 3667, Pappi 2197; between Asmara and Altigliana, Tellini 344; between Keren and Az Dachesan, id. 1132; Saraé, Bellini 247; ibidem alt. 1900 m, Pappi 194 et 419; Scimenzana, Mt Matara, alt. 2440 m, id. 927; Oculé Cusai, id. 1440; Medri-Terfa, id. 6564; Guna-Guna, id. 729.

Uganda: between Kisora and Lake Matanda, alt. 1800 m, Chandler & Hancock 2606; Bubundu, Bamba, alt. 1800 m, Thomas 703; Kampala, Kichuamba, Hazel 268; Toro, Itanda, Fishlock & Hancock 209; Toro, Mwenge, alt. 1800 m, Snowden 81; Toro, Nyakasura, Hancock 108/36; Balegenyi-Bukedi, alt. 1350 m, Snowden 502; between Mabungo and

Lake Chakagi, alt. 2000 m, Gardner 350; Kigezi District, Ruzumbara, alt. 1800 m, Purseglove 678; Virunga Mnts, Sajitine Crater, Taylor 2117; Virunga Mnts, nr Mabungo, alt. 1800 m, Eggeling 1116; Entebbe, Fyffe 133; Ruwenzori, Nawamba Valley, Kilembi, alt. 1600 m, Taylor 2277; Uobuku Valley, Bikoni, id. 2759; Vijongo, alt. 1600 m, Scott Elliot s.n.; Mowokota, alt. 1200 m, Brown 216.

Kenya: nr Lake Solai, alt. 1500 m, Lyne Watt 1322; Mt Elgon, alt. 2100 m, Lugard 100, Mrs Tweedie O 212, 213, 780 (the last one with long calyx lobes); Nakuro, Alluaud 125; Mt Kenya, alt. 2000 m, id. 201; Northern slopes of Kilimanjaro, alt. 1900 m, Gilbert Rogers 413; Nanyuki, alt. 2100 m, Mr and Mrs Moreau 92; Mbagathi, alt. 1800 m, Miss Napier 41; Kipkarren, Mrs Brockhurst-Hill 134 (with very small corolla limb), 63, 101, 177 (all three with very long calyx lobes); between Kikuya and Eldowa Ravine, Nairobi, alt. 1650 m, Whyte, Bogdan 1654 (with small flowers), MacDonald 765, Battiscombe 86 (both with long calyx lobes); Sabatia, alt. 2200 m, Graham 3025 (with very long calyx lobes).

Tanganyika: Bukoba Prov., Bugufi, alt. 1800 m, Miss Chambers s.n.; Mbulu Distr., Mbulumbulu, alt. 1500 m, Greenway 6912; Moshi Distr., Mpololo, alt. 1000 m, Haarer 1537; Monduli Distr., Anderson H 33/40; Mbeya Distr., Asafwe, alt. 1600 m, Davies 146; Mporoto, St Clair-Thomson 775; Rungwe Distr., Mbosi, alt. 1500 m, Davies 542; Rungwe, Geilinger 2494; summit of Upipa Range, nr Lumbowango, alt. 1800 m, Webb 77; Ruhudje, Lupembe, Schlieben 664; Songea Distr., alt. 1600 m, Lynes I.g. 266; s.l. De Beerst s.n. (type of *O. Debeerstii* de Wild. et Th. Dur.).

Belgian Congo: Kiboli—Ituri, between Beni and the Ruwenzori, Lebrun 4399; ibid., between Farodje and Aru, alt. 1100—1400 m, id. 3526; Urundi, between Umbibena and Mukuba, Becquet 144; Ngozi—Urundi, Kukororo, alt. 1700 m, id. 878; Kabinda River, Kaessner 2833; Lake Moera, id. 2825; between Pweto and Baudouinville, alt. 1200 m, Robyns 2089; between Kampala and Kagaballon, alt. 1450 m, id. 2169; Buziga, alt. 1900 m, id. 2393; Kivu, Goma Vulcan, Mullenders 2667; Kivu, Virunga Mnts nr Sake, Burtt 3721; Gaby—Golu, Shari River, Taton 506; Elisabethville, Hoffman s.n.; Marungu, Tompa, Dubois 1349; Bikima (Mboga), alt. 1400 m, Bequaert 2994; Kabaska, alt. 1200 m, Louis 4762; Kitize, Elskens 16; Katanga, Kasombi, alt. 1100 m, Quarré 4050 et 6300; Kipila, id. 1663; Kapiri, Homblé 1276; Kitendu—Kuriki, de Witte 430.

Nyasaland: Kalungwesi River, Ziwero, Carson 33 (type of *Pentas modesta* Baker); Lake Tanganyika, id. 107 (type of *O. macrodonta* Baker); Kondowe, alt. 1500—1800 m, Whyte s.n.; Fort Hill, alt. 1150 m, id. s.n.; Blantyre, Shire Highlands, Last s.n., Buchanan 187 et 725.

Northern Rhodesia: Abercorn, Mwengo, alt. 1600 m, Bullock 3959; Mumbwe, Mrs Macaulay 309 et 704.

Southern Rhodesia: Salisbury, Eyles 1632, Daphne King in herb.

Eyles 5222, Wild 2544 (with very small flowers); Umvukwe Mnts, Toroshanga Pass, Rodin 4453.
Port. East Africa: northern part, Melonie, Mrs Hornby 3753; Massangula, alt. 1100 m, Sousa A 377.

K. coccinea Royle varies widely in its dimensions and to some extent also in the length of the calyx lobes and in the width of the corolla limb. Originally I was inclined to refer the larger specimens, which as a rule are provided with the longer calyx lobes, to a var. *macrodonta* based on the type of *O. macrodonta* Baker, and the small plants with very small flowers (e.g. Mrs Brodhurst–Hill 134 from Kipkarren, Kenya) to a var. *parviflora*, but although the differences are sometimes very striking, there are also numerous specimens with a more or less intermediary character. The material probably comprises a greater number of genetically different forms, but as it is for the moment impossible to recognize the latter with certainty, it seemed better to drop the varieties altogether. On the whole, the smaller specimens are found in the northern part of the area, and the larger ones on the mountains of Central Africa and in the southern part of the area, but occasionally specimens of very different size are found in the same locality: at Kipkarren in Kenya Mrs Brodhurst–Hill collected not only the small-flowered form (n. 134) but also very robust plants with long calyx lobes (n. 63, 101, 177), and in the vicinity of Salisbury in Southern Rhodesia the small-flowered form was collected by Wild (n. 2541), whereas the specimens in Eyles' Herbarium represent the large form with the long calyx lobes.

K. coccinea and the next species are easily distinguished from the other members of this series by the great length of the calyx lobes and by the large capsules. They differ from each other in habit: *K. coccinea* is a haplocaulous annual, whereas *K. pleiocaulis* is a perennial with several stems.

15. **Kohautia pleiocaulis** Brem. n. spec. subgeneris *Eu-kohautiae*, series *Diurnarum*, maxime ut *K. coccinea* Royle sed habitu perenni, appendicibus filiformibus vaginae stipularis utroque latere caulis plerumque duabus sese approximantibus ab ea recedens.

Herba perennis, pleiocaulis, 18—40 cm alta. Caules suberecti, plerumque simplices, papillis albidis scabriduli, subteretes, internodiis usque ad 5 cm longis. Folia linearia, 2.0—4.5 cm longa et 1.5—5.0 mm lata, supra scabridula. Vagina stipularis utroque latere caulis in appendices filiformes plerumque duas a foliis remotas et sese approximantes, circ. 1 mm longas producta. Inflorescentia plerumque e triadibus tribus composita, triadibus lateralibus a foliis suffultis. Flores centrales triadum pedicellis 1—2 mm longis, flores laterales pedicellis usque ad 5 mm longis instructi. Ovarium papillis subglobosis obtectum. Calycis lobi 3 mm longi, margine scabrido-papillosi, cum appendicibus filiformibus alternantes. Corolla colore ignoto, extus papillosa, tubo 5—8 mm longo, parte angusta 0.5—1.0 mm diam.,

parte dilatata 2—3.5 mm longa et 1—1.5 mm diam., limbo patente fisso-partito, lobis 5—6 mm longis et 3—3.5 mm latis, acutis et mucronatis. Antherae 1.5—1.8 mm longae, subobtusae. Granula pollinis 4-colporata, 12—13 μ alta et 9 μ diam. Stylus 1.2 mm longus; stigmata 0.8—1.4 mm longa. Capsula globosa, 4.5 mm diam., papillis subglobosis obtecta.

Habitat Abyssiniam.

Abyssinia: between Hawash and Maki River, Welby, Jan. 1899, type (K); Country of the Arussi, Drake Brockman 164.

The last-quoted specimen consists of a single shoot only, but the latter is curved at its base in the same way as the stems of the plants collected by Welby. The corolla lobes are somewhat larger than those of Welby's plants, and the tube is slightly shorter; the pollen grains, on the other hand, are of exactly the same size.

As stated above, this is a very near ally of *K. coccinea* Royle, from which it is, however, easily distinguishable by its pluricipitous root, the stipular sheath, the form of the inflorescence and the shape of the capsule.

16. **Kohautia angolensis** Brem. n. spec. subgeneris *Eu-kohautiae*, series *Diurnarum*, habitu speciebus aliquibus subgeneris *Pachystigmatis* ut *K. microcala* Brem. et *K. leucostoma* Brem. similior, sed corolla imberbi tubo graciliori instructa et stigmatibus duobus ab eis faciliter distinguenda, inter species series *Diurnarum* granulis pollinis 3-colporatis, inflorescentia e triadi terminali et triadibus axillaribus composita, floribus graciliter pedicellatis distincta. —*Oldenlandia rigida* Bth. apud Hiern in Cat. Afr. Pl. 2, 442, 1898, quoad Welwitsch 3074 et 5326, haud quoad typum.

Herba annua, erecta, haplocaulis, aliquoties ramificata, 6—35 cm alta. Caulis scabridulus, internodiis usque ad 5 cm longis. Folia anguste linearia vel filiformia, 2—4 cm longa et 0.3—1.3 mm lata, supra marginem versus scabridula vel utrimque scabridula. Vagina stipularis utroque latere caulis in appendices filiformes 2—4 exeuns, appendicibus longioribus 2—4 mm longis ad folia approximatis. Inflorescentia e triadi terminali et triadibus lateralibus, omnibus longius pedunculatis composita. Pedicelli filiformes 3—10 mm longi, scabriduli. Ovarium scabrido-papillosum. Calycis lobi 1.2 mm vel in var. *macrocalyci* 2.5 mm longi, margine et costa scabriduli. Corolla purpurea vel violacea, extus ad faucem scabridula, tubo 8.5—9 mm longo, parte angusta 0.3—0.4 mm diam., parte dilatata 3—3.5 mm longa et 0.6—0.7 mm diam., intus ad basin vix conspicue papillosa, limbo patente fisso-partito, lobis 3.5—4.3 mm longis et 1.8—2.2 mm latis, subacuminatis. Antherae 1.1 mm longae, obtusae. Granula pollinis 3-colporata, 11—12 μ alta et 7—9 μ diam. Stylus 1.2—1.3 mm longus; stigmata 1.2 mm longa. Capsula subglobosa 3—3.5 mm alta et 2.8—3.7 mm diam., scabridula. Semina madefacta glutinosa.

Habitat Angolam.

var. *angolensis*; calycis lobi 1.2 mm longi.

Angola: Mossamedes. Welwitsch 3074, type (K), id. 5326 p.p., Pearson

2275 et 2291; Mossamedes Railway, Km 107, id. 2353; between Mossamedes and Humpata, Fritsche 15.

var. *macrocalyx* Brem. n. var. statura paulo majore sed praesertim calycis lobis bis longioribus a typo recedens.
Angola: Mossamedes, Shella Mnts, alt. 400 m, Herb. Serviços de Agricultura de Angola 9440, type of variety (K); Mossamedes, Welwitsch 5326 p.p.; Mossamedes Railway, Km 90, Pearson 2382.

K. angolensis Brem. differs from the other species of this series by its very narrow leaves, its long pedicels, the very narrow corolla tube and the 3-colporate pollen grains. Its nearest ally probably is *K. huillensis* Brem. v. infra, from which it differs in the much greater length of the pedicels, by the arrangement of the flowers in triads and by the 3-colporate pollen grains. Habitually there is some resemblance with *K. leucostoma* Brem. and *K. microcala* Brem. but hardly with *K. rigida* (Bth.) Brem., to which some of the specimens were referred by Hiern.

17. **Kohautia huillensis** Brem. n. spec. series *Diurnarum*, maxime ut *K. angolensis* Brem. sed floribus subsessilibus, plerumque in paria dispositis, granulis pollinis 4-colporatis ab ea faciliter distinguenda.

Herba annua, erecta, haplocaulis, aliquoties ramificata, circ. 20 cm alta. Caulis scabridulus, internodiis usque ad 7 cm longis. Folia anguste linearia, 2—3 cm longa et 1—2 mm lata, utrimque scabridula. Vagina stipularis utroque latere caulis in appendices filiformes duas 1—2.5 mm longas, ad folia approximatas producta. Inflorescentia basi interdum dichasialis vel e monochasio terminali et monochasio axillari composita, floribus ad nodos monochasii plerumque in paria dispositis. Pedicelli maxime 1 mm longi, post anthesin interdum paulo elongati. Ovarium scabrido-papillosum. Calycis lobi 2.5 mm longi, margine et costa scabridi. Corolla violacea vel purpurea, extus praesertim tubo scabrido-papillosa, tubo 10.5 mm longo, parte angusta 0.5 mm diam., parte dilatata 3 mm longa et 1.2 mm diam., intus fere tota papilloso-hirtella, limbo patente partito, lobis 5 mm longis et 3.5 mm latis, subacuminatis. Antherae 1.4 mm longae, obtusae. Granula pollinis 4-colporata, 14 μ alta et 10.5—11 μ diam. Stylus 1.8 mm longus; stigmata 2.2 mm longa. Capsula 3.5 mm alta et 4 mm diam., scabridula. Semina madefacta subglutinosa.

Habitat Angolam.
Angola: Huilla Plateau, Berthelot 13/95, type (P), "in large masses in the sorghum fields of the natives"; Cahama, Pearson 2423, "open Bauhinia forest".

K. huillensis comes nearest to *K. angolensis*, but is easily distinguishable from the latter by its subsessile flowers, which are for the greater part arranged in pairs, and by its 4-colporate pollen grains.

A rather curious feature is the presence of a fairly dense indumentum consisting of short hairs in the widened part of the corolla tube. In *K.*

angolensis similar hairs are found near the insertion of the stamens only, and in the other species of this series they are entirely absent.

18. **Kohautia grandiflora** DC, Prodr. **4**, 430, 1830; *Oldenlandia grandiflora* (DC) Hiern in Fl. Trop. Afr. **3**, 57, 1877, syn. *Hedyoti quartiniana* excepto; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1905, specimine zanguebarico excepto; Hutch. et Dalz., Fl. Trop. Afr. **2**, 131, 1931.

Herba annua, erecta, haplocaulis, 25—80 cm alta, apicem versus ramosa. Caulis plerumque papillis albidis scabridulus, basi obtuse quadrangularis, ceterum subteres, internodiis supremis interdum ad 10 cm longis, plerumque multo brevioribus. Folia linearia, plerumque circ. 5 cm longa et 2 mm lata, interdum ad 10 cm longa et 9 mm lata, margine foliorum latiorum plana, facie superiore marginem versus semper scabridula. Vagina stipularis utroque latere caulis in appendices filiformes 2 usque ad 3 mm longas, ad folia approximatas producta. Inflorescentiae corymbi- vel paniculiformes, in corymbum amplum confluentes. Pedicelli plerumque subnulli, interdum aliqui usque ad 3 mm longi. Ovarium papillosum. Calycis lobi 1—1.5 mm longi. Corolla rubra, raro rosea vel alba, extus vix notabile scabridula, tubo 12—14 mm longo, parte angusta 0.8—1.0 mm diam., parte dilatata 4—4.5 mm longa et 0.9—1.1 mm diam., intus glabra, limbo patente fisso-partito, lobis 4.5—7 mm longis et 3—6 mm latis, acutis et mucronatis. Antherae 2.5—3 mm longae, acutae. Granula pollinis 4-colporata, 14 μ alta et 10—12 μ diam. (Tab. XI, fig. k). Stylus 2.5—4.5 mm longus; stigmata 1.5 mm longa. Capsula depresse globosa 2—3 mm alta et 3—4 mm diam., glabra. Semina madefacta glutinosa. Cellulae testae centro areola incrassata instructae.

Habitat partes septemtrionales Africae Tropicalis a Promontorio Viridi usque ad Cameroniam et Ugandam.

Senegal: Dagana, Leprieur s.n.; Dakar, Thiebaut 210, Baldwin 5710; Cape Verde between Khan and Wolkan, Brunner 112; Cercle de Thiès, Mt Roland, de Wailly 4569; s.l. Bacle, type, n.v., Perrottet 382, Heudelot s.n., Roger s.n., Talmy 39, de Wailly 4580, Waterlot 1487.

Gambia: s.l. Brown–Lester 64, Dawe 5 et 65, Farmer 133, Ingram s.n., Brooks 16.

French Sudan: between Senegal and Niger, Bellamy 445 et 446; Bamako, Chevalier 202bis.

Gold Coast: Sandama, Danko 446; southern province, Tamale, Lloyd Williams 494.

Togo: Sokoda, Kersting A 681.

Dahomey: Save, Annet 23.

Niger Colony: Niamey, Hagerup 501; between Niger and Lake Chad, Gaillard s.n.

Northern Nigeria: Zaria, Hill 38 et 46, Keay F. H. I. 21666; Zugeru, Dalziel 223, Elliott 27; Bornu, Parsons s.n.; Sokoto, Ryan 27 et 57; Ilorin, Aguje, Thornton s.n.

Southern Nigeria: Lagos, Rowland s.n.; Sapoba, Kennedy 2873; Niger, Barter 856.
Cameroons: Buea, Mildbraed 9618 et 9791, Tessmann 2673.
French Aequatorial Africa: Haut Logone, Lenfant 1090.
Anglo-Egyptian Sudan: between Fazogle and Kassan, Kotschy 465; Fazogle, Boriani & Kotschy 159; Gallabat, Schweinfurth 1470; Mahalal, Douglas Simpson 7438; Toxswana, Andrews 64; between Dilling and Kadugli, id. 33.
Uganda: Karamojo District, nr Kangole, Thomas 3065; Lochoi, id, 3538; Iriri, Mrs Tweedie 149 et 770, Dale U 185, Mearns 2208.

K. grandiflora varies in the size of the flowers and fruits, and also in the length of the style; in the Uganda plants the latter reaches its highest value, but the differences are nowhere of sufficient importance to justify the distinction of more than one species.

K. grandiflora is easily distinguishable from the other members of this series by the numerous inflorescences which together form a large corymb, and by the comparatively short calyx lobes and the long corolla tube. In general aspect it is not unlike *K. senegalensis* C. et S., which belongs to the next series, but the inflorescences of *K. grandiflora* are more compact, the corolla is usually red, its lobes are wider and they are united at the base.

19. **Kohautia confusa** (Hutch. et Dalz.) Brem. n. comb.; *Oldenlandia confusa* Hutch. et Dalz., Fl. West Trop. Afr. **2**, 131, 1931, specimine a Schlechter in Togo lecto excluso (cf. *K. senegalensis* C. et S.); — *Kohautia stricta* (Smith) DC, Prodr. **4**, 430, 1830, quoad specimina ad Walo lecta, haud quoad typum qui ad *Oldenlandiam herbaceam* (L) Roxb. pertinet; — *O. effusa* Oliv. apud Hiern in Fl. Trop. Afr. **3**, 59, 1877, quoad specimen ab Heudelot in Senegambia lectum.

Herba annua, erecta, haplocaulis, 35—70 cm alta, aliquoties ramificata. Caulis glaber vel vix notabile scabridulus, internodiis usque ad 8 cm longis. Folia anguste linearia, 3—6 cm longa et 0.8—1.5 mm lata, sublaevia, sicc. nigrescentia. Vagina stipularis utroque latere caulis in appendices filiformes duas 0.7—1.5 mm longas, ad folia approximatas et interdum insuper in denticula 2 centro approximata producta. Inflorescentia ample paniculiformis. Pedicelli gracillimi, ad anthesin 1—1.5 cm longi, postea usque ad 2 cm accrescentes. Ovarium papillosum. Calycis lobi 1.3 mm longi, extus praesertim margine et costa scabriduli. Corolla rubra, tubo extus minute papilloso 4.5 mm longo, parte angusta 0.4 mm diam., parte dilatata 1.5 mm longa et 0.5 mm diam., intus glabra, intrusionibus ad orem inconspicuis, limbo patente fisso-partito, lobis 1.3 mm longis et 0.7 mm latis, apice mucronatis. Antherae 1.1 mm longae, connectivo in apiculum producto. Granula pollinis 4-colporata, 15 μ alta et 12—12.5 μ diam. Stylus 1.3 mm longus; stigmata 1.7 mm longa. Capsula subglobosa 3 mm diam., glabra. Semina madefacta glutinosa.

Habitat Africam Tropicalem.

Senegal: nr Galam, Heudelot 220, type (K); Walo, Leprieur s.n., Perrottet s.n. ("*Kohautia stricta* DC"); between Nyammo and Koulikoro, Chevalier 2024.
French Guinea: Kouroupa, Pobéquin 436; frontier with Portuguese Guinea, Maclaud s.n.
Tanganyika: Lake Tanganyika, Lt Cameron s.n. (very poor fruiting specimen; identification therefore not quite certain).
Nyasaland: between Kondowe and Kasongo, Whyte s.n.; Zomba Plateau, Brass 16089 (the identification of this specimen is not quite certain, as no flowers are present; the testa cells are slightly larger than in the other specimina).

K. confusa and the next species, *K. ubangensis* Brem., occupy a somewhat anomalous position in the series *Diurnae*, because the intrusions in the mouth of the corolla tube are not clearly discernible. From the next series they differ by the red colour of the flowers. From the preceding members of the series *Diurnae* they are easily distinguishable by the small size of the flowers and by the comparatively long style, the stigmata being in touch with the anthers; from *K. azurea* (Dinter et K. Krause) Brem. v. infra they differ in the structure of the stipular sheath, the filiform appendages being far removed from the centre, in the colour of the corolla, and in the 4-colporate pollen grains. *K. confusa* differs from *K. ubangensis* in its smooth or nearly smooth stem and leaves, in the somewhat smaller width of the latter, in the papillose, not scabrido-papillose ovary, in the slightly shorter calyx lobes, in the smaller size of the corolla limb, and in the shorter style, the stigmata just touching the base of the anthers.

20. **Kohautia ubangensis** Brem. n. spec. maxime ut *K. confusa* (Hutch. et Dalz). Brem. sed caule foliisque scabridulis, foliis paulo latioribus, ovario scabrido-papilloso, calycis lobis longioribus, corollae limbo multo majore, stigmatibus totis ad antheras adjicientibus, capsula majore ab ea distinguenda.

Herba annua, erecta, haplocaulis, aliquoties ramificata, 35 cm alta. Caulis scabridulus, internodiis usque ad 4.5 cm longis. Folia linearia, 2—5 cm longa et 0.6—2 mm lata, praesertim marginem versus scabridula. Vagina stipularis utroque latere caulis in appendices filiformes 2 ad folia approximatas, 1.2 mm longas producta. Inflorescentia ample paniculiformis. Pedicelli gracillimi, ad anthesin 0.5—1 cm longi, postea usque ad 2 cm elongati. Ovarium scabrido-papillosum. Calycis lobi 1.7 mm longi, extus scabrido-papillosi. Corolla rubra, extus tubo densius, limbo sparsius papillosa, tubo 4.2 mm longo, parte angusta 0.4 mm diam., parte dilatata 2.2 mm longa et 0.8 mm diam., intrusionibus ad orem inconspicuis, intus glabra, limbo patente fisso-partito, lobis 3.7 mm longis et 2.2 mm latis, mucronatis. Antherae 1.2 mm longae, apice acutae. Granula pollinis 4-colporata, 13—15 μ alta et circ. 12 μ diam. Stylus 2 mm longus; stigmata

1 mm longa. Capsula subglobosa 3.5 mm alta et 4 mm diam., subglabra. Semina madefacta glutinosa.

Habitat Africam Aequatorialem Gallicam.

French Aequatorial Africa: Ubangi, Region of the Bozoum, Tisserant 3195, type (P).

The position of this species and its near ally, *K. confusa*, has already been discussed, and the differences between these two species too have been pointed out in the note attached to the description of *K. confusa*.

21. **Kohautia azurea** (Dinter et K. Krause) Brem. n. comb.; *Oldenlandia azurea* Dinter et K. Krause in Bot. Jahrb. **43**, 132, 1909.

Herba annua, erecta, haplocaulis, 8—25 cm alta. Caulis simplex vel ramosus, casu quo ramis ascendentibus, papillis albis scabridulus, internodiis 1—6 cm longis. Folia linearia, subpatentia, 1.5—4 cm longa et 0.6—2 mm lata, nunc utrimque scabrido-papillosa, nunc margine et costa subtus solum scabrido-papillosa. Vagina stipularis utroque latere caulis centro paulo producta et ibi in appendices filiformes 2 circ. 2 mm longas exeuns. Inflorescentia basi plerumque dichasialis, ramulis monochasialibus, interdum tota monochasialis. Pedicelli 5—17 mm longi; bracteae infimae interdum usque ad 1.5 cm longae, filiformes. Ovarium scabrido-papillosum. Calycis lobi 1—1.5 mm longi, margine scabrido-papillosi. Corolla azurea, extus ad faucem et ad costas loborum scabrido-papillosa, tubo 2.8 mm longo, parte angusta 0.3 mm diam., parte dilatata 1.4 mm longa et 0.5 mm diam., ore intrusionibus instructa, intus glabra, limbo patente fissopartito, lobis 0.8—1.5 mm longis et 0.6—0.9 mm latis, acuminatis. Antherae 0.5—0.7 mm longis, subapiculatae. Granula pollinis 3-colporata, 14.5 μ alta et 11 μ diam. Stylus 0.8 mm longus; stigmata 0.8—1.0 mm longa. Capsula 3 mm alta et 4 mm diam., scabridula. Semina madefacta glutinosa.

Habitat Africam Austro-occidentalem.

South-west Africa: Okahandja, Dinter 475, type (K), id. 5791; Ameib, id. 6839.

This species might easily be mistaken for an *Oldenlandia* in the neighbourhood of *O. herbacea* (L) Roxb., for it has the small flowers of the latter and its long pedicels, and the lower flowers, moreover, are subtended by ordinary leaves instead of bracts. However, the included anthers and stigmata, the small size of the pollen grains and the structure of the testa leave no doubt with regard to its generic position.

The presence of intrusions in the mouth of the corolla tube and the coloured corolla limb indicate for this species a place in the series *Diurnae*, but its affinity with the other members of this series is apparently but remote.

Series Noctiflorae Brem. corolla alba, luteola, rosea, dilute caerulea vel brunneola, limbo plerumque ad basin partito, vix patente, ore sine intrusionibus a seriebus precedentibus distinguendae.

Speciebus plus quam 25 per totam Africam et partem occidentalem Asiae Tropicalis distributae. Typus: *K. senegalensis* C. et S.

22. **Kohautia quartiniana** (A. Rich.) Brem. n. comb.; *Hedyotis* (*Kohautia*) *quartiniana* A. Rich., Tent. Fl. Abyss. **1**, 362, 1847; — *Oldenlandia grandiflora* (DC) Hiern in Fl. Trop. Afr. **3**, 57, 1877, quoad syn. *Hedyotis quartiniana* A. Rich.

Herba annua, erecta, haplocaulis, aliquoties ramificata, 30—40 cm alta. Caulis glaber, internodiis usque ad 9 cm longis. Folia anguste linearia vel filiformia, 2—3 cm longa et usque ad 1 mm lata, glabra et laevia. Vagina stipularis utroque latere caulis in appendices filiformes 2 circ. 1.5 mm longas, ad folia approximatas et centro plerumque in denticula 2 minuta producta. Inflorescentia ample paniculiformis e cymis laxis composita. Pedicelli graciles 1.5—12 mm longi. Ovarium glabrum et sublaeve. Calycis lobi 4 mm longi, carinati, glabri et sublaeves. Corolla extus tubo minute papillosa, tubo circ. 12 mm longo, ubique 0.5 mm diam., parte antheras continente 5 mm longa, intus glabra, limbo usque ad basin partito, lobis 7.5 mm longis et 4 mm latis, acuminatis et mucronatis. Antherae 2.6 mm longae, subacutae. Granula pollinis 4- vel 5-colporata, 12.5 μ alta et 10—12 μ diam. Stylus 0.8 mm longus; stigmata 1.2 mm longa. Capsula 3 mm alta et 4.5 mm diam., glabra. Semina madefacta glutinosa. Cellulae testae facie exteriore non areola tumida instructae.

Habitat Abyssiniam.

Abyssinia: between Adua and Gondar, Quartin Dillon & Petit 12, type (P).

Hiern included this species in *K. grandiflora* DC, but it is obviously much nearer to *K. senegalensis* C. et S. From *K. grandiflora* it differs in the white colour of the corolla, the absence of intrusions at the entrance of the tube, the entirely free lobes and the absence of the curious circular swellings on the outer walls of the testa cells.

The difference between *K. quartiniana* and *K. senegalensis* is of far less importance. The calyx lobes are longer and the corolla lobes are much wider, the anthers shorter, and the fruits of somewhat larger size. The width of the corolla lobes is in *K. senegalensis* rather variable, but the lobes are never so wide as in *K. quartiniana*, which in this respect shows a superficial resemblance to *K. grandiflora*.

23. **Kohautia senegalensis** Cham. et Schlecht. in Linnaea **4**, 156, 1829 (*Knoxia senegalensis* Reichenb. nomen in Sieber, Fl. Seneg. Exsic. n° 9), DC, Prodr. **4**, 430, 1830; *Oldenlandia senegalensis* (C. et S.) Hiern in Fl. Trop. Afr. **3**, 56, 1877; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 131, 1931; — *Kohautia stricta* (Smith) DC, Prodr. **4**, 430, 1830, quoad specimina aliqua citata, haud quoad typum (*Hedyotis stricta* Smith in Rees, Cycl. **17**, n. 21, 1811) qui *Oldenlandiae herbaceae* (L) Roxb. conspecificus videtur; — *Hedyotis grandiflora* (DC) A. Rich., Tent. Fl. Abyss. **1**, 363, 1847, quoad

specimen citatum (*Kohautia noctiflora* Hochst. in Hb. Schimp. Abyss. **2**, n. 827, nomen), haud quoad typum, qui est *Kohautia grandiflora* DC; *Oldenlandia noctiflora* Hiern in Fl. Trop. Afr. **3**, 57, 1877; — anne *Oldenlandia garuensis* K. Krause in Bot. Jahrb. **48**, 404, 1912 absentia typi incertum; — *O. confusa* Hutch. et Dalz., Fl. West Trop. Afr. **2**, 131, 1931, quoad specimen in Togo lectum, non quoad typum qui est *Kohautia confusa* (Hutch. et Dalz.) Brem.

Herba plerumque annua, erecta, haplocaulis, 15—90 cm alta, apicem versus ramificata. Caulis glaber vel vix notabile scabridulo-papillosus, in speciminibus robustioribus interdum obtuse quadrangularis, internodiis usque ad 8 cm longis, plerumque tamen 2—2.5 cm. Folia linearia, plerumque 3—5 cm longa et 1—2 mm lata, interdum usque ad 8 cm longa et 7 mm lata, glabra et laevia vel vix notabile scabridula. Vagina stipularis utroque latere caulis in appendices filiformes 2 ad folia approximatas, circ. 2 mm longas producta. Inflorescentia laxe paniculiformis vel corymbiformis, basi interdum semel vel bis trichotoma, ramulis semel vel bis dichasialibus, ceterum pseudo-monochasialibus, re vera dichasialibus sed quoque pari ramulorum alter semper uniflorus et absentia bracteae pedicellum usque ad 1.5 cm longum imitans. Pedicelli veri subnulli vel in furcis dichasiarum interdum usque ad 6 mm longi. Ovarium sublaeve vel papillosum. Calycis lobi 0.5—2.0 mm longi, vix carinati, sublaeves vel margine scabriduli. Corolla plerumque alba, interdum rosea, dilute caerulea, luteola vel brunneola, extus intusque glabra, tubo 8—11.5 mm longo, ubique 0.4—0.8 mm diam. vel parte antheras continente 2—3.5 mm longa paulo ampliore, limbo usque ad basin partito, lobis 4—8 mm longis et 0.5—2.0 mm latis, acuminatis et mucronatis. Antherae parti dilatatae tubi aequilongae vel subaequilongae, acutae. Granula pollinis 4- vel 5-colporata, 10—15 μ alta et 9—15 μ diam. Stylus 1—3.5 mm longus; stigmata 1.3—1.5 mm longa. Capsula subglobosa 2.5—3 mm diam., glabra. Semina madefacta glutinosa.

Habitat partem septemtrionalem Africae Tropicalis et Arabiam.

Cape Verde Islands: Togo Island, Newton s.n.

Senegal: Cape Verde, Sieber 9 ("*Knoxia senegalensis* Reichenb.") type (K); Four à Chaux, Leprieur s.n.; Dagana, id. s.n.; Galam, id. s.n.; Walo, Perrottet 382 ("*K. stricta* DC"), id. 383; M. Bidjem, Thierry 37; Cercle de Thiès, de Wailly 4488; Sédhiou, Chevalier 2113; s.l. Heudelot s.n., Richard s.n., Morel s.n.

Gambia: Brooks 7, Brown-Lester N 3.

French Sudan: Medina, Colin 179; between Senegal and Niger, Bellamy 150; Bamako, Waterlot 1496; Cercle de Gao, de Wailly 4998, 5051, 5129; Timbuktu, Hagerup 211[b] et 256.

Niger Colony: Niamey, Bellamy 523.

French Guinea: Siguiri, Pobéquin1146; Farunah, Chevalier 20552; border of Port. Guinea, Maclaud s.n.

Sierra Leone: Talla Hills, alt. 1200 m, Scott Elliott 5087[A].

Ivory Coast: Baoulé, Singonobo, Pobéquin 129.
Gold Coast: Achimota, ccll. ign. 1618; Kintampe, Dalziel 31; Krobo Plain, Johnson 491.
Togo: Badja, Schlechter 12978.
Nigeria: Nupe, Barter 956; Bauchi Plateau, Dent Young 1137, Mac Gregor 427; Naraguta, Lely 471; Kontagora, Dalziel 222; Enugu Prov., Distr. Udi, Ujor F. H. I. 23939; Minna Division, nr Minna, Meikle 735.
Cameroons: Buea, Mildbread 9283; Bamenda, Maitland 1698; Boudoli, Périquet 58; Sanaga, Zenker 1442.
French Equatorial Africa: Ubangi, between Léré and Kam, Mr and Mrs Talbot 260; Yalinga, Letestu 3133 (with monstrous flowers) et 3754; Bambari, Tisserant 2615 (with monstrous flowers); Haut Chari, Gribingui, Chevalier 6346; Chari Central, Koulfé. id. 8872; Pays des Senoussi, Dar Banda — Ndelli, id. 6802[bis] et 7669.
Anglo-Egyptian Sudan: Kororak, Andrews 144; Gallabat, Matamma, Schweinfurth 1468, 1470 (both with wide corolla lobes), 1469; Kordofan, Fazogle, Kotschy & Boriani 159 (with wide corolla lobes), Figari s.n. (dito), Kotschy 515; Obeid, id. 283; Tueor, Mr and Mrs Broun 1245; Sennar, Kotschy 194 p.p. (cf. *K. aspera*); Schetyss, Cienkowski 335; Kordofan s.l., Colston 268, Pfund 734.
Abyssinia: Selasquilla, Schimper 827 ("*Kohautia noctiflora* Hochst.", type of *Oldenlandia noctiflora* Hiern, with wide corolla lobes; a specimen bearing the same number in the Stockholm Herbarium has narrow corolla lobes); Dschadscha, id. 264; Legua, alt. 1600 m, id. 776; s.l., id. 1924 (all with wide corolla lobes.)
Eritrea: Bogos, Beggineck, alt. 1300 m, Pappi 522; Maragus, Cohail, alt. 1700 m, id. 1004.
Arabia: Yemen, Gebel Bura, alt. 1000 m, Schweinfurth 502.

The difference between *K. senegalensis* and Hochstetter's *K. noctiflora* can hardly be regarded as material. It rests entirely on the somewhat greater width of the latter's corolla lobes, and would therefore at the most justify the distinction of two varieties, but the width of the corolla lobes proves to be so variable that it is not always possible to decide whether a specimen is to be referred to the type or to the variety. For this reason it seems better to postpone the splitting of this species into varieties until more material becomes available.

K. senegalensis and *K. quartiniana* are doubtless nearly related species, but their differences, which have been summarized in the note attached to the description of the latter, seem to be of sufficient importance to keep them apart. From the other members of the *Noctiflorae* they differ in the shape of the corolla lobes, which are drawn out in a long mucro: this is especially conspicuous in the buds, which are distinctly pointed.

24. **Kohautia euryantha** Brem. n. spec. series *Noctiflorarum*, a speciebus aliis *K. socotrana* Brem. excepta floribus longe pedicellatis distinguenda, pedicellis multo longioribus necnon corollae tubo minus gracili, lobis multo latioribus a *K. socotrana* diversa.

Herba perennis, e basi ramosa, caulibus erectis, infra inflorescentiam subsimplicibus, 25—40 cm altis. Caules teretes, basi scabriduli, internodiis usque ad 8 cm longis. Folia linearia, 2.5—4 cm longa et 1.5—2 mm lata, supra primum scabridula, deinde glabrescentia. Vagina stipularis utroque latere caulis in appendices filiformes plerumque 2 usque ad 1 mm longas, plerumque mox deciduas producta. Inflorescentia laxe paniculiformis, pauciflora, glabra, pedunculo usque ad 8 cm longo elata, rachidis internodio infimo pedunculo subaequilongo. Pedicelli gracillimi 2—4 cm longi. Ovarium minutissime et vix notabile verruculosum. Calycis lobi 1 mm longi, glabri. Corolla colore non certe noto, extus intusque glabra, tubo 10 mm longo, parte angusta 0.7 mm diam., parte dilatata 2.5 mm longa et 1.0 mm diam., limbo usque ad basin partito, lobis 4 mm longis et 1.2 mm latis, subacutis. Antherae 2.2 mm longae, subobtusae. Granula pollinis subglobosa, 4- vel saepius 5-colporata, 16—17 μ diam. Stylus 2 mm longus; stigmata 2.2 mm longa. Capsula subglobosa 3 mm alta et 2.5 mm diam., glabra. Semina (nondum matura) madefacta subglutinosa.

Habitat Africam Centralem.

Belgian Congo: National Parc of the Garamba, Mt Bawezi, alt. 700 m, Germain 626, type (B).

The flowers are described in a note attached to the sheet as very small and orange with red stripes, but as the flowers in this genus are never striped, this can hardly be right.

The slender pedicels remind one of *K. confusa* (Hutch. et Dalz.) Brem. and *K. ubangensis* Brem., but the narrow part of the corolla tube is much longer than the style with the stigmata, and the anthers too are much longer. In the series *Noctiflorae* there is only one other species with long-pedicellate flowers, viz. *K. socotrana* Brem., but the true pedicels of the latter vary in length between 0.5 and 1 cm (some of the pseudo-pedicels, i.e. the one-flowered cyme branches, reach a length of 2.5 cm), and the corolla tube as well as the corolla lobes are much narrower.

25. **Kohautia socotrana** Brem. n. spec. series *Noctiflorarum*, a speciebus aliis corollae lobis anguste linearibus diversa, floribus longe pedicellatis cum *K. euryantha* Brem. solum comparanda.

Herba perennis, e basi ramosa, caulibus erectis, iterum ramosis, 20—40 cm altis. Caules graciles, basi vix 1 mm diam., glaberrimi, internodiis usque ad 5 cm longis. Folia anguste linearia, usque ad 3 cm longa et 1 mm lata, plerumque multo minora, glaberrima, haud raro mox decidua. Vagina stipularis utroque latere caulis in appendices filiformes plerumque 2 usque ad 0.4 mm longas producta. Inflorescentia basi plerumque bis trichotoma,

interdum ex axillis foliorum superiorum inflorescentiis accessoriis aucta, ample paniculiformis, ramulis dichasialibus vel monochasialibus. Pedicelli gracillimi 5—10 mm longi; ramuli uniflori pedicellos imitantes usque ad 2.5 cm longi. Ovarium glabrum. Calycis lobi 1.2 mm longi, glabri. Corolla livida vel flavo-viridis, extus intusque glabra, tubo 9.5 mm longo, parte angusta 0.4 mm diam., parte dilatata 2.5 mm longa et 0.8 mm diam., limbo ad basin partito, lobis anguste linearibus 5 mm longis et 0.4 mm latis, subobtusis. Antherae 2 mm longae, subobtusae. Granula pollinis 5- vel raro 6-colporata, 13 μ alta et 12 μ diam. (Tab. XI, fig. i). Stylus 3.5 mm longus; stigmata 1.2 mm longa. Capsula subglobosa 2.5 diam., glabra. Semina nondum visa.

Habitat insulam Socotram.

Socotra: Keregnigiti, alt. 170 m, Schweinfurth 548, type (K); s.l., Balfour 39.

This species is easily distinguishable from all its allies by the extremely narrow corolla lobes. The structure of the flower suggests affinity with *K. senegalensis* C. et S., but the corolla lobes are subobtuse. The similarity with *K. euryantha* Brem., the only other species with long-pedicellate flowers found in this series, is more striking, but they differ in several minor points: *K. socotrana* is completely glabrous, its leaves are smaller and especially narrower, the corolla lobes are much longer and narrower, and the pollen grains are smaller.

26. **Kohautia latibrachiata** Brem. n. spec. series *Noctiflorarum*, a speciebus aliis inflorescentiae ramulis patentibus, calycis lobis brevibus, corollae tubo gracili distinguenda, antheris parte dilatata tubi dimidio brevioribus necnon vagina stipulari utroque latere caulis in lobum triangularem, apice in appendices duas filiformes exeuntem producta *K. stenosiphoni* (K. Sch. ex S. Moore) Brem., *K. brachylobae* (Sond.) Brem., *K. longiscapae* Brem. comparabilis, sed inflorescentia ample paniculiformi ab eis valde recedens.

Herba annua, haplocaulis, circ. 60 cm alta, ramosior. Caulis ad basin papillis albis scabridulus, internodiis gradatim longitudine increscentibus, supremis 15—25 cm longis, foliis plerumque ramulos abbreviatos foliis minoribus instructos suffulcientibus. Folia subpatentia, linearia, 4—6 cm longa et 2—3.5 mm lata, supra glabra et laevia, subtus costa basin versus scabridula. Vagina stipularis utroque latere costae in lobum triangularem apice in appendices 2 filiformes circ. 2 mm longas exeuntem producta, intra folia superiora centro vix producta et appendicibus filiformibus 2 ad folia approximatis, circ. 3 mm longis instructa. Inflorescentia basi trichotoma, ramulis aliquoties dichasialibus, ramificationibus patentibus, internodiis ramulorum infimorum 4—12 cm longis, gracilibus. Flores subsessiles vel breviter pedicellati. Ovarium vix notabile papillosum. Calycis lobi 0.8 mm longi, glabri. Corolla alba, extus intusque glabra, tubo 12 mm longo, parte angusta 0.3 mm diam., parte dilatata 2 mm longa

et 0.8 mm diam., limbo ad basin partito, lobis 3 mm longis et 1.2 mm latis, subobtusis. Antherae 1.1 mm longae, subobtusae. Granula pollinis 4-colporata, 12 μ alta et 10 μ diam. Stylus 2 mm longus; stigmata 1.8 mm longa. Capsula 2.5 mm alta et 3 mm diam., glabra. Semina madefacta paulum glutinosa.

Habitat Rhodesiam et Transvaaliam.

Rhodesia: Upper Zambesi, Mad[elle] Kiener s.n., type (P).

Transvaal: District Pietersburg, Potgietersrust, Bolus 10837.

The differences between this species and the other representatives of the series *Noctiflorae* in which the anthers are but half as long as the widened part of the corolla tube and whose stipular sheath is produced between the leaves in triangular lobes ending in two filiform appendages, are very striking. The three other species are small, few-flowered plants, whereas *K. latibrachiata* is a large plant with long leaves and a very showy inflorescence.

27. **Kohautia stenosiphon** (K. Sch. ex S. Moore) Brem. n. comb.; *Oldenlandia stenosiphon* K. Sch. ex S. Moore in Journ. Linn. Soc. **37**, 300, 1906.

Herba annua, erecta, simplex, 12—27 cm alta. Caulis gracilis, 0.3—0.7 mm diam., papilloso-puberulus, ex internodiis 3—7 compositus, internodiis infimis circ. 1 cm, supremis usque ad 8 cm longis. Folia linearia, 0.7—2.5 cm longa et 1—2 mm lata, supra vix notabile papillosa, subtus glabra vel costa basin versus papillosa. Vagina stipularis utroque latere caulis in lobum triangularem apice in appendices 2 filiformes usque ad 1 mm longas exeuntem producta. Flores in exemplis minoribus 2 vel 3 apice caulis approximati, in exemplis robustioribus in fasciculum terminalem interdum a florum pari praecessum dispositi casu quo fasciculus internodio satis longo a florum pari separatus; inflorescentia haec interdum inflorescentia axillari 2- vel 3-flora comitata. Pedicelli vix 0.5 mm longi. Ovarium brevissime hirtellum. Calycis lobi 0.7—0.9 mm longi, margine et costa breviter hirtelli. Corolla extus intusque glabra, tubo 9 mm longo, parte angusta 0.4 mm diam., parte dilatata 1.8 mm longa et 0.6 mm diam., limbo ad basin partito, lobis 2.5 mm longis et 0.6 mm latis, subacutis. Antherae 1.1 mm longae, apice calloso-mucronatae. Granula pollinis 4-colporata, 16—17 μ diam. Stylus 3.3 mm longus; stigmata 1.7 mm longa. Capsula 2.5 mm alta et 3 mm diam., breviter hirtella. Semina madefacta subglutinosa.

Habitat Angolam et Rhodesiam.

Angola: District Loanda, Pentico, Gossweiler 154, type (NH, dupl. K); Malange, Pogge 396.

Southern Rhodesia: Que-Que, Mrs McLeod 25.

Three of the four species provided with anthers half as long as the widened part of the corolla tube, and with stipules produced in triangular

interpetiolar lobes ending in two filiform appendages, are small, few-flowered plants. They are *K. stenosiphon*, *K. brachyloba* (Sond.) Brem. and *K. longiscapa* Brem. *K. stenosiphon* differs from *K. brachyloba* in the greater length of the lower internodes and the hirtellous ovary, from *K. longiscapa* in the erect shoots and the smaller size of the flowers, and from both in the larger size of the pollen grains.

28. **Kohautia brachyloba** (Sond.) Brem. n. comb.; *Hedyotis* (*Kohautia*) *brachyloba* Sond. in Linnaea **23**, 50, 1850; Walp., Ann **2**, 771, 1851/52; Sond. in Fl. Cap. **3**, 10, 1864; *Oldenlandia brachyloba* (Sond.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891, non quoad specimen citatum op. cit. **3**, 121, 1893, quod ad *K. lasiocarpam* Klotzsch var. *thymifoliam* Brem. pertinet; — *Oldenlandia Welwitschii* Hiern, Cat. Welw. Afr. Pl. **1**, 442, 1898.

Herba annua, erecta, simplex vel parce ramosa, interdum perennis et e basi ramosa, 7—17 cm alta. Caulis basi obtuse quadrangularis, papilloso-puberulus vel apicem versus glabrescens, internodiis basalibus brevibus et foliis inde subrosulatis, internodio supremo longissimo. Folia linearia, 1.5—3 cm longa et 1.5—3.5 mm lata, supra minute papillosa, subtus glabra vel costa basin versus papillosa. Vagina stipularis utroque latere caulis in lobum triangularem apice in appendices 2 filiformes usque ad 1.5 mm longas exeuntem producta. Inflorescentia nunc tota monochasialis, nunc basi trichotoma et ramulis semel vel bis dichasialibus, floribus ad nodos interdum in paria dispositis. Pedicelli subnulli, in furcis dichasiarum tamen usque ad 1.5 mm longi. Ovarium papillosum. Calycis lobi 0.7 mm longi, margine papillosi. Corolla alba, lobis extus puberula, ceterum extus intusque glabra, tubo 7.3—8.8 mm longo, parte angusta 0.3 mm diam., parte dilatata 1.8 mm longa et 0.8 mm diam., limbo ad basin partito, lobis 2—4.5 mm longis et 0.6—1.3 mm latis. Antherae 0.9 mm longae, apiculatae. Granula pollinis 4-colporata, 14 μ alta et 12 μ diam. Stylus 1.2 mm longus; stigmata 1 mm longa. Capsula 2—3 mm alta et 2.5—3.5 mm diam., subglabra vel papillosa. Semina madefacta glutinosa.

Habitat Angolam, Africam Austro-occidentalem, partem occidentalem Ditionis Capensis.

Angola: Mossamedes, Welwitsch 5327 (type of *O. Welwitschii* Hiern).
South-west Africa: Namib, 23 miles from Swakopmund, Schweickerdt 2221; Otjimbingue, Marloth 1400; Keetmanshoop, Oertendahl 163; Eisib nr Walvis Bay, Schinz 449; Namaland, Ugip, Pearson s.n.
Cape Province: Namaqualand, Kraaiwater, M. Schlechter 63; Sabiesis, Pearson 4105; Raman's Drift, id. 4039; Calvinia Division, Komseep nr Springbokkuil, Zeyher 761, type (K).

Very near to the preceding and the following species, but differing from the first in the shorter length of the lower internodes and from *K. longiscapa* Brem. in the erect stems.

K. brachyloba looks at first sight like a dwarfed *K. lasiocarpa* Klotzsch, and it is therefore worth noting that in that species too part of the

stipular sheaths are drawn out in interpetiolar triangular lobes, and that the latters anthers, although not so short as in *K. brachyloba* and its nearest allies, are nevertheless somehat shorter than the dilated part of the corolla tube. Part of the flowers of *K. brachyloba* and its allies are moreover arranged in pairs, and this too might indicate a nearer affinity.

29. **Kohautia longiscapa** Brem. n. spec. series *Noctiflorarum*, vagina stipulari utroque latere caulis in lobum triangularem apice in appendices 2 filiformes exeuntem producta, antheris parte dilatata tubi dimidio brevioribus ad *K. stenosiphonem* (K. Sch. ex S. Moore) Brem. et *K. brachylobam* (Sond.) Brem. accedens, ab ambabus caulibus e basi decumbente ascendentibus, inflorescentiis longe pedunculatis diversa; — *Oldenlandia Welwitschii* Hiern in errore apud K. Sch. in Warburg, Kunene-Sambesi Expedition, Berl. 1903.

Herba probabiliter perennis, oligocaulis, caulibus e basi decumbente suberectis, plerumque simplicibus, 25—35 cm altis, ex axillis foliorum majorum interdum ramulos abbreviatos foliis magnitudine redactis instructos emittentibus. Caules glabri vel in var. *scabridula* ad basin hirtelli, internodiis inferioribus circ. 1 cm longis, internodio inflorescentiam precedente usque ad 12 cm elongato. Folia suberecta, linearia; inferiora 1.5—2.5 cm longa et 1.5—2.5 mm lata; superiora 2 mm longa et 0.3 mm lata; omnia glabra vel in var. *scabridula* utrimque scabridula. Vagina stipularis utroque latere caulis in lobum triangularem apice in appendices 2 filiformes circ. 0.8 mm longas exeuntem producta. Inflorescentia interdum tota monochasialis, plerumque basi semel vel bis dichasialis, ramulis monochasialibus, floribus interdum in paria dispositis, paribus inferioribus longe distantibus. Pedicelli plerumque nulli. Ovarium glabrum vel in var. *scabridula* hirtellum. Calycis lobi 1.2 mm longi, glabri vel in var. *scabridula* hirtelli. Corolla extus intusque glabra, tubo 11.5 mm longo, parte angusta 0.6 mm diam., parte dilatata 2.5 mm longa et 1 mm diam., limbo ad basin partito, lobis 5.5 mm longis et 1.3 mm latis, subacutis. Antherae 1.2 mm longae, subobtusae. Granula pollinis 4-colporata, 15 μ alta et 12—12.5 μ diam. Stylus 3.5 mm longus; stigmata 1.5 mm longa. Capsula 2.5 mm alta et 3 mm diam., glabra vel in var. *scabridula* hirtella. Semina madefacta glutinosa.

Habitat Angolam.

var. *longiscapa*, caulis, folia, ovarium, calycis lobi glabri.
Angola: along the Longa River at Napalanka, alt. 1150 m, Baum 599 p.p., type (K).

var. *scabridula* Brem. n. var. caulibus ad basin hirtellis, foliis utrimque scabridulis, ovario et capsula hirtellis a typo recedens.
Angola: along the Longa River at Napalanka, alt. 1150 m, Baum 599 p.p., type of the variety (K), together with the type.

I have seen five sheets of Baum 599 (K, P, G, S, W), and in all of them shoots of the type proved to be mixed with shoots of the variety.

The differences between this species and the nearly related *K. stenosiphon* (K. Sch. ex S. Moore) Brem. and *K. brachyloba* (Sond.) Brem. have already been indicated under the descriptions of the latter.

30. **Kohautia sarcophylla** (Chiov.) Brem n. comb.; *Oldenlandia sarcophylla* Chiov., Fl. Somala 2, 233, 1932.

Herba perennis, e basi ramosa, caulibus e basi decumbente suberectis, 10—16 cm altis. Caules basi hirtelli, apicem versus glabrescentes, internodiis basalibus plerumque circ. 0.5 cm longis, duobus superioribus 3—4 cm longis. Folia linearia, 1—2 cm longa et 1—2 mm lata, crassiora, margine non revoluta, supra scabrido-papillosa, subtus costa papillosa; folia suprema triangularia, nondum 2 mm longa. Vagina stipularis utroque latere caulis in appendices 2 filiformes circ. 0.3 mm longas, ad folia approximatas producta. Inflorescentia e floribus 6—9 composita; pedicelli 1—10 mm longi. Ovarium glabrum et laeve. Calycis lobi 0.7 mm longi, glabri. Corolla extus intusque glabra, tubo 8—12 mm longo, parte angusta 0.5—0.6 mm diam., parte dilatata 2.1 mm longa et 0.7—0.8 mm diam., limbo ad basin partito, lobis 3—4 mm longis et 0.8—1.2 mm latis. Antheras 2 mm longae, calloso-apiculatae. Granula pollinis 5-colporata, 14 μ alta et 12 μ diam. Stylus 2.5 mm longus; stigmata 1.6 mm longa. Capsula nondum nota.

Habitat Somaliam.

Somaliland: Mogadiscio, on the dunes, Senni 572, type (F), Paoli & Stefanini 38.

Habitually this species shows some resemblance to *K. longiscapa* Brem., from which it differs in the fleshy leaves, the structure of the stipular sheath and the greater length of the anthers. In the last two characters it agrees with the following species.

31. **Kohautia somaliensis** Brem. n. spec. series *Noctiflorarum*, indumento et foliis latioribus ad *K. retrorsam* (Boiss.) Brem n. comb. (*Oldenlandia* Boiss.) accedens, sed brevitate internodiorum inferiorum et absentia brachyblastorum axillarium ab ea distinguenda.

Herba perennis, radice multicipiti, caulibus simplicibus vel basi ramificatis 20—40 cm altis. Caules basi breviter hirtelli, internodiis basalibus brevibus et foliis inde approximatis, apicem caulis versus usque ad 7 cm longis. Folia lineari-lanceolata vel linearia, circ. 3 cm longa et 5 mm lata, utrimque scabridulo-hirtella. Vagina stipularis utroque latere caulis centro in appendices 2 filiformes circ. 1 mm longas producta. Inflorescentia basi nunc trichotoma, nunc dichotoma, ramulis interdum semel dichasialibus, plerumque tamen monochasialibus. Pedicelli subnulli, maxime 1 mm longi. Ovarium glabrum vel vix notabile papillosum. Calycis lobi 0.9 mm

longi, glabri. Corolla luteola vel brunneola, extus intusque glabra, tubo 10.5 mm longo, parte angusta 0.5 mm diam., parte dilatata 2 mm longa et 0.8 mm diam., limbo ad basin partito, lobis 3.2 mm longis et 0.8 mm latis, subacutis. Antherae 2.2 mm longae, apice paulum exsertae, subacutae. Granula pollinis 4-colporata, 12 μ alta et 10 μ diam. Stylus 2 mm longus; stigmata 1.7 mm longa. Capsula 3—4 mm alta et 3.5—4.5 mm diam., glabra. Semina madefacta subglutinosa.

Habitat Somaliam.

British Somaliland: Hargeisa, junction of tugs, alt. 800 m, Gillett 4344, type (K); Wardere Wells, Glover & Gilliland 301; Berber, Capt. Peck 287 p.p. (cf. *K. caespitosa* Schnizl. var. *caespitosa*).

This species comes perhaps nearest to *K. retrorsa* (Boiss.) Brem., from which it differs in the shortness of the basal internodes and by the absence of the axillary short-shoots. From the preceding species and from most of the following ones which it resembles in the comparatively long anthers, it differs in the form of the stipular sheath, which is slightly produced between the leaves and bears the two filiform appendages near the middle of these lobes, and, of course, also in the nature of the indumentum and in the shape of the leaves. In the form of the stipular sheath it shows an approach to the first four species of this series, but it differs conspicuously from the latter in the greater length of the anthers. A similar stipular sheath is also met with in *K. lasiocarpa* Klotzsch.

32. **Kohautia obbiadensis** (Chiov.) Brem. n. comb.; *Oldenlandia obbiadensis* Chiov., Fl. Somala **1**, 191, 1929.

Herba perennis, e basi ramosa, caulibus ramisque fastigiatis, 20—25 cm alta. Caules graciles, basi scabrido-papillosi, apicem versus glabri, basi plerumque subero vestiti, internodiis 3—4.5 cm longis. Folia filiformia, 7—10 mm longa et 0.3 mm lata, margine et facie inferiore costae scabrido-papillosa, plerumque mox decidua. Vagina stipularis utroque latere caulis in appendices 2 filiformes 0.5 mm longas producta. Inflorescentia ramulis monochasialibus instructa. Pedicelli subnulli. Ovarium glabrum. Calycis lobi 0.6 mm longi, glabri. Corolla extus intusque glabra, tubo 9.5 mm longo, parte angusta 0.3 mm diam., parte dilatata 2 mm longa et 0.7 mm diam., limbo ad basin partito, lobis 2.5 mm longis et 0.5 mm latis, subacutis. Antherae 2 mm longae, subobtusae. Granula pollinis 4- vel 5-colporata, 10—12 μ alta et 8—10 μ diam. Stylus 0.6 mm longus; stigmata 0.8 mm longa. Capsula 2 mm alta et 2.5 mm diam., glabra.

Habitat Somaliam.

Somaliland: Sultanate Obbia, between Adani and Uarandi, Puccioni & Stefanini 496, type (F); Vittoria d'Africa, Polacci & Maffei 14.

Easily recognizable by its thin fastigiate shoots, small filiform leaves and narrow corolla lobes.

33. **Kohautia dolichostyla** Brem. n. spec. series *Noctiflorarum*, caulibus gracilibus, foliis parvis *K. obbiadensi* (Chiov.) Brem. similior, sed glabritate partium omnium, inflorescentia paniculiformi, corollae lobis brevioribus et latioribus, antheris minoribus et praesertim stigmatibus antheras attingentibus ab ea faciliter distinguenda.

Herba perennis, caespitosa dicta. Caules graciles, e basi ramosi, circ. 25 cm alti, glaberrimi, internodiis usque ad 4 cm longis. Folia subulata, inferiora circ. 7 mm longa, apicem caulis versus longitudine usque ad 1.5 mm diminuenda, glaberrima. Vagina stipularis utroque latere caulis in appendices 2 filiformes ad folia approximatas, vix 0.5 mm longas producta. Inflorescentia basi trichotoma, laxe paniculiformis. Flores plerumque sessiles; aliqui tamen ramulos usque ad 1 cm longos, pedicellos fingentes terminantes. Ovarium glabrum. Calycis lobi 0.8 mm longi, albidi, glabri, marginibus revolutis. Corolla brunneola, extus intusque glabra, tubo 11 mm longo, parte angusta 0.3 mm diam., parte dilatata 0.8 mm longa et 0.7 mm diam., limbo ad basin partito, lobis 1.4 mm longis et 0.7 mm latis, subacutis, apice callosis. Antherae 0.7 mm longae, subobtusae. Granula pollinis 4-colporata, 14 μ alta et 13 μ diam. Stylus 8.5 mm longus; stigmata 2 mm longa. Capsula subglobosa vix 1.5 mm diam., glabra.

Habitat Somaliam.

Somaliland: Wareg, Glover & Gilliland 894, type (K).

The material is rather poor, and as the underground parts are absent, the habit remains somewhat dubious. According to a note on the label it is a caespitose plant. It is well characterized by the small subulate leaves, the very long style and the complete absence of hairs and papillae. The shortness of the widened part of the corolla tube is also a noteworthy feature.

34. **Kohautia gracillima** Brem. n. spec. series *Noctiflorarum*, caule ramisque gracilibus *K. obbiadensi* (Chiov.) Brem. et *K. dolichostylae* Brem. similior, sed habitu plerumque annuo, caule ramisque totis scabridulis, internodiis longioribus, calycis lobis longioribus, corolla majore, capsula majore ab eis distinguenda.

Herba plerumque annua et haplocaulis, 20—40 cm alta, caule ex axillis omnibus ramificato, ramis iterum ramosis. Caulis apicem versus et rami toti gracillimi, ubique scabridulo-papillosi, internodiis ad medium caulem 3.5—6 cm longis, apicem versus multo longioribus. Folia aliqua linearia, 2—3.5 cm longa et circ. 1.5 mm lata, plurima filiformia et gradatim in bracteas aciculares vergentia, supra scabrido-papillosa. Vagina stipularis utroque latere caulis in appendices filiformes 2 ad folia approximatas, usque ad 1.5 mm longas producta. Inflorescentia semel vel bis trichotoma, ramulis basi dichasialibus, ceterum monochasialibus. Pedicelli florum infimorum interdum usque ad 5 mm longi, alii breviores vel subnulli. Ovarium papillosum. Calycis lobi 1.2 mm longi, papillosi. Corolla extus

vix notabile papillosa, tubo 14 mm longo, parte angusta 0.3 mm diam., parte dilatata, 2.6 mm longa et 0.5 mm diam., limbo ad basin partito, lobis 3 mm longis et 0.5 mm latis. Antherae 2.3 mm longae, acutae. Granula pollinis 4-colporata, 12 μ alta et diam. Stylus 2 mm longus; stigmata 1.2 mm longa. Capsula subglobosa, 3.5 mm diam., scabrido-papillosa. Semina madefacta glutinosa.

Habitat Eritream.

Eritrea: Beni-Amer, along the River Acara, Pappi 6415, type (F), id. 6430; Carajai, id. 6261, 6262, 6366; Baza, Badua nr the River Marel, alt. 900 m, id. 6888; Cheren, Tellini 1128; Emberemi, Pappi 1275.

Notwithstanding the fact that some of the leaves reach a length of 3.5 cm, these plants make an almost leafless impression. This is due to the circumstance that the larger leaves are confined to the lower part of the stem and of the lower branches, whereas the other leaves are all very small and separated from each other by long internodes. For this reason its habit is not unlike that of the two preceding species, which it resembles also in the slender corolla, but it is, as a rule, an annual plant with a single stem; its stem and branches are, moreover, entirely scabridulo-papillose and the internodes are much longer; its calyx lobes and corolla too are longer, and its capsules larger.

35. **Kohautia baddadensis** Brem. n. spec. series *Noctiflorarum*, internodiis paucis gradatim longitudine increscentibus, foliis inferioribus anguste oblongis, utroque latere costae nervis 2 vel 3 instructis a speciebus aliis diversa.

Herba perennis, e basi ramosa, caulibus simplicibus ascendentibus, 45—50 cm alta. Caules basi densius papilloso-hirtelli, ceterum glabrescentes, ex internodiis paucis apicem versus gradatim longitudine usque ad 9 cm increscentibus compositi. Folia inferiora anguste oblonga, circ. 4.5 cm longa et 9 mm lata, superiora minora et angustiora, omnia apice acuminata et longe mucronata, costa subtus et margine basin versus papillosa, ceterum glabra et laevia, nervis utroque latere costae 2 vel 3. Vagina stipularis utroque latere caulis paulum producta et centro in appendices 2 filiformes circ. 1.5 mm longas exeuns. Inflorescentia basi semel vel bis trichotoma, ramulis semel vel bis dichasialibus, ceterum monochasialibus. Pedicelli florum plurium subnulli, aliqui tamen usque ad 1 mm longi. Ovarium glabrum. Calycis lobi 1 mm longi, glabri. Corolla extus intusque glabra, tubo 10 mm longo, parte angusta 0.6 mm diam., parte dilatata 2 mm longa et 0.8 mm diam., limbo ad basin partito, lobis 2 mm longis et 0.8 mm latis, obtusis. Antherae 2 mm longae, apiculatae. Granula pollinis 5-colporata, 13 μ alta et 10—12 μ diam. Stylus 3 mm longus; stigmata 2.5 mm longa. Capsula globosa, 2.3 mm diam., glabra. Semina madefacta glutinosa.

Habitat Somaliam.

Somaliland: Baddada, Senni 307, type (F).

This species resembles *K. somaliensis* Brem. and also *K. Pappii* Brem. and *K. ceaspitosa* Schnizl., but it differs from all of them in the comparatively wide lower leaves; from *K. somaliensis* it differs moreover in the nature of the indumentum and in the shortness of the corolla lobes, from *K. Pappii* in the mode of branching, which is here confined to the lower part of the plant, and from *K. caespitosa* in the shortness of the corolla lobes and in the small size of the fruits.

36. **Kohautia Pappii** Brem. n. spec. series *Noctiflorarum*, maxime ut *K. caespitosa* Schnizl. sed caulibus ex axillis omnibus ramos patentes emittentibus, internodiis omnibus subaequilongis, corollae lobis brevioribus ab ea recedens.

Herba perennis, e basi ramosa, circ. 50 cm alta, radice palari in specimine solo noto 10 mm diam. Caules stricti, minute sed densissime papillosi, vix scabriduli, ex internodiis subaequilongis 3.5—4.5 cm longis compositi, ex axillis omnibus ramulos floriferos patentes emittentes. Folia linearia 2.2—3 cm longa et 2.2—4 mm lata, utrimque glabra et laevia. Vagina stipularis utroque latere caulis in appendices 2 filiformes usque ad 1.5 mm longas producta. Inflorescentiae in paniculam amplam confluentes. Pedicelli subnulli. Ovarium papillosum. Calycis lobi 0.8 mm longi, glabri. Corolla extus intusque glabra, tubo 9 mm longo, parte angusta 0.6 mm diam., parte dilatata 2 mm longa et 0.8 mm diam., limbo ad basin partito, lobis 2 mm longis et 0.6 mm latis, subobtusis. Antherae 2 mm longae, connectivo apice dilatato, obtusae tamen. Granula pollinis 4-colporata, 12 μ alta et 10 μ diam. Stylus 1.5 mm longus; stigmata 1 mm longa. Capsula subglobosa 2.3 mm diam., subglabra. Semina madefacta glutinosa.

Habitat Eritream.

Eritrea: Beni-Amer, Carajai, Pappi 6327, type (F).

This species is doubtless nearly related to *K. caespitosa* Schnizl., but the differences seem to be of sufficient importance to regard it as more than a mere variety of the latter: they are found in the equal spacing of the leaves, in the numerous patent flowering branches and in the shortness of the corolla lobes. The affinity with *K. baddadensis* Brem., which it resembles in the shortness of the corolla lobes and in the small size of the capsules, is probably more remote.

37. **Kohautia caespitosa** Schnizlein in Flora **25,** Beibl. 1, No. 10, 145, 1842; *Hedyotis caespitosa* (Schnizl.) Walp., Repert. **6,** 56, 1846/47; — *Oldenlandia Schweinfurthii* A. Terr. in Ann. del R. Inst. Bot. di Roma **5,** 107, 1894, cf. var. *caespitosa* f. *monstrosa*; — *Hedyotis Schimperi* Presl, Bot. Bemerk. 85, 1844; Walp., Repert. **6,** 56, 1846/47; Vatke in Oesterr. Bot. Zeitschr. **25,** 231, 1875 p.p. (cf. var. *caespitosa*); *Oldenlandia Schimperi* (Presl) T. And. in Journ. Linn. Soc. **5,** suppl. 1, 21, 1860 (v. infra var. *Schimperi* (Presl) Brem.); non Hiern in Fl. Trop. Afr. **3,** 56, 1877, nec K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895, nec Hutch. in

Kew Bull. 1931, 150, ubi varietates aliae contemplatae sunt; — *O. delagoensis* Schinz in Mém. Herb. Boiss. n. 10, 64, 1900 (v. infra var. *delagoensis* (Schinz) Brem.); — anne *O. Schaeferi* K. Krause in Bot. Jahrb. **48,** 405, 1912, absentia typi incertum (v. infra var. *delagoensis*); — *O. amaniensis* K. Krause in Bot. Jahrb. **43,** 129, 1909 (v. infra var. *amaniensis* (K. Krause) Brem.); — *O. commutata* Cuf. in Nuovo Giorn. Bot. Ital. **55,** 82, 1948 (v. infra var. *delagoensis*); — *O. saganensis* Cuf. op cit. 84 (v. infra var. *amaniensis*).

Herba annua vel perennis, in var. *Schimperi* suffruticosa, radici palari speciminum veteriorum interdum usque ad 8 mm diam. Caulis plerumque subsimplex vel e basi solum ramificatus, in var. *ramosiore* ex axillis fere omnibus ramos emittens, 10—50 cm altus, basi papillis albis scabridulus et apicem versus glabrescens vel totus papillosus, basi plerumque 0.8—2.0 mm diam., in var. *ramosiore* interdum usque ad 5 mm, in var. *Schimperi* usque ad 6 mm diam., internodiis basalibus plerumque brevibus, in var. *Schimperi* tamen internodiis sequentibus subaequilongis, apicem caulis versus usque ad 7 cm elongatis. Folia anguste linearia vel in var. *delagoensi* et in var. *eritreensi* lineari-lanceolata, plerumque 1—5 cm longa et 1—5 mm lata, in var. *delagoensi* interdum usque ad 10 mm lata, utrimque scabrido-papillosa, subtus interdum glabrescentia, nervis utroque latere costae 2 vel 3, plerumque vix distinguendis. Vagina stipularis utroque latere caulis in appendices 2 filiformes, minime in caulibus robustioribus ad folia approximatas, usque ad 2.5 mm longas producta. Inflorescentia basi haud raro trichotoma vel dichasialis, ramulis semel vel pluries dichasialibus vel totis monochasialibus, floribus fere omnibus solitariis ad nodos. Pedicelli breviores vel subnulli; inferiores interdum usque ad 5 mm longi. Ovarium in var. *caespitosa*, var. *Schimperi*, var. *eritreensi*, var. *ramosiore* verruculosum, in var. *delagoensi* et in var. *dolichostyla* hispidulo-verruculosum, in var. *amaniensi* glabrum. Calycis lobi 0.5—1.5 mm longi, glabri vel margine vix notabile papilloso-scabriduli. Corolla alba, luteola, roseo-suffusa, lilacina vel apicem versus lurida, extus papillosa vel in var. *delagoensi*, var. *dolichostyla*, var. *amaniensi* glabra, intus semper glabra, tubo 11.5—14 mm longo, parte angusta 0.3—0.4 mm diam., parte dilatata 1.7—3 mm longa et 0.6 mm diam., limbo ad basin partito, lobis plerumque 3—4 mm longis et 1.2 mm latis, in var. *dolichostyla* 2 mm longis et 0.6 mm latis. Antherae parti dilatatae tubi aequilongae, apice subacutae vel callosae. Granula pollinis 4- vel haud raro aliqua 5-colporata, 11—14 μ alta et 9—12 μ diam. Stylus plerumque 1.5—3 mm longus, in var. *dolichostyla* 4 mm longus; stigmata 1—2 mm longa, in var. *dolichostyla* antheras attingentia. Capsula plerumque subglobosa, 2.5—3 mm diam., in var. *Schimperi* et var. *ramosiore* ovoidea et usque ad 4 mm alta, plerumque verruculosa, in var. *delagoensi* et var. *dolichostyla* hispidula, in var. *amaniensi* glabra. Semina madefacta glutinosa.

Habitat Africam Orientalem et Australem, Arabiam.

var. *caespitosa*, herbacea, subsimplex vel parce ramosa, caule basi 0.8—2.0 mm diam., internodiis basalibus sequentibus brevioribus, foliis anguste linearibus vel filiformibus, 1—5 cm longis et 1—3 mm latis, nervis lateralibus haud conspicuis, ovario verruculoso, corolla extus papillosa, stylo 1.5—3 mm longo, capsula subglobosa, 2.5—3 mm diam., verruculosa, ultimo interdum glabrescente.

Arabia: Djedda, Schimper 879, Kruyt 66, 68, 162, 248 (162 et 248 specimina monstrosa *Oldenlandiae Schweinfurthii* A. Terr. similiora), Fischer 45, Hildebrandt 167 (sub nomine *Hedyotis Schimperi* Presl), Zohrab 93, 221 (221 specimen monstrosum *O. Schweinfurthii* similius). Suakin: Khor Ashat, 70 miles from Port Sudan, Maxwell Darling 147; Erkowit, Mr and Mrs Broun 1175 (dwarfed), Lady Maffy s.n., Aylmer 225, 557 (dwarfed); Kasala Province, Tokar District, Khor Sebat, Robbie 21; Erkassit, Schweinfurth 295; Gebel Uaratal nr Suakin, id. 1464; Island Macaur, id. 1466; Wadi Serartai, Elba, Newberry 132.

Eritrea: between Carora and Ras Casar, Jannoni 72; Aboteglade, Terraciano & Pappi 1; Asta, id. 31; Aleita, Terraciano 44; Habab, between Melchet and Tzaroba, Pappi 1084; between Ras Amar and Ras Tucul, Terraciano 69; Hoasa-ta-hareb, id. 42; Ingal, Pappi 23; Mensa, Terraciano & Pappi 2253; Assaorta, between Farrar Kantis and Adeita, id. 2935; Assaorta, between Zaga and Fatta, id. 2881; Bogos, Cheren, Terraciano & Pappi 2746; Barca, Agordat, id. 2859; Barca, Dunghad, Baldrati 3684; Nefasti, id. 3706; Amasen, Mai Atal, Pappi 3198; Amasen, between Mai Atal and Sabarguma, Tellini 727; Amasen, between Samhar and Sabarguma, Ragazzi 307; Amasen, Samhar, Moncullo, Fiori 1665; Amasen, Samhar, Nahico, id. 1664, Baldrati 3658, 3710; Amasen, Samhar, Dogali, Garetti 8, Terraciano & Pappi 71; Saati, Ragazzi & Pappi 19; Massaua, Otumbo, id. 1256; Massaua, Gherar, Baldrati 3659; Massaua, Russel s.n.; Massaua, Arkiko, Pappi 49; Ghinda, Baldrati 3660, 3716; Beni-Amer, Carajai, Pappi 6267, 6481; Beni-Amer, River Acara, id. 6432; Isola Hotha, Terraciano 407; I. Dub, id. 39; I. Dilemni, id. 451; I. Assarka id. 530; I. Dar Gullah, id. 992; I. Um-Namus, id. 499; I. Dissei, id. 234; I. Sciumma, Tellini 56, Terraciano 592; I. Du-racahan, id. 949; I. Sarad, id. 899; I. Dahalak, id. 678; I. Omat, Pappi 4582; Baja di Anfila, I. Midir, Terraciano 67bis; Baja di Anfila, Vulcani-Haressan, id. 62; Baja di Anfila, Vulcani di Ferehan, id. 20 (type of *O. Schweinfurthii* A. Terr., forma monstrosa); Damba, Nello Beccari 124; North Eritrea s.l., Bally 6895. Kordofan: Arusch Cool, Kotschy 138, type (K); Fazogle, Figari s.n.; Khartoum, Burri, Schweinfurth 837; Khartoum, Mr and Mrs Broun s.n. Somaliland: Kabulbagat Pass, Gillett 4688; Berbera, Capt. Peck 287 A, p.p. (cf. *K. somaliensis* Brem.); Goetton, Miss Edith Cole s.n.; s.l. Mrs Lort Phillips. s.n.

var. *ramosior* Brem. n. var. a var. *caespitosa* caule ex axillis omnibus ramosa, basi interdum usque ad 5 mm diam., capsula subglobosa vel ovoidea 3—3.5 mm diam. recedens.

Eritrea: Cheren, Tellini 914 (with large, ovoid fruits); between Cheren and Daari, alt. 1350 m, Fiori 1666; between Cheren and Anseba, Tellini 819; Adrde, Baldrati 321 (almost leafless); Assaorta, Monte Dijot, alt. 1200—1800 m, Pappi 5800; Baza, Ghindilla on the River Marel, alt. 850 m, id. 6920 (with a very short stem); Beni-Amer, Carajai, id. 6373, type of the variety (F); id. 6331; Beni-Amer, along the River Sectel no Dalul, id. 6461; Beni-Amer, along the River Mansura nr Debra Nehasir, id. 6411; Beni-Amer, Mai Garassit, id. 6512; Beni-Amer, along the River Acara, id. 6419, 6786; Beni-Amer, along the Ghergher, alt. 800 m, id. 7438.

var. *eritreensis* Brem. n. var. a var. *caespitosa* caule e nodis inferioribus ramosa, foliis paulo latioribus (2—5 cm longis et 2—5 mm latis), nervis lateralibus utroque latere costae 2 vel 3 plerumque distinguendis recedens. Eritrea: Massaua, Arkiko, Schweinfurth & Riva 132; Massaua, Mt Ghedem, id. 172, Tellini 250; Massaua, Otumlo, Schweinfurth & Riva 187, Tellini 409; Massaua, Dogali, De Benedictis 323, 465; Uaka, Dainelli & Marinelli 232; Chagâli (Damas Supérieur), Schweinfurth & Riva 663, type of the variety (F); Amasen, Mai Atal, Tellini 1407; Amasen, Sabarguma — Dongolla, Baldrati 3675; Amasen, between Algata and Bet-Custa, Fiori 1663; Schedon, Pappi s.n.; Barca, Agordat, Terraciano & Pappi 2857; Assaorta, Mt Fatta, id. 3106; Assaorta, Valle del Comailé, id. 5871; Oculé Cusai, id. 3953.

var. *Schimperi* (Presl) Brem. n. comb.; *Hedyotis Schimperi* Presl, Bot. Bemerk. 85, 1844; Walp., Repert. **6**, 56, 1846/47; *Oldenlandia Schimperi* (Presl) T. And. in Journ. Linn. Soc. **5**, Suppl. **1**, 21, 1860, non Hiern in Fl. Trop. Afr. **3**, 56, 1877, nec K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 376, 1895, nec Hutch. in Kew Bull. 1931, 150, ubi varietates aliae contemplatae sunt; — a var. *caespitosa* habitu suffruticoso, internodiis basalibus satis longis, foliis linearibus 1.3 cm longis, capsula ovoidea 3.5 mm alta et 2.5—3 mm diam. recedens.
Egypt.: Gebel Elba, Mohammed Dras 83, 143, 207, 210, 293, G. Täckholm s.n.; between Kosoer and Ras Benass, Schweinfurth 1403; Upper Thebaid, Kralik 205 (as the lower parts are missing, identification not fully certain).
Sinai: Wadi Hebron, Schimper 186 et 358, types of *Hedyotis Schimperi* Presl (K); Wadi Mahash, Kaiser 21; s.l. Aucher-Eloy 657 (sub nomine *Kohautia fruticulosa*).
Arabia: s.l. Ehrenberg 240 (sub nomine *Hedyotis grandiflora* A. Rich.); Qunfuda, Rochman, Ehrenberg & Hemprich 2/1825 (sub nomine *H. fruticosa*); Aden, Gillett 5487, Perry 6/78, Thomson s.n., Meyer Madden 6, Schweinfurth 23 (flowers partly monstrous, resembling those of *Oldenlandia Schweinfurthii* A. Terr.), id. 1165[b], de Beck s.n., Perrottet s.n.

var. *delagoensis* (Schinz) Brem. n. comb.; *Oldenlandia delagoensis* Schinz in Mém. Herb. Boiss. n. 10, 64, 1900; — anne *O. Schaeferi* K. Krause in Bot. Jahrb. **48**, 405, 1912, absentia typi incertum sed probabile; — *O. commutata* Cuf. in Nuovo Giorn. Bot. Ital. **55**, 82, 1948; — maxime ut

var. *eritreensis*, sed foliis latioribus etiam, 2—5 cm longis et 1.5—10 mm latis, ovario hispidulo-verruculoso, corolla extus glabra, capsula hispidulo-verruculosa ab ea recedens.
Abyssinia: Sagan-Omo, Filtu, Corradi 2856 (type of *O. commutata* Cuf.); Sagan-Omo, Neghelli, id. 2866, Cufodontis 246; Borana, Javello, id. 525; Dumum, Vatova 283.
Southern Rhodesia: Umtali Commonage, Fisher & Schweickerdt 473.
Portuguese East Africa: Delagoa Bay, Rikatla, Junod 203 (type of *O. delagoensis* Schinz) type of the variety (Z); Lourenço Marques, Schlechter 12574, Bolus 7778.
Transvaal: Zoutpansberg, Laatstgevonden, Mrs v. d. Berg 8; between Leydsdorp and Malati, Hafstrom & Acocks 1438, Erik Wall (the pollen grains of these specimens are almost all 5-colporate, and they measure $16 \times 16\,\mu$; Barberton, Rogers 30465; Pretoria, Smith 1244.
Cape Province: Kenhardt Division, between Kakamas and Letterkop, Wasserfall 1077; Hay Division, Buchuberg, Acocks in herb. Hafstrom 1185; Griqualand West, Asbestos Mnts, Kloof Village, Burchell 2051; Bushmanland, Wortel, Pearson 3604, 3087; Little Namaqualand, Richtersveld, between Kubus and Orange River, Marloth 12356; Little Namaqualand, Zendelingsdrift, Pillans 5084; Viols Drift, id. 6374; Schakalskuppe, alt. 1700 m, Pearson 4241.
South-west Africa: Great Namaqualand, Gr. Karas Mnts, Noachabab, Oertendahl 599; Gr. Karas Mnts, Wasserfall Alt, Pearson 8247; Kl. Karas Mnt, Dinter 5076; Warmbad, Kanibis-Aiais on the Lower Fish River, Marloth 4789; Namaqualand, s.l., Wyley s.n.; between Windhoek and Walvis Bay, Esdaile in Herb. Rogers 15221; between Tschaunaup and Seeheim, Gertner 6401; Tschaunaup Mission, id. 6322.

var. *dolichostyla* Brem. n. var. a var. *delagoensi* corollae lobis 2 mm longis et 0.6 mm latis, stylo longiore, stigmatibus antheras attingentibus diversa.
Northern Rhodesia: along the Zambesi, alt. 900 m, Borle 223, type of variety (PRE).
Southern Rhodesia: district Umtali, Umtali Commonage, alt. 1000 m, Chase 1626.

var. *amaniensis* (K. Krause) Brem. n. comb.; *Oldenlandia amaniensis* K. Krause in Bot. Jahrb. **43**, 129, 1929; — *O. saganensis* Cuf. in Nuovo Giorn. Bot. Ital. **55**, 84, 1948; — maxime ut var. *delagoensis*, sed ovario glabro vel subglabro ab ea recedens.
Somaliland: Webi Scebeli, del Giudice 29 (without flowers and identification therefore not fully certain); Hebe Balessa nr Coromma, Riva 1615.
Abyssinia: Sagan-Omo, Saviti, Riva 1561; Amar Cocchi (Gondaraba), Corradi 2867, 2868; Murlé, id, 2851, 2852, 2857, 2858, 2859, 2860; between Murlé and Atana, id. 2850; Elolo, id. 2846, 2847, 2848, 2849, 2853, 2854, 2855; Dande, id. 2864, 2865; Caschei, id. 2862; Ghizo, id. 2861 (*O.*

saganensis Cuf.); Maiunchiti, Senni 1094; Lake Margherita, Vatova 1244; Galla Arussi, Negri 770.

Uganda: Karamojo, Kongole, alt. 1200 m, Thomas 3466; Mt Debasien, between Amales and Napyenenya, Eggeling 2541.

Kenya: Mombasa, Linder 2654, Miss Napier 3269, 6292, Graham 1743, Sacleux 2186, Boivin s.n., Whyte s.n., Fries & Fries 3572; Lamu, Hildebrandt 1905, Miss Werner 1000; "40—60 miles from coast", Johnston s.n.; Voi, Miss Napier 1063; 40 miles S. E. of Nairobi, Bogdan 885; Sokoke Forest, Jeffery 262; Kipkarren, Mrs Brodhurst-Hill 108; between Nandi and Munias, Kavaronda, Whyte s.n.; Turkana, Miss Mortimer 104.

Tanganyika: Totohoon nr Moa, Braun 1383 (type of *O. amaniensis* K. Krause) type of variety (East African Herbarium, Nairobi); Moshi, alt. 900 m, Haarer 459; Pare, alt. 800 m, Uhlig 874; Kondoa District, Kolo, alt. 1500 m, Burtt 825, 1114; Marangu, alt. 1000 m, Volkens 2150; Dschallacu, id. 1762; Duga, Holst 3192; Pangani, Davies 1248, Mrs Faulkner 740.

Belgian Congo: Katanga, Musora, Bredo 3013.

The distribution of the var. *delagoensis* looks rather anomalous: a number of specimens have been collected in South-western Abyssinia, another batch comes from the Eastern part of South Africa, and a third one from the dry regions in the latters western part. This would suggest the presence of three distinct varieties instead of one, but I am unable to find any well-marked differences between the representatives from these various areas.

The differences between the varieties *caespitosa*, *ramosior* and *eritreensis* are of a quantitative kind only. The difference between this group of varieties and the varieties *delagoensis* and *amaniensis* lies mainly in the character of the ovary, and is perhaps somewhat more important. The var. *dolichostyla* recedes slightly more from the general type, for it has an abnormally long style and very short corolla lobes, and the var. *Schimperi* too occupies a somewhat isolated position, for it differs not only in its suffuticose growth-form but also in its rather large, ovoid instead of subglobose capsules. The capsules of the var. *ramosior*, however, are also somewhat larger than those of the other varieties and occasionally more or less distinctly ovoid.

The difference between *K. caespitosa* Schnizl. and *K. lasiocarpa* Klotzsch rests in the first place on the arrangement of the flowers along the branchlets of the inflorescence. In *K. caespitosa* each node bears, as a rule, but a single flower, and if a second flower is present, the latter is always distinctly pedicellate. In *K. lasiocarpa* there are, on the contrary, almost always two flowers at each node, and they are both subsessile. Whether this difference is of sufficient importance to justify the distinction of two species, is difficult to decide. However, the circumstance that we know no other pair of *Kohautia* species which differ in this way

and might therefore be reduced to varieties, nor any other species of which on account of a difference of this kind two varieties have been distinguished, seems to indicate that this difference is of more than varietal importance. More convincing, perhaps, is the argument that the two species differ also in another important character, viz. the structure of the stipular sheath; the latter is in *K. caespitosa* truncate with the filiform appendages, at least in the more robust shoots and branches, separated from each other by a wide gap, whereas it is in *K. lasiocarpa*, at least in the lower part of the shoots, produced into distinct interpetiolar lobes with the main filiform appendages at the top and sometimes one or two shorter ones on each side near the base.

38. **Kohautia lasiocarpa** Klotzsch in Peters, Reise Mossamb., Bot. 296, 1862; *Oldenlandia lasiocarpa* (Klotzsch) Hiern in Fl. Trop. Afr. **3**, 55, 1877; — *O. papillosa* K. Sch. in Bot. Jahrb. **23**, 416, 1897; Hiern in Cat. Welw. Afr. Pl. 2. 443, 1898 p.p.; — *Hedyotis thymifolia* Presl, Bot. Bemerk. 85, 1844 (*Kohautia thymifolia* Presl var. a in sched.), non R. et P., Fl. Per. **1**, 56, tab. 88, 1794; *Oldenlandia thymifolia* (Presl) O. Ktze, Rev. Gen. Pl. **1**, 293, 1891, comb. illeg. (v. infra var. *thymifolia* Brem); — *O. brachyloba* (Sond.) O. Ktze op cit. **3**, 121, 1893 quoad specimen citatum, haud quoad typum (cf. var. *thymifolia*); — *O. subverticillata* K. Sch. in Bot. Jahrb. **23**, 419, 1897, Hiern in Cat. Welw. Afr. Pl. **2**, 444, 1898, p.p. (v. infra var. *subverticillata* (K. Sch.) Brem.); — *O. sordida* K. Krause in Bot. Jahrb. **43**, 133, 1909 (cf. var. *subverticillata*); — *O. rhodesiana* S. Moore in Journ. of Bot. **40**, 250, 1902 (cf. var. *subverticillata*); — *O. setulosa* F. C. Wilson in Kew Bull. 1924, 256 (cf. var. *subverticillata*); — *O. xerophila* Schinz in Vierteljahrsschr. Natur. f. Gesellsch. Zürich **68**, 431, 1923 (v. infra var. *xerophila* (Schinz) Brem).

Herba annua vel perennis, erecta, ramosa, 15—55 cm alta. Caulis plerumque papillis albis scabridulus, in var. *xerophila* tomentellus, basi haud raro lignescens et ibi 1.5—4.5 mm diam., internodiis apicem versus longitudine increscentibus, supremis usque ad 15 cm longis, ex axillis foliorum plerumque ramulos abbreviatos foliis minoribus instructos emittens. Folia subpatentia, linearia vel lineari-lanceolata, plerumque 2—5 cm longa et 2—5 mm lata, raro usque ad 6 cm longa et 10 mm lata, supra papillis albis scabridula, in var. *xerophila* utrimque tomentella, sicc. vix conspicue discolorata, nervis utroque latere costae 1 vel 2 subtus plerumque distinguendis; folia superiora gradatim minora et in bracteas vergentia. Vagina stipularis inter folia inferiora interdum in lobum triangularem usque ad 2 mm longum, inter folia superiora in lobum bifidum vel bipartitum basi utroque latere insuper denticulis 1 vel 2 instructum producta. Inflorescentia basi trichotoma vel dichasialis, ramulis interdum semel dichasialibus vel saepius totis monochasialibus. Flores sessiles, fere omnes ad nodos ramulorum in paria dispositi. Ovarium in var. *lasiocarpa*, var. *subverticillata*, var. *xerophila* hispidulum, in var.

thymifolia, var. *eritreensis*, var. *breviloba* verruculosum. Calycis lobi 1.4—1.8 mm longi, margine et costa scabriduli. Corolla albida, luteola, viridula, lurida vel livida, extus praesertim ad costas loborum papillosa, intus glabra, tubo in var. *lasiocarpa* 12—15 mm, in var. *thymifolia* et var. *breviloba* 9—14 mm, in var. *subverticillata*, var. *eritreensis*, var. *xerophila* 5—6.5 mm longa, parte angusta 0.3—0.5 mm diam., parte dilatata in var. *lasiocarpa* et var. *thymifolia* 1.5—2.8 mm longa et 1.2 mm diam., in varietatibus aliis 1.1—1.5 mm longa et 0.5—1.0 mm diam., limbo ad basin partito, lobis plerumque 1.7—4.5 mm longis et 0.5—1.3 mm latis, in var. *breviloba* 1.3—2.2 mm longis et 0.6—1.0 mm latis. Antherae parte dilatata tubi paulo breviores, subacutae. Granula pollinis 4-colporata, plerumque 12.5—14 μ alta et 11—13 μ diam., in var. *subverticillata* et var. *xerophila* 15—17 μ alta 14—16.5 μ diam. Stylus 2.5—5 mm longus; stigmata 1.5—2.0 mm longa, in var. *subverticillata*, var. *xerophyla*, var. *eritreensi* antheras attingentia. Capsula in var. *lasiocarpa*, var. *subverticillata*, var. *xerophila* sparse setulosa, in varietatibus aliis verruculosa, ultimo interdum glabrescens. Semina madefacta glutinosa.

Habitat Eritream, Tanganyikam, Africam Australem.

var. *lasiocarpa*; — *Oldenlandia papillosa* K. Sch. in Bot. Jahrb. **23**, 416, 1897. Caulis papillis albis scabridulus; folia supra papillis albis scabridula; ovarium hispidulum; corollae tubus 12—15 mm longus, parte dilatata 1,5—1.8 mm longa; lobi 2.5—4.5 mm longi et 1.0—1.4 mm lati; granula pollinis 12.5—14 μ alta et 11—13 μ diam.; stigmata ab antheris paulo remota; capsula sparse setulosa, ultimo interdum glabrescens.

Tanganyika: Iringa Province, between Usagara and Mazombe, Ward U 85, U 42; Kondoa District, Kandaga, Burtt 1220, 1263.

Portuguese East Africa: Rios de Sena, Peters, type, not seen.

Northern Rhodesia: Mazabuke, Rogers 8726, neotype (K); Sesheke District, Miss Gairdner 121.

Southern Rhodesia: Salisbury, Eyles 1905; District Manica, Odzani River, Teague 260; s.l., Gardner 14, Hislop 33.

Angola: Mossamedes, Welwitsch 3067 (type of *O. papilosa* K. Sch.), Pearson 2390.

South-west Africa: nr Okahandja, Dinter 520; Grootfontein, Schoenfelder 515, 599; Windhoek, Pearson 9642; Little Karas Mnt, id. 9760; Brandberg, Liebenberg 5210.

var. *thymifolia* Brem. n. var.; (*Kohautia thymifolia* Presl var. a in sched.); *Hedyotis thymifolia* Presl, Bot. Bemerk. 85, 1844, nom. illeg. (non R. et P., Fl. Peruv. **1**, 56, 1794); *Oldenlandia thymifolia* (Presl) O. Ktze, Rev. Gen. Pl. **1**, 293, 1891, comb. illeg. — a var. *lasiocarpa* ovario verruculoso, corollae tubo 9—14 mm longo, parte dilatata 1.8—2.8 mm longa, capsula verruculosa distinguenda.

Natal: Port Natal, Drège s.n. ("*Kohautia thymifolia* Presl a") type of variety, Gerrard & McKen 2367; Colenso, alt. 1050 m, Kuntze s.n. (sub

nomine *Oldenlandia brachyloba*); Blauwkrans, Wood 3470; Ladysmith District, Acocks 9993; s.l., Gerrard 1363.
Orange Free State: between Vaal River and Taba Unchu, Zeyher 757.
Transvaal: Lijdenburg, Wilms 580; Houtbosch, Rehmann 6047; Irene, Doornkloof, Hutchinson 2387; Pretoria, Smith 82; Kaalfontein, Pole Evans 17566; Rustenburg, Miss Nation 335; Lichtenburg, Sutton 438 A.
Angola: Pungo Andongo, Welwitsch 3040 (P not G, cf. var. *breviloba*).
South-west Africa: Karibib, Dinter 6890.
Cape Province: Namaqualand, Schakalskuppe, Pearson 4792; Hay Division, Clifton, Acocks 2130 p.p.; Griqualand West, nr Mafeking, Brueckner 409, Burtt Davy 11365; Vrijburg, Armoedsvlakte, Miss Henrici 78.

var. *breviloba* Brem. n. var. a var. *thymifolia* corolla tubo graciliore et praesertim lobis multo minoribus (1.3—2.2 mm longis et 0.6—1.0 mm latis) recedens.
Tanganyika: Lukwa Valley, Nilepa, Pielou 152; nr Shinyanga, Miss Bax 199.
Portuguese East Africa: Lourenço Marques, Borlé 174.
Northern Rhodesia: Kalomo, Mukweda, Rogers 26004; Broken Hill, id. 8136.
Southern Rhodesia: Trelawney, 60 miles N.W. of Salisbury, Jack 169, 184; Umtali, Fisher 1590.
Transvaal: Pretoria, Smith 1412, 1526, Lotsy & Goddijn s.n., Repton 972; Lijdenburg, Wilms 580 (W not K, cf. *K. virgata*).
Orange Free State: Kroonstad, Pont 265.
Cape Province: Hay Division, Clifton, Acocks 2130 p.p.; Bechuanaland, source of the Kuruman River, Burchell 2487/8; Griqualand West, id. 2609; Barkley West, Nelson's Fontein, Miss Wilman 1258.
South-west Africa: Otjimbingue, alt. 1400 m, Marloth s.n.; Grootfontein, Borlé 28.
Angola: Kubango, Kabindere, alt. 1150 m, Baum 360; Pungo Andongo, Welwitsch 3040 (G not P, cf. var. *thymifolia*), 3066; Ambaca, id. 3065; Loanda, id. 3064.

var. *subverticillata* (K. Sch.) Brem. n. comb.; *Oldenlandia subverticillata* K. Sch. in Bot. Jahrb. **23**, 419, 1897; Hiern in Cat. Welw. Afr. Pl. **2**, 444, 1898; — *O. sordida* K. Krause in Bot. Jahrb. **43**, 133, 1909; — *O. setulosa* F. C. Wilson in Kew Bull. 1924, 256; — *O. rhodesiana* S. Moore in Journ. of Bot. **40**, 250, 1902; — a var. *lasiocarpa* corollae tubo 5—6.5 mm longo, granulis pollinis 15—17 μ alta et 14—16.5 μ diam., stigmatibus antheras attingentibus distinguenda.
Portuguese East Africa: between Tette and the sea coast, Kirk s.n.; Shiramba, id. s.n. (*O. lasiocarpa* Hiern in Fl. Trop. Afr. **3**, 55, 1877).
Nyasaland: s.l., Whyte 76 p.p. (cf. *K. confusa*); between Mpata and commencement of Tanganyika Plateau, id. s.n.

Southern Rhodesia: District Salisbury, Agr. Exp. Stat., alt. 1500 m, Arnold S. Rh. G. H. 10195; Salisbury, Rand 122 (type of *O. rhodesiana* S. Moore, v. phot.).
Transvaal: District Waterberg, Naboomspruit, Galpin M 487 (type of *O. setulosa* F. C. Wilson), id. M. 164; District Pretoria, Rust der Winter, Pole Evans 3853.
South-west Africa: Amboland, Ulukonda, Schinz 450; Okahandja, alt. 1300 m, Dinter 465 (type of *O. sordida* K. Krause); Grootfontein, Schoenfelder 344.
Angola: Sopola, Welwitsch 5321, type (K); between Gambos Fort and Mission Station, Pearson 2532; Loanda, Welwitsch 3064.

var. *xerophila* (Schinz) Brem. n. comb.; *Oldenlandia xerophila* Schinz in Vierteljahrsschr. Naturf. Gesellsch. Zürich **68,** 431, 1923; — a var. *subverticillata* caule ramisque tomentellis, foliis margine fortiter revolutis, utrimque tomentellis recedens.
Portuguese East Africa: Region of the Zambesi, on the Komadzi, Menyharth 611, type of the variety (Z).

var. *eritreensis* Brem. n. var. a var *thymifolia* corollae tubo 5—6.5 mm longo, stigmatibus antheras attingentibus, a var. *subverticillata* ovario verruculoso, granulis pollinis minoribus, capsula glabrescente recedens.
Eritrea: Beni-Amer, Carajai, Pappi 6384, type of variety (F).

It is rather unfortunate that no specimens are available from the type locality. The description given by Klotzsch, however, does not leave much doubt that my interpretation of this species is the correct one. The specimen quoted by Hiern in the Flora of Tropical Africa belongs to the var. *subverticillata*. Klotzsch does not mention the arrangement of the flowers in pairs along the branchlets of the inflorescence, and this suggests the possibility that his plant may have belonged to *K. caespitosa* Schnizl. var. *delagoensis* (Schinz) Brem., but as Klotzsch says of the stipules "superioribus bifidis", this seems excluded.

The near affinity between *K. lasiocarpa* and *K. caespitosa*, and the way in which the two species are to be distinguished, has already been discussed in the note attached to the description of the latter.

In comparing the varieties of *K. lasiocarpa* with those of *K. caespitosa* we observe that small-flowered varieties are confined to the first-named species (var. *subverticillata*, var. *xerophila*, var. *eritreensis*), and that a variety with entirely glabrous ovary is unknown in this species. Varieties with hispidulous ovaries, however, occur in both species. In the past the value of this admittedly rather striking character has often been overestimated and this has led to the creation of several new species which could not be kept up.

39. **Kohautia aspera** (Heyne ex Roth) Brem. n. comb.; *Hedyotis aspera* Heyne ex Roth, Nov. Pl. Sp. 94, 1821; *Oldenlandia aspera* (Heyne ex

Roth) DC, Prodr. **4**, 428, 1830; E. H. C. Krause in Bot. Jahrb. **14**, 413, 1892; Chevalier in Rev. Bot. Appl. **15**, 892, 1935; — *Kohautia strumosa* Hochst. in Flora **23**, Beibl. 1, 134, 1842, nomen; *Hedyotis* (*Kohautia*) *strumosa* A. Rich., Tent. Fl. Abyss. **1**, 364, 1847; Walp. Ann. **2**, 77, 1851/52; *Oldenlandia strumosa* (A. Rich.) Hiern in Fl. Trop. Afr. **3**, 58, 1877; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895; — anne *O. Trothae* K. Krause in Bot. Jahrb. **43**, 133, 1909, incertum sed probabile; — *O. cyanea* Dinter in Fedde, Repert. **19**, 318, 1924, nomen; — anne *O. Leclercii* A. Chev. in Bull. Mus. Hist. Nat. Paris, sér. 2, **5**, 162, 1933 dubiosum.

Herba annua, caule paucinodo, ex axillis fere omnibus ramoso, 13—30 cm alta. Caulis papillis albis scabridus, internodiis 3—6 cm longis. Folia linearia, plerumque 1.5—3 cm longa et 1—2 mm lata, interdum usque ad 5 cm longa et 3 mm lata, supra glabra, subtus costa basin versus papillis albis scabridula. Vagina stipularis utroque latere caulis in lobum triangularem in appendices 2 filiformes 0.5—1.5 mm longas exeuntem, basi interdum insuper dentibus minutis instructum producta. Inflorescentia basi interdum trichotoma vel dichasialis, ramulis monochasialibus vel tota monochasialis, floribus ad nodos plerumque in paria dispositis, sessilibus, flore in furca dichasii inserto tamen interdum longius pedicellato. Ovarium verruculosum. Calycis lobi 0.7—0.8 mm longi, glabri. Corolla alba, dilute caerulea vel violacea, fragrans, extus interdum parce papillosa, tubo 2.5—4.7 mm longo, parte angusta 0.4—0.5 mm diam., parte dilatata 1.3 mm longa et 0.6—0.8 mm diam., intus basin versus pilis basiscopis brevibus vestita, limbo fisso-partito, lobis 1.2 mm longis et 0.9 mm latis, subacutis. Antherae 0.6 mm longae, connectivo in lobum obtusum producto. Granula pollinis 4- vel 5-colporata, 15—19 μ alta et 12—18 μ diam. Stylus 0.6 mm longus; stigmata 1.2—1.4 mm longa. Capsula 2.5—3 mm alta et 2.5—3.5 mm diam., sublaevis vel basi verruculosa. Semina madefacta glutinosa (Tab. VII, fig. f).

Habitat Indiae partem occidentalem, Arabiam, Africam Orientalem et Australem, Insulas Gorgades; typus ex India Orientali.

Arabia: Yemen, Uossil, alt. 1400 m, Schweinfurth 1136.

Eritrea: Addiche, Baldrati 3703, 3705; Sarai, alt. 1900 m, Pappi 488, 600; ibid., alt. 1700 m, id. 366, Bellini 444, Di Martino 29/3; Oculé Cusai, alt. 2600 m, Pappi 1393; Beni-Amer, Debra Nahib, Pappi 7172.

Abyssinia: Golleb, alt. 800—1200 m, Schimper 83, alt. 1200—1800 m, id. 378; Gandawa, id. 1285; Alba Lerrouqué, id. 1867; Dschadscha, alt. 1800 m, id. s.n.; Harrar, alt. 1800 m, Negri 1332; Scioa, id. 675.

Anglo-Egyptian Sudan: Gezira, Andrews 94; Sennar, Kotschy 194; Kordofan, Abu-Gerad, id. 46 (type of *Hedyotis strumosa* A. Rich.); Fazogle, Figari s.n.

Uganda: Karamojo, Kangole, alt. 1200 m, Thomas 3484, Mrs Tweedie 791; Komalo, alt. 1200 m, Liebenberg 386.

Kenya: Nairobi, alt. 1750 m, Dowson 422.

Tanganyika: Western slope of Kilimanjaro, Engare Nairobi, alt.

1500 m, Greenway 6883; Pare District, Ngulu, alt. 750 m, Haarer 1431; Moshi, Kiruru, alt. 900 m, id. 432; Elmenbata, Scott Elliot 6757; Muanza, Davies 121; Ardai Plains, Fuggles Cauchman 75; nr Shinyanga, Romola D. Bax 199 p.p.
Transvaal: Waterberg District, nr Warmbad, alt. 1000 m, Codd 1025.
Orange Free State: Heilbron, Goossens 526.
Bechuanaland: Griqualand West, Honeynest Kloof, Miss Wilman s.n.
South-west Africa: Grootfontein, Schoenfelder 350 (a note of Dr. H. G. Schweickerdt attached to this sheet says that this specimen agrees with Dinter 866 from Bubus in the Berlin Herbarium; this is the plant mentioned in Fedde's Repert. **19,** 318, 1924 under the manuscript name *O. cyanea* Dinter).
Cape Verde Islands: St Vincent (São Vincente), Lowe s.n., Bolle s.n., Watson s.n.; St Antonio (São Antão), Ansell s.n.; Fogo, Prayo 10.

The specimen on which *Oldenlandia Leclercii* A. Chev. was founded, was collected in the Sundanese Sahara on the bank of the Oued Sadibene. The description, in particular the small, dark purple flowers and the form of the stipules, suggests *K. aspera*, but the dimensions are for this species somewhat large. If it really belongs here, it would bridge more or less the gap between the Cape Verde Islands and the Anglo-Egyptian Sudan.

The flowers of the specimens collected in the Cape Verde Islands are slightly larger than those of the specimens collected in East Africa, but I can find no other differences of any importance. The South-African plants have slightly smaller pollen grains (15—16 μ high and 12 μ diam., whereas those of the other specimens are 17—19 μ high and 15—18 μ diam.), and they seem to be all 4-colporate, whereas those of the other specimens are for the greater part 5-colporate, but here too I find no other differences of any importance.

The position of *K. aspera* is rather difficult to determine. The corolla limb is sometimes deeply coloured, which would be an argument to place it in the series *Diurnae,* but the flowers are also described as fragrant, which they are apparently never in that series. The hairs on the inside of the widened part of the corolla tube are not met with in any other species of the series *Noctiflorae,* but they return in *K. angolensis* Brem. and *K. huillensis* Brem., both belonging to the series *Diurnae.* However, these two species are so entirely different in general aspect that they can hardly be regarded as near allies of *K. aspera*, and it seems therefore that the agreement in this character is to be regarded as a mere analogy. The stipular sheath of *K. aspera* is similar to that of *K. lasiocarpa*, and the arrangement of the flowers in pairs along the branchlets of the inflorescence too points in the direction of the latter, and for these reasons it has been placed in the latter's vicinity.

40. **Kohautia kimuenzae** (de Wild.) Brem. n. comb.; *Oldenlandia kimuenzae* de Wild. in Ann. Mus. Congo Sér. 5, **1,** 75, 1903.

Herba perennis, haplo- vel oligocaulis, 20—35 cm alta, caulibus erectis simplicibus vel parce ramosis, casu quo ramis erectis. Caules ad basin scabridulo-hirtelli, apicem versus glabrescentes, basi 1 mm diam., internodiis longis, supremis usque ad 14 cm. Folia erecta, filiformia, 1—4 cm longa et 0.3—0.8 mm lata, utrimque glabra. Vagina stipularis foliorum inferiorum utroque latere caulis in lobum triangularem integrum circ. 1 mm altum producta, foliorum superiorum in lobum bifidum vel bipartitum exeuns. Flores apice caulis et ramulorum in triades dispositi quarum flos lateralis alter interdum suppressus vel a cyma breviter pedunculata substitutus est. Pedicelli 0.5—1.0 mm longi, post anthesin usque ad longitudinem duplam elongati. Ovarium glabrum. Calycis lobi 1.4 mm longi, glabri. Corolla luteola vel viridula, extus intusque glabra, tubo 11.5 mm longo, parte angusta 0.7 mm diam., parte dilatata 2.5 mm longa et 1.1 mm diam., limbo ad basin partito, lobis 4.3 mm longis et 1,4 mm latis, subacutis. Antherae 2.2 mm longae, obtusae. Granula pollinis 4-colporata, 15—16 μ alta et 12 μ diam. Stylus 2 mm longus; stigmata 0.8 mm longa. Capsula 2.4 mm alta et 2.8 mm diam., glabra. Semina madefacta paulum glutinosa.

Habitat Guineam Transaequatorialem.

Gaboon: Région de Lastourville, Le Testu 8081; Région du Niari, Komba, Thollon 1062; Région de Brazzaville, Babet s.n.

Belgian Congo: Lower Congo Basin, Kimuenza, Gillet 2115, type (B); Boko, Vanderijst B 310; between Panzi and the Tungila, Flamigny C 479; Basin of the Fufu, between Kwango and Lufuma, Germain 2713; Wombali, Vanderijst 2307, 2419, 2427; Leopoldville, Bequaert 7509, Achten 281[a].

This species and the next one differ from the other members of this series by their very narrow erect or suberect leaves, the absence of filiform appendages on the stipular sheaths in the lower part of the stem, and the compact, few-flowered inflorescences. *K. kimuenzae* differs from *K. amatymbica* in the thinness of its shoots and in the narrower leaves, in the distinctly pedicellate flowers, and in the smaller size of the capsule.

41. **Kohautia amatymbica** Eckl. et Zeyh., Enum. 360, 1837; *Hedyotis* (*Kohautia*) *amatymbica* (Eckl. et Zeyh.) Steud. in Nom. ed. 2, 726, 1840; Hochst. in Flora **27**, 552, 1844; Sonder in Fl. Cap. **3**, 11, 1864; *Oldenlandia amatymbica* (Eckl. et Zeyh.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891.

Herba perennis, plerumque plesiocaulis, caulibus erectis, simplicibus vel parce ramosis, casu quo ramis erectis, 30—55 cm alta. Caulis glaber, basi circ. 2.5 mm diam., internodiis longioribus, supremis interdum usque ad 14 cm longis. Folia suberecta, anguste linearia vel filiformia, 1.5—5 cm longa et 0.3—2.5 mm lata, utrimque glabra. Vagina stipularis utroque latere caulis in lobum triangularem 1.5 mm longum integrum vel ad nodos superiores bifidum vel bipartitum producta. Flores apice caulis et ramorum capitati. Capitula floribus usque ad 12, plerumque tamen

paucioribus composita. Ovarium glabrum. Calycis lobi 2.2—2.8 mm longi, glabri. Corolla lactea, luteola, viridula vel dilute violacea, extus intusque glabra, tubo 14 mm longo, parte angusta 0.8 mm diam., parte dilatata 3 mm longa et 1.2 mm diam., limbo ad basin partito, lobis 5.5 mm longis et 1.5 mm latis, subacutis. Granula pollinis 4-colporata, 18—20 μ alta et 14—16 μ diam. Stylus 4 mm longus; stigmata 1 mm longa. Capsula 5 mm lata et 4.5 mm diam., glabra. Semina madefacta paulum glutinosa.

Habitat partem orientalem Africae Australis a ditione Uitenhage usque ad Rhodesiam Australem.

Cape Province: Zuurberg Range, alt. 600—900 m, Drège 7657[a], Holland 63; Zuurberg Sanatorium, Long 279; Albany, Miss Bowker s.n., Zeyher 886; Cooper 3123, Williamson s.n.; Grahamstown, alt. 600 m, MacOwan 102; Howison's Poort, alt. 250 m, Marloth 10888; Hangklip nr Queenstown, alt. 1300 m, Galpin 1606; Winterberg, between Tarka and Katberg, Zeyher 758, type (K); Zwarte Hoogtens, Zeyher s.n.; Blackridge, Katberg Pass, Hutchinson & Dyer 1681; Key River, Zeyher s.n., Krook in herb. Penther 2067; Komgha, Flanagan 78; Kentani, Miss Pegler 119; Kokstad, alt. 1200 m, Tyson 322, 1103; between Kokstad and Mt Currie, Dyer 1816; Mt Currie, Goossens 266; British Caffraria, Cooper 153.

Natal: District Alexandra, Dumisa, alt. 600 m, Rudatis 684; Durban, Gueinzius 35; Fields Hill, Wood 13172; Pinetown, Schlechter 3169; Maritzburg, Wilms 2020, Wahlberg, s.n.; Bothas Hill, Hutchinson 4724; Greytown, Wylie s.n.; Inanda, Wood 132, 189; Vrijheid, Galpin 9684; Eshowe, Gerstner 2372; Mooi River, Meteor Ridge, Mogg 3258; Bergville, Hutchinson, Forbes and Verdoorn 169; National Parc, Mt aux Sources, Lanjouw 987, Hutchinson 4647; Eastcourt, alt. 1200 m, West 361; ibid. alt. 1500 m, id. 451; Paulpietersburg, Galpin 9655; Van Reenen, Wood 12103; Weenen Division, Culvers, Rogers 30129 p.p., Wood 4980; s.l. Gerrard 390.

Basutoland: Leribe, Mrs Dieterlen 33; s.l. Cooper 2441, 3516.

Orange Free State: Caledon River, Burke s.n.; Thaba Unchu, Page s.n.; Harrysmith, Sankey 220; Senekal, Doornkop, Goossens 738; Fouriesburg, Potts 3041; Bethlehem, alt. 1600 m, Potgieter 29, Phillips 3122; Ficksburg, alt. 1700 m, Galpin 13977; Viljoensdrift, Burtt Davy 7005; Kroonstad, Pont 479; Heilbron, Brandmuller 122.

Swaziland: s.l., coll. ign. s.n.

Transvaal: Standerton, Burtt Davy 5600; Carolina, alt. 1600 m, Galpin 13511, Rogers 19122, 19710; Lijdenburg, Wilms 581; Barberton District, Plaston, alt. 750—900 m, Holt 25; Nelspruit, alt. 700 m, Rogers 21336, v. Elden 2, Erik Wall s.n.; Ermelo, Miss Henrici 1104; Vereeniging, Story 31, Shantz 287; Benoni, Bradfield T 59; Johannesburg, Hafström & Acocks 1435; Irene, Doornkloof, Hutchinson 2399; Pretoria, Burtt Davy 1989, Smith 570, 753, 1768, Phillips 3047, McClean 63, Miss Leendertz s.n., Trapnell 545, Rehmann 4243; Magaliesberg, Burke & Zeyher (758); Potchefstroom, Louw 53, Liebenberg G 12, Goossens 1663; Lichtenburg,

Hakboslaagte, Kinges 1865; Warmbad, alt. 1200 m, Sidey 1321; between Warmbad and Nijlstroom, alt. 1350 m, Wall s.n.; Kaalfontein, Pole Evans 12845; Pietersburg, New Agatha, McCallum s.n.; Haenertsburg, Lam & Meeuse 5013; Zoutpansberg, the Downs, Rogers 22099; Shilouvane, Junod 750, 1335.

Southern Rhodesia: Chimanimani Mnts, Wild 2966; slopes of Inyangani Mt, alt. 2100 m, Eyles 8514.

An easily recognizable species with a well-defined area of distribution. The only species with which it shows a well-marked resemblance is *K. kimuenzae* (de Wild.) Brem. from Lower Guinea, and from the latter it is easily distinguishable by its more robust growth and by the capitate flowers. A remarkable feature are the tuberous lateral roots.

42. **Kohautia rigida** Bth. in Hook., Niger Fl. 402, 1839; *Hedyotis rigida* (Bth.) Walp., Ann. **2**, 772, 1851/52; *Oldenlandia rigida* (Bth.) Hiern in Fl. Trop. Afr. **3**, 55, 1877; id. in Cat. Welw. Afr. Pl. **2**, 442, 1898, p.p. cf. *K. omahekensis* et *K. angolensis*; — *O. rigida* (Bth.) Hiern forma Hiern in Cat. Welw. Afr. Pl. **1**, 442, 1894; — *O. graminifolia* Chiov. in Bull. Soc. Bot. Ital. 1924, n. 2, 39; — *O. breviflora* Chiov. l.c. forma floribus monstrosis.

Herba annua, basi lignescens, divaricate ramosa, 50—100 cm alta. Caulis glaber, sicc. nigrescens, internodiis usque ad 6 cm longis, ex axillis foliorum ramulos abbreviatos foliis brevioribus et praesertim angustioribus instructos emittens. Folia subpatentia, filiformia, internodiis plerumque breviora, 3—4 cm longa et 0.4—0.8 mm lata, glabra et laevia, sicc. nigrescentia. Vagina stipularis utroque latere caulis in appendices 2 filiformes ad folia approximatas, circ. 1 mm longas producta. Inflorescentia ample corymbiformis, basi trichotoma, ramulis dichasialibus, divaricate ramosis, internodiis infimis 2 cm longis, aliis gradatim usque ad 5 mm decrescentibus. Pedicelli maxime 1 mm longi. Ovarium glabrum. Calycis lobi 0.5 mm longi, glabri. Corolla dilute caerulea, livida vel luteola, extus intusque glabra, tubo 10.3 mm longo, parte angusta 0.5 mm diam., parte dilatata 1.8 mm longa et 1.2 mm diam., limbo ad basin partito, lobis 4 mm longis et 1.6 mm latis, subacuminatis. Antherae 1 mm longae, subacutae. Granula pollinis 3-colporata, 12—14 μ alta et 10—13 μ diam. Stylus 1.5 mm longus; stigmata 1.6 mm longa. Capsula 3 mm alta et 4 mm diam., glabra. Semina madefacta glutinosa.

Habitat Angolam.

Angola: Loanda, Porto Amboin, Gossweiler 9764; Benguella, Lobito Bay, Pearson 2298, 2299, 2300, Milne-Redhead 2506, Mocqungo 176[bis], Masocchi-Alemanni s.n. (type of *O. graminifolia* Chiov. n.v.), 36 (type of *O breviflora* Chiov.), with monstrous flowers; Elephants Bay, Curror s.n., type (K); Lengue, Gossweiler 4934; Benguella, on the coastal plain, De Wawra 245, Welwitsch 3039; Mossamedes, id. 5322 (infected by a fungus), id. 5324.

Pearson describes this species on the label of one of his specimens as a straggling suffrutex, but it is without any doubt an annual. He collected at Lobito Bay on account of differences in the colour of the flower three specimens, but in the herbarium there is no longer any difference between them.

K. rigida seems to be confined to the coastal plain of Angola. It is easily distinguishable from the other species of the series *Noctiflorae* that are provided with 3-colporate pollen grains by its ample inflorescences with their throughout dichasial branchlets of which the successive ramifications stand out at almost right angles.

43. **Kohautia gracilifolia** Brem. n. spec. series *Noctiflorarum*, inter species herbaceas granulis pollinis 3-colporatis instructas caule erecto et foliis suberectis ad *K. omahekensem* (K. Krause) Brem. accedens, sed caule singulo, ramosiore, foliis angustioribus quam internodia brevioribus, granulis pollinis minoribus, capsulis minoribus ab ea recedens; — *Oldenlandia senegalensis* (C. et S.) Hiern apud Brem. et Oberm. in Ann. Transv. Mus. **16**, 436, 1935, quoad specimen citatum.

Herba annua, erecta, haplocaulis, ex axillis omnibus ramificata, 50—60 cm alta. Caulis ramique vix notabile quadricostati, glabri vel basin versus vix notabile scabriduli, sicc. haud conspicue discolorati, internodiis usque ad 10 cm longis, ramis ad nodos ramulos abbreviatos foliis minoribus instructos emittentibus. Folia suberecta, filiformia, internodiis breviora, 2—3.5 cm longa et circ. 0.4 mm lata, glabra et laevia vel vix notabile scabridula, sicc. haud conspicue discolorata. Vagina stipularis plerumque mox disrupta, utroque latere caulis in appendices 2 filiformes, ad folia approximatas, usque ad 2 mm longas producta, appendicibus interdum latere a folio remoto appendiculo multo breviore comitatis. Inflorescentia ample corymbiformis, basi semel vel bis trichotoma, ramulis semel dichasialibus, ceterum monochasialibus, floribus haud raro in paria ad nodos dispositis, flore altero sessili, altero breviter pedicellato. Ovarium minute papillosum. Calycis lobi 1.5—1.8 mm longi, glabri. Corolla tubo lurido-viridula, lobis extus luridis, intus albis, extus intusque glabra, tubo 8.6—10.8 mm longo, parte angusta 0.3 mm diam., parte dilatata 1.6—1.8 mm longa et 0.8 mm diam., limbo ad basin partito, lobis 1.7—2.2 mm longis et 0.6—0.8 mm latis, obtusis. Antherae 1 mm longae, obtusae. Granula pollinis 3-colporata, 13 μ alta et 10.5—11.5 μ diam. Stylus 0.7 mm longus; stigmata 1 mm longa. Capsula 1.8 mm alta, 2.8 mm diam., glabra. Semina madefacta valde glutinosa.

Habitat Africam Austro-occidentalem, Bechuaniam, Transvaaliam, Rhodesiam australem.

South-west Africa: Damaraland, nr Welwitsch, Pearson & Galpin 7512, Mariental, Liebenberg 5129.

Bechuanaland: Gaberones, van Son T.M. 28993.

Transvaal: Zoutpansberg, Messina, alt. 900 m, Rogers 21704.

Southern Rhodesia: Lower Sabi, alt. 500 m, Wild 2429, type (K); Chiribira Falls, alt. 250 m, id. 3425.

This species comes very near to *K. omahekensis* (K. Krause) Brem., and has almost the same distribution. It does not assume in the herbarium the dark colour of the latter, is haplocaulous, more strongly ramified, has shorter and much narrower leaves, a papillose ovary, shorter corolla lobes, smaller pollen grains and smaller capsules.

They differ from *K. rigida* Bth. in the structure of the inflorescence, the ultimate ramifications showing a monochasial structure, and from *K. cynanchica* DC and *K. raphidophylla* Brem. in the greater length of the basal internodes, from the first moreover in the erect shoots and from the second in the form of the stipular sheath.

44. **Kohautia omahekensis** (K. Krause) Brem. n. comb.; *Oldenlandia omahekensis* K. Krause in Bot. Jahrb. **48**, 404, 1912; — *O. cynanchica* (DC) K. Sch. in errore apud O. Ktze, Rev. Gen. Pl. **3**, 121, 1893.

Herba perennis, plerumque plesiocaulis, caulibus suberectis, simplicibus vel parce ramosis, casu quo ramis suberectis, circ. 35 cm alta. Caules scabriduli vel apicem versus glabrescentes, internodiis usque ad 10 cm longis, ex axillis ramulos abbreviatos foliis minoribus instructos emittentes. Folia suberecta, filiformia, internodiis longiora, 2—6 cm longa et 0.4—0.8 mm lata, sicc. fuscescentia vel nigrescentia, utrimque glabra vel vix notabile scabridula. Vagina stipularis numquam disrupta, utroque latere caulis in appendices filiformes 2 ad folia approximatas, circ. 2 mm longas producta, appendicibus interdum latere a folio remoto appendiculis una vel duabus multo brevioribus comitatis. Inflorescentiae basi interdum dichasiales, ceterum monochasiales, in corymbum amplum confluentes, floribus haud raro in paria ad nodos ramulorum dispositis, flore altero sessili, altero breviter pedicellato. Ovarium semper glabrum et laeve. Calycis lobi 1.2—1.5 mm longi, glabri. Corolla alba, extus intusque glabra, tubo 9.7—12.2 mm longo, parte angusta 0.5 mm diam., parte dilatata 1.7—2.2 mm longa et 1.4 mm diam., limbo ad basin partito, lobis 3—4.5 mm longis et 1.2—1.6 mm latis, acuminatis. Antherae 1.4 mm longae, apice paulum productae. Granula pollinis 3-colporata, 16—18 μ alta et 13—15 μ diam. (Tab. XI, fig. l). Stylus 1.7—2.5 mm longus; stigmata 0.8—1.0 mm longa. Capsula 2.8—3.5 mm alta et 3.5—4 mm diam., glabra. Semina madefacta glutinosa.

Habitat Angolam, Africam Austro-occidentalem et Australem, Rhodesiam Australem.

Angola: Mossamedes, Welwitsch 5325.

South-west Africa: Damaraland, Een s.n.; Omaheke Island nr Karibib, Dinter 6874, neotype; District Otjiwarongo, Quickborn, Bradfield 150; Mariental, Voigtsgrund, Steyn 22545, Liebenberg 5129 et 5131.

Bechuanaland: Ngamiland, Kwebe Hills, Mrs Lugard 111, Lugard 166; nr Mafeking, Bolus 6419; nr Kimberley, Miss Wooly in Herb. Galpin 6347.

Orange Free State: Modderrivier, Kuntze s.n. sub nomine *O. cynanchica* K. Sch.); nr Bethulie, Flanagan 1917.
Transvaal: Magaliesberg, Wahlberg s.n.; Makapansberge, Strijdpoort, Rehmann 5400; Bosveld, Klippan, id. 5275; District Waterberg, Leeuwpoort, Rogers 22911; Naboomspruit, Galpin M. 163; District Zoutpansberg, Dengola Reserve, Sita Diamond Mine, Codd. & Dyer 3826; Messina, Rogers 20050, 20713, 22499, Wall s.n., Pole Evans 1926, Gerstner 5465; Middle Letaba River, Junod 1540; District Lijdenburg, Sekukuniland, Groenlands, Barnard & Mogg 1055; Nelspruit, Krüger National Parc, Codd & de Winter 4968.
Southern Rhodesia: Matopos, Pasture Station, Rattray 92; Plumtree, Eyles 8554, 8560.

Examples of the type were not available to me, and it is not impossible that they have all been lost. However, Dinter 6874, collected at the same place and named by the collector by comparison with the type, is apparently a good substitute.

K. omahekensis (K. Krause) Brem. and *K. gracilifolia* Brem. resemble *K. rigida* Bth. in the comparatively well developed lower internodes, but they differ from the latter in the structure of the inflorescence. The points in which *K. omahekensis* differs from *K. gracilifolia* have already been enumerated under the latter. The resemblance with *K. cynanchica* DC is also rather striking, but the two species are easily distinguishable by their habit, the shoots of *K. omahekensis* being erect or suberect and rather vigorous, whereas those of *K. oynanchica* ascend from a densely foliate base and are much less vigorous; the widened part of the corolla tube of *K. cynanchica* is moreover much longer than that of *K. omahekensis*. From *K. raphidophylla* Brem., the last of the herbaceous *Noctiflorae* with 3-colporate pollen grains, *K. omahekensis* is easily distinguishable by the shape of the stipular sheath, and also by the thinner shoots, the smaller leaves and the smaller flowers and capsules.

45. **Kohautia cynanchica** DC, Prodr. **4,** 430, 1830; *Hedyotis cynanchica* (DC) Steud., Nom. ed. 2, **1,** 727, 1840; *Oldenlandia cynanchica* (DC) K. Sch. ex O. Ktze, Rev. Gen. Pl. 3, 121, 1893, quoad typum, non quoad specimen ad Modderrivier lectum, cf. *K. omahekensis* (K. Krause) Brem.; — *Kohautia longiflora* DC, l.c.; *Hedyotis longiflora* (DC) Steud., l.c. non Schum. ex Schum. et Thonn., Beskr. Guin. Pl. 78, 1827; — *Hedyotis stricta* Smith apud Sonder, Fl. Cap. 3, 11, 1864 quoad specimina citata; — *Oldenlandia neglecta* Schinz in Vierteljahrsschr. Naturf. Gesellsch. Zürich **68,** 430, 1923; — *Kohautia thymifolia* Presl *b* in sched.; — *Oldenlandia calcitrapifolia* Pears. in sched.

Herba perennis, plesiocaulis, 10—25 cm alta, caulibus simplicibus parte basali interdum in arena condita casu quo erecta, supra arenam semper e parte decumbente ascendentibus. Caules basi plerumque scabridulo-papillosi, apicem versus glabrescentes, basi dense foliati, internodiis

gradatim longitudine increscentibus, ex axillis ramulos abbreviatos foliis minoribus instructos emittentes. Folia suberecta, linearia, 1.5—2.5 cm longa et 0.8 —1.5 mm lata, utrimque glabra vel vix notabile scabridula, sicc. fusco-nigrescentia. Vagina stipularis utroque latere caulis in appendices 2 filiformes, circ. 1 mm longas, ad folia approximatas producta, appendicibus interdum latere a folio remoto ab appendiculo breviore comitatis. Inflorescentia basi interdum trichotoma, saepius dichasialis, ramulis univel paucifloris, casu quo monochasialibus. Flos in furca dichasii insertus plerumque pedicello usque ad 1 cm longo elatus; flores alii sessiles. Ovarium glabrum et laeve. Calycis lobi 1—1.4 mm longi, glabri. Corolla albida, luteola, viridula, lurida vel dilute violacea, extus intusque glabra, tubo 11.2—14.4 mm longo, parte angusta 0.6—0.8 mm diam., parte dilatata 3.2—3.4 mm longa et 1.3—1.4 mm diam., limbo ad basin partito, lobis 3.5—5.5 mm, raro usque ad 8 mm longis et 1.4—2.3 mm latis, subacutis. Antherae 1.6 mm longae, longius apiculatae. Granula pollinis nunc omnia 3-colporata, nunc partim 4-colporata, 15—17 μ alta et 12.5—13 μ diam. Stylus 1.5—2 mm longus; stigmata 1.5 mm longa. Capsula 4 mm alta et 5 mm diam., glabra et laevis. Semina madefacta glutinosa.

Habitat partem occidentalem Africae Australis.

South-west Africa: Kubib, Pearson 9480; Nauchas, Kam River, id. 9045; Nairkluft Mnts, between Goas and Kabinas, id. 9082; Gr. Karasberg, Narudas Süd., id. 8236; Little Karasberg, Dinter 5077; Namaland, Padraskloof, Pearson s.n. ("*O. calcitrapifolia* Pears."); Daberas, Fleck (type of *O. neglecta* Schinz, L).

Cape Province: Bushmanland, Kijkgat, M. Schlechter s.n.; Bushmanland, Rozijnbosch, alt. 800 m, Pearson 3834; Bushmanland, Pella, id. 3593; Gr. Namaqualand, Buchholzbrunn, id. 3671; Gr. Namaqualand, Seeheim, Schaf River, alt. 900 m, id. 3731; Gr. Namaqualand, north of Raman's Drift, alt. 750 m, id. 4543; Gr. Namaqualand, Gawachab, Leeuwen River, id. 4086; Springbokkuil and Gamka River, Zeyher 760; Springfield, Hafström 1194; Winterveld and Nieuwe Veld, Drège s.n. ("*Kohautia thymifolia* Presl *b*"); Prieska, Bryant I 211, 579; Herbert Division, Moran Grange s.n., Burchell 1772, type (K); between Griquatown and Wittewater, id. 1197 (type of *K. longiflora* DC); Gamber River, Burke s.n.; Moshowing River, Burchell 288; Hopetown District, Potfontein, Smith 2821; Colesberg, Shaw s.n.; Graaf Reinet, Bolus 729; Hanover C.C., Sim in Herb. Galpin 5981; Middelburg C.C., Theron 96, Miss Verdoorn 1521; Rietfontein Plantation nr Craddock, Sim in Herb. Galpin 5645.

Orange Free State: Jacobsdal, Schweickerdt 1158; Fauresmith, Smith 3985, 5368, 5510, Miss Verdoorn 2316, Miss Henrici 1993, Pont 1304, 1321; Bloemfontein, Bolus 10814, Burtt Davy 786; between Bloemfontein and Christiania, Marloth 807; Christiania, Theron S 449, Burtt Davy 12479; Thaba Unchu, Burke s.n., Zeyher 759.

Bechuanaland: Griqualand West, Kimberley, Bolus 326; Warrenton, Adams s.n.; Philippolis, McLea in Herb. Bolus 5654; Vrijburg, Burtt Davy

11147; Armoedsvlakte, Mogg 8020, Sharpe 7187; Tigerkloof, Brueckner 410; Parla, Klingberg s.n.

Transvaal: Wolmaransstad, Liebenberg 2956; Pretoria, Niekerk & Wasserfall 48; Aapies River, alt. 1600 m, Schlechter 3614; Wonderboom Poort, Mogg 9941; Onderste Poort, Smith 6063; Pietersburg, Murray 585.

K. cynanchica DC is an easily recognizable species with a well-defined area. A remarkable feature is the mixture of 3-colporate and 4-colporate pollen grains met with in the anthers of some of the specimens. The normal number of pores is three. Variability in the number of pores is not uncommon in species with a greater number of pores, but among the species with 3-colporate pollen grains *K. cynanchica* is so far the only one in which I noticed this phenomenon.

K. cynanchica and *K. omahekensis* resemble each other in the dark colour they assume in the herbarium, in the structure of the stipular sheath, in that of the inflorescence and in the entirely glabrous and smooth ovary. *K. cynanchica* differs from *K. omahekensis* in its lower stature, the decumbent base of the stems and the shortness of the lower internodes, the smaller size of the leaves, the greater length of the widened part of the corolla tube and of the anthers, and the projecting connective of the latter. The northern boundary of the area of *K. cynanchica* overlaps in some places the southern boundary of that of *K. omahekensis*, and it is therefore not impossible that hybrids may occur.

46. **Kohautia raphidophylla** Brem. n. nom.; *Oldenlandia filifolia* K. Krause in Bot. Jahrb. **43,** 130, 1909, nom. illeg. nam non Elmer, Leafl. Philipp. Bot. **1,** 64, 1906; — anne *O. Dinteri* K. Krause in Bot. Jahrb. **39,** 518, 1907, absentia typi haud certe determinandum.

Herba perennis, caudice multicipiti usque ad 6 mm diam. instructa vel e basi ramosa, 20—35 cm alta. Caules ramique teretes, glaberrimi, basi circ. 1.5 mm diam., internodiis 1.5—7.5 cm longis. Folia filiformia, 1.5—3.5 cm longa et 0.2—0.5 mm lata, utrimque glaberrima. Vagina stipularis utroque latere caulis centro breviter producta et ibi in appendices 2 filiformes circ. 1 mm longas exeuns. Inflorescentia basi semel vel bis dichasialis, ramulis ultimis monochasialibus. Ovarium glabrum et laeve. Calycis lobi 1—1.5 mm longi, glabri. Corolla alba, extus intusque glabra, tubo 9 mm longo, parte angusta 0.4 mm diam., parte dilatata 1.6 mm longa et 0.9 mm diam., limbo ad basin partito, lobis 3.5 mm longis et 1 mm latis. Antherae 1.3 mm longae, subobtusae. Granula pollinis 3-colporata, 15 μ longa et 11 μ diam. (Tab. XI, fig. m). Stylus 2.2 mm longus; stigmata 1.5 mm longa. Capsula globosa 3 mm diam., glabra. Semina madefacta glutinosa (Tab. VII, fig. g).

Habitat partem occidentalem Africae Australis.

South-west Africa: nr Walvis Bay, Eisib, Schinz 454; between Walvis Bay and Windhoek, Esdaile in Herb. Rogers 15262; between Kubus and Ababis, Engler 6149, type (K).

Cape Province: Gr. Namaqualand, Sandverhaar, Pearson 4682; Little Namaqualand, Pillans 5538.

Kohautia raphidophylla is as yet but imperfectly known. From *K. gracilifolia* it differs in habit: it is a perennial plant, which develops in the end a multicipitous caudex, and also in the entirely glabrous ovary and the somewhat larger fruits, and from this and all the other species with 3-colporate pollen grains belonging to the *Noctiflorae* it differs in the presence of interpetiolar stipular lobes and in the position of the filiform appendages at the top of the latter instead of near the base of the leaves.

47. **Kohautia ramosissima** Brem. n. spec. series *Noctiflorarum*, inter species granulis pollinis tricolporatis instructas habitu fruticuloso ad *K. aphyllam* Brem. v. infra accedens, sed caulibus ramisque scopariis, basin versus cortice papyraceo vestitis, inflorescentiae ramulis ascendentibus, floribus longius pedicellatis, antheris parte dilatata tubo brevioribus ab ea recedens; — *Oldenlandia ramosissima* Dinter in sched. non Spreng.; — *O. Heynii* G. Don in errore apud Dinter in Fedde, Repert, **29**, 319, 1924.

Fruticulus scoparius, ramosissimus, circ. 60 cm altus. Caulis et rami inferiores basi cortice papyraceo, albido vel dilute brunneo vestiti, novelli glabri et opaci, internodiis plerumque 2—5 cm, interdum usque ad 7 cm longis. Folia plerumque ad squamas triangulares redacta, interdum aliqua filiformia et usque ad 1 cm longa. Vagina stipularis utroque latere caulis in appendices filiformes 2 vel 4 usque ad 0.4 mm longas producta. Inflorescentia pluries trichotoma, ramulis ultimis monochasialibus, omnibus angulo acuto ascendentibus. Pedicelli gracillimi, plerumque 3—4 mm longi. Ovarium glabrum et laeve. Calycis lobi 0.5 mm longi, glabri. Corolla extus intusque glabra, tubo 8.5 mm longo, parte angusta 0.4 mm diam., parte dilatata 2 mm longa et 1.1 mm diam., limbo ad basin partito, lobis 1.7 mm longis et 0.7 mm latis, subacutis. Antherae 1.2 mm longae, acutae. Granula pollinis 3-colporata, subglobosa, 14 μ diam. Stylus 1 mm longus; stigmata 2.2 mm longa. Capsula 3 mm alta et 4 mm diam., glabra. Semina pauciora et majora, madefacta glutinosa.

Habitat partem occidentalem Africae Australis.

South-west Africa: Swakop River, mouth of Hussab River, Dinter 8459, type (K); Dorstrivier, alt. 900 m, Marloth 1449 ("*O. Heynii*" Dinter in Fedde's Repert. **29**, 319, 1924).

Cape Province: Namaqualand, Orange River, south of Bethany Drift, Pearson 6072.

Bechuanaland: Griqualand West, Kimberley, Marloth 781.

K. ramosissima Brem. and *K. aphylla* Brem. are easily distinguishable from all other *Kohautia* species by their habit: it are both strongly ramified shrublets with very small leaves. Another point in which they differ from all their allies is the very small number of seeds per capsule. *K.*

ramosissima is easily distinguishable from *K. aphylla* by its more or less fastigiate stems and branches and by the papyraceous bark with which the older parts are covered; its pedicels, moreover, are much longer than those of *K. aphylla*, and the anthers are distinctly shorter than the widened part of the tube. *K. aphylla* is divaricately branched and probably more or less semi-globose in outline, its older parts are not covered by a papyraceous bark, the flowers are provided with a shorter pedicel, and the anthers are slightly longer than the widened part of the corolla tube.

48. **Kohautia aphylla** Brem. n. spec. series *Noctiflorarum*, inter species granulis pollinis tricolporatis instructas habitu fruticuloso ad *K. ramosissimam* Brem. v. supra accedens, sed ramificatione divaricata, cortice partium veteriorum haud papyraceo, inflorescentiae ramulis patentibus, floribus breviter pedicellatis, antheris parte dilatata tubi paulo longioribus ab ea recedens.

Fruticulus divaricate et haud raro pseudo-dichotome ramosus, probabiliter plus minusve semiglobosus, circ. 30 cm altus. Ramuli veteriores cortice brunneo, primum nitidulo, vestiti; novelli glabri et opaci, internodiis plerumque 1.5—3 cm, interdum usque ad 7 cm longis. Folia plerumque ad squamas triangulares 1—2 mm longas, subpatentes redacta, interdum aliqua filiformia et usque ad 1 cm longa. Vagina stipularis utroque latere caulis in appendices 2 filiformes interdum vix conspicuas producta. Inflorescentia basi interdum trichotoma, ceterum semel vel pluries dichasialis, ramulis ultimis monochasialibus, omnibus patentibus. Pedicelli plerumque circ. 1 mm longi. Ovarium glabrum et laeve. Calycis lobi 0.7 mm longi, glabri. Corolla extus intusque glabra, tubo 7.7 mm longo, parte angusta 0.4 mm diam., parte dilatata 1.2 mm longa et 0.9 mm diam., limbo ad basin partito, lobis 1.5 mm longis et 0.7 mm latis, subacutis. Antherae 1.4 mm longae, acutae. Granula pollinis 3-colporata, subglobosa, 15—17 μ diam. Stylus 2 mm longus; stigmata 1.7 mm longa. Capsula 2.3 mm alta et 3.2 mm lata, glabra. Semina pauciora et majora, madefacta glutinosa.

Habitat Africam Austro-occidentalem.

South-west Africa: Kooisberge, Dinter 6679, type (K).

7. CONOSTOMIUM Cuf.

Conostomium Cuf. in Nuovo Giorn. Bot. Ital. **55**, 85, 1948; *Oldenlandia* L sect. *Conostomium* Stapf in Journ. Linn. Soc. **37**, 517, 1906; *Oldenlandia* spec. Beck in Paulitschke, Harrar, Leipzig 1888, 461; O. Ktze, Rev. Gen. Pl. **1**, 292, 1891; Baker in Kew Bull. 1895, 216; Hiern in Journ. of Bot. **37**, 59, 1899; K. Sch. in Bot. Jahrb. **28**, 56, 1900; id. op cit. **33**, 334, 1903; Brem. in Ann. Transv. Mus. **15**, 456, 1933; *Pentas* spec. Rendle in Journ. of Bot. **34**, 127, 1896; *Neurocarpaea* spec. id. op. cit. **36**, 29 1898: *Hedyotis* spec. Hochst. in Flora **27**, 552, 1844; Sond. in Fl. Cap. **3**, 12, 1865.

Genus *Hedyotidearum* flore tetramero, corolla hypocrateriformi longituba, staminibus semper inclusis et stylo plerumque exserto, granulis pollinis magnis, 3-poratis, pariete tenui instructis, cellulis testae pariete basali conspicue granulata instructis a generibus aliis distinguenda.

Herbae perennes, haplo- vel pleiocaules vel fruticuli ramosiores. Caules ramique plerumque quadricostati, brachyblastos axillares foliis minoribus instructos emittentes. Folia opposita, sessilia, ovato-lanceolata, lanceolata vel linearia. Vagina stipularis truncata, nunc margine pilis et colletris aliquibus instructa, nunc utroque latere caulis dentibus 2 vel pluribus munita. Flores nunc omnes in axillis foliorum singuli, in paria superpositi vel in fasciculos dispositi, quo modo inflorescentiam spiciformem formantes, nunc ramos vel brachyblastos terminantes, nunc in corymbos terminales dispositi, semper tetrameri, homostyli, interdum forsitan unisexuales. Ovarium biloculare; placenta peltata, stipite brevi parti basali septi affixa; ovula numerosa placenta immersa. Calyx fere ad basin in lobos lineari-subulatos partitus. Corolla hypocrateriformis, alba, luteola, viridula, caerulea vel violacea, fauce et limbo extus intusque sparse pilosa vel tota glabra, tubo longissimo supra insertionem staminum paulo dilatato, limbo patente. Stamina sessilia vel subsessilia, plerumque tota fauce inclusa, raro apicibus exserta; antherae apiculatae vel obtusae, basi interdum bilobatae. Granula pollinis globosa, 3- vel 4-porata, pariete tenui instructa, satis magna (cf. Tab. XI, fig. o—r). Discus plerumque conicus, glaber. Stylus glaber vel papillosus, plerumque exsertus, raro inclusus, casu quo stigmatibus antheras non attingentibus; stigmata lineari-oblonga, utraque facie papillosa. Capsula ovoidea vel subglobosa, calyce coronata, intra calycem in rostrum applanatum parti seminiferae interdum subaequilongum producta, intra calycem rima loculicida dehiscens. Semina in placentam immersa, lutea, luteo-brunnea vel rubro-brunnea, angulata, apice truncata, laevia, madefacta subglutinosa; cellulae testae parietibus rectis instructae, pariete basali granulata (cf. Tab. VII, fig. i—k).

Distributum speciebus adhuc notis 9 in Africa Orientali a Somalia usque ad Kenyam et a Zambesia usque ad Caffrariam.

Species typica: *C. quadrangulare* (Rendle) Cuf. (syn. *Oldenlandia dolichantha* Stapf).

Stapf l.c. described the capsule as "dentibus 4 angustis dehiscente", but the mode of dehiscence is in reality the same as in *Kohautia* C. et S. and in *Oldenlandia* sensu meo, although it must be admitted that the valves may occasionally split at the top. In reality this genus can not be characterized by the shape or the mode of dehiscence of the capsule: rostrate capsules are also met with in other genera belonging to this circle of affinity, and in *Conostomium* itself the rostrum varies a good deal. In size too there is much variability, and although the capsules are, as a rule, much larger than in the allied genera, this is no general character (cf. *C. microcarpum* Brem.).

The style is usually exserted, but in some of the specimens of *C. longitubum* (Beck) Cuf., in one specimen of *C. brevirostrum* Brem. and in the only known specimina of *C. hispidulum* Brem. and *C. microcarpum* Brem. it proved to be included. Stapf regarded these flowers as brachystylous, but this can not be right, for their stigmata occupy a much lower position than the anthers in the ordinary type of flower do, and their anthers are found nearly at the same level as those of the latter. These flowers might be male ones, but this supposition is contradicted by the fact that the plants were found to produce fruits. I regard them as teratological, although I must admit that it is rather strange that this anomaly is found in no less than four of the nine species. In the only specimen of *C. zoutpansbergense* (Brem.) Brem. of which flowers were available, the anthers proved to be sterile, and it is possible therefore that this species will prove to be dioecious.

The best diagnostic characters of the genus are found in the structure of the pollen grains and in that of the testa cells. The basal wall of the latter is always granulate, and the pollen grains are larger than in the other genera belonging to this circle of affinity, they possess a very thin wall, and they are not colporate but porate. The pores, moreover, are enclosed between a couple of short, easily staining bars, one at the top and the other one at the base of the pore.

The nine species form three groups, which differ so conspicuously that they are to be regarded as subgenera.

The first subgenus, which I will call *Beckia* in honour of the author of *C. longitubum* (Beck) Cuf., the species on which it is based, consists of a number of desert shrublets with narrowly linear leaves and white flowers. The latter are either solitary at the top of ordinary branches or of axillary brachyblasts or, occasionally, in the fork between two branches or more or less spicate. In the latter case they are always subtended by ordinary leaves and, at least in the lower part of the spike, provided with leaflike bracteoles. The corolla is inside entirely glabrous. This subgenus is confined to the northern area.

The second subgenus, for which I will use the name *Eu-conostomium*, contains but a single species, viz. *C. quadrangulare* (Rendle) Cuf., the type of the genus. Its flowers are spicate, but they are subtended by ordinary leaves which gradually decrease in size towards the top of the stem. The flowers themselves are of uncommonly large size, the tube measuring 9—13.5 cm. The corolla throat is inside hairy. This subgenus too is confined to the northern area.

The third subgenus comprises two species occurring in the southern area, viz. *C. natalense* (Hochst.) Brem. and *C. zoutpansbergense* (Brem.) Brem. I will call it *Hochstetteria*. It is characterized by the arrangement of the flowers in terminal corymbs. The colour of the corolla is usually blue or violet, but occasionally pink- or white-flowered specimens are met with.

Key to the Species.

1. Desert shrublets with narrowly linear or, more rarely, linear or linear-lanceolate, 1-nerved leaves; flowers either solitary at the end of ordinary branches or of axillary short-shoots or in the fork between two branches, or axillary and more or less spicate: in the latter case at least the lower ones with leaf-like bracteoles. . . . . Subgenus 1. *Beckia*

2. Beak of the capsule not more than a quarter as long as the rest of the capsule. Shoots subterete, almost entirely covered with a whitish cork. Leaves linear or linear-lanceolate, nearly flat . . . . . 1. *C. brevirostrum*

2: Beak of the capsule more than half as long as the rest of the capsule. Shoots quadricostate; the upper part green or reddish. Leaves narrowly linear with a strongly revolute margin.

3. Flowers either all or at least the upper ones sessile.

4. Shoots glabrous or subglabrous. Leaves 1.5—3 cm long. Stipular sheath glabrous. Corolla lobes at least 6 mm long. . . . . 2. *C. longitubum*

4: Shoots with scabrido-hirtellous ribs. Leaves 1—1.5 cm long. Stipular sheath with a hispidulous margin. Corolla lobes less than 3.5 mm long. . . . . 3. *C. hispidulum*

3: Flowers all distinctly pedicellate.

5. Ramification stopping below the first flower. Leaves at least 1.5 cm long. Corolla lobes at least 8 mm long.

6. Circ. 1 m high. Teeth of the stipular sheath circ. 1.2 mm long. Pedicels straight . . . . . 4. *C. kenyense*

6: Not more than 30 cm high. Teeth of the stipular sheath barely visible. Pedicels recurved at the base and then once more ascending . . . . . 5. *C. camptopodum*

5: Ramification continued in the flowering region. Leaves less than 1.5 cm long. Corolla lobes less than 5 mm long . . . . . 6. *C. microcarpum*

1: Herbs with one or more erect shoots and linear, linear-lanceolate, lanceolate or ovate-lanceolate, usually distinctly penninervous leaves; flowers either in the axil of ordinary leaves and then combined into a long terminal spike or in terminal corymbs.

7. Flowers subtended by ordinary leaves which towards the top of the stem gradually decrease in size, together forming a spike-like inflorescence . . . . . Subgenus 2. *Eu-conostomium*
Only species . . . . . 7. *C. quadrangulare*

7: Flowers subtended by filiform, often very minute bracts, in terminal corymbs consisting of triads with a subsessile terminal flower and distinctly pedicellate lateral ones . . . . . Subgenus 3. *Hochstetteria*

8. Leaves usually narrowly ovate-lanceolate, rarely slightly wider. Branchlets of the corymb and pedicels of the lateral flowers very short. Corolla tube not more than 1.5 cm long, inside glabrous . . . . . 8. *C. natalense*

8: Leaves linear. Branchlets of the corymb rather slender and the pedicels of the lateral flowers as long as the ovary and the calyx taken together. Corolla tube 3 cm long; throat pilose . . . . . 9. *C. zoutpansbergense.*

Subgenus *Beckia* Brem., fruticuli foliis anguste linearibus, rarius linearibus vel lineari-lanceolatis, semper 1-nerviis, vagina stipulari utroque latere caulis cuspidibus duabus interdum denticulis duobus comitatis instructa, floribus ramos ordinarios vel brachyblastos axillares terminantibus, interdum in furcis ramorum insertis vel axillaribus casu quo plerumque subspicatis et minime spicae parte inferiore bracteolis foliaceis instructis, corolla alba, intus glabra. — Species adhuc notae 6 deserticolae in Africa Orientali Cisaequatoriali endemicae.

1. **Conostomium brevirostrum** Brem. n. spec. a speciebus aliis subgeneris *Beckiae* ramis subteretibus fere totis cortice albido desquamante vestitis, foliis latioribus, margine vix recurvatis, granulis pollinis 4-poratis, capsula brevius et obtuse rostrata diversa.

Fruticulus ramosissimus circ. 50 cm altus. Rami novelli circ. 0.7 mm diam., glabri, mox cortice albido desquamante vestiti et usque ad 3 mm incrassati, subteretes, internodiis 1.5—4.5 cm longis. Folia linearia vel lineari-lanceolata, ramorum principalium 1.5—3 cm longa et 3—6 mm lata, brachyblastorum paulo minora, omnia margine vix conspicue revoluta scabrida, ceterum subglabra. Vagina stipularis circ. 2.5 mm alta, ultimo inter folia disrupta et laminis dejectis squamarum oppositarum instar remanens. Flores e brachyblastis orientes, terminales et axillares, subsessiles. Ovarium glabrum. Calycis lobi 3 mm longi, vix carinati, margine vix notabile scabriduli. Corolla extus glabra, tubo 3.5 cm longo, lobis 8 mm longis et 4.5 mm latis. Antherae 2 mm longae, apice conduplicatae, normaliter orem tubi non attingentes, in floribus stylo incluso munitis apicibus exsertis. Granula pollinis 4-pora, 24—25 μ diam. (Tab. XI, fig. q). Stylus normaliter tubo paulo longior, interdum inclusus et stigmatibus 2.5 mm longis circ. 12 mm infra antheras remanens. Capsula rostro obtuso vix 1 mm longo incluso 5 mm alta, 4 mm diam., glabra.

Habitat Somaliam.

Somaliland: between Doloun and Batta, Ruspoli & Riva 1094, type (F); Baidoan, Paoli & Stefanini 1247; between Usciacca Garan and El Uri, id. 1037 (short-styled).

This species is easily distinguishable from its allies by its subterete branches, which are almost entirely covered with a whitish cork layer, by the comparatively wide and flat leaves, and by the fairly large capsules with their broad and short, obtuse beak.

One of the three specimens proved to be short-styled. The question of the status to be assigned to such short-styled specimens has already been discussed; see also below under *C. longitubum* (Beck) Cuf.

2. **Conostomium longitubum** (Beck) Cuf. in Nuovo Giorn. Bot. Ital. **55,** 85, 1948; *Oldenlandia longituba* Beck in Paulitschke, Harrar, Leipzig 1888, 461, fig. 2; — *O. rotata* Baker in Kew Bull. 1895, 216; Engler in Drude, Vegetation der Erde IX, **1,** 183, fig. 160, 1910; *Conostomium rotatum* (Baker) Cuf. l.c.; — *O. fasciculata* Hiern in Journ. of Bot. **37,** 59, 1899; *Conostomium fasciculatum* (Hiern) Cuf. l.c., quoad typum, quoad specimina citata, cf. *C. kenyense* Brem. var. *subglabrum* Brem.; — *O. rhynchotheca* K. Sch. in Bot. Jahrb. **33,** 334, 1903; *Conostomium rhynchothecum* (K. Sch.) Cuf. l.c.

Fruticulus basi ramosus, 10—25 cm altus, ramis plerumque simplicibus. Rami quadricostati, glabri, novelli 1 mm diam., internodiis 0.5—2 cm longis. Folia anguste linearia, ramorum principalium 1.5—3 cm longa et 1—2 mm lata, brachyblastorum semper minora, omnia scabrida, margine revoluta. Flores in axillis foliorum ramorum principalium singuli vel rarius in triades dispositi; inferiores interdum pedicello usque ad 1.5 cm longo elati, superiores semper sessiles, subspicati. Flores inferiores bracteolis foliaceis instructi, superiores bracteolis gradatim minoribus, ultimo fere ad nihilum redactis. Ovarium papillosum vel hirtellum. Calycis lobi 2.5—5 mm longi, subglabri vel hirtelli. Corolla extus glabra, tubo 3—4.2 cm longo, lobis 6—8 mm longis et 2—3 mm latis. Antherae 2.7 mm longae, obtusae, plerumque 1.5 mm infra orem tubi remanentes, raro (in floribus brachystylis) apicibus exsertae. Granula pollinis 3-pora, 20—25 μ diam. (Tab. XI, fig. p). Stylus glaber, plerumque tubo paulo longior, interdum tamen in dimidio inferiore tubi inclusum; stigmata 2.7—3.0 mm longa. Capsula rostro acuto 2 mm longo incluso 4.2 mm alta, 2.2 mm diam., glabra vel hirtella.

Habitat Abyssiniam Orientalem et Somaliam.

Abyssinia: Harrar, Hardegger s.n., type (W).

Somaliland: Golis Range, Miss Edith Cole and Mrs Lort Phillips s.n., (types of *O. rotata* Baker); Mnt Wagga, Mrs Lort Phillips s.n. (type of *O. fasciculata* Hiern), Drake-Brockman 214; Hargesia, alt. 1350 m, Gillett 4023; Afard, alt. 1100 m, id. 4461; valley of Las Warwas, Glover & Gilliland 1102; Wadaba, id. 1190; Somali Plateau, Webi, Robecchi-Bricchetti 611; Galla Plateau, Ogadena Lofary, Riva 54 (type of *O. rhynchotheca* K.Sch.); valley of Las Agiz, Migurtini, Puccioni & Stefanini 765, 788.

The type consists of a single, 15 cm long branch. The flowers, of which a single one is still completely undamaged, are exactly like the larger ones observed in the types of *Oldenlandia rotata* Baker; the length of the tube proved to 4 cm and not 4—5 cm as stated by Beck, and the lobes proved to be considerably longer than they are shown in the figure that accompanies Beck's description.

The sheet in the Kew Herbarium which contains duplicates of the types of *O. rotata* Baker, also contains some branches of another specimen. These branches exhibit two peculiarities, viz. long-pedicellate lower flowers and included styles and stigmata; the anthers, moreover, protrude with their tops just beyond the mouth of the tube. The same structure is shown by the specimen collected by Drake-Brockman. Stapf attached a note to the latter, in which he interprets these flowers as brachystylous ones, but as I have already pointed out, this can hardly be right, for in the short-styled flowers of heterostylous species the anthers are always found at the same level as the stigmata of the long-styled flowers, whereas the anthers of the latter occupy the same position as the stigmata of the short-styled flower, and in the case of *C. longitubum* the stigmata of the short-styled flower remain far below the level at which in the other flowers the anthers are inserted, whereas the position of the latter differs but slightly in the two kinds of flowers. I regard the flowers with the short style therefore as teratological. In *C. longitubum* the number of specimens in which this anomaly occurs is far smaller than that of the normal ones. The anomaly has also been observed in one of the three specimens of *C. brevirostrum* Brem. v. supra, and in the type specimens of *C. hispidulum* Brem. and *C. microcarpum* Brem., of which species no other specimens have been collected. In the two other subgenera the phenomenon is unknown.

The differences between this species and the nearly allied *C. hispidulum* Brem. will be given under the latter. They resemble each other in the subspicate arrangement of the flowers, and in this respect they differ from the remaining species of this subgenus.

3. **Conostomium hispidulum** Brem. n. spec. floribus subspicatis *C. longitubo* similior sed ramorum costis hispidulis, vagina stipulari margine hispidula, corollae lobis brevioribus ab eo recedens.

Fruticulus basi ramosus, circ. 25 cm altus, ramis etiam ramosis. Rami quadricostati, costis scabrido-hispiduli, novelli circ. 0.7 mm diam., internodiis 1—2 cm longis. Folia anguste linearia, ramorum principalium 1—1.5 cm longa et 0.5—1 mm lata, brachyblastorum paulo minora, omnia scabrido-hispidula, margine valde revoluta. Vagina stipularis margine scabrido-hispidula. Flores aliqui furcis ramorum in triades dispositi, ceteri subspicati; inferiores interdum pedicello glabro usque ad 5 mm longo elati, superiores sessiles. Bracteolae foliaceae, foliis tamen minores. Ovarium hispidum. Calycis lobi 3 mm longi, margine et costa scabrido-hirtelli. Corolla extus ad faucem sparse scabrido-hirtella, lobis apice etiam hirtellis, tubo 2.7 cm longo, lobis 3.2 mm longis et 1.5 mm latis. Antherae 2.5 mm longae, obtusae, in specimine solo noto apicibus exsertae. Granula pollinis 3-pora, 23—25 μ diam. Stylus in specimine solo noto inclusus, stigmatibus 2 mm longis 2.5 mm infra antheras remanens. Capsula submatura rostro acuto 1.5 mm longo incluso 3.5 mm alta, 2.7 mm diam., hispida.

Habitat Somaliam.

Somaliland: Basin of the Nogal River, between Balli Igole and Bei Dagoi, Puccioni & Stefanini 873, type (F).

Some of the flowers are terminal, and these are distinctly pedicellate and accompanied by two lateral ones. Below the latter the rudiments of another flower are found , and the bracteoles of these flowers too support rudimentary ones. These cymes therefore show some resemblance to the corymbs found in the subgenus *Hochstetteria*.

The length of the style and the position of the anthers agree with the condition found in the short-styled specimens of *C. longitubum* and *C. brevirostrum*.

4. **Conostomium kenyense** Brem. n. spec. subgeneris *Beckiae*, floribus omnibus pedicellatis a speciebus precedentibus recedens et ad *C. camptopodum* Brem. et *C. microcarpum* Brem. accedens, a *C. camptopodo* pedicellis rectis, a *C. microcarpo* foliis longioribus, ramis floriferis simplicibus distinguenda.

Fruticulus circ. 1 m altus, ramosior, ramorum parte florifera tamen semper simplici. Rami primum scabrido-hirtelli, deinde scabriduli vel in var. *subglabro* glabri vel parcissime hirtelli, usque ad 1.5 mm diam., internodiis usque ad 5 cm longis. Folia anguste linearia, ramorum principalium 2—3 cm longa et 1—1.5 mm lata, brachyblastorum paulo minora, omnia margine revoluta, scabrido-hirtella vel in var. *subglabro* glabra vel subglabra. Vagina stipularis utroque latere caulis cuspidibus duabus 1.2 mm longis et interdum dentibus duobus multo brevioribus instructa. Flores aliqui in furcis ramorum inserti, alii in ramis principalibus et interdum in brachyblastis axillares, semper singuli ad nodos, pedicellis patentibus rectis 3—10 mm longis elati. Ovarium hirtellum. Calycis lobi 2 mm longi, hirtelli vel in var. *subglabro* glabri. Corolla extus ad faucem parce et vix notabile pilosa vel in var. *subglabro* tota glabra, tubo 2.0—3.3 cm longo, lobis 8—10 mm longis et 2—2.5 mm latis. Antherae 2—2.5 mm longae, obtusae, apicibus 2.5—3 mm infra orem tubi remanentes. Granula pollinis 3-pora, 25 μ diam. Stylus tubo paulo longior, stigmatibus 3.5—4 mm longis. Capsula acute rostrata, matura nondum nota.

Habitat Kenyam et Abyssiniam Australem.

var. *kenyense*; rami primum scabrido-hirtelli, deinde scabriduli; folia scabrido-hirtella; corolla extus ad faucem parce pilosa.

Kenya: Leroki, alt. 1800 m, Leakey 3466, type (K), Mrs Leakey 8564; valley between Mt Nyiro and Mt Eldonumara, alt. 1000 m, Cockburn s.n.

var. *subglabrum* Brem. n. var. a typo ramis glabris vel subglabris, foliis glabris vel parcissime hirtellis, corolla extus tota glabra recedens; — *C. fasciculatum* (Hiern) Cuf. in Nuovo Giorn. Bot. Ital. **55,** 85, 1948 quoad specimina citata.

Abyssinia: Galla-Sidamo, nr Dande, Corradi 2705, type of variety (F), 2706.

Kenya: Baragoi, alt. 1300 m, Mrs Joy Adamson 16; Mogala Road, ead. 1848.

In all specimens belonging to this species the style is exserted.

The specimens of the variety are smaller in their dimensions than the type, but this may be due to a difference in the habitat.

C. kenyense differs from the preceding as well as from the following species of this subgenus by its larger dimensions, and from the preceding species also by the pedicellate flowers. From *C. camptopodum* it differs by the straight pedicels, and from *C. microcarpum* by the unbranched flowering shoots.

5. **Conostomium camptopodum** Brem. n. spec. subgeneris *Beckiae*, maxime ut *C. kenyense* Brem. sed statura minore, pedicellis basi recurvatis, deinde ascendentibus ab eo recedens.

Fruticulus 20—30 cm altus, ramosior, parte ramorum florifera tamen semper simplici. Rami novelli glabri, vix 1 mm diam., quadricostati, internodiis usque ad 2.5 cm longis. Folia anguste linearia, ramorum principalium 1.5—2.5 cm longa et vix 1 mm lata, brachyblastorum paulo minora, omnia margine revoluta, basin versus ciliata, ceterum glabra. Vagina stipularis utroque latere caulis vix distincte bicuspidata, interdum denticulis duobus accessoriis instructa. Flores aliqui in furcis ramorum inserti, alii in ramis principalibus et interdum in brachyblastis axillares, semper singuli ad nodos, pedicellis basi recurvatis, ceterum curvato-ascendentibus, 2.5—6 mm longis, glabris elati. Ovarium primum papillosum, deinde glabrescens. Calycis lobi 3 mm longi, glabri. Corolla extus glabra, tubo 3.2—3.7 cm longo, lobis 9—10 mm longis et 2—2.5 mm latis. Antherae 2 mm longae, obtusae, apicibus 4 mm infra orem tubi remanentes. Granula pollinis nondum visi. Stylus tubo paulo longior, stigmatibus 3 mm longis. Capsula matura nondum nota.

Habitat Kenyam.

Kenya: Turkana Desert, Wateparin, alt. 600 m, Champion T 136, type (K).

Although ripe fruits have not been observed, there can be no doubt that this species belongs to the group in which the fruit is provided with an acute beak: a rudiment of the latter is seen already in the flower.

C. camptopodum comes very near to *C. kenyense*, but is easily distinguishable by the s-shaped base of the pedicel and by its much smaller size.

6. **Conostomium microcarpum** Brem. n. spec. subgeneris *Beckiae*, a speciebus aliis ramificatione multo uberiore, ramis teneribus, foliis minoribus et praesertim floribus pluribus in furcis ramorum insertis, corollae lobis brevioribus, capsulis parvis distinguenda.

Fruticulus circ. 75 cm altus, ramosissimus, ramorum parte florifera

etiam ramificata. Rami novelli 0.6 mm diam., quadricostati, costis vix notabile scabriduli, ceterum glabri, veteriores cortice brunneo lacerante vestiti, internodiis 0.5—4 cm longis. Folia anguste linearia, ramorum principalium 6—13 mm longa et 0.2—0.5 mm lata, brachyblastorum paulo minora, margine revoluta, supra scabridula, subtus glabra. Vagina stipularis utroque latere caulis bicuspidata. Flores plurimi in furcis ramorum. Pedicelli primum 0.5—1 mm longi, deinde usque ad 3 mm elongati. Ovarium glabrum. Calycis lobi 2.5 mm longi, margine scabriduli. Corolla extus glabra, tubo 3.5 cm longo, lobis 4 mm longis et 1.7 mm latis. Antherae 2.5 mm longae, obtusae. Granula pollinis 3-pora, 23 μ diam. Stylus in specimine solo noto tubo 1.5 cm brevior; stigmata 2 mm longa. Capsula rostro acuto 1 mm longo incluso 2.6 mm longa, 1.8 mm diam., straminea, costis parce scabridula, ceterum glabra.

Habitat Kenyam.

Kenya: Edge of Turkana Desert, on hill slope, Pole Evans & Erens 1558, type (K); Lake Rudolf, Welby s.n.

In this species the flowers are apparently all or nearly all terminal, and this explains why the ramification is almost throughout of the dichasial type. The style is in all the flowers included, but this probably is, as has already been discussed, an anomaly.

C. microcarpum is easily recognizable by its mode of branching and by the small size of the capsules.

Subgenus *Eu-conostomium*; species unica adhuc nota est planta herbacea caule singulo vel caulibus pluribus erectis, foliis ad medium caulem anguste ovato-lanceolatis, penninerviis, vagina stipulari truncata pilis atque colletris marginata, inflorescentia spiciformi, floribus inferioribus tamen foliis normalibus, superioribus foliis gradatim minoribus suffultis, bracteolis minutis vel nullis, corolla alba tubo longissimo, intus ad insertionem staminum piloso; — in Sudania Anglo-Aegyptiaca, Abyssinia, Uganda, Kenya endemica.

7. **Conostomium quadrangulare** (Rendle) Cuf. in Nuovo Giorn. Bot. Ital. **55,** 85, 1948; *Pentas quadrangularis* Rendle in Journ. of Bot. **34,** 127, 1896; *Neurocarpaea quadrangularis* (Rendle) Rendle op. cit. **36,** 29, 1898; — *Oldenlandia megistosiphon* K. Sch. in Bot. Jahrb. **28,** 56, 1900; — *O.* (*Conostomium*) *dolichantha* Stapf in Journ. Linn. Soc. **37,** 518, 1906; id. in Bot. Mag. t. 8165, 1907; — anne *Otomeria? heterophylla* K. Sch. in Bot. Jahrb. **33,** 336, 1903, incertum sed probabile.

Herba perennis, 30—60 cm alta, caule singulo erecto vel caulibus pluribus e radice ascendentibus. Caulis simplex, quadricostatus, glaber, internodiis inferioribus plerumque 4—5 cm longis, aliis gradatim longitudine decrescentibus. Folia inferiora e basi angustata linearia, ad medium caulem anguste ovato-lanceolata, usque ad 6 cm longa et 1.5 cm lata, brachyblastorum angustiora; omnia subcoriacea, sicc. haud conspicue

discolorata, facie superiore basin versus plerumque pilis aliquibus sparsa, subtus glabra, margine haud revoluta, nervis lateralibus paucis, vix conspicuis. Vagina stipularis margine pilosa et colletris aliquibus instructa. Flores subspicati, nunc solitarii in axillis foliorum, nunc duo superpositi, raro aliqui fasciculati; inferiores foliis magnitudine normali, alii foliis magnitudine gradatim diminuendis suffulti. Bracteolae minutae vel nullae; flores laterales fasciculorum interdum bracteolis linearibus instructi. Ovarium 8-costatum, glabrum vel costis ciliatum. Calycis lobi 6—8 mm longi. Corolla extus ad faucem pilis crassis sparsa, tubo 9—13.5 cm longo, ad insertionem staminum piloso, lobis extus viridulis, intus albis vel lilacino suffusis, 10—18 mm longis et 3—5 mm latis. Antherae 5—6 mm longae, apiculatae, apicibus 1—2 mm infra orem tubi remanentes. Granula pollinis 3-pora, 27—31 μ diam. (Tab. XI, fig. o). Stylus breviter exsertus; stigmata 4 mm longa. Capsula 8-costata, rostro acutissimo 2 mm longo incluso 9 mm alta, 5 mm diam., calycis lobis usque ad 11 mm elongatis coronata, glabra.

Habitat Sudaniam Anglo-Aegyptiacam, Abyssiniam Australem, Ugandam, Kenyam.

Anglo-Egyptian Sudan: Bahr el Gebel, Mongalla Province, Rajaf, Sillitoe 421, Mr and Mrs Broun 1451, Douglas Simpson 7807, Lankester s.n.
Southern Abyssinia: Lake Stephanie, Donaldson-Smith, type (NH) n.v.; Galla—Sidamo, El Meti, Corradi 2822, 2823; Gondaraba, River Sagan, id. 2811, 2812; Gondaraba, Amar Cocchoe, id. 2825; between Dande and Marmara, id 2826; Marmara, id 2810; Caschei, id. 2819, 2821, 2824; Murle, id. 2800, 2801, 2802, 2803, 2804, 2813, 2814, 2815, 2816; Asile, id. 2808, 2809; Lake Rudolf nr Coro, id. 2817, 2818; Girma nr Mt Robé, Riva 159 (type of *Otomeria? heterophylla* K. Sch.) n.v.
Uganda: Nile Province, Dawe 945 (type of *Oldenlandia dolichantha* Stapf); Karamojo District, Kotido, alt. 1200 m, Thomas 3682; Karamojo, Johnston 635; East Teso, Dale 173; Serni Teso, alt. 1100 m, Chandler 813; Napyenenga, base of Mt Debasien, Eggeling 2598; Oropoi Valley, Liebenberg 155.
Kenya: Northern Province, Barabai, Lady Muriel Jex-Blake 9144; Kitezi District, Mwingi, Edwards 90; W. Suk, N.W. from Moribus Pass, alt. 600 m, Miss Napier 2067; N.E. Aberdares, alt. 2100 m, Dowson 549; Zingout, alt. 660 m, Champion T. 181; Mt Labur. alt. 1200 m, id. T. 54; s.l. Fisher 234 (type of *O. megistosiphon* K. Sch.) n.v.

Although neither Rendle's type nor that of *O. megistosiphon* K. Sch. were available to me, I have no doubt that they are both conspecific with *O. dolichantha* Stapf. The type of *Otomeria? heterophylla* K. Sch. is also unknown to me. The description reveals some slight differences with the general type of *C. quadrangulare*: it is a somewhat higher plant (90 cm high) with more distinctly nerved leaves and a somewhat denser spike, but these differences seem hardly sufficient to regard it as specifically distinct.

That *C. quadrangulare* was originally referred to the genus *Pentas* Bth. is probably due to the large size of its flowers. The latter, however, are tetramerous, and the calyx lobes are all of the same size. The structure of the inflorescence, moreover, is entirely different, for the flowers are axillary and opposite at the nodes, whereas those of *Pentas* are arranged in a corymbose inflorescence with dichasial or monochasial branchlets. For the same reason it can not belong to *Otomeria*, where the flowers, it is true, are arranged in spikes, but where the spikes are in reality monochasial inflorescences.

Subgenus 3. Hochstetteria Brem.; herbae perennes, erectae, foliis linearibus, lanceolatis vel ovato-lanceolatis, penninerviis, inflorescentia terminali corymbiformi e triadibus composita, flore centrali triadis subsessili, floribus lateralibus pedicellatis; — speciebus adhuc notis 2 in Africa Austro-orientali endemicum.

7. **Conostomium natalense** (Hochst.) Brem. n. comb.; *Hedyotis natalensis* Hochst. in Flora **27**, 552, 1844; Sonder in Fl. Cap. **3**, 12, 1865; *Oldenlandia natalensis* (Hochst.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891; E. P. Phillips in Flow. Pl. S. Afr. **10**, t. 364, 1930; — *Crusea? acuminata* E. Mey. ex Drège in Flora **26**, Suppl. 176, 1843, nomen; — *Oldenlandia pentasoides* Gillil. in sched. herb. Kew.

Herba e basi ramosa, 15—75 cm alta. Caulis ramique in var. *natalensi* primum pubescentes, in var. *glabro* et var. *ovalifolio* ad nodos solum pilosi, in var. *tomentello* tomentelli, basi lignescentes, internodiis 1—3.5 cm longis. Folia plerumque anguste ovato-lanceolata, 3.5—6 cm longa et 0.9—1.6 cm lata, in var. *ovalifolia* usque ad 2 cm lata, basin versus semper rotundata sed ad insertionem subito contracta, in var. *natalensi* supra scabrida, subtus ubique sparse, costa densius pubescentia, in var. *glabro* et var. *ovalifolio* facie inferiore costae sola sparse pilosa, in var. *tomentello* utrimque tomentella, nervis utroque latere costae 4—7, vix conspicuis. Vagina stipularis cuspidibus duabus 0.5—1.0 mm longis instructa. Corymbi ramuli basales foliis magnitudine paulo redactis, alii bracteis filiformibus brevissimis suffulti; pedicelli florum lateralium breves, post anthesin tamen usque ad 2 mm elongati. Ovarium in var. *natalensi* sparse pubescens, in var. *glabro* et var. *ovalifolio* glabrum, in var. *tomentello* sparse hirtellum. Calycis lobi 2—5 mm longi, circ. 1 mm lati, in var. *ovalifolio* tamen usque ad 1.5 mm lati, margine ciliati, fructu haud raro usque ad 5 mm elongati. Corolla caerulea, violacea, lilacina, lactea vel alba, extus in var. *natalensi* et var. *tomentello* hirtella, in var. *glabro* et var. *ovalifolio* glabra, intus semper glabra, tubo 10—15 mm longo, lobis 2.5—4.5 mm longis et 1.4—1.9 mm latis. Antherae 1.8 mm longae, obtusae, apicibus 0.5 mm infra orem tubi remanentes. Granula pollinis 3-pora, 21 μ diam. (Tab. XI, fig. r). Stylus breviter exsertus; stigmata 1.8 mm longa. Capsula rostro 1.5 mm longo incluso 5.5 mm alta, 4.5 mm diam.

Habitat Africam Austro-occidentalem.

var. *natalense*; — var. *hirsuta* J. Bär in Vierteljahrsschr. Naturf. Gesellsch. Zürich **68**, 430, 1923; caulis ramique primum pubescentes; folia supra scabrida, subtus ubique sparse, costa densius pubescentia; ovarium sparse pubescens; corolla extus sparse hirtella.
Cape Province: Kentani, Miss Pegler 413; Lusikisiki, Acocks 13418, Galpin 10995.
Natal: District Alexandra, Dumisa, Rudatis 869; Durban, Rehmann 8818, Krauss 86, type (K), Sutherland s.n.; Paddock, Murchison Flats nr Oribi George, McClean 315; Isiguingo, Schlechter 2994 (type of *O. natalensis* var. *hirsuta* J. Bär) n.v.
Transvaal: Machadodorp, Pole Evans 16954; Belfast, Galpin 13273.

var. *glabrum* Brem. n. var.; — caulis ramique ad nodos sparse pilosi, ceterum glabri vel pilis perpaucis sparsi; folia supra glabra, subtus costa solum sparse pilosa, margine scabridula; ovarium glabrum.
Cape Province: District East London, Nahoon River, Smith 3733; Panmure coast of Caffraria, Mrs Hutton s.n.; Griqualand East, nr Clydesdale, Tyson 872; between Ibisi and Rietvlei, id. 1199; Umzinkulu, id. 2108; Komgha, Flanagan 504; Port St Johns, Howlett 29.
Natal: District Drummond, Botha's Hill, McClean 114; District Alexandra, Dumisa, Rudatis 268; Durban, Miss Lansdell & Miss Forbes 8304 (figured in Flow. Pl. S. Afr. **10**, t. 364, 1930), type of variety (PRE), Drège (*Crusea ? acuminata*), Wood 263, O. Kuntze s.n. (f. *lilacina* O. Ktze); Pinetown, Umkomaas, van O. Bruyn 209; Howick, Junod 90; Kranskloof, O. Kuntze (f. *albiflora* O. Ktze); Weenen, Acocks 11356; Eastcourt, Cathkin Peak, Galpin 11736, West 162, Howlett 60; Bergville, Mt aux Sources, Hutchinson, Miss Forbes & Miss Verdoorn 148; Olivershoek, Repton 1021; Inanda, Wood 91; Rabanango, King 217; Zululand, Wudeni, Fisher 890; s.l. Cooper 1083, Gerrard 536.
Swaziland: Mbabane, Rogers 11486; Hlalikulu, alt. 1200 m, Stewart 62.
Transvaal: Barberton, Repton 902, Galpin 768, Hutchinson 2435; Kaapsche Hoop, alt. 1000 m, Gilmore 2317, Rogers 21262; Pelgrimsrust, id. 14612; Graskop, Galpin 14736; Lijdenburg, id. 13626; Sterkspruit, Wilms 583; Waterval Boven, Rogers 14442; Houtbosch, Rehmann 5997; Zoutpansberg, The Downs, Junod 4263; Entabeni, Hutchinson & Gillett 4197, Codd 4204; Punda Maria, id. 5336 (leaves very narrow and corolla tube rather long; perhaps a distinct species); Louis Trichardt, Rogers 21157; Marovunge, Junod 2488.
Southern Rhodesia: Gazaland, Chirinda, Swynnerton 303; Umtali, Dep. Agr. S. Rhod. 1148 ("*O. pentasoides* Gillil."); Distr. Vumba, Norseland, alt. 1250 m, Wild 2842; Distr. Inyanga, Troutbeck, alt. 1200 m, Rattray 1446.
Port. East Africa: Matusi, Johnson 156.

var. *tomentellum* Brem. n. var.; caulis ramique tomentelli; folia utrimque tomentella; ovarium sparse hirtellum; corolla extus hirtella.
Natal: Durban, Drège s.n. "*Crusea*? *acuminata* E. Mey. b", type of

variety (G). The specimens that bear this name in the Kew and Vienna herbaria, belong to the var. *natalense*.

var. *ovalifolium* Brem. n. var.; folia usque ad 2 cm lata; calycis lobi usque ad 2.5 mm lata; characteris aliis cum var. *glabro* congruens. Transvaal: Zoutpansberg, Selasa, north of Pepiti, Smuts & Gillett 3267, type of variety (PRE).

The species of the subgenus *Hochstetteria* differ from the other *Conostomium* species in the corymbiform inflorescence, and *C. natalense* differs from *C. zoutpansbergense*, which is so far the only other species of this subgenus, in the greater width of the leaves, the shorter pedicels and the shorter corolla tube.

C. natalense is a rather variable species. Apart from the four varieties described above there are other ones which differ in the colour of the corolla, but as the latter is in dried material no longer recognizable, these varieties have here been neglected. The various forms apparently grow together and occasionally plants collected under the same number prove to belong to different varieties. The difference in the character of the indumentum on account of which the var. *glabrum* was separated from the typical form, is itself somewhat variable, which may mean that this variety is in reality a mixture of a larger number of genotypically different forms. The var. *tomentellum* is known in one specimen only, and as the latter was collected in a region that has been thoroughly explored, this means that it must be very rare. The var. *ovalifolium* too is known in a single specimen only, but as this specimen was collected in a part of the country that is but rarely visited, this does not mean much.

9. **Conostomium zoutpansbergense** (Brem.) Brem. n. comb.; *Oldenlandia zoutpansbergensis* Brem. in Ann. Transv. Mus. **15**, 256, 1933.

Herba plesiocaulis, circ. 50 cm alta. Caulis ramique ad nodos et in costis scabrido-papillosi, ceterum glabri, basi lignescentes et cortice griseo vestiti, internodiis 2—4 cm longis. Folia linearia, 1.5—4.5 cm longa et 2—5 mm lata, brachyblastorum axillarium angustiora, omnia basi cuneata, nervis lateralibus vix conspicuis. Vagina stipularis extus scabrido-papillosa. Corymbi laxi, ramulis pedicellisque glabris; ramuli foliis minoribus et praesertim angustioribus suffulti; flores laterales triadum pedicellis 3—7 mm longis elati. Ovarium glabrum. Calycis lobi 3.5 mm longi, margine basin versus scabrido-ciliati. Corolla caerulea vel alba, tubo 2.6—3 cm longo, extus glabro, intus fauce pubescente, lobis 6—7 mm longis et 1.5—1.8 mm latis. Antherae in specimine solo florifero 1 mm longae, steriles, apicibus 2.7 mm infra orem tubi remanentes. Stylus papillis conicis obtectus, breviter exsertus; stigmata 2 mm longa. Capsula glabra, rostro 2 mm longo incluso 6 mm alta.

Habitat Africam Austro-Orientalem.

Transvaal: Zoutpansberg, Njelele Valley, Bremekamp & Schweickerdt 320, type (TRV, dupl. K), with blue flowers.
Port. East Africa: Mangalane, alt. 80 m, Sousa 564, "fleurs blanches"; this is a fruiting specimen; the flowers were not seen by me. The description of the capsule is based on this specimen.

8. PENTANOPSIS RENDLE

Pentanopsis Rendle in Journ. of Bot. **36**, 28, 1898, genus *Hedyotidearum* adhuc monotypicum habitu *Conostomio* Cuf. subgeneri *Beckiae* Brem. similior, sed vagina stipulari utroque latere caulis in lobum triangularem margine fimbriatum producta, corollae lobis alabastro basin versus induplicatis, intus pilis clavatis dense vestitis, granulis pollinis colporatis, capsula intra calycem non distincte rostrata, seminibus applanatis, pariete interna cellularum testae haud punctata ab eo recedens.
Specie singula in Somalia endemicum.

Pentanopsis fragrans Rendle op. cit. 29.
Fruticulus ramosissimus. Caulis ramique primigenii crassiusculi, rami alii tenuiores, omnes fere toti cortice cinereo, mox lacerante vestiti, internodiis 1—2 cm longis, ex axillis foliorum deciduorum brachyblastos emittentes. Folia opposita, sessilia, linearia, 1.2—2.0 cm longa et 1—3 mm lata, mucronata, margine revoluta, ubique sed praesertim ad marginem pilis conicis scabrida, 1-nervia. Vagina stipularis utroque latere caulis in lobum triangularem usque ad 2.5 mm longum, margine fimbriatum producta. Flores 4-meri, singuli vel in triades dispositi, brachyblastos terminantes; brachyblastus florifer basi reliquiis foliorum induratis obtectus; flores laterales triadum bracteis foliaceis usque ad 1 cm longis suffulti. Pedicelli usque ad 1 cm longi. Bracteolae nullae. Ovarium sparse scabridum 2-loculare; placenta peltata stipite brevi e parte basali dissepimenti oriens; ovula numerosa placenta peltatim affixa. Calyx fere ad basin partitus; lobi lineares 5—6 mm longi, margine scabridi. Corolla hypocrateriformis, alba roseo-suffusa, fragrans, extus glabra, tubo 2.5—3 cm longo, ad insertionem staminum paulum dilatato, intus sparse piloso, lobis alabastro basin versus induplicatis 10—15 mm longis et 5—8 mm latis, acutis, supra pilis clavatis brevibus dense vestitis. Antherae dimidio inferiore dorsi affixae, subsessiles, in flore dolichostylo dimidio superiore tubi, flore brachystylo ad apicem tubi insertae, sed apicibus solis exsertae, lineares, 2.5—3.0 mm longae, utroque extremo obtusae. Granula pollinis ellipsoidea, 32 μ alta et 25 μ diam., 4-colporata (Tab. XI, fig. n). Discus tumidus. Stylus glaber; stigmata linearia, applanata, praesertim ad marginem papillosa, 4—5 mm longa, in flore dolichostylo exserta, in flore brachystylo ad medium tubum inclusa. Capsula obovoidea, 5 mm alta et 4 mm diam., intra calycem breviter producta et ibi rima loculicida dehiscens, straminea, subglabra. Semina applanata, centro affixa,

brunnea; cellulae testae parietibus rectis instructa, pariete interna haud punctata (Tab. VII, fig. 1).

Habitat Somaliam.

Somaliland: Wagga Mnt, Mrs Lort Phillips, type (BM) n.v.; 10°14′ × 48°47′, Colenette 77 (vern. name: jajabod i.e. fragile; grased and stunted by animals), f. dolichostyla; Golis Range, Drake–Brockman 323, f. brachystyla; 10°20′ × 45°5′, Gillett 4774, f. dolichostyla.

Whether the dimorphism of this plant is comparable to that known as heterostylism, or whether it is of the same kind as that found in some of the *Conostomium* species (v. supra), is difficult to decide. Here too, at any rate, the stigmata of the dolichostylous form are farther exserted than the anthers of the brachystylous form, and the latter's stigmata are more deeply hidden in the corolla tube than the anthers of the dolichostylous form. The differences, however, are not so marked as in the *Conostomium* species of which two different forms are known.

The most noteworthy features of this genus are the dense felt of clavate hairs by which the corolla lobes are covered, the induplicate aestivation of these lobes, the 4-colporate pollen grains, and the smooth internal wall of the testa cells.

9. **EXALLAGE** Brem. n. gen.

Exallage Brem. n. gen.; *Metabolos* Bl., Bijdr. Fl. Ned. Ind. 990, 1826, *M. rugoso* Bl. excluso; DC, Prodr. **4**, 435, 1830, *M. rugoso* Bl. et *M. ferrugineo* Bartlett ex DC exclusis; Zoll. et Mor., Syst. Verz. 63, 1846; Brem. in Rec. d. trav. bot. Néerl. **36**, 439, 1939; non Hochreutiner in Candollea **5**. 277, 1934 (*M. rugosus* Bl.); — *Sclerococcus* Bartl., Ord. 210, 1830, p.p.; — *Hedyotis* L, Sp. Pl. ed. 1, 101, 1753, quoad *H. auriculariam* L; *Hedyotis* L sect. *Eu-hedyotis* W. et A., Prodr. Fl. Ind. 411, 1834; Hooker in Bentham & Hooker, Genera Plantarum **2**, 151, 1873, quoad series a et c; *Oldenlandia* L sect. *Hedyotis* (L) K. Sch. in Engler & Prantl, Naturl. Pflanzenfam. IV, **4**, 25, 1891, *O. pinifolia* (Wall.) K. Sch. excepta.

Genus *Hedyotidearum* inflorescentiis axillaribus et praesertim fructibus parvis indehiscentibus pyrenas duas continentibus a generibus affinibus distinguendum.

Speciebus pluribus in Asia Tropicali endemicum; species singula in Africa Tropicali reperta probabiliter ex Asia introducta.

Species typica *Exallage auricularia* (L) Brem. n. comb. (*Hedyotis* L; syn. *Metabolos venosus* Bl.).

A full description of this genus is omitted, because it would be premature. It would require a study of the numerous Asiatic species, and this seems for the moment superfluous.

The introduction of the name *Exallage* requires some explanation.

It has been argued that *Hedyotis auricularia* L is to be regarded as the

type of the genus *Hedyotis* L, and if this were right, the name *Exallage* would, of course, be superfluous. Although it can not be denied that this species has already at a very early date been proposed as the generic type, there can, as I have already explained in the General Part of this work, be no doubt that this was a mistake. Priority is to be taken into consideration in questions of this kind when there is freedom of choice, but as *H. auricularia* L does not answer the generic description given by Linné, it does not belong to the species between which the choice had to be made. As I have pointed out at an earlier occasion, it should have fallen on *H. fruticosa* L.

As *Hedyotis auricularia* L is to be transferred to another genus, and as it is conspecific with *Metabolos venosus* Bl.. it would be plausible to refer it to Blume's genus. However, Hochreutiner (in Candollea **5**, 277, 1934) has indicated as type of this genus *M. rugosus* Bl., a species which, as Boerlage already had recognized, is conspecific with *Allaeophania decipiens* Thw. Hochreutiner was of opinion that the other species of *Metabolos* were to be referred to *Hedyotis* L, and that the name *Metabolos* therefore might be retained for this one. As Blume's generic description is drawn up in such a way that it comprises this species as well as the other ones, Hochreutiner's choice must be regarded as legitimate. It might perhaps be objected that a choice had already been made by Boerlage when he transferred *M. rugosus* to *Allaeophania* Thw., because this apparently meant that he regarded the other *Metabolos* species as the true representatives of the genus, and one of them therefore as the latter's type. The other possibility, viz. that he regarded the name *Metabolos* as a "nomen confusum", need not be seriously considered, because it has never been customary to discard generic names for this reason. At any rate, as Boerlage does not mention a type species by name, there has been no choice in the sense of the "Rules of Nomenclature", and Hochreutiner's choice will have to be accepted. It is clear therefore that *Hedyotis auricularia* L and its allies will have to obtain another generic name. This might perhaps be found in *Sclerococcus* Bartl., but as the species belonging to this genus are known only from the synonymy of the *Metabolos* species enumerated by De Candolle in the "Prodromus", it can hardly be regarded as validly published. Moreover, as one of the species is conspecific with *Xanthophytum fruticulosum* Reinw. ex Bl., it is perhaps best regarded as a synonym of *Xanthophytum.* In this way the reinstatement of this badly defined and now entirely forgotten generic name may be obviated. An entirely new name that can not be misunderstood, seems indicated, and for this reason I have coined *Exallage*, which, as I have explained in the "General Part" of this work, has the same meaning as *Metabolos.*

The following list may give some idea of the number of species that are referred by me to this genus. It is preliminary only, and lays no claim to completeness.

List of **Exallage** Species

1. **angustifolia** (Bartl. ex DC) Brem. (*Metabolos* Bartl. ex DC)
2. ***auricularia** (L) Brem. (*Hedyotis* L; syn.: *Metabolos venosus* Bl.)
3. **barbata** (Korth.) Brem. (*Hedyotis* Korth.)
4. **buruensis** (Miq.) Brem. (*Hedyotis* Miq.)
5. **ciliicaulis** (Miq.) Brem. (*Hedyotis* Miq.)
6. **congesta** (R. Br. ex G. Don) Brem. (*Hedyotis* R. Br. ex G. Don)
7. **costata** (Roxb.) Brem. (*Spermacoce* Roxb.; syn.: *Hedyotis vestita* R. Br. ex G. Don; *Metabolos coeruleus* Bl.; *Hedyotis capituliflora* Miq.)
8. **glabra** (Roxb.) Brem. (*Spermacoce* Roxb.)
9. **Havilandii** (King) Brem. (*Hedyotis* King)
10. **Kunstleri** (King) Brem. (*Hedyotis* King)
11. **latifolia** (Bl.) Brem. (*Metabolos* Bl.; syn.: *Oldenlandia Reinwardtii* Backer et forsitan *Hedyotis macrophylla* Wall. ex W. et A. non DC)
12. **lineata** (Bartl. ex DC) Brem. (*Metabolos* Bartl. ex DC)
13. **macrophylla** (Zoll. et Mor.) Brem. (*Metabolos* Zoll. et Mor.; syn.: *Hedyotis jodoneura* Miq.)
14. **microcephala** (Pierre ex Pitard) Brem. (*Oldenlandia* Pierre ex Pitard)
15. **pachycarpa** (Ridl.) Brem. (*Hedyotis* Ridl.)
16. **paradoxa** (Kurz) Brem. (*Hedyotis* Kurz)
17. **parietarioides** (Miq.) Brem. (*Hedyotis* Miq.)
18. **perhispida** (Elm.) Brem. (*Hedyotis* Elm.)
19. **philippinensis** (Willd.) Brem. (*Spermacoce* Willd.; syn.: *Metabolos prostratus* Bl.; *M. laevigatus* Bartl. ex DC)
20. **pressa** (Pitard) Brem. (*Oldenlandia* Pitard)
21. **pubescens** (Val.) Brem. (*Hedyotis* Val.)
22. **radicans** (Bartl. ex DC) Brem. (*Metabolos* Bartl ex DC)
23. **rigida** (Bl.) Brem. (*Metabolos* Bl.; syn.: *Hedyotis carnosa* Korth.; *H. leucocarpa* Elm.)
24. **ulmifolia** (Wall.) Brem. (*Hedyotis* Wall.; syn.: *H. lineata* Roxb.).

Not all the species quoted in this list have been seen by me, and it is possible therefore that a few of them will have to be sunk in other ones, but a few more will certainly have to be added, especially from more recent literature.

Exallage auricularia (L) Brem. n. comb.; *Hedyotis auricularia* L, Sp. Pl. ed. 1. 101, 1753; — *Oldenlandia leopoldvillensis* de Wild., Pl. Bequaert. **5**, 427, 1932.

Herba subscandens, circ. 50 cm alta, ramosior. Caulis ramique subteretes, usque ad 2.5 mm diam., internodiis 2—7 cm longis, bisulcatis, sulcis pubescentibus. Folia opposita, petiolo interdum usque ad 0.5 mm longo instructa; lamina ovato-lanceolata, 1.5—3.2 cm longa et 0.5—1.2 cm lata, apice acuta, basi rotundata, margine vix conspicue revoluta, sicc. vix conspicue discolorata, costa canaliculata sparse et brevissime pilosa, margine et interdum facie costae inferiore scabridula, ceterum

glabra, nervis utroque latere costae plerumque 3. Vagina stipularis hyalina, circ. 1.5 mm alta, utroque latere caulis in aristam pilosam usque ad 5 mm longam producta. Flores in glomerulos axillares subsessiles vel interdum pedunculo hirtello usque ad 10 mm longo elatos dispositi, tetrameri, isostyli. Ovarium hirtellum. Calycis lobi anguste oblongi, 1—1.5 mm longi, margine et costa ciliolati. Corolla alba extus glabra, tubo 0.3—0.8 mm longo, ad costas e lobis decurrentes barbato, lobis supra minute papillosis 1.4—1.5 mm longis. Stamina ad incisuras corollae inserta; filamenta glabra, 0.4—0.5 mm longa; antherae dorsifixae, ovoideae, 0.4—0.5 mm longae. Granula pollinis depresse globosa, 3-porata, 20—22 μ alta et 22—24 μ diam. (Tab. XI, fig. s). Discus annularis. Stylus dense hirtellus 1.5 mm longus; stigmata 2 crassiora 0.3—0.5 mm longa. Drupa subglobosa 1.5 mm diam., calycis lobis usque ad 1.3 mm elongatis coronata, alba, hirtella. Semina angulata, alveolata; cellulae testae satis magnae, parietibus rectis instructae, nec punctatae nec granulatae (Tab. VII, fig. m).

Habitat Asiam Tropicalem. In ditione Congensi probabiliter introducta. Belgian Congo: Leopoldville, Bequaert 7544 (type of *Oldenlandia leopoldvillensis* de Wild.), "steppe boisée"; nr Coquilhatville, Wendje, Lebrun 753, "secondary forest"; Eala, Leonard 825, Couteaux 331, "secondary forest."

Exallage auricularia is a weed, and it has therefore a better chance to be transported to new areas than plants belonging to other vegetation types. In the Congo it has so far been found only in the neighbourhood of some of the more important European settlements, and may have been introduced with the seeds of garden plants.

10. **STEPHANOCOCCUS** Brem. n. gen.

Stephanococcus Brem. n. gen. *Hedyotidearum*, caule volubili, foliis petiolatis, lamina satis magna ovato-lanceolata penninervia, vagina stipulari ad lineam elevatam interpetiolarem redacta, inflorescentiis cymoso-congestis axillaribus, floribus tetrameris heterostylis parvis, corollae lobis intus pilis crassioribus villosis, fructu dicocco, coccis ultimo apice dehiscentibus, seminibus dorsiventraliter complanatis, angustissime marginatis, facie superiore minutissime echinulatis, madefactis non glutinosis, a generibus aliis distinguendum.

Genus adhuc monotypicum in parte occidentali Africae Centralis endemicum.

Species unica: *Stephanococcus crepinianus* (K. Sch.) Brem. (*Oldenlandia* K.Sch).

Stephanococcus crepinianus (K. Sch.) Brem. n. comb.; *Oldenlandia crepiniana* K. Sch. in Bot. Jahrb. **28**, 55, 1900.

Herba helictice (sinistrorsum sensu Eichleri) volubilis, 0.5—4 m alta. Caulis primum quadricostatus, costis pilis brevissimis retrorsis vix notabile

scabridulus, circ. 1 mm diam., internodiis plerumque 3—5 cm, interdum usque ad 11 cm longis. Folia in petiolum canaliculatum, sulco et margine breviter pubescentem, 2—5 mm longum contracta; lamina anguste ovato-lanceolata, 2.5—6 cm longa et 0.7—2.5 cm lata, plerumque circ. 4 cm longa et 1 cm lata, apicem versus sensim attenuata, tenuis, sicc. nigrescens, supra costa canaliculata puberula, ceterum utrimque glabra, nervis utroque latere costae 3—4 vix conspicuis. Vagina stipularis ad lineam elevatam interpetiolarem pubescentem redacta. Inflorescentiae axillares cymosae, floribus congestis; bracteae bracteolaeque inconspicuae. Pedicelli vix 1 mm longi, glabri. Flores tetrameri, heterostyli. Ovarium glabrum vel subglabrum, 2-loculare; placenta peltata stipite brevi ad medium septum affixa; ovula pauciora, dorsiventraliter complanati. Calyx fere ad basin in lobos late triangulares, 0.5 mm longos partitus. Corolla alba vel viridula, extus glabra, tubo infundibuliformi 1.0—1.3 mm longo, intus glabro, lobis tubo subaequilongis, intus pilis crassioribus villosis. Stamina ad incisuras corollae inserta, filamentis in flore brachystylo longioribus, in flore dolichostylo brevioribus, antheris dorsifixis utroque extremo obtusis, 0.6 mm longis. Granula pollinis ellipsoidea, 20 μ alta et 16 μ diam., 3-colporata (Tab. XI, fig. t). Discus pulviniformis, papillosus. Stylus glaber in stigmata 2 stylo crassiora, haud patentia exeuns, in flore dolichostylo longius exsertus quam in flore brachystylo. Fructus dicoccus, 1.8 mm altus, 2.2 mm latus, 1.8 mm crassus, calycis lobis patentibus coronatus, coccis ultimo apice dehiscentibus. Semina subnigra, dorsiventraliter complanata, angustissime marginata, madefacta non glutinosa; cellulae testae facies superioris echinulo ornatae, parietibus nec punctatis nec granulatis, tenuibus, rectis. (Tab. VII, fig. n).

Habitat partem occidentalem Africae Centralis.

Cameroons: Bitye, River Ja, Bates 1561.

Belgian Congo: between Kisantu and Dembo, Gillett 1540; Lulanga, Laurent 1.1. 04; Ikengo sur Congo, Lebrun 771; Coquilhatville, Laurent 26.2.96, type (B), Schlechter 12622, Pynaert 289; Bikoro-Coquilhatville, Km 27, Germain 1958; Bangala, Hens C 111; Eala, Corbesier 1732, Laurent 831, 840, Pynaert 832, Staner 1470, 1597, Louis 2037, Lebrun 965; Yangambi, Louis 8440, 8806; Banalia, Bequaert 1399; Urega (Maniéma), alt. 1290 m, Lebrun 5606.

The name of this new genus has been derived from the small subglobose fruits that surround the nodes in the form of wreaths.

To indicate the direction in which the stem winds I have used above the term "helictice" instead of the usual "sinistrorsum", which without the addition "sensu ....." always remains ambiguous. The terms "helictic" and "antihelictic" (i.e. in the direction or opposite to the direction of the cork skrew) were introduced by me in "Verh. Ned. Akad. v. Wetensch. sect. 2, **41**, 24, 1944".

Stephanococcus occupies a more or less isolated position in this group

of genera. The faculty to wind recurs among the African *Hedyotideae* in *Sacosperma* G. Tayl. and in *Danais* Commerç. ex Vent., but these genera, which have their flowers in large terminal panicles, can certainly not be regarded as very near allies. Among the Asiatic genera this faculty is found in *Dimetia* Meisn. (*Hedyotis* L sect. *Dimetia* W. et A.), and this genus resembles *Stephanococcus* also in the axillary position of the inflorescences, but it differs from the latter in the subsessile leaves, the structure of the stipular sheath, the mode of dehiscence of the fruits, and in the distinctly winged seeds. Axillary inflorescences return in part of the *Hedyotis* species (*Hedyotis* L sect. *Diplophragma* W. et A.), but the affinity between this genus and *Stephanococcus* is certainly not closer than that between the latter and *Dimetia*. Among the African genera axillary flower clusters are found in the two species of *Manostachya* Brem. v. infra, where they consist of a very small number of flowers, and towards the top of the shoots even of a single flower. *Manostachya*, however, resembles *Stephanococcus* in the structure of the stipular sheath and in the flattened seeds, although it should not be overlooked that the latter are not marginate, and that the structure of the testa cells is entirely different. The habit of the *Manostachya* species is quite different from that of *Stephanococcus*, and their fruits are capsular.

11. MANOSTACHYA Brem. n. gen.

Manostachya Brem. n. gen. *Hedyotidearum*, a generibus aliis capsula intra calycem loculicida instructis floribus bracteolatis parvis tetrameris heterostylis, singulis vel paucis in axillis foliorum insertis, superioribus subspicatis, seminibus dorsiventraliter applanatis, madefactis non glutinosis, testae cellularum pariete externa crassa et reticulata distinguendum.

Herbae. Folia opposita, sessilia, parva et angusta, superiora gradatim in bracteas mergentia. Vagina stipularis truncata, interdum breviter et sparse ciliata. Flores sessiles vel breviter pedicellati, bracteolati, inferiores haud raro in triadibus vel fasciculis in axillis foliorum magnitudine normalium inserti vel ramos laterales gradatim ad brachyblastos redacto, terminantes, superiores foliis gradatim minoribus suffulti, subspicatis omnes tetrameri et heterostyli. Ovarium biloculare; placenta peltata ad medium septum affixa; ovula haud numerosa, in placentam immersa. Calyx ad basin partitus. Corolla alba, lobis tubo subaequilongis vel eo paulo longioribus. Stamina paulo infra incisuras corollae inserta; filamenta glabra, in flore dolichostylo sub antheras latentia; antherae dorsifixae, utroque extremo obtusae. Granula pollinis ellipsoidea, satis magna, 3- vel 4-colporata (cf. Tab. XII, fig. a et b). Stylus glaber, in flore dolichostylo exsertus, in flore brachystylo inclusus; stigmata dua, nunc ovoidea, nunc filiformia. Capsula subglobosa, nunc intra calycem distincte, nunc vix producta, intra calycem rima loculicida dehiscens. Semina pauca, brunnea, dorsiventraliter applanata, ambitu oblonga, madefacta non glutinosa;

cellulae testae parietibus rectis instructae, pariete externa crassa, reticulata (Tab. VIII, fig. a).

Speciebus duabus adhuc notis in Angola, parte occidentali Rhodesiae Septemtrionalis, parte australi ditionis Congensis endemicum.

Species typica: *M. staelioides* (K. Sch.) Brem. (*Oldenlandia* K. Sch.).

Manostachya too is a rather isolated genus. Subspicate flowers are found also in *Conostomium* Cuf., viz. in the subgenus *Eu-conostomium* and in some of the species of the subgenus *Beckia*, and in *Thecorchus*, but apart from the arrangement of the flowers there is hardly any point of resemblance between these plants and *Manostachya*. A very remarkable feature of the latter are the thick outer walls of the testa cells with their network of ridges on the inside, for such walls are found nowhere else. Noteworthy too is the rather large size of the pollen grains.

Key to the Species.

1. Shoots 20—45 cm high, simple or pseudo-dichotomously branched. Leaves linear-subulate, 2—6 mm long. Stipular sheath glabrous. Calyx lobes 0.4 mm long. Corolla tube glabrous, lobes densely hairy. Pollen grains 4-colporate. Capsule with its upper half above the insertion of the calyx . . . . . 1. *M. staelioides*

1: Shoots 7—25 cm high, branched from the base. Leaves narrowly linear, 7—13 mm long. Stipular sheath shortly and sparsely ciliate. Calyx lobes 1.2 mm long. Corolla tube bearded, lobes papillose. Pollen grains 3-colporate. Capsule hardly produced above the insertion of the calyx . . . . . 2. *M. juncoides.*

1. **Manostachya staelioides** (K. Sch.) Brem. n. comb.; *Oldenlandia staelioides* K. Sch. in Bot. Jahrb. 23, 418, 1897; Hiern in Cat. Welw. Afr. Pl. 2, 446, 1898; — *O. staelioides* K. Sch. f. *major* de Wild. in Ann. Mus. Congo, Sér. 4, 2, 150, 1913, tab. IV.

Herba perennis, plesiocaulis, 20—45 cm alta. Caules erecti, subteretes, internodiis superioribus tamen bisulcatis, glabri, basi 1—1.2 mm diam., sub inflorescentia haud raro pseudo-dichotome ramificati, internodiis inferioribus 2.5—8 cm longis, in parte florifera gradatim usque ad 0.5 cm decrescentibus. Folia lineari-subulata, 2—6 mm longa et vix 0.3 mm lata, glabra vel margine basin versus vix conspicue ciliolata. Vagina stipularis 0.5 mm alta, margine haud ciliata. Flores omnes distincte bracteolati, sessiles vel pedicello usque ad 0.6 mm longo elati, singuli vel plures in axillis foliorum, haud raro utroque latere nodi evoluti, spicas longas formantes. Bracteolae foliis similiores, 2—3 mm longae. Ovarium glabrum. Calycis lobi late triangulares, 0.4 mm longi. Corolla extus glabra, tubo cylindrico 1.2 mm alto et 2.5 mm diam., intus glabro, lobis ovatis 1.5 mm longis et 1.2 mm latis, supra pilis obtusis satis longis dense velutinis. Stamina in flore dolichostylo filamentis 0.2 mm, in flore brachystylo

filamentis 0.6 mm longis munita; antherae 0.6 mm longae. Granula pollinis 4-colporata, 31 μ alta et 29 μ diam. (Tab. XII, fig. b). Stylus in flore dolichostylo 2 mm, in flore brachystylo 0.5 mm longus; stigmata ovoidea 0.3 mm longa. Capsula subglobosa 1.7 mm alta, dimidio superiore supra insertionem calycis producta.

Habitat Angolam, partem occidentalem Rhodesiae Septemtrionalis, partem australem ditionis Congensis.

Angola: Huilla, Lopollo, Welwitsch 5328, typus (K); Humpata, Fritzsche 265.

Northern Rhodesia: Golwezi District, Golwezi, Milne-Redhead 1198.

Belgian Congo: Lukeni, Hoek s.n. (f. *major* de Wild.); Elisabethville, Rogers 10195.

The differences between this species and *M. juncoides* (K. Sch.) Brem. will be discussed below.

2. **Manostachya juncoides** (K. Sch.) Brem. n. comb.; *Oldenlandia juncoides* K. Sch. in Bot. Jahrb. **23**, 414, 1897; Hiern in Cat. Welw. Afr. Pl. **2**, 447, 1898.

Herba probabiliter perennis, e basi ramosa, 7—25 cm alta. Caulis ramique subteretes, costulis a foliorum marginibus decurrentibus scabrido-papillosi, 0.7—1.4 mm diam., internodiis ad medium caulem 0.7—2.5 cm longis, in parte florifera gradatim brevioribus. Folia lineari-filiformia, ad medium caulem 7—13 mm longa et 0.5—0.8 mm lata, supra et facie inferiore costae scabrido-papillosa, basi conspicue ciliata; superiora gradatim breviora. Vagina stipularis 0.5 mm alta, margine breviter et sparse ciliata. Flores plerumque bracteolati, pedicellis usque ad 1 mm longis elati, singuli vel in diades et triades juncti ramos sed praesertim brachyblastos axillares terminantes; superiores subspicati. Bracteolae parvae vel minimae. Ovarium glabrum. Calycis lobi triangulares, 1.2 mm longi, margine et costa scabrido-ciliati. Corolla extus apicem versus sparse hirtella, tubo infundibuliformi 0.7 mm alto, fauce sparse barbato, lobis 1.2 mm longis, intus papillosis. Stamina in flore dolichostylo filamentis 0.2 mm, in flore brachystylo filamentis 1.2 mm longis munita; antherae 0.5 mm longae. Granula pollinis 3-colporata, 32 μ alta et 29 μ diam. (Tab. XII, fig. a). Stylus in flore dolichostylo 1.5 mm, in flore brachystylo 0.5 mm longus; stigmata filiformia 0.6 mm longa, in flore dolichostylo recurvata. Capsula globosa, intra calycem vix producta.

Habitat Angolam.

Angola: Pungo Andongo, Welwitsch 3063, type (K).

The differences between this species and *M. staelioides* are rather important. In the first place there is a difference in habit, for *M. staelioides* is a plant with several erect, simple or pseudo-dichotomously branched, almost leafless stems, whereas *M. juncoides* has a single stem with several branches, and as its internodes are shorter and the leaves longer, it does

not look so naked. Moreover, the arrangement of the flowers is in *M. staelioides* more distinctly spicate; the flowers of *M. juncoides* are borne singly or in pairs or groups of three by axillary branches which towards the top of the shoots decrease in length, so that here too the upper ones form a more or less spikelike inflorescence. However, if the leaflike bracteoles of *M. staelioides* are homologized with the leaves on the flowering brachyblasts of *M. juncoides*, the difference in the structure of the inflorescence becomes theoretically of little importance. More important perhaps are the differences in the corolla, the stigmata and the capsule. In *M. staelioides* the corolla tube is inside glabrous, and the lobes are densely velutinous, whereas in *M. juncoides* the tube is sparsely bearded, and the lobes are minutely papillose. The stigmata of *M. staelioides* are much shorter than those of *M. juncoides*, and in *M. staelioides* the upper half of the capsule lies above the insertion of the calyx, whereas in *M. juncoides* but a very small portion of the capsule projects above the latter.

12. **DIOTOCRANUS** Brem. n. gen.

Diotocranus Brem. n. gen. *Hedyotidearum*, inter genera quae capsula intra calycem non solum loculicida sed etiam septicida instructa sunt, vagina stipulari utroque latere caulis in lobum triangularem apice biaristatum producta, capsula basi cordata, apice in rostrum parte basali longiorem exeunte, seminibus subglobosis, cellulis testae centro umbonatis et parietibus sinuosissimis instructis cognoscendum.

Genus adhuc monotypicum in Africa Centrali endemicum.

Species unica: *Diotocranus Lebrunii* Brem.

Diotocranus Lebrunii Brem. n. spec.

Herba annua haplocaulis, erecta, 12—20 cm alta, ex axillis omnibus ramificata, ramis subsequentibus gradatim brevioribus. Caulis ramique quadricostati, in var. *Lebrunii* glabri, in var. *sparsipilo* sparse hirsuti; caulis 0.6—1.0 mm, rami 0.4—0.6 mm diam.; internodia caulis 2—3 cm longa, ramorum paulo breviora. Folia opposita, sessilia, linearia vel rarius lineari-lanceolata, 0.9—2.7 cm longa et 1—5.5 mm lata, apice acuta, basi sensim attenuata, margine plerumque anguste revoluta, tenuiora, discoloria, sicc. supra nigrescentia, subtus fucescentia, supra scabridula, subtus glabra, costa et dimidio basali marginis in var. *Lebrunii* scabrido-ciliolata, in var. *sparsipilo* sparse sed longe ciliata, costa supra basin versus impressa, subtus prominula, nervis inconspicuis. Vagina stipularis vix 0.5 mm alta, utroque latere caulis in lobum triangularem 0.5—1.0 mm longum producta, lobo in aristas ciliatas duas usque ad 1 mm longas exeunte. Flores subsessiles, 7—9 in inflorescentiam terminalem basi plerumque dichasialem, ramulis brevibus monochasialibus dispositi, 4-meri, isostyli. Ovarium biloculare, utroque loculo placenta peltata instructo, ovulis haud numerosis, in var. *Lebrunii* puberulum, in var. *sparsipilo* hirtellum. Calyx usque ad basin partitus; lobi triangulares,

0.5 mm longi, hirtelli. Corolla violacea, extus glabra, tubo 0.6—0.8 mm longo, fauce barbato, lobis intus papillosis 0.5—0.7 mm longis. Stamina antheris dorsifixis sessilibus, paulo infra incisuras corollae insertis, 0.4 mm longis, utroque extremo obtusis. Granula pollinis 3-colporata, 20 μ alta et 18—19 μ diam. (Tab. XII, fig. c). Stylus glaber, 0.3 mm longus; stigmata linearia 0.3 mm longa. Capsula basi bilobata, intra calycem deciduum in rostrum parte fertili longius producta, rostro 1 mm longo incluso 1.4 mm alta, 2.2 mm diam., rostro primum loculicide, deinde septicide dehiscente, in var. *Lebrunii* puberula, in var. *sparsipilo* hirtella. Semina pauca, subglobosa, bullata, brunnea, madefacta non glutinosa; cellulae testae centro umbonatae, parietibus sinuosissimis instructae, nec punctatae nec granulatae (Tab. VIII, fig. b).

Habitat Africam Centralem.

var. *Lebrunii*, caule ramisque glabris, foliis margine et costa scabrido-ciliolatis, ovario et capsula puberulis.
Belgian Congo: Kwango District, Mt Sörensen, 8° S lat., alt. 1100 m, Lebrun 155, type (B).

var. *sparsipilus* Brem. n. var., caule ramisque sparse hirsutis, foliis margine et costa sparse sed longe ciliatis, ovario et capsula hirsutis.
Tanganyika: Bukoba District, nr Bukoba, alt. 1200 m, Haarer 2182, type of variety (K).
Angola: Kuiriri, Mincibi Kassuango, Gossweiler 4045.

Diotocranus and the next three genera, *Hedythyrsus* Brem., *Agathisanthemum* Klotzsch and *Dibrachionostylus* Brem. agree with each other in the mode of dehiscence of the capsule; with *Hedythyrsus* it shares, moreover, the small number of seeds per capsule, and the strongly undulating walls of the testa cells. From all of them it differs in the great length of the beak in which the capsule is drawn out, and by the latter's bilobate base.

Loculicidal followed by septicidal dehiscence is among the African *Hedyotideae* confined to the genera enumerated above, but it recurs in some of the Asiatic representatives of this group, e.g. in *Hedyotis* L sensu meo (*Hedyotis* L sect. *Diplophragma* W. et A.). The relations with these Asiatic plants will be discussed under *Agathisanthemum* Klotzsch.

13. **HEDYTHYRSUS** Brem. n. gen.

Hedythyrsus Brem. n. gen. *Hedyotidearum*, inter genera quae capsula intra calycem non solum loculicida sed etiam septicida instructa sunt, vagina stipulari utroque latere caulis in fimbrias colletris coronatas 3—7 producta, seminibus paucis, dorsiventraliter applanatis et subalatis, cellulis testae parietibus sinuosissimis instructis sed centro non umbonatis cognoscendum.

Fruticuli haplocaules, ramosiores. Caulis ramique quadricostati, glabri, sicc. nigrescentes. Folia opposita, basi in petiolum brevissimum contracta,

lineari-lanceolata, apice calloso-mucronata, margine anguste revoluta, coriacea, discoloria, sicc. supra tota, subtus costa sola nigrescentia, nervis utroque latere costae 2—3 tenuioribus. Vagina stipularis extus pubescens, utroque latere caulis in lobum brevissimum producta, lobo in fimbrias colletris coronatas 3—7 exeunte, intra marginem colletris pluribus vestita. Flores in inflorescentias terminales, cymo-botryosas, corymbiformes vel depresse paniculiformes dispositi; ramuli infimi foliis magnitudine redactis, ramuli alii plerumque bracteis subulatis basi rudimentis stipularum fimbriatis suffulti; bracteae ultimae ad rudimenta stipularum redactae. Flores 4-meri, heterostyli. Ovarium biloculare, glabrum, utroque loculo placenta peltata instructo; ovula pauca. Calyx fere ad basin partitus; lobi ovato-triangulares, basin versus ciliati. Corolla tubiformis, extus glabra; tubus intus interdum sparse pilosus, in flore dolichostylo brevior quam in flore brachystylo; lobi intus minute papillosi. Stamina ad incisuras corollae inserta; filamenta glabra, in flore dolichostylo fere ad nihilum redacta; antherae dorsifixae, apice vix notabile mucronulatae, basi obtusae. Granula pollinis subglobosa, tricolporata (cf. Tab. XII, fig. d). Discus farinosus. Stylus glaber; stigmata subglobosa. Capsula in rostrum conicum producta, rostro primum loculicide, deinde etiam septicide dehiscente. Semina utroque loculo plerumque 6, dorsiventraliter applanata, ambitu oblonga, margine vel extremis solis subalata, madefacta non glutinosa; cellulae testae parietibus sinuosissimis instructae, centro non umbonatae (cf. Tab. VIII, fig. c).

Speciebus adhuc notis duabus in montibus Africae Aequatorialis endemicum.

Species typica: *Hedythyrsus spermacocinus* (K. Sch.) Brem. (*Oldenlandia* K. Sch.).

Noteworthy characters of this genus are the black discoloration of the shoots and leaves in the herbarium, the fimbriate stipular sheath and the presence of colleters at the end of the fimbriae and on the inside of the margin, the septicidal as well as loculicidal dehiscence of the rostrate capsule, the small number of seeds and the dorsiventral flattening of the latter, and the strongly undulating walls of the testa cells.

The dehiscence of the capsule takes place in the same way as in *Diotocranus* Brem., in *Agathisanthemum* Klotzsch and in *Dibrachionostylus* Brem. This means that the loculicidal fissure across the top is followed by a splitting of the septum, brought about by a dissolution of the soft inner tissue.

Key to the Species.

1. Inflorescences flat-topped, with about hundred flowers and more than 3 cm wide; the ultimate ramifications monochasial; flowers all subsessile; corolla tube in the brachystylous flower less than 1.5 mm, in the dolichostylous one less than 2 mm long . . . . . 1. *H. spermacocinus*

1: Inflorescences with raised centre, with about thirty flowers and less than 2.5 cm wide; the ultimate ramifications dichasial; the lateral flowers of the cymes pedicellate; corolla tube in the brachystylous flower more than 1.5 mm, in the dolichostylous one more than 2 mm long . . . . . 2. *H. thamnoideus.*

1. **Hedythyrsus spermacocinus** (K. Sch.) Brem. n. comb.; *Oldenlandia spermacocina* K. Sch. in Bot. Jahrb. **23,** 418, 1897; Hiern in Cat. Welw. Afr. Pl. **2,** 443, 1898.

Fruticulus 0.40—1.20 m altus. Caulis ramique ad apicem 1 mm diam., basin versus ad 4 mm et forsitan ultra incrassati; internodia 1—4 cm longa. Folia petiolo usque ad 1 mm longo instructa, 1—3 cm longa et 3—7 mm lata. Vagina stipularis circ. 1 mm alta; fimbriae 3—5, usque ad 4 mm longae. Inflorescentiae corymbiformes, e floribus circ. 100 compositae, primum 3.5—4 cm diam., post anthesin usque ad 5 cm dilatatae; ramuli omnes sparse hirtelli, ultimi monochasiales; flores omnes subsessiles. Calyx tubo 0.2 mm alto, lobis 0.8—1.0 mm longis. Corolla alba; tubus intus sparse pilosus, in flore dolichostylo 1 mm, in flore brachystylo 1.8 mm longus; lobi 1.8 mm longi. Filamenta in flore dolichostylo 0.2 mm, in flore brachystylo 1.3 mm longa; antherae in flore dolichostylo 0.5 mm, in flore brachystylo 0.6 mm longae. Granula pollinis 18—21 μ diam. (Tab. XII, fig. d). Stylus in flore dolichostylo 2.5 mm longus, in flore brachystylo 1.5 mm. Capsula rostro 0.9 mm longo incluso 1.8 mm alta, 1.6 mm diam.

Habitat Angolam.

Angola: Huilla, Ferrão da Sola, Welwitsch 5332; Lopollo, id. 5333, type (K); Lunda, Dala, nr the river Chiumba, alt. 1150 m, Gossweiler 11548.

2. **Hedythyrsus thamnoideus** (K. Sch.) Brem. n. comb.; *Oldenlandia thamnoidea* K. Sch. in Bot. Jahrb. **28,** 56, 1899; op cit. 485, 1900; — anne *O. rhamnoidea* K. Sch. in Engler, Pflanzenw. Ost Afrikas A, 131, 1895, nomen, incertum sed probabile.

Fruticulus 0.3—2 m altus. Caulis ramique ad apicem 1 mm diam.; caulis basin versus usque ad 9 mm incrassatus et ibi cortice griseo opaco vestitus; internodia 1—4 cm longa. Folia petiolo usque ad 1 mm longo instructa, 1—2.5 cm longa et 3—8 mm lata. Vagina stipularis 1—2 mm alta; fimbriae 5—7 usque ad 4 mm longae, haud raro ciliatae. Inflorescentiae corymboso-paniculiformes, e floribus circ. 30 compositae, 1.5—2 cm diam.; ramuli sparse hirtelli, omnes dichasiales; flores centrales subsessiles, laterales pedicellis usque ad 1 mm longis elati. Calyx tubo 0.2 mm alto, lobis 1.3 mm longis. Corolla alba, rosea vel dilute violacea; tubus intus interdum pilis paucis sparsus, in flore dolichostylo 1.8 mm, in flore brachystylo 2.8 mm longus; lobi 1.5 mm longi. Filamenta in flore dolichostylo 0.3 mm, in flore brachystylo 1.5 mm longa; antherae in flore dolichostylo 0.8 mm, in flore brachystylo 0.9 mm longae. Granula pollinis

22—25 μ diam. Stylus in flore dolichostylo 3 mm, in flore brachystylo 1.7 mm longus. Capsula rostro 1.0—1.1 mm longo incluso 2.0—2.2 mm alta, 1.8 mm diam.

Habitat montes Tanganyikae et Congoliae Orientalis.

Tanganyika: Ulugurus, summit of Lukwangulo, alt. 2400—2500 m, Stuhlmann 9167, 9187, 9193, types, n.v.; ibid., Bruce 691, neotype (K); summit of Lupanga, alt. 2100 m, Burtt 3477, Schlieben 2971; ibid., alt. 1400 m, Michelmore 849, "sticky herb"; Morogoro District, s.l., Davies 614; Iringa Province, Njombe, Ward U 25; ibid., alt. 1800 m, Staples 209; Undalis, alt. 1800 m, Davies 847; Lupembe, Upper Ruhudje, Schlieben 222; ibid., alt. 1600 m, id. 1109 A; Mt Rungwe, alt. 2400—2700 m, St Clair-Thomsen 836, Stolz 1037; mountains east of Lake Nyasa, Johnson s.n.

Belgian Congo: West of Lake Edward, between Kasinde and Lubango, alt. 1940 m, Lebrun 4692, 4804; West of Lake Kivu, Kahusi Mnts, alt. 2800 m, Humbert 7701, Jessen 48, Scaetta s.n.; between Kahusi and Taibinda, Scaetta 1403; Kahusi, alt. 3000 m, Hendrickx 356; Mokoto — Kivu, Claessens 60; Kivu, Mt Kuhunda, Scaetta 37 M; Mt Senga, Kaessner 2965; Biano Tableland, Greleo, Quarré 5882; Lukso, alt. 2400 m, Dale C 667.

The two *Hedythyrsus* species are doubtless very near allies, but the differences, although all of them individually of little importance, are too numerous to be neglected.

These plants show a superficial resemblance to *Nesohedyotis arborea* (Roxb.) Brem. (*Hedyotis* Roxb.; *Hedyotis* sect. *Nesohedyotis* Hook. f. in Benth. et Hook., Gen. Pl. **2**, 1, 81, 1873), the arboreous representative of the *Hedyotideae* in St Helena, i.a. in the black colour the specimens assume in the herbarium, in the shape of the leaves and in the position and structure of the inflorescence, but the flowers of this plant are unisexual, the corolla tube is much shorter, and the capsules open by a single, loculicidal fissure inside the calyx. *Nesohedyotis* therefore can not be regarded as a near ally of this genus.

14. AGATHISANTHEMUM KLOTZSCH

Agathisanthemum Klotzsch in Peters, Naturw. Reise nach Mossambique, Botanik **1**, 294, Berlin 1862; — *Hedyotis* spec. Hochst. in Flora **27**, 553, 1844; A. Rich., Tent. Fl. Abyss. **1**, 360, 1847; Sond. in Fl. Cap. **3**, 8, 1864; Vatke in Oesterr. Bot. Zeitschr. **25**, 232, 1875; — *Oldenlandia* spec. Hiern in Fl. Trop. Afr. **3**, 53/4, 1877; O. Kuntze, Rev. Gen. Pl. **1**, 292, 1891; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895.

Inter genera africana quorum capsula non solum loculicida sed etiam septicida dehiscet, stylo dimidio inferiore hirtello, stigmatibus subglobosis vel ovoideis a generibus aliis distinguendum, corolla fauce barbata

et stylo hirtello ad *Hedyotem* sensu meo (i.e. *Hedyotis* L sect. *Diplophragma* W. et A.) accedens sed ab eo stigmatibus brevioribus et crassioribus, seminibus angulatis parvis diversum.

Herbae perennes, haplocaulae vel pleiocaulae, erectae. Caules simplices vel parce ramosi, ex axillis foliorum plerumque brachyblastos foliis magnitudine redactis instructos emittentes. Folia opposita, sessilia vel subsessilia, anguste lanceolata, lanceolata, ovata vel ovato-oblonga, apice calloso-mucronata, margine anguste revoluta, nervis utroque latere costae 2—4, plerumque fortioribus. Vagina stipularis utroque latere caulis in lobum ovatum vel ovato-triangularem in fimbrias 3—13 exeuntem producta. Flores in inflorescentias terminales, cymo-botryosas, corymbiformes vel subglobosas dispositi; inflorescentiae ramuli infimi foliis magnitudine redactis, alii bracteis subulatis vel setaceis, basi rudimentis stipularum fimbriatis suffulti; bracteae ultimae ad rudimenta stipularum redactae. Flores iso- vel saepius heterostyli. Ovarium biloculare, utroque loculo placenta peltata instructa; ovula numerosa. Calyx fisso-partitus; lobi ovato-triangulares, carinati. Corolla tubiformis, tubo intus dense barbato, lobis intus minute papillosis. Stamina ad incisuras corollae inserta; filamenta glabra; antherae dorsifixae, utroque extremo obtusae. Granula pollinis depresse globosa, tri- vel rarius tetracolporata (cf. Tab. XII, fig. e). Discus farinosus vel puberulo-hirtellus. Stylus dimido inferiore, in flore brachystylo interdum totus hirtellus; stigmata subglobosa vel ovoidea. Capsula intra calycem in rostrum conicum producta, rostro non solum loculicide sed etiam septicide dehiscente. Semina numerosa, angularia, madefacta non glutinosa; cellulae testae parietibus subrectis vel leviter undulatis instructae, minutissime punctatae (cf. Tab. VIII, fig. d et e).

Speciebus adhuc notis 6 in Africa Orientali, in parte occidentali Africae Transaequatorialis et in insulis Mascarenensibus distributum.

Species typica: *A. Bojeri* Klotzsch.

Agathisanthemum Klotzsch is easily distinguishable from the other African genera provided with loculicidal and septicidal capsules: from *Diotocranus* Brem. by its more robust growth, the wider leaves, the 3—13 fimbriae on each side of the stipular sheath, the much shorter beak and the rounded or subacute base of the capsule, the smaller and more numerous angular seeds and the but slightly wavy or almost straight walls of the densely but minutely punctate testa cells; from *Hedythyrsus* Brem. by the simple or but sparingly branched shoots, the absence of colleters at the top of the fimbriae of the stipular sheath and on the latter's inside, the bearded corolla tube, the hirtellous style, the smaller and more numerous angular seeds, and the but slightly wavy or nearly straight walls and the minute but dense punctation of the testa cells; from *Dibrachionostylus* Brem. by the erect stems, the inside bearded corolla tube, the hirtellous, undivided style, the short stigmata and the minutely but densely punctate testa cells.

Agathisanthemum shows a close resemblance to *Hedyotis* sensu meo (i.e. *Hedyotis* L sect. *Diplophragma* W. et A), from which it differs in the short stigmata, in the smaller and more numerous angular seeds and in the minute but dense punctation of the testa cells. More points of difference will probably come to light when the Asiatic representatives of this group of genera are more intensively studied.

Key to the Species.

1. Disk shortly but distinctly hirtellous.
   2. Leaves aequidistantly penninerved. Fimbriae of the stipular sheath not more than 3 mm long. Calyx lobes during anthesis less than 2 mm long. Capsule (without the calyx lobes) circ. 2 mm high . . . . . 1. *A. Bojeri*
   2: Leaves more or less distinctly curvinerved, i.e the nerves all springing from the basal half of the midrib and strongly curved. Fimbriae of the stipular sheath usually more than 3 mm long. Calyx lobes during anthesis more than 2 mm long. Capsule (without the calyx lobes) at least 2.5 mm high.
      3. Stems several, the young parts rather densely pubescent, at the base covered with a loose cork which comes off in large patches. Calyx lobes on the capsule hardly elongated, circ. 2.5 mm long . . . . . 2. *A. angolense*
      3: Stems probably single, the young parts sparsely pubescent, at the base covered with a cork layer that does not come off in large patches. Calyx lobes on the capsule distinctly elongated, circ. 4.5 mm long . . . . . 3. *A. assimile*
1: Disk farinose.
   4. Inflorescences corymbiform. Calyx lobes at the most 2.5 mm long . . . . . 4. *A. chlorophyllum*
   4: Inflorescences subglobose, not rarely in groups of three. Calyx lobes at least 3.5 mm long.
      5. Stipular fimbriae 5—9. Flowers heterostylous . . . . . 5. *A. quadricostatum*
      5: Stipular fimbriae 3—5. Flowers homostylous. . . . . 6. *A. globosum.*

1. **Agathisanthemum Bojeri** Klotzsch in Peters, Naturw. Reise nach Mossambique, Botanik **1,** 294, Berlin 1862; *Hedyotis Bojeri* (Klotzsch) Vatke in Oesterr. Bot. Zeitschr. **25,** 232, 1875; *Oldenlandia Bojeri* (Klotzsch) Hiern in Fl. Trop. Afr. **3,** 53, 1877; non in Cat. Welw. Afr. Pl. **2,** 440, 1898, quae est *A. globosum*; — anne *Agathisanthemum Petersii* Klotzsch op. cit. 295 ut Vatke et Hiern assumpserunt, absentia typi haud certe determinandum, cf. *A. quadricostatum* Brem. var. *pubescens* Brem; — *Oldenlandia chlorophylla* (Hochst.) O. Ktze in errore apud Schinz in Mém. Herb. Boiss. **1,** 64, 1900.

Herba pleiocaula, 30—75 cm alta. Caules ex axillis omnibus vel minime ex axillis superioribus ramosi, subteretes, primum densius pubescentes, deinde plus minusve glabrescentes et cortice brunneo desquamante vestiti, ad apicem 0.8—1 mm diam., basin versus usque ad 3.5 mm incrassati; internodia caulium usque ad 6.5 cm longa, ramorum raro 4 cm excedentia, inferiora vix notabile, superiora distincte bisulcata. Folia subsessilia, in subspec. *Bojeri* anguste lanceolata, ad medium caulem plerumque circ. 4 cm longa et 7 mm lata, in subspec. *australi* interdum lanceolata vel ovato-oblonga et raro longitudine 3 cm excedentia, ubique tenuia, supra glabra vel vix notabile scabridula, subtus costa nervisque puberulo-pubescentia, discoloria, sicc. supra saturate, subtus dilute olivacea, costa et interdum nervis supra impressis, costa subtus prominula, nervis utroque latere costae 3—4 aequidistantibus et haud distincte curvatis; brachyblasti axillares semper evoluti. Vagina stipularis usque ad 2 mm alta, extus pubescens, utroque latere caulis in lobum ovatum 1.5 mm longum, in fimbrias 5 usque ad 3 mm longas, plerumque patentes vel recurvatas exeuntem producta. Inflorescentiae corymbiformes, 2—4 cm diam., post anthesin usque ad 6 cm dilatatae; ramuli primarii satis longi, alii breves sed semper distincti. Pedicelli circ. 1 mm longi, fructu paulo accrescentes. Flores heterostyli. Ovarium pubescens vel in subspec. *Bojeri* var. *glabrifloro* et in subspec. *australi* var. *glabrifloro* glabrum. Calyx sparse pubescens vel in varietatibus memoratis glaber, tubo 0.7 mm longo, lobis 1.8 mm longis. Corolla semper alba, extus glabra vel pilis aliquibus tenuibus sparsa; tubus 2—2.5 mm longus; lobi 1.5 mm longi. Filamenta in flore brachystylo 3.5 mm, in flore dolichostylo 0.6 mm longa; antherae 0.6 mm longae. Granula pollinis 3- vel 4-colporata, 18 μ alta et 20 μ diam. Discus puberulo-hirtellus. Stylus in flore brachystylo 1.8 mm, in flore dolichostylo 6 mm longus. Capsula sparse pubescens rostro 0.5 mm longo incluso 2 mm alta, calycis lobis usque ad 3 mm elongatis, patentibus coronata.

Habitat Africam Aequatorialem et insulas Mascarenenses.

subspec. *Bojeri*, foliis semper lanceolatis, longitudine plerumque 3 cm excedentibus.

subspec. *Bojeri* var. *Bojeri*, ovario calyceque pubescentibus.
Somaliland: between Berbera and Ras es Sogair, Robecchi-Brichetti 345.
Kenya: Witu, Thomas 171; Kilifi, alt. 60 m, Moggridge 484, Jeffery K 215; Kibarani, id. K 43; Mombasa, Whyte s.n., Riva 543, Wall s.n., Linder 2648, Wakefield s.n., Miss Napier 6290, Mac Naughton 2625; Mazeras, Graham 1732; Kwale, alt. 300 m, Mrs McCraig 9158; Makadara, Shimba Hills, alt. 300 m, Van Someren Sh 29; Nairobi, Dowson 283 (the altitude of Nairobi is about 1800 m; this is very high for this species, of which the subspec. *Bojeri* seems to be confined to the hot coastal plains; the specimen might be wrongly labelled).
Tanganyika: Mansa, Kaessner 23; Tanga Province, Tanga, Holst 2007, Volkens 206; Tanga Province s.l., Don Carlos DP/2/1; Amani, Burtt 260,

Soleman 5963; Tengeni, alt. 200 m, Greenway 1927; Makayuni District, alt. 400—1000 m, Koritschoner 691, 776, 1055; Monga, Zimmermann 5964; between Derema and Lunguza, id. 7844; Lunguza, id. 7845; Kiongwe, Braun 3505; Muoa, Busse 2274; s.l., id. 2295, 2627; Amboni, Geitlinger 108; Pemba, Waterland 8, Vaughan 478, 1297; Zanzibar, Bojer ("*Hedyotis hyssopoides* Bojer"), type (K), Blackburn s.n., Kirk s.n., Hildebrandt 1130, Boivin s.n., Mrs Taylor 7, 35, Lynes 60, Duparquet s.n., Revoil s.n., Sacleux 231, v. Düben s.n., Fries 3576, Greenway 1159, Paulay 8.87; Bagamojo, Stuhlmann 8030; Dar-es-Salaam, id. 7920, van Rensburg 382, Kuntze s.n., Raymond 9, Staples 259, Marshall 1, 23; Mafia Island, Greenway 5244.
Portuguese East Africa: Mozambique, Forbes s.n.; Nyasa, Messalu River, Allen 146; Lower Shiré, Morambala, Scott 10/1887; s.l., Stocks 65.

subspec. *Bojeri* var. *glabriflorum* Brem. ovario calyceque glabris a var. *Bojeri* recedens.
Tanganyika: North of Lake Nyasa, Maroko Crater, Geilinger 2654. Portuguese East Africa: Valley of the Pungue, Vasse 280, type of variety (P).

subsp. *australe* Brem. magnitudine foliorum quae ad medium caulem longitudine 3 cm raro excedunt a subspec. *Bojeri* recedens.
subsp. *australe* Brem. var. *australe*, ovario calyceque pubescentibus.
Portuguese East Africa: Lower Shiré, Morambala, Scott 2/1887; Inhaco-ongo, 90 km south of Inhambane, Sousa 1662; District Lourenço Marques, Mantico, id 452; Rikatla, Junod 281; Lourenço Marques, Borlé 43, 67, 297; Delagoa Bay, Junod s.n. ("*O. chlorophylla*" Schinz), Forbes 26. Southern Rhodesia: District Umtali, alt. 1100 m, Chase 244; between Umtali and Salisbury, Rogers 4068; District Manica, Odzani River, Teague 197; Odzi, alt. 1050 m, Eyles 8574; District Chipinga, Sabi-Chipinga Road, alt. 800 m, Wild 2448; District Marandellas, Pasture Station, Miss Stent 5465; Chirinda, alt. 1000 m, Swynnerton 500; Buluwayo, Rand 118; Matopos, Rattray 6953; s.l., Hislop 153 b.
Transvaal: Komatipoort, Schlechter 11864, type of subspecies (K), Kirk 103; Nelspruit, Acocks 1450, Miss Leendertz 2371, Borman 2, Codd & de Winter 4907, id. 4925; Barberton, Williamson 261, Lanjouw 944; Hector's Spruit, Hutchinson 2533; nr Petronella, Hutchinson & Mogg 2852; Lijdenburg, Wilms 589; Kaap Valley, alt. 750 m, Wood 4505; Houtbosch, Rehmann 6029; Klippan, id. 5281; between Kameelspoort and Elandsrivier, id. 4808; Louis Trichardt, Rodin 4082; Shilouvane, Junod 1058; Pietersburg, alt. 1200 m, Bolus 10911; Potgietersrust, Lotsy & Goddijn 1022; Nijlstroom, Repton 532; Nabocmspruit, Galpin M 174; Twenty-four Rivers, alt. 1200 m, Codd 957; Leeuwpoort, Rogers 42910; between Warmbad and Rooiberg, Dyer & Miss Verdoorn 4258; Warmbad, Collett 519, Thode A 1712, Rogers 21820; Magaliesberg, Wahlberg s.n.; Pretoria, Reck 179, Smith 6566; Rustenburg, Olive Nation 160.

Natal: Zululand, Isandhlwana, Mrs McKenzie s.n.; Inyezaan, alt. 300—600 m, Wood 7571; Somkeli, alt. 0—300 m, id. 9257; Nomgoma, Gerstner 31614, 4661; Hlabisa District, False Bay, id. 4793.

subsp. *australe* Brem. var. *glabriflorum* Brem. ovario calyceque glabris a subspecies typo recedens.
Portuguese East Africa: Beira Railway, Mrs Evelyn Cecil 10, type of variety (K); Madanda Forest, alt. 120 m, Swynnerton 2159.
South Rhodesia: Chipinga, Chirinda, 1100 m, Hack 178/50.

The only specimen I have seen from the Comores (Boivin 3187, collected in Mayotte) has slightly narrower leaves than are usually met with in the subspecies *Bojeri*, but it might fall within the latter's range of variability.

The specimens quoted under subspecies *Bojeri* vary but little, and they were moreover all collected in the hot coastal plain or in the lower parts of the mountains to an altitude of circ. 500 m, the only exception being the specimen said to have been collected by Dowson at Nairobi (alt. circ. 1800 m). In proceeding farther southwards we meet specimens with the same kind of flowers and fruits but with a much greater variability in the size and shape of the leaves, and also with other demands on their environment, for these plants are not confined to the coastal plain and the lower slopes of the mountains, but occur also farther inland and at higher altitudes. They probably form a hybrid population, of which an offshoot with particularly long leaves colonized the northern coastal plain: this is the form described above as the subspecies *Bojeri*. The rest of the population has provisionally been brought together under the subspecies *australe*. In creating this subspecies I have confined my attention to the size of the leaves, leaving their variability in width out of consideration. I was forced to do this, because a subdivision of this group based on differences in the width of the leaves could not be carried through, as there was too much overlapping. However, it should be borne in mind that this subspecies is provisional only.

2. **Agathisanthemum angolense** Brem. n. spec. disco puberulo-hirtello cum *A. Bojeri* Klotzsch et *A. assimili* Brem. congruens, nervatura foliorum, vagina stipulari longius fimbriata, calycis lobis longioribus, capsula majore ab *A. Bojeri* valde diversa, ab *A. assimili* pubescentia densiore, cortice in parte veteriore caulis desquamante, calycis lobis praesertim in fructu brevioribus recedens, foliorum forma *A. quadricostato* Brem. similior, sed ab eo disco puberulo-hirtello, inflorescentia minus congesta, caulibus subteretibus distincta.

Herba plerumque pleiocaula, 25—60 cm alta. Caules simplices, subteretes, densius pubescentes, basi cortice desquamante vestiti, ad apicem 1.2 mm, basin versus usque ad 3.5 mm incrassati, internodiis haud profunde bisulcatis 2.5—7.5 cm longis. Folia subsessilia, lanceolata, ad medium

caulem plerumque 3—4.5 cm longa et 9—12 mm lata, interdum tamen 2.3 cm longa et 4 mm lata, tenuiora, supra subglabra vel scabridula, subtus praesertim costa nervisque puberulo-pubescentia, discoloria, sicc. vix notabile decolorata, costa supra impressa et subtus prominula, nervis utroque latere costae 3 quorum duo inferiores approximati, omnibus apicem versus curvatis; brachyblasti axillares non ubique evoluti. Vagina stipularis usque ad 2 mm alta, sub foliis pubescens, utroque latere caulis in lobum ovatum producta, lobo fimbriis plerumque 5 usque ad 4.5 mm longis, plerumque patentibus instructo. Inflorescentiae corymbiformes, 1.5—3.5 cm diam.; ramuli omnes breves, semper distinguendi tamen. Pedicelli 0—1 mm longi. Flores heterostyli. Ovarium dense pubescens. Calyx sparse pubescens, tubo 0.5 mm alto, lobis 2.5 mm longis, margine et costa hirtello-ciliatis. Corolla alba vel violaceo suffusa, extus apicem versus sparsius hirtella; tubus 2.8 mm longus; lobi 2.3 mm longi. Filamenta in flore dolichostylo 1 mm longa; antherae 0.5 mm longae. Granula pollinis 4-colporata, 21 μ diam. Discus puberulo-hirtellus. Stylus in flore dolichostylo 4 mm longus. Capsula pubescens rostro 0.8 mm longo incluso 2.8 mm alta, calycis lobis vix elongatis coronata.

Habitat Angolam et partem adjicientem Rhodesiae Septemtrionalis. Angola: Cubal, alt. 2000 m, Faulkner A 143, type (K); Huilla, Antunes & Dekindt 3215; Cuanza-Sul, Seles, alt. 1000 m, Gossweiler 9354 (slightly abnormal: the plant is infected by a fungus which in the manner of some of the Ustilagineae replaces the pollen grains of the host by its spores); Cahalla, nr Malange, Gossweiler 3871 (with very narrow leaves). Northern Rhodesia: Chomea, Rogers 8077; Katikatari, Bredo 3857; Kabwe, id. 3804; Kaputa, id. 3746.

3. **Agathisanthemum assimile** Brem. n. spec. ab *A. angolensi* Brem. pubescentia parciore, cortice non desquamante, calycis lobis praesertim in fructu multo longioribus recedens, ab *A. quadricostata* Brem. caulibus non distincte quadricostatis, vagina stipulari fimbriis paucioribus instructa, inflorescentiis minus congestis, disco puberulo-hirtello diversa.

Herba probabiliter haplocaula, in specimine solo noto caule circ. 10 cm supra solum decapitato ramis pluribus suberectis circ. 50 cm longis, subsimplicibus instructa. Caulis ad basin circ. 5.5 mm diam.; rami sparse pubescentes ad apicem 1—2 mm diam., paulum applanati, internodiis bisulcatis usque ad 9 cm longis. Folia subsessilia, lanceolata, ad medium caulem 4.5 cm longa et 1 cm lata, tenuiora, supra glabra, subtus sparse puberulo-pubescentia, sicc. vix decolorata, costa et nervis supra impressis et subtus prominulis, nervis utroque latere costae plerumque 3; brachyblasti axillares semper evoluti. Vagina stipularis circ. 2.5 mm alta, suturis dense pubescentibus a foliis separata, ceterum sparse pubescens, utroque latere caulis in lobum late triangularem, circ. 1 mm altum producta, lobo fimbriis 3 vel 5 usque ad 5 mm longis, plerumque patentibus vel recurvatis instructo. Inflorescentiae corymbiformes, haud raro in triades

dispositae, 2—4.5 cm diam., ramuli primarii satis longi, alii breves. Pedicelli circ. 1 mm longi, fructu interdum usque ad 2 mm elongati, pubescentes. Ovarium puberulo-pubescens. Calyx tubo 0.5 mm alto, lobis 2.6 mm longis, margine et praesertim carina scabrido-hirtellis. Corolla extus interdum apicem versus pilis brevibus hirtella, tubo 2 mm longo, lobis 2.5 mm longis. Filamenta in flore dolichostylo 0.4 mm longa; antherae 0.7 mm longae. Discus puberulo-hirtellus. Stylus in flore dolichostylo 3.8 mm longus. Capsula pubescens rostro 0.8 mm longo incluso 2.8 mm alta, calycis lobis usque ad 4.5 mm elongatis coronata.

Habitat Tanganyikam.

Tanganyika: Tabora District, Igolula, east of Tabora, Murray Lunnan H 86/46, type (K), "very prevalent weed of cassave fields; appears to have a great effect on cassave so that the land has to be abandoned."

In my key to the species I have used the nature of the disk for a subdivision in two groups, but this gives a wrong idea of the affinities within this genus, for there can be little doubt that *A. angolense* and *A. assimile* are very near allies of the following species, especially of *A. quadricostatum*. The points in which it differs from these species have been indicated in the diagnosis by which the description is preceded.

4. **Agathisanthemum chlorophyllum** (Hochst.) Brem. n. comb.; *Hedyotis chlorophylla* Hochst. in Flora 27, 553, 1844; Sonder in Fl. Cap. 3, 8, 1864; *Oldenlandia chlorophylla* (Hochst.) O. Ktze, Rev. Gen. Pl. 292, 1891, non Schinz in Mém. Herb. Boiss. 1, 64, 1900, quae est *A. Bojeri* Klotzsch subsp. *australe* Brem.

Herba pleiocaula, 20—45 cm alta. Caules simplices, quadrangulares, in var. *chlorophyllo* vix conspicue scabrido-puberuli, in var. *pubescente* molliter pubescentes, ad apicem 1.2 mm, basin versus 2—3 mm diam., internodiis bisulcatis, superioribus longioribus, 1—8 cm, raro usque ad 12 cm longis. Folia sessilia, lanceolata vel oblonga, ad medium caulem nunc 4—7 cm longa et 7—15 mm lata, nunc 4—6 cm longa et 15—24 mm lata, subcoriacea, in var. *chlorophyllo* utrimque scabridula vel rarius glabra, in var. *pubescente* molliter pubescentia, vivo luteo-viridia, sicc. plerumque griseo-viridia, costa supra impressa, subtus prominula, nervis utroque latere costae in foliis lanceolatis 2—3 e dimidio inferiore costae orientibus, in foliis oblongis 3—4 prope basin emergentibus, nervis a basi remotissimis costam versus incurvatis et in apicem folii excurrentibus; brachyblasti axillares vix conspicui. Vagina stipularis 2—2.5 mm longa, extus pubescens, utroque latere caulis in lobum ovatum 1—3 mm longum producta, lobo fimbriis 5—13 usque ad 4 mm longis, plerumque plus minusve ciliolatis instructo. Inflorescentiae corymbiformes. Flores subsessiles vel pedicellis usque ad 2 mm longis elati, heterostyli. Ovarium in var. *chlorophyllo* glabrum, in var. *pubescente* puberulo-pubescens. Calyx tubo 0.7—1.0 mm alto, lobis 1—2.5 mm longis, in var. *pubescente* sparse

ciliolatis. Corolla alba vel luteola, tubo 2—4 mm longo, lobis 2.2—2.5 mm longis, in var. *chlorophyllo* totis glabris, in var. *pubescente* sparse ciliolatis. Filamenta in flore brachystylo 2 mm, in flore dolichostylo 0.3 mm longa; antherae in flore brachystylo 1.0—1.2 mm, in flore dolichostylo 0.8 mm longae. Granula pollinis 3- vel interdum aliqua 4-colporata, 25 μ diam. (cf. Tab. XII, fig. e). Discus farinosus. Stylus in flore brachystylo 2—2.6 mm, in flore dolichostylo 4.5 mm longus. Capsula glabra rostro 1.0 mm longo incluso 2.7 mm alta.

Habitat Nataliam.

var. *chlorophyllum*, caulibus vix conspicue scabrido-puberulis, foliis glabris vel utrimque scabridulis, ovario calyceque glabris.
Natal: Alfred District, nr Harding, alt. 750 m, Acocks 12247; Ixopo District, Ngongeni, alt. 850 m, id. 13294; District Alexandra, Dumisa, alt. 600 m, Rudatis 814; District Pinetown, nr Camperdown, Acocks 10866, ibid. alt. 600 m, Wood 10859; Durban, id. 9537, Krauss 39, 53, types (K), Gueinzius 125; between Durban and Maritzburg, Wahlberg s.n.; Maritzburg, Botha's Hill, McClean 103, Wood 10277; Inanda, id. 537; Inchanga, alt. 600—1200 m, id. 9752, 12542, 13006.

var. *pubescens* Brem. caulibus foliisque molliter pubescentibus, ovario sparse puberulo-pubescente, calycis lobis sparse ciliolatis.
Natal: s.l., Sanderson 399, type of variety (K).

An easily recognizable species with a well-defined area of distribution. The width of the leaves is rather variable, and it is not impossible that on account of these differences other varieties may be distinguished, but for the moment it seems better to leave them under the same name.

5. **Agathisanthemum quadricostatum** Brem. n. spec. maxime ut *A. angolense* Brem. et *A. assimile* Brem. sed caulibus quadricostatis et disco farinoso ab eis distinguenda.

Herba haplocaula vel pleiocaula, 35—100 cm alta. Caules subsimplices vel apicem versus ramosi, quadricostati, in var. *quadricostato* toti glabri vel pilis paucis sparsi, in var. *pubescente* pubescentes, basin versus cortice desquamante vestiti, ad apicem 1.2—2 mm diam., basin versus 2.5—3.5 mm diam., internodiis caulium usque ad 7 cm longis, subaequalibus, ramorum paulo brevioribus. Folia subsessilia, anguste lanceolata, ad medium caulem plerumque circ. 4.5 cm longa et 10 mm lata, tenuiora, in var. *quadricostata* utrimque glabra vel vix notabile scabridula, in var. *pubescente* utrimque scabridula, sicc. vix distincte decolorata, costa nervisque supra impressis, costa subtus prominula, nervis utroque latere costae plerumque 4 aequidistantibus, apicem versus haud distincte curvatis; brachyblasti axillares semper evoluti. Vagina stipularis usque ad 3.5 mm alta, suturis densius pubescentibus a foliis separata, utroque latere caulis in lobum triangularem circ. 1.5 mm altum producta, lobo fimbriis 5—9 usque ad 5 mm longis

instructo. Inflorescentiae subglobosae, interdum aliquae confluentes, 1.5—2.2 cm diam., fructu paulo majores; ramuli brevissimi; pedicelli subnulli. Flores heterostyli. Ovarium in var. *quadricostato* glabrum, in var. *pubescente* pubescens. Calyx tubo 0.4 mm alto, lobis 3.5 mm longis, in var. *quadricostato* margine ciliatis, in var. *pubescente* totis pubescentibus, patentibus. Corolla alba vel dilute violacea, extus glabra, tubo 1.6 mm alto, lobis 1.9 mm longis. Filamenta in flore brachystylo 1.5 mm, in flore dolichostylo 0.3 mm longa; antherae 0.8 mm longae. Granula pollinis 3-colporata, 18—22 μ diam. Discus farinosus. Stylus in flore brachystylo 1.4 mm, in flore dolichostylo 4 mm longus. Capsula glabra, rostro 1 mm longo incluso 3 mm alta, calycis lobis recurvatis coronata.

Habitat regiones lacum Tanganyikam circumdantes.

var. *quadricostatum*, caulibus foliisque glabris, ovario glabro, calycis lobis margine solo ciliatis.

Tanganyika: Langenburg, Ukanga Berg, alt. 500 m, Goetze 891 ("*Oldenlandia Bojeri*", Bot. Jahrb. **30**, 40, 1901); Kyimbila, Stolz 1285.

Nyasaland: Nyika Plateau, alt. 2000 m, McClounie 38; Fort Hill, alt. 1000—1200 m, Whyte s.n.; between Kondowe and Kanonga, Whyte s.n.; s.l., Whyte 12, Buchanan 1216.

Belgian Congo: Ngano-ngano, Shantz 750; Lengwe, Luxen 160; Mondwe, alt. 700 m, Brenez 106; Kasiki, de Witte 409, type (B).

var. *pubescens* Brem., caulibus pubescentibus, foliis utrimque scabridulis, ovario calyceque pubescentibus a typo recedens; anne *A. Petersii* Klotzsch in Peters, Naturw. Reise nach Mossambique, Botanik **1**, 295, 1862, absentia typi haud certe determinandum, sed haud improbabile.

Nyasaland: Zomba, alt. 900 m, J.M.P. 114, type of variety (K); Whyte s.n.; Shire Highlands, Blantyre, Buchanan 65; Shire Highlands, s.l., Adamson 203; Namasi, Cameron 2; s.l., Buchanan 146, 166, 211.

Portuguese East Africa: Massangulo, alt. 1100 m, Sousa 1300.

Northern Rhodesia: Mazabuka, Martin 171/32; Kalomo, alt. 900 m, Rogers 8216.

Southern Rhodesia: Trelawney, 60 miles N.W. of Salisbury, alt. 1200 m, Jack 247; Marandellas, Diggleford, Corby 298.

Transvaal: Pietersburg, Pusela, alt. 600 m, Isobel McCallum 137.

This species comes nearest to *A. assimile* Brem. and *A. angolense* Brem. The differences between these three species have already been discussed.

6. **Agathisanthemum globosum** (Hochst. ex A. Rich.) Klotzsch ex Hiern in Fl. Trop. Afr. **3**, 54, 1877, in syn. *Oldenlandia globosa* (Hochst. ex A. Rich.) Hiern; *Hedyotis globosa* Hochst. in Herb. Schimp. Abyss. **2**, n. 512, nomen; A. Richard, Tent. Fl. Abyss. **1**, 360, 1847, descr.; *Oldenlandia globosa* (Hochst. ex A. Rich.) Hiern l.c.; id. in Cat. Welw. Afr. Pl. **2**, 440, 1898.

Herba pleiocaula, 25—60 cm alta. Caules plerumque simplices, raro

apicem versus sparse ramosi, subteretes, in var. *globoso* dense pubescentes, in var. *subglabro* subglabri, ad apicem 1.5—2.5 mm, basin versus 2.5—4 mm diam., internodiis superioribus distincte, inferioribus vix conspicue bisulcatis, omnibus fere aequilongis, 2.5—8 cm longis. Folia sessilia, ovato-oblonga vel ovato-lanceolata, ad medium caulem nunc 4 cm longa et 1.8—2.5 cm lata, nunc circ. 4.5 cm longa et 1 cm lata, basi plerumque plus minusve rotundata, subcoriacea, in var. *globoso* utrimque scabridula, in var. *subglabro* margine solo scabridula, sicc. plerumque vix conspicue discolorata, costa nervisque supra praesertim basin versus impressis, subtus prominentibus, nervis utroque latere costae 3, omnibus dimidio inferiore costae orientibus et costam versus curvatis, subtus scabrido-puberulis vel hirtellis; brachyblasti axillares semper evoluti. Vagina stipularis 1—2 mm alta, extus pubescens, utroque latere caulis in lobum ovato-triangularem 1—2 mm longum producta, lobo fimbriis 3 vel 5 usque ad 5 mm longis instructo. Inflorescentiae singulae vel in triades dispositae, subglobosae, 1.5—2 cm, fructu usque ad 3 cm diam.; ramuli omnes brevissimi. Flores isostyli. Ovarium hirtello-pubescens. Calyx tubo subglabro 1 mm alto, lobis 3.5—5 mm longis, margine et interdum costa ciliatis. Corolla alba vel luteola, interdum violaceo suffusa, vel rosea, extus puberula et costis loborum interdum hirtella, tubo 3—3.5 mm longo, lobis 2.2—2.5 mm longis. Filamenta circ. 1 mm longa; antherae 0.8—1.0 mm. Granula pollinis plerumque 3-colporata, 25 μ diam. Discus farinosus. Stylus 4—4.5 mm longus; stigmata alabastro ad antheras adjicientia, in flore aperto plerumque supra antheras producta. Capsula rostro 0.8 mm longo incluso 3.2 mm alta, calycis lobis usque ad 7 mm elongatis coronata.

Habitat Africam Tropicalem.

var. *globosum*, caulibus dense pubescentibus, foliis utrimque scabridulis. Abyssinia: Prov. Sana, nr Dachli, Schimper 512, type (K); s.l., Quartin Dillon 635, Quartin Dillon & Petit s.n.

Uganda: Nandi Country, Sibu, Evan James s.n.

Kenya: Distr. Kipkarren, Mrs Brockhurst-Hill 463 et 487; Kapenguria, alt. 2100 m, Miss Napier 1968; Cherangani Hills, alt. 2100 m, Lady Muriel Jex-Blake 2132.

Tanganyika: Bukoba Distr., Nyashozi Karage, alt. 1500 m, Haarer 2379; Iringa Prov., Msima Stock Farm, Emson 357 (East African Herb.); ibid., Signal Hill, alt. 1800 m, St Clair-Thomson 486; Distr. Mahenge, alt. 950 m, Schlieben 1739; Kyimbila Distr., Stolz 128 et 2468; between Lake Tanganyika and Lake Rukwa, alt. 1800 m, Nutt s.n.

Nyasaland: Nyika Mts, Whyte s.n.; Zomba Plateau, alt. 1700 m, Whyte s.n.; Chifumbazi, Nicholson 10/1897; s.l., Buchanan 243.

Port. East Africa: Quelimane Distr., Namagoa, Mrs Faulkner P 354.

Northern Rhodesia: Mfuliza, alt. 1200 m, Cruse 175; Broken Hill, alt. 1200 m, Hutchinson & Gillett 3628, Allen 488; nr Mumbwa, Mrs

Macaulay 760; Fort Jameson, Winterbottom 16; Mazabuka, alt. 1000 m, Vet. Off. 370; Mwinilunga Distr., Matonchi Farm, Milne-Redhead 2554 et 3867; ibid., Dobeka Bridge, id. 3878.
Southern Rhodesia: Inyanga, alt. 1500 m, Dep. Agr. S. Rhod. 3204, "for scab of goats"; Miami, Wild 1707.
Angola: Pungo Andongo, Welwitsch 3080; Huilla, id. 3081; Empalana, id. 3802; Golungo Alto, id. 3221; Ganda, Alto Catumbela, Mrs Faulkner A 418; Distr. Malange, Gossweiler 1243, 4162 et 4228; Distr. Cazengo, id. 704.
Belgian Congo: between Hongo and Kainde, Luxen 416 (style remarkably short); Lutété, alt. 550 m, Hens A 230; Kisantu, Vanderijst B 206, L 83, 28835, 28980, Germain 2147; Baudouinville, Robijns 2113; Munama Derme, id. 1567; Kaponda, id. 1807; Haut Lomami, Kasendji, Mullenders 1542, 1561, 2804, 2903; Lualaba (Kat.), Homblé 917; Elisabethville, Bequaert 300, Schmitz 1011; Shinsenda, Ringosi, Homblé 399; Welgelegen (Kat.), id. 613; Katanga, Mimana, Quarré 1134; Kipila, id. 1628; Lovoi, Kamina, id. 2928; Kivu, Kaessner 3316; Kivu, between Pansi and Ruhava, Luja 36; Gandajika, Matagne 85; National Parc of the Upemba, de Witte 05026; Nioka Reserve Inéac, Taton 380.
French Aequatorial Africa: Gabon, Libreville, Klaine 1542; Haut Logone, north of Bouala, Lenfant s.n.

var. *subglabrum* Brem. n. var. caulibus subglabris, foliis margine solo scabridulis a typo recedens.
Tanganyika: Iringa Prov., Msima Stock Farm, Emson 357, type of var. (K), together with the typical form cf. Emson 357 in East African Herbarium v. supra.
Belgian Congo: Ruanda, National Park of the Kagera, Mt Kiburara, alt. 1600 m, Lebrun 9748.

Easily recognizable by the globose inflorescences, the isostylous flowers and the long calyx lobes.

15. **DIBRACHIONOSTYLUS** Brem. n. gen.

Dibrachionostylus Brem n. gen. *Hedyotidearum*, inter genera africana quae capsula non solum loculicida sed etiam septicida instructa sunt stylo bilobo facile cognoscendum, ab *Agathisanthemo* Klotzsch insuper corolla intus glabra, stylo glabro, stigmatibus longioribus, cellulis testae non punctatis, a *Hedythyrso* Brem. seminibus numerosis, angulatis, cellulis testae parietibus rectis instructis, a *Diotocrano* Brem. vagina stipulari fimbriata, capsula intra calycem vix distincte producta, seminibus numerosioribus, cellulis testae parietibus rectis instructis distinguendum.

Genus adhuc monotypicum in montibus Africae Orientalis Aequatorialis endemicum.

Species unica: *D. Kaessneri* (S. Moore) Brem. (*Oldenlandia* S. Moore).

Dibrachionostylus Kaessneri (S. Moore) Brem. n. comb.; *Oldenlandia Kaessneri* S. Moore in Journ. of Bot. **43**, 249, 1905, non K. Sch. et K. Krause in Bot. Jahrb. **39**, 520, 1907, quae est *O. Wiedemannii* K. Sch. (cf. S. Moore in Journ. of Bot. **45**, 115, 1907).

Herba pleiocaula, 15—40 cm alta. Caules e rhizomate pluricipiti orientes, e basi decumbente ascendentes, simplices vel parce ramosi, quadricostati vel subalati, 1—2 mm diam., basi interdum usque ad 4 mm incrassati, glabri, internodiis apicem versus gradatim longioribus, 2—10 cm longis, axillis foliorum brachyblastos foliis minoribus munitos emittentes. Folia opposita, sessilia, linearia vel lineari-lanceolata, 1.5—5 cm longa et 3.5—8 mm lata, apice calloso-mucronata, margine anguste revoluta, utrimque glabra, sicc. nunc dilute, nunc saturatius olivacea, costa subtus prominula, nervis utroque latere costae 2—5 difficiliter distinguendis. Stipulae breves, utroque latere caulis in fimbrias 5—7 usque ad 2.5 mm longas exeuns. Flores in inflorescentias terminales dispositi. Inflorescentiae cymo-botryosae, corymbiformes; ramuli primarii plerumque foliis magnitudine redactis, ramuli alii bracteis triangularibus, basi rudimentis stipularum fimbriatis suffulti; bracteae ultimae brevissimae vel ad rudimenta stipularum redactae. Pedicelli plerumque 0.5—1 mm longi, glabri. Flores 4-meri, heterostyli. Ovarium glabrum, biloculare, utroque loculo placenta peltata instructo; ovula numerosa. Calyx glaber, fisso-partitus, tubo 0.3 mm alto, lobis triangularibus 1.2 mm longis, sinibus inter lobos latioribus centro colletris duobus instructis. Corolla tubiformis, dilute violacea, extus intusque glabra, tubo floris brachystyli 2 mm, floris dolichostyli 1.5 mm longo, lobis ubique 2 mm longis, intus minute papillosis. Stamina ad incisuras corollae inserta; filamenta glabra, in flore brachystylo 2 mm, in flore dolichostylo 0.3 mm longa; antherae dorsifixae, apice vix notabile mucronulatae, basi subemarginatae, in flore brachystylo 1 mm, in flore dolichostylo 0.6 mm longae. Granula pollinis 3-colporata, subglobosa, 22 μ diam. (Tab. XII, fig. f). Discus farinosus. Stylus glaber, in bracchia dua brevia divisus, parte indivisa in flore brachystylo 1.5 mm, in flore dolichostylo 4 mm, bracchia in flore brachystylo 0.5 mm, in flore dolichostylo 0.8 mm longa; stigmata ubique circ. 0.5 mm longa. Capsula subglobosa, intra calycem breviter producta et ibi primum loculicide, deinde septicide dehiscens, 1.8 mm alta, 2.2. mm diam., glabra. Semina numerosa, angulata, nigrescentia, madefacta subglutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae (Tab. VIII, fig. f).

Habitat montes Africae Orientalis Aequatorialis.

Kenya: Nairobi, alt. 1650—1800 m, Kaessner 957, type (BM, dupl. K), Whyte 8/1903, Miss Johnstone 151, Dümmer 1905; Thika, alt. 1500 m, Bogdan 848; Nyong Forest, alt. 1750 m, Taylor 1606; Nadamlenzki, B.N. 3, Miss Napier 156, 2188, 2593, Verdcourt 360; Kabeti, alt. 1800 m, Mettam 169; Emberre, Stabwa, alt. 1100 m, Graham 2205.

Tanganyika: Meru, alt. 1500 m, Mrs Ward 2564.

A specimen in the Kew Herbarium according to the label collected by Miss Mason, Jan. 1911, in East Griqualand, belongs doubtless to this species, but as the small size of the area and the comparatively narrow limits of the altitudinal zone in which it is found in Kenya suggest a species with rather special demands on its environment, its occurrence in such a far off and climatically entirely different region as East Griqualand requires confirmation. Maybe the specimen was wrongly labelled.

Dibrachionostylus Kaessneri has in the herbaria often been confused with *Agathisanthemum Bojeri* Klotzsch, from which it is easily distinguishable by the inside glabrous corolla, the glabrous, two-lobed style, the longer stigmata and the non-punctate testa cells. *Agathisanthemum Bojeri* moreover prefers lower stations.

16. **EIONITIS** Brem. n. gen.

Eionitis Brem. n. gen. *Hedyotidearum*, maxime ut *Oldenlandia* sensu meo sed foliis succulentis, vagina stipulari in appendices producta quarum centralis aliis longior, seminibus dorsiventraliter applanatis ab ea recedens, ab *Amphiasmate* Brem. ad quod seminibus paucis, applanatis accedit, foliis succulentis, latioribus, vagina stipulari distincte appendiculata, seminibus madefactis glutinosis distinguendum; — *Oldenlandia* species Chiov. in Result. Sc. Miss. Stefan. Paoli, Somali Ital. **1**, 89, 1916 et Fl. Somala **2**, 232, 1932.

Herbae perennes. Folia opposita, sessilia, elliptica, ovato-lanceolata vel lanceolata, acuta et mucronata, succulenta. Vagina stipularis hyalina, utroque latere caulis in appendices quarum centralis aliis longior producta. Flores apice ramorum in cymas pluri- vel pauci-flores congesti, rarius aliqui solitarii, breviter pedicellati, 4-meri, heterostyli. Ovarium biloculare, utroque loculo placenta peltata instructo; ovula satis numerosa. Calyx ad basin partitus; lobi ovati. Corolla extus glabra, tubo brevi, fauce barbato, lobis intus papillosis vel basin versus barbatis. Stamina in flore brachystylo filamentis glabris ad incisuras corollae inserta, in flore dolichostylo paulo infra incisuras corollae sessilia; antherae dorsifixae, utroque extremo obtusae. Granula pollinis ellipsoidea, 3-colporata (cf. Tab. XII, fig. g). Stylus in flore dolichostylo exsertus, dimidio inferiore distincte vel brevissime hirtellus, in flore brachystylo inclusus, totus distincte vel brevissime hirtellus; stigmata filiformia patentia. Capsula subglobosa, intra calycem breviter producta et ibi rima loculicida dehiscens. Semina pauca, dorsiventraliter applanata, ambitu oblonga vel elliptica, nigra vel saturate brunnea, madefacta glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae (cf. Tab. VIII, fig. g).

Speciebus adhuc notis duabus in litore Somaliae endemicum.

Species typica: *Eionitis Chiovendii* Brem. n. nom. (*Oldenlandia littoralis* Chiov. non Mohr).

The two species of this genus have been found on sand dunes near the sea at Mogadiscio. They differ at first sight very strongly, but a closer investigation reveals that these differences are almost entirely confined to the shape of the leaves and the mode of branching.

Eionitis comes very near to some of the subgenera of *Oldenlandia* described below, and at first I was inclined to include it in that genus, but on account of the dorsiventrally flattened seeds and the aberrant structure of the stipular sheath it seemed more appropriate to keep it apart.

Key to the Species.

1. Older parts of the plant conspicuously thickened and covered with a scaly cork; leaves elliptic; stipular sheath fimbriate; flowers several together in terminal cymes; style very shortly, almost imperceptibly hirtellous; seeds strongly flattened . . . . . 1. *E. Chiovendii*

1: Older parts of the plant not conspicuously thickened and not covered with cork; leaves lanceolate or ovate-lanceolate; stipular sheath on each side of the shoot 3-lobed; flowers either solitary or a few together, terminal or pseudo-axillary; style distinctly hirtellous; seeds semi-globose . . . . . 2. *E. psammophila*

1. **Eionitis Chiovendii** Brem. n. nom.; *Oldenlandia littoralis* Chiov., Result. Sc. Miss. Stefan. Paoli, Somali Ital. **1**, 89, 1916, non Mohr in Bull. Torr. Bot. Club 1897, 29.

Herba perennis, suffruticosa, ramis patentibus vel decumbentibus, valde ramosis, basi conspicue incrassatis et ibi subero squamoso vestitis, parte novella 1—2 mm diam., glabra, internodiis quadricostatis 0.5—1.5 cm longis. Folia elliptica, 5—12 mm longa et 3—9 mm lata, basi obtusa, margine subrevoluta, novella sicc. nigrescentia, veteriora grisea, utrimque glabra, costa basin versus subimpressa, subtus vix prominula, nervis inconspicuis. Vagina stipularis circ. 1 mm alta, extus inter folia setulosa, margine fimbriis pluribus coronata, fimbria centrali circ. 0.5 mm longa. Flores apice ramorum in cymas plurifloras congesti. Pedicelli 0.5—1 mm longi, post anthesin usque ad 1—2 mm elongati, glabri. Ovarium glabrum. Calycis lobi ovati, 1.2 mm longi. Corolla tubo 1.6 mm longo, fauce dense barbato, lobis 1.5 mm longis. Stamina in flore brachystylo filamentis 0.5 mm longis, antheris 0.9 mm longis; stamina in flore dolichostylo antheris sessilibus 0.7 mm longis. Granula pollinis (Tab. XII, fig. g) in flore brachystylo 25 μ alta et 24 μ diam., in flore dolichostylo 25 μ alta et 20 μ diam. Stylus in flore brachystylo 0.8 mm longus, brevissime hirtellus; in flore dolichostylo 1.2 mm longus, dimidio inferiore brevissime hirtellus; stigmata 0.4—0.5 mm longa. Capsula 1.2 mm alta et 1.5 mm diam., glabra. Semina discoidea.

Habitat arenosa maritima Somaliae.

Somaliland: Mogadiscio, Paoli 16 et 27, types (F), Puccioni & Stefanini 70, Boivin s.n. Jan. 1848.

The name of the locality where Boivin's specimen was collected, is not fully certain, because a part of the label has been cut off; the remaining part reads "Mogg".

Easily recognizable by its shrubby growth and its elliptic succulent leaves.

2. **Eionitis psammophila** (Chiov.) Brem. n. comb.; *Oldenlandia psammophila* Chiov., Fl. Somala 2. 232, 1932.

Herba perennis, e basi ramosa, caulibus parce ramosis subpatentibus, 3.5—5 cm alta. Caules obtuse quadrangulares, in var. *psammophila* et var. *laxiflora* subglabri vel hic inde parce et brevissime hirtelli, in var. *hirtella* et var *compacte-hirtella* densius hirtelli, internodiis ad medium caulem 2.5—5 mm longis. Folia lanceolata vel ovato-lanceolata, 5—10 mm longa et 1.8—4 mm lata, basi subacuta, margine late revoluta, sicc. olivacea, in var. *psammophila* et var. *laxiflora* supra setulis minimis sparsa, subtus glabra, in var. *hirtella* et var *compacte-hirtella* supra et facie inferiore costae densius hirtella, costa basin versus impressa, subtus prominula. Vagina stipularis circ. 1.2 mm alta, utroque latere caulis in lobulum centralem usque ad 2 mm longum et in duos lobulos multo minores producta. Flores in inflorescentias cymosas pseudo-axillares ad apicem caulium et ramorum congesti. Inflorescentiae pauciflorae, inferiores interdum ad florem singulum redactae, in var. *psammophila* et var. *compacte-hirtella* subsessiles, in var. *laxiflora* et var. *hirtella* pedunculo usque ad 1 cm longo elatae. Pedicelli in var. *psammophila* et var. *compacte-hirtella* ad anthesin circ. 1 mm longi, in var. *laxiflora* et var. *hirtella* usque ad 3 mm longi, post anthesin paulo accrescentes. Ovarium in var. *psammophila* et var. *laxiflora* glabrum, in var. *hirtella* et var. *compacte-hirtella* hirtellum. Calycis lobi ovati, 1.1 mm longi, valde succulenti. Corolla dilute lilacina, tubo 0.8 mm longo, intus densius piloso, fauce barbato, lobis 1.8 mm longis, intus pilis similioribus apicem versus longitudine decrescentibus vestitis. Stamina in flore brachystylo filamentis glabris 1 mm longis instructa, antheris 0.7 mm longis; stamina floris dolichostyli paulo infra incisuras corollae inserta, antheris sessilibus 0.7 mm longis, apicibus exsertis. Granula pollinis in flore brachystylo 30 μ alta et 24 μ diam., in flore dolichostylo 25 μ alta et 20 μ diam. Stylus in flore brachystylo 1 mm longus, totus hirtellus, in flore dolichostylo 1.8 mm longus, dimidio inferiore hirtellus; stigmata 0.4—0.6 mm longa. Capsula 1.8 mm alta et 2.2 mm diam. Semina semiglobosa.

Habitat arenosa maritima Somaliae.

var. *psammophila*, caulibus ramisque subglabris, foliis supra setulis minimis sparsis, inflorescentiis subsessilibus, pedicellis ad anthesin circ. 1 mm longis, ovario glabro.

Somaliland: Mogadiscio, Senni 615 p.p., type (F).

var. *laxiflora* Brem. n. var., inflorescentiis pedunculo usque ad 1 cm longo, floribus pedicellis usque ad 3 mm longis a var. *psammophila* recedens.
Somaliland: Mogadiscio, Senni 615 p.p., type of variety (F).

var. *hirtella* (Chiov.) Brem. n. comb.; *Oldenlandis psammophila* Chiov. var. *hirtella* Chiov. l.c., a var. *laxiflora* caulibus, foliis supra et facie inferiore costae, ovario densius hirtellis recedens.
Somaliland: Mogadiscio, Senni 629, type of variety (F); Lower Uebi Sebeli, north of Merca, Ciferri 10, "molto frequente nel litorale marino".

var. *compacte-hirtella* Brem. n. var., a var. *psammophila* caulibus, foliis supra et facie inferiore costae, ovario densius hirtellis recedens.
Somaliland: Mogadiscio, Senni 1337, type of variety (F).

17. **AMPHIASMA** Brem. n. gen.

Amphiasma Brem. n. gen. *Hedyotidearum*, inter genera africana capsula intra calycem loculicida solum dehiscente, seminibus applanatis ad *Eionitim* accedens, sed foliis multo angustioribus, vagina stipulari truncata, seminibus madefactis non glutinosis ab eo valde diversum.

Fruticuli vel herbae perennes. Caules subteretes, glabri vel subglabri. Folia opposita, sessilia, linearia vel filiformia, rigida et plerumque lon giora, erecta vel subpatentia, apice acuta et calloso-mucronata, margine revoluta. Vagina stipularis plerumque tubulosa, truncata, interdum utroque latere caulis cuspidibus duabus instructa. Flores in inflorescentias cymosas, terminales et interdum insuper axillares, casu quo haud raro in corymbum amplum confluentes, dispositi; bracteae ommes in paria connatae. Flores tetrameri, isostyli vel heterostyli. Ovarium biloculare, utroque loculo placenta peltata instructo, placenta stipite brevi paulo infra medium septum affixa; ovula satis numerosa. Calyx fere ad basin partitus, lobis triangularibus. Corolla alba, tubo tereti vel subinfundibuliformi lobis longiore, lobis patentibus, tubo minime fauce et lobis minime usque ad medium pilis applanatis obtusis dense barbatis. Stamina in flore dolichostylo dimidio superiore tubi inclusa, in flore brachystylo et in floribus isostylis ad incisuras corollae inserta, exserta; filamenta glabra; antherae dorsifixae lineares, apice basique obtusae. Granula pollinis ellipsoidea, 3-colporata (cf. Tab. XII, fig. h et i). Discus pulviniformis, farinosus. Stylus glaber, in flore brachystylo inclusus, in flore dolichostylo et in floribus isostylis exsertus; stigmata filiformia, longe et dense papillosa. Capsula globosa, intra calycem paulo producta et ibi rima loculicida dehiscens, septo tenui. Semina in placentam immersa, haud numerosa et satis magna, dorsiventraliter applanata, ambitu oblonga, laevia, saturate brunnea, madefacta non glutinosa; cellulae testae parietibus tenuibus rectis, nec punctatis nec granulatis instructae (cf. Tab. VIII, fig. h).

Speciebus adhuc notis 8 in parte australi Africae Tropicalis et Subtropicalis endemicum.

Species typica: *A. luzuloides* (K. Sch.) Brem. (*Oldenlandia* K. Sch.).

J. Bär (in Vierteljahrsschr. Naturf. Gesellsch. Zürich **68**, 432, 1923) referred one of the species of this genus to *Houstonia* L sect. *Ericotis* A. Gray, and although this is a mistake, it is an easily comprehensible one, for if one tries to identify species belonging to this genus by means of the key given by K. Schumann in Engler and Prantl's "Natürliche Pflanzenfamilien", one arrives on account of the dorsiventrally flattened seeds inevitably at the genus *Houstonia*. This applies also to the representatives of the other genera with dorsiventrally flattened seeds dealt with in this work: they all seem to fall in *Houstonia*. The affinity between the latter and these genera, however, is but remote, for on account of its corneous endosperm and of the cavity on the ventral side of the seed, *Houstonia* occupies an entirely different position in the tribe.

Amphiasma is doubtless a near ally of *Eionitis* Brem., of *Oldenlandia* L emend. Brem. and of *Lelya* Brem. With *Eionitis* it agrees in the flattened seeds, and with all three in the mode of dehiscence of the capsule and in the terminal inflorescences.

Important common characters of the *Amphiasma* species are found in the narrow leaves, the connate bracts, the hairyness of the corolla lobes and the rather large, flattened and smooth seeds, which do not become slimy when they are moistened. The majority of the species, moreover, is easily recognizable by the tubular, truncate stipular sheath, the character from which the genus derives its name. In *A. divaricatum* (Engl.) Brem. the sheath is only 0.5—0.8 mm high, and this species is therefore in this respect exceptional, and in *A. merenskyanum* Brem. too the sheath is shorter than in the remaining species, but here it is nevertheless distinctly tubular.

Key to the Species.

1. Herbs with erect shoots springing from a pluricipitous rhizome.
   2. Inflorescences capituliform; the one at the end of the shoot overtopping the other ones . . . . . 1. *A. luzuloides*
   2: Inflorescences umbelliform or cymose. Pedicels 1.5—3 mm long.
      3. Pedicels suberect. Flowers umbellate; the umbels solitary or in small corymbs. Calyx at least 1 mm high. Upper half of the corolla lobes minutely papillose.
         4. Each stem, as a rule, with a single umbel. Corolla lobes more than 3 mm long and 2 mm wide. . . . 2. *A. Redheadii*
         4: Each stem with several umbels, which together form a small corymb. Corolla lobes less than 3 mm long and less than 2 mm wide.
            5. Flowers heterostylous. Corolla outside glabrous; tube 4 mm long . . . . . 3. *A. Robynsii*
            5: Flowers isostylous. Corolla outside papillose; tube 2 mm long . . . . . 4. *A. assimile*
      3: Pedicels spreading. Flowers in cymes that together form a

comparatively large panicle. Calyx circ. 0.5 mm high. Corolla lobes entirely covered with hairs . . . . . 5. *A. micranthum*

1: Shrublets with more or less spreading branches.

6. Stipular sheath at the middle of the stems 5—9 mm long. Leaves scabrid. Calyx and corolla outside densely papillose . . . . . 6. *A. benguellense*

6: Stipular sheath much shorter. Leaves smooth. Calyx and corolla outside glabrous.

7. Leaves 2.5—4 cm long, suberect. Stipular sheath circ. 2.5 mm high. Pedicels at the time of flowering 3—8 mm long . . . . . 7. *A. merenskyanum*

7: Leaves 0.3—1 cm long, more or less spreading. Stipular sheath less than 1 mm high. Pedicels at the time of flowering less than 3 mm long . . . . . 8. *A. divaricatum*

1. **Amphiasma luzuloides** (K. Sch.) Brem. n. comb.; *Oldenlandia luzuloides* K. Sch. in Bot. Jahrb. **28**, 55, 1899; id. op. cit. **30**, 411, 1901, cum descriptione nova.

Herba perennis, caulibus erectis e rhizomate pluricipiti orientibus, 15—40 cm alta. Caules simplices vel parce ramosi, ramis suberectis, glabri; internodia bisulcata foliis suberectis aequilonga, superiora eis longiora. Folia linearia, ad medium caulem 2.5—4 cm longa et 1.5—2 mm lata, supra scabrida, basi costis plus minusve ciliolatis a vagina stipulari separata. Vagina stipularis ad medium caulem circ. 5 mm alta, non cuspidata. Inflorescentiae quoque caule duae vel tres, capituliformes; pedunculus inflorescentiae terminalis aliis longior. Flores subsessiles, heterostyli. Ovarium glabrum. Calyx tubo 0.2—0.4 mm alto, lobis 1.0—1.2 mm longis, margine ciliolatis. Corolla extus glabra, tubo subinfundibuliformi 2.8—4.0 mm longo et 0.8 mm diam., dimidio superiore piloso, lobis 2.2 mm longis et 1.6 mm latis, usque ad medium pilosis. Stamina floris dolichostyli circ. 1.0 mm infra incisuras corollae inserta, filamentis subnullis, antheris 0.8 mm longis; stamina floris brachystyli filamentis 1 mm longis instructa, antheris 1.0 mm longis. Granula pollinis 22 μ alta et 17 μ diam. (Tab. XII, fig. i). Stylus in flore dolichostylo circ. 4 mm longus, in flore brachystylo 2 mm; stigmata 1 mm longa.

Habitat Nyasam et Tanganyikam.

Nyasaland: Nyika Plateau, Whyte s.n., f. *brachystylum* et f. *dolichostylum*, types (K).

Tanganyika: Northern part of Kinga Mnts, Ussangu, alt. 2500 m, Goetze 998, f. *brachystylum*.

Easily distinguishable from the other herbaceous species by the arrangement of the flowers in capitula.

2. **Amphiasma Redheadii** Brem. n. spec., a speciebus herbaceis aliis quoque caule plerumque inflorescentiam singulam ferente distincta, ab

A. luzuloide insuper floribus distincte pedicellatis, ab *A. Robijnsii* Brem. et *A. assimili* Brem. corollae lobis longioribus, ab *A. micrantho* (Chiov.) Brem. pedicellis suberectis diversa.

Herba perennis, caulibus erectis e rhizomate pluricipiti orientibus, circ. 50 cm alta. Caules parce ramosi, ramis suberectis, glabri; internodia bisulcata, foliis suberectis aequilonga, superiora eis longiora. Folia filiformia, ad medium caulem 3—4 cm longa et 0.5—1.0 mm lata, margine ciliolata, supra scabrida, basi costis ciliolatis a vagina stipulari separata. Vagina stipularis ad medium caulem circ. 5 mm alta, non cuspidata. Inflorescentia quoque caule plerumque singula, umbelliformis. Flores pedicello suberecto usque ad 3 mm longo elati, heterostyli. Ovarium glabrum. Calyx tubo 0.3 mm alto, lobis 1.1 mm longis, margine parce ciliolatis. Corolla extus glabra, sicc. nervis brunnescentibus conspicue striata, tubo subinfundibuliformi 4 mm longo, dimidio inferiore 1.1 mm diam., intus fere usque ad basin piloso, lobis 3.2 mm longis et 2.0 mm latis, usque ad medium pilosis. Stamina in flore dolichostylo 1.5 mm infra incisuras corollae inserta, filamentis 0.3 mm longis, antheris 1.2 mm longis. Granula pollinis 22 μ alta et 17 μ diam. Stylus in flore dolichostylo 5.5 mm longus; stigmata 1.3 mm longa.

Habitat Rhodesiam Septemtrionalem.

Northern Rhodesia: Mwinilunga District, River Danilolo, Milne-Redhead 859, f. *dolichostylum*, type (K), "in *Brachystegia* woodland".

Differing from the other herbaceous species with umbellate flowers by the absence of lateral umbels and by the comparatively large size of the flowers.

3. **Amphiasma Robijnsii** Brem. n. spec. inter species herbaceas floribus umbellatis instructas ab *A. Redheadii* inflorescentiis pluribus ad apicem caulis in corymbum confluentibus, ab *A. assimili* Brem. floribus heterostylis, corollae tubo longiore distinguenda.

Herba perennis, caulibus erectis e rhizomate pluricipiti orientibus, 40—60 cm alta. Caules parce ramosi, ramis suberectis, glabri; internodia bisulcata foliis suberectis aequilonga, superiora eis longiora. Folia filiformia, ad medium caulem 3—4 cm longa et 0.7—1.0 mm lata, supra scabrida, basi costis vix distinctis a vagina stipulari separata. Vagina stipularis ad medium caulem circ. 4—5 mm alta, non cuspidata. Inflorescentiae quoque caule plures, umbelliformes; pedunculus inflorescentiae terminalis aliis haud longior et inflorescentiae inde in corymbum confluentes. Flores pedicello suberecto usque ad 3 mm longo elati, heterostyli. Ovarium glabrum. Calyx tubo 0.3 mm alto, lobis 1.0 mm longis, vix conspicue ciliolatis. Corolla extus glabra, tubo subinfundibuliformi 4 mm longo, dimidio inferiore 1.1 mm diam., intus fere ad basin piloso, lobis 2.3 mm longis et 1.3 mm latis, usque ad medium pilosis. Stamina in flore dolichostylo ad medium tubum inserta, antheris subsessilibus, in flore brachystylo filamentis 1 mm longis instructa; antherae 1.1. mm longae. Granula

pollinis 22 μ alta et 17 μ diam. Stylus in flore brachystylo 3 mm, in flore dolichostylo 5 mm longus; stigmata 0.9 mm longa.

Habitat Congoliam.

Belgian Congo: West of Lake Tanganyika, between Kayala and Lungulungu, alt. 1650 m, Robijns 2186, f. *brachystylum*, type (B), "in tree savannah"; Kasiki, alt. 2300 m, de Witte 363, f. *dolichostylum*.

The differences between this species and *A. Redheadii* are not very striking. The most important ones are the more numerous inflorescences and the shorter corolla lobes, but it is possible that when more material becomes available, intermediate forms will be met with, and in that case the two species will have to be united.

4. **Amphiasma assimile** Brem. n. spec., maxime ut *A. Robijnsii*, sed floribus minoribus isostylis, corolla extus papillosa ab ea recedens.

Herba perennis, caulibus erectis e rhizomate pluricipiti orientibus, 25—40 cm alta. Caules parce ramosi, ramis suberectis, glabri; internodia bisulcata foliis suberectis aequilonga, superiora eis longiora. Folia filiformia, ad medium caulem 2.5—3.5 cm longa et 0.8—1.2 mm lata, supra scabrida, basi costis vix distinctis, haud ciliolatis a vagina stipulari separata. Vagina stipularis ad medium caulem circ. 5 mm alta, non cuspidata. Inflorescentiae quoque caule plures, umbelliformes; pedunculus inflorescentiae terminalis aliis haud longior et inflorescentiae inde in corymbum confluentes. Flores pedicello suberecto usque ad 2.5 mm longo elati, isostyli. Ovarium glabrum. Calyx tubo 0.5 mm alto, lobis 1.0 mm longis, sparse ciliolatis. Corolla extus papillosa, tubo subinfundibuliformi 2.0 mm longo, dimidio inferiore 0.8 mm diam., intus fere ad basin piloso, lobis 1.8 mm longis et 1.1 mm latis, usque ad medium pilosis. Stamina ad incisuras corollae inserta; filamenta 0.4 mm longa; antherae 1.0 mm longae. Stylus 1.8 mm longus; stigmata 0.5 mm longa.

Habitat Nyasam.

Nyasaland: Nyika Plateau, between Kondowe and Karonga, Whyte s.n., type (K).

A. assimile differs from the preceding species by the smaller, isostylous flowers and the outside papillose corolla.

5. **Amphiasma micranthum** (Chiov.) Brem. n. comb.; *Oldenlandia micrantha* Chiov. in Bull. Soc. Bot. Ital. 1924, n. 2, 39.

Herba perennis, caulibus erectis e rhizomate pluricipiti orientibus, circ. 90 cm alta. Caules parce ramosi, ramis suberectis, glabri; internodia quadricostata foliis suberectis aequilonga, superiora eis longiora. Folia ad medium caulem linearia, usque ad 6 cm longa et 2 mm lata, supra scabrida, basi costis ciliolatis a vagina stipulari separata; folia superiora filiformia et gradatim longitudine decrescentia. Vagina stipularis ad

medium caulem 5—8 mm longa, tenuissima et inde plerumque discissa, utroque latere caulis cuspidibus duabus vix conspicuis instructa. Inflorescentiae cymosae, in paniculam amplam confluentes. Pedicelli patentes, usque ad 3 mm longi. Flores isostyli. Ovarium papillosum. Calyx papillosus 0.5 mm altus, fere ad basin partitus, lobis ovatis apicem versus glabrescentibus. Corolla extus papillosa, tubo infundibuliformi 2.8 mm longo, dimidio inferiore 0.4 mm diam., intus fere usque ad basin piloso, lobis 1.7 mm longis et 1.2 mm latis, obtusis, fere totis pilosis. Stamina filamentis 1 mm longis instructa, antheris 1 mm longis. Granula pollinis 25 μ alta et 17 μ diam. Stylus 2.5 mm longus; stigmata 1 mm longa.

Habitat Angolam.

Angola: Mossamedes, Humbo Catapi, Mazzocchi-Alemanni s.n., type, n.v.; Benguella, between Nova Lisboa and Huambo, alt. 1500 m, Gossweiler 10787.

The description given above has been based on Gossweiler 10787, but as it agrees in all essential points with that given by Chiovenda, there can be no doubt that his type and Gossweiler 10787 are conspecific.

A. micranthum is easily distinguishable from the other herbaceous species by the nature of the inflorescence, a large panicle composed of cymes with the lateral flowers borne by spreading pedicels. In the shortness of the calyx and in the almost totally pilose corolla limb it resembles the fruticose species. Among the latter *A. benguellense* (Hiern) Brem. shows a similar stipular sheath and flowers of nearly the same size borne by pedicels of nearly the same length, but the subpatent leaves and branches give it a quite different aspect.

6. **Amphiasma benguellense** (Hiern) Brem. n. comb.; *Oldenlandia benguellensis* Hiern in Cat. Welw. Afr. Pl. 2, 448, 1898.

Fruticulus 0.5—2 m altus, ramulis subpatentibus. Ramuli glabri; internodia vix conspicue costata, foliis subpatentibus aequilonga vel eis paulo breviora. Folia linearia, ad medium ramulum 4—5 cm longa et 1.5—2.3 mm lata, supra scabrida, basi costis vix distinctis a vagina stipulari separata. Vagina stipularis 6—9 mm alta, non cuspidata. Inflorescentiae laxe corymbiformes, multiflorae. Pedicelli usque ad 2 mm longi. Flores heterostyli. Ovarium papillosum. Calyx papillosus 0.7 mm altus, fere ad basin partitus, lobis late triangularibus. Corolla extus papillosa, tubo infundibuliformi 2.5 mm longo, dimidio inferiore 1 mm diam., intus dimidio superiore piloso, lobis fere totis pilosis, 1.5 mm longis et 1.3 mm latis, acutis. Stamina in flore dolichostylo 0.5 mm sub incisuris corollae inserta, filamentis 0.4 mm longis, antheris apicibus exsertis 1.1 m longis; stamina in flore brachystylo filamentis 1.1 mm longis, antheris 1.3 mm longis. Granula pollinis 25 μ longa et 17 μ diam. (Tab. XII, fig. h). Stylus in flore dolichostylo 3.5 mm, in flore brachystylo 1.0 mm longus; stigmata 0.5 mm longa.

Habitat Angolam.

Angola: Huilla, Welwitsch 5355, fr.; Mossamedes, River Maiombo, id. 5353 et 5354, f. *dolichostylum*, type (BM, dupl. K); at Km 107 on the Mossamedes Railway, Pearson 2887, f. *dolichostylum*; between Mossamedes and Humpata, Fritzsche 165, f. *brachystylum*; Benguella litoral, Lengue, Gossweiler 9686, f. *dolichostylum*.

A. benguellense is a fruticose species, and comes nearest to *A. merenskyanum* Brem., from which it differs in the somewhat greater width of the leaves, the much longer stipular sheath, the greater number of flowers in the inflorescence, the shorter pedicels and the presence of papillae on the ovary, calyx and corolla. The third fruticose species is a much lower plant with squarrose branches, much smaller leaves and a very short stipular sheath. Among the herbaceous species *A. micranthum* seems its nearest ally.

7. **Amphiasma merenskyanum** Brem. n. spec.; *Oldenlandia merenskyana* Dinter in schedula; inter species fruticulosas maxime ut *A. benguellense*, sed foliis angustioribus, vagina stipulari breviore, pedicellis longioribus, floribus minus numerosis ab ea recedens.

Frutex circ. 2.5 m altus, ramulis subpatentibus. Ramuli glabri; internodia costata foliis suberectis aequilonga vel eis paulo longiora. Folia anguste linearia vel filiformia, 2.5—4 cm longa et 0.5—1.0 mm lata, supra scabrida, basi haud distincte a vagina stipulari separata. Vagina stipularis hyalina, plerumque circ. 2.5 mm alta, non cuspidata. Inflorescentia laxe corymbosa, e floribus circ. 9 composita. Pedicelli suberecti 3—8 mm longi. Flores heterostyli. Ovarium glabrum. Calyx glaber 0.8 mm altus, fere ad basin partitus; lobi sinibus obtusis separati. Corolla extus glabra tubo 2—3 mm longo, 1.5 mm diam., intus fere usque ad basin piloso, lobis 1.8—4 mm longis et 1.3 mm latis, fere totis pilosis. Stamina 1 mm infra incisuras corollae inserta; filamenta 0.5 mm longa; antherae 1.2 mm longae. Granula pollinis 22 μ alta et 15 μ diam.

Habitat Africam Austro-occidentalem.

South-west Africa: Erongo Mnts, Ameib, Dinter 6836, type (K), "in cleft of granit blocks", id. 7060; Fransfontein, Liebenberg, 4968, f. *dolichostylum*.

As in the type specimen no fully developed flowers were preserved, it was difficult to say whether this species would be di- or monomorphic. The type specimen may belong to the brachystylous form, but the distance between the point of insertion of the filament and the base of the incision between the two nearest corolla lobes is more like that observed in dolichostylous flowers; the specimen collected by Liebenberg is dolichostylous.

The differences between this species and *A. benguellense* have already been given under the latter.

8. **Amphiasma divaricatum** (Engl.) Brem. n. comb.; *Oldenlandia divaricata* Engl. in Bot. Jahrb. **10**, 269, 1889; Dinter in Fedde, Repert.

19, 319, 1924; Range op. cit. 38, 272, 1935; — *O. trichotoma* Schinz in Bull. Herb. Boiss. 2e Sér. 1, 880, 1901; *Houstonia trichotoma* (Schinz) J. Bär in Vierteljahrsschr. Naturf. Gesellsch. Zürich 68, 432, 1923.

Fruticulus 30—60 cm altus, ramosissimus, ramulis squarrosis rigidis. Ramuli glabri vel glabrescentes, mox cortice griseo-brunneo vestiti; internodia costata foliis subpatentibus aequilonga vel eis longiora. Folia anguste linearia, 3—10 mm longa et 0.3—0.8 mm lata, supra glabra, basi costis a vagina stipulari separata. Vagina stipularis hyalina, 0.5—0.8 mm alta, utroque latere caulis cuspidibus duabus usque ad 0.3 mm longis, plerumque tamen multo brevioribus instructa. Inflorescentiae plerumque ad triades singulas redactae. Pedicelli patentes 1.5—3 mm longi, post anthesin tamen bis longiores. Flores heterostyli. Ovarium glabrum. Calyx glaber, fere ad basin partitus; lobi 0.5 mm longi. Corolla extus papillosa, tubo 2 mm longo et 1.2 mm diam., intus fere ad basin piloso, lobis 2.5 mm longis et 1.2 mm latis, usque ad medium pilosis. Stamina in flore brachystylo filamentis glabris circ. 1 mm longis instructa; antherae 1.2 mm longae. Stylus in flore brachystylo stigmatibus inclusis circ. 1 mm longus.

Habitat Africam Austro-occidentalem.

South-west Africa: Hereroland, Otjimbingwe, alt. 900 m, Marlott 1409, type (PRE), f. *brachystylum*; Karibib, Dinter 2525 (n.v.), 6721, f. *brachystylum*; Grosz-barmen, id. 512 (n.v.); Great Namaland, between Lüderitzbucht and Inachab, Dinter 1898, f. *dolichostylum*, type of. *O trichotoma* Schinz.

Engler l.c. gives for the length of the corolla tube 5 mm, but this is a mistake, for the whole corolla is at the most 5 mm long, and the lobes are slightly longer than the tube.

Range l.c. quotes the following specimens: between Ausis and Khuia (Huib plateau) Schenck 208; Onanis River, Belck 47; Klipdas River, Range 874; s.l. Fleck 799.

A. divaricatum is the most aberrant member of this genus; its mode of branching is different, the leaves are smaller, and the stipular sheath is much shorter than in the other species, but in the characters of the flower and the fruit it fully agrees with them.

18. **PENTODON** Hochst.

Pentodon Hochst. in Flora 27, 551, 1844; Benth. et Hook. f., Genera Plantarum 2, 151, 1873; K. Sch. in Engler u. Prantl, Natürl. Pflanzenfam. IV, 4, 28, 1891; *Hedyotis* spec. Schum. et Thonn., Beskr. Guin. Pl. in Kongl. Dansk Vidensk. Selsk. Afhandl. 3, 71, 1827; Sonder in Fl. Cap. 3, 12, 1865; *Oldenlandia* spec. DC, Prodr. 4, 427, 1830; Hiern in Fl. Trop. Afr. 3, 63, 1877.

Herbae glabrae et succulentae. Caules quadrangulares. Folia opposita, sessilia vel subsessilia, penninervia. Vagina stipularis utroque latere caulis in denticula 2 vel 4, interdum vix conspicua producta. Flores in

inflorescentias terminales vel pseudo-axillares, i.e. solitarias ad nodos dispositi. Inflorescentiae nunc semel dichasiales ramulis monochasialibus, nunc totae monochasiales, nunc totae dichasiales vel plus minusve paniculiformes, laxae. Flores 5-meri, isostyli vel heterostyli. Ovarium biloculare, utroque loculo placenta peltata, apice biloba, subcarnosa instructo; ovula numerosa. Calyx fisso-partitus vel partitus. Corolla alba, dilute caerulea vel dilute violacea, tubo e basi tereti infundibuliformi, fauce dense vel parce barbato, lobis ovatis tubo multo brevioribus. Stamina in floribus isostylis et dolichostylis tota inclusa, in floribus brachystylis filamentis glabris dimidio superiore tubi inserta, exserta; antherae dorsifixae, utroque extremo obtusae. Granula pollinis ellipsoidea, 3-colporata (cf. Tab. XII, fig. j). Stylus glaber; stigmata filiformia in floribus isostylis interdum exserta, in floribus brachystylis inclusa, in floribus dolichostylis tota exserta. Capsula obovoidea, pariete subcoriacea instructa, intra calycem breviter producta et ibi rima loculicida dehiscens. Semina parva et numerosa, angulata, brunnea, madefacta non glutinosa. Cellulae testae parietibus undulatis, hic inde incrassatis instructae (Tab. VIII, fig. i et j).

Speciebus duabus in Africa, Arabia et Madagascar endemicum, specie tertia in America Boreali reperta probabiliter cum specie africana conspecifica et forsitan ex Africa introducta.

Important characters of the genus *Pentodon* are the pentamerous flowers, the curious shape of the placenta with its bilobate top, the comparatively low insertion of the stamens, the rather thin and flexible wall of the capsule, the absence of slime formation in the testa of moistened seeds, and the curious swellings on the lateral walls of the testa cells. Its nearest allies are found in *Oldenlandia* sensu meo and in some of the Asiatic plants that so far have been included in *Oldenlandia*, but which probably will have to be transferred to genera of their own (e.g. *O. biflora* L).

Key to the Species.

1. Decumbent, rarely suberect, fairly large plant. Leaves linear-lanceolate or lanceolate. Inflorescences pseudo-axillary, i.e. solitary at the nodes, dichasial or paniculiform. Bracts minute or absent . . . . . 1. *P. pentander*

1: Erect, 3—6 cm high annual plant. Leaves ovate. Inflorescence terminal, either once dichasial with monochasial branchlets or entirely monochasial. Bracts leaflike . . . 2. *P laurentioides*

1. **Pentodon pentander** (sphalm. *pentandrus*) (Schum.) Vatke in Oesterr. Bot. Zeitschr. **25**, 231, 1875 (quoad specimina citata cf. var. *minor*); K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 377, 1895; *Hedyotis pentandra* Schum. apud Schum. et Thonn. in Kongl. Dansk Vidensk. Selsk. Afhand. 3, 71, 1827; *Oldenlandia pentandra* (Schum.) DC, Prodr. **4**, 427, 1830, comb. illeg. nam non *O. pentandra* Retz., Obs. **4**, 22, 1786, quae est

Vahlia pentandra (Retz.) C. E. C. Fischer; *Pentas*? *Thonningii* Walp., Repert. **6**, 58, 1846; — *Oldenlandia macrophylla* DC, Prodr. **4**, 427, 1830 (*Hedyotis macrophylla* Leprieur in sched.); Hiern in Fl. Trop. Afr. **3**, 63, 1877 et in Cat. Welw. Afr. Pl. **2**, 450, 1898; Schinz in Mém. Herb. Boiss. **1**, 64, 1900; *Hedyotis macrophylla* (DC) Walp., Ann. **2**, 772, 1851/52; — *Pentodon abyssinicus* Hochst. in Flora **27**, 552, 1844, cf. var. *pentander*; — *P. decumbens* Hochst. l.c., cf. var. *minor*; Klotzsch in Peters, Naturw. Reise Mossambique, Botanik **1**, 293, 1862; — *Oldenlandia laxiflora* Bth. in Hook., Niger Flora 404, 1849, cf. var. *pentander*; — *Hedyotis pentamera* Hochst. ex Sond. in Fl. Cap. **3**, 12, 1865; — anne *Hedyotis Halei* T. et G., Fl. N. Am. **2**, 42, 1841; *Oldenlandia Halei* (T. et G.) Chapm., Fl. S. U. S. 181, 1860; *Pentodon Halei* (T. et G.) A. Gray, Syn. Fl. N. Am. 1, 28, 1884; Standley in North American Flora **32**, 18, 1918 et *Oldenlandia succulenta* C. Wright ex Griseb., Cat. Pl. Cub. 285, 1866, adhuc incertum sed probabile, v. infra.

Herba plerumque decumbens, rarius suberecta, caulibus sympodialibus. Caules subquadrangulares, internodiis longioribus. Folia sessilia vel subsessilia, plerumque lineari-lanceolata, rarius lanceolata, magnitudine valde variabilia, apice acuta vel subacuta, basi rotundata vel breviter cuneata, margine revoluta, subtus pallida, costa latiore, nervis utroque latere costae 5—7 vix conspicuis. Vagina stipularis utroque latere caulis in denticulos 2 vel 4 producta. Inflorescentiae pseudo-axillares, longius pedunculatae, dichasiales vel paniculiformes, floribus longe pedicellatis, pedicellis patentibus, post anthesin patentissimis vel subreflexis; bracteae minutae vel nullae. Flores in var. *pentandro* isostyli, nunc antheris stigmatibusque inclusis, nunc antheris inclusis, stigmatibus exsertis, in var. *minore* heterostyli. Ovarium glabrum. Calyx fisso-partitus, lobis triangularibus tubo paulo longioribus. Corolla alba, rosea, dilutea caerulea vel dilute violacea, extus glabra, tubo calyci subaequilongo, fauce subinfundibuliformi, in var. *minore* magis dilatato quam in var. *pentandro*, in floribus isostylis et dolichostylis dense, in floribus brachystylis parce barbato, lobis triangularibus tubo dimidio brevioribus. Stamina ad medium tubum inserta, in floribus isostylis et dolichostylis inclusa, in floribus brachystylis exserta. Granula pollinis 20—23 μ alta et 16—18 μ diam. (Tab. XII, fig. j). Stigmata in floribus isostylis nunc inclusa, nunc exserta, in floribus brachystylis inclusa, in floribus dolichostylis tota exserta. Capsula obovoidea, in var. *pentandro* 3.7 mm alta et 3.5 mm diam., in var. *minore* 3 mm alta et 2.8 mm diam.

Habitat Africam Tropicalem et Subtropicalem, Arabiam, Madagascar, ubi praesertim in locis salinis crescat, interdum tamen in locis aliis humidis usque ad 1500 m alt.; in Insulis Antillanis introducta.

var. *pentander*, floribus isostylis, nunc antheris stigmatibusque inclusis (i), nunc antheris inclusis sed stigmatibus exsertis (floribus pseudo-dolichostylis, pd), capsulis circ. 3.7 mm alta et 3.5 mm diam.; syn.: *Olden-*

landia macrophylla DC; *Pentodon abyssinicus* Hochst.; *Oldenlandia laxiflora* Bth.

Cape Verde Islands: Sao Antao, Chevalier 45287 (i).

Senegal: s.l., Leprieur (type of *O. macrophylla* DC, i).

Portuguese Guinea: Pussubéo, Espirito Santo 1181 (fr).

French Guinea: Nunkore, Baldwin 9727 (pd), Le Testu 859 (pd).

Sierra Leone: Kafogo, Scott Elliott 5493 (i); Port Pokko, id. 5863 (no fl.); Pendembu, alt. 100 m, Thomas 736 (i), 800 (i); Kamal, id. 365 (i); Bumbune, id. 2228 (fr); Njan Geru, id. 7311 (i); Urika, Glanville 189 (i); Nganyakun, Deighton 3080 (fr); Gbimti, id. 4850 (pd); Rokupr, Jordan 16 (pd); s.l., Afzelius s.n. ("*O. trichotoma* Afz.", pd).

Liberia: Firestone Plantation III, Du River, Lindner 262 (i); Eastern Province, Wabo District, Nyaake, Baldwin 6198 (i).

Ivory Coast: Yapo, Chevalier 22365 (fr); between Taumodi and Dimbokro, id. 22251 (i); District Epe, Epe, Keay 16057 (i).

Gold Coast: Owali, Andoh 4552 (i); Ashanti, Prah River, Irvine 438 (i); Thonning s.n., type (C, S).

Togo: Lome, Warnecke 240 (i).

Nigeria: Western Lagos, Rowland s.n. (i); Nun River, Barter 91 (type of *O. laxiflora* Bth., i); Sokoto, Dalziel 401 (i); Ijebu, Tamajong 23256 (i); Ibadan, Mamu Forest Reserve, Latilo F.H.I. 7926 (i); nr Ibadan, Meikle 670.

Cameroons: Bonge, Dusén s.n. (i); Edea, Annet 500 (i).

French Aequatorial Africa: Upper Ubangi, country of the M'Brous, Chevalier 5955 (i); region of the Bambari, Tisserant 2668 (i); Bessone, id. 135 (i); Corisco Island, Mann 1860; Loango, Soyaux 46; Gabon, Duparquet s.n. (i); Ogoué, Neljobu, Schwäbisch & Thollon 96 (pd); French Congo, Kitabi, Lecomte A 69 (pd).

San Thomé: Roça Ledroma, Mocquerys 72 et 95 (pd).

Sudan: White Nile, Petterick s.n. (i); Bahr el Gebel, below Bos, Mr and Mrs Broun 28 (i); Niam-niam, at the Boddo, Schweinfurth 3728 (i); at the Bodumo, id. 3768 (i); Azza Forest nr Meridi, Andrews 1407 (i).

Somaliland: Berbera, Robecchi-Briquetti 344; Uebi Sebeli, Suckert 3 (i); Joicia Baidoa, Paoli 1212 (i), Vatova 55 (i); Dolo on the Dana, Riva 1181 (i).

Arabia: Yemen, Wolledje, Schweinfurth s.n. (fr).

Abyssinia: Modat, Schimper 1750 (type of *P. abyssinicus* Hochst., i); Boran, Malea Guba, Cufodontis 126 (fr).

Uganda: Sezibua River, alt. 1200 m, Dümmer s.n. (i); Miagigji, alt. 1200 m, id. 2472 (fr); Gwagalo, alt. 1200 m, Thomas 854 (i); Kiagwe, Namanve, alt. 1200 m, Eggeling 869 (i); Entebbe, alt. 1500 m, Maitland 226 (i); Kampala, alt. 1200 m, Chandler & Hancock 47 (i); Bugamba, Bungoro, Purseglove 1407 (pd), 1570 (fr).

Tanganyika: W. Usambaras, M'komazi, alt. 450 m, Greenway 3981, 3982 (i); Ulugurus, M'tali, alt. 700 m, Miss Bruce 576 (i); Ulanga, Ifakara, Mrs Culwich 16 (i); Kyimbila, Stolz 1828 (i).

Belgian Congo: Rutshuru, Chesquière 9956 (i); Yangambi, Louis 2584, 8461, 8734, 10694, 10786, 10906, 11380, 14437 (all i), Léonard 1151 (i); Lakulu, VandenBrande 653 (i); National Parc of the Upembe, de Witte 4645, 5791, 6293 (all i); Moanda, VandeRijst 27692, 27891, 27488 (all pd); Boma, id. 27297 (pd); Matadi, id. 25893, 25925 (pd); Majidi, id. 28583 (pd); Kisantu, id. 28753 (pd); Pepokoloaka, id. 15201 (pd); St Jean, id. 1271 (pd); Leopoldville, Achten 72; Ganda, de Briey s.n. (pd); Doruma, De Graer 574; Elisabethville, Schmitz 205 (pd); Luki, Devred 3162 (pd).
Angola: Loanda, Gossweiler 416 (i); Ambriz, Welwitsch 3069; Barra do Bengo, id. 3072 (pd); Golungo Alto, id. 3068; Ambaca, id. 3071 (pd).
Nyasaland: Nyika Plateau, Mc Clounie 74, 128 (i), 94 (fr); Blantyre, Buchanan 146 (i); Shire Highlands, s.l., Scott Eliott 8663 (fr), s.n. (pd).
Northern Rhodesia: Mwinilunga District, Milne-Redhead 5395 (i); Victoria Falls, Wild 3166 (i).

var. *minor* Brem., fructibus minoribus, floribus dimorphis, corollae tubo apicem versus magis dilatata a typo recedens; *Pentodon decumbens* Hochst. l.c.; *Hedyotis pentamera* Hochst. ex Sond. l.c.
Kenya: Witu, Thomas 190 (b); between Mombasa and Lamu, Sacleux 348 (b); Mombasa, Whyte s.n. (d), Miss Napier 6221 (b, d), Shinoni, south of Mombasa, Whyte s.n. (b, d); Voi, alt. 600 m, Miss Napier 997 (b, d); Arabuko, Graham 1710 (d); Sokoke, Jeffery 151 (b); Kilifi, id. 386 (d); Kibarani, id. 500 (b, d).
Tanganyika: Kiongwe, Braun 3525 (d); Moa, id. 1386 (b); Upare District, Usangi, alt. 1400 m, Haarer 834 (d); Suji, alt. 1500 m, id. 1567 (d); Rufiji, Musk 3 (d); Pangani District, Bushiri Estate, Mrs Faulkner K. 651; Pangani, Geilinger 27, 8. 32 (b); Amboni, id. 178 (d); Kissantu, Kränzlin 2977 (d); Tanga, Volkens 22 (b), Greenway 1857 (b, d), Burhani Mohammad 20 (d); Pemba, Barrand s.n. (b); Zanzibar, Hildebrandt 993 (b, d), Boivin s.n. (b, d), Kuntze s.n. (fr), Vaughan 1759, Toms 171 (d), Last s.n. (b, d), Greenway 1099 (d), Mrs Taylor 6 (d), Wallace 787 (b, d), Obtoby 26 (b); Gombela, Holst 2145 (fr); Muoa, id. 3124 (b, d); Maschaua, id. 3523 (b); Mafia, Schlieben 2582 (fr, very small plant with a somewhat unusual aspect, perhaps a new species); District Mahenge, nr Mahenge, alt. 600 m, id. 1774 (b, d), 2331 (d); Lindi District, id. 6090 (b).
Portuguese East Africa: Expedition Island, Kirk s.n. (d); Kongone mouth of Zambesi, id. s.n. (b); Shupanga, id. s.n.; Senna, id. s.n. (b); M'zimbili, Comp. de Moç. 355 (b, d); Valley of the Revue, Vasse 155 (d); Quelimane District, Lugela, Mrs Faulkner K 109 (d); Lourenço Marques, Schlechter 11662 (b, d), Moss & Rogers 947 (d); Rikatla, Junod 192 (b), 402 (b, d).
Southern Rhodesia: District Ndanga, Umtilikwe River, alt. 300 m, Wild 2741 (b).
Transvaal: Zoutpansberg, Valdezia, Miss Obermeyer 1140 (b);

Punda Maria, Codd 5352 (d); Swaziland, Mafutane, Bolus s.n. (d). Natal: Inanda, Wood 1650 (b); Claremont, Schlechter 3156 (d); Durban, Krauss 332 (type of *P. decumbens* Hochst. and of *H. pentamera* Hochst. ex Sond., fr), Gueinzius 471, Wood 1425 (b, d), Rudatis 1520 (b, d), Scott Elliot 1707 (b); s.l., Drège 4887 (d).

Pentodon pentander appears as a pioneer on more or less saline soils near the sea, but is also found on clayey deposits along rivers and lakes, and reaches in such stations an altitude of circ. 1500 m.

A comparatively large percentage of the specimens quoted under the var. *pentander* possess flowers with included anthers but exserted stigmata. Their flowers, therefore, might easily be mistaken for those of the dolichostylous form of a dimorphic variety, but as no specimens are met with of which the stigmata are included and the stamens exserted, the plants with the exserted stigmata can apparently not belong to such a variety: they are "pseudo-dolichostylous" (pd). We must assume that the var. *pentander* is a mixture of two genotypically distinct forms differing in the length of the style. This idea finds support in the regional separation of the two forms, e.g. in the Belgian Congo (see the list of localities given above), but as these forms are distinguishable only when flowers are available, it seemed better to ignore the difference. In Tanganyika, where the var. *pentander* as well as the var. *minor* occur, it is sometimes very difficult, especially when no ripe fruits are present, to decide to which of them a plant with long-styled flowers is to be referred.

The American *Pentodon Halei* (T. et G.) A. Gray is said to differ from *P. pentander* in the glabrous inside of the corolla tube, the cymose inflorescences, the shortness of the peduncles and the clavate, rather stout pedicels, but these characters seem to be of little importance. The corolla of the specimens investigated by me, had no fully glabrous throat, and this character varies in the African plants too, where the brachystylous flowers of the var. *minor* are but very sparsely bearded. In the African plants the inflorescences are either paniculiform or dichasial; this depends on the more or less vigorous growth: the inflorescences of the less vigorous specimens are exactly like those of the American specimens. The pedicels of the latter too are not more distinctly clavate nor stouter than they are in some of the African specimens, and that they are somewhat shorter than in their African allies may be due to the circumstance that their main area of distribution, Florida to Texas, lies somewhat farther to the north than the area of the latter. The type specimen of *Pentodon decumbens* Hochst., my var. *minor*, which was collected in the neighbourhood of Durban, i.e. far to the south, is in this respect not very different from the American plants. For the moment it seems therefore better to sink *P. Halei* in *P. pentander*.

2. **Pentodon laurentioides** Chiov., Fl. Somala 1, 192, 1929.

Herba haplocaulis, erecta, 3—6 cm alta, plerumque e basi ramosa.

Caulis 0.3 mm diam., internodiis 1—1.5 cm longis. Folia sessilia, ovata, 4—11 mm longa et 2—5 mm lata, apice acuta et mucronata, basi rotundata, margine vix revoluta, costa subtus vix prominula, nervis lateralibus vix conspicuis. Vagina stipularis brevis, utroque latere caulis in denticulos vix conspicuos producta. Flores heterostyli, in inflorescentiam terminalem nunc basi semel dichasialem ramulis monochasialibus, nunc totam monochasialem dispositi. Bracteae omnes foliaceae. Pedicelli gracillimi, 1—2 cm longi. Flores heterostyli. Ovarium glabrum. Calyx fere ad basin partitus, lobis anguste triangularibus 0.9 mm longis, glabris. Corolla alba, extus glabra, tubo 4 mm longo, dimidio inferiore tereti, dimidio superiore infundibuliformi, in flore dolichostylo dense, in flore brachystylo sparsius barbato, lobis ovatis 1.5 mm longis. Stamina in flore dolichostylo 1 mm supra basin tubi affixa, antheris subsessilibus dimidio inferiore tubi inclusis, in flore brachystylo filamentis 1 mm longis dimidio superiore tubi inserta; antherae 0.8 mm longae. Granula pollinis in flore dolichostylo 15—16 μ alta et 12 μ diam., in flore brachystylo 21 μ alta et 13 μ diam. Stylus in flore dolichostylo 4 mm longus; stigmata patentia 1.5 mm longa; stylus in flore brachystylo 0.5 mm longus; stigmata erecta 1.1 mm longa. Capsula 2 mm alta et 1.8 mm diam., glabra.

Habitat Somaliam.

Somaliland: Southern part, on the bank of the River Duldis, Puccioni & Stefanini 201, type (F). The type collection consists of several dolichostylous and brachystylous specimens.

This species differs considerably from *P. pentander*, even in the structure of the testa cells. The lateral walls of *P. laurentioides* are more strongly undulating, and the local swellings are less numerous and much less prominent (cf. Tab. VIII, fig. i and j).

19. LELYA Brem. n. gen.

Lelya Brem. n. gen. *Hedyotidearum*, vagina stipulari utroque latere caulis in lobum late triangularem, in parte inferiore caulis indivisum, in parte superiore apice bidentatum producta, fructu pariete ossea instructo et in rostrum solidum producto, seminibus paucis ab *Oldenlandia* L emend. Brem. recedens.

Genus adhuc monotypicum in savannis africanis endemicum.

Species unica: *L. osteocarpa* Brem.

Lelya osteocarpa Brem. n. spec.

Herba perennis, e basi ramosa, caulibus decumbentibus, ramosis. Caules ramique in var. *osteocarpa* dense pubescentes, in var. *angustifolia* subglabri; novelli 0.4—0.8 mm diam., basin versus usque ad 3 mm incrassati et hic cortice griseo-brunneo obtecti. Folia opposita, in petiolum in var. *osteocarpa* dense pubescentem, in var. *angustifolia* subglabrum, 1.5—2.5 mm longum, dimidio inferiore tamen in vagina stipulari absorptum

contracta; lamina in var. *osteocarpa* elliptico-lanceolata vel lanceolata et in var. *angustifolia* linearis, in var. *osteocarpa* plerumque 5—8 mm, interdum usque ad 14 mm longa, 3.5—5 mm lata, in var. *angustifolia* 5—7 mm longa et circ. 1 mm lata, apice subobtusa, basi contracta, margine recurvata, subcoriacea, vix distincte discolor, sicc. plerumque vix distincte discolorata, interdum olivacea vel lutescens, supra glabra vel scabridula, subtus in var. *osteocarpa* pubescens, in var. *angustifolia* glabra, costa supra impressa, subtus prominula, nervis utroque latere costae 2—3. Vagina stipularis circ. 1 mm alta, inter petiolos in lobum late triangularem, in parte inferiore caulis indivisum, in parte superiore bidentatum producta. Flores in triades terminales dispositi, floribus lateralibus foliis magnitudine paulo redactis et praesertim angustioribus suffulti. Pedicelli circ. 1 mm longi. Flores 4-meri, heterostyli. Ovarium biloculare, in var. *osteocarpa* pubescens, in var. *angustifolia* glabrum, utroque loculo placenta peltata instructo; ovula satis numerosa. Calyx fisso-partitus, tubo 0.4 mm alto, lobis oblongo-spatulatis 2.2 mm longis, carnosis, carinatis, subobtusis, in var. *osteocarpa* sparse pubescentibus, in var. *angustifolia* glabris. Corolla alba, extus in var. *osteocarpa* apicem versus sparse hirtella, in var. *angustifolia* glabra, tubo 1.6—2 mm longo, intus sparse piloso, lobis intus papillosis 3—5 mm longis. Stamina ad incisuras corollae inserta, in flore brachystylo filamentis 2.4 mm, in flore dolichostylo filamentis 0.3 mm longis instructa; filamenta semper glabra et in tubo decurrentia; antherae dorsifixae utroque extremo obtusae in flore brachystylo 0.8 mm, in flore dolichostylo 0.6 mm longae. Granula pollinis ellipsoidea, 3- vel 4-colporata (Tab. XII, fig. k), in flore brachystylo 33 μ alta et 30 μ diam., in flore dolichostylo 22 μ alta et 20 μ diam. Stylus in flore brachystylo 2 mm longus, basin versus sparse hirtellus, in flore dolichostylo 3 mm longus, dimidio inferiore sparše hirtellus; stigmata 0.6 mm longa. Capsula in var. *osteocarpa* hirtella, in var. *angustifolia* nondum nota, pariete ossea instructa et in costrum ronicum solidum producta, rostro loculis dimidio breviore, tarde rima loculicida dehiscens. Semina pauca, subnigra, angulata, alveolata, madefacta non glutinosa. Cellulae testae parietibus rectis instructae, minute sed distincte punctatae (Tab. VIII, fig. k).

Habitat Africam Tropicalem.

var. *osteocarpa*, caulibus petiolisque dense pubescentibus, foliis elliptico-lanceolatis vel lanceolatis, subtus pubescentibus, ovario pubescente, corolla apicem versus hirtella.

Northern Nigeria: Bauchi Plateau, Lely P 96, type (K), id. P 663; Naraguta, alt. 1200 m, id. 249.

Belgian Congo: Haut Lomami, Kisamba-samba, alt. 1020 m, Mullenders 1070, "savane".

Northern Rhodesia: Solwezi District, Milne-Redhead 1197.

Tanganyika: Iringa Province, Njombe, alt. 1800 m, Staples 153; Lupembe Road, alt. 1600 m, Haarer 1605.

var. *angustifolia* Brem. n. var., caulibus petiolisque subglabris, foliis linearibus, utroque latere glabris, ovario glabro, corolla extus glabra. Tanganyika: Iringa Province, Idodi area, Ward 16, type of variety (K).

When more material becomes available, this variety may perhaps prove to to be a distinct species, but for the moment it seems better to regard it is a variety.

The name *Lelya* was proposed by Mr E. Milne-Redhead on the label of his n° 1197. He proposed it as a subgenus of *Oldenlandia*, but it seems better to keep it apart, although it can not be denied that it comes very near to this genus. Apart from the very curious bony fruits, it differs from *Oldenlandia* in the form of the stipules.

20. **OLDENLANDIA** L EMEND. BREM.

Oldenlandia L, Genera Plantarum (ed. 1, n. 154, 1737), ed. 2, n. 119, 1753; Species Plantarum, ed. 1, n. 119, 1753; *Oldenlandia* L subgenus *Oldenlandia* Roxb. et subgenus *Karamyschewia* Fisch. et Mey. necnon *Hedyotis* L subgenus *Anotidopsis* Hook. f. in Bentham et Hooker, Genera Plantarum 2, 57, 1873; *Oldenlandia* L sect. *Anotidopsis* Hook. f., sect. *Karamyschewia* Fisch. et Mey., sect. *Eu-oldenlandia* K. Sch. in Engler u. Prantl, Nat. Pflanzenfam. IV, 4, 25, 1891, eodem modo in Engler, Pflanzenw. Ost-Afrikas C, 374, 1895.

Herbae vel raro suffrutices. Folia opposita, apice calloso-mucronata, basi vagina stipulari connecta. Flores plerumque in inflorescentias terminales vel terminales et pseudo-axillares, i.e. solitarias ad nodos, dispositi, rarius ad nodos solitarii vel in paria vel fascicula aggregati, casu quo flos unus pseudo-axillaris, alter vel alii a brachyblastis interdum vix distinguendis elati. Flores 4-meri, isostyli vel heterostyli. Ovarium biloculare, utroque loculo placenta peltata instructo; ovula numerosa in placentam immersa. Calyx fisso-partitus vel partitus. Corolla tubo plerumque brevi instructa, fauce plerumque barbata. Stamina plerumque ad incisuras corollae inserta, in floribus dolichostylis tamen ab incisuris remotiora; filamenta glabra vel rarissime scabrido-papillosa; antherae dorsifixae, utroque extremo obtusae. Granula pollinis globosa vel ellipsoidea, plerumque 3-colporata, rarissime 4- vel 5-colporata (cf. Tab. XII, fig. l—u, Tab. XIII, fig. a—o). Stylus glaber vel hirtellus; stigmata subglobosa vel elongata. Capsula pariete cornea vel rarissime pergamentacea et septo indivisibili instructa, intra calycem interdum in rostrum producta et ibi rima loculicida dehiscens. Semina plerumque numerosa, subglobosa vel angulata, laevia vel alveolata, madefacta interdum glutinosa. Cellulae testae parietibus rectis vel undulatis instructae, plerumque laeves, rarius minutissime punctatae, in speciebus aliis grosse granulatae vel reticulatae (cf. Tab. VIII, fig. l—n, Tab. IX et Tab. X).

Speciebus satis numerosis per partes tropicales et subtropicales totius orbis distributum.

Species typica: *O. corymbosa* L.

Even in this restricted sense *Oldenlandia* is still a rather polymorphic genus, and accordingly difficult to grasp. Within the group of genera provided with comparatively small flowers, which when isostylous have their anthers and stigmata at the same height, and with capsules opening by means of a loculicidal fissure that does not extend beyond the enclosure of the calyx, it is characterized by the tetramery of its flowers, the more or less horny wall and the indivisible septum of the capsule, and the subglobose or angular seeds.

As the key to the subgenera shows, it comprises a comparatively large number of well-defined groups, of which only those that are represented on the African Continent and in the island Socotra are here dealt with. Some of these groups, especially some of those whose seeds do not become slimy when they are moistened, might be given generic rank, but for the moment it seems better to leave them in *Oldenlandia*. Most of the groups are apparently confined to Africa. The more widely distributed ones are *Anotidopsis*, *Octoneurum*, *Aneurum* and *Eu-oldenlandia*.

Key to the Subgenera and Species.

1. Seeds not becoming slimy when moistened.
   2. Stigmata subglobose.
      3. Capsule not distinctly beaked. Stipular sheath on each side of the stem with a single undivided lobe.
         4. Glabrous herb with ovate or ovate-lanceolate leaves. Flowers in lax monochasia; pedicels very slender. Corolla tube bearded. Style hirtellous. Capsule narrowly ovoid . . . . . Subgenus 1. *Alsinastrum*
         4: Hirtellous, strongly ramified herb with linear leaves. Flowers subcapitate. Corolla tube glabrous. Style glabrous. Capsule subglobose, hidden between the leaf-like bracts and bracteoles, thin-walled . . . . . Subgenus 2. *Cryptocarpum*
      3: Capsule distinctly beaked; the beak nearly half as long as the basal part. Stipular sheath on each side of the stem with a bifid or bipartite lobe. Corolla tube and style glabrous . . . . . Subgenus 3. *Anotidopsis*
   2: Stigmata elongated.
      5. Leaves petiolate, varying between lanceolate and ovate.
         6. Perennials with a more or less woody rhizome and decumbent shoots. Calyx lobes wide, not separated by distinct gaps. Seeds few, angular; testa cells with straight walls . . . . . Subgenus 4. *Orophilum*
         6: Annuals or, rarely, perennials with erect stems and rather large and thin leaves. Calyx lobes narrow, separated by distinct gaps. Seeds numerous, subglobose; testa cells with wavy walls . . . . . Subgenus 5. *Hymenophyllum*
      5: Leaves sessile.

7. Capsule distinctly beaked.
   8. Calyx lobes with a wide hyaline margin. Corolla tube long, bearded with coarsely pustulate hairs. Style glabrous. . . . . Subgenus 6. *Platyrrhynchus*
   8: Calyx lobes entirely green. Corolla tube short, bearded with flattened, finely granulate hairs. Style hirtellous. . . . . Subgenus 7. *Hemicephalum*
7: Capsule not distinctly beaked.
   9. Erect or ascending herbs. Cauline leaves linear or filiform. Inflorescences confined to the top of the stem.
      10. Inflorescences contracted, involucrate. Flowers sessile or subsessile . . . . . Subgenus 8. *Tardavelinum*
      10: Inflorescences lax, without involucre. Flowers slenderly pedicellate . . . . . Subgenus 9. *Trichopodium*
   9: Decumbent or straggling herbs. Inflorescences or flowers usually for the greater part pseudo-axillary; rarely all the flowers combined in a lax terminal panicle, but in that case the leaves not linear.
      11. Straggling herbs. Leaves ovate-lanceolate to linear-oblong, towards the base conspicuously ciliate. Flowers in laxly dichasial inflorescences that are sometimes combined in a terminal panicle. Corolla tube sparsely bearded. Capsule globose, 8-costate. Testa cells not punctate . . . . . Subgenus 10. *Octoneurum*
      11: Decumbent herbs. Leaves linear or, rarely, linear-lanceolate, not ciliate. Flowers solitary or more or less fascicled. Corolla tube glabrous. Capsule ecostate. Testa cells minutely punctate . . . Subgenus 11. *Aneurum*

1: Seeds becoming slimy when moistened.
   12. Inflorescences confined to the top of the stem and, eventually, its branches. Shoots erect or ascending, monopodial. Style always hirtellous.
      13. Inflorescences spiciform, racemiform or paniculiform.
         14. Inflorescences spiciform. Capsule shortly but distinctly beaked . . . . . Subgenus 12. *Stachyanthus*
         14: Inflorescences racemiform or paniculiform. Capsule not distinctly beaked.
            15. Inflorescences racemiform. Testa cells with wavy walls. Herb with spreading branches . . . . . Subgenus 13. *Euryanthus*
            15: Inflorescences paniculiform. Testa cells with straight walls. Herbs with suberect branches . . . . . Subgenus 14. *Polycarpum*
      13: Inflorescences contracted, more or less corymbiform or capituliform . . . . . Subgenus 15. *Cephalanthium*

12: Inflorescences, or flowers, for the greater part at the nodes, usually solitary; if in pairs than one of the two with a rudimentary leaf pair at the base . . . . . Subgenus 16. *Eu-oldenlandia*

Subgenus 1. *Alsinastrum*

1. A 10—20 cm high herb with decumbent, sparsely ramified stems, 5—12 mm long leaves and flowers with 5—10 mm, in the fruiting stage up to 4.5 cm long pedicels. . . . . 1. *O. Balfourii*

Subgenus 2. *Cryptocarpum*

1. Herb with patent branches and crowded 1—2 cm long leaves. Corolla tube 6 mm long . . . . . 2. *O. cryptocarpa*

Subgenus 3. *Anotidopsis*

1. Erect herbs. Leaves linear to elliptic-oblong. Lobes of the stipular sheath bifid. Flowers isostylous.
   2. Leaves linear-oblong to elliptic-oblong, 1.2—3 cm long and 3—13 mm wide. Heads consisting of 20—30 flowers . 3. *O. cephalotes*
   2: Leaves linear, 1—1.5, rarely up to 2 cm long and 1—2, rarely up to 3.5 mm wide. Heads consisting of 5—15 flowers . . . . . 4. *O. angolensis*

1: Decumbent or creeping herbs. Leaves lanceolate to suborbicular. Lobes of the stipular sheath bipartite. Flowers isostylous or heterostylous
   3. Flowers isostylous. Corolla lobes up to 1.2 mm long. Pedicels at the most 3 mm long.
      4. Leaves ovate or lanceolate, 10—15 mm long and 5—7 mm wide; the impressed midrib strigose. Inflorescence consisting of 9—25 flowers. Pollen grains 3-colporate . . . . . 5. *O. goreensis*
      4: Leaves ovate or suborbicular, 4—7 mm long and 2—5 mm wide; the impressed midrib glabrous. Inflorescence consisting of 3—9 flowers. Pollen grains 4-colporate . . . . . 6. *O. anagallis*
   3: Flowers heterostylous. Corolla lobes at least 1.4 mm long. Pedicels in the fruiting stage up to 5 mm long. Leaves ovate, usually 6—12 mm long and 4.5—7 mm wide . . . . . 7. *O. verticillata*

Subgenus 4. *Orophilum*

1. Testa cells either entirely smooth or almost invisibly punctate.
   2. Flowers solitary or in pairs superposed at the nodes . . . . . 8. *O monanthos*
   2: Flowers in triads or cymes at the end of the shoots.
      3. Flowers distinctly pedicellate.
         4. Leaves on the upper side entirely glabrous. Pedicels 4—6 mm long. Style hirtellous . . . . . 9. *O. Hockii*
         4: Leaves towards the margin scabridulous. Pedicels 0.5—1.5 mm long. Style glabrous.

5. Leaves membranaceous, ovate-lanceolate, 6—12 mm long, remaining green in drying. Stipular sheath subtruncate, on each side of the shoot with 2 filiform appendages . . . . . 10. *O. geophila*

5: Leaves subcoriaceous, ovate, 12—25 mm long, turning olivaceous in drying. Stipular sheath on each side of the shoot with a triangular lobe provided with 5 or 7 filiform appendages . . . . . 11. *O. Friesiorum*

3: Flowers subsessile. The few-flowered partial inflorescences provided with a 4—15 mm long peduncle and usually arranged in triads . . . . . 12. *O. Johnstonii*

1: Testa cells either coarsely reticulate or coarsely granulate. Style either entirely glabrous or almost imperceptibly puberulous.

6. Leaves lanceolate. Pollen grains 34—38 μ high and 30—35 μ in diam. Testa cells reticulate. . . . . 13. *O. Greenwayi*

6: Leaves ovate. Pollen grains smaller. Testa cells reticulate or coarsely granulate.

7. Corolla tube densely bearded.

8. Leaves membranaceous, at least 3 mm long and 2.5 mm wide, but usually 5—12 mm long and 4—9 mm wide, on the upper side either scabridulous or hirtellous. Testa cells coarsely granulate . . . . . 14. *O. rupicola*

8: Leaves subcoriaceous, 1.5—4 mm long and 0.8—2.5 mm wide, on both sides smooth and glabrous. Testa cells reticulate . . . . . 15. *O. muscosa*

7: Corolla tube subglabrous. Leaves thinly membranaceous . . . . . 16. *O. tenella*

Subgenus 5. *Hymenophyllum*

1. Annuals with a single stem.

2. Inflorescence sessile and capituliform. Flowers always isostylous. Ovary more or less hirtellous.

3. Leaves pellucid, on the upper side glabrous. Corolla tube 1.5—3 mm long. Anthers with the upper half exserted . . . . . 17. *O. pellucida*

3: Leaves less thin, on the upper side at first sparsely strigose. Corolla tube 4.3 mm long. Anthers entirely included . . . . . 18. *O. echinulosa*

2: Inflorescence either a spike, corymb or panicle composed of 3- or 5-flowered cymes or dichasial at the base and going out in monochasial branchlets. Ovary glabrous.

4. Flowers heterostylous. Calyx lobes up to 1 mm, corolla tube up to 1.2 mm long.

5. Leaves with 5—8 nerve pairs. Inflorescence a spike, corymb or panicle consisting of 3- or 5-flowered cymes. Corolla tube

1.0 mm, lobes 1.2 mm long . . . . . 19. *O. nervosa*

5: Leaves with 3 or 4 nerve pairs. Inflorescence forked. Corolla tube 0.6 mm, lobes 0.5 mm long . . . 20. *O. Chevalieri*

4: Flowers isostylous. Calyx lobes 2 mm, corolla tube 7 mm long. Inflorescence forked . . . . . 21. *O. hymenophylla*

1: Perennial with several stems. Inflorescence once dichasially forked, 3- to 9-flowered. Calyx lobes 3 mm, corolla tube 7 mm long . . . . . 22. *O. sipaneoides*

Subgenus 6. *Platyrrhynchus*

1. Rosulate or subrosulate herb, usually with two leaf pairs. Leaves linear, 1.5—5 cm long. Flowers in cymes, isostylous . . . . . 23. *O. bicornuta*

1: More or less pulvinate shrublets. Flowers solitary, heterostylous.

2. Leaves spatulate. Stipular sheath without fringe. Calyx lobes subquadrate, in the centre with a green dot . . . . 24. *O. ocellata*

2: Leaves linear-oblong or linear. Stipular sheath fringed; fringe in the centre of the shoot produced above the young leaves. Calyx lobes narrow, with a green stripe extending to the top.

3. Leaves circ. 5 mm long; the apical part distinctly patent. Calyx lobes 1.6 mm long . . . . . 25. *O. aretioides*

3: Leaves 9—20 mm long; the apical part not distinctly patent. Calyx lobes 3—4.2 mm long . . . . . 26. *O. pulvinata*

Subgenus 7. *Hemicephalum*

1. Semiglobose, circ. 5 cm high cushion-plant with linear, circ. 3 mm long leaves and small flowers. Style hirtellous. 27. *O. saxifragoides*

Subgenus 8. *Tardavelinum*

1. Stem not more than 6 cm high. Leaves filiform, not more than 8 mm long. Flowers shortly but distinctly pedicellate, in subsessile cymes . . . . . 28. *O. nematocaulis*

1: Larger plants with linear, more than 8 mm long leaves and capitate flowers.

2. Stem 7—15 cm high. Flowers isostylous. Corolla tube 4 mm, lobes 1.2 mm long. Pollen grains 30 μ in diam. . . . 29. *O. gregaria*

2: Stem 15—20 cm high. Flowers heterostylous. Corolla tube 6 mm, lobes 2.2 mm long. Pollen grains 14 μ in diam. . . . . 30. *O. tardavelina*

Subgenus 9. *Trichopodium*

1. Stem 5—20 cm high. Cauline leaves 3—10 mm long. Panicle few-flowered. Pedicels 1—3 cm long. Corolla tube, according to the variety, 1.2—3.6 mm long . . . . . 31. *O. rosulata*

1: Stem 50—55 cm high. Cauline leaves 1—3 cm long. Panicle many-flowered. Pedicels 0.6—1 cm long. Corolla tube 4.7 mm long . . . . . 32. *O. microcalyx*

Subgenus 10. *Octoneurum*

1. Internodes at the middle of the stem 2—4.5 cm long. Leaves narrowly ovate-lanceolate or linear-oblong, usually 2—4.5 cm long and 6—16 mm wide. Pedicels 2—5 mm long. Flowers heterostylous . . . . . 33. *O. affinis*

1: Internodes at the middle of the stem 0.3—1.0 cm long. Leaves ovate, 7—11 mm long and 4—6.5 mm wide. Pedicels 1.5—2 mm long. Flowers isostylous . . . . . 34. *O. Laurentii*

Subgenus 11. *Aneurum*

1. Herb with decumbent, occasionally rooting, shoots. Leaves usually 2—6 cm long and 2—7 mm, rarely up to 12 mm wide. Pedicels 0.5—3 cm long. Calyx lobes 1—1.5 mm and corolla tube 1—2 mm long. Style glabrous. Seeds yellow or light brown . 35. *O. lancifolia*

Subgenus 12. *Stachyanthus*

1. Perennial with erect or ascending stems and linear, 1—3.5 cm long leaves. Stipular sheath fimbriate. Flowers in glomerules along the axis of the spiciform inflorescence . . . . . 36. *O. flosculosa*

Subgenus 13. *Euryanthus*

1. Annual with a single stem and spreading branches. Leaves linear, 3—5.5 cm long. Stipular sheath fimbriate. Stem and branches ending in racemiform inflorescences with a filiform rhachis; flowers in pairs; pedicels 2—5 mm, and in the fruiting stage up to 8 mm long . . . . . 37. *O. patula*

Subgenus 14. *Polycarpum*

1. Panicle consisting of slenderly pedunculate fascicles; pedicels in the flowering stage less than 1 mm, afterwards up to 2 mm long. Calyx lobes 1 mm long . . . . . 38. *O. taborensis*

1: Panicle consisting of slenderly pedunculate triads or cymes; most of the pedicels already in the flowering stage more than 2 mm long. Calyx lobes at the most 0.6 mm long

2. Leaves on the upper side scabridulous; the lower ones 0.7—1.2 cm long. Filaments glabrous. Capsule 1.6 mm high and 2.1 mm in diam. . . . . 39. *O. Duemmeri*

2: Leaves on both sides smooth; the lower ones 2—3 cm long. Filaments scabrido-papillose. Capsule 1.2 mm high and 1.7 mm in diam. . . . . 40. *O. microcarpa*

Subgenus 15. *Cephalanthium*

1. Calyx lobes entirely green. Top of the corolla lobes not distinctly uncinate.

2. Stipular sheath 1—1.5 mm high, on each side of the stem with 2 filiform, 1—1.5 mm long appendages. Flowers all distinctly pedicellate . . . . . 41. *O. scopulorum*
2: Stipular sheath 2—4 mm high, on each side of the stem with 4 filiform, up to 4 mm long appendages. Most of the flowers subsessile . . . . . 42. *O. Wiedemannii*

1: Calyx lobes with a hyaline margin. Top of the corolla lobes distinctly uncinate.
3. Fimbriae of the stipular sheath rarely more than 0.5 mm long. Ovary subhirtellous. Calyx lobes narrowly triangular . . . . . 43. *O. capitata*
3: Fimbriae of the stipular sheath rarely less than 2 mm long. Ovary glabrous. Calyx lobes ovate-lanceolate . . . 44. *O. ichthyoderma*

Subgenus 16. *Eu-oldenlandia*

1. Flowers solitary or in pairs at the nodes and provided with pedicels as long as the leaves. Testa cells coarsely granulate.
2. Flowers nearly all in pairs. Leaves linear . . . 45. *O. herbacea*
2: Flowers nearly all solitary. Leaves lanceolate or elliptic-lanceolate . . . . . 46. *O. pumila*

1: Flowers at least partly in pedunculate cymes or in fascicles, rarely all solitary or in pairs, but then the pedicels always much shorter than the leaves or almost entirely suppressed. Testa never coarsely granulate.
3. Flowers in pedunculate cymes, sometimes accompanied by a few slenderly pedicellate solitary ones, heterostylous or isostylous.
4. Flowers heterostylous. Style always hirtellous.
5. Stems ascending. Leaves linear. The brachystylous form with glabrous filaments.
6. Leaves 7—16 mm long and 0.8—2 mm wide. Peduncle scabridulous. Testa cells with slightly wavy walls . . . . . 47. *O. umbellata*
6: Leaves 2.5—6 cm long and 1.5—5.5 mm wide. Peduncle glabrous. Testa cells with straight walls . . 48. *O. somala*
5: Stems erect or suberect. Leaves very narrowly linear or filiform, 1.5—2.5 cm long and 0.3—1.2 mm wide. The brachystylous form with scabridulous filaments . . 49. *O. eludens*
4: Flowers isostylous.
7. Stamens provided with filaments. Style hirtellous. Testa cells with wavy walls . . . . . 50. *O. praetermissa*
7: Anthers sessile. Style glabrous. Testa cells various.
8. Leaves linear or linear-lanceolate.
9. Leaves 1.5—3 cm long and 2.5—5 mm wide. Corolla tube 0.6 mm, lobes 1.2 mm long. Testa cells with wavy walls, smooth . . . . . 51. *O. corymbosa*

9: Leaves 1—3 cm long and 1—2.3 mm wide. Corolla tube 0.9 mm, lobes 0.7 mm long. Testa cells with straight walls, finely but distinctly granulate . 52. *O. aemulans*

8: Leaves narrowly linear or filiform.

10. Leaves 4—12 mm long and 0.3—0.8 mm wide. Corolla tube 0.3 mm, lobes 0.5 mm long. Seeds unknown . . . . . 53. *O. microphylla*

10: Leaves 1—4 cm long and 0.4—0.6 mm wide. Corolla tube 0.6—1.0 mm, lobes 0.7—1.0 mm long. Testa cells with straight walls . . . . . 54. *O. linearis*

3: Flowers either solitary or in pairs, fascicles or cymes, but then the peduncle very short or the majority of the flowers solitary; always isostylous.

11. Flowers in more or less dense groups, distinctly pedicellate.

12. Corolla tube 1.0 mm, lobes 0.7 mm long. Style hirtellous. Testa cells with nearly straight walls . 55. *O. fastigiata*

12: Corolla tube 0.5 mm, lobes 0.5 mm long. Style glabrous. Testa cells with distinctly wavy walls . . 56. *O. densiflora*

11: Most of the flowers solitary or in pairs. Testa cells with wavy walls.

13. Flowers distinctly pedicellate. Style slightly hirtellous . . . . . 57. *O. caespitosa*

13: Flowers subsessile. Style glabrous.

14. Leaves thin. Stipular sheath shortly fimbriate.

15. Calyx lobes not more than 1 mm long 58. *O. capensis*

15: Calyx lobes more than 3 mm long . 59. *O. geminiflora*

14: Leaves rigid. Stipular sheath with longer fimbriae.

16. Leaves linear, 2—3 cm long and 1.8—2.3 mm wide. Fimbriae of the stipular sheath circ. 2 mm long . . . . . 60. *O. sclerophylla*

16: Leaves acicular, 2—3 cm long and 0.5—0.7 mm wide. Fimbriae of the stipular sheath up to 4 mm long . . . . . 61. *O. acicularis*

Subgenus 1. *Alsinastrum* Brem.

Subgenus seminibus madefactis non glutinosis necnon stigmatibus subglobosis ad subgenera *Cryptocarpum* Brem. et *Anotidopsem* (Hook. f.) K. Sch. accedens, sed floribus graciliter pedicellatis, antheris sessilibus ut stigmata in corollae tubo inclusis ab ambobus recedens, ab *Anotidopsi* insuper vagina stipulari utroque latere caulis in lobum indivisum producta, calyce fissopartito, capsula non distincte rostrata, a *Cryptocarpo* foliis ovatis vel ovato-lanceolatis, glabris, corolla fauce barbata, stylo hirtello, capsula elongata et pariete crassiore instructa distinguendum.

Subgenus adhuc monotypicum in insula Socotra endemicum.

Species unica: *O. Balfourii* Brem.

1. **Oldenlandia Balfourii** Brem. n. nom.; *Hedyotis stellarioides* Balf. f. in Proc. Roy. Soc. Edinb. **11**, 836, 1882, non *Oldenlandia stellarioides* Hiern in Cat. Welw. Afr. Pl. **2**, 417, 1898.

Herba perennis, e basi ramosa, caulibus gracilibus decumbentibus, sparse ramosis, 10—20 cm alta. Caules ramique quadricostulati, glabri vel costulis vix conspicue scabrido-papillosi, 0.4—0.6 mm diam., internodiis ad medium caulem 1.5—3.5 cm longis. Folia ovata vel ovato-lanceolata, 5—12 mm longa et 3.5—8 mm lata, basi contracta, paulum discoloria, sicc. supra olivacea, utrimque glabra, costa subtus prominula, nervis inconspicuis. Vagina stipularis vix 0.5 mm alta, utroque latere caulis in lobum late triangularem parte basali paulo breviorem producta. Flores primum terminales, deinde in positionem lateralem coacti et inde semper solitarii ad nodos, isostyli. Pedicelli ad anthesin 5—10 mm longi, post anthesin interdum usque ad 4.5 cm elongati. Ovarium glabrum. Calyx fisso-partitus, tubo 0.4—0.5 mm longo, lobis ovato-triangularibus 0.9 mm longis, margine sublaevi. Corolla extus glabra, tubo tereti 3 mm longo et 1.1 mm diam., intus fauce barbato, ceterum sparse piloso, lobis 2—3 mm longis. Antherae sessiles, paulo supra medium tubum affixae, 1.0 mm longae. Granula pollinis 3-colporata, 22 μ alta et 20 μ diam. (Tab. XII, fig. 1). Stylus hirtellus, 2.5—3 mm longus, crassior; stigmata subglobosa 0.5 mm alta et 0.7 mm diam., paulo supra antheras producta. Semina subglobosa, saturate brunnea, madefacta non glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae (Tab. VIII, fig. 1).

Habitat insulam Socotram.

Socotra: s.l., Balfour c.s. 313, type (K), id. 59 p.p.; Upper Wadi Dilal, Kischen, alt. 900 m, Schweinfurth 579; ibid. alt. 1000 m, id. 633.

This species shows a rather striking resemblance to *O. Sieberi* Baker (in Fl. Maur. et Seych. 138, 1877), but a closer inspection shows that the two species differ in several taxonomically important points. In *O. Sieberi* the corolla is inside entirely glabrous, the pollen grains are provided with 3 or 4 pores not situated in fissures, the style is glabrous, the stigmata are elongated and the testa cells have strongly undulating walls (Tab. VIII, fig. m).

O. Balfourii occupies a very isolated position. Even among the species provided with subglobose stigmata and with seeds that do not become slimy when they are moistened, it has no near allies.

Subgenus 2. *Cryptocarpum* Brem.

Subgenus seminibus madefactis non glutinosis necnon stigmatibus subglobosis ad subgenera *Alsinastrum* Brem. et *Anotidopsem* (Hook. f.) K. Sch. accedens, sed capsula globosa, pariete papyracea instructa ab ambobus recedens, ab *Alsinastro* insuper floribus sessilibus, subcapitatis, corolla longituba intus glabra, stylo glabro, ab *Anotidopsi* vagina stipulari

utroque latere caulis in lobulum singulum producta, calyce fisso-partito, corolla longituba distinguendum.

Subgenus adhuc monotypicum in Somalia endemicum.

Species unica: *O. cryptocarpa* Chiov.

2. **Oldenlandia cryptocarpa** Chiov., Result. Sc. Miss. Stefan.-Paoli, Somali Ital. **1**, 88, 1916.

Herba perennis, e basi ramosa, caulibus etiam ramosis quoquoversus patentibus, subaequilongis, circ. 14 cm alta et 20 cm diam. Caules ramique subteretes, hirtelli, ad medium 1—1.5 mm diam., basi cortice desquamante vestiti, internodiis ad medium caulem 1—2 cm longis, superioribus gradatim brevioribus. Folia linearia, 1—2 cm longa et 0.6—1.7 mm lata, subsucculenta, sicc. haud conspicue discolorata, supra praesertim marginem versus hirtella, subtus costa sola hirtella, costa supra impressa, subtus prominula. Vagina stipularis hyalina, circ. 1.5 mm alta, subtruncata sed utroque latere caulis centro in lobulum acutum parti basali subaequilongum producta. Flores subsessiles, subcymosi; ramuli cymae foliis ordinariis suffulti et flores ultimi foliis ordinariis bracteolati; cymae ramos ordinarios et brachyblastos terminantes; flores heterostyli. Ovarium hirtellum. Calyx fisso-partitus, tubo 0.4 mm alto, hyalino, lobis linearibus 1.5 mm longis, margine et costa hirtellis, basi etiam hyalinis, ceterum viridibus. Corolla extus subglabra, tubo 6 mm longo, intus glabro, lobis 2 mm longis. Stamina in flore brachystylo (solo noto) filamentis 1 mm longis ad incisuras corollae inserta; antherae 0.7 mm longae. Granula pollinis 3-colporata subglobosa, 26 μ diam. Stylus glaber in flore brachystylo 5 mm longus; stigmata subglobosa. Capsula hirtella, subglobosa, 1.6 mm diam., pariete papyracea instructa, tarde dehiscens. Semina satis numerosa, dilute brunnea, madefacta non glutinosa; cellulae testae humiles, parietibus tenuibus rectis instructae, non punctatae (Tab. VIII, fig. n).

Habitat Somaliam.

Somaliland: between Gorici and El Maju, Paoli 626, type (F).

This species too occupies an isolated position. The capituliform inflorescences consisting of flowers that are preceded by a pair of normal leaves, and the thin-walled capsules are features that are met nowhere else. The single stipular lobes, the inside glabrous corolla tube and the glabrous style are also noteworthy characters. The habit and the undivided stipular lobes suggest affinity with the genus *Eionitis* Brem., but the flowers and the seeds are quite different.

Subgenus 3. *Anotidopsis* (Hook. f.) K. Sch.

Herbae annuae, rarius plus minusve perennantes, nunc caulibus erectis vel ascendentibus instructae, nunc prostratae vel repentes. Folia sessilia vel breviter petiolata, forma variabili. Vagina stipularis brevis, utroque latere caulis in lobum triangularem, interdum breviorem, bifidum vel bipartitum producta. Inflorescentiae terminales et interdum pseudo-

axillares, capituliformes vel umbelliformes. Flores parvi, isostyli vel heterostyli. Calyx ad basin partitus, lobis ovatis vel ovato-triangularibus. Corolla brevituba extus intusque glabra vel subglabra. Granula pollinis 3- vel 4-colporata (cf. Tab. XII, fig. m et n). Stylus glaber; stigmata subglobosa. Capsula intra calycem in rostrum parte basali dimidio breviorem producta. Semina numerosa, subglobosa et angulosa, subnigra, madefacta non glutinosa; cellulae testae parietibus rectis vel undulatis instructae, densissime sed minutissime punctatae (cf. Tab. IX, fig. d—f).

Speciebus pluribus in regionibus tropicalibus Africae et Asiae et forsitan Americae distributum.

Species typica: *O. trinervia* Retz.

3. **Oldenlandia cephalotes** (Hochst.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891; *Hedyotis cephalotes* Hochst. in Flora **27**, 553, 1844; — *Oldenlandia sphaerocephala* Schinz in Mém. Herb. Boiss. n° 1, 65, 1900; — *O. limnophila* K. Sch. nomen (Plantae Schlechterianae Austro-Africanae, Iter secundum, n. 12049); — *O. brachyphylla* K. Sch. inedit. in herb. Delessert (Wood s.n., van Reenen).

Herba annua, haplo- vel pleiocaula, caulibus erectis vel ascendentibus, simplicibus vel apicem versus parce ramosis, post anthesin interdum decumbentibus et ex axillis innovationes emittentibus, 20—50 cm alta. Caules subteretes, ad nodos sparse pilosi, ceterum glabri vel sub inflorescentia pilis aliquibus sparsi, 1—2 mm diam., internodiis bisulcatis quam folia multo longioribus, ad medium caulem plerumque 4—6 cm longis. Folia subsessilia, lineari-oblonga, oblonga vel elliptico-oblonga, 1.2—3 cm longa et 3—13 mm lata, rigidiora, concoloria, sicc. interdum fucescentia sed saepius haud conspicue discolorata, glaberrima, costa basin versus impressa, subtus prominula, nervis utroque latere costae 2 vix conspicuis. Vagina stipularis perbrevis, inter folia in lobum bifidum circ. 2.5 mm longum producta. Inflorescentiae capituliformes, plerumque longius pedunculatae, interdum ex axillis foliorum superiorum capitulis brevius pedunculatis comitatae, si ipsae breve-pedunculatae interdum cum capitulis lateralibus confluentes. Capitula subglobosa, e floribus 20—30 composita. Pedicelli maxime 1 mm longi. Flores isostyli. Ovarium sparse hirtellum. Calycis lobi ovato-triangulares 1.2 mm longi, margine sparsissime ciliati. Corolla alba tubo 0.4 mm alto, lobis 1.2 mm longis. Stamina filamentis 0.3 mm longis ad incisuras corollae inserta; antherae 0.4 mm longae. Granula pollinis 3-colporata, 18 μ alta et 16 μ diam. Stylus 0.3 mm longus. Capsula hirtella.

Habitat Africam Austro-orientalem.

Natal: Port St-Johns, alt. 300 m, Flanagan 2594, "on mountain top"; Distr. Alexandra, Dumisa, Rudatis 1804; Pinetown, Wood 256; Clairmont, id. 1031; Durban, Krauss 111, type (K); Tafelberg, id. s.n.; Inanda, Wood 72; van Reenen, id. s.n. ("*O. brachyphylla* K. Sch."); s.l., Sanderson 321, Gerrard 753.

Transvaal: Barberton Distr., Kaapse Hoop, alt. 1000 m, Rogers 21022; Potgietersrust, Lotsy & Goddijn s.n.; Zoutpansberg District, Zoutpan, Bremekamp & Schweickerdt 226, Obermeyer, Schweickerdt & Verdoorn 201.
Portuguese East Africa: Delagoa Bay, Speke 6, Junod 400 (type of *O. sphaerocephala* Schinz); Magaia, Schlechter 12049 ("*O. limnophila* K. Sch.").

This species and *O. angolensis* K. Sch. differ from the other species of this subgenus by their erect shoots, the sessile or subsessile leaves and the bifid instead of bipartite lobes of the stipular sheath. *O. cephalotes* differs from *O. angolensis* in the greater width of the leaves and in the greater number of flowers in the capitula.

4. **Oldenlandia angolensis** K. Sch. in Bot. Jahrb. 23, 412, 1897; non de Wild. et Durand in Herb. Boiss. 2e Sér. 1, 754, 1901, nec de Wild. in Pl. Bequaert. (cf. *O. goreënsis*); — *O. congensis* de Wild. et Durand in Bull. Herb. Boiss. 2e Sér. 1, 754, 1901.

Herba annua, haplo- vel pleiocaula, caulibus erectis vel ascendentibus, simplicibus vel apicem versus parce ramosis, post anthesin interdum decumbentibus et ex axillis innovationes emittentibus, 15—40 cm alta. Caules subteretes, ad nodos interdum parce et vix notabile hirtelli, ceterum semper glaberrimi, 0.3—1.5 mm diam., internodiis bisulcatis quam folia multo longioribus, ad medium caulem plerumque 4—7 cm longis. Folia sessilia, linearia, 1—1.5 cm, rarius usque ad 2 cm longa et 1—2 mm, rarius usque ad 3.5 mm lata, rigidiora, vix notabile discoloria, sicc. haud conspicue discolorata, glaberrima vel margine scabridula, costa supra impressa, subtus prominula, nervis inconspicuis. Vagina stipularis perbrevis, inter folia in lobum bifidum 1.5—3 mm longum producta. Inflorescentiae capituliformes, plerumque longius pedunculatae, interdum capitulis brevius pedunculatis ex axillis foliorum superiorum orientibus comitatae vel ex axilla bracteae infimae capitulum novum emittentes, casu quo capitulum principale pseudo-sessile. Capitula subglobosa, e floribus 5—15 composita. Pedicelli ad anthesin vix 0.5 mm, postea usque ad 1.5 mm longi. Flores isostyli. Ovarium glabrum vel vix notabile hirtellum. Calycis lobi ovato-triangulares 1—1.2 mm longi, glabri vel margine sparse hirtelli. Corolla alba vel dilute purpurea, tubo 0.5 mm alto, lobis 1.3 mm longis. Stamina filamentis 0.4 mm longis ad incisuras corollae inserta; antherae 0.4 mm longae. Granula pollinis 3-colporata, 20 μ alta et 18 μ diam. (Tab. XII, fig m). Stylus 0.2 mm longus. Capsula glabra vel sparse hirtella.

Habitat Africam Tropicalem Occidentalem et Centralem.
Southern Rhodesia: Salisbury, alt 1400 m, Eyles 4638, 4725, "in swamp"; Cranborn, alt. 1500 m, Wild 450, 767, "in swamp"; Marandellas, Driffield, alt. 1500 m, Rattray 1364.
Northern Rhodesia: Mwinilunga District, Dobeka Bridge, Milne-Redhead 3881, "boggy grassland"; Abercorn, Bullock 1072.

Angola: Huilla, Catumba, Welwitsch 5343; Malange, Mechow 379, type (K); Benguella District, Cuito, R. Campulua, Gossweiler 2849; Cuito, Bunja, id. 2563.
Belgian Congo: Leopoldville, Achten 4145; Stanley-Pool, alt. 300 m, Hens B 87; between Dembo and Kisantu, Gillet 1565 (type of *O. congensis*); Kimuenza, id. 1779; Valley of the Djuma, Gentil s.n.; Boko, Vanderijst 29810, B 295, C 102.
French Aequatorial Africa: Ubangi, Bambari, Tisserant 364, "marais".
Cameroons: Buea, alt. 1000 m, Mildbread 9476.
Uganda: Masaka District, Bukakata, alt. 1100 m, Maitland 814, "in grassy plain subject to flooding during rain"; Lake Nabugabo, alt. 1100 m, Chandler 1300, "bog", Thomas 953, "swamp".
Tanganyika: Bukoba District, Bugandike, alt. 1200 m, Haarer 2458.

The name *O. congensis* de Wild. et Durand owes its origin to the circumstance that de Wildeman and Durand mistook *O. goreënsis* (DC) Summerh. for *O. angolensis*, so that they had to find a new name for the real *O. angolensis*.

The area occupied by this species consists of a western and an eastern part separated by a rather wide gap. It is possible that the plant has so far been overlooked in the intervening area.

5. **Oldenlandia goreënsis** (DC) Summerhayes in Kew Bull. 1928, 392; *Hedyotis goreënsis* DC, Prodr. **4**, 421, 1830, incl. *β erecta* DC l.c.; — *Oldenlandia trinervia* Retz. apud Hiern in Fl. Trop. Afr. **3**, 63, 1877 et in Cat. Welw. Afr. Pl. **2**, 449, 1898, apud K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 374, 1895, non Retz., Obs. Bot. **4**, 23, 1786, quae est species in Asia endemica, foliis minoribus et inflorescentiis paucifloris sed numerosioribus a specie africana distinguenda; — *O. angolensis* K. Sch. in errore apud de Wild. et Durand in Bull. Herb. Boiss. Sér. 2, **1**, 754, 1901 et alibi.

Herba annua, plerumque e basi ramosa, caulibus decumbentibus, simplicibus vel parce ramosis, 5—40 cm longis, basi interdum radicantibus. Caules ramique quadricostati, in var. *goreënsi* glabri vel ad nodos parce hirsuti, in var. *trichocaula* ubique sparse hirsuti, 0.3—2 mm diam., internodiis longitudine valde variabilibus. Folia in petiolum 0.5—2 mm longum, glabrum vel pilis mollibus ciliatum contracta; lamina ovata vel lanceolata, plerumque circ. 12 mm longa et 5—7 mm lata, interdum usque ad 2.5 cm longa et 1.5 cm lata vel 6 mm longa et 3 mm lata, basi contracta, firmior, paulum discolor, sicc. haud conspicue discolorata, supra in costa impressa et in foliis majoribus etiam in nervis pilis brevibus sed rigidis conspicue strigosa, margine in var. *goreënsi* vix notabile scabridula, in var. *trichocaula* densius ciliolata, costa subtus prominula, nervis utroque latere costae 2 vel 3 plerumque difficiliter distinguendis. Vagina stipularis plerumque 0.7—1.0 mm, raro usque ad 2 mm alta, inter folia in lobum bipartitum plerumque circ. 1 mm, raro usque ad 2 mm longum producta.

Inflorescentiae interdum a ramulo axillari in positionem lateralem coactae, semper sessiles, e floribus 9—25 compositae, ramulis subnullis, pedicellis plerumque 1—1.5 mm, raro usque ad 3 mm longis, glabris vel sparse pilosis. Flores isostyli, in var. *goreënsi* plurimi 4-meri, in var. *trichocaula* fere omnes 5-meri. Ovarium glabrum vel sparse pilosum. Calycis lobi ovato-triangulares 1.4 mm longi et 0.5 mm lati, margine et costa sparse ciliati. Corolla alba vel albida, rarius rosea vel coccinea, in var. *goreënsi* extus glabra vel rarius sparse pilosa, in var. *trichocaula* apicem versus hirtella, tubo 0.3 mm alto, intus pilis paucis sparso, lobis 0.8—1.2 mm longis. Stamina filamentis 0.3 mm longis ad incisuras corollae inserta; antherae 0.3 mm longae. Granula pollinis 3-colporata, 18—21 μ alta et 16—18 μ diam. (Tab. XII, fig. n). Stylus glaber, 0.3 mm longus, rarius usque ad 1.0 mm elongatus. Capsula glabra vel sparse hirtella.

Habitat Africam Tropicalem, Insulas Comorenses, Madagascar, Insulas Mascarenas.

var. *goreënsis*, caulibus glabris vel ad nodos hirsutis, foliis margine non ciliatis, subtus totis glabris, floribus fere omnibus 4-meris, corolla extus glabra vel sparsius pilosa.

Senegal: Cape Verde Peninsula, Kounoum nr Gorée, Perrottet 484, type (P); ibid. N'batas, id. s.n.; Dakkar, Boivin s.n.

Gambia: Albreda, Leprieur s.n.; Pays de Kombo, Heudelot 72.

Sierra Leone: Pendembu, Thomas 833; Makump, id. 988; Konta, Deighton 1254, "in marsh"; Giena, id. 1620; Rokupr, id. 2952, "common on bunds through tidal rice swamp"; Kangahun, id. 4137, "swamp"; Kobala, id. 4195.

Nigeria: Nupe, Barter 1241, "a weed in rice fields"; Vom, Bauchi Plateau, Dent Young 114 (with very large leaves and magenta flowers); Kontagora, Dalziel 215; Ilorin Division, Jebba, Meikle 846; Bida Division, Bida, id. 1020.

Cameroons: Bamenda, alt. 1000 m, Maitland 1591, "a wayside weed near water".

French Aequatorial Africa: Dendala, Chevalier 633; Ubangi, Bambari, Tisserant 343, 1566, 3147; Yalinga, Le Testu H 493; Country of the Senussi, Ndellé, Chevalier 6921.

Anglo-Egyptian Sudan: Country of the Djur, Seriba Ghattas, Schweinfurth 1459.

Abyssinia: Gimma, alt. 1800 m, Ufficio Agrario 8 G.S.

Uganda: Kampala, alt. 1200 m, Chandler & Hancock 13, "marsh"; Kigezi, Kashambya, Purseglove 2987; Kiangwe, alt. 1200 m, Eggeling 486, 813, "swamp"; Kipayo, alt. 1200 m, Dümmer 682, "swamp"; Kigezi, Bufumbisa, alt. 1800 m, Purseglove 2495; ibid. Kacherchano Farm, alt. 2000 m, id. 3336; Damba, Kome, Maitland 1081.

Kenya: Kipkarren, alt. 1600 m, Mrs Brodhurst-Hill 711, "marsh".

Tanganyika: Bukoba District, Bukoba, alt. 1200 m, Haarer 2018, 2114,

"swampy place"; Zanzibar, Boivin s.n., Hildebrandt 1002; Kyimbila District, Kasan'anda, Stolz 1173.
Belgian Congo: Moanda, Vanderijst 27659; Boma, Dacremont 54; Kinanga, Robijns 159, "marais"; Dolo, Bavicki 393; Kimuenza, Gillet s.n.; Kisantu, id. s.n., 1105, 1333 ("*O. angolensis*"), Vanderijst C 106, 29107, 29108, 29113, 34125; Stanley-Pool, Schlechter 12532; Kwango, Lazaret du Sacré Coeur, Vanderijst s.n.; Merode, Vanderijst 22864; Luluabourg, id. 23983, 23985; Mboga, Bequaert 4814 ("*O. angolensis*"); between Irumu and Kilo, id. 4841, "bords d'une mare" ("*O. angolensis*"); Kabango, id. 6154; between Cubero and Butembo, alt. 1800 m, Lebrun 9897; Tsibinda, Scaetta 1240; Nangu, Claessens 834 bis, 834 ter, "foret marécageuse"; Majumbe, Bingila, Dupuis s.n.; Upper Lomami, Kamakoko, Mullenders 1960; Kibali-Ituri, alt. 1250 m, Lebrun 3613; Nanguma River, Asigala, alt. 700 m, Germain 548; Upemba National Parc, de Witte 3915, 3732.
Angola: Ambriz, Welwitsch 3077; Loanda, id. 3079; Pungo Andongo, id. 3078.
Northern Rhodesia: Mwinilunga District, R. Matonchi, Milne-Redhead 2919; Kalendo Dambo, id. 3598; Abercorn, Bullock 1128.
Nyasaland: Zomba Plateau, Brass 16297; ibid. s.l., Buchanan 37, Whyte s.n.
Southern Rhodesia: Melsetter, Walters 2760; Gazaland, Inyamadzi Valley, Swynnerton 1534.
Portuguese East Africa: Rikatla, Junod 191; District Lourenço Marques, Sim 426; Magaia, Schlechter 12045.

var. *trichocaula* Brem. caulibus sparse hirsutis, foliis margine et facie inferiore costae densius, nervis sparse ciliolatis, floribus fere omnibus 5-meris, corollae lobis extus hirtellis.
Togo: nr Lome, Warnecke 239, type of variety (K).

The number of flower parts varies in both varieties, but whereas in the var. *goreënsis* the majority of the flowers are always 4-merous, the majority in var. *trichocaula* prove to be 5-merous. In both varieties occasionally a few hexamerous flowers are met with.

K. Schumann remarks in Bot. Jahrb. 23, 413, 1897 that the specimen collected by Schweinfurth in the Country of the Djur differs from the other ones by its longer stamens and a longer, 2-partite style. The difference in the length of the filaments is hardly noticeable, but the style indeed is unusually long (1 mm), although not bipartite, for it ends in the usual way in two subglobose stigmata. A similar long style was noted in the specimen collected by Mrs Brodhurst-Hill in Kenya.

O. goreënsis is easily distinguishable from its allies, *O. verticillata* Bull. ex Brem. var. *trichocarpa* Brem. excepted, by the strigose midrib of the leaves; from *O. verticillata* var. *trichocarpa* it differs in the large size of the leaves and the isostylous flowers.

6. **Oldenlandia anagallis** Brem. n. spec., maxime ut *O. goreënsis* (DC) Summerhayes sed foliis multo minoribus, costa supra non strigosa, inflorescentiis e floribus paucioribus compositis, granulis pollinis 4-colporatis ab ea recedens, ab *O. trinervia* Retz. inflorescentiis rarius axillaribus, e floribus pluribus compositis distinguenda.

Herba annua, repens, valde ramosa, ramis floriferis ascendentibus. Caules ramique quadrangulares, hirsuti, ultimo interdum glabrescentes, 0.5—0.8 mm diam., internodiis 0.5—3.0 cm longis. Folia in petiolum 0.5—1.0 mm longum, margine plerumque pilis mollibus ciliatum contracta; lamina ovata vel suborbicularis, 4—7 mm longa et 2—5 mm lata, basi plus minusve rotundata sed prope petiolum semper contracta, firmior, concolor, sicc. haud conspicue discolorata, margine ciliolata, ceterum utraque facie glabra vel costa subtus parce pilosa, costa subtus prominula, nervis inconspicuis. Vagina stipularis vix 0.5 mm alta, inter folia in lobum bipartitum circ. 1.5 mm longum producta. Inflorescentiae interdum a ramulo axillari in positionem lateralem coactae, sessiles, e floribus 3—9 compositae, ramulis subnullis, pedicellis 1—2.5 mm longis, parce pilosis. Flores isostyli. Ovarium parce pubescens. Calycis lobi triangulares, 1.2 mm longi et 0.4 mm lati, margine et costa parce ciliati. Corolla extus glabra, tubo 0.3 mm alto, lobis 0.8 mm longis. Stamina filamentis 0.3 mm longis ad incisuras corollae inserta; antherae 0.3 mm longae. Granula pollinis 4-colporata, 22 μ alta et 19 μ diam. (Tab. XII, fig. o). Stylus 0.4 mm longus. Capsula subglabra.

Habitat Tanganyikam.

Tanganyika: Upper Ruhudje, Lupembe, Schlieben 350, type (B), 891.

This species might at first sight be regarded as a mere form of *O. goreënsis* (DC) Summerhayes, but the absence of the appressed hairs along the midrib of the leaves and the presence of four instaed of three pores in the pollen grains make it probable that these plants represent a distinct species. They can not belong to *O. trinervia* either, for the latter has more numerous inflorescences, each consisting of a smaller number of flowers, and longer calyx lobes.

7. **Oldenlandia verticillata** Bullock inedit. in herb. kew.; maxime ut *O. anagallis* Brem., sed floribus longius pedicellatis, heterostylis, granulis pollinis 3-colporatis ab ea faciliter distinguenda.

Herba annua vel perennis, ramosissima, caulibus ramisque decumbentibus, interdum hic inde radicantibus. Caules ramique subteretes, sparse vel densius hirsuti, 0.6—1.2 mm diam., internodiis bisulcatis usque ad 4 cm longis. Folia petiolata; petiolus 0.5—1.0 mm longus, in var. *verticillata* glaber, in var. *trichocarpa* sparse vel densius hirsutus; lamina ovata, plerumque 6—12 mm, interdum usque ad 15 mm longa, 4.5—7 mm lata, basi contracta vel plus minusve rotundata, casu quo prope petiolum semper contracta, rigidior, discolor, sicc. vix conspicue discolorata vel plus minusve fucescens, margine ciliata, in var. *verticillata* ceterum glabra, in

var. *trichocarpa* supra costa pilis brevibus albo-notata, subtus sparse villosa, costa basin versus impressa, subtus prominula, nervis inconspicuis. Vagina stipularis vix 0.5 mm alta, inter folia in lobum bipartitum circ. 2 mm longum, margine ciliatum producta. Inflorescentiae haud raro a ramulo axillari in positionem lateralem coactae, sessiles, e floribus 7—15 compositae, ramulis inconspicuis, pedicellis in var. *verticillata* glabris, in var. *trichocarpa* hirtellis, primum 1—2 mm, post anthesin usque ad 5 mm longis. Flores heterostyli. Ovarium in var. *verticillata* glabrum, in var. *trichocarpa* dense hirtellum. Calycis lobi 1.2—1.4 mm longi, in var. *verticillata* glabri, in var. *trichocarpa* margine et costa hirtelli. Corolla alba, extus in var. *verticillata* tota glabra, in var. *trichocarpa* costis loborum sparse hirtellis, tubo 0.3—0.6 mm alto, lobis 1.4—1.8 mm longis. Stamina in flore brachystylo filamentis 1—1.4 mm longis ad incisuras corollae inserta, in flore dolichostylo filamentis 0.2—0.5 mm longis paulo infra incisuras inserta; antherae 0.5 mm longae. Granula pollinis 3-colporata, 17—18 μ alta et 15—17 μ diam. Stylus in flore brachystylo 0.3—0.4 mm, in flore dolichostylo 1.8—2.0 mm longus. Capsula in var. *verticillata* glabra, in var. *trichocarpa* hirtella.

Habitat Africam Tropicalem Orientalem et Centralem.

var. *verticillata*, petiolo glabro, foliis margine ciliata excepta glabris, ovario glabro, calycis lobis glabris, capsula glabra.
Kenya: First day's march from Munias, Whyte s.n., type (K).

var. *trichocarpa* Brem., petiolo hirsuto, lamina facie superiore costae strigosa, subtus ubique sparse villosa, ovario hirtello, calycis lobis margine et costa hirtellis, capsula hirtella.
Uganda: Buganga Buddu, Scott Elliot 7401; Masaka, alt. 1100 m, Maitland 1071, 1075; Serere, Teso, alt. 1000 m, Chandler 193, 1086; Kuyandongo Bunyoro, alt. 1100 m, Purseglove 1326, "dried-up swamp"; Kashambya, alt. 1200 m, Haarer 2331.
Kenya: Kipkarren, alt. 1800 m, Mrs Brodhurst-Hill 349.
Tanganyika: Bukoba District, Nyakate, alt. 1200 m, Haarer 2060, type of variety (K); Tabora, Braun 5473; Iringa, Geilinger B XIV N° 12.
Belgian Congo: Ruzizi, Germain 6292.
Portuguese East Africa: Province Mozambique, Mocuba, Namagoa, Mrs Faulkner 239.

This species is easily recognizable by its heterostylous flowers and the comparatively long pedicels. In the small size of the leaves it approaches *O. anagallis* Brem.

Subgenus 4. *Orophilum* Brem.

Herbae perennes, e basi ramosae, caulibus decumbentibus. Folia petiolata; lamina plerumque ovata, rarius ovato-lanceolata, ovato-oblonga vel subspatulata, penninervia. Vagina stipularis utroque latere caulis in lobum triangularem plerumque breviorem producta, margine fimbriis

duabus vel pluribus instructa. Flores plerumque pedicellati, nunc solitarii vel in paria, nunc in triades, cymas paucifloras vel capitula pauciflora dispositi; inflorescentiae primum terminales, postea haud raro in positionem lateralem coactae. Flores semper heterostyli. Calyx plerumque ad basin partitus; lobi ovato-triangulares vel lanceolati. Corolla brevituba, extus glabra, fauce in floribus dolichostylis dense barbata, in floribus brachystylis sparsius barbata, rarius (*O. tenella*) fere tota glabra. Granula pollinis 3-colporata. Stylus hirtellus vel glaber; stigmata elongata. Capsula intra calycem vix producta. Semina pauca, angulosa, madefacta non glutinosa; cellulae testae parietibus rectis instructae, laeves, minutissime punctatae, granulatae vel reticulatae (cf. Tab. IX, fig. g—m).

Speciebus pluribus in Africa Tropicali distributum.

Species typica: *O. monanthos* (Hochst. ex A. Rich.) Hiern.

8. **Oldenlandia monanthos** (Hochst. ex A. Rich.) Hiern in Fl. Trop. Afr. 3, 60, 1877; K. Sch. in Engler, Hochgebirgsfl. trop. Afr. in Abh. Preuss. Akad. d. Wiss. 1891, 396, 1892; id. in Engler, Pflanzenw. Ost Afrikas C, 374, 1895; *Hedyotis monanthos* Hochst. in Herb. Schimp. Iter Abyss. 2, n. 1370, 1843, nomen; A. Rich., Tent. Fl. Abyss. **1**, 359, 1847; — *O. violacea* K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 374, 1895; — *O. roseiflora* K. Sch. et K. Krause in Bot. Jahrb. **39**, 516, 1907.

Caules decumbentes interdum hic inde radicantes; caules ramique glabri vel sulcis sparse pilosi, subteretes, plerumque 0.3—0.7 mm, interdum usque ad 1.4 mm diam., internodiis bisulcatis plerumque 0.3—1.5 cm, interdum usque ad 4.5 cm longis. Folia petiolo 1.2—3 mm longo, interdum fere toto in vagina stipulari absorpto, parte libera plerumque ciliato instructa; lamina ovato-oblonga, plerumque 5—9 mm longa et 2—4.5 mm lata, interdum usque ad 2 cm longa et 9 mm lata, basi cuneata vel subrotundata sed prope petiolum semper contracta, subcoriacea, discolor, sicc. supra plerumque saturate fusca, subtus dilute brunnea, supra ad marginem et interdum in costa scabrida, alibi glabra, subtus tota glabra vel raro costa sparse hispida, costa basin versus impressa, subtus prominula, nervis utroque latere costae 2—4, plerumque vix conspicuis. Vagina stipularis 0.7—1.5 mm alta, inter folia in lobum triangularem, margine in fimbrias 4—6, plerumque usque ad 2 mm, interdum usque ad 2.5 mm longas exeuntem producta. Flores plerumque solitarii ad nodos, interdum tamen in paria et rarius in fascicula dispositi. Pedicelli glabri, plerumque 5—10 mm, interdum usque ad 2 cm longi. Ovarium glabrum. Calycis lobi ovato-triangulares, 1.0—1.8 mm longi, margine plerumque vix distincte, rarius distincte ciliolati vel ciliati. Corolla alba, rosea vel violacea, tubo 1.0—3.0 mm longo, intus fauce dense barbato, alibi praesertim nervis pilis mollibus sparso, lobis basi barbatis 1.7—3.2 mm longis. Stamina in flore brachystylo filamentis circ. 1 mm longis ad incisuras corollae inserta, antheris circ. 1.0 mm longis; in flore dolichostylo filamentis vix 0.2 mm longis 0.3—0.5 mm infra incisuras corollae inserta, antheris circ. 0.9 mm longis. Granula pollinis 20—22 μ alta et 18—20 μ diam. (Tab. XII, fig. p).

Stylus in flore brachystylo 1.5 mm longus, totus hirtellus, stigmatibus 0.3 mm longis instructus, in flore dolichostylo 2.0—3.2 mm longus, parte inclusa dense hirtella, stigmatibus 0.7—1.0 mm longis. Capsula glabra, 2 mm alta et 2.5 mm diam. Semina brunnea; cellulae testae laeves (Tab. IX, fig. g).

Habitat regiones montanas Africae Orientalis.

Abyssinia: Enschedcap, Schimper 1370, type (K); Tigre, id. 1155; Choa, Dillon & Petit s.n.; Sédène, alt. 2000 m, Newille 127; Mt Chillalo, alt. 2700 m, Hugh Scott s.n.; Gallal Pass, alt. 2200 m, Gillet 5113; Entoto nr Addis Abeba, alt. 2900 m, Senni 291, 360, 1712bis, Borini 35, Nagio 141, 261, 396; Galla Sidoma, Nollega, Benedetto 336, 452; Amhara, Semien, Chiovenda 832; Wola, Vatova 595; Waddi Gossa, id. 676.

Uganda: Mt Debasien, Karamojo, alt. 2000 m, Thomas 2218; Mt Elgon, Butandiga, alt. 2100 m, Dümmer 3684; Mt Elgon, Bulambuli, alt. 2700 m, Bot. Dep. Agr. Uganda T 2360; Sipi, alt. 2600 m, Synge 1064.

Kenya: Mt Elgon, s.l., alt. 2700 m, Thorold 2745, alt. 2600 m, Maj. E. J. and Mrs Cyril Lugard 345, 494; N. E. Elgon, Mrs Tweedie 712; Lake Naivasha District, Mrs Brodhurst-Hill 630; Aberdare Mnts, Sir Evan James s.n.; Nairobi District, alt. 1700 m, Miss Napier 473; Kinangop, alt. 2400—2700 m, id. 711; Ngong Hills, alt. 2200 m, Bally 59; Chyulu, North, alt. 1600 m, id. 216, 763; Londiani, Dümmer 37; Upper Plateau, Whyte s.n.; Mt Kenya, Meru, Rob. E & Th. C. E. Fries 1516.

Tanganyika (Northern part only): Kilimanjaro, Djalla Crater, Geilinger 4266; Engongo-Engare and Njovo Lkatenda, alt. 1700 m, Uhlig 452 (type of *O. roseiflora* K. Sch. et K. Krause); Kili-forest, alt. 2900 m, Geilinger 4349; alt. 1850 m, id. 4097; alt. 3500 m, id. 5037; Rongai, Kiwengalia stream, alt. 2300 m, Gilbert Rogers 149; Mashami, Fau, alt. 1500 m, Haarer 1028 (leaves with hispid midrib); Arusha, alt. 1500 m, id. 294; alt, 2500 m, Geilinger 3875 (leaves with hispid midrib); Marangu, alt. 2300 m, Volkens 848 (type of *O. violacea* K. Sch.); Machame, alt. 1400 m, Moreau 54; Moshi, alt. 1400 m, Sanders 15, Sacleux 1596; Mbulu District, Oldeani, alt. 1400 m, St Clair-Thomson 607; Ngorongoro Crater, Pole Evans & Erens 941, alt. 2200 m, Mr & Mrs Hornby 2109, Mr & Mrs Moreau 36.

The specimens on which *O. violacea* K. Sch. and *O. roseiflora* K. Schf et K. Krause were based, are somewhat more robust than the type o. *O. monanthos*, but as the dimensions of the various specimens differ considerably, these differences may be due to habitat factors. There are, however, also differences in the length of the corolla tube and in the pattern of the hairy zone at the entrance of the latter, and these differences might prove of greater importance. More material will have to be studied before a definite conclusion can be drawn, but for the moment it seems better to recognize within this circle of affinity but one species.

O. monanthos is easily recognizable by the pseudo-axillary, solitary or more rarely fascicled flowers. When more than one flower is present at the

node, the supernumerary ones are always provided with a rudimentary leaf pair at the base of the pedicel, which means that they are borne by axillary shortshoots.

9. **Oldenlandia Hockii** de Wild. in Fedde, Repert. **13**, 108, 1914.

Caules plerumque decumbentes sed numquam radicantes; caules ramique dense puberuli, 0.5—1 mm diam., internodiis ad medium caulem 7—10 mm longis, vix sulcatis. Folia petiolo dense puberulo 0.5—1.5 mm longo instructa; lamina ovata, 0.8—1.4 cm longa et 4—10 mm lata, basi rotundata sed prope petiolum subito contracta, subcoriacea, discolor, sicc. supra olivacea vel olivaceo-brunnea, subtus grisea, costa subtus puberula excepta glaberrima, costa basin versus impressa, subtus prominula, nervis utroque latere costae 1 vel 2, plerumque difficiliter distinguendis. Vagina stipularis circ. 1 mm alta, inter folia vix producta et ibi in fimbrias paucas ei breviores et interdum vix conspicuas exeuns. Flores longius pedicellati in triades vel cymas paucifloras dispositi, triadibus et cymis interdum a ramulo axillari in positionem lateralem coactis, interdum pluribus in corymbum terminalem congestis. Pedicelli 4—6 mm longi, subglabri. Ovarium glabrum. Calycis lobi 2.0 mm longi, ovato-triangulares, basi breviter connati, angustissime hyalino-marginati, glabri. Corolla alba, tubo intus fauce barbato, alibi sparse piloso, 2.4—2.7 mm longo, lobis basi sparse pilosis 1.8—2 mm longis. Stamina in flore brachystylo filamentis 0.6 mm longis ad incisuras corollae inserta, antheris 1.1 mm longis instructa; in flore dolichostylo filamentis brevissimis ad medium tubum inserta, antheris 0.9 mm longis. Granula pollinis 27 μ alta et 24 μ diam. Stylus in flore brachystylo 1.2 mm longus, fere totus hirtellus, stigmatibus 0.4 mm longis instructus; in flore dolichostylo 3 mm longus, dimidio inferiore hirtellus, stigmatibus 0.8 mm longis. Capsula glabra 2 mm diam. Semina saturate brunnea; cellulae testae laeves (Tab. IX, fig. h).

Habitat Katangam.

Belgian Congo: Katanga, Elisabethville, Hock s.n., type (B); Kipushi, alt. 1300 m, Robijns 1819; Munema, id. 1581, Kerkvoorde 191, Becquet 77; Katuba, Quarré 4219; Mimama, id. 1861; Kantu, Kaessner 2371.

This species is easily distinguishable from the other representatives of this subgenus in which the flowers are arranged in triads or cymes, by its slender pedicels and by the hyaline margin of the calyx lobes.

10. **Oldenlandia geophila** Brem. n. spec. a speciebus aliis subgeneris *Orophili* caulibus ramosissimis prostratis, foliis sicc. non discoloratis conspicue diversa, cellulis testae nec reticulatis nec granulatis, stylo glabro ad *O. Friesiorum* Brem. accedens.

Caules ramosissimi, prostrati; caules ramique subglabri, quadricostati, 0.3—1.2 mm diam., internodiis bisulcatis 0.6—2 cm longis. Folia petiolo circ. 1 mm longo instructa; lamina ovato-lanceolata, 6—12 mm longa et 3.5—7 mm lata, basi contracta, tenuis, concolor, sicc. vix discolorata,

supra praesertim marginem versus scabridula, subtus glabra vel costa nervisque parce hirtella, costa basin versus subimpressa, subtus prominula, nervis utroque latere caulis 2 vel 3. Vagina stipularis 0.8 mm alta, inter folia vix producta, plerumque in fimbrias 2 exeuns. Flores apice ramorum in triades vel cymas paucifloras dispositi, rarius solitarii. Pedicelli plerumque circ. 1 mm longi. Ovarium glabrum. Calycis lobi ovati, 1 mm longi, glabri. Corolla malvacea, tubo 0.8 mm longo, intus praesertim ad orem et prope basin sparse piloso, lobis 1.0 mm longis. Stamina in flore dolichostylo (adhuc solo noto) filamentis 0.2 mm longis paulo infra incisuras corollae inserta, antheris 0.5 mm longis. Granula pollinis 22 μ alta et 19 μ diam. (Tab. XII, fig. r). Stylus glaber in flore dolichostylo 1.6 mm longus; stigmata 0.3 mm longa. Capsula glabra 1.2 mm alta et 1.5 mm diam. Semina subnigra; cellulae testae laeves (Tab. IX, fig. i).

Habitat Rhodesiam Septemtrionalem.

Northern Rhodesia: Mufulina, Eyles 8131, type (K).

Because of the strongly ramified prostrate shoots and also because of the absence of the usual discoloration of the green parts in the herbarium, the aspect of this species is quite different from that of the other representatives of this subgenus, with which, however, it agrees in all the more important characters.

Habitually it shows a greater resemblance to those species of the subgenus *Anotidopsis* (Hook. f.) K. Sch. that are provided with decumbent shoots (*O. goreënsis*, *O. anagallis*, *O. verticillata*), but it differs from the latter, and from the representatives of that subgenus in general, in the form of the stigmata, which are not swollen but elongate, by the nature of the capsule, which is not provided with a distinct beak, and by the smooth testa cells. The latter, in fact, are not unlike those of *O. monanthos*, the type species of the subgenus *Orophilum*.

It is unfortunate that *O. geophila* has but once been collected, for now it remains somewhat uncertain whether it really is heterostylous.

11. **Oldenlandia Friesiorum** Brem. n. spec. inter species subgeneris *Orophili* cellulis testae nec reticulatis nec granulatis et stylo glabro cum *O. geophila* Brem. congruens sed ab ea caulibus ascendentibus ramis paucioribus instructis, partibus viridibus sicc. conspicue discoloratis, foliis subcoriaceis, vagina stipulari fimbriis pluribus instructa, cellulis testae minutissime punctatis valde diversa, ab *O. Johnstonii* (Oliv.) K. Sch., ad quam habitu magis accedit, foliis brevioribus et pro rato latioribus, floribus distincte pedicellatis et majoribus, stylo subglabro distinguenda.

Caules plerumque decumbentes et ultimo interdum ad nodos radicantes et hoc modo propagantes; caules ramique glabri, 1—2 mm diam., internodiis ad medium caulem 1.5—6 cm longis, haud profunde bisulcatis. Folia petiolo glabro 1—2 mm longo instructa; lamina plerumque ovata, 1.2—2.5 cm longa et 9—15 mm lata, basi rotundata sed prope petiolum subito contracta, subcoriacea, discolor, sicc. supra saturate olivacea vel

olivaceo-brunnea, subtus haud distincte discolorata vel dilute brunnea, supra ad marginem dense scabridula, costa minime basin versus scabridula, ceterum utrimque glabra, costa basin versus subimpressa, subtus prominula, nervis utroque latere costae 4 vel 5, subtus faciliter distinguendis. Vagina stipularis 0.5—1.2 mm alta, extus sparse hirtella vel subglabra, inter folia in lobum triangularem vaginae subaequilongum producta, lobo margine fimbriis 5 vel 7 apicem caulis versus longioribus et ibi usque ad 2 mm longis instructo. Flores in cymas paucifloras dispositi, cymis nunc solitariis nunc in triades dispositis, cymis lateralibus plerumque a foliis normalibus suffultis. Pedunculi cymarum 4—7 mm longi, glabri. Pedicelli 1—1.5 mm longi, glabri. Ovarium glabrum. Calycis lobi ovato-triangulares 2 mm longi, glabri. Corolla alba vel rosea, tubo 2 mm longo, fauce dense barbato, lobis basi barbatis 2.5 mm longis. Stamina in flore brachystylo filamentis 2 mm longis, antheris 0.8 mm longis instructa, in flore dolichostylo filamentis subnullis, antheris 0.6 mm longis. Granula pollinis 26 μ alta et 24 μ diam. (Tab. XII, fig. q). Stylus glaber vel vix notabile puberulus in flore brachystylo 1.2 mm, in flore dolichostylo 3 mm longus; stigmata 0.4—0.5 mm longa. Capsula glabra 2 mm alta et 2.5 mm diam. Semina subnigra; cellulae testae minutissime punctatae (Tab. IX, fig. j).

Habitat regiones altiores Africae Orientalis Tropicalis.

Kenya: Eastern part, Chusi, Rob. E & Th. C. E. Fries 1848, type (S), f. brachystyla; Mt Aberdare, id. 2313; southern part, between the rivers Karuti and Kiringa, id. 2056, co-type (K), f. dolichostyla; Leikipia Plateau and Aberdare Range, Scoresby Routledge s.n.; s.l., Prescott Decie s.n. Tanganyika: Mbeya District, Kiwara River, Lower Fishing Camp, Greenway & Brennan 8261; Southern part, Undalis, alt. 2000 m, Davies 865 (with a rather densely puberulous style); Mountains east of Lake Nyasa, Johnson s.n.; Kyimbila District, Mbaka, Stolz 1129; ibid., Kinga Mnts, alt. 2100 m, id. 2338.

Some of the collections quoted above have been distributed over a large number of herbaria, and the fact that all plants collected under the same number always prove to belong to the same form, indicates that the vegetative propagation by means of the decumbent shoots must be very effective.

Stolz 1129 was distributed under the name *O. procurrens* K. Sch., but this is a misidentification. The description of this species points to a plant belonging to the genus *Parapentas* (cf. *P. silvatica*).

O. Friesiorum comes probably nearest to *O. Johnstonii* (Oliv.) K. Sch., from which it is easily distinguishable by the pedicellate flowers, the smaller and thicker leaves and the glabrous or subglabrous style. In the last-named character it agrees with *O. geophila* Brem., from which it is habitually quite distinct.

12. **Oldenlandia Johnstonii** (Oliv.) K. Sch. in Engler, Hochgebirgsflora trop. Afr. in Abh. Preuss. Akad. d. Wiss. 1891, 397, 1892; id. in Engler, Pflanzenw. Ost Afrikas C, 375, 1895; *Hedyotis Johnstonii* Oliv. in H.

Johnston, Kilim. Exped., App. 341, 1886 et in Trans. Linn. Soc. Ser. 2, 2, 335, 1897; — *O. sphaerocarpa* K. Sch. ex Engler in Abh. Preuss. Akad. d. Wiss. 1894, 37, nomen.

Caules plerumque decumbentes et ultimo interdum ad nodos radicantes; caules ramique glabri vel subglabri, 1—1.5 mm diam., basin versus cortice griseo obtecti et ibi usque ad 2 mm diam., internodiis ad medium caulem 3.5—5.5 cm longis, bisulcatis. Folia petiolo puberulo-pubescenti vel rarius glabro 2—3 mm longo instructa; lamina ovata vel ovato-oblonga, 1.6—4.5 cm longa et 0.5—1.6 cm lata, basi rotundata vel cuneata, prope petiolum tamen semper subito contracta, tenuior, discolor, sicc. supra saturate brunnea, subtus dilute brunnea, opaca, supra primum costa densius, alibi sparse puberulo-hirtella, deinde subglabra, basibus pilorum persistentibus tamen scabridula, subtus costa puberulo-pubescens, alibi subglabra, costa basin versus subimpressa, subtus prominula, nervis utroque latere costae plerumque 5 vix conspicuis. Vagina stipularis 0.8—1.5 mm alta, extus hirtella, inter folia in lobum triangularem vaginae aequilongum, margine fimbriis 5 vel 7 apicem versus longioribus et ibi 2—3.5 mm longis instructum producta. Flores in capitula pauciflora congesti; capitula plerumque in triades disposita. Pedunculus communis 1.5—5.5 cm longus, gracilis; pedunculi capitulorum 4—15 mm longi, laterales interdum foliis magnitudine redactis suffulti; capitula lateralia interdum ad triades redacta vel tota suppressa. Ovarium subglabrum vel puberulo-hirtellum. Calycis lobi triangulares, 2 mm longi, carinati, vix notabile puberuli. Corolla alba, tubo intus orem versus densius barbato 1.2 mm longo, lobis basi barbatis 2.5 mm longis. Stamina in flore brachystylo filamentis 2 mm longis, antheris 0.7 mm longis instructa, in flore dolichostylo filamentis 0.3 mm longis, antheris 0.6 mm longis, in floribus omnibus ad incisuras corollae inserta. Granula pollinis 20—22 μ alta et 18—20 μ diam. Stylus in flore brachystylo 1 mm longus, dense hirtellus vel interdum pilis paucis sparsus, in flore dolichostylo 3 mm longus, totus dense hirtellus vel apicem versus glabrescens; stigmata 0.7 mm longa. Capsula glabra vel subglabra 1.3 mm alta et 1.8 mm diam. Semina subnigra; cellulae testae minutissime punctatae (Tab. IX, fig. k).

Habitat regiones altiores Africae Orientalis Tropicalis.

Kenya: Mombasa, Rabai Hills, Maweni, Taylor s.n.; Mombasa, Boivin s.n.; Pemba River, Kaessner 358; Kibarani, Jeffery K 189; nr Nairobi, alt. 1600 m, Mc Donald 824; Mbagathi, alt. 1800 m, Miss Napier 73; French Mission land, Bally 7805.

Tanganyika: Kilimanjaro, Johnston s.n., type (K), ibid. alt. 1800 m, Geilinger 4113, ibid. alt. 2000 m, id. 4390; Marangu, alt. 1550 m, Volkens 420, ibid. alt. 1300 m, id. 2235; between Moshi and Marangu, alt. 1000 m, Grote 3897; Moshi, Sacleux 1596 p.p.; Lunguza, Zimmermann 7866; Kamwald, Upare, alt. 1500 m, Haarer s.n.; Maschaua, Holst 8743 ("*O. sphaerocarpa* K. Sch."); District Pangani, Bushni, Mrs Faulkner K 564.

As the name *O. sphaerocarpa* K. Sch. mentioned by Engler in Abh. Preuss. Akad. d. Wiss. 1894 does not return in Engler's "Pflanzenw. Ost Afrikas" it is to be assumed that Schumann had in the meantime recognized its identity with *O. Johnstonii*.

O. Johnstonii is easily recognizable by the rather large size of its leaves and by its subcapitate flowers. At first sight one might be inclined to refer it to the subgenus *Anotidopsis* (Hook. f.) K. Sch. but the fimbriate stipular sheath, the bearded corolla tube and the absence of a beak on the capsule show that this is impossible, and that it is to be included in the subgenus *Orophilum*.

13. **Oldenlandia Greenwayi** Brem. n. spec. subgeneris *Orophili* stylo glabro et structura testae ad *O. rupicolam* (Sond.) O. Ktze accedens sed foliis angustioribus, granulis pollinis majoribus, cellulis testae reticulatis non granulatis ab ea distinguenda.

Caules decumbentes, raro hic inde radicantes, ramosi; caules ramique gracillimi, 0.2—0.7 mm diam., glabri, internodiis bisulcatis 0.4—2 cm longis. Folia petiolo glabro 0.5—1 mm longo instructa; lamina lanceolata, 3—8 mm longa et 1—3 mm lata, basi sensim in petiolum contracta, subcoriacea, discolor, sicc. supra saturate, subtus dilute fucescens, utrimque glabra, costa haud impressa, subtus prominula, nervis lateralibus inconspicuis. Vagina stipularis vix 0.5 mm alta, inter folia vix producta, in fimbrias 4—6 usque ad 2.5 mm longas exeuns. Flores in cymas interdum in paniculam confluentes dispositi. Pedicelli glabri, 0.5—2 mm longi. Ovarium glabrum. Calycis lobi ovati, basi breviter connati, 1.7 mm longi, carinati, glabri. Corolla alba, tubo 2.0—3.5 mm longo, in flore brachystylo ad orem sparse, in flore dolichostylo dense barbato, lobis 2.5 mm longis. Stamina in flore brachystylo filamentis 2.5—3 mm longis circ. 1 mm infra incisuras corollae inserta, antheris 1.2 mm longis, in flore dolichostylo filamentis subnullis 0.5 mm infra incisuras affixa, antheris 0.7—0.8 mm longis. Granula pollinis 34—38 μ alta et 30—35 μ diam. (Tab. XII, fig. u). Stylus glaber in flore brachystylo 1.5—2.8 mm longus, in flore dolichostylo 4.5—5 mm longus; stigmata 0.4 mm longa. Capsula glabra 2.2 mm alta et 3.0 mm diam. Semina nigra; cellulae testae reticulo irregulariter incrassato ornatae (Tab. IX, fig. m).

Habitat Tanganyikam

Tanganyika: Central Province, Mpwapwa, Kibarani Mnts, alt. 1650—1900 m, Greenway 2436, type (K), Mr and Mrs Hornby 848, Burtt 3885; West Usambara, Bumbuli, alt. 1800 m, Gillman 941.

This species comes very near to *O. rupicola* (Sond.) O. Ktze, and might perhaps be regarded as a narrow-leaved variety of the latter. However, in view of the much larger pollen grains and of the somewhat different sculpture of the testa cells, it seemed better to keep it apart.

14. **Oldenlandia rupicola** (Sond.) O. Ktze, Rev. Gen. Pl. **1**, 293, 1891; *Hedyotis rupicola* Sond. in Fl. Cap. **3**, 12, 1865; — *H. hirtula* Harv. ex Sond. l.c.; *Oldenlandia hirtula* (Harv. ex Sond.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891, cf. var. *hirtula* (Harv. ex Sond.) Brem.; — *O. oliveriana* K. Sch. in Engl., Hochgebirgsfl. trop. Afr. in Abh. Preuss. Akad. d. Wiss. 1891, 397 (1892); id. in Engler, Pflanzenw. Ost Afrikas C, 375, 1895 p.p., cf. var. *psilogyna* Brem.; — *O. Schlechteri* Schinz in Vierteljahrsschr. Nat. Ges. Zürich **52**, 432, 1907, cf. var. *hirtula*; — *O. Junodii* Schinz op. cit. 431, 1907 (nom. illeg. nam non *O. Junodii* Schinz in Mém. Herb. Boiss. n^{0} 10, 65, 1900, quae est *Borreria* spec.), cf. var. *parvifolia* Brem.; — *O. Rogersii* S. Moore in Journ. of Bot. **59**, 229, 1921, cf. var. *psilogyna*.

Caules decumbentes et interdum hic inde radicantes, ramosi; caules ramique graciles, plerumque 0.4—0.8 mm diam., in var. *parvifolia* raro 0.6 mm diam. excedentes, glabri vel in var. *hirtula* sparse et irregulariter hirtelli, internodiis bisulcatis vel plus minusve quadricostatis plerumque 1—2.5 cm longis, in var. *parvifolia* 0.3—2 cm longis. Folia petiolo glabro vel in var. *hirtula* sparse hirtello 0.5—2 mm longo instructa; lamina ovata, rarius hic inde ovato-lanceolata, plerumque 5—12 mm longa et 4—9 mm lata, in var. *parvifolia* 3—8 mm longa et 2.5—6 mm lata, basi rotundata sed prope petiolum subito contracta, margine incrassata, tenuior, discolor, sicc. plerumque olivacea, in var. *hirtula* tamen vix discolorata, supra minime primum scabridula, in var. *hirtula* tamen conspicue albo-hirtella et margine hirtello-ciliata, subtus glabra sed in var. *hirtula* interdum marginem versus sparse hirtella, costa vix impressa et subtus vix prominula, nervis utroque latere costae plerumque 2. Vagina stipularis circ. 0.5 mm alta, glabra vel in var. *hirtula* extus hirtella, inter folia in lobum triangularem producta, lobo in fimbrias plures usque ad 2 mm longas exeunte. Flores in triades vel cymas paucifloras dispositi, rarius aliqui solitarii, cymis interdum a ramulo axillari in positionem lateralem coactis. Pedicelli 0.5—2 mm longi. Ovarium plerumque papillis subglobosis sparsum, in var. *hirtula* hirtellum, in var. *psilogyna* glabrum vel subglabrum. Calycis lobi ovato-triangulares, carinati, glabri vel in var. *hirtula* margine et costa hirtelli, plerumque basi connati et 2.0—2.5 mm longi, in var. *hirtula* liberi et 1.5 mm longi. Corolla alba, dilute coerulea vel dilute violacea, tubo plerumque 3—4 mm longo, in var. *hirtula* tamen 7—10 mm longo, in flore brachystylo sparse, in flore dolichostylo dense barbato, lobis 2.0—3.5 mm longis. Stamina in flore brachystylo filamentis 3.3 mm longis 0.7 mm infra incisuras corollae inserta, antheris 1.2 mm longis instructa; in flore dolichostylo filamentis subnullis 0.7—1.0 mm infra incisuras affixa, antheris 0.9—1.1 mm longis. Granula pollinis 28—32 μ longa et 24—28 μ diam. (Tab. XII, fig. t). Stylus glaber in flore brachystylo 3 mm, in flore dolichostylo 5—7 mm longus; stigmata 0.3—0.7 mm longa. Capsula glabra vel subglabra, in var. *hirtula* sparse hirtella, 2 mm alta et 2.5 mm diam. Semina subnigra; cellulae testae carunculatae (Tab. IX, fig. l).

Habitat Africam Orientalem Subtropicalem et Tropicalem.

var. *rupicola*, caulibus glabris, foliis 5—12 mm longis et 4—9 mm latis subglabris, ovario papillis subglobosis sparso.
Natal: Tagoma, Gerrard & McKen 1364, type (TCD, dupl. K).
Transvaal: Magaliesberg, Jacksons Tuin, alt. 1400 m, Acocks 12361.
Southern Rhodesia: Gazaland, Chimanimani Mts, alt. 2100 m, Swynnerton 2152.
Nyasaland: Zomba Plateau, alt. 1400 m, Whyte s.n.; Mt Milanji, Forbes 91, Turner 8, Whyte s.n., McClounie 35; Namasi, Mt Malosa, Cameron 7; Milanji Mnt, Luchenya Plateau, alt. 1800 m, Brass 16421.
Portuguese East Africa: Namuli Plateau, Mahua Country, Last s.n. p.p. (cf. var. *psilogyna*).

var. *psilogyna* Brem. ovario glabro vel subglabro a var. *rupicola* recedens; *O. oliveriana* K. Sch. l.c.; *O. Rogersii* S. Moore l.c.
Transvaal: Lijdenburg District, Graskop, alt. 1450 m, Irvine 20, Rogers 14857 (type of *O. Rogersii* S. Moore) n.v., Galpin 14348, Burtt Davy 5369; Mariepskop, alt. 1400 m, Taylor 625; Zoutpansberg, Pepiti, Hutchinson & Gillett 4364.
Nyasaland: s.l., Buchanan 307; Mt Milanji, Whyte s.n.
Portuguese East Africa: Namuli Plateau, Makua Country, Last s.n. (type of *O. oliveriana* K. Sch. and of the variety, K) p.p. (cf. var. *rupicola*); Chimanimani Mnts, alt. 1200 m, Wild 2935.

var. *hirtula* (Harv. ex Sond.) Brem.; *Hedyotis hirtula* Harv. ex Sond. l.c.; *Oldenlandia hirtula* (Harv. ex Sond.) O. Ktze l.c.; *O. Schlechteri* Schinz l.c.; a var. *rupicola* caulibus sparse hirtellis, foliis supra et praesertim margine albo-hirtellis, ovario capsulaque hirtellis, calycis lobis brevioribus, corollae tubo longiore recedens.
Natal: Krans Kloof, Sanderson 605 (type of *Hedyotis hirtula* Harv. ex Sond., TCD, n.v.), Schlechter 3196 (type of *O. Schlechteri* Schinz, Z); Inanda, Wood 546, 952.

var. *parvifolia* Brem.; *O. Junodii* Schinz 1907, non 1900, v. supra; a var. *rupicola* internodiis 0.3—2 cm longis, foliis 3—8 mm longis et 2.5—6 mm latis recedens.
Transvaal: Swazieland, nr Dalriach, alt. 1450 m, Bolus 11923; Mbabane, Rogers 11942; Mt Mamotsuiri, alt. 1500 m, Junod 2007 (type of *O. Junodii* Schinz 1907 and of var., Z), id. 808, 1079.
Nyasaland: Mt Milanji, alt. 1800 m, Forbes 89.
Tanganyika: Morogoro, Ulugurus, alt. 1600 m, Miss Bruce 966, Schlieben 2776; between Kingo and Kwai, Braun 2860; S. Highlands Province, Geilinger 2037.

S. Moore l.c. says that his *O. Rogersii* is "much like *O. Oliveriana* K. Schum., which has larger and differently-shaped calyx segments, corolla with longer and relatively narrower tube and larger lobes, and entirely different stamens", but I find no difference between the type of *O. oliveriana* and Moore's description. The dimensions of the calyx given by Schumann

are too high; in reality the lobes are of exactly the same size as in Moore's description. In the stamens there is no difference either.

The var. *psilogyna* based on K. Schumann's *O. oliveriana* differs from the var. *rupicola* only in the total or almost total absence of the subglobose papillae on the ovary, and the var. *parvifolia* differs from the type only in its somewhat smaller dimensions, but the var. *hirtula* recedes from the latter not only in the character of the indumentum but also in the dimensions of the calyx and the corolla, and the size of the testa cells, whose sculpture too is somewhat different. It is not impossible that a study based on better material may lead to the reinstatement of this plant in its original status.

15. **Oldenlandia muscosa** Brem. n. spec. subgeneris *Orophili*, maxime ut *O. rupicola* (Sond.) O. Ktze, sed dimensionibus omnibus multo minoribus, foliis utrimque glabris, subcoriaceis ab ea distinguenda.

Caules decumbentes sed non radicantes, ramosi; caules ramique graciles, 0.3—0.7 mm diam., glabri, internodiis bisulcatis usque ad 1.8 cm longis, superioribus longitudine valde decrescentibus et foliis inde ad apicem ramorum plus minusve congestis. Folia petiolo glabro usque ad 1 mm longo instructa; lamina ovata vel subspatulata, 1.5—4 mm longa et 0.8—2.5 mm lata, basi rotundata sed prope petiolum contracta, subcoriacea, concolor, sicc. haud conspicue discolorata, utrimque glabra, costa basin versus impressa, subtus vix prominula, nervis inconspicuis. Vagina stipularis 0.2 mm alta, inter folia vix producta et ibi in fimbrias paucas vix 0.3 mm longas exeuns. Flores solitarii vel in triades dispositi, interdum a ramulo axillari in positionem lateralem coacti. Pedicelli glabri 1.6—3 mm longi. Ovarium glabrum. Calycis lobi ovati 1.6 mm longi, carinati, glabri. Corolla alba, tubo in flore dolichostylo denssissime barbato 3 mm longo, lobis basi etiam barbatis 3 mm longis. Stamina in flore dolichostylo filamentis subnullis 0.6 mm infra incisuras corollae, in flore brachystylo filamentis 1.5 mm longis ad incisuras corollae inserta, antheris in flore dolichostylo 1.2 mm, in flore brachystylo 1.5 mm longis. Granula pollinis 33 μ alta et 28 μ diam. Stylus in flore dolichostylo 6 mm, in flore brachystylo 3 mm longus, vix notabile puberulus; stigmata 0.6 mm longa. Capsula glabra, 1.8 mm alto et 2.0 mm diam. Semina nigra; cellulae testae reticulo irregulariter incrassato ornatae.

Habitat Transvaaliam.

Transvaal: Zoutpansberg District, Summit of Franzhoek Peak, alt. 1450 m, Galpin 14882, type (PRE), W. Zoutpansberg, Crewe Farm, alt. 1450 m, Hutchinson & Gillett 4432.

The affinity of this species with *O. rupicola* (Sond.) O. Ktze, *O. Greenwayi* Brem. and *O. tenella* (Hochst.) O. Ktze can not be doubted. A look at the large pollen grains alone would already suffice to dispel all doubts. The structure of the testa is difficult to make out because the cells are filled with a very dark gum.

16. **Oldenlandia tenella** (Hochst.) O. Ktze, Rev. Gen. Pl. **1**, 293, 1891; *Hedyotis tenella* Hochst. in Flora **27**, 553, 1844; Sond. in Fl. Cap. **3**, 13, 1865.

Caules decumbentes sed non radicantes, ramosi; caules ramique gracillimi, 0.2—0.6 mm diam., glabri, internodiis bisulcatis 0.4—2 cm longis. Folia petiolo glabro 0.4—3 mm longo instructa; lamina ovata vel subspatulata, 3—14 mm longa et 2.5—9.5 mm lata, basi rotundata sed prope petiolum subito contracta, tenuis vel tenuissima, discolor, sicc. plerumque vix conspicue discolorata, utrimque glaberrima, costa nec impressa nec subtus prominula, nervis utroque latere costae 1 vel 2 vix conspicuis. Vagina stipularis vix 0.5 mm alta, inter folia in lobum brevem producta, lobo in fimbrias aliquas vix 1 mm longas exeunte. Flores solitarii vel in paria vel triades dispositi, haud raro a ramulo axillari in positionem lateralem coacti. Pedicelli 1.5—3 mm longi. Ovarium glabrum. Calycis lobi ovati 1.1 mm longi, fructu usque ad 1.6 mm accrescentes, glabri, apice acutissime exeuntes. Corolla alba vel dilute violacea, tubo 3.8 mm longo, intus minime in flore brachystylo glabro, lobis 2.2 mm longis. Stamina in flore brachystylo filamentis 2 mm longis 1 mm infra incisuras corollae inserta, in flore dolichostylo filamentis 0.2 mm longis 0.6 mm infra incisuras affixa; antherae ubique 0.8 mm longae. Granula pollinis 33 μ alta et 30 μ diam. Stylus in flore brachystylo 2.5 mm, in flore dolichostylo 5 mm longus; stigmata in flore brachystylo 0.6 mm, in flore dolichostylo 0.8 mm longa. Capsula glabra 1.8 mm alta et 2.2 mm diam., calyce paulo accrescente coronata. Semina nigra; cellulae testae carunculatae.

Habitat Africam Austro-orientalem.

Natal: District Maritzburg, Table Mountains, McClean 193, "on rocky places on the top of the mountain, fairly common", probably the locality of Krauss' specimen on which the species was based, but which was not available to me; s.l., Drège 4010 ("*O. Dregei* Sond.").

Transvaal: Magaliesberg, Wonderboompoort, alt. 1400 m, Mogg 15132, "with mosses and Streptocarpus in cracks and fissures", "gregarious, matted"; Magaliesberg, Rustenburg, nr Kroondal, Young 27488; Magaliesberg, nr Rustenburg, alt. 1350 m, Miss Olive Nation 212; ibid. nr Avondzon, Rose Innes 184, "in moist, cool, shaded crevices".

The identification is not fully certain. The type was not available, and the description is not sufficiently detailed. In view of the fact that none of the species seen by me answers the description so well as this one does, and also because one of the specimens quoted above was apparently collected in the type locality, I think that my identification may be accepted.

A rather unexpected feature of this species, which otherwise comes very near to *O. rupicola* (Sond.) O. Ktze, is the inside glabrous corolla tube. Another noteworthy character are the pellucid, perfectly glabrous leaves.

The distribution of this species is rather unusual: a small area in Natal

and a somewhat larger one in the Magaliesberg extending from Wonderboompoort nr Pretoria to Rustenburg. However, as it is a small plant, it is not impossible that it has been overlooked in the less well explored parts of the country.

Subgenus 5. *Hymenophyllum* Brem.

Herbae erectae, plerumque annuae et haplocaulae, una specie perenni et pleiocaula. Caulis 4-costatus. Folia petiolata; lamina lanceolata, ovata vel ovato-oblonga, tenuis, penninervia. Vagina stipularis brevis, inter folia vix producta, margine fimbriata. Flores in cymas terminales, interdum capituliformes dispositi; cymae pauciflorae, interdum a ramulo axillari in positionem lateralem coactae, hic inde floribus aliquibus axillaribus praecessae. Flores isostyli vel heterostyli. Calyx ad basin partitus; lobi plerumque sinibus obtusis separati, angustiores. Corolla alba vel azurea, plerumque extus glabra, tubo plerumque brevi, raro satis longo, fauce barbato. Granula pollinis 3-colporata, subglobosa. Stylus glaber; stigmata filiformia. Capsula intra calycem breviter producta. Semina parva et numerosa, subglobosa, madefacta non glutinosa; cellulae testae parietibus undulatis instructae (cf. Tab. IX, fig. n).

Speciebus pluribus in Africa Tropicali praesertim in parte occidentali distributum.

Species typica: *O. echinulosa* K. Sch.

17. **Oldenlandia pellucida** Hiern in Cat. Welw. Afr. Pl. 2, 448, 1898.

Herba annua haplocaula, var. *pellucida* 4—8 cm, var. *robustior* usque ad 30 cm alta. Caulis in var. *pellucida* 0.4—0.8 mm, in var. *robustiore* usque ad 1.7 mm diam., glaber vel vix notabile scabridulus, internodiis in var. *pellucida* 1—3 cm, in var. *robustiore* usque ad 5 cm longis. Folia petiolo glabro vel parce scabrido 2—3.5 mm longo instructa; lamina ovata vel ovato-oblonga, in var. *pellucida* plerumque 1.2—1.7 cm longa et 6—9 mm lata, in var. *robustiore* usque ad 4 cm longa et 1.7 cm lata, apice in var. *pellucida* subobtusa, in var. *robustiore* acuta, basi rotundata sed prope petiolum subito contracta, tenerrima, discolor, sicc. haud conspicue discolorata, utrimque glabra vel margine et costa subtus parce scabridulo-ciliolata, costa tenuiore, nervis utroque latere costae plerumque 4. Fimbriae vaginae stipularis in var. *pellucida* vix 0.5 mm, in var. *robustiore* usque ad 2 mm longae. Inflorescentia capituliformis, e floribus 3—7 composita, basi plerumque foliis ordinaribus, interdum tamen et praesertim in var. *robustiore* bracteis subulatis vel filiformibus suffulta, interdum ab inflorescentiis axillaribus ad florem singulum redactis, basi tamen semper foliis duobus parvis suffultis praecessa. Flores subsessiles, isostyli. Ovarium in var. *pellucida* parce, in var. *robustiore* dense hirtellum. Calycis lobi triangulares, in var. *pellucida* 0.7—1.0 mm, in var. *robustiore* usque ad 1.2 mm longi. Corolla alba, tubo in var. *pellucida* 1.5—1.7 mm, in var. *robustiore* usque ad 3 mm longo, lobis in var. *pellucida* 0.4—0.5 mm, in

var. *robustiore* usque ad 0.8 mm longis. Stamina filamentis subnullis ad incisuras corollae inserta; antherae 0.5 mm longae, semi-exsertae. Granula pollinis 21—24 μ diam. (Tab. XII, fig. s). Stylus tubo paulo longior; stigmata 0.4—0.8 mm longa. Capsula in var. *pellucida* parce, in var. *robustiore* densius hirtella (Tab. IX, fig. n).

Habitat Africam Tropicalem.

var. *pellucida*, 4—8 cm alta, caule 0.4—0.8 mm diam., foliis 1.2—1.7 cm longis et 6—9 mm latis, fimbriis vaginae stipularis vix 0.5 mm longis, ovario parce hirtello, corolla tubo 1.5—1.7 mm, lobis 0.4—0.5 mm longis, capsula parce hirtella.

Angola: Huilla, Empalanca, Welwitsch 5344, type (BM, dupl. K).
Southern Rhodesia: District Salisbury, Domboshawa, alt. 1500 m, Wild 905, "on floor of damp cave"; ibid., Rumani, alt. 1350 m, id. 2528, 2543, "on floor of cave in damp humus; leaves purplish beneath".

var. *robustior* Brem., usque ad 30 cm alta, caule usque ad 1.7 mm diam., foliis usque ad 4 cm longis et 1.7 cm latis, fimbriis vaginae stipularis usque ad 2 mm longis, ovario dense hirtello, corollae tubo usque ad 3 mm longo, lobis usque ad 0.8 mm longis, capsula dense hirtella a typo recedens.
Tanganyika: District Mahenge, Ngongo, 35 Km south of Mahenge, alt. 1200 m, Schlieben 2214, type of variety (B), "on wet rocks".

O. pellucida Hiern and *O. echinulosa* K. Sch. are nearly related species. They resemble each other in the sessile, capituliform inflorescences, the small, isostylous flowers and the hirtellous ovary, but differ in the texture of the leaves and in the length of the calyx lobes. *O. pellucida* Hiern var. *robustior* Brem. shows in the dimensions of the vegetative parts an approximation to *O. echinulosa*, and might perhaps be regarded as a distinct species. It might also be possible to reduce the two forms of *O. pellucida* to varieties of *O. echinulosa*, but in view of the differences in the texture of the leaves, the dimensions of the flower parts and the position of the anthers, it seems better to retain *O. pellucida* as a distinct species.

18. **Oldenlandia echinulosa** K. Sch. in Engler, Pflanzenw. Ost-Afrikas C, 375, 1895; — *O. nesaeoides* Hiern in Cat. Welw. Afr. Pl. 2, 448, 1898; — anne *O. microcoryne* K. Sch. in Bot. Jahrb. 32, 144, 1902, incertum sed haud improbabile.

Herba annua haplocaula, plerumque valde ramosa, 8—40 cm alta. Caulis circ. 1.5 mm diam., glaber vel costis scabrido-papillosus, internodiis 2—7 cm longis. Folia petiolo 2—5 mm longo, glabro vel margine et facie inferiore parce ciliato instructa; lamina ovato-lanceolata, 2—5 cm longa et 7—17 mm lata, basi plus minusve contracta, tenuis, paulum discolor, sicc. plerumque fucescens, supra primum sparse strigosa, deinde plerumque glabrescens, subtus subglabra, ad marginem supra interdum appresse pubescens, costa basin versus impressa, subtus prominula, nervis utroque latere costae 4 vel 5. Fimbriae vaginae stipularis usque ad 3 mm longae.

Inflorescentia subcapituliformis, e floribus 3—9 composita, basi plerumque foliis magnitudine redactis suffulta. Flores ad anthesin subsessiles, postea pedicellis interdum usque ad 3 mm longis elati, isostyli. Ovarium hispidulum. Calycis lobi triangulares 1—2 mm longi, margine et costa ciliolati. Corolla alba, tubo 4.3 mm longo, lobis 1.2 mm longis. Stamina filamentis subnullis paulo infra incisuras corollae inserta, inclusa; antherae 0.5 mm longae. Granula pollinis 22—23 μ diam. Stylus tubo paulo longior; stigmata 0.8 mm longa. Capsula hispidula.

Habitat Africam Tropicalem Occidentalem et Centralem.
Nigeria: Bauchi Plateau, Jos & Keay F. H. I. 12712.
Belgian Congo: Rando, de Witte 171; Elisabethville, Quarré 5363.
Angola: Huilla, Welwitsch 5346 (type of *O. nesaeoides* Hiern), Antunes & Dekindt 3230.
Southern Rhodesia: District Manica, Odzani River, Teague 526.
Northern Rhodesia: nr Mumbwa, Mrs Macaulay 614.
Nyasaland: 44 miles east of Abercorn, alt. 1550 m, St Clair-Thomson 1111; Masuku Plateau, alt. 2000 m, Whyte 272; between Songue and Karanga, id. 99; Plateau of Mt Zomba, id. s.n.; between Kondowi and Karonga, id. s.n.; s.l., Buchanan 122, 498, type (K).
Tanganyika: Nyasa Plateau, Station Kyimbila, Stolz 722; Rungwe District, Mbeya, alt. 1600 m, Davies 417; Rungwe, Geilinger 2199, 2466.

The type of *O. microcoryne* K. Sch. is "Antunes s.n., Huilla". It must have been collected at a somewhat earlier date than the specimen of Antunes & Dekindt quoted above. The description indicates a plant identical with or else very near to *O. echinulosa*, but the shoots are described as terete which is probably a mistake, as such shoots are never met with in this subgenus, and the young ones as "minutissime puberuli". A more serious difficulty is found in the form of the stipular sheath, which is said to be provided with two subulate lobes. In *O. echinulosa* the number of fimbriae is usually larger, although in very small plants sometimes two are found.

Oldenlandia golungensis Hiern in Cat. Welw. Afr. Pl. 2, 451, 1898, is apparently a species nearly related to *O. echinulosa*. I have seen no specimens that could be referred to it, but the erect quadrangular stem, the thin and rather large, petiolate leaves with their 5 or 6 pairs of nerves and the fimbriate stipular sheath leave no doubt that it belongs to the subgenus *Hymenophyllum*, and the subcapitate flowers and puberulous capsules bring it in the neighbourhood of *O. pellucida* and *O. echinulosa*. It is a comparatively vigorous plant, higher even than the largest specimens of *O. echinulosa* seen by me, and the large size of the leaves and of the capsule suggest a distinct species.

19. **Oldenlandia nervosa** Hiern in Cat. Welw. Afr. Pl. 2, 450, 1898; — *O. asperuliflora* K. Sch. in Schlechter, W. Afr. Kautschuk Exp. 318, 1900,

nomen; — anne *O. malacophyton* K. Sch. in Bot. Jahrb. **33**, 333, 1903, incertum sed probabile; — *O. florifera* de Wild., Miss. Laurent **1**, 271, 1906.

Herba annua haplocaula, plerumque valde ramosa, 15—100 cm alta. Caulis circ. 2 mm diam., glaber, internodiis 2—6 cm longis. Folia petiolo glabro, 2—10 mm longo instructa; lamina ovata vel ovato-lanceolata, 1.5—7 cm longa et 0.8—2.7 cm lata, basi prope petiolum subito contracta, tenuior, discolor, sicc. olivacea, utrimque glabra vel supra praesertim ad marginem minute strigosa, costa basin versus impressa, subtus prominula, nervis utroque latere costae 5—8. Fimbriae vaginae stipularis usque ad 5 mm longae. Inflorescentiae partiales cymae e floribus 3—5 compositae; cymae in inflorescentias spici-, corymbi- vel paniculiformes dispositae; flos centralis cymae sessilis, laterales pedicellis usque ad 1 mm longis elati. Flores heterostyli. Ovarium glabrum. Calycis lobi triangulares, 0.7 mm longi, glabri. Corolla alba vel dilute violacea, tubo 0.9—1.1 mm alto, lobis 1.1—1.3 mm longis. Stamina in flore brachystylo filamentis 0.8 mm longis ad incisuras corollae inserta, antheris 0.6 mm longis instructa, in flore dolichostylo filamentis subnullis paulo infra incisuras corollae inserta, antheris 0.5 mm longis instructa. Granula pollinis 22—23 μ diam. Stylus in flore brachystylo 0.6 mm, in flore dolichostylo 2 mm longus; stigmata in flore brachystylo 0.2 mm, in flore dolichostylo 0.4 mm longa. Capsula glabra.

Habitat Africam Tropicalem Occidentalem.

French Aequatorial Africa: Gaboon, Kitabi, Lecomte B 90; Niounvoua, id. C 41; Ogôoué, Schwäbisch & Thollon 351; Gaboon, s.l., Duparquet s.n.; Ubangi, Bambari, Tisserant 1996, 1996[bis].

Portuguese Congo: Buco Zau, Gossweiler 7221.

Belgian Congo: Coquilhatville, Schlechter 12597 ("*O. asperuliflora* K. Sch."), Lebrun 715, 1269; Eala, Corbisier-Baland 993, Pynaert 1272; Bokuma, Hulstaert 710; Kisanji, Renier 157; Lac Léopold II, Body s.n.; Kikonka, Vanderijst 3096; Kipako, id. 30393; Matadi, Dacrémont 404, 409; Pfini, Laurent s.n. (type of *O. florifera* de Wild.); Lake Tumba, Mpotia, Léonard 637.

Angola: Pungo Andongo, Welwitsch 5305, type (BM, dupl. K); Golungo Alto, id. 5307; Granja de S. Luiz, Gossweiler 4639; Amboim, Capiz, alt. 850 m, id. 10056.

The type of *O. malacophyton* K. Sch. is a specimen collected by Dinklage on the Sibange Farm in Gaboon. Judging from the description I think that it may safely be identified with *O. nervosa*, of which I have seen several examples collected in the same region.

O. nervosa and *O. Chevalieri* Brem. differ from the other species of this subgenus whose flowers are arranged in cymes, in the shortness of the corolla tube. From *O. Chevalieri* *O. nervosa* is distinguishable by the larger number of nerves.

20. **Oldenlandia Chevalieri** Brem. n. spec. subgeneris *Hymenophylli*, maxime ut *O. nervosa* Hiern sed caulibus post anthesin decumbentibus et ad nodos radicantibus, foliis nervis paucioribus instructis, floribus minoribus ab ea distinguenda.

Herba annua haplocaula, caule post anthesin decumbente et ad nodos radicante, 20—30 cm alta. Caulis 1—1.5 mm diam., glaber, internodiis 2—7 cm longis. Folia petiolo glabro 2—6 mm longo instructa; lamina ovata, 1.5—3 cm longa et 7—15 mm lata, basi rotundata sed prope petiolum subito contracta, tenuis, discolor, sicc. supra saturate et subtus dilute fusca, utrimque glabra, costa basin versus impressa, subtus vix prominula, nervis utroque latere costae 3 vel 4. Fimbriae vaginae stipularis usque ad 3.5 mm longae. Inflorescentia dichasialis; ramuli infimi plerumque bracteis filiformibus circ. 1.5 mm longis, interdum tamen foliis magnitudine redactis suffulti; bracteae aliae minutae. Pedicelli 0.5—3 mm longi. Flores heterostyli sed adhuc in forma brachystyla sola noti. Ovarium glabrum. Calycis lobi lineares, 1 mm longi, glabri. Corolla colore ignoto, fere tota in calyce abscondita, tubo 0.6 mm alto, lobis 0.5 mm longis. Stamina in flore brachystylo filamentis 0.4 mm longis ad incisuras corollae inserta; antherae 0.4 mm longae. Granula pollinis 18 μ diam. Stylus in flore brachystylo 0.3 mm longus; stigmata 0.3 mm longa. Capsula nondum nota.

Habitat Africam Tropicalem Occidentalem.

Ivory Coast: Attié District, Alépé, Chevalier 17470, type (P); between Alépé and the Potou Lagoon, id. 17383.

In both specimens the stamens are provided with filaments, whereas the stigmata do not protrude beyond the mouth of the tube; this makes it almost certain that the flowers are to be regarded as brachystylous.

It is rather unfortunate that no fruits are known of this species, which in its general aspect is not unlike *O. Johnstonii* (Oliv.) K. Sch. However, the quadricostate stem, the thin leaves, the narrow calyx lobes, as well as the circumstance that it grows in the western half of the continent, make it probable that it belongs to the subgenus *Hymenophyllum*.

21. **Oldenlandia hymenophylla** Brem. n. spec.; *O. sipaneoides* K. Sch. var. *asperuloides* Hiern in Cat. Welw. Afr. Pl. 2, 441, 1898.

Herba annua haplocaula, 9—20 cm alta. Caulis 0.4—0.7 mm diam., glaber, internodiis 1.5—4.5 cm longis. Folia petiolo glabro 1—3 mm longo instructa; lamina ovato-oblonga, 1.5—2.5 cm longa et 6.5—10 mm lata, apice basique acuta, tenuissima, discolor, sicc. haud conspicue discolorata, utrimque glabra vel costa supra pilis brevissimis sparsa, costa non impressa et subtus non prominula, nervis utroque latere costae 4 vel 5, vix conspicuis. Fimbriae vaginae stipularis paucae, usque ad 1.7 mm longae, fugaces. Inflorescentia basi dichasialis; ramuli monochasiales nunc foliis, nunc bracteis suffulti. Pedicelli 0.1—0.5 mm longi. Flores isostyli. Ovarium glabrum. Calycis lobi lineari-triangulares, 2 mm longi,

vix conspicue ciliolati. Corolla azurea, tubo 7 mm longo, lobis 2.5 mm longis. Stamina filamentis 1.4 mm longis ad incisuras corollae inserta; antherae 0.9 mm longae. Granula pollinis nondum nota. Stylus tubo paulo longior; stigmata 1.2 mm longa. Capsula glabra.

Habitat Angolam.

Angola: Pungo Andongo, Welwitsch 3076, type (BM, dupl. K).

This species resembles *O. sipaneoides* K. Sch. in the comparatively long-tubed corolla, but is easily distinguishable by its single stem, thinner leaves, isostylous flowers and glabrous ovary. In fact, it is probably more closely related to *O. nervosa* Hiern, which, however, has much smaller, heterostylous flowers.

22. **Oldenlandia sipaneoides** K. Sch. in Bot. Jahrb. **23**, 417, 1897, Hiern in Cat. Welw. Afr. Pl. **2**, 441, 1898, var. *asperuloides* Hiern exclusa (cf. *O. hymenophylla* Brem.); — *O. huillensis* Hiern l.c., cf. var. *pubescens* Brem.

Herba perennis, caulibus pluribus simplicibus vel praesertim e basi ramosis e radice lignoso orientibus, 15—35 cm alta. Caules ramique 0.5—1.0 mm diam., basin versus subteretes, in var. *sipaneoidi* glabri, in var. *pubescenti* pubescentes, internodiis 1.5—6.5 cm longis. Folia petiolo 1—5 mm longo, in var. *sipaneoidi* subglabro, in var. *pubescenti* pubescenti instructa, vel in var. *pubescenti* interdum subsessilia; lamina ovato-lanceolata vel lanceolata, 1.5—5.5 cm longa et 6—20 mm lata, basi nunc rotundata sed prope petiolum subito contracta, nunc sensim contracta, tenuis, discolor, sicc. haud conspicue discolorata, in var. *sipaneoidi* facie superiore costae dense, alibi sparse puberula, subtus glabra, in var. *pubescenti* utrimque pubescens, costa supra vix impressa, subtus vix prominula, nervis utroque latere costae 3 vel 4. Fimbriae vaginae stipularis utroque latere caulis 3—5 circ. 3 mm longae. Inflorescentia e floribus 3—9 composita, basi dichasialis, ramulis ultimis plerumque monochasialibus, ramulis infimis foliis ordinariis suffultis, plerumque ab inflorescentia nova in positionem lateralem coacta, inflorescentia nova basi bracteis filiformibus instructa et inde pedunculata, pedunculo ramulisque in var. *sipaneoidi* glabris, in var. *pubescenti* pubescentibus. Pedicelli 0.3—1.0 mm longi. Flores heterostyli, ad huc in forma dolichostyla sola noti. Ovarium in var. *sipaneoidi* sparse, in var. *pubescenti* dense pubescens. Calycis lobi lineari-triangulares, 3 mm longi, in var. *sipaneoidi* margine et costa ciliolati, in var. *pubescenti* extus toti pubescentes. Corolla azurea, extus glabra vel in var. *pubescenti* costa et margine loborum parce pilosa, tubo 7 mm longo, lobis 3.2 mm longis. Stamina in flore dolichostylo filamentis subnullis paulo infra incisuras corollae inserta; antherae 0.9 mm longae, inclusae. Granula pollinis 22—26 μ diam. Stylus in flore dolichostylo 13 mm longus, i.e. tubo fere duplo longior; stigmata 1.5 mm longa. Capsula sparse vel dense hirtella, matura nondum visa.

Habitat Angolam.

var. *sipaneoides*, caulibus glabris, foliis subglabris, inflorescentia glabra, ovario sparse pubescenti.
Angola: Pungo Andongo, Tunda Quilombo, Welwitsch 3075, type (BM, dupl. K).

var. *pubescens* Brem. n. var., caulibus pubescentibus, foliis utrimque pubescentibus, inflorescentiis pubescentibus, ovario dense pubescenti a typo recedens; *O. huillensis* Hiern l.c.
Angola: District Huilla, Lopollo, Welwitsch 5313, type of variety (type of *O. huillensis* Hiern) (BM, dupl. K).

Schumann remarks l.c. "Die Pflanze ist gewiss heterostyl, wobei in beiden Formen wenigstens die Narben die Kronenröhre überragen; ich habe nämlich auch die langgrifflige Form in einer Blüte vor mir, die ich aber nicht der Untersuchung opfern will. Sie ist in der Blumenkrone etwas gröszer, die Zipfel sind ein wenig länger und breiter, etc."

Schumann's description of the vegetative parts is doubtless based on Welwitsch 3075, but the details of the flower have probably been derived from Welwitsch 3076, the collection on which I have based my *O. hymenophylla*; the flowers of the latter are isostylous, the stigmata, although in the open flower slightly exserted, being in contact with the anthers in the bud. This would make *O. sipaneoides* K. Sch. a "nomen confusum", but the admixture of foreign material is so slight that it seems admissible to retain the name. Examples of the brachystylous form were not available to me.

Subgenus 6. *Platyrrhynchus* Brem.

Herba annua rosulata vel suffrutices subpulvinati vel pulvinati. Folia sessilia, linearia vel spatulata, plerumque succulenta, uninervia. Vagina stipularis cylindrica vel infundibuliformis, hyalina, truncata et interdum fimbriata. Flores terminales et pseudo-axillares, sessiles vel subsessiles, solitarii vel in capitulum dispositi, isostyli vel heterostyli. Ovarium glabrum. Calyx fissus vel fisso-partitus; lobi centro solo vel ad costam virides, ceterum hyalini. Corolla longituba extus glabra, fauce infundibuliformi pilis grosse granulatis et plerumque clavatis barbato (cf. Tab. XIII, fig. q et r). Granula pollinis 3-colporata. Stylus glaber; stigmata filiformia. Capsula in rostrum applanatum producta. Semina subglobosa, saturate brunnea, madefacta non glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae.

Speciebus adhuc notis 4 in insula Socotra endemicum.

Species typica: *O. pulvinata* (Balf. f.) Vierh.

23. **Oldenlandia bicornuta** (Balf. f.) Brem. n. comb.; *Hedyotis bicornuta* Balf. f. in Proc. Roy. Soc. Edinb. **12**, 405, 1884.

Herba annua rosulata, e foliorum jugis duobus et capitulo terminali sessili composita, rarius e nodo supremo ramulum a rosella nova coronatum emittens. Folia linearia, 1.5—5 cm longa et 1—3 mm lata, sicc. haud

conspicue discolorata, supra minute papillosa, subtus glabra. Vagina stipularis infundibuliformis, margine parce et breviter fimbriata; fimbria mediana in stipulis supremis usque ad 0.7 mm longa. Flores in capitulum sessile dispositi, isostyli. Calyx tubo hyalino 0.6 mm alto, lobis ovato-lanceolatis 3 mm longis, late hyalino-marginatis, fructu ovatis et usque ad 4 mm elongatis. Corolla tubo gracillimo 13—14 mm longo, fauce parce barbato, lobis 1.2 mm longis. Stamina filamentis 0.3 mm longis ad incisuras corollae inserta; antherae 0.5 mm longae. Granula pollinis 33 μ alta et 26 μ diam. Stylus tubo paulo brevior; stigmata 1.2 mm longa, dimidio superiore exserta. Capsula valde complanata et intra calycem accrescentem in rostrum bilobatum producta, 5 mm alta et 3 mm diam., glabra.

Habitat insulam Socotram.

Socotra: nr Galonsir, Balfour c.s. 178, type (K).

This species is easily distinguishable from the other representatives of the subgenus *Platyrrhynchus* by its habit; it is a small annual with a rosette consisting, as a rule, of four leaves only.

24. **Oldenlandia ocellata** Brem. n. spec. a speciebus aliis suffruticosis subgeneris *Platyrrhynchi* ramulis minus dense aggregatis, foliis longioribus spatulatis, calycis lobis centro macula orbiculari viridi notatis faciliter distinguenda.

Suffrutex subpulvinatus nanus, ramulis ramosissimis. Rami novelli 0.8 mm diam., veteriores vix incrassati sed subero griseo vestiti, internodiis vix 1.5 mm longis. Folia spatulata, 1—2 cm longa, parte dilatata circ. 2 mm lata, parte basali 0.4 mm lata, mucronata, anguste hyalino-marginata, sicc. haud conspicue discolorata, succulenta, utrimque glabra, costa vix conspicua. Vagina stipularis margine integra. Flores terminales sed mox in positionem lateralem coacti, solitarii, sessiles, heterostyli. Calyx glaber tubo hyalino 1 mm longo, lobis ovatis 1.5 mm longis, acuminatis, centro area orbiculari viridi notatis sed ceterum hyalinis, margine laevi. Corolla tubo gracillimo 15 mm longo, lobis 3 mm longis. Stamina in flore brachystylo filamentis 1 mm longis ad incisuras corollae inserta, in flore dolichostylo filamentis 0.3 mm longis 2 mm infra incisuras affixa; antherae 1.5 mm longae. Granula pollinis 25 μ alta et 21—22 μ diam. Stylus in flore brachystylo corollae tubo circ. 3 mm brevior in stigmata 1.0 mm longa exeuns, in flore dolichostyli tubo aequilongus et in stigmata 1.2 mm longa productus. Capsula glabra.

Habitat insulam Socotram.

Socotra: Abdulkuri, Ogilvie, Grant & Forbes 60, type (E), id. 66.

Easily distinguishable from the other pulvinate species by the longer leaves and by the curious calyx lobes with their green "eye".

25. **Oldenlandia aretioides** Vierh. in Oesterr. Bot. Zeitschr. **56**, 300, 1906; id. in Fl. Südarabien und Sokotra I, Denkschr. Akad. d. Wiss.

Wien, 71, 470, Tab. 15 fig. 8, 1907; *Hedyotis pulvinata* Balf. f. in Proc. Roy. Soc. Edinb. 13, 405, 1881 p.p.

Suffrutex pulvinatus, ramulis contortis ramosissimis; pulvinus depressus 3—5 cm altus et 9—15 cm diam. Rami novelli 1.0 mm diam., veteriores usque ad 5 mm incrassati, subero griseo crasso obtecti, internodiis vix 1 mm longis et foliis inde dense congestis. Folia lineari-oblonga, circ. 5 mm longa et 1.2 mm lata, parte superiore ad 2 mm longa patente, longius mucronata, basin versus sensim ampliata, anguste hyalino-marginata, succulenta, supra plana, subtus convexa, basin versus tenuiora et hyalina, utrimque glabra, costa vix conspicua, basin versus impressa. Vagina stipularis cylindrica, circ. 1 mm alta, margine irregulariter sed longe fimbriata, fimbriis centro rosellae supra folia immatura productis. Flores primum terminales, deinde in positionem lateralem coacti, solitarii. Calyx tubo 0.4 mm longo, lobis lanceolatis 1.6 mm longis, ad costam viridibus, margine ciliatis, fructu accrescentibus. Corolla nondum nota. Capsula glabra, pariete tenui instructa.

Habitat Socotram.

Socotra: Uadi Falenk, Paulay 2. 2. 1899, type (WU); s.l., Balfour 15 p.p. (sub nomine *Hedyotis pulvinata* Balf. f.).

Although the corolla is still unknown, the very near affinity of this species with *O. pulvinata* (Balf. f.) Vierh. can not be doubted. It is, however, easily distinguishable from the latter by the much smaller size of the leaves, the distinctly patent upper part of the latter and the shorter calyx lobes.

26. **Oldenlandia pulvinata** (Balf. f.) Vierh. in Denkschr. Akad. d. Wiss. Wien **71**, 469, 1907, Tab. 15 fig. 7; *Hedyotis pulvinata* Balf. f. in Proc. Roy. Soc. Edinb. **13**, 405, 1883 p.p., cf. *O. aretioides* Vierh.

Suffrutex pulvinatus, ramulis ramosissimis; pulvinus depressus, vix 5 cm altus et usque ad 30 cm diam. Rami novelli 1.5 mm diam., veteriores usque ad 4 mm incrassati, subero griseo obtecti, internodiis vix 1.5 mm longis et foliis inde dense congestis. Folia linearia, 0.9—2 cm longa et 0.5—1 mm lata, mucronata, hyalino-marginata, succulenta, supra plana, subtus convexa, basin versus tenuiora et hyalina, utrimque glabra, costa supra impressa. Vagina stipularis cylindrica, circ. 1 mm alta, margine irregulariter sed longe fimbriata, fimbriis centro rosellae supra folia immatura productis. Flores primum terminales, deinde in positionem lateralem coacti, solitarii, heterostyli. Calyx tubo 0.8 mm longo, lobis lineari-lanceolatis 3—4.2 mm longis, ad costam viridibus, margine ciliatis. Corolla dilute violacea, tubo gracili 6.5—13.5 mm longo, fauce pilis clavatis granulatis barbato, lobis 3.5 mm longis, intus pilis clavatis laevibus obtectis. Stamina in flore brachystylo filamentis 1.2 mm longis ad incisuras corollae inserta, antheris 1.4 mm longis, in flore dolichostylo filamentis 0.5 mm longis 3.5 mm infra incisuras corollae affixa, antheris 1.2 mm longis. Granula pollinis 32 μ alta et 25 μ diam. (Tab. XIII, fig. a).

Stylus in flore brachystylo tubo dimidio brevior, in flore dolichostylo tubo subaequilongus; stigmata circ. 1.5 mm longa. Capsula glabra, pariete tenui instructa.

Habitat insulam Socotram.

Socotra: Galonsir, Balfour c.s. 15 p.p., type (K), Schweinfurth 716; Djebel Rhahmân, Simony fide Vierh. l.c.; Djebel Mûmi, Paulay fide Vierh. l.c.; s.l., Mr and Mrs Bus.

The description given above is based on specimens which Vierhapper l.c. refers to his forma *congesta*. Whether his forma *laxa* really belongs to this species, is difficult to say, as neither flowers nor fruits were available. Part of Balfour's specimens would belong to this form, but the aspect of these specimens is so totally different from that of the type that I suppose that they belong to a different species.

The subgenus *Platyrrhynchus* occupies a rather isolated position in the genus. Apart from the differences brought forward in the key and in the diagnosis given above, there is also a difference in the structure of the placenta, the cells in the ripening fruit not growing out so far as in the other subgenera.

Subgenus 7. *Hemicephalum* Brem.

Subgenus novum inter subgenera seminibus madefactis non glutinosis et stigmatibus elongatis instructa capsula distincte rostrata ad *Platyrrhynchum* accedens, sed ab eo corolla brevituba, fauce pilis applanatis non-granulatis instructa, granulis pollinis 4-colporatis, stylo hirtello recedens.

Subgenus adhuc monotypicum in Somalia endemicum.

Species unica: *O. saxifragoides* Chiov.

27. **Oldenlandia saxifragoides** Chiov., Fl. Somala **1**, 190, 1929.

Suffrutex pulvinatus, circ. 5 cm altus et 10 cm diam., ramulis valde contortis, ramosissimis. Rami novelli 0.7 mm diam., veteriores usque ad 2 mm incrassati, cortice griseo obtecti, internodiis circ. 1.5 mm longis et foliis inde dense congestis. Folia linearia, circ. 3 mm longa et 0.6 mm lata, basin versus tamen sensim ampliata, anguste hyalino-marginata, crassa, sicc. recurvata, supra plana, subtus convexa, glabra, 1-nervia, costa subtus haud prominula; folia veteriora gradatim destructa. Vagina stipularis late infundibuliformis, hyalina, 0.7 mm alta, truncata, margine hic inde colletris ciliata. Flores primum terminales, deinde in positionem lateralem coacti, solitarii, heterostyli sed adhuc in forma brachystyla sola noti. Pedicelli vix 0.5 mm longi. Ovarium glabrum. Calyx fissopartitus, tubo 0.4 mm alto, lobis ovato-triangularibus 1.2 mm longis, margine sparse ciliolatis. Corolla extus glabra, tubo 1.8 mm longo, fauce barbato et infra faucem satis dense piloso, lobis 1.5 mm longis. Stamina in flore brachystylo filamentis 0.8 mm longis an incisuras corolla inserta,

in tubo decurrentia; antherae 1 mm longae. Granula pollinis 4-colporata, 22 μ longa et 19 μ diam. (Tab. XIII, fig. b). Stylus in flore brachystylo 0.9 mm longus, dimidio superiore dense hirtellus; stigmata 0.3 mm longa. Capsula circ. 2 mm alta et 2 mm diam., intra calycem in rostrum parte basali dimidio brevius producta, glabra. Semina subglobosa, alveolata, nigra, nitida, madefacta non glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae.

Habitat Somaliam.

Somaliland: Sultanate Obbia, between Gouen en Garbanan, Puccioni & Stefanini 478, type (F).

Notwithstanding the striking resemblance in habit with *O. aretioides* Vierh. and *O. pulvinata* (Balf. f.) Vierh. *O. saxifragoides* can apparently not be regarded as a very near ally of these species. The hairs in the corolla throat lack the knobs by which those of the Socotran species are covered, and are of the same kind as those found in the other species of *Oldenlandia*; the flowers, moreover, are much smaller and the style is hirtellous. Decurrent stamens are seen also in the genus *Lelya*.

Subgenus 8. *Tardavelinum* Brem.

Herbae annuae haplocaulae, caule erecto simplici vel ramoso. Folia sessilia, linearia vel filiformia. Vagina stipularis nunc utroque latere caulis in fimbrias 2 producta, nunc inappendiculata, casu quo margine interdum ciliata. Flores in cymas capituliformes terminales et interdum insuper axillares dispositi; cymae terminales involucro e foliis 4—8 composito circumdatae; cymae axillares ad nodos singulae, foliis 2 suffultae. Flores isostyli vel heterostyli. Calyx ad basin partitus; lobi anguste triangulares. Corolla extus glabra, fauce barbata. Granula pollinis 3-colporata. Stylus glaber; stigmata filiformia. Capsula subglobosa, intra calycem vix producta. Semina subglobosa, alveolata, madefacta non glutinosa; cellulae testae parietibus rectis instructae.

Speciebus adhuc notis tribus in Africa Tropicali endemicum.

Species typica: *O. tardavelina* Hiern.

28. **Oldenlandia nematocaulis** Brem. n. spec. foliis angustis necnon inflorescentiis involucratis ad *O. gregariam* K. Sch. et ad *O. tardavelinam* Hiern accedens, sed foliis etiam angustioribus, floribus pedicellatis ab eis distinguenda.

Herba gracillima, 2.5—6 cm alta. Caulis filiformis 0.3 mm diam., simplex, vix notabile scabridulus, internodiis 0.5—2.0 cm longis. Folia filiformia, 4—8 mm longa et 0.3—0.4 mm lata, hyalino-marginata, margine et facie inferiore costae scabridula, ceterum glabra. Vagina stipularis circ. 1 mm alta, utroque latere caulis in fimbrias 2 usque ad 1.2 mm longas exeuns. Cyma terminalis pauciflora, basi involucro e foliis plerumque 4 composito circumdata, interdum a cymis lateralibus praecessa. Pedicelli 0.2—1.0 mm longi. Flores isostyli. Ovarium scabrido-

puberulum. Calycis lobi 1.5 mm longi, margine et costa scabrido-hirtelli. Corolla rosea, tubo 2.6 mm longo, lobis 1.5 mm longis. Stamina filamentis subnullis 0.5 mm infra incisuras corollae inserta; antherae 0.5 mm longae, inclusae. Granula pollinis 21—23 μ alta et 18—20 μ diam. Stylus tubo paulo longior; stigmata 0.5 mm longa. Capsula circ. 2 mm alta et 2.5 mm diam., subglabra. Semina matura nondum visa.

Habitat Tanganyikam.

Tanganyika: District Mbeye, M'poroto Mnts, between Tukuyn and M'poroto, alt. 1850 m, St Clair-Thomson 787, type (K), "on pumice-lava rubble, locally more or less gregarious".

The position of this species is not fully certain as the seed characters are still unknown. The structure of the stipular sheath with its two filiform appendages at each side of the stem differs from that observed in the two other species of this subgenus, but as the latter shows in several respects an approximation to the subgenus *Hymenophyllum*, this difference is perhaps not very important, for in that subgenus the stipular sheath is always fimbriate.

The collection quoted above consists of a fairly large number of specimens, 17 of which are provided with well-developed flowers. In all of them the style is exserted and the stamens included. As means of vegetative reproduction seem to be absent (there is, of course, no absolute certainty in this respect, for the plants might be apogamous), this species may be regarded as isostylous.

29. **Oldenlandia gregaria** K. Sch. in Bot. Jahrb. 23, 414, 1897.

Herba gracilis, 7—15 cm alta. Caulis quadricostatus, ramosus, 0.4—0.5 mm diam., hirtellus, internodiis 1—3 cm longis. Folia linearia, 0.8—1.5 cm longa et 0.7—1.2 mm lata, basi paulum dilatata, rigidiora, vix discoloria, sicc. fucescentia, supra ad marginem scabrida, subtus basin versus parce hirtella, costa supra vix conspicua, subtus basin versus prominula. Vagina stipularis infundibuliformis, 1—1.5 mm alta, haud fimbriata. Cymae omnes terminales, capituliformes, involucro e foliis 4 longitudine normalibus sed basi magis dilatatis composito circumdatae. Flores sessiles, isostyli. Ovarium dense pubescens. Calycis lobi 1.6 mm longi, margine ciliati, extus sparse pubescentes. Corolla tubo 4 mm longo, lobis 1.2 mm longis. Stamina ad incisuras corollae inserta; filamenta nulla; antherae 1.2 mm longae. Granula pollinis 32 μ alta et 30 μ diam. (Tab. XIII, fig. d). Stylus tubo paulo longior; stigmata 0.7 mm longa. Capsula hirto-pubescens, matura nondum nota.

Habitat Angolam.

Angola: Huilla, Empalanca, Welwitsch 3053, type (K).

Apparently very near to *O. tardavelina* Hiern, but differing from the latter in its smaller size, hirtellous stem, smaller, isostylous flowers, a more densely hairy ovary, and much larger pollen grains.

30. **Oldenlandia tardavelina** Hiern in Cat. Welw. Afr. Pl. 2, 445, 1898.

Herba 15—20 cm alta. Caulis quadricostatus, ramosus, 0.6—1.2 mm diam., costis scabridulus, basin versus subteres et glabrescens, internodiis 1.5—3.5 cm longis. Folia linearia, 1—2 cm longa et 0.5—1.0 mm lata, basin versus dilatata, rigidiora, discoloria, sicc. haud conspicue discolorata, supra scabrida, subtus costa parce scabridula, costa supra vix conspicua, subtus basin versus prominente. Vagina stipularis infundibuliformis, 2—3 mm alta, margine parce ciliolata sed non fimbriata. Cymae terminales et interdum aliquae axillares, capituliformes; involucrum capituli terminalis e foliis 4—8, longitudine normalibus sed basi magis dilatatis compositum; involucra capitulorum lateralium, quae e floribus paucioribus constant, e foliis duobus composita; capitulum terminale longius pedunculatum; capitula lateralia sessilia. Flores sessiles, heterostyli. Ovarium breviter hirtellum. Calycis lobi 2.8 mm longi, margine ciliolati, carinati. Corolla tubo 6 mm longo, lobis 2.2 mm longis. Stamina in flore brachystylo filamentis 0.8 mm longis 0.3 mm infra incisuras corollae inserta; in flore dolichostylo antheris sessilibus 1 mm infra incisuras affixa; antherae 0.9 mm longae. Granula pollinis 16 μ longa et 14 μ diam. (Tab. XIII, fig. c). Stylus in flore brachystylo 4 mm longus, in flore dolichostylo 6.8 mm longus; stigmata 0.6—0.8 mm longa. Capsula sparse hirtella.

Habitat Angolam.

Angola: Pungo Andongo, Welwitsch 3229, type (BM, dupl. C), 1104.

It is rather unfortunate that seeds are known in only one of the species of this subgenus, viz. in *O. tardavelina*, for the testa cells of this species are, in contradistinction to the testa cells in the subgenus *Hymenophyllum*, provided with straight walls and if this should prove a general character of this subgenus, it would accentuate the difference between the two subgenera.

Subgenus 9. *Trichopodium* Brem.

Herbae annuae haplocaulae, interdum heterophyllae, caule erecto gracili. Folia caulina linearia vel filiformia. Vagina stipularis infundibuliformis, brevissima, utroque latere caulis in dentes 2 breves vel brevissimos producta. Flores graciliter pedicellati in inflorescentias racemivel paniculiformes dispositi, iso- vel heterostyli. Calyx ad basin partitus; lobi late triangulares. Corolla alba vel dilute violacea extus glabra, fauce vix conspicue barbata. Granula pollinis plerumque 4- vel 5-colporata (cf. Tab. XIII, fig. e et f). Stylus glaber; stigmata filiformia. Capsula subglobosa, intra calycem distincte producta. Semina alveolata, dilute brunnea, madefacta non glutinosa; cellulae testae magnae, parietibus rectis instructae, nec punctatae nec granulatae (cf. Tab. X, fig. a).

Speciebus adhuc notis duabus in Africa Aequatoriali et Transaequatoriali endemicum.

Species typica: *O. rosulata* K. Sch.

31. **Oldenlandia rosulata** K. Sch. in Bot. Jahrb. **23**, 416, 1897; Hiern in Cat. Welw. Afr. Pl. **2**, 447, 1898.

Herba gracillima 5—20 cm alta. Caulis subteres, maxime 0.5 mm diam., plerumque tamen tenuior, glaber vel basin versus scabridulo-puberulus, internodiis ad medium caulem usque ad 5 cm longis, ex axillis foliorum caulinorum omnium vel inferioribus exceptis ramificatus. Folia inferiora rosulata, spatulata vel lanceclata, 3—7 mm longa, interdum evanescentia; folia caulina linearia vel filiformia, 3—10 mm longa; folia omnia glabra, costa subtus prominula. Flores terminales et laterales, solitarii vel in diades et triades dispositi, omnes longe et gracillime pedicellati, inflorescentiam paniculiformem formantes. Pedicelli 1—3 cm longi et 0.1 mm diam. Flores in var. *rosulata* heterostyli, in var. *parviflora* isostyli. Ovarium glabrum. Calycis lobi 0.5—0.6 mm longi. Corolla tubo in var. *rosulata* 2.2—3.6 mm, in var. *parviflora* 1.2 mm longo, lobis in var. *rosulata* 2 mm, in var. *parviflora* 0.7 mm longis. Stamina in var. *rosulata* forma *dolichostyla* et in var. *parviflora* antheris sessilibus fauce inclusa, in var. *rosulata* forma *brachystyla* filamentis 0.8 mm longis ad incisuras corollae inserta; antherae 0.8 mm longae. Granula pollinis plerumque 4-colporata, in var. *rosulata* 26 μ alta et 24 μ diam., in var. *parviflora* 22 μ alta et 20 μ diam. (Tab. XIII, fig. e). Stylus in var. *rosulata* forma *brachystyla* 1.2 mm longus stigmatibus 0.6 mm longis instructus, in var. *rosulata* forma *dolichostyla* 2.9 mm longus stigmatibus 0.8 mm longis, in var. *parviflora* stigmatibus ad antheras adjicientibus. Capsula 1.8 mm alta et 2 mm diam., glabra.

Habitat Africam Aequatorialem et Transaequatorialem.

var. *rosulata*, floribus heterostylis, corollae tubo 2.2—3.6 mm, lobis 2 mm longis.

Belgian Congo: Katanga, Elisabethville, Schmitz I 437.
Angola: Huilla, Welwitsch 5320, type (K).
Northern Rhodesia: Kassana, between Lukona and border of Angola, alt. 1100 m, Pocock 240.
Transvaal: Pretoria, Tijgerpoort road, Young 2345.
Natal: Great Noodsberg, alt. 1000 m, Wood 5307.

var. *parviflora* Brem., floribus isostylis, corollae tubo 1.2 mm longo, lobis 0.7 mm longis.

Uganda: Lake Kampala, alt. 1200 m, Chandler & Hancock 85; West Kigezi, Rubuguli, alt. 1800 m, Purseglove 2699.
Northern Rhodesia: Broken Hill District, nr Mulungushi River, Brenan & Greenway 7926.
Belgian Congo: Ruanda, Rushake — Bumba, Becquet 268, type of variety (B).

Hiern l.c. quotes another specimen (Welwitsch 5319) from the plateau of Humpata, which I have not seen, and with some hesitation also one

from Lopollo (Welwitsch 3054), but the latter is a small specimen of *O. herbacea* (L) Roxb.

The specimens collected by Wood in Natal possess 3-colporate pollen grains. It is rather remarkable that all the specimens of which his collection consists, seem to be dolichostylous. This might indicate the presence of some means for vegetative propagation, but of what kind the latter might be, I am unable to make out.

The areas in which the two varieties occur, show so far no overlapping, and they are not even contiguous, but as this is a very small and inconspicuous species, it may be more generally distributed than we know at present. At any rate, it is no sufficient ground to regard these varieties as specifically distinct.

32. **Oldenlandia microcalyx** K. Sch. in Bot. Jahrb. 23, 415, 1896.

Herba gracilis, 50—55 cm alta. Caulis subteres, glaber, ad medium 0.8 mm diam., internodiis ad medium caulem circ. 6 cm longis, late sed haud profunde bisulcatis, ex axillis foliorum caulinorum, inferioribus exceptis, ramificatus. Folia basalia ignota; caulina linearia, 1—3 cm longa et 1.2—2.5 mm lata, glabra, costa subtus prominula. Flores in paniculam laxissimam dispositi; paniculae ramuli plures foliis longitudine redactis suffulti. Pedicelli gracillimi, 6—10 mm longi. Flores heterostyli, adhuc in forma dolichostyla sola noti. Ovarium glabrum. Calycis lobi 0.4 mm longi, subglabri. Corolla tubo 4.7 mm longo, lobis 3 mm longis. Stamina in flore dolichostylo antheris sessilibus 1.1 mm longis in parte superiore tubi inclusa. Granula pollinis subglobosa, 4- vel 5-colporata, 22 μ diam. (Tab. XIII, fig. f). Stylus in flore dolichostylo 6.2 mm longus; stigmata 1.6 mm longa. Capsula 1.4 mm alta et 1.6 mm diam., ad medium calyce cincta.

Habitat Angolam.

Angola: Bango, Buchner 620, type (K).

Differs from *O. rosulata* K. Sch. in its far greater height, the more numerous flowers, the shorter pedicels, slightly shorter calyx lobes and a longer corolla.

Subgenus 10. *Octoneurum* Brem.

Inter subgenera seminibus madefactis non glutinosis et stigmatibus elongatis instructa capsula non rostrata, foliis latioribus, inflorescentiis dichasialibus cognoscendum.

Speciebus una vel duabus in Africa tota et in Asia Tropicali distributum.

Species typica: *O. affinis* (R. et S.) DC.

33. **Oldenlandia affinis** (R. et S.) DC, Prodr. 4, 428, 1830; *Hedyotis affinis* R. et S., Syst. Veg. 3, 194, 1818; *H. dichotoma* Koen. ex Roth, Nov. Sp. Pl. 93, 1821, nom. illeg. nam non Cav., Ic. 6, 53, 1801, quae est *Oldenlandia biflora* L; *Oldenlandia dichotoma* (Koen. ex Roth) Hook. f., Fl. Brit. Ind. 3, 67, 1883, nom. illeg. nam non Spreng., Pugillus 2, 36,

1815, quae est *Vahlia* spec.; — *Hedyotis decumbens* Hochst. in Flora **27**, 552, 1844; Sond. in Fl. Cap. **3**, 11, 1865; *Oldenlandia decumbens* (Hochst.) Hiern in Fl. Trop. Afr. **3**, 54, 1877, comb. illeg. nam non Spreng., Pugillus **2**, 36, 1815, quae est *Vahlia* spec.; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895, Hiern in Cat. Welw. Afr. Pl. **2**, 442, 1898; Schinz in Mém. Herb. Boiss. 2e Sér. **1**, 64, 1900; Th. et H. Durand, Syll. Fl. Cong. 245, 1909; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 132, 1931; *Oldenlandia prostrata* P. Lima in Bol. Soc. Brot. ser. 2, **2**, 151, 1924, nom. nov. illeg. nam non (Bl.) O. Ktze, Rev. Gen. Pl. 292, 1891, quae est *Exallage philippinensis* (Willd.) Brem.; — *Hedyotis* (*Kohautia*?) *fugax* Vatke in Oesterr. Bot. Zeitschr. **25**, 232, 1875.

Herba perennis, plerumque e basi ramosa, caulibus primum interdum suberectis, postea semper decumbentibus, raro hic inde radicantibus. Caules glabri, subteretes, 0.7—1.7 mm diam., internodiis late bisulcatis ad medium caulem plerumque 2—4 cm longis, superioribus multo longioribus. Folia sessilia, anguste ovato-lanceolata vel anguste oblonga, raro aliquae linearia, ad medium caulem plerumque 2—4.5 cm longa et 0.6—1.6 cm lata, basi acuta, tenuiora, subdiscoloria, sicc. vix conspicue discolorata, supra marginem versus densius sed vix notabile scabridula, subtus glabra, margine basin versus parce sed longius ciliata, costa subtus prominula, nervis utroque latere costae 4—6, tenuibus. Vagina stipularis circ. 1 mm alta, inter folia vix producta, margine interdum colletris aliquibus ciliata, plerumque mox disrupta. Inflorescentiae laxe dichasiales, terminales et pseudo-axillares, ad apicem caulis haud raro in paniculam amplam confluentes; ramuli filiformes, basales plerumque foliis magnitudine redactis suffulti. Pedicelli plerumque 2—5 mm, interdum usque ad 15 mm longi. Flores heterostyli. Ovarium glabrum. Calyx ad basin partitus; lobi late triangulares 1.0 mm longi, margine ciliolati. Corolla violacea vel purpurea, extus glabra, tubo 4.5 mm longo, intus sparse, orem versus paulo densius piloso, lobis 3.2 mm longis. Stamina in flore brachystylo filamentis 1.5 mm longis 0.3 mm infra incisuras corollae inserta, antheris 1.3 mm longis instructa; in flore dolichostylo filamentis 0.3 mm longis 1.5 mm infra incisuras affixa, antheris 1.0 mm longis. Granula pollinis 3-colporata, in flore brachystylo 29—31 μ alta et 27—30 μ diam. (Tab. XIII, fig. g^2), in flore dolichostylo 26 μ alta et 24—25 μ diam. (Tab. XIII, fig. g^1). Stylus glaber, in flore brachystylo 3 mm longus stigmatibus 1 mm longis instructus, in flore dolichostylo 4.5 mm longus, stigmatibus 1.3 mm longis. Capsula globosa, 8-costulata, glabra, intra calycem vix producta. Semina numerosa, angulosa, brunnea, laevia, madefacta non glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae (Tab. X, fig. b).

Habitat Africam Tropicalem et Subtropicalem, Malagasciam, Indiam, Peninsulam Malayensem.

Ivory Coast: Dabou, Chevalier 17157, "savanna"; Abidjean, Scaetta 3008; Bingerville, Jolly s.n.

Gold Coast: Atwabo, Fishlock 66, 77; Western Province, Anaji, Lloyd Williams 30, "in undergrowth".
Togo: Lome, Warnecke 261; Noépe, Mahout 513.
Dahomey: Agoué, Ménager s.n.
Cameroons: Douala, alt. 30 m, Exell 747; Cameroon River, Mann 2229.
Nigeria: Lagos, Barter 2181, Dalziel 1049, Moloney 4183, Miller 50; Abeokuta, Guy Roberty 1606; Akwa District, Agolo, Thomas 186; Aguku District, id. 698, 1070; Anaoto, id. 1381; Ogwashi, alt. 200 m, id. 2060; Wani Province, Jesse, Butler-Cole 11, "grass plain"; Old Calabar, Holland 113, Thollon 677; Eket District, Mr and Mrs Talbot 3815; Obraraku, Freeman s.n.
Gaboon: Libreville, Pierre 143; Munda, Sibange Farm, Soyaux 438; Loango, id. 44, Dybowski s.n.; Brazzaville, de Brazza 66; Mansimu, Håkanson 22.9.1931; Yalinga, Le Testu 4435; s.l. Duparquet s.n.
Portuguese Congo: Sumba, Peco, alt. 20 m, Gossweiler 8675.
Belgian Congo: Moanda, Vanderijst 27597; Boma, Dacrémont 9, Vanderijst s.n., Monteiro s.n.; Matadi, Dacrémont 340, "savane humide"; M'vuazi, Devred 408; Mayombe, Luki, Brexly 13, Devred 300; Bingila, Dupuis s.n.; Lutété, alt. 600 m, Hens A 41, A 15, A 226; Léopoldville, alt. 300 m, Mrs Joan Russell 7, Bequaert 824, Vanderijst 30.1.07, Dubois 1437; Dolo, Kilima, Bavicchi 118; Dolo, Kiambusi, id. 30; Dolo, Kalome, id. 88; Kinshasa, Linder 1638; Boko, Vanderijst C 93, C 157, 29122, 29180, 29881, 29918, 39373; Kisantu, id. 20146, 32569, 33355, 36594, 39582, 40193, Gillet 107, 620, 707, 758, 1084, 3517, Robijns 250, "brousse", Louis 7; Kimuenza, Gillet 2130; Yokolo, Vanderijst 34347; Mpase, id. 39003; River Inkisi, id. 28288, 28302, 28324, 28326; Kipaho, id. 30388, 36253, 40489; Kasai, Kikwit, id. 2914, Lebrun 55; Wombali, Vanderijst 1522, 2015, 2294; between Bandundu and Leverville, Vermoesen 547, 548; Bololo, Bequaert 7123; Bokalo, Nelis s.n.; Uélé-Itumbiri, Monga, Lebrun 2302; Bili, id. 2854; Lower Katanga, Kapanga, Overlaet 107, "savane boisée", 1201; Upper Katanga, Pweto, Robijns 1991, "savane herbeuse"; Kasai, Lusambo, Laurent 520; Kasai, Munungu, Sapin s.n.; Madibi, id. s.n.; Central Forest Province, Galunia, Pijnaert 117; Gombasi, Claessens 1031; Yangambi, Léonard 1688; Upper Lomomi, Kaniama, Mullenders 391; Upemba Nat. Parc, de Witte 3372.
Angola: Pungo Andongo, Welwitsch 3073; Lunda, Dundo nr the river Luachima, Gossweiler 13831.
Uganda: White Nile, Kaboko, Hazel 728; Unyoro nr Masinde, alt. 1000 m, Bagshawe 1534; Kigayasa, alt. 1200 m, Dümmer 3245; Nyakagime, Kigezi, Purseglove 2419; Mt Otze, alt. 1500 m, Thomas 1965; Entebbe, Brown 236, 298, Maitland 224.
Kenya: Kibarani, Jeffery K 4, K 30; Kwale, alt. 300 m, Mrs Craig 9182; between Mombasa and Lamu, White s.n.
Tanganyika: Pemba, Vaughan 582, Greenway 1475; Zanzibar, Hildebrandt 1007 (type of *Hedyotis fugax* Vatke, W), 1007[b], Sacleux 1188,

Marseillé 62, Vaughan 1135, Mrs Taylor 4, Last s.n., Toms 98, Duparquet s.n., Boivin s.n., Paulay Aug. '87; Mafia Island, Wallace 770; Usambara, Duga, Holst 3158; Ulugurus, Tanana, alt. 1350 m, Miss Bruce 825; Ulugurus, Kibogwa, alt. 1200 m, Haarer 1875; Hills N.E. of Lake Tanganyika, Scott Elliot 8242; Kilwa-kiwindsche, Braun 1322, 7854; District Mahenge, Mahenge, alt. 950 m, Schlieben 1871; Nyasa Plateau, Kyimbila, Kagulwe, Stolz 1171.

Portuguese East Africa: Kongone mouth of Zambesi, Kirk s.n.; bank of Luabe, id. 30; Beira, Rogers 13116, Dümmer 4658; Delagoa Bay, Kuntze s.n., Mrs Borlé 345; Matola, Schlechter 11696, Junod s.n.

Northern Rhodesia: Livingstone, alt. 900 m, Rogers 7094; Victoria Falls, Flanagan 3166.

Southern Rhodesia: Chimanimani Mnts, alt. 1500 m, Johnson 210; R. Tandai, Miss Myres 694; Odzi, alt. 1000 m, Chase 2132; Vumba Mnts, alt. 1500 m, Miss E. Ferrar 4067, "open forest"; Norseland, alt. 1500 m, Chase 1528, 2162, 2889.

Transvaal: Zoutpansberg District, Shilouvane, Junod 1043; at foot of Zoutpansberg, Schweickerdt & Miss Verdoorn 592; Lijdenburg District, Suid-Walliskraal, Liebenberg 3348; Nelspruit, alt. 700 m, id. 2599.

Natal: Tugela District, Stanger, Pentz & Acocks 10365; Oribi Flats, Mc Clean 569; Durban, Krauss 305 (type of *Hedyotis decumbens* Hochst.), Gueinzius 159, 470, Sutherland s.n., Plant 69, Rodway s.n., Wood 244, 1647, 8266, 8516, Scott Elliot 1669; Inanda, Wood 532; s.l. Drège s.n., Sanderson s.n.

This species is not only widely distributed, but it occurs also at very different altitudes, viz. from sea level to about 1500 m; it seems to avoid the drier regions. The type was collected by Koenig in India.

34. **Oldenlandia Laurentii** de Wild. in Miss. Laurent **1**, 272, 1906; Th. et H. Durand, Syll. Fl. Cong. 247, 1909.

Herba perennis, e basi ramosa, caulibus decumbentibus et hic inde radicantibus. Caules marginibus sulcarum brevissime hirtelli, subteretes, 0.5—1.0 mm diam., internodiis bisulcatis ad medium caulem 0.3—1.0 cm longis, superioribus brevioribus. Folia sessilia, ovata, 7—11 mm longa et 4—6.5 mm lata, basi acuta, tenuia, subdiscoloria, sicc. olivacea, supra marginem versus densius sed vix notabile scabridula, subtus costa vix conspicue hirtella, ceterum glabra, margine basin versus parce sed longius ciliata, costa subtus prominula, nervis utroque latere costae 4 vel 5, tenuibus. Vagina stipularis circ. 0.7 mm alta, inter folia vix producta, margine colletris aliquibus ciliata. Inflorescentiae dichasiales, caules ramosque terminantes; ramuli basales foliis magnitudine redactis suffulti. Pedicelli 1.5—2 mm longi. Flores homostyli. Ovarium glabrum. Calyx ad basin partitus; lobi late triangulares 0.7 mm longi, margine ciliolati. Corolla violacea, extus glabra, tubo 3.2 mm longo, ad orem parce piloso, lobis 1.8 mm longis. Stamina filamentis 0.8 mm longis ad incisuras

corollae inserta, antheris 0.7 mm longis. Granula pollinis 3-colporata, 25 μ alta et 21 μ diam. Stylus glaber 3 mm longus; stigmata 1.2 mm longa. Capsula globosa, 8-costulata, glabra, intra calycem vix producta. Semina numerosa, angulosa, brunnea, laevia, madefacta non glutinosa; cellulae testae parietibus rectis instructae, nec punctatae nec granulatae.

Habitat Congoliam.

Belgian Congo: Province Stanley-Pool, between Bololo and Mopolenge, Laurent 620, type (B).

The only existing specimen is infected by a parasitic fungus whose minute fruiting bodies are visible on the shoots, peduncles and pedicels and even on the capsules. The plant is doubtless nearly related to *O. affinis* (R. et S.) DC, and it is possible that the differences with the type of the latter are due to the influence of the fungus. More material, however, will have to be studied before this question can be settled.

Subgenus 11. *Aneurum* Brem.

Inter subgenera seminibus madefactis non glutinosis et stigmatibus elongatis instructa caulibus decumbentibus, floribus ad nodos solitariis, corolla intus glabra, seminibus luteo-brunneis, cellulis testae minutissime punctatis distinguendum.

Subgenus e speciebus duabus, altera in Africa, altera in Asia Tropicali endemica compositum; species tertia (*O. Boscii* (DC) Chapm. in America Boreali reperta forsitan speciei Asiaticae (*O. diffusae* (Willd.) Roxb.) conspecifica.

Species typica: *O. lancifolia* (Schum.) DC.

35. **Oldenlandia lancifolia** (Schum.) DC, Prodr. 4, 425, 1830; (Schum.) Schweinf. ex Hiern in Fl. Trop. Afr. 3, 61, 1877; Schumann in Engler, Pflanzenw. Ost Afrikas C, 375, 1895; Th. et H. Durand, Syll. Fl. Cong. 246, 1909; Hutch. et Dalz., Fl. West Trop. Afr. 2, 131, 1931; *Hedyotis lancifolia* Schum. in Schum. et Thonn., Beskr. Guin. Pl. 72, 1827; — *H. longifolia* Schum. in op. cit. 70; *Oldenlandia longifolia* (Schum.) DC, Prodr. 4, 426, 1830; — *O. rutshurensis* de Wild., Pl. Bequaert. 5, 428, 1932, cf. var. *rutshurensis*; — anne *Hedyotis* (*Oldenlandia*) *herbacea* Blume em. Vatke in Oesterr. Bot. Zeitschr. 25, 232, 1875 absentia speciminum incertum.

Herba annua vel perennis, plerumque a basi ramosa, caulibus decumbentibus et interdum hic inde radicantibus, simplicibus vel ramosis. Caules ramique obtuse quadrangulares, quadrisulcati, partibus novellis haud raro complanatis, in var. *lancifolia*, var. *grandiflora*, var. *microcarpa*, var. *rutshurensi*, var. *seseënsi*, glabri, in var. *scabridula*, var. *longipedi*, var. *brevipedi* minime partibus novellis scabriduli, 0.5—2 mm diam., internodiis plerumque 3—6 cm, in var. *seseënsi* 1—2 cm, in var. *microcarpa* 1.5—3 cm, in var. *rutshurensi* 4—7 cm longis. Folia sessilia, plerumque

linearia et 2—6 cm longa, 2—7 mm lata, in var. *rutshurensi* linearilanceolata, 4.5—5 cm longa et 10—12 mm lata, in var. *seseënsi* lanceolata, 1.0—2.2 cm longa et 2.5—6 mm lata, in varietatibus omnibus basi acuta, supra ad marginem scabridula, subtus in var. *lancifolia*, var. *grandiflora*, var. *microcarpa*, var. *rutshurensi*, var. *seseënsi* tota glabra, in var. *scabridula*, var. *longipedi*, var. *brevipedi* costa scabridula, in varietatibus omnibus rigidiora, discoloria, sicc. supra saturate et subtus dilute olivacea vel fusca, costa supra impressa, subtus prominula, nervis utroque latere costae 4—6, tenuissimis et in foliis angustioribus difficiliter distinguendis. Vagina stipularis crateriformis, circ. 1 mm alta, truncata, utroque latere caulis in fimbrias 2 vaginae aequilongas vel ei paulo longiores producta. Flores plerumque singuli ad nodos. i.e. pseudo-axillares, interdum tamen duo vel plures, casu quo unus pseudo-axillaris, alii basi foliis fere as nihilum redactis instructi, i.e. brachyblastos terminantes. Pedicelli graciles, plerumque 0.5—1 cm longi, in var. *seseënsi* et var. *brevipedi* raro 5 mm excedentes, in var. *longipedi* 1.5—3 cm longi, glabri vel in var. *scabridula*, var. *brevipedi*, var. *longipedi* scabriduli. Flores isostyli. Ovarium glabrum vel in var. *scabridula*, var. *brevipedi*, var. *longipedi* parce puberulum. Calyx ad basin partitus; lobi ovato-triangulares 1—1.5 mm longi, glabri vel margine vix notabile scabriduli. Corolla alba vel interdum roseo vel violaceo suffusa, extus intusque glabra, plerumque tubo 1 mm longo, lobis tubo aequilongis, in var. *grandiflora* bis longior. Stamina filamentis 0.5 mm vel in var. *grandiflora* 1 mm longis paulo infra incisuras corollae inserta; antherae 0.5 mm, in var. *grandiflora* tamen 1 mm longae. Granula pollinis 3-colporata, globosa, 20 μ diam. (Tab. XIII, fig. *h*). Stylus glaber tubo paulo longior; stigmata filiformia 0.7 mm longa, in var. *grandiflora* bis longiora. Capsula plerumque circ. 3 mm diam., in var. *microcarpa* vix 2 mm diam., intra calycem vix producta, glabra vel in var. *scabridula*, var. *brevipedi*, var. *longipedi* vix notabile puberula. Semina numerosa, angulosa, luteo-brunnea, madefacta non glutinosa; cellulae testae parietibus rectis instructae, minutissime punctatae (Tab. X, fig. *c*).

Habitat Africam Tropicalem et Malagasciam; in America Tropicali introducta.

var. *lancifolia*, foliis ad marginem scabridulis exceptis ubique glabra, pedicellis 0.5—1 cm longis, corolla tubo 1 mm, lobis 1 mm longis, capsulis 3 mm diam.

Senegal: Cape Verde, Maille s.n.; Casamance, Perrottet s.n.

Sierra Leone: Kamali, Thomas 313; Kanya, id. 3089; Yonibana, id. 4700, 4719; Njala, Deighton 752; Makump, id. 1391; Mano Bonjema, id. 3707; Ghambama, id. 9520; between Bumban and Port Loko, Scott Elliot 5726; Kundita, Talla, id. 5045.

Liberia: Monrovia, Cooper 4, Delafosse s.n.; Kakatown, Whyte s.n.; Sanokwale District, Gbau, Baldwin 9419.

Gold Coast: Anaja nr Sekondi, W.P. s.n.; Assuantsi, Irvine 1573;

Awentia, id. 512; Valley of Aquapin, Schumacher s.n., type (C, S).
Togo: Lome, Mahoux 514.
Southern Nigeria: Oban, Talbot 226; Jorubaland, Schlechter 12344; Ondo, Akure, Brenan 8660; Akok, Barter 178; Aguku District, Thomas 1078.
Cameroons: Efulen, Bates 240; Bibundi, Jungner 245, Dusén s.n.; Bipinde, Zenker 1198, 4042; Buea, Maitland 57.
Gaboon: Munda, Soyaux 337; Sibange, Büttner 158; Bagroo River, Mann 870.
Belgian Congo: Boma, Bequaert 805; Stanley-Pool, Hens B 4, Luja 60; Léopoldville, Bequaert 7478; Ganda, de Briey 2010; Kisantu, Gillet 990, Vanderijst 28953, 29569, 32181, 33307, 35056, 35182, 35412; Kizu, id. 26828, 26859, 26860, 26891; Coquilhatville, Lebrun 312; Ikengo, Germain 1837; Nouvelle Anvers, De Georgi 770; Dundasana, id. 1120; Beala, Hulstaert 524; Batuma, id. 109; Eala, Pynaert 1179[bis], Robijns 634, Corbisier-Baland 1019, Léonard 75, Germain 4244, Flamigni 48/A, Lebrun 427; Kitu, id. 208; Equatorial District, Pynaert 364; Ifuta, Em. et M. Laurent s.n.; Banalia, Goldermans 28; Luluabourg, Vanderijst 24062; Kitwit, id. 2895; Lulua, Sapin s.n.; Yangambi, Louis 1609, 1831, 2437, 6061, 8549, 9658, 10740, 13812, 15738, 16020, 16146, 16213; Gali, Thonner 25; Songololo, Jespersen s.n.
Angola: District Alta Catumbela, Ganda, alt. 1350 m, Faulkner A 91.

var. *grandiflora* Brem., floribus bis majoribus a var. *lancifolia* recedens.
Southern Nigeria: Port Harcourt, Taylor 10, type of variety (K).
Cameroons: Efulen, Bates 964.
Spanish Guinea: s.l. Tessmann 964.

var. *microcarpa* Brem., internodiis dimidio brevioribus, capsulis vix 2 mm diam. a var. *lancifolia* recedens.
French Sudan: Bufaga, Chevalier 702, type of variety (P).

var. *rutshurensis* (de Wild.) Brem. (*O. rutshurensis* de Wild. l.c.), internodiis 4—7 cm longis, foliis lineari-lanceolatis 4.5—5 cm longis et 1.1—1.4 cm latis a var. *lancifolia* recedens.
Belgian Congo: Rutshuru (Kivu), Bequaert 6231, type of variety (B).

var. *seseënsis* Brem., internodiis 1—2 cm longis, foliis lanceolatis 1.0—2.2 cm longis et 2.5—6 mm latis, pedicellis ad anthesin 0.5 mm non excedentibus a var. *lancifolia* recedens.
Uganda: Sese Islands, Soyi, Maitland 415, type of variety (K); ibid., Kalangala, Purseglove 1741; ibid., Bugala, Thomas 73.

var. *scabridula* Brem., caulibus minime apicem versus scabridulis, pedicellis scabridulis, ovario puberulo a var. *lancifolia* recedens.
Sierra Leone: Matotoka, Thomas 1306; Kailahun, Deighton 4008; Yonibana, Thomas 4725; Binkolo, id. 1852.
Liberia: Firestone Plantation N° 3, Linder 216.
Southern Nigeria: Nupe, Barter 1659.

Northern Nigeria: Bauchi Plateau, Vom, alt. 1200—1400 m, Dent Young 112, Lely P 343; Naraguta, id. 262.
Cameroons: Bamenda, alt. 1100 m, Maitland 1592; alt. 750 m, id. 580.
French Aequatorial Africa: Bambari, Tisserant 756, 2488, 2546; Bozoum, id. 2914, 3199; Yalinga, Le Testu 3125.
Anglo-Egyptian Sudan: Madi, Speke & Grant s.n.; Lado, Yei River, Sillitoe 458.
Uganda: White Nile, Koboko, Hazel 483; ibid. Maracha, Eggeling 3876; Kampala, Botanist Dep. Agr. Ug. 2095, Chandler & Hancock 84; Busoga, Brown 245; Kiagwa, alt. 1200 m, Eggeling 784; Kipayo, alt. 1200 m, Dümmer 460; Semliki Valley, Scott Elliot 8055; Kivava, alt. 1200 m, Dümmer 972, 1225.
Kenya: Kipkarren, Mrs Brodhurst-Hill 287, 557.
Tanganyika: Zanzibar, Sacleux 634, Vaughan 1286, Boivin s.n.; Pemba, Vaughan 688; Upper Ruhudje, Schlieben 626, type of variety (K); Bomole, Zimmermann 7851; Monga, id. 7852; Dodwe, id. 7853; Myombo Mbogo, Geilinger 3082; Muanza (Lake Victoria), id. 3357.
Belgian Congo: Nangu, Claessens 834^{quater}; Tsikama, Vanderijst 23556; Nlamkarie, Greshoff 12; Lutété, Hens A 235; Country of the Mombuttu (Mangbettu), Schweinfurth 3298, 3631; M'vuazi, Devred 16; Dolo, Bavicchi 371, 454; Kimpako, Vanderijst 20/8/08; Kisantu, Gillet 331, 976, Vanderijst 29023; Kinanga, Robijns 164; Dundusana, Mortehan 994; Likimi, Malchair 26; Ubangi, between Libenge and Zongo, Lebrun 1653; Uélé, Itumbiri, id. 2563; Bambesa, Brédo 1118, 1216, 00370, Steyaert 82, 248, 287, 342, 385, 548, 561, 621, 742, 766, Pittery 702, Louis 1670; Epulu, Putman 137; Yangambi, Louis 16092, 16128; Kibali-Ituri, Aru, alt. 1250 m, Lebrun 3614; Rutshuru (Kivu), id. 9035; Muhe Valley, id. 8095; Yambutu, Claessens 719; Doruma, De Graer 537, 624; Upper Lomani, Sakadi, Mullenders 788, 1693; Ruanda-Urundi, Usuambara, Vrijdagh 724; Urundi, Kitega, Elskens 245.
Angola: Pungo Andongo, Welwitsch 3059; Amboin, Cuanza Sul, Capiz, Gossweiler 9989.
Northern Rhodesia: Mwinilunga, Milne-Redhead 3478; Kalomo, Rogers 8241.
Southern Rhodesia: Salisbury, alt. 1400 m, Eyles 4641, 4723, Wild 569, 2525; Inyanga, Chase 697; s.l., Hislop 379.
Portuguese East Africa: nr Beira, 25-miles Station, Schlechter 12255.
Transvaal: Waterberg District, north of Warmbad, Smuts & Gillett 3075; Potgietersrust, Lotsy & Goddijn 1012.

var. *longipes* Brem., a var. *scabridula* foliis anguste linearibus, 6—7 cm longis et vix 3.5 mm latis, pedicellis in fructu circ. 3 cm longis recedens.
Southern Nigeria: Nupe, Barter 1714, type of variety (K).
Cameroons: Neu-Kamerun, Tessmann 2481.

var. *brevipes* Brem., a var. *scabridula* pedicellis raro 5 mm excedentibus recedens.

Abyssinia: Gimma, Malco, coll. ign. 147, type of variety (F), Fiori 9.

The type specimina of *Hedyotis lancifolia* Schum. and *H. longifolia* Schum. are no longer available, but duplicates are present in Vahl's herbarium at Copenhague (of *H. lancifolia* also in the herbarium of the National Museum at Stockholm). As the two species are here for the first time united, it might perhaps be argued that I ought to have adopted the epithet *longifolia*, as the description of *H. longifolia* is found on p. 70 of Thonning and Schuhmacher's work, whereas that of *H. lancifolia* occurs on p. 72, but as it is not absolutely certain that the plant in the herbarium Vahl to which the name *H. longifolia* has been attached, really represents this species, and as the epithet *lancifolia* has now for a long time been used, it seemed advisable to retain it.

O. lancifolia (Schum.) DC has been introduced in Tropical South America, where it has often been confused with *O. herbacea* (L) Roxb., e.g. by Schumann in the Flora Brasiliensis and by myself in Pulle's Flora of Suriname. It is easily distinguishable from that species by the decumbent shoots, the inside glabrous corolla, the yellowish-brown seeds, which do not become slimy when moistened, and by the minute but very dense punctation of the testa cells.

The var. *brevipes* comes very near to the Asiatic *O. diffusa* (Willd.) Roxb., which differs from *O. lancifolia* mainly in the subsessile or shortly pedicellate flowers. The North-American *O. Boscii* (DC) Chapm. shows a very striking resemblance to *O. diffusa*, and may even be conspecific with this Asiatic representative of the group. If this supposition should prove right, the presence of this species in America might perhaps be explained as the result of a post-Columbian introduction.

Subgenus 12. *Stachyanthus* Brem.

Inter subgenera seminibus madefactis glutinosis instructa vagina stipulari fimbriata, floribus in axillis glomeratis et glomerulis in inflorescentiam spiciformem dispositis cognoscendum.

Subgenus adhuc monotypicum in Tanganyika endemicum.

Species unica: *O. flosculosa* Hiern.

36. **Oldenlandia flosculosa** Hiern in Fl. Trop. Afr. 3, 60, 1877; K. Sch. in Engler, Pflanzenw. Ost Afrikas C, 375, 1895.

Herba perennis, e basi lignescente ramosa, caulibus erectis vel ascendentibus, ramosioribus, 15—40 cm alta. Caules ramique quadricostati, in var. *flosculosa* glabri vel ad nodos et in costis puberulo-hirtelli, in var. *hirtella* distincte hirtelli, 0.4—1.0 mm diam., internodiis usque ad 7 cm longis. Folia sessilia, linearia, 1—3.5 cm longa et 1.5—5.5 mm lata, basin versus attenuata, subcoriacea, discoloria, sicc. supra saturate fusca, subtus

griseo-brunnea, in var. *flosculosa* utrimque glabra, in var. *hirtella* sparse hirtella, costa basin versus impressa, subtus prominula, nervis utroque latere costae 2—3, in foliis majoribus interdum distinctis. Vagina stipularis 1—2 mm alta, margine in fimbrias 3 vel 5 usque ad 2 mm longas producta. Flores glomerati et glomeruli in inflorescentias spiciformes dispositi; glomeruli internodiis 0.5—3 cm longis separati; pedicelli 0—1.5 mm longi. Flores heterostyli. Ovarium in var. *flosculosa* glabrum, in var. *hirtella* hirtellum. Calyx ad basin partitus; lobi ovato-triangulares 0.7—0.8 mm longi, in var. *flosculosa* glabri, in var. *hirtella* costa et margine hirtello-ciliati. Corolla alba, extus glabra, tubo 1.5 mm longo, in flore brachystylo sparse, in flore dolichostylo dense barbato, lobis 1.3 mm longis. Stamina in flore brachystylo filamentis 0.8 mm longis ad incisuras corollae inserta, in flore dolichostylo filamentis subnullis paulo infra incisuras affixa; antherae 0.8 mm longae. Granula pollinis 3-colporata, 26—28 μ alta et 23—25 μ diam. (Tab. XIII, fig. i). Stylus in flore brachystylo 0.8 mm longus, totus sparse hirtellus, in flore dolichostylo 3 mm longus, dimidio inferiore hirtellus; stigmata filiformia 0.5 mm longa. Capsula breviter rostrata, in var. *flosculosa* glabra, in var. *hirtella* hirtella. Semina numerosa, angulosa, brunnea, madefacta glutinosa; cellulae testae parietibus rectis instructae, haud punctatae (Tab. X, fig. e).

Habitat Tanganyikam.

var. *flosculosa*, caulibus ramisque, foliis, ovario, calycis lobis glabris.
Tanganyika: Zanzibar, Hildebrandt 1348, type (K), "zwischen Culturen auf sandigen Boden", Greenway 1220, 1311, both "in grass on coral rock"; Vaughan 1164, 1690, 1791, Sacleux 499, 1038, Marseille 89, Mrs Taylor 114/2, Oxtoby 2, Boivin s.n.; Tendaguru, Leakey 72, Migeod 91.

var. *hirtella* Brem., caulibus ramisque, ovariis distincte hirtellis, foliis sparse hirtellis, calycis lobis costa et margine hirtello-ciliatis a typo recedens.
Tanganyika: Mlayar, Jaeger 88, type of variety (W).

O. flosculosa Hiern occupies on account of the spiciform inflorescences a somewhat isolated position in the genus. Its nearest ally is probably *O. patula* Brem., from which it differs in the short pedicels, the shortly but nevertheless distinctly rostrate capsule, and the straight walls of the testa cells.

Subgenus 13. *Euryanthus* Brem.

Inter subgenera seminibus madefactis glutinosis instructa vagina stipulari fimbriata, inflorescentiis terminalibus, racemiformibus cognoscendum.

Subgenus adhuc monotypicum in Tanganyika endemicum.

Species unica: *O. patula* Brem.

37. **Oldenlandia patula** Brem. n. spec. prima facie *O. affini* (R. et S.) DC similior, sed caule erecto, foliis linearibus, stipulis longius fimbriatis, floribus fructibusque multo minoribus, seminibus madefactis glutinosis ab ea recedens et ad *O. flosculosam* Hiern accedens, a qua ramis patentibus, floribus graciliter pedicellatis, cellulis testae parietibus undulatis instructis faciliter distinguenda.

Herba annua, erecta, 18—35 cm alta, haplocaula sed ex axillis omnibus ramos patentes emittens. Caulis scabrido-papillosus, subteres, basi 1—2 mm diam., apicem versus filiformis, internodiis vix conspicue quadricostulatis ad medium caulem 3—4 cm longis, superioribus usque ad 6 cm elongatis. Folia sessilia, linearia, 3—5.5 cm longa et 3.5—5 mm lata, apice basique acuta, tenuiora, subdiscoloria, sicc. supra saturate fusca, subtus griseo-brunnea, supra glabra, subtus costa papillosa, margine basin versus scabridulo-papillosa, costa vix impressa, subtus basin versus prominula, nervis utroque latere costae circ. 4 vix conspicuis. Vagina stipularis 1—1.5 mm alta, margine in fimbrias aliquas usque ad 3 mm longas producta. Flores in inflorescentias terminales dispositi; inflorescentiae monochasiales, racemiformes, rachide filiformi instructae, internodiis rachidis elongatis, floribus ad nodos in paria dispositis. Pedicelli primum 2—5 mm longi, post anthesin 5—8 mm longi. Flores heterostyli. Ovarium glabrum. Calyx ad basin partitus; lobi late triangulares 0.8 mm longi, toti glabri. Corolla colore ignoto, extus glabra, tubo 1.4 mm longo, intus praesertim orem versus sparse piloso, lobis 1.2—1.6 mm longis. Stamina in flore brachystylo filamentis 1 mm longis ad incisuras corollae inserta, in flore dolichostylo filamentis subnullis paulo infra incisuras affixa; antherae 0.8 mm longae. Granula pollinis 3-colporata, 25—27 μ alta et 22—24 μ diam. Stylus hirtellus, in flore brachystylo 0.7 mm, in flore dolichostylo 2.5 mm longus; stigmata filiformia 0.5 mm longa. Capsula depresse globosa, 1.2 mm alta et 1.8 mm diam., intra calycem haud producta, glabra. Semina numerosa, angulosa, madefacta glutinosa; cellulae testae parietibus undulatis instructae, haud punctatae.

Habitat Tanganyikam.

Tanganyika: Tendaguru, Migeod 21/3/26, type (BM).

Nothwithstanding the striking difference in habit and the perhaps more important differences in the structure of the inflorescence and of the seedcoat this species is probably nearest to *O. flosculosa* Hiern., with which it agrees in the structure of the stipular sheath, the terminal inflorescences, the shape and size of the pollen grains and the hirtellous style.

Subgenus 14. *Polycarpum* Brem.

Herbae perennes, e basi ramosae, caulibus erectis. Caules subteretes costulis 4 e foliorum marginibus decurrentibus notati. Folia sessilia, filiformia, distincte mucronata, superiora sensim longitudine decrescentia. Vagina stipularis truncata, utroque latere caulis in appendices filiformes

2 longiores et interdum aliquas breviores producta. Flores in glomerulos, triades vel corymbos dispositi qui in paniculam amplam confluunt. Flores heterostyli. Ovarium glabrum. Calyx ad basin partitus; lobi triangulares, margine scabrido-papillosi. Corolla alba, extus glabra, fauce barbata. Granula pollinis 3-colporata. Stylus in flore brachystylo totus, in flore dolichostylo dimidio inferiore hirtellus; stigmata filiformia. Capsula intra calycem vix producta, glabra. Semina brunnea, madefacta glutinosa; cellulae testae parietibus rectis instructae, granulatae (cf. Tab. X, fig. f).

Speciebus adhuc notis 3 in Africa Orientali Tropicali distributum.

Species typica: *O. taborensis* Brem.

38. **Oldenlandia taborensis** Brem. n. spec.; *O. parviflora* (Bth.) Oliv. in Trans. Linn. Soc. **29**, 84, 1873 et Hiern in Fl. Trop. Afr. **3**, 60, 1877 quoad specimen a Speke et Grant lectum, haud quoad typum qui ad *Kohautiam virgatam* (Willd.) Brem. pertinet. — A speciebus aliis subgeneris *Polycarpi* floribus plus minusve glomeratis, ab *O. Duemmeri* S. Moore insuper foliis longioribus, ab *O. microcarpa* Brem. fructibus majoribus distinguenda.

Herba 17—22 cm alta. Caules ramique 0.5—1.5 mm diam., internodiis ad medium caulem 2.5—5 cm longis, glabri vel costulis interdum minute scabrido-papillosi. Folia inferiora usque ad 3.5 cm longa sed vix 1 mm lata, supra et facie inferiore costae scabrido-papillosa, margine basin versus minime in foliis inferioribus hirtello-ciliata. Vagina stipularis usque ad 2 mm alta; appendices filiformes 2 principales 2—4 mm longae, interdum fimbriis aliquibus brevioribus comitatae. Panicula e glomerulis graciliter pedunculatis composita; pedicelli ad anthesin vix 1 mm longi, post anthesin interdum usque ad 2 mm elongati. Calycis lobi 1 mm longi. Corolla tubo 1.4 mm longo, lobis 2 mm longis. Stamina in flore brachystylo filamentis 0.4 mm longis instructa, in flore dolichostylo antheris sessilibus; antherae 0.6—0.7 mm longae. Granula pollinis globosa, 20 μ diam. Stylus in flore brachystylo 0.4 mm, in flore dolichostylo 2.8 mm longus; stigmata 0.6—0.8 mm longa. Capsula 1.5 mm alta et 2.2 mm diam.

Habitat Tanganyikam.

Tanganyika: District Tabora, nr Kazek, alt. 1200 m, Speke & Grant s.n., type (K); ibid. between Nyembe and Uyago, Braun 5406; ibid. nr Tabora, alt. 1100 m, id. 5764; Tabora District, s.l., Wallace 42.

A fruiting specimen collected at Kazikazi, Manyani District (Burtt 3625) comes very near to those enumerated above, but has somewhat longer pedicels.

39. **Oldenlandia Duemmeri** S. Moore in Journ. of Bot. **54**, 250, 1916.

Herba 12—25 cm alta. Caules ramique 0.5—1.0 mm diam., glabri, internodiis ad medium caulem 2.5—3.5 cm longis. Folia inferiora usque ad 1.2 cm longa et 0.8 mm lata, supra scabrido-papillosa, sicc. vix discolorata, costa supra immersa. Vagina stipularis usque ad 1.5 mm alta; appendices filiformes 2 principales vaginae subaequilongae, raro fimbriis

brevioribus comitatae. Panicula e triadibus longe pedunculatis composita; pedicelli 1—4 mm longi. Calycis lobi 0.6 mm longi. Corolla tubo 2.0 mm longo, lobis 1.4 mm longis. Stamina in flore brachystylo filamentis 0.5 mm longis instructa, in flore dolichostylo antheris sessilibus; antherae 0.7 mm longae. Granula pollinis 22 μ alta et 18—20 μ diam. Stylus in flore brachystylo 0.7 mm, in flore dolichostylo 3 mm longus; stigmata 0.6—0.7 mm longa. Capsula 1.6 mm alta et 2.1 mm diam.

Habitat Ugandam.

Uganda: Bugoye, alt. 1300 m, Dümmer 2624, type (BM, dupl. K); Lake Nabugabo, alt. 1100 m, Chandler 1782.

O. Duemmeri S. Moore resembles *O. taborensis* Brem., but the leaves are much shorter, the panicle consists of triads instead of glomerules, the calyx and corolla lobes are shorter, and the corolla tube is somewhat longer.

40. **Oldenlandia microcarpa** Brem. n. spec.

Herba 20—35 cm alta. Caules ramique 0.7—1.5 mm diam., internodiis ad medium caulem 2.5—3.5 cm longis. Folia inferiora usque ad 3 cm longa et 0.8 mm lata, utrimque glabra, sicc. vix discolorata, costa supra impressa. Vagina stipularis usque ad 1.2 mm alta; appendices filiformes 2 principales usque ad 1 mm longae, interdum fimbriis brevioribus comitatae. Panicula e corymbis et triadibus composita; pedicelli 2—3 mm longi. Calycis lobi 0.4 mm longi. Corolla tubo 1.8 mm longo, lobis 1.4 mm longis. Stamina in flore brachystylo (solo noto) filamentis scabrido-papillosis 0.5 mm longis instructa; antherae 0.8 mm longae. Granula pollinis globosa 22 μ diam. Stylus 0.6 mm longus; stigmata 0.6 mm longa. Capsula 1.2 mm alta et 1.7 mm diam.

Habitat Tanganyikam.

Tanganyika: Shinyanga, alt. 1100 m, Burtt 2422, type (K), id. 3745, "on marshy ground covered with short grass and in fields".

The scabrido-papillose filaments are an unexpected feature, as the filaments of almost all other *Oldenlandiae* are glabrous (cf. *O. eludens* Brem.).

O. microcarpa Brem. resembles *O. Duemmeri* S. Moore in the structure of the inflorescence, but it has longer and entirely glabrous leaves, slightly smaller flowers and much smaller fruits.

The three species of this subgenus are doubtless nearly related; they are found, moreover, in the same region and at similar altitudes. The differences nevertheless are too numerous to regard these plants as mere varieties.

Subgenus 15. *Cephalanthium* Brem.

Herbae perennes, e basi ramosae, humiles. Folia sessilia, linearia, apice distincte mucronata. Vagina stipularis truncata, utroque latere caulis in appendices filiformes 2 vel plures producta. Flores in inflorescentias terminales corymbiformes vel subcapituliformes dispositi, heterostyli. Calyx fere ad basin partitus, raro (*O. ichthyodermati* Cuf.) fissopartitus;

lobi plerumque triangulares, raro (*O. ichthyodermati*) ovato-lanceolati, interdum anguste hyalino-marginati. Corolla alba, rosea vel violaceo suffusa, extus glabra vel subglabra, tubo intus sparse vel densius piloso, fauce plerumque barbato. Stamina in flore brachystylo filamentis ad incisuras corollae inserta, in flore dolichostylo antheris sessilibus in dimidio superiore tubi inclusa. Granula pollinis 3-colporata. Stylus in flore brachystylo totus hirtellus, in flore dolichostylo dimidio inferiore hirtellus. Stigmata elongata. Capsula intra calycem breviter producta. Semina brunnea, madefacta glutinosa; cellulae testae parietibus rectis instructae, nunc punctatae, nunc laeves (cf. Tab. X, fig. g et h).

Speciebus adhuc notis 4 in Africa Orientali distributum.

Species typica: *O. scopulorum* Bullock.

41. **Oldenlandia scopulorum** Bullock in Kew Bull. 1932, 497.

Herba e caudice multicipiti ramosa, 6—15 cm alta. Caules ramique subteretes, 0.4—0.8 mm diam., glabri, internodiis bisulcatis ad medium caulem in var. *scopulorum* plerumque 0.6—1.5 cm, in var. *lanceolata* 2—4 cm longis. Folia in var. *scopulorum* anguste linearia, plerumque 1—1.7 cm longa et 0.7—1.5 mm lata, in var. *lanceolata* lineari-lanceolata, 1.5—2 cm longa et 2—2.5 mm lata, sicc. plerumque fuscescentia, interdum tamen vix discolorata, utrimque glabra vel ad marginem sparse et vix notabile papillosa, costa supra impressa, subtus prominula. Vagina stipularis 1—1.5 mm alta; appendices filiformes 2 principales vaginae subaequilongae, interdum fimbriis aliquibus brevioribus comitatae. Inflorescentia subcorymbiformis, pedunculo gracili 2.5—20 mm longo instructa, e floribus 3—5 composita; pedicelli 1—2 mm longi, in fructu elongati. Ovarium glabrum. Calyx fere ad basin partitus; lobi triangulares in var. *scopulorum* 1.2—1.5 mm, in var. *lanceolata* 1.5—1.7 mm longi, carinati, margine vix notabile scabrido-papillosi. Corolla rosea vel dilute violacea, rarius alba, tubo in var. *scopulorum* 2.4—2.5 mm, in var. *lanceolata* 2.5—3 mm longo, fauce dense barbato, infra faucem pilis aliquibus sparso, lobis in var. *scopulorum* 2.2 mm, in var. *lanceolata* 2.5 mm longis, etiam pilis aliquibus sparsis. Stamina in flore brachystylo filamentis 0.5 mm longis instructa; antherae 0.8 mm longae. Granula pollinis 24 μ alta et 22 μ diam. (cf. Tab. XIII, fig. j). Stylus in flore brachystylo circ. 1 mm, in flore dolichostylo circ. 4 mm longus; stigmata 0.7—1.2 mm longa. Capsula subglobosa 1.5 mm alta et 2 mm diam., intra calycem in rostrum 0.4 mm altum producta, glabra.

Habitat partes altiores Kenyae et Tanganyikae.

var. *scopulorum*, internodiis ad medium caulem 0.6—1.5 cm longis, foliis anguste linearibus plerumque 1—1.7 cm longis et 0.7—1.5 mm latis, calycis lobis 1.2—1.5 mm longis, corolla 4.5—5 mm longa.

Kenya: Mt Elgon, alt. 2200 m, Lugard 40, type (K); ibid. alt. 2450 m, Major and Mrs Lugard 346; Londiani, alt. 2200 m, Mrs Brodhurst-Hill 601; Gigil, alt. 1800 m, van Someren 1439; Kikuya, alt. 2100 m, id. 1172;

Kinangop, alt. 2400 m, Miss Harvey 169, 170; Thompson's Falls, alt. 2300 m, Peirce 1672; Northern slopes of Mt Kenya, Nanyuki, alt. 2500 m, Gilbert Rogers 398; Aberdare Mnts, alt. 1800 m, Dowson 538; between Nyeri and Nanyuki, Mrs Prescott Decie s.n.; Soy, alt. 1800 m, Mrs Brodhurst-Hill 188, 206, 310, 311; Molo, alt. 2400 m, Dümmer 12.
Tanganyika: Kadubulila, Davis 137; Tabora, Ugogo-Nyembe, Braun 5406; Ugalla River, alt. 1150 mm, Bally 7525.

var. *lanceolata* Brem., internodiis ad medium caulem 2—4 cm longis, foliis lineari-lanceolatis 1.5—2 cm longis et 2—2.5 mm latis, calycis lobis 1.5—1.7 mm longis, corolla 5—6 mm longa a var. *scopulorum* recedens.
Kenya: Londiani, Lindblom 5.1920, type of variety (S); Leikipia Plateau and Aberdare Range, district around Nyeri, Scoresby Routledge s.n.; Nakuro, alt. 1800 m, Snowden 538; Thomson Falls, Miss Brenda E. Lacey 2.

O. scopulorum Bullock differs from the other species of this subgenus in the distinctly pedicellate flowers. It resembles *O. Wiedemannii* in the entirely green calyx lobes and in the absence of a distinct hook at the top of the corolla lobes, but is easily distinguishable from that species by the greater length of the pedicels and the shorter and less conspicuously fimbriate stipular sheath.

42. **Oldenlandia Wiedemannii** K.Sch. in Bot. Jahrb. **28**, 57, 1899 (sphalm. *Wiedenmannii*); — *O. Uhligii* K.Sch. et K.Krause op cit. **39**, 518, 1907; — *O. Kaessneri* K.Sch. et K.Krause op. cit. 520 (cf. var. *glabricaulis*), non S. Moore in Journ. of Bot. **43**, 249, 1905 et op. cit. **45**, 115, 1907.

Herba ramosa 7.5—28 cm alta. Caules ramique subteretes costulis 4 e foliorum marginibus decurrentibus notati, 0.5—2 mm diam., internodiis ad medium caulem 1—5 cm longis, in var. *Wiedemannii* breviter hirtelli, in var. *glabricauli* subglabri. Folia anguste linearia, ad medium caulem 1.6—6 cm longa et 0.8—3 mm lata, in var. *Wiedemannii* supra et facie inferiore costae sparse scabrido-hirtella, in var. *glabricauli* utrimque glabra, sicc. olivacea vel fuscescentia, costa supra impressa. Vagina stipularis 2—4 mm alta; appendices filiformes plerumque 4 usque ad 4 mm longae. Flores subcapitati. Capitula terminalia plerumque capitulo axillari praecessa, interdum subsessilia, casu quo bracteis 2 plus minusve foliaceis involucrata, plerumque pedunculo usque ad 5 mm longo elata, internodio praecedente in pseudo-pedunculum gracilem mutato. Pedicelli plerumque vix 0.5 mm longi, rarius aliqui usque ad 3 mm longi, fructu paulo accrescentes. Ovarium in var. *Wiedemannii* hirtello-pubescens, in var. *glabricauli* subglabrum. Calyx fere ad basin partitus; lobi triangulares 1.7 mm longi, carinati, in var. *Wiedemannii* hirtello-pubescentes et costa margineque distincte scabrido-ciliati, in var. *glabricauli* margine et costa ciliati sed alibi glabri. Corolla plerumque alba, rarius violaceo suffusa, extus glabra vel hirtella,

tubo 2—2.2 mm longo, fauce barbato, infra faucem sparse piloso, lobis 1.6—1.7 mm longis. Stamina in flore brachystylo filamentis 1.3 mm longis, antheris 1.0 mm longis instructa; antherae floris dolichostyli sessiles, 0.8 mm longae. Granula pollinis 19—22 μ alta et 18—21 μ diam. Stylus in flore brachystylo 1.8 mm longus, fere totus hirtellus, in flore dolichostylo 3 mm longus, dimidio inferiore hirtellus; stigmata 0.4 mm longa. Capsula parce hirtella vel subglabra 1.7 mm alta et 2.3 mm diam., calycis lobis paulo elongatis coronata.

Habitat Kenyam et Tanganyikam.

var. *Wiedemannii*, caulibus ramisque breviter hirtellis, foliis supra et facie inferiore costae sparse scabrido-hirtellis, ovario et calycis lobis hirtello-pubescentibus; — *O. Uhligii* K.Sch. et K.Krause, v. supra.

Kenya: Mt Kenya, Ngare — Ndara, alt. 1800 m, Mrs Ward 2569; Menengai, alt. 2100 m, Mrs Brodhurst-Hill 615; Chyulu South, Bally 8337; Machakos District, van Someren 1585; Voi District, Uwatali, alt. 900 m, Miss Napier 954; Voi, ead. 1069; Maungu, alt. 900 m, Johnston s.n.; between Maungu and Bura, Sacleux 2493; between Nyeri and Nanyuki, Mrs Prescott Decie s.n.

Tanganyika: Kilimanjaro, Moshi, alt. 800 m, Haarer 474, neotype (K); Lembeni, alt. 800 m, id. 1247; between Schuma and Mkumbara, Braun 2899; North-east side of Mt Meru, alt. 1500 m, Uhlig 728 (type of *O. Uhligii*); Arusha, Haarer 251; Serengeti Plains, Mrs Moore 18; Kinganwezi, Mmemia, Phillips s.n.; Massai Steppe, Mlayar, Jaeger 88; Pangani Steppe, id. 78.

var. *glabricaulis* Brem., caulibus, foliis, ovario capsulaque glabris a var. *Wiedemannii* recedens; — *O. Kaessneri* K.Sch. et K.Krause, non S. Moore, v. supra.

Kenya: Sultan Hamoud, Kaessner 653, type of variety (K).

The type of the var. *glabricaulis* is probably the same plant as that on which *O. Kaessneri* K.Sch. et K.Krause non S. Moore was based, although the number of the latter is said to be 665; the locality and the date of collection, however, agree.

The points of resemblance and of difference between this species and *O. scopulorum* Bullock have already been discussed.

43. **Oldenlandia capitata** Brem. n. spec. subgeneris *Cephalanthii*, calycis lobis hyalino-marginatis, basi in tubum distinctum connatis, corollae lobis apice uncinatis ad *O. ichthyodermatem* Cuf. accedens, foliis paulo latioribus, vagina stipulari breviore et minus conspicue fimbriata, calycis lobis multo angustioribus ab ea distinguenda.

Herba 3.5—7 cm alta. Caules subsimplices, subteretes, costulis 4 in paria approximatis e foliorum marginibus decurrentibus notati, 0.6—1.0 mm diam., ubique scabrido-hirtelli, internodiis superioribus gradatim longioribus. Folia linearia, 1—2 cm longa et 1.5—3 mm lata, supra scabrido-

papillosa, subtus glabra, sicc. olivacea, costa supra vix impressa. Vagina stipularis usque ad 2 mm alta, parte superiore sola hyalina; appendices filiformes usque a 0.5 mm longae, plerumque multo breviores. Flores subcapitati; capitula sessilia, basi foliis circ. 1.5 cm longis suffulta; bracteae partim foliaceae; pedicelli ad anthesin subnulli, postea usque ad 1 mm elongati. Ovarium sparse et breviter hirtellum. Calyx fisso-partitus; tubus 0.8 mm altus; lobi anguste triangulares 2.5 mm longi, anguste hyalino-marginati, margine et costa scabrido-papillosi. Corolla alba, extus apicem versus puberula, tubo 2 mm longo, fauce barbato, lobis 2 mm longis, apice uncinatis. Antherae in flore dolichostylo (solo noto) dimidio superiore tubi insertae, sessiles, 0.9 mm longae. Granula pollinis 24 μ alta et 23 μ diam. Stylus 3.5 mm longus, dimidio inferiore hirtellus; stigmata 0.5 mm longa. Capsula 2 mm alta et 2.5 mm diam., scabrido-papillosa.

Habitat Somaliam.

Somaliland: El Sheikh, nr Erigavo, Peck 216, type (East African Herbarium); between Biher and Las Anod, Glover & Gilliland 147; Basin of the Nogal, between Tur Cahio and Handungab, Puccioni & Stefanini 935 (1026).

O. capitata Brem. and *O. ichthyoderma* Cuf. differ from the two preceding species in the structure of the calyx with its distinct tube and the hyaline margin of the lobes and in the uncinate top of the corolla lobes. It differs from *O. ichthyoderma* in its slightly wider leaves, its shorter, less conspicuously fimbriate stipular sheath, the slightly hirtellous ovary and the much narrower calyx lobes.

44. **Oldenlandia ichthyoderma** Cuf. in Nuovo Giorn. Bot. Ital. **55**, 83, 1948.

Herba 7—25 cm alta. Caules subsimplices, quadricostati, costulis subaequidistantibus, 0.6—1.3 mm diam., internodiis superioribus gradatim longioribus, costulis sparse et interdum vix notabile scabrido-hirtelli. Folia anguste linearia, 1.5—4 cm, rarius usque ad 7 cm longa et 1—2 mm lata, acutissima, supra scabrido-papillosa, subtus glabra vel costa scabrido-papillosa, sicc. pallide viridia, costa supra impressa. Vagina stipularis usque ad 3 mm alta, hyalina; appendices filiformes usque ad 5 mm longae, 2 principales raro minus quam 2 mm longae. Flores subcapitati; capitula sessilia, basi foliis 1.5—3 cm longis suffulta; bracteae parvae, plerumque ad stipulas fimbriatas redactae; pedicelli ad anthesin circ. 1 mm longi, postea usque ad 2 mm elongati. Ovarium glabrum. Calyx fisso-partitus; tubus 0.4 mm altus; lobi ovato-lanceolati 2.8 mm longi, costa viridi excepta hyalini, carinati, margine et costa scabrido-papillosi. Corolla alba, extus glabra, tubo 3.3 mm longo, intus densius piloso sed fauce sparse piloso, lobis 1.5 mm longis, apice uncinatis. Stamina in flore brachystylo (solo investigato) filamentis 0.7 mm longis ad incisuras corollae inserta; antherae 1.2 mm longae. Granula pollinis 22 μ alta et 20 μ diam.

Stylus 2 mm longus, vix conspicue hirtellus; stigmata 0.5 mm longa. Capsula 1.7 mm alta et 2.2 mm diam., glabra.

Habitat Abyssiniam.

Abyssinia: Sagan Omo, Elolo (Lake Rudolph), Corradi 2754, type (F), 2758, 2759; Atana to Murlé, id. 2755, 2756; Murlé, id. 2757, 2760.

Cufodontis does not indicate a type specimen. I have chosen Corradi 2754, as the latter is probably the most complete one. The name *ichthyoderma* refers probably to the epidermis on the upper side of the leaves which makes on account of the large size of the cells and their convex surface a more or less "scaly" impression. Cufodontis ascribes this aspect of the epidermis to the presence of impressed veinlets, but in reality the veinlets are invisible. It is also possible that the name *ichthyoderma* refers to the silvery epidermis that in the lower part of the shoots gradually peels off.

The lower part of the plant is apparently buried in the sand, and produces suberect branches; the aerial part of the latter is sparingly branched, and these branches too are suberect, and they all end in capitula preceded by a rather long internode.

The nearly glabrous corolla throat is a somewhat unexpected feature, but it should be borne in mind that the beard in the throat of the brachystylous form is very often somewhat less well developed than in the dolichostylous one, although I must admit that I know no other species in which the reduction has gone so far as it did here.

Subgenus 16. *Eu-oldenlandia* K.Sch.

Herbae plerumque annuae, caulibus sympodialibus. Folia sessilia, plerumque angustiora. Vagina stipularis truncata vel utroque latere caulis breviter producta, haud raro in fimbrias vel dentes 2 vel 4 exeuns. Flores nunc omnes pseudo-axillares, nunc in inflorescentias cymoso-umbellatas pseudo-axillares dispositi, isostyli vel heterostyli. Calyx ad basin partitus. Corolla extus glabra, fauce barbata. Granula pollinis 3-colporata. Stylus glaber vel hirtellus; stigmata filiformia. Capsula intra calycem plerumque breviter producta. Semina brunnea, subglobosa, madefacta glutinosa; cellulae testae parietibus rectis vel undulatis instructae, laeves vel granulatae.

Speciebus pluribus in regionibus tropicalibus et subtropicalibus praesertim Africae et Asiae distributum; species una in America introducta.

Species typica: *O. corymbosa* L.

This subgenus is in America represented by the introduced *O. corymbosa* L. Whether *O. herbacea* (L) Roxb. is also represented, is as yet uncertain (see my remarks on the distribution of *O. lancifolia*), and whether there are any indigenous species belonging to this group, is also unknown: of none of the American species that might belong to it, sufficient material was at my disposal.

45. **Oldenlandia herbacea** (L) Roxb., Fl. Ind. ed. Car. et Wall. **1**, 445, 1820; DC, Prodr. **4**, 425, 1830; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 131, 1931; *Hedyotis herbacea* L [Fl. Zeyl. 65] Spec. Pl. ed. 1, 102, 1753; — H. *stricta* Sm. in Rees, Cycl. **17**, n. 21, 1811, non Sond. in Fl. Cap. **3**, 11, 1865, quae est *Kohautia cynanchica* DC; — *Oldenlandia Heynii* G. Don, Gen. Syst. **3**, 531, 1834; Oliv. in Trans. Linn. Soc. **29**, 84, 1873; Hiern in Fl. Trop. Afr. **3**, 59, 1877, syn. *O. lineari* DC excl.; K.Sch. in Engler's Pflanzenw. Ost Afrikas C, 376, 1895; *Hedyotis Heynii* (G. Don.) Sond in Fl. Cap. 3, 10, 1865; — *H. dichotoma* Koen. ex Roth in errore apud A. Rich., Tent. Fl. Abyss. **1**, 361, 1847, non Koen. ex Roth, Nov. Sp. Pl. 93, 1821 quae est *Oldenlandia affinis* (R. et S.) DC; H. (*Kohautia*) *micrantha* Hochst. in Herb. Schimp. Abys. (1854) n. 2263, nomen, cf. var. *flaccida*; — *H. trichopoda* A. Rich., Tent. Fl. Abyss. **1**, 360, 1847, cf. var. *flaccida*; — *Oldenlandia Holstii* K.Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895, cf. var. *Holstii*.

Herba plerumque annua, var. *suffruticosa*, var. *Holstii*, var. *Goetzei* perennis, plerumque 15—30 cm alta, erecta et ramosa. Caulis ramique glabri, quadricostati; caulis ad medium plerumque circ. 1 mm diam., internodiis ad medium caulem plerumque 2.5—3 cm longis, in var. *dolichosepala* usque ad 6 cm longis. Folia linearia, ad medium caulem plerumque circ. 2 cm longa et 1 mm lata, in var. *flaccida*, var. *papillosa* circ. 2 mm lata, in var. *dolichosepala* 3 cm longa, sicc. plerumque supra nigrescentia, subtus brunnescentia, plerumque utrimque glabra, margine basin versus setulis paucis ciliata, costa subtus prominula. Vagina stipularis brevis, raro plus quam 0.5 mm alta, truncata, setulis aliquibus ciliata, non fimbriata. Flores pedicellis gracilibus, foliis subaequilongis, patentibus instructi, solitarii vel saepius bini ad nodos, casu quo alter basi foliis rudimentariis munitus et ergo re vera brachyblastum terminans, plerumque isostyli, in var. *Holstii* heterostyli. Ovarium glabrum, in var. *papillosa* papillosum vel breviter hirtellum. Calycis lobi plerumque circ. 1 mm longi, in var. *dolichosepala* fructu usque ad 2.5 mm elongati, margine papillis paucis scabriduli, sicc. nigrescentes. Corolla tubo cylindrico, apice dilatato plerumque 3.3—3.7 mm, in var. *dolichosepala* et var. *dolichantha* 6—7 mm, in var. *Goetzei* et var. *Holstii* 7—8 mm longo, lobis plerumque 1—1.3 mm, in var. *dolichosepala* et in var. *dolichantha* 1.7—2.2 mm, in var. *Goetzei* et in var. *Holstii* 2.5—3.0 mm longis. Stamina in floribus isostylis et in floribus dolichostylis var. *Holstii* antheris sessilibus 0.5 mm longis in parte dilatata tubi inclusa, in floribus brachystylis var. *Holstii* filamentis 1.5 mm longis ad incisuras corollae inserta. Granula pollinis 23—24 μ alta et 22—23 μ diam. (Tab. XIII, fig. l). Stylus glaber in floribus isostylis tubo paulo, in floribus dolichostylis var. *Holstii* conspicue longior, in floribus brachystylis var. *Holstii* cum stigmatibus inclusis; stigmata filiformia 0.7—0.9 mm longa. Capsula dimidio superiore calyce nigrescente cincta, plerumque subglobosa et circ. 2.2 mm alta, 2 mm diam., in var. *suffruticosa* 1.8 mm diam., in var. *dolichocarpa* elongata, 3.5—5 mm

alta et 1.5—2 mm diam., glabra vel in var. *papillosa* papillosa vel breviter hirtella. Cellulae testae parietibus rectis instructae, granulatae (Tab. X, fig. i et j).

Habitat partes tropicales et subtropicales Africae et Asiae; typus e Ceylania.

var. *herbacea*, annua, foliis ad medium caulem plerumque 2.5—3 cm longis et circ. 1 mm latis, floribus isostylis, ovario glabro, calycis lobis circ. 1 mm longis, in fructu non conspicue accrescentibus, corollae tubo 2.2—3.7 mm longo, lobis 1—1.3 mm longis, capsula subglobosa circ. 2 mm diam., glabra.

Cape Province: Pondoland, Port St John's, alt. 240 m, Bolus 10094.

Natal: Port Shepstone, Wall s.n.; Durban, Drège s.n. ("*Kohautia dregeana* Presl b"), Gerard & M'Ken 1365, Sutherland s.n.; Oribi Flats, McClean 516; Botha's Hill, alt. 750 m, Wood 8056; Inanda, id. 514; Noodsberg, alt. 700 m, id. 5328; District Greytown, Mowbray, alt. 1500 m, Miss Fisher 983; Inchanga, Wood 13009; Paulpietersburg, Galpin 9717.

Basutoland: Leribe, alt. 1700 m, Mrs Dieterlen 266, Mamathes 5850, Guillarmoth 523.

Orange Freestate: Hoopstad, Goossens 1290.

Swaziland: between Bremersdorp and Dalriach, Bolus 11924; Havelock Concession, Saltmarshe 1041.

Transvaal: Komatipoort, Schlechter 11740; Pilgrimsrest, Galpin 14453; Sabie Falls, Burtt Davy 1556; Kruger National Park, nr Pretoriuskop, Codd 6056; Sekukuniland, Barnard 397; Lijdenburg, Wilms 579, 579a; Spitskop, id. 1031; Ermelo, Dr Henrici 1530; Middelburg, Hutchinson 2715; Heidelberg, Miss Leendertz 1019; Pretoria, Kirk 21, Repton 138, Smith 127, Acocks 11335, Lotsy & Goddijn 344; Grootfontein, Mogg 15954; Benoni, Bradfield 122; Johannesburg, Galpin 1433, Rogers 22962, 1626; District Potchefstroom, Dassiesrand, v. d. Westhuizen 271; Elandsfontein, Theron 757; Buffelshoek, Goossens 1492; District Wolmaransstad, Strijdpoort, Sutton 271; Modderfontein, Conrath 337; Rustenburg, Miss Nation 316, Rose Innes 138; between Warmbad and Nijlstroom, Acocks 1444; Warmbad, Repton 791; Nooitgedacht, Acocks & Naudé 70; Sandpoort, Smuts & Gillett 3403; Potgietersrust, Galpin 8987; Pietersburg, McCallum 137; between Pietersburg and Houtbosch, Bolus 10910; Zoutpansberg, Shilouvane, Junod 545a.

Bechuanaland: Mafeking Division, Moshesh, Brueckner 8136.

Scuthern Rhodesia: Matopos, alt. 1350 m, Eyles 997; Buluwayo, Gardner 73; Wankie, Levy 21; Salisbury, alt. 1500 m, Eyles 599, 4699, Rogers 13105, Wild 2285, 2531, 2538; Trelawney, Jack 200; Umtali, Odzani River, Teague 271; Marandellas, Rattray 344, Corby 50; Zimbabwe, Hutchinson & Gillett 3357.

Northern Rhodesia: Zambesi, above Kali, Pocock 150; Upper Zambesi, M^{elle} Kiener s.n.; Choma, Rogers 8014; Mwinilunga District, Matonchi

Farm, Milne-Redhead 2753; Kalenda Plain, id. 4576; River Isongailu, id. 3894.

Nyasaland: nr. Blantyre, Last s.n.; Twanbo, south of Lake Tanganyika, Nutt s.n.; Fort Hill, alt. 1000 m, Whyte s.n.; Masuku Plateau, alt. 2000 m, id. s.n.; Mzimba, Ekwendeni District, Wilson 1937.

Tanganyika: Kyimbila District, Kyimbila, Stolz 264; Upper Ruhudje, Lupemba, Schlieben 460; Rungwe District, Mbosi, alt. 1500 m, Davies 538; Rungwe, Geilinger 2200; Ulugurus, alt. 1200 m, Miss Bruce 443; Marangu, Volkens 715; Moshi, Haarer 335; Mashami, id. 342; Kamwala, Upare, alt. 1500 m, id. s.n.; Bukoba District, Nyakate, Gillman 193; Songea District, Matengo Highlands, Ugano, Zimmer 21; Pemba, Vaughan 618; Madoroma, Kagune, Swynnerton 719.

Kenya: Kavirondo, between Nandi and Mumias, Whyte s.n.; between Mumias and Subwas, alt. 1300 m, id. s.n.; Kipkarren, Mrs Brodhurst-Hill 357, 498; Mbagathi, Miss Napier 69; Chyulu, alt. 1600 m, Bally 1030; South-east Kenya, alt. 1500 m, Battiscombe 686; Machakos District, Mbooni Hills, alt. 1700 m, Bogdan 1208; Mt Kenya, alt. 2100 m, Dale 3052; Leikipia Plateau, Scoresby Routledge 1908; Kisumu, alt. 1200 m, Alluaud 56; South-west Elgon, alt. 2000 m, Mrs Tweedie 778; Uasin Gishu, alt. 2200 m, Miss Harvey 51; Eldoret, alt. 2100 m, Bogdan 1966.

Uganda: Bugala, Sese, Thomas 99; Kampala, Dümmer 2695; Entebbe, Fyfe 121; Toro, Nyakasusa, Hancock 108 a/36; Teso, alt. 1000 m, Chandler 40; White Nile, Kobopo, Hazel 471; Buddu, Dawe 310; Lake Bungoni, alt. 1900 m, Chandler & Hancock 2607; Aremo, alt. 1500 m, Mrs Tweedie 776.

Abyssinia: Gimma, Ufficio Agrario s.n.; Chiré, Quartin Dillon & Petit s.n. (*Hedyotis dichotoma* A. Rich.); Mariam Chawisso, id. s.n.

Anglo-Egyptian Sudan: Lado, Yei River, Sillitoe 411.

Eritrea: Hamasen, Ghinda, Fiori 1661, Tellini 124.

Socotra: Keregnigiti, Schweinfurth 469; Wadi Kischen, id. 625; s.l. Balfour 381.

Cape Verde Islands: Ile de Togo, Chapadeiro, Chevalier 44906; s.l. Webb s.n.

Senegal: Albuda, Perrottet s.n.; Cap Vert, Geoffroy St Hilaire s.n.; Kounoum, Perrottet s.n.; Bakel, Collin 163; Bamako, Waterlot 1134; Ile de Casamanca, Leprieur s.n.; s.l., Perrottet 385, 386, Heudelot 175.

Gambia: Kombo, Dawe 4; s.l. Pirie 38.

French Guinea: Fouta-Djallon, Paroisse 182, Chevalier 18708, 18837; Kouria, id. 14990; Conakry, Maclaud 5; s.l., Smeathman s.n., Paroisse 23, '41.

Sierra Leone: Freetown, Deighton 2195; Muraia, id. 4518; Yetaya, Thomas 2404; Benikoro, id. 2891; Matonto, id. 3518; Magbile, id. 6458; Port Sothol, id. 6675; Kambia, Deighton 834; Kitchom, id. 942; Njala, id. 1497; Makump, id. 1714; Kumvabai, Thomas 6797; Kennema, id. 7965, 7918; s.l. Afzelius ("*Oldenlandia prostrata* Afz., Fl. Guin. msc.").

Liberia: Gran Bassa, Dinklage 1774; Monrovia, id. 3276, Linder 1557, Johnston s.n.
Gold Coast: Accrah, Don s.n., Lloyd Williams 455; Navorongo Mountains, Tono, Darko 451.
Togo: Büttner 208.
Dahomey: Porto-Novo, Messager s.n.; Ouécé, Annet 48.
Nigeria: Nupe, Barter 893; Agolo, Thomas 192; Lagos, Dawden 357, 358, Mac Gregor 357, Moloney 4/83, Rowland s.n., Dalziel 1374; Sokoto, Lely 123; Bauchi Plateau, Vom, Dent Young 115; Jola Province, Dalziel 46; Bida Division, nr Bida, Meikle 1322; Ilorin Division, Jebba, id. 1290.
Cameroons: between Bali and Bamenda, alt. 1200 m, Migeod 287; Bamenda, Maitland 1707.
French Aequatorial Africa: Libreville, Pierre 108; Vandou N'Seka, Lecomte E 106; Goré, Dybowski 82; Ubangi, Bambari, Tisserant 755, 1216.
Belgian Congo: Lutété, Hens A 191; Léopoldville, Achten 297a, Bequaert 7491; Stanley-Pool, Schlechter 12572; Nouvelle Anvers, De Giorgi 1179; Hemptinne, Vanderijst 23955, Callewaert s.n.; Lazaret du Sacré Coeur, Vanderijst s.n.; Kisantu, Gillet s.n., Vanderijst 28646, 28655; Boko, id. B 306, 34599, 40216, 29923, 29945; Nyere, id. 39128; Kipako, id. 31472; Yokole, id. 39856; Inkisi, id. 28749; Eala, Robijns 514, Coûteaux 353, 497, Toussaint 1931, Corbesier 1948; Bas Sankuru, Em. et M. Laurent s.n.; Kasai, Kotola, Sapin s.n.; Lomami, Brenez 67; Luamisole, Hendrickx 71, 1164; Katanga, Arboretum, Quarré 444; Kasomba, id. 4056; Tchoma to Mwero Wantipa, Mususa, Bredo 3012; Mapué, id. 3187; Kipila, Quarré 1675; Lovoi, Kamina, id. 2920, 4569; Biano, id. 5934; Tsibinda to Tshamoussi, Scaetta 593; Elisabethville, P. Salésiens 296, Schmitz I 430; Katanga, route de l'Etoile, alt. 1250 m, Robijns 1615; Nyaya, route de Tanda, id. 1751; Gabiro-Ruanda, Muller 90; West Kivu, Kaessner 3299; Tshitshiangutu (Kivu), Scaetta 1751; Ruanda, eastern shore of Lake Kivu, Mushao, Humbert 8472; Irumu, Bequaert 2840; Nioka, Jurion 163, Wilbaux 78, Lathouwers 1/25, 1/26, Germain 3996; Bunio, Claessens 1954; Ruanda, between Mushao and Ruwengeri, Zappelli 26; Magya Moto, de Witte 2026; Valley of the Muhé, Lebrun 9095bis; Kagera to Gobrio, id. 9799; Kisori, Vrijdagh 641; Beni, Bequaert 3321; Kabango, id. 6167; Ankoro, between Borre and Jadotville, Bredo 2725; Kimangu, Vanderijst 1907; Kompaho, id. s.n.; Luozi, Luja 138; between Lula and Lumeru, Gillet 3038; Aru (Kibali to Ituri), Lebrun 3584; Mt Rumoka, alt. 1600 m, Germain 3153; Bwanatshyambwe, Molitor 30bis; Marungu to Tompa, alt. 2000 m, Dubois 1427; Difuma (Kindu), Rossignol 53; Kapanga, Overlaet 160, 1043; Kando, de Witte 151; Mont Hewa, Belot 50; Puvila, Allaud 247; Adja, Claessens 1009; Mumuru, id. 909; National Park of the Upemba, de Witte 02480; Kasangula, Jespersen s.n.; Kitoga to Kaninya, Elskens 15; Kitété, id. 143.
Angola: District Malange, Gossweiler 1263; Cuanza Sul, Amboim, Capiz, id. 9853; Cuiriri, Micango, id. 4089; Cuito, River Fiengo, id. 3667; Golungo

Alto, Welwitsch 3055; Benguella, Gossweiler s.n.; Longa River, below Chijija, alt. 1200 m, Baum 623; Huilla, Antunez 3140; Lopollo, Welwitsch 3056, 3058; Humpata, id. 3054, Fritsche 99 p.p., Pearson 2606, 2755; Mossamedes, Chinguari, Mazzocchi–Alemanni 220.

var. *suffruticosa* Brem. n. var., habitu suffruticoso et insuper capsulis minoribus (1.8 mm diam.) a var. *herbacea* recedens.
Transvaal: Zoutpansberg, Skijffontein, Galpin 14929, type of variety (PRE), "on rocks at base of krantz"; 15 cm high and very densely branched, more or less caespitose; the lower parts distinctly woody.
Belgian Congo: P.N.V. Lusinga, alt. 1800 m, de Witte 2377; upper Lomami, Kitengo, alt. 900 m, Mullenders 523.

var. *dolichocarpa* Brem. n. var., capsulis elongatis, 3.5—5 mm longis et 1.5—2 mm diam. a var. *herbacea* recedens.
Belgian Congo: Lower Congo, Inkisi, Sanga, Vanderijst 25239, type of variety (B), id. 25240.

var. *flaccida* Brem. n. var.; *Hedyotis dichotoma* Koen. ex Roth in errore apud A. Rich., Tent. Fl. Abyss. **1**, 361, 1867, non Koen. ex Roth, Nov. Sp. Pl. 93, 1821, nec *H. dichotoma* Cav., Ic. **6**, 53, 1801; — *H. trichopoda* A. Rich. l.c. 360 (calycis lobis 1.5 mm longis a typo paulo recedens); *H.* (*Kohautia*) *micrantha* Hochst. in Herb. Schimp. Abyss. (1854) n. 2263, nomen; — *Oldenlandia tenerrima* Dinter inedit. (Dinter 7078); — *O. Heynii* Oliv. in Trans. Linn. Soc. **29**, 84, 1873, quoad specimen citatum; — foliis usque ad 2 mm latis a typo recedens.
Natal: Zululand, Ngassa, Wylie s.n.
Transvaal: Naboomspruit, Galpin M 165.
Southern Rhodesia: Salisbury, alt. 1800 m, Eyles 4868.
Portuguese East-Africa: Mafusi, alt. 1100 m, Johnson 158.
Nyasaland: Shire Highlands, Blantyre, Buchanan 49.
Tanganyika: Djalla to Krala, Geilinger 4268; Muanza, id. 3240; Ulugurus, Bundahi, alt. 1200 m, Miss Bruce 443.
Kenya: nr Nairobi, Whyte s.n.; West Kenya, Graham 72.
Uganda: Karague, Speke & Grant 447 (*O. Heynii* G. Don apud Oliv.); Entebbe, alt. 1200 m, Maitland 76, Brown 301; Mugomba, alt. 1200 m, Dümmer 865; Victoria Nyanza region, Maitland 101.
Abyssinia: Chiré, Quartin Dillon & Petit s.n. (type of *Hedyotis trichopoda* A. Rich.); Gageras Schimper 152, 1232, 2263 ("*Hedyotis dichotoma* Koen. ex Roth" apud A. Rich.); Hamada, Schimper 102; Scioa, between Ambo and Gudere, alt. 2100 m, Senni 1661.
Eritrea: Hamasen, Ghinda, Fiori 1660, Pappi 4476, 4289; Filfil, Fiori 1662; Valle Avero, Terraciano & Pappi 32; Assaorta, Monte Fatta, alt. 1000 m, Pappi 3085; Monte Dijot, alt. 1200—1800 m, id. 5710; Beni Amer, Monte Curcù, alt. 1000 m, id. 7539; Hazamot, River Boloa, id. 66[bis].
Egypt: Upper Thebaide, Figari s.n.

Anglo-egyptian Sudan: Country of the Djur, Schweinfurth 2376; Kordofan, Arasch Cool, Kotschy 445 p.p.
Cape Verde Islands: Island St Antao, Bolle s.n.
Senegambia: Koulikoro, Chevalier 2116.
Sierra Leone: Bumban, Thomas 1958; Bindolo, id. 1842.
Dahomey: Conakry, Maclaud s.n.; Kouria, Chevalier 14990.
Nigeria: Naraguta, Lely 501; Quorra, Vogel 135 p.p.; Nupe, Barter 1719.
Cameroons: Yaunde, alt. 800 m, Zenker & Staudt 500.
French Aequatorial Africa: Ubangi, Bambari, Tisserant 2616; Yalinga, id. 3036.
Belgian Congo: Lake Mwero, Mpeto, Chanjois s.n.; Lubiko, Hendrickz 5868.
Angola: Pungo Andongo, Welwitsch 3061.
South-west Africa: Klein Ameib, Dinter 7078 ("*Oldenlandia tenerrima* Dinter"); Okahandja, alt. 1300 m, id. 486 (sub nomine *O. decumbens*).

var. *papillosa* (Chiov.) Brem. n. comb.; *O. dichotoma* A. Rich. var. *papillosa* Chiov., ovario capsulaque papillosis vel breviter hirtellis a var. *flaccida* recedens.
Somaliland: Bur Meldoc, Paoli 703, type of variety (F).
Tanganyika: West Usambara, Mombo, Braun 1902; Tabora, Lindeman 350; Shinyanga, Miss Bax 198; between Mwanza and Kwimba, Rounce 71; Mwanza, Davis 279; Mfwafwa, alt. 1050 m, Hornby 243.
Northern Rhodesia: Mumbwa, Mrs Macaulay 613.

var. *dolichantha* Brem. n. var., corollae tubo 6—7 mm, lobis 1.7—2.2 mm longis a var. *herbacea* recedens.
Belgian Congo: Kisoni, Lejeune 249, type of variety (B); s.l. Muller 93.

var. *dolichosepala* Brem. n. var., internodiis usque ad 6 cm longis, foliis plerumque circ. 3 cm longis, corollae tubo 6 mm longo, calycis lobis in fructu usque ad 2.5 mm elongatis a var. *herbacea* recedens.
Belgian Congo: Lemfu, 625 m, Germain 2049, type of variety (B).

var. *Goetzei* Brem. n. var., habitu perenni, corollae tubo 7—8 mm longo, lobis 3 mm longis a var. *herbacea* recedens.
Northern Rhodesia: Mwinilunga District, Luakera Falls, Milne-Redhead 3894, 4340; Muska Hills nr Kanona on Great North Road, alt. 1650 m, StClair Thompson 1278.
Tanganyika: Langenburg, Goetze 840, type of variety (K), cited by Schumann in Bot. Jahrb. **30**, 411, 1901 under the name *O. Holstii* K.Sch.; Kyimbila District, Kafuja, Stolz 807.
Belgian Congo: Mt Senga, Kaessner 2915.

var. *Holstii* (K.Sch.) Brem. n. comb.; *O. Holstii* K.Sch. in Engler, Pflanzenw. Ost Afrikas C, 376, 1895; id. in Bot. Jahrb. **30**, 411, 1901, Goetze 840 excl. (cf. var. *Goetzei*); floribus heterostylis a var. *Goetzei* recedens.
Tanganyika: Upper Ruhudje, Lupembe, Schlieben 250; Kilosa Sub-

district, Kisarawe, Swynnerton 1158; Usambara, Mschusha's Dorf, Holst 8942 (type of *O. Holstii* K.Sch.); Eastern Usambara, Lutindi, Braun 2676; Ndola, alt. 950 m, Verdcourt and Greenway 219; Western Usambara, Irente Platte, Geilinger 365; Pare Mnts, Hemvera, alt. 2000 m, Mr & Mrs Luchman 20; Mahayuni District, Koritschoner 1517; Usambara, s.l., Buchwald 66.
Kenya: Voi, alt. 600 m, Miss Napier 1335; Wusi, alt. 600 m, ead. 1099; Wara, Taitaberg, alt. 900 m, Hildebrandt 2435.
Somaliland: Goles Range, Miss Edith Cole 29, 30; Daraas, Drake Brockman 568.
Abyssinia: Javello, Cufodontis 475; Galla-Sidama, Socoru, Vatova 468; Uodara, id. 937; Mega, Corradi 2707, 2702.

O. herbacea (L) Roxb. and *O. pumila* (L.f.) DC occupy on account of the long-pedicellate flowers and the granulate testa cells a somewhat isolated position in the subgenus *Eu-oldenlandia*. *O. herbacea* is easily distinguishable from *O. pumila* by the narrow leaves, the presence of two flowers at each node, and the longer corolla tube. *O. pumila* is apparently a recent introduction in Africa, but whether *O. herbacea* may be regarded as an autochthonous species is difficult to decide, as it is in Africa as well as in Asia universally distributed. On account of its affinity with *O. pumila* I am inclined to think that it originated in Asia. An argument for its African origin might be found in the greater number of varieties by which it is represented in that part of the world.

46. **Oldenlandia pumila** (L.f.) DC, Prodr. **4**, 425, 1830; *Hedyotis pumila* L.f., Suppl. Pl. 119, 1781; — *Oldenlandia crystallina* Roxb., Fl. Ind. **1**, 422, 1820; Hook.f., Fl. Brit. Ind. **3**, 65, 1880.

Herba annua, e basi ramosa, caulibus ramosis decumbentibus, 3—15 cm alta. Caules ramique quadricostati, costulis scabriduli, 0.5—1 mm diam., internodiis ad medium caulem 0.6—2.4 cm longis. Folia lanceolata vel elliptico-lanceolata, 6—15 mm longa et 2—5 mm lata, discoloria, sicc. supra olivacea, subtus pallida, supra setulis minimis sparsa, marginem versus densius scabridula, subtus subglabra, costa basin versus impressa, subtus prominula, nervis inconspicuis. Vagina stipularis 0.5—2 mm alta, utroque latere caulis centro producta et ibi in fimbrias plerumque duas circ. 0.5 mm longas exeuns. Flores plerumque ad nodos solitarii, pedicellis foliis subaequilongis instructi, ad apices ramorum interdum redactione foliorum suffulcientium in inflorescentias congesti. Flores isostyli. Ovarium glabrum. Calycis lobi 1 mm longi, margine setulis minimis scabriduli. Corolla alba, tubo 1 mm longo, lobis vix 0.6 mm longis. Antherae sessiles supra medium tubum affixae, apicibus exsertae, 0.5 mm longae. Granula pollinis 22 μ alta et 18 μ diam. Stylus hirtellus 0.8 mm longus; stigmata 0.7 mm longa. Capsula ovoidea 2.5 mm alta et 1.5 mm diam., intra calycem vix producta, glabra. Cellulae testae parietibus rectis instructae, granulatae.

Habitat Indiam, Indo-Chinam (Siamiam), partem occidentalem Malesiae; in Africa probabiliter introducta.
Tanganyika: Morogoro, alt. 450 m, Haarer 1915.

The presence of this species in Tanganyika is rather unexpected. The collector unfortunately gives no particulars with regard to its habitat: it may have been collected in a plantation. It has also been found as an introduced weed in Jamaica.

47. **Oldenlandia umbellata** L, Spec. Pl. 174, 1753; DC, Prodr. 4, 426, 1830; Hook. f., Fl. Brit. Ind. 3, 66, 1880.

Herba perennis, e basi ramosa, caulibus ramosis decumbentibus. Caules ramique obtuse quadrangulares, scabrido-papillosi, 0.7—1.0 mm diam., internodiis ad medium caulem plerumque 1—1.5 cm longis. Folia linearia, 7—16 mm longa et 0.8—2 mm lata, subdiscoloria, sicc olivacea, supra ubique scabridula, subtus glabra, costa basin versus impressa, subtus prominula. Vagina stipularis 1.5—2 mm alta, margine utroque latere caulis in fimbrias 4 usque ad 1.5 mm longas producta. Flores in inflorescentias pedunculatas, ad nodos solitarias dispositi; pedunculus gracilis 6—12 mm longus, scabrido-papillosus; flores cymosi, congesti; bracteae ad vaginam fimbriatam redactae; pedicelli 0.5—2 mm longi. Flores heterostyli. Ovarium glabrum. Calycis lobi late triangulares 1 mm longi, margine scabrido-papillosi. Corolla alba, tubo 1—1.5 mm longo, fauce barbato et infra faucem sparse piloso, lobis 1.5—2 mm longis, basi pilosis. Stamina in flore brachystylo filamentis 0.9 mm longis instructa; antherae 0.9 mm longae. Granula pollinis 27 μ longa et 20 μ diam. Stylus hirtellus, in flore brachystylo 0.7 mm, in flore dolichostylo 2—2.5 mm longus; stigmata vix 0.5 mm longa. Capsula depresse globosa, 1.8 mm alta et 2.2 mm diam., intra calycem breviter producta, glabra. Cellulae testae parietibus subrectis instructae, laeves.

Habitat Indiam, in Africa Occidentali Tropicali forsitan olim culta.
Senegal: Cape Verde, Kounoun, Perrottet 1829 (P).

De Candolle l.c. quotes a specimen collected by Perrottet near Pt Joal; the specimen seen by me may be a duplicate of the latter. *O. umbellata* L is grown in India for the alizarin content of its roots, and it is not impossible that at one time culture experiments with this species have been taken in Senegal. This would explain why it has not been found again in recent times. According to the "Flora of North America" the Mexican specimen quoted by de Candolle belonged probably to another species.

48. **Oldenlandia somala** Chiov. in schedulis, inter species subgeneris *Eu-oldenlandiae* quae floribus in cymas pedunculatas dispositis instructae sunt floribus heterostylis et stylo hirtello ad *O. umbellatam* L et ad *O. eludentem* Brem. accedens, foliis multo longioribus ab *O. umbellata*, foliis longioribus et latioribus ab *O. eludenti* diversa.

Herba annua, caule plerumque e basi ramoso, caule ramisque ascendenti-

bus vel patentibus, quadricostatis, costis sparse scabridulis. Folia linearia 2.5—6 cm longa et 1.5—4.5 mm lata, discoloria, sicc. supra olivacea vel fusca, subtus dilute viridia vel grisea, utrinque glabra vel in var. *scabridula* supra scabridulo-papillosa, costa impressa. Vagina stipularis obconica vel campanulata, intra folia interdum breviter producta et ibi in fimbrias aliquas plerumque vagina breviores exeuns. Flores in umbellas vel paniculas contractas, distincte pedunculatas dispositi; pedunculus 0.5—3 cm longus, glaber; bracteae ad vaginam fimbriatum redactae; pedicelli 1.5—2 mm longi. Flores heterostyli. Ovarium glabrum. Calycis lobi 1.2 mm longi, margine scabriduli. Corolla alba, tubo 1.6 mm longo, fauce barbato et infra faucem sparse piloso, lobis 1.6—2.0 mm longis. Stamina in flore brachystylo filamentis 1.3 mm longis instructa; antherae 0.9—1.0 mm longae, in flore dolichostylo apicibus exsertae. Granula pollinis 22 μ alta et 19 μ diam. Stylus hirtellus in flore brachystylo 0.6 mm, in flore dolichostylo 2.8 mm longus; stigmata in flore brachystylo 0.8 mm, in flore dolichostylo 1.0 mm longa. Capsula depresse globosa, 2 mm alta et 2.5 mm diam., intra calycem vix producta, glabra. Cellulae testae parietibus rectis instructae, laeves.

Habitat Somaliam, Abyssiniam, Kenyam, Tanganyikam.

var. *somala*, foliis utrinque glabris, costa viridi.

Somaliland: Genale, Bisi 8, 137, Suckert 77; Bulo Aran, Bisi 134, type (F), 157; Torda, Paoli 300; Bur Meldoc, id. 703bis; Bulo Merere, id. 418; Guelidi in the River Webi, Revoil; Webi, Robecchi-Brichetti 606, Ruspoli & Riva 737, 1037; Dolo, id. 1147; Chisimaio nr El Ualud, Gorini 490.
Abyssinia: Sagan-Omo, El Meti, Corradi, 2725; ibid., Gondaraba, id. 2710, 2723, 2724; ibid., Daua Parma, id. 2714.
Kenya: Witu, Thomas (Denhardt) 23; Voi, alt. 600 m, Miss Napier 968; Thomson's Fall, Miss Lacey 40.
Tanganyika: Pare, alt. 800 m, Uhlig 894.

var. *scabridula* Brem., foliis supra dense scabridulo-papillosis, costa alba instructis a var. *somala* recedens.

Kenya: Elmentesta, alt. 1800 m, Bogdan 990.
Tanganyika: Shinyanga, Miss Bax 197, type of variety (K).

This species shows a rather striking resemblance to *O. corymbosa* L, but differs from the latter in the heterostylous flowers with their hirtellous style. In these characters it agrees with *O. umbellata* L and *O. eludens* Brem., but the first has much shorter and the second narrower leaves; both, moreover, are perennials.

49. **Oldenlandia eludens** Brem. n. spec., inter species subgeneris *Euoldenlandiae* quae floribus in cymas pedunculatas dispositis instructae sunt floribus heterostylis et stylo hirtello ad *O. umbellatam* L et ad *O. somalam* Chiov. ex Brem. accedens, sed caulibus ramisque suberectis, foliis anguste linearibus vel filiformibus ab eis distinguenda.

Herba perennis, pleiocaula, caulibus suberectis, circ. 20 cm alta. Caules ramosi, ramis etiam suberectis; caules ramique subteretes, 0.9 mm diam., glabri, internodiis haud profunde bisulcatis 2—3 cm longis. Folia angustissime linearia vel filiformia, 1.5—2.5 cm longa et 0.3—1.2 mm lata, utrimque subglabra, costa supra subimpressa. Vagina stipularis cupularis, utroque latere caulis in fimbrias pilosulas 2, circ. 1.5 mm longas producta. Flores 2—5 in inflorescentias longe et graciliter pedunculatas dispositi; pedunculus 0.6—2 cm longus, glaber; pedicelli 2—4 mm longi. Flores heterostyli. Ovarium glabrum. Calycis lobi 1.5 mm longi, carinati, margine et costa ciliolati. Corolla alba, tubo 1.7 mm longo, lobis 1.4—1.6 mm longis. Stamina in flore brachystylo filamentis scabrido-papillosis 1 mm longis instructa; antherae 0.9 mm longae, in flore dolichostylo subinclusae. Granula pollinis 22 μ alta et 20 μ diam. Stylus hirtellus, in flore brachystylo 1.2 mm, in flore dolichostylo 2.6 mm longus; stigmata 0.7 mm longa. Capsula 2 mm alta et 2.6 mm diam., glabra. Cellulae testae parietibus undulatis instructae, laeves.

Habitat Congoliam.

Belgian Congo: Ruanda, Kagera, Bredo 2257, type (B); Kagera, Rwita, Lebrun 9610; between Murwita and the Kamakabo, id. 9709.

In its narrowly-linear to filiform leaves this species resembles *O. microphylla* de Wild. et Th. Dur. and *O. linearis* DC, which, however, are haplocaulous annuals with isostylous flowers and a glabrous style.

50. **Oldenlandia praetermissa** Brem. n. spec., inter species subgeneris *Eu-oldenlandiae* quae floribus in cymas pedunculatas dispositis instructae sunt floribus isostylis cum *O. corymbosa* L, *O. aemulanti* Brem., *O. microphylla* Brem. et *O. lineari* DC congruens, sed ab eis stylo sparse hirtello recedens, foliorum forma *O. corymbosae* et *O. aemulanti* similior, sed ab ambobus non solum stylo hirtello sed etiam staminum filamentis brevibus diversa.

Herba annua, caule e basi ramosa decumbente, ramis patentibus. Caulis ramique subteretes, glabri, internodiis haud profunde bisulcatis. Folia linearia, 2—4.5 cm longa et 2.5—4 mm lata, margine dense sed minutissime scabridula, margine basin versus interdum setulis aliquibus ciliata, discoloria, primum supra et facie inferiore costae scabridula, costa basin versus impressa. Vagina stipularis obconica, margine in fimbrias aliquas vaginae subaequilongas producta. Flores in diades vel umbellas paucifloras, longe pedunculatas dispositi; pedunculus filiformis 1—2 cm longus; pedicelli 2—5 mm longi. Flores homostyli. Ovarium glabrum. Calycis lobi 1.6 mm longi, margine et costa scabriduli. Corolla alba, tubo 1—1.5 mm longo, lobis 1—1.5 mm longis. Stamina filamentis 0.2—0.4 mm longis paulo infra incisuras corollae inserta; antherae ovoideae. Granula pollinis 25 μ alta et 21 μ diam. Stylus sparse hirtellus; stigmata breviter exserta. Cellulae testae parietibus undulatis instructae, laeves.

Habitat Africam Occidentalem Tropicalem.

Gold Coast: Atwabo, Fishlock 7 (1931).
Togo: Lome, Warnecke 173, type (K).
Dahomey: Cotonon, Debeaux 154.
Nigeria: Yoruba-land, between Ibadan and Abeokuta, Schlechter 13036.
Belgian Congo: N'Dembo, Gillet s.n. (specimen monstrosum, stylo hirtello necnon antheris stigmatibusque exsertis cum specie hac congruens).

This species shows a striking resemblance to *O. corymbosa* L, from which it differs in its somewhat larger dimensions, in the hirtellous style, and in the exserted anthers and stigmata.

51. **Oldenlandia corymbosa** L, Sp. Pl. 119, 1753; Hiern in Fl. Trop. Afr. 3, 62, 1877, excl. syn. *O. herbacea* DC, *Hedyoti pusilla* Hochst., *H. sperguloidi* et *H. trichopoda* A. Rich., *H. longifolia* Schum., *Oldenlandia longifolia* DC, *O. sp.* in Hb. Schimp. n. 68; eodem modo K.Sch., in Engler, Pflanzenw. Ost Afrikas C, 375, 1895; Hutch. et Dalz., Fl. West Trop. Afr. 2, 132, 1931; *Hedyotis corymbosa* (L) Lam., Tab. Encycl. 1, 272, 1791; Vatke in Oesterr. Bot. Zeitschr. 25, 232, 1875 p.p. cf. *Oldenlandia fastigiata* Brem.: *Gerontogea corymbosa* (L) C. et S. in Linnaea 4, 154, 1829; — non *Oldenlandia corymbosa* L var. *subpedunculata* O. Ktze, Rev. Gen. Pl. 3, 121, 1893, quae est *O. caespitosa* Hiern var. *subpedunculata* (O. Ktze) Brem. n. comb.

Herba annua, caule plerumque e basi ramoso, caule ramisque ascendentibus, patentibus vel prostratis. Caulis ramique subteretes, glabri, internodiis bisulcatis; margines sulcorum plerumque apicem versus papillis conicis scabridulae. Folia lineari-lanceolata, 1.5—3 cm longa, 2.5—5 mm lata, margine dense sed minutissime scabridula, basin versus setulis aliquibus fortioribus scabrida, plerumque distincte discoloria, primum papillis aliquibus sparsa sed mox glabrescentia, costa basin versus impressa. Vagina stipularis obconica, margine in fimbrias aliquas ei subaequilongas producta. Flores aliqui solitarii, plures tamen in paria vel triades, rarius in corymbos 4- vel 5-floros dispositi; inflorescentiae semper pedunculatae; pedunculus filiformis, foliis plerumque dimidio brevior, rarius eis subaequilongus, glaber; pedicelli filiformes pedunculo breviores vel longiores. Flores isostyli. Ovarium glabrum. Calycis lobi triangulares 1.1 mm longi, margine scabriduli. Corolla alba vel malvacea, tubo 0.6 mm longo, lobis 1.2 mm longis. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae ovoideae. Granula pollinis 21 μ alta et 19 μ diam. Stylus glaber; stigmata ad antheras adjicientia. Capsula plerumque 1.7—2.0 mm alta et 2.2—2.5 mm diam., in var. *microcarpa* 1.3 mm alta et 2.0 mm diam., glabra. Cellulae testae parietibus undulatis instructae, laeves.

Habitat regiones tropicales et subtropicales totius orbis. Typus in America lectus, ubi species haec tamen probabiliter introducta.

var. *corymbosa*, capsula plerumque 1.7—2.0 mm alta et 2.2—2.5 mm diam.
Cape Verde Islands: St Jago, Porto Prayo, Webb 98.

Senegal: Cape Verde, Bolle s.n., Perrottet s.n.; Bondou, Heudelot s.n.; Dakar, Thiebaut 188; Goree, Talmy 46; Cercle de Thiès, de Wailly 4522; Niame, Hagerup 505.
French Guinea: Iles de Los, Serand 22; Conakry, Maclaud 14; Isle Tristao, Paroisse s.n.
Sierra Leone: Powala, Thomas 1040; Kamke, id. 2098; Njala, Deighton 1354; Bonthe Island, Tisana, id. 2325.
Liberia: Grand Bassa, coll. ign. in herb. Maille s.n.; Fishtown, Dinklage 2079.
Gold Coast: Accra, Wall 16, G. Don s.n.; at the Quarra, Vogel 67, 133; Shai Plains, Johnson 530; Krobo Plains, id. 492; Atwabo, Fishlock 7.
Dahomey: Cotonon, Debeaux 194.
Nigeria: Abinsi, Dalziel 649; Bauchi Plateau, Vom, Dent Young 111; Aguden District, Thomas 676, 683, 699; Ibadau, Newberry 75; between Ibadau and Abeokuta, Schlechter 13036 p.p.; Oware and Benin, Palisot de Beauvois s.n. (*"Oldenlandia subserrata"*); Akassa, Vogel 9; Fernando Po, id. 201.
Cameroons: Bibundi, Jungner 244.
French Aequatorial Africa: Bas Kouilou, Lecomte P 39; Ogouwé, Thollon 791; Région de Niari, Combo, id. 1051; Loango, Lecomte P 51, Dybowski s.n.; Libreville, Thollon 410; Ubangi-Chari, Ft Archambault, Chevalier 10536.
Belgian Congo: Boma, Vanderijst 20553, Bequaert 531; Banana, de Wèvre 33; Zambi, Bequaert 710[bis]; Léopoldville, id. 819; Lutété, Hens A 226; Eala, Lebrun 611, Corbesier–Baland 1054, 1107, 2068; Nyira, Cabra 23, 45; Kasumbi, Quarré 6273; Yangambi, Louis 11669, 10637; Yambata, Montchal 74; Kisantu, Robijns 251, Vanderijst 39743, 39469[bis], Gillet 1899, Louis 5; Ndembo, Vanderijst 7/1/07; Botongo, Luja 139; Kangu, Willem 5; Kasombo, Quarré 4084; La Kulu, Vandenbrande 83; N'kombo on the Momboyo, Louis 117; Bengamisa, Louis 631; Yambao, id. 3637; Bengamisa-Stanleyville, Louis 4393; Coquilhatville, Goossens 3092; Elisabethville, Schmitz I 436; Lac Albert, Bredo 2043; Okuli, Jespersen s.n.; Kabare, Bequaert 5444; Rutshuru, Mt Katale (Kivu), Lebrun 9164; Buta (Uélé to Itumbiri), id. 2559; Beni, Bequaert 3377; Ruindi, Lebrun 7914; Doruma, de Graer 786; Kikwit to Muschia, Vanderijst 3912; Lomami, Seke, coll. ign. 78; Basoko, Magis s.n.; Mobwara, Lemaire 328, Reygaert 888; Kivu, Kahunda to Rjekisemodo, Scaetta 308; Mbunga, de Graer 741; Kasingi, Bredo 2007; Mt Hawa, Belot 61; Bukama, Robijns 1479; Mundanzi, Burton s.n.; Fungmume, Quarré 6445; Ruanda-Urundi, Usumbura, Vrijdagh 504.
Angola: Cazengo, Gossweiler 4418; Loando, id. 236, 405, 490, Welwitsch 3041, 3042, 3043; Ambriz, id. 3044; Golungo Alto, id. 3045; PungoAndongo, id. 3046; Huilla, id. 3049.
Southern Rhodesia: Victoria Falls, Rogers 13149, Hutchinson & Gillett 3437.

Transvaal: Zoutpansberg, Junod 1037, 2496, 4452.
Portuguese East Africa: Kongone mouth of Zambesi, Kirk s.n.; Mazzaro, between Tette and the sea coast, id. s.n.; along Lake Nyasa, at M'bucca, Sousa 1523.
Northern Rhodesia: Kalomo, Rogers 8247; Mumbwa, Mrs Macaulay 331.
Nyasaland: South Nyika Mnts, alt. 1200—2000 m, Whyte s.n.; tongue of Kasonga, alt. 500—600 m, id. s.n.
Tanganyika: Lake Kivu, Virunga Mnts, Kateruni Volcano, Burtt 3277; W. Usambara, Amboni, Holst 2742; Usambara s.l., Buchwald 543; Zanzibar, Hildebrandt 908 p.p., Greenway 1275, Boivin s.n.
Kenya: Mombasa, Scott s.n.; Nyika County, Wakefield s.n.; Malindi, Bogdan 2565; Emberre, alt. 1150 m, Graham 2252; N.E. Elgon, 2300 m, Mrs Tweedie 777.
Uganda: Kipayo, alt. 1200 m, Dümmer 800; Ankole, alt. 1200 m, Purseglove 562; N. Kigezi, Bugangari, id. 3257; Red Nile, nr Rhizo Camp Fael Station, Edwards s.n.; Nanya (Victoria Nyanza), Allen Turner 6714.
Abyssinia: Gambila, Germain 1042.
Anglo-Egyptian Sudan: Bahr el Ghazal, Country of the Bongo, Gir, Schweinfurth 2344; Kordofan, Arasch-Cool, Kotschy 369; D. Kassan, Cienkowsky 71.

var. *microcarpa* Brem. n. var., foliis minoribus et angustioribus, inflorescentiis pluribus unifloris et paucis e floribus plus quam duobus compositis, capsula 1.3 mm alta et 2.0 mm diam. a var. *corymbosa* recedens.
Senegal: Soudan, Oualia, Chevalier 32; Niamy, Hagerup 505.
Sierra Leone: Mabonte, Thomas 3658; Makump, Deighton 1358; Bonthe, id. 2270.
Nigeria: Ibadan Division. nr Ibadan, Meikle 1001.
Cameroons: Victoria, Winkler 42[a].
French Aequatorial Africa: Libreville, de Brazza 410.
Belgian Congo: Congo da Lemba, Feller B 16; Boma, Vanderijst 27293, 31646, de Wèvre 14; Wombali, Vanderijst 1529; between Libenga and Gemura (Ubangi), Lebrun 1861; Eala, Leonard 74, Goossens 3092; Yambata, De Giorgi 1393, type of variety (B); Parc National Albert, Lebrun 7646, 7024; between Bikoro and Coquilhatville, Brown s.n.; Bambili, Steyaert O 64, 351, 493; Bambesa, id. 146; between Kikwit and Gingungi (Kwango), Lebrun 59; Muschic, Vanderijst 3936; Ndembo, id. 7.1.07; Lemfu, id. 27.4.11; Kisantu, id. 28804; Matadi, id. 25890; Yangambi, alt. 470, Louis 13931; Yambuya, id. 12337; Lusanga, Roucou s.n.; Yaosuka, Louis 9529; N'Kombo sur la Momboyo, id. 117; Dundusana, Reygaert 69; Luki, Devred 3385.
Angola: Loanda, Gossweiler 396.

O. corymbosa L is a wide-spread weed, but as it has its nearest allies in Africa, its country of origin will probably form a part of that continent.

In America it has no near allies, and this makes it very probable that it is in that part of the world a post-Columbian introduction.

52. **Oldenlandia aemulans** Brem. n. spec. maxime ut *O. corymbosa* L sed foliis siccitate haud conspicue discoloratis, plerumque paulo angustioribus, corolla paulo majore et praesertim testae cellulis parietibus rectis instructis et distincte granulatis ab ea recedens.

Herba annua, caule erecto, ramis patentibus. Caulis ramique quadricostati; costae ad basin caulis hirtellae, in internodiis superioribus glabrae vel apicem versus scabridulae. Folia linearia, 1—3 cm longa et 1—2.3 mm lata, margine sparse et vix notabile scabridula, basin versus interdum setulis aliquibus ciliata, discoloria, supra subglabra vel setulis minimis sparsa, subtus glabra, costa vix impressa. Vagina stipularis obconica vel campanulata, margine in fimbrias aliquas ei aequilongas vel breviores producta. Flores plurimi solitarii ad nodos, aliqui tamen semper in diades, rarius in triades, gracillime pedunculatas dispositi; pedunculus diadis filiformis foliis circ. dimidio brevior, glaber; pedicelli pedunculo dimidio breviores. Flores isostyli. Ovarium glabrum. Calycis lobi 1.0 mm longi, margine vix notabile scabriduli. Corolla alba, tubo 0.9 mm longo, fauce barbato et infra faucem sparse et breviter piloso, lobis 0.7 mm longis. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae ovoideae. Granula pollinis 24 μ alta et 21 μ diam. Stylus glaber. Capsula ut in *O. corymbosa*. Cellulae testae parietibus rectis instructae, distincte granulatae.

Habitat Eritream et Abyssiniam, ad altitudines inter 700 et 2600 m. Eritrea: Ghinda, Baldrati, 2138, type (F), 3671, 3674, 3690, Fiori 830, 1656, Pappi 4287, 4299; Filfil, Fiori 1659; Hamasen, Embatcalla, id. 1658; Sabarguma, Pappi 4016; Keren, Beccari 223, Tellini 450, 1301, 1325; Debri Nelib, Pappi 760; Mensa, Terraciano & Pappi 1569; Maragus Cohait, Pappi 1005; Oculé Cusai, Pappi 1762, 1390; Scimenzana, Guna Guna, id. 767, 768; Carajai, id. 6371; between Medri and Tesfa, id. 6691. Abyssinia: Neghelli, Vatova 154; Scioa, between Guder and Ambo, Senni 1661.

The most important difference between this species and *O. corymbosa* L is found in the structure of the testa cells which are here separated from each other by straight walls. They are moreover distinctly granulate. This granulation is much finer than in *O. herbacea* (L) Roxb. and in *O. pumila* (L.f.) DC, and consists probably of oil drops. The aspect of the plants is also somewhat different, especially because of the comparatively few flowers that are arranged in diads or triads.

53. **Oldenlandia microphylla** de Wild. et Th. Dur. in Ann. Mus. Congo sér. 2, 2, 28, 1900; id. Reliq. Dewevr. 108, 1901; Durand, Sylloge 247, 1909.

Herba annua, diffuse ramosa, 15—20 cm alta. Caules ramique graciles 0.4—1.0 mm diam., quadricostati, glabri, internodiis maxime 16 mm

longis. Folia filiformia, 0.4—1.2 cm longa et 0.3—0.8 mm lata, margine valde revoluta, apicem versus minutissime scabridula, ceterum utrimque glabra, costa impressa. Vagina stipularis obconica, margine utroque latere caulis in fimbrias duas ei subaequilongas producta. Flores in diades pedunculatas vel sessiles dispositi, rarius solitarii, a ramulis abbreviatis flores solitarios ferentibus comitati; pedunculi usque ad 2 mm longi, glabri; pedicelli florum solitariorum usque ad 5 mm longi, florum in diades dispositorum usque ad 3 mm longi, semper glabri. Flores isostyli. Ovarium glabrum. Calycis lobi late triangulares 0.4 mm longi, margine vix notabile scabriduli. Corolla alba tubo 0.3 mm longo, lobis 0.5 mm longis. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae in specimine solo noto haud aperientes et polline non maturante instructae. Stylus glaber; stigmata antheras attingentia. Capsulae vacuae.

Habitat Congoliam.

Belgian Congo: Région de l'Equateur, de Wèvre 565, type (B).

The only specimen that so far has been collected, proves to be completely sterile. This suggests a hybrid origin, but it is difficult to guess who the parents may have been. From the other species with pedunculate inflorescences and a glabrous style it is easily distinguishable by its small leaves and short internodes, by the large number of solitary flowers and by the shortness of the peduncle of the diads, and by the small size of the flowers. The ramification reminds one of *O. corymbosa* L or of *O. caespitosa* Hiern, but the shape of the leaves is more like that observed in *O. linearis* DC.

54. **Oldenlandia linearis** DC, Prodr. **4**, 425, 1830; *Hedyotis linearis* (DC) Steud., Nomencl. ed. 2, **1**, 728, 1841; — *H. pusilla* Hochst. ex A. Rich., Tent. Fl. Abyss. **1**, 362, 1847; — *H. sperguloides* A. Rich. op. cit. 361; — *Oldenlandia subtilis* S. Moore in Journ. of Bot. **43**, 249, 1905; — anne *O. delicatula* K.Sch. in Engler, Pflanzenw. Ost Afrikas C, 375, 1895 incertum sed probabile.

Herba annua, caule erecto, ramis patentibus, plerumque 10—25 cm alta, in var. *nana* 2—5 cm alta. Caulis ramique quadricostati, costis parte basali caulis totis, parte superiore apicem internodiorum versus scabridulis. Folia anguste linearia vel filiformia, plerumque 1—4 cm longa et 0.4—1.6 mm lata, in var. *nana* maxime 1.5 cm longa, margine usque ad costam recurvata, sparse scabridula, setulis basin versus vix longioribus, supra setulis minimis sparsa, costa basin versus plerumque distincte impressa. Vagina stipularis obconica, margine in fimbrias aliquas ei subaequilongas producta. Flores nunc plurimi solitarii, nunc fere omnes in diades et triades graciliter pedunculatas dispositi; pedunculus filiformis foliis plerumque dimidio brevior; pedicelli filiformes pedunculo aequilongi vel paulo breviores. Flores isostyli. Ovarium glabrum. Calycis lobi 0.9—1.1 mm longi, margine vix conspicue scabriduli. Corolla alba vel rarius dilute violacea, tubo 0.6—1.0 mm longo, barbato, infra faucem sparse piloso,

lobis 0.7—1.0 mm longis. Stamina antheris sessilibus dimidio superiore tubi inserta. Granula pollinis plerumque 3-colporata, rarius 4-colporata, plerumque 20 μ alta et 17 μ diam., in var. *nana* subglobosa, 17 μ diam. Stylus glaber; stigmata stylo subaequilonga, antheras attingentia. Capsula 1.6 mm alta et 2.6 mm diam., intra calycem breviter producta, glabra. Cellulae testae parietibus rectis instructae, laeves.

Habitat Africam Tropicalem.

var. *linearis*, 10—25 cm alta, foliis 1—4 cm longis, granulis pollinis ellipsoideis.

Senegal: along the Bay of St Louis, Perrottet s.n., type (G, dupl. P), pollen partly 4-colporate; s.l. Leprieur.

Anglo-Egyptian Sudan: Country of the Djur, Schweinfurth 2396.

Abyssinia: between Amhara and Dembia, Chiovenda 2126; Ambo, alt. 2000 m, Giordano 2118; Gimma, alt. 1900 m, Uff. Agr. s.n.; Aksum, Schimper 1522 (type of *Hedyotis pusilla* Hochst. ex A. Rich.); Adoa, id. 68; Tigre, id. 1115; s.l., Quartin Dillon 619 (type of *H. sperguloides* A. Rich.).

Eritrea: Assaorta, Bosco del Caribozzo, alt. 2700 m, Pappi 2867.

Uganda: Serere, Teso, alt. 1000 m, Chandler 950.

Kenya: Golunka, Kaessner 781 (type of *O. subtilis* S. Moore); S. W. Elgon, alt. 1600 m, Mrs Tweedie 757.

Tanganyika: Kilimatinde, v. Prittwitz 85; Moshi, alt. 900 m, Haarer 327; Tabora, Lindeman 350; Rungwe District, Mbeya, alt. 1700 m, Davies 455.

Belgian Congo: Parc National Albert, Ruindi, alt. 1000 m, Lebrun 7914 p.p., 7977; Katanda, id. 7568; Korengi, Claessens 1198.

Northern Rhodesia: Sesheke, Miss Gairdner 508; Mwinilunga District, Matonchi Farm, Milne-Redhead 2750.

Southern Rhodesia: District Lomagundi, alt. 1200 m, Jack 91.

var. *nana* Brem. n. var., statura parva, 2—5 cm alta, foliis maxime 1.5 cm longis, granulis pollinis subglobosis a var. *lineari* recedens.

Abyssinia: Cahaito Plateau, Russel 179.

Uganda: Bulayo, Bugishu, alt. 1900 m, Thomas 320, type of variety (K); Kigezi, Eggeling 918, Gardner 351 p.p.

Belgian Congo: Parc National Albert, volcan Rumoka, alt. 1600 m, Germain 3200.

Hiern (in Fl. Trop. Afr. 3, 59, 1877) brings *O. linearis* DC to *O. Heynii* G. Don. i.e. *O. herbacea* (L) Roxb., and *Hedyotis pusilla* Hochst. ex A.Rich. as well as *H. sperguloides* A. Rich. to *Oldenlandia corymbosa* L, but *O. linearis* DC differs widely from *O. herbacea* (L) Roxb. in the structure of the testa and in the arrangement of the flowers, and I can find no difference of any importance between this species and the two *Hedyotis* species described by A. Richard. It is true that the type of *O. linearis* was collected in an area that seems to be separated by a wide gap from the area in which the types of *Hedyotis pusilla* and *H. sperguloides* were

found, but this is in itself no sufficient argument to keep them apart. *O. linearis* belongs doubtless to the same circle of affinity as *O. corymbosa*, but it is easily distinguishable from the latter by its very narrow leaves and by the straight walls of the testa cells.

55. **Oldenlandia fastigiata** Brem. n. spec. subgeneris *Eu-oldenlandiae* floribus pluribus in inflorescentiam brevissime pedunculatum dispositis *O. densiflorae* Brem. solae comparanda, sed ab ea stylo hirtello, cellulis testae parietibus subrectis instructis diversa; — *Hedyotis corymbosa* (L) Lam. in Oesterr. Bot. Zeitschr. **25**, 232, 1875 p.p., cf. *O. corymbosa*.

Herba annua, 15—40 cm alta, e basi ramosa, caulibus fastigiatis. Caules ramique quadricostati, costis apicem internodiorum versus scabridulis. Folia linearia, in var. *fastigiata* 1.2 —3.5 cm longa et 1—3.5 mm lata, in var. *longifolia* 3—6 cm longa et 3—4.5 mm lata, sicc. fuscescentia, supra praesertim apicem et marginem versus minutissime scabridula, margine et facie inferiore costae etiam scabridulis, costa usque ad apicem impressa. Vagina stipularis obconica, margine inter folia ad centrum in fimbrias paucas vagina paulo breviores producta. Flores in inflorescentias breviter pedunculatas dispositi; inflorescentia e floribus 2—5 composita sed praesentia brachyblasti etiam inflorescentia instructi inflorescentiam plurifloram imitans; pedunculus 0—2 mm longus; rachis pedunculo subaequilonga; pedicelli primum 1—2 mm, post anthesin usque ad 2—3 mm elongati, glabri. Flores isostyli. Ovarium glabrum. Calycis lobi 1.2 mm longi, margine scabriduli. Corolla alba, tubo 1.0 mm longo, fauce barbato et infra faucem sparse et breviter piloso, lobis 0.7 mm longis. Stamina paulo infra incisuras corollae inserta; filamenta antheris dimidio breviores; antherae ovoideae, breviter exsertae. Granula pollinis 17—18 μ alta et 16—17 μ diam. Stylus pilosus, 1.2 mm longus; stigmata exserta 0.3 mm longa. Capsula parva, 1—1.2 mm alta et 1.5—2 mm diam. Cellulae testae parietibus rectis instructae, laeves.

Habitat Africam Orientalem Tropicalem et Arabiam.

var. *fastigiata*, foliis 1.2—3.5 cm longis et 1—3.5 mm latis.

Anglo-Egyptian Sudan: Cordofan, Fazogl, Figari s.n.; Obeid, Cienkowsky 439; Bahr el Gebel, Shambe, Mr & Mrs Broun G 86.

Abyssinia: Sagan-Omo, Murlé, Corradi 2721; Riva del Ghizo, id. 2717, 2718; Sagan, towards Lake Stephanie, id. 2715.

Somaliland: Galla Arussi, Negri 725; Ermoi, Ruspoli & Riva 1492.

Kenya: Kibarani, Jeffery K 62; Mombasa, Sacleux 2185, Miss Napier 6288, Boivin s.n.; Mazeras, Graham 727; Samburu, alt. 300 m, Kaessner 487; Kibwezi, alt. 900 m, Dümmer 5068; N.E. slopes of Aberdare Mnts, alt. 1800 m, Dowson 539.

Tanganyika: Ukamba, Kitui, Hildebrandt 2680; Kilimanjaro, Madschame, alt. 1000 m, Volkens 1643; Moshi, Kiruru, alt. 900 m, Haarer 489; Tangon, Holst 2001; Mombo, Braun 1903; Zanzibar, Sacleux 2185; Amboni, Geilinger 94, 588; Usaramo, Stuhlmann 6462; Ulugurus, alt.

700 m, Miss Bruce 573; Rufidji, alt. 250 m, Goetze s.n.; Mahenge, Mangala, Schlieben 1797, type (B).
Belgian Congo: Hemptinne, Vanderijst 23862.
Nyasaland: Chikwawa District, Lower Mwanza River, Brass 18013.

var. *longifolia* Brem. n. var., foliis 3—6 cm longis et 3—4.5 mm latis a var. *fastigiata* recedens.
Anglo-Egyptian Sudan: Bahr el Gebel, Bor, Douglas Simpson 7256.
Abyssinia: along the River Ghizo, Corradi 2716, 2719; along the River Caschei, id. 2713, 2720, 2722.
Somaliland: Webi, Ruspoli & Riva 724, 869.
Tanganyika: Moshi, Haarer 333; Gwari, id. 1449, type of variety (K); Mandera, Sacleux 988; Zanzibar, Hildebrandt 908 p.p. (cf. *O. corymbosa* L); Rufidji, Kränzlin 2975; W. Usambara, Mombo, Braun 642.

This easily recognizable species has always been confused with *O. corymbosa* L, from wich it differs conspicuously in the shortly pedunculate inflorescence, the hirtellous style and the straight walls of the testa cells. The only species with which confusion would be excusable, is *O. densiflora*, which, however, has much smaller flowers, a glabrous style, and testa cells with undulating walls.

56. **Oldenlandia densiflora** Brem. n. spec. subgeneris *Eu-oldenlandiae*, maxime ut *O. fastigiata* Brem. sed floribus minoribus, stylo glabro, cellulis testae parietibus undulatis instructis ab ea faciliter distinguenda.

Herba annua, circ. 25 cm alta, ramis fastigiatis. Caulis ramique quadricostulati, costis subglabris. Folia linearia, plerumque 1.2—2.5 cm longa et 1.5—2.5 mm lata, superiora longitudine usque ad 4 mm redacta, filiformia, supra ubique sparse scabridula, subtus costa scabridula, costa basin versus impressa. Vagina stipularis obconica, margine in fimbrias vagina paulo breviores producta. Flores ad nodos congesti; inflorescentia pseudoaxillaris pedunculo usque ad 5 mm longo instructa, 2-flora, plerumque floribus pluribus e brachyblastis orientibus comitata; pedicelli 0.5—2 mm longi, subglabri. Flores isostyli. Ovarium sparse scabridulum. Calycis lobi 0.6 mm longi, margine hirtelli. Corolla alba, tubo 0.5 mm longo, lobis tubo aequilongis. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae ovoideae. Granula pollinis 22 μ alta et 18 μ diam. Stylus glaber 0.2 mm longus; stigmata 0.2 mm longa. Capsula sparse scabridula. Cellulae testae parietibus undulatis instructae, laeves.

Habitat Congoliam.
Belgian Congo: Léopoldville, Achten 16, type (B).

Nothwithstanding the rather striking resemblance in habit with *O. fastigiata* Brem., I do not believe that these two species can be regarded as nearly allied. The small flowers and the wavy walls of the testa cells of *O. densiflora* remind one of *O. caespitosa* Hiern, in which species too part of the flowers are arranged in pedunculate diads.

57. **Oldenlandia caespitosa** Hiern in Fl. Trop. Afr. 3, 61, 1877; *O. herbacea* (L) Lam.? var. *caespitosa* Bth. in Hook., Niger Fl. 403, 1849; — *O. tenuissima* Hiern in Fl. Trop. Afr. 3, 61, 1877, cf. var. *caespitosa*; — *Hedyotis scabrida* (DC) Sond. in Fl. Cap. 3, 9, 1865 quoad specimen citatum, haud quoad typum, cf. var. *major*; — *Oldenlandia corymbosa* L var. *subpedunculata* O. Ktze, Rev. Gen. Pl. 3, 121, 1893, cf. var. *subpedunculata*; — *O. Proschii* Briq. in Ann. Conserv. et Jard. Bot. Genève **6**, 8, 1902, cf. var. *caespitosa*.

Herba annua, e basi ramosa, caulibus decumbentibus plerumque ramosis. Caules ramique subquadrangulares, internodiis bisulcatis, marginibus sulcorum scabridulis. Folia lineari-lanceolata, in var. *caespitosa* circ. 1 cm longa et 1.2 mm lata, raro usque ad 1.5 cm longa et 2.5 mm lata, in var. *subpedunculata* 1.5—2 cm longa et 2—2.5 mm lata, in var. *majore* circ. 2 cm longa et 2.5 mm lata, in var. *lanceolata* 1.5—3 cm longa et 4—7 mm, interdum usque ad 9 mm lata, in varietatibus omnibus discoloria, supra praesertim marginem versus scabridula, subtus glabra vel costa parce scabridula, costa basin versus plus minusve impressa, subtus prominula, nervis in var. *lanceolata* utroque latere costae 3—4 vix distinguendis. Vagina stipularis obconica, margine in fimbrias aliquas producta quarum duae vaginae subaequilongae vel ei paulo breviores sunt. Flores plerumque solitarii ad nodos, interdum duo vel plures, praesertim in var. *lanceolata* in inflorescentias graciliter pedunculatas dispositi; pedicelli graciles 1.5—8 mm longi, glabri. Flores isostyli. Ovarium glabrum. Calycis lobi in var. *caespitosa* 0.6 mm longi, in var. aliis bis longiores. Corolla alba, tubo in var. *caespitosa* 0.6 mm longo, in var. aliis bis vel ter longiore, lobis in var. *caespitosa* 0.6 mm longis, in var. aliis paulo longioribus. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae ovoideae. Granula pollinis 3- vel 4-colporata, 18—25 μ alta et 16—22 μ diam. Stylus subglaber vel vix conspicue hirtellus; stigmata ad antheras adjicientia. Capsula in var. *caespitosa* 1.7 mm alta et 2 mm diam., in var. *subpedunculata* 2.2 mm alta et 2.2 mm diam., in var. *majore* 2—3 mm alta et 2.5—3.5 mm diam., in var. *lanceolata* 2.5 mm alta et 2.5 mm diam., glabra. Cellulae testae parietibus undulatis instructae, laeves.

Habitat Africam Tropicalem et Subtropicalem, Malagasciam, Syriam.

var. *caespitosa*; *O. caespitosa* et *tenuissima* Hiern, *O. Proschii* Briq. l.c.; foliis circ. 1 cm longis et 1.2 mm latis, calycis lobis 0.6 mm, corollae tubo 0.6 mm, corollae lobis 0.6 mm longis, capsula 1.7 mm alta et 2 mm diam.
Cape Verde Islands: Togo, between Cova Figueira and Mosteiros, Chevalier 45043; S. Antao, Schmidt s.n.
Senegal: Cape Verde, Perrottet 387; Lower Casamance, nr Ziguinchor, Trochain 1536 (type of *O. parva* Trochain, n.v.).
Liberia: Cape Palmas, Vogel 51, type (K).
Nigeria: Ikom, Rosevear 10/31; Eket District, Mr & Mrs Talbot s.n.
Cameroons: Batanga, Bates 3.

Belgian Congo: Léopoldville, Capt. Comyo s.n.; Matadi, Vanderijst 7752.
Angola: Ambriz, Welwitsch 3044 p.p. (cf. *O. corymbosa* L).
Northern Rhodesia: Barotse-land, Sofula, Prosch 8 (type of *O. Proschii* Briq.).
Southern Rhodesia: Victoria Falls, Kirk s.n. (type of *O. tenuissima* Hiern), Galpin 14988, Wall 12/10/38; Salisbury, Wild 2818.
Portuguese East Africa: Quelimane, Scott s.n., "in rice fields".
Tanganyika: Aruscha, alt. 1400 m, Uhlig 1060.
Kenya: Takaungu, Thomas II 71.
Uganda: Mbale District, Bulucheke, alt. 1300 m, Mrs Forbes 227.

var. *subpedunculata* (O. Ktze) Brem. n. comb.; *O. corymbosa* L var. *subpedunculata* O. Ktze l.c., foliis 1.5—2 cm longis et 2—2.5 mm latis, floribus bis majoribus a var. *caespitosa* recedens.
Marocco: Salé, on the road to Meknès, Maire 6137.
Egypt: island nr Luksor, Kralik s.n.
Abyssinia: Irpalem (Dalto), Vatova 1042 p.p., 1063; Uadani, id. 737; Socome, id. 532.
Somaliland: Webi, Karanle, Riva 889.
Socotra: Balfour 582; Schweinfurth 323, 683, 702.
Kenya: Mt Elgon, alt. 2400 m, Miss Webster 8832; Mombasa-Shimoni, Whyte s.n.; Mombasa–Lamu, id. s.n.; Mombasa, Rabai Hills, Taylor s.n.; Mombasa, id. 3922; Digo Province, Maji Ya Chumvi, id. 3910.
Uganda: Kigezi District, Sajitina Crater, Taylor 2119; Ruwenzori, Nawampa Valley, id. 2395; Nyakasura, Sillitoe 103.
Tanganyika: Marangu, Geilinger 4805; Moshi District, Lyamumgu, alt. 1300 m, Wallace 1052; Moshi, Haarer 327; Monga, Zimmermann 7847; Virunga Mnts, Kateruzi Volcano, north of Lake Kivu, Burtt 3277; Lake Nyasa, Lukoma, Bellingham s.n.
Portuguese East Africa: s.l. Kuntze s.n. (type of *O. corymbosa* L var. *subpedunculata* O. Ktze, K); Lake Nyasa, M'Bucca, alt. 600 m, Sousa 1523; Quelimane District, Namagoa, Mrs Faulkner K 442.
Southern Rhodesia: Marandellas, Love, alt. 1400 m, Wild 2419; Mkota Reserve, Mazoe River, alt. 350 m, id. 2692.
Nyasaland: North Nyasa, Kanonga, Whyte s.n.
Belgian Congo: Kikwit, Vanderijst 2897; Kitobola, Laurent s.n.; Nioka, de Craene 161, Taton 364; Pweto, Robijns 1966; Upper Lomami, Mullenders 390; Rutshuru (Kivu), Lebrun 8262, 9011; Kivu, Gronnier-Le Petit s.n.; Léopoldville, Dubois 3277.
French Aequatorial Africa: Ubangi-Chari, Upper Ubangi, Krebedje (Ft Sibut), Chevalier 5641.
Also in Syria, Madagascar, Bourbon and Mauritius.

var. *major* Brem. n. var., *Hedyotis scabrida* (DC) Sond. l.c. quoad specimen natalense haud quoad typum, foliis circ. 2 cm longis et 2.5 mm latis,

floribus bis majoribus, capsulis 2—3 mm altis et 2.5—3.5 mm diam. a var. *caespitosa* recedens.
Uganda: Kampala, Fort Portal, alt. 2100 m, Hazel 178 et 190; Kampala, alt. 1300 m, Alluaud 404; Serere, Teso, alt. 1100 m, Chandler 128.
Tanganyika: Moshi District, Kibosho, alt. 1200—1500 m, Haarer s.n.; Pemba, Vaughan 575; Pandeni, Zimmermann 7848; Sigi, id. 7849 ("*O. hirta* A. Peter inedit"); Languza, id. 7850; Morogoro, alt. 500 m, Haarer 1915.
Belgian Congo: Marungu, Quarré 7619; between Kakunde and Kahanja, Zappelli 294; Kipako, Vanderijst 31395; Upper Lomami, Mullenders 1757, 1793.
Nyasaland: Shire Highlands, Buchanan 95; Fort Hill, Tanganyika Plateau, 1100—1200 m, Whyte s.n.
Northern Rhodesia: Broken Hill, Rogers 7688.
Southern Rhodesia: Salisbury District, Rattray 517; Umtali, Manica, Odzani River, Teague 168; Shamva, alt. 1200, Miss Waller in herb. Eyles 2176.
Portuguese East Africa: nr Expedition Island, Kirk s.n.; Nhandoa, Le Testu 363.
Transvaal: Zoutpansberg, alt. 1200 m, Junod 4269; Shilouvane, id. 545 p.p.
Natal: Durban, Gueinzius 133 ("*Hedyotis scabrida* Sond.", type of var. P); Inanda, Wood 527; Zululand, Ungoya, id. 9435.
Also in Madagascar.

var. *lanceolata* Brem., foliis 1.5—3 cm longis et 4—7 mm, interdum usque ad 9 mm latis, utroque latere costae nervis 3—4 vix conspicuis instructis, inflorescentiis partim plurifloris et graciliter pedunculatis, floribus bis majoribus, capsulis 2.5 mm altis et diam. a var. *caespitosa* recedens.
Nigeria: Aguku, Thomas 1003.
Cameroons: Batanga, Bates 3 p.p. (cf. var. *caespitosa*), type of variety (P).
French Aequatorial Africa: Iles de Los, Ile de Tamara, Sérand s.n.
Northern Rhodesia: Mumbwa, Mrs Macaulay 331.
Also in Arabia (Wolledje, Gebel Melhan, Schweinfurth 1983).

O. caespitosa Hiern is difficult to define. The various varieties differ considerably from each other, especially the var. *caespitosa* and the var. *lanceolata*; the two other varieties on the other hand are not always readily distinguishable. The var. *lanceolata* looks more or less like *O. corymbosa* L, but differs from the latter in the hairy style; it might perhaps be regarded as a distinct species. The other varieties are easily distinguishable from *O. corymbosa* because of the shorter leaves and of the arrangement of the flowers, which for the greater part are solitary at the nodes. The rather strong variability in size displayed by the pollen grains may perhaps be interpreted as an indication of genetic diversity, and a further splitting might therefore be necessary. Ths study of this species offers

particular difficulties owing to the large number of specimens in which more or less anomalous inflorescences are met with. One of these specimens is the type of *O. Proschii* Briq.

The type of *O. parva* Trochain is unknown to me, but the description and the figure leave little doubt that this is a somewhat dwarfed form of the var. *caespitosa*. The shoots look as if they have been formed on specimens that had flowered and fruited already earlier in the season.

The type of *O. tenuissima* Hiern has probably been collected in the spray of the Victoria Falls; it consists of a number of very thin plantlets that appear to have grown up together, perhaps between other rank vegetation. The specimens collected at the same place by Galpin and by Wall look more normal.

58. **Oldenlandia capensis** L. f., Suppl. 127, 1781; Thunb., Prodr. 29, 1794; id., Fl. Cap. **1**, 47, 1811; DC, Prodr. **4**, 424, 1830; Hiern in Fl. Trop. Afr. **3**, 62, 1877; K.Sch. in Engler, Pflanzenw. Ost Afrikas C, 375, 1895; Th. et H. Durand, Syll. Fl. Cong. 245, 1909; Hutch. et Dalz., Fl. West Trop. Afr. **2**, 130, 1931; *Hedyotis capensis* (L. f.) Lam., Tab. Encycl. **1**, 271, 1791; Sond. in Fl. Cap. **3**, 9, 1865; — *Oldenlandia sabulosa* DC, Prodr. **4**, 424, 1830; *Hedyotis sabulosa* (DC) Steud., Nom. ed. 2, 728, 1841; — *Oldenlandia riparia* DC l.c.; *Hedyotis riparia* (DC) Steud. l.c.; — *Oldenlandia ramosissima* Spreng., Mant. **1**, 35, 1807; DC, Prodr. **4**, 424, 1830; *Hedyotis ramosissima* (Spreng.) Spreng., Pug. **2**, 31, 1815; *Oldenlandia ramosissima* (Spreng.) Hohen. ex Walp., Rep. **2**, 502, 1843, comb. superfl.; Hiern in Cat. Welw. Afr. Pl. **2**, 450, 1898; — *Karamyschewia hedyotoides* Fisch. et Mey. in Bull. Soc. Nat. Mosc. 1838, 266; Endl., Gen. Pl. Suppl. **1**, 1393, 1841; Walp., Rep. **2**, 502, 1843; *Oldenlandia hedyotoides* (Fisch. et Mey.) Boiss., Fl. Orient. **3**, 11, 1875; Hiern in Fl. Trop. Afr. Afr. **3**, 64, 1877, cf. var. *pleiosepala*; — *Theyodis octodon* A. Rich., Tent. Fl. Abyss. **1**, 364, 1847, cf. var. *pleiosepala*; — *Oldenlandia inconstans* Pomel. ex Batt. et Trab., Fl. de l'Algérie 388, 1889, cf. var. *pleiosepala*.

Herba annua, radice palari instructa, e basi ramosa, caulibus prostratis vel rarius ascendentibus, ramosissimis. Caules ramique quadricostati, costis plerumque parce et minutissime setulosis. Folia linearia, plerumque 1.0—1.5 cm longa et 0.6—1.6 mm lata, rarius usque ad 3 cm longa et 2 mm lata, supra scabridula, subtus tota glabra vel costa scabridula, discoloria, sicc. supra fuscescentia, costa basin versus impressa, subtus prominula. Vagina stipularis obconica, margine irregulariter et breviter fimbriata. Flores nunc ad nodos solitarii, nunc pauci in fasciculos ad nodos solitarios aggregati; fasciculi subsessiles; pedicelli primum subnulli, post anthesin accrescentes et ultimo capsulae aequilongi vel ea paulo longiores. Flores isostyli. Ovarium parce hirtellum. Calycis lobi in var. *capensi* 4, triangulares, 0.9 mm longi, distincte carinati, margine et costa scabrido-hirtelli, in var. *pleiosepala* usque ad 8, lineari-subulati, valde inaequales, 0.6—1.1 mm longi. Corolla alba vel lilacina, semper 4-mera, tubo 0.6—0.9 mm longo,

lobis 0.5—0.6 mm longis. Stamina antheris sessilibus dimidio superiore tubi inserta; antherae ovoideae, inclusae. Granula pollinis 19—23 μ alta et 18—20 μ diam. Stylus glaber, 0.2 mm longus; stigmata crassiora stylo aequilonga, ad antheras adjicientia. Capsula sparse hirtella. Cellulae testae parietibus undulatis instructae, laeves.

Habitat Europam Meridionalem, Transcaucasiam, Persiam, Africam totam.

var. *capensis*, calyce 4-mero.

Marocco: nr Sale, Maire 4.12.18.

Egypt: North of Assuan, Schweinfurth 30.1.07 p.p.; Salug Island nr Assuan, Täckholm 17.1.27; Island Schêl nr Assuan, Muschler 8 p.p.; Helman, id. 27.4.10; above Thebes, Kralik 17.1.1848 p.p.; Second Cataract, id. 6.2.1848.

Anglo-Egyptian Sudan: Cordofan, Fazogl, Figari s.n.; Country of the Djur, Seriba Ghallas, Schweinfurth 2035.

Abyssinia: s.l., Quartin Dillon & Petit s.n.

Eritrea: Gimma, Saccardo 41.

Tanganyika: Nyasa Plateau, Kyimbila, Kabasa, alt. 1350 m, Stolz 254.

Nyasaland: nr Umbaka River, Scott s.n.; Nyasaland s.l., Buchanan 202.

Northern Rhodesia: Victoria Falls, Livingstone Island, Wild 3124.

Portuguese East Africa: Moçambique, Forbes s.n.; Quelimane, Scott s.n.; Amaramba Flats, Hornby 3558; Marral, Le Testu 923.

Transvaal: Zoutpansberg, between Shilouvane and Spelonken, Junod 1546; Komatipoort, Schlechter 11741, Rogers 23991; District Waterberg, Leeuwpoort, Rogers 22912; between Elandsrivier and Klippan, Rehmann 5083; Naboomspruit, Galpin 8851.

Bechuanaland: Khamas Country, Shashi River, Klingberg s.n.; Ngamiland, Gotsela, Curson 225.

Natal: nr Durban, Wood 9799; Klipriver District nr Wesselsnek, Pentz & Acocks 10267; s.l. Gerrard 1953.

Cape Province: Uitenhage District, Witrivier, Drège 7659 ("*Diodia*"); nr Waverley, Schlechter 1163; Kenilworth Flats nr Wijnberg, id. 625; Cape Town, Camp Ground, Bolus 4491, Bunbury s.n.; District Calvinia, Nieuwoudtville, Leipoldt in herb. Bolus 9393; Clanwilliam, Phillips 9.1908; Mosterthoek on the Bergrivier, alt. 300 m, Schlechter 256; s.l. Thunberg s.n. 1775, type (S).

South-West Africa: Lower Omuramba, Matako, Dinter 7319.

Angola: Huilla, Antunez & Dekindt 3139, Welwitsch 3050, 3051; District Mossamedes, id. 3048 ("*O. ramosissima* Hohen. ex Walp. var.", Hiern in Cat. Welw. Afr. Pl. 2, 450).

Belgian Congo: Léopoldville, Bequaert 7292, 7703; between Basoko and Stanleyville, Claessens 627; Valley of the Muhe, Lebrun 8095; Buhumba, Mullenders 2543; Yangambi, Léonard 1877 p.p.

French Aequatorial Africa: Ubangi-Chari, Baguirmi et région du lac Fittri, Korbo, Chevalier 9328.
Nigeria: Mongu, alt. 1300 m, Lely 440; Taura, id. 121; Sokoto, Moiser 6.3.22; Nupe, Barter s.n.; Katsima, Meikle 1360.
Senegal: on the bank of the Senegal River, Perrottet 388 (type of *O. riparia* DC); Walo, id. 389 (type of *O. sabulosa* DC); Foula Toro, Leprieur s.n.; Dagana, id. 4; nr Richard-Toll, Perrottet s.n.; Qualo, id. s.n.; Cercle de Gao, between Gao and Bura, de Wailly 4996; Timbuctu, Bandiagara, Chudeau s.n.

var. *pleiosepala* Brem. n. var.; *Karamyschewia hedyotoides* Fisch. et Mey., *Oldenlandia hedyotoides* (Fisch. et Mey.) Boiss.; — *Theyodis octodon* A. Rich.; — *Oldenlandia inconstans* Pomel. ex Batt. et Trab.; calyce pleiosepalo, lobis angustioribus inaequilongis a var. *capensi* distincta.
Algeria: Seba nr Bone, Letourneux in Kralik, Pl. Alg. Sel. 161.
Egypt: Raddi, Savi s.n. ("*Hedyotis aegyptia* nobis"); north of Assuan, Schweinfurth, 30.1.07 p.p.; Island Schêl nr Assuan, Muschler 824 p.p., 825; Ibrim, Letourneux 262; nr Yournak, id. s.n.; nr Faschout, Kralik 13.1.1848; Luksor, id. 26.2.1848; Sebu, id. 9.2.1848; Selsekak, id. 16.2.1848; above Thebes, id. 17.1.1848 p.p., 21.2.1848.
Anglo-Egyptian Sudan: Cordofan, Fazogl, Martin St Ange s.n.; Cordofan s.l., Kotschy 41; Eregno Sennen, id. 216; Country of the Djur, at the Wau, Schweinfurth 1637; Country of the Niam Niam, Huah, id. 3734.
Abyssinia: Chiré, Quartin Dillon & Petit s.n.
Tanganyika: Bukoba District, Kongolero, alt. 1200 m, Haarer 2187; Rufiji, Musk 82.
Nyasaland: Shire Highlands, Milanje, Scott Elliot 8654.
Northern Rhodesia: Solwezi District, Solwezi, Milne-Redhead 465; Mwinilunga District, id. 3390.
Southern Rhodesia: Victoria Falls, Cataract Island, Wild 3164; Salisbury, Greatrex, s.n., Eyles 7570.
Angola: Libongo, Welwitsch 3062 ("*O. ramosissima* Hohen. ex Walp." Hiern, Cat. Welw. Afr. Pl. 2, 450); River Cubango, P. Amelia, Gossweiler 2338.
Belgian Congo: Boma, Bequaert 803; Stanley-Pool, Hens B 4; Dembo, Quarré 3770bis; Dembia (Uélé), Louis 1685; Yangambi, Léonard 1877 p.p., 1878; Plateau d'Eshilabaka, Overlaet 964; Parc National de la Garamba, au pied du Mt Bawezi, le long de l'Atha, Germain 631; Namvugu River, Assigala-Timboa, id. 593.
French Aequatorial Africa: Ubangi-Chari, Région de la Uaka, Tisserant 1927; Région de Bambari, id. 2162, 2802; Région de Bozoum, id. 3307.
Nigeria: Province Zaria, Mande, Keay F. H. I. 25869; Ilorin Division, Jebba Island, Meikle 1290.
Sierra Leone: Falaba, Scott Elliot 5169; Port Loko, id. 5876.

The var. *capensis* has also been collected in Southern Europe, viz. in Montenegro near Cettinje (Lehmann 29.8.1904; Gross 16.8.1901); the var. *pleiosepala* in Transcaucasia (Lencoran, Hohenacker s.n., the type of *Karamyschewia hedyotoides* Fisch. et Mey.,) and in Persia.

The two varieties often occur together and have repeatedly been collected under the same number.

O. capensis belongs to a small group of species with subsessile flowers. From *O. geminiflora* (Sond.) O. Ktze it is distinguishable by the much shorter calyx lobes (1 mm instead of 3 mm), and from *O. acicularis* Brem. and *O. sclerophylla* Brem. by the thin leaves.

59. **Oldenlandia geminiflora** (Sond.) O. Ktze, Rev. Gen. Pl. **1**, 292, 1891, non K.Sch. in Bot. Jahrb. **28**, 483, 1900 (nom. illeg.); *Hedyotis geminiflora* Sond. in Linnaea **23**, 51, 1850; id. in Fl. Cap. **3**, 10, 1865.

Species minus cognita, ut videtur *O. capensi* L. f. valde affinis, corolla nondum visa tamen haud certe locanda. Ab *O. capensi* caulibus robustioribus, foliis longioribus, vagina stipulari ampliore, floribus distinctius pedicellatis et praesertim calycis lobis plus quam 2 mm longis distinguenda.

Habitat Africam Australem.

Transvaal: Magaliesberg, Zeyher 756, type (K).

The following specimen probably belongs to this species: Greatrex S. Rh. Gov. Hb. 13971, collected in Southern Rhodesia, District Salisbury, Arthur's Seat, alt. 1350 m, but more material will have to be examined before a description can be given.

60. **Oldenlandia sclerophylla** Brem. n. spec. subgeneris *Eu-oldenlandiae*, maxime ut *O. capensis* L. f. sed habitu robustiore, foliis rigidioribus subtus conspicue albo-costatis, stipulis fimbriis pluribus instructis ab ea distinguenda.

Herba annua, e basi ramosa, caulibus ascendentibus, ramosis, usque ad 15 cm alta. Caules subteretes, internodiis tamen late bisulcatis, marginibus sulcorum scabrido-hirtellis, ad medium circ. 1.0 mm diam., internodiis ad medium caulem circ. 2 cm longis. Folia linearia, 2—3 cm longa et 1.8—2.3 mm lata, rigidiora, supra scabrida, subtus costa sola scabrido-hirtella, sicc. vix discolorata, costa supra subimpressa, subtus albida, prominula. Vagina stipularis 1.2—1.6 mm alta, margine utroque latere caulis in fimbrias plerumque 4 producta; fimbriae medianae usque ad 2 mm longae. Flores in fasciculos ad nodos solitarios dispositi; fasciculi e floribus 2—6 compositi; pedicelli circ. 1 mm longi. Flores isostyli. Ovarium sparse scabridum. Calycis lobi triangulares 1.0 mm longi, margine scabrido-papillosi. Corolla calycem haud excedens, lobis tubo aequilongis. Stamina antheris sessilibus tubo inserta, apicibus vix conspicue exsertis. Granula pollinis subglobosa, 18 μ diam. Capsula 1.8 mm alta et 2 mm diam.,

calycis lobis patentibus coronata, subglabra. Cellulae testae parietibus undulatis instructae, laeves.

Habitat, Sudaniam Occidentalem.

French West Africa: Timbuktu, Hagerup 163a, type (C).

To this species probably also belong the very small specimens (not more than 2 cm high) collected by de Wailly (n. 5008) in the district Gao and by Collin (n. 167) somewhere in Senegal. In their small size these specimens recall *O. parva* Trochain, which I referred to *O. caespitosa* Hiern, but the plant described by Trochain has somewhat wider leaves and longer pedicels.

O. sclerophylla Brem. is doubtless a near ally of *O. capensis* L. f., from which it differs in its more robust stems, thicker leaves provided with a very conspicuous white midrib, and a more conspicuously fimbriate stipular sheath.

61. **Oldenlandia acicularis** Brem. n. spec. subgeneris *Eu-oldenlandiae*, floribus pseudo-axillaribus breviter pedicellatis ad *O. capensem* L.f. accedens, sed caule parce ramoso erecto, foliis acicularibus, stipulis longe fimbriatis, calycis lobis longioribus ab ea faciliter distinguenda.

Herba annua, haplocaulis, erecta, parce ramosa, circ. 15 cm alta. Caulis quadricostatus, costis sub lente hirtellis, circ. 0.8 mm diam., internodiis ad medium caulem circ. 2.5 cm longis. Folia acicularia, 2—3 cm longa et 0.5—0.7 mm lata, rigidiora, supra scabridula, sicc. vix discolorata, costa supra subimpressa. Vagina stipularis 1.5—3 mm alta, margine utroque latere caulis in fimbrias plures usque ad 4 mm longas producta. Flores ad nodos solitarii vel in paria dispositi; pedicelli 1—1.5 mm longi. Flores isostyli. Ovarium sparse scabridum. Calycis lobi anguste triangulares, 1.2 mm longi, post anthesin paulo accrescentes, margine et costa scabrido-papillosi. Corolla alba, calycem vix excedens, tubo fauce barbato et infra faucem sparse piloso, lobis tubo paulo brevioribus. Stamina antheris sessilibus tubo inserta, apicibus exsertis. Granula pollinis subglobosis, 3- vel 4-colporata, 23 μ alta et 22 μ diam. Stylus glaber; stigmata stylo paulo longiora, ad antheras adjicientia. Capsula 1.3 mm alta et 1.8 mm diam., subglabra. Cellulae testae parietibus undulatis instructae.

Habitat Kenyam.

Kenya: District Kipkarren, Mrs Brodhurst-Hill 221, type (K), "growing in rock pools".

In habit this species resembles *O. linearis* DC, from which it is at once distinguishable by the subsessile flowers and by the wavy walls of the testa cells. In these two characters it shows its affinity with *O. capensis* L. f.

When the manuscript was ready for the press, I received from the herbarium of the Royal Botanic Gardens, Kew, some specimens of the West-Indian "*Oldenlandia*" *callitrichoides* Griseb. collected in a garden

at Njala, Sierra Leone (Deighton 4659 et 5331). This is very probably a recent introduction in Africa. It is a prostrate herb with very small ovate leaves and solitary, long-pedicellate flowers It does not belong to the genus *Oldenlandia* as defined here, nor to any of the other genera dealt with in this work, but the determination of its exact position is better postponed until the other American species are revised. Its pollen is figured on Tab. XIII, fig. p; its testa cells resemble those found in the genus *Parapentas* Brem.

INDEX GENERUM

14. *Agathisanthemum* Klotzsch 152
17. *Amphiasma* Brem. 168
2. *Chamaepentas* Brem. 46
7. *Conostomium* Cuf. 125
15. *Dibrachionostylus* Brem. 163
12. *Diotocranus* Brem. 148
16. *Eionitis* Brem. 165
9. *Exallage* Brem. 140
Gerontogea C. et S. cf. *Oldenlandia* L emend. Brem.
Hedyotis L sensu Lam. p.p. cf. *Agathisanthemum* Klotzsch, *Conostomium* Cuf., *Exallage* Brem., *Kohautia* Cham. et Schlecht., *Oldenlandia* L emend. Brem., *Pentodon* Hochst.
13. *Hedythyrsus* Brem. 149
Houstonia L sensu J. Bär cf. *Amphiasma* Brem.
Karamyschewia Fisch. et Mey. cf. *Oldenlandia capensis* L. f.
6. *Kohautia* Cham. et Schlecht. 56
19. *Lelya* Brem. 181
11. *Manostachya* Brem. 145
Metabolos Bl. p.p. cf. *Exallage* Brem.
20. *Oldenlandia* L emend. Brem. 183
Oldenlandia L sensu Hiern et K.Sch. cf. genera omnia in opere hoc accepta
4. *Parapentas* Brem. 50
Peltospermum Bth. non DC cf. *Sacosperma* G. Taylor
8. *Pentanopsis* Rendle 139
18. *Pentodon* Hochst. 175
1. *Sacosperma* G. Taylor 43
10. *Stephanococcus* Brem. 143
3. *Tapinopentas* Brem. 49
5. *Thecorchus* Brem. 54
Theyodis A. Rich. cf. *Oldenlandia capensis* L. f.

INDEX SPECIERUM

Agathisanthemum

2. *angolense* Brem. ... 157
3. *assimile* Brem. ... 158
1. *Bojeri* Klotzsch ... 154
   subspec. 2. *australe* Brem. var. 1. *australe* ... 156
   subspec. 2. *australe* Brem. var. 2. *glabriflorum* Brem. ... 157
   subspec. 1. *Bojeri* var. 1. *Bojeri* ... 155
   subspec. 1. *Bojeri* var. 2. *glabriflorum* Brem. ... 156
4. *chlorophyllum* (Hochst.) Brem. ... 159
   var. 1. *chlorophyllum* ... 160
   var. 2. *pubescens* Brem. ... 160
6. *globosum* (Hochst. ex A. Rich.) Klotzsch ex Hiern ... 161
   var. 1. *globosum* ... 162
   var. 2. *subglabrum* Brem. ... 163
   Petersii Klotzsch, spec. non satis nota cf. *Bojeri* et *quadricostatum*
5. *quadricostatum* Brem. ... 160
   var. 2. *pubescens* Brem. ... 161
   var. 1. *quadricostatum* ... 161

Amphiasma

4. *assimile* Brem. ... 172
6. *benguellense* (Hiern) Brem. ... 173
8. *divaricatum* (Engl.) Brem. ... 174
1. *luzuloides* (K.Sch.) Brem. ... 170
7. *merenskyanum* Brem. ... 174
5. *micranthum* (Chiov.) Brem. ... 172
2. *Redheadii* Brem. ... 170
3. *Robijnsii* Brem. ... 171

Chamaepentas

1. *Greenwayi* Brem. ... 47
   var. 2. *glabra* Brem. ... 48
   var. 1. *Greenwayi* ... 47

Conostomium

   subgenus 1. *Beckia* Brem. ... 129
   subgenus 2. *Eu-conostomisum* Brem. ... 134
   subgenus 3. *Hochstetteria* Brem. ... 136
1. *brevirostrum* Brem. ... 129
5. *camptopodum* Brem. ... 133
   fasciculatum (Hiern) Cuf. = *longitubum*
3. *hispidulum* Brem. ... 131
4. *kenyense* Brem. ... 132
   var. 1. *kenyense* ... 132
   var. 2. *subglabrum* Brem. ... 132
2. *longitubum* (Beck) Cuf. ... 130
6. *microcarpum* Brem. ... 133
8. *natalense* (Hochst.) Brem. ... 136

var. 2. *glabrum* Brem. ... 137
var. 1. *natalense*. ... 137
var. 4. *ovalifolium* Brem. ... 138
var. 3. *tomentellum* Brem. ... 137
7. *quadrangulare* (Rendle) Cuf. ... 134
rhynchothecum (K.Sch.) Cuf. = *longitubum*
rotatum (Baker) Cuf. = *longitubum*
9. *zoutpansbergense* (Brem.) Brem. ... 138

Crusea

?*acuminata* E. Mey. ex Drège, nomen = *Conostomium natalense*

Dibrachionostylus

1. *Kaessneri* (S. Moore) Brem. ... 164

Diotocranus

1. *Lebrunii* Brem. ... 148
var. 1. *Lebrunii* ... 149
var. 2. *sparsipilus* Brem. ... 149

Eionitis

1. *Chiovendii* Brem. ... 166
2. *psammophila* (Chiov.) Brem. ... 167
var. 4. *compactihirtella* Brem. ... 168
var. 3. *hirtella* Brem. ... 168
var. 2. *laxiflora* Brem. ... 168
var. 1. *psammophila*. ... 167

Exallage

1. *auricularia* (L) Brem. ... 142
enumerationem specierum aliarum vide ... 142

Gerontogea

capensis (L. f.) C. et S. = *Oldenlandia capensis*
corymbosa (L) C. et S. = *Oldenlandia corymbosa*
herbacea (L) C. et S. = *Oldenlandia herbacea*
umbellata (L) C. et S. = *Oldenlandia umbellata*

Hedyotis

abyssinica Hochst. ex A. Rich. = *Kohautia coccinea*
aegyptia Savi in sched. = *Oldenlandia capensis* var. *pleiosepala*
affinis R. et S. = *Oldenlandia affinis*
amatymbica (Eckl. et Zeyh.) Steud. = *Kohautia amatymbica*
arborea Roxb. = *Nesohedyotis arborea*
aspera Heyne ex Roth = *Kohautia aspera*
auricularia L = *Exallage auricularia*
bicornuta Balf. f. = *Oldenlandia bicornuta*
Bojeri (Klotzsch) Vatke = *Agathisanthemum Bojeri*
brachyloba Sond. = *Kohautia brachyloba*
caespitosa (Schnizl.) Walp. = *Kohautia caespitosa*

caffra (Eckl. et Zeyh.) Steud. = *Kohautia virgata*
var. *pubescens* Sond. = prec.
capensis (L. f.) Lam. = *Oldenlandia capensis*
cephalotes Hochst. = *Oldenlandia cephalotes*
chlorophylla Hochst. = *Agathisanthemum chlorophyllum*
— — in errore apud Schinz cf. *Agathisanthemum Bojeri*
corymbosa (L.) Lam. = *Oldenlandia corymbosa*
cynanchica (DC) Steud. = *Kohautia cynanchica*
decumbens Hochst. = *Oldenlandia affinis*
dichotoma Koen. ex Roth non Cav. = *Oldenlandia affinis*
— — — — in errore apud A. Rich. cf. *Oldenlandis herbacea* var. *flaccida*
fugax Vatke = *Oldenlandia affinis*
geminiflora Sond. = *Oldenlandia geminiflora*
Gerrardi Harv. ex Sond. = *Kohautia virgata* (forma monstrosa)
globosa Hochst. ex A. Rich. = *Agathisanthemum globosum*
goreënsis DC = *Oldenlandia goreënsis*
— — var. *erecta* DC = *Oldenlandia goreënsis* var. *goreënsis*
grandiflora (DC) Steud. = *Kohautia grandiflora*
Halei T. et G. cf. *Pentodon pentander*
herbacea L = *Oldenlandia herbacea*
Heynii (G. Don) Sond. = *Oldenlandia herbacea*
hirtula Sond. = *Oldenlandia rupicola* var. *hirtula*
Johnstonii Oliv. = *Oldenlandia Johnstonii*
lancifolia Schum. = *Oldenlandia lancifolia*
laxiflora (Bth.) Walp. = *Pentodon pentander*
linearis (DC) Steud. = *Oldenlandia linearis*
longiflora (DC) Steud. = *Kohautia cynanchica*
longifolia Schum. = *Oldenlandia lancifolia*
macrophylla Lepr. et Perr. ex DC = *Pentodon pentander*
micrantha Hochst. nomen = *Oldenlandia herbacea* var. *flaccida*
monathos Hochst. ex A. Rich. = *Oldenlandia monanthos*
natalensis Hochst. = *Conostomium natalense*
parviflora (Bth.) Walp. = *Kohautia virgata*
pentamera Hochst. ex Sond. = *Pentodon pentander* var. *minor*
pentandra Schum. = *Pentodon pentander*
pulvinata Balf. f. = *Oldenlandia pulvinata* et *O. aretioides*
pumila L. f. = *Oldenlandia pumila*
pusilla Hochst. ex A. Rich. = *Oldenlandia linearis*
quartiniana A. Rich. = *Kohautia quartiniana*
ramosissima (Spreng.) Spreng. = *Oldenlandia capensis* var. *pleiosepala*
rigida (Bth.) Walp. = *Kohautia rigida*
riparia (DC) Steud. = *Oldenlandia capensis*
rupicola Sond. = *Oldenlandia rupicola*
sabulosa (DC) Steud. = *Oldenlandia capensis*
scabrida (DC) Sond. quoad specimen citatum = *Oldenlandia caespitosa* var. *major*
Schimperi Presl = *Kohautia caespitosa* var. *Schimperi*
senegalensis (C. et S.) Steud. = *Kohautia senegalensis*
— — — in errore apud A. Rich. = *Kohautia coccinea*
setifera (DC) Steud. = *Kohautia virgata*
sperguloides A. Rich. = *Oldenlandia linearis*
stellarioides Balf. f. = *Oldenlandia Balfourii*

stricta Smith = *Oldenlandia herbacea*
— — in errore apud Sond. = *Kohautia cynanchica*
strumosa A. Rich. = *Kohautia aspera*
tenella Hochst. = *Oldenlandia tenella*
thymifolia Presl non R. et P. = *Kohautia lasiocarpa* var. *thymifolia*
trichopoda A. Rich. = *Oldenlandia herbacea* var. *flaccida*
virgata Willd. = *Kohautia virgata*
zanguebariae (Lour.) R. et S. = *Kohautia* spec. non satis nota cf. *obtusiloba* et *longifolia*

Hedythyrsus

1. *spermacocinus* (K.Sch.) Brem. 151
2. *thamnoideus* (K.Sch.) Brem. 151

Houstonia

trichotoma (Schinz) J. Bär = *Amphiasma divaricatum*

Karamyschewia (*Karamyschovia*)

hedyotoides Fisch. et Mey. = *Oldenlandia capensis* var. *pleiosepala*

Kohautia

subgenus 2. *Eu-kohautia* Brem. 81
series 1. *Diurnae* Brem. 81
series 2. *Noctiflorae* Brem. 91
subgenus 1. *Pachystigma* Brem. 66
series 1. *Barbatae* Brem. 66
series 2. *Imberbae* Brem. 77
41. *amatymbica* Eckl. et Zeyh. 116
11. *amboensis* (Schinz) Brem. 76
16. *angolensis* Brem. 86
var. 1. *angolensis* 86
var. 2. *macrocalyx* Brem. 87
48. *aphylla* Brem. 125
39. *aspera* (Heyne ex Roth) Brem. 113
21. *azurea* (Dinter ex K. Krause) Brem. 91
35. *baddadensis* Brem. 103
28. *brachyloba* (Sond.) Brem. 98
37. *caespitosa* Schnizl. 104
var. 7. *amaniensis* (K. Krause) Brem. 108
var. 1. *caespitosa* 106
var. 5. *delagoensis* (Schinz) Brem. 107
var. 6. *dolichostyla* Brem. 108
var. 3. *eritreënsis* Brem. 107
var. 2. *ramosior* Brem. 106
var. 4. *Schimperi* (Presl) Brem. 107
9. *cicendioides* (K.Sch.) Brem. 75
14. *coccinea* Royle 82
19. *confusa* (Hutch. et Dalz.) Brem. 89
8. *cuspidata* (K.Sch.) Brem. 74
45. *cynanchica* DC 121

33. *dolichostyla* Brem. 102
5. *effusa* (Oliv.) Brem. 72
var. 1. *effusa* 72
var. 2. *hirtella* Brem. 72
24. *euryantha* Brem. 95
43. *gracilifolia* Brem. 119
34. *gracillima* Brem. 102
18. *grandiflora* DC. 88
17. *huillensis* Brem. 87
40. *kimuenzae* (de Wild.) Brem. 115
38. *lasiocarpa* Klotzsch 110
var. 3. *breviloba* Brem. 112
var. 6. *eritreënsis* Brem. 113
var. 1. *lasiocarpa* 111
var. 4. *subverticillata* (K. Sch.) Brem. 112
var. 2. *thymifolia* Brem. 111
var. 5. *xerophylla* (Schinz) Brem. 113
26. *latibrachiata* Brem. 96
7. *leucostoma* Brem. 74
longiflora DC = *cynanchica*
longiflora E. Mey. ex Sond. in syn. = *Oldenlandia affinis*
3. *longifolia* Klotzsch 68
var. 1. *longifolia* 69
var. 4. *macrocalyx* Brem. 70
var. 3. *psilogyna* Brem. 70
var. 2. *vestita* Brem. 70
29. *longiscapa* Brem. 99
var. *longiscapa* 99
var. *scabridula* Brem. 99
macrophylla Klotzsch spec. non satis nota cf. *longifolia*
6. *microcala* Brem. 73
noctiflora Hochst. ex A Rich, in syn. *Hedyotis grandiflorae* = *senegalensis*
32. *obbiadensis* (Chiov.) Brem. 101
1. *obtusiloba* (Hiern) Brem. 66
44. *omahekensis* (K. Krause) Brem. 120
36. *Pappii* Brem. 104
parviflora Bth. = *virgata*
13. *platyphylla* (K. Sch.) Brem. 81
15. *pleiocaulis* Brem. 85
2. *prolixipes* (S. Moore) Brem. 67
22. *quartiniana* (A. Rich.) Brem 92
47. *ramosissima* Brem. 124
46. *raphidophylla* Brem. 123
retrorsa (Boiss.) Brem. in diagnosi *K. somaliensis*
42. *rigida* Bth. 118
30. *sarcophylla* (Chiov.) Brem. 100
Schimperi Hochst. ex Steud. = *caespitosa* var. *Schimperi*
23. *senegalensis* Cham. et Schlecht. 92
4. *Sennii* Brem. 71
setifera DC = *virgata*
25. *socotrana* Brem. 95
31. *somaliensis* Brem. 100
10. *stellarioides* (Hiern) Brem. 76

27. *stenosiphon* (K.Sch. ex S. Moore) Brem. ... 97
stricta (Smith) DC quoad specimina citata cf. *confusa* et *senegalensis*
strumosa Hochst. nomen = *aspera*
thymifolia Presl in sched.: a. = *lasiocarpa* var. *thymifolia*; b. = *cynanchica*; c. = *virgata*
20. *ubangensis* Brem. ... 90
12. *virgata* (Willd.) Brem. ... 77
var. 2. *oblanceolata* Brem. ... 80
var. 1. *virgata* ... 78

Lelya

1. *osteocarpa* Brem. ... 181
var. 2. *angustifolia* Brem. ... 183
var. 1. *osteocarpa* ... 182

Manostachya

2. *juncoides* (K.Sch.) Brem.
1. *staëlioides* (K.Sch.) Brem.

Metabolos cf. *Exallage*

Nesohedyotis

arborea (Roxb.) Brem. ... 152

Neurocarpaea

quadrangularis (Rendle) Rendle = *Conostomium quadrangulare*

Oldenlandia

subgenus 1. *Alsinastrum* Brem. ... 191
subgenus 11. *Aneurum* Brem. ... 230
subgenus 3. *Anotidopsis* (Hook. f.) K.Sch. ... 193
subgenus 15. *Cephalanthium* Brem. ... 238
subgenus 2. *Cryptocarpum* Brem. ... 192
subgenus 16. *Eu-oldenlandia* K.Sch. ... 243
subgenus 13. *Euryanthus* Brem. ... 235
subgenus 7. *Hemicephalum* Brem. ... 221
subgenus 5. *Hymenophyllum* Brem. ... 212
subgenus 10. *Octoneurum* Brem. ... 226
subgenus 4. *Orophilum* Brem. ... 200
subgenus 6. *Platyrrhynchus* Brem. ... 218
subgenus 14. *Polycarpum* Brem. ... 236
subgenus 12. *Stachyanthus* Brem. ... 234
subgenus 8. *Tardavelinum* Brem. ... 222
subgenus 9. *Trichopodium* Brem. ... 224
abyssinica (Hochst. ex. A. Rich.) Hiern = *Kohautia coccinea*
61. *acicularis* Brem. ... 269
acutidentata C. H. Wright = *Kohautia cuspidata*
52. *aemulans* Brem. ... 257
33. *affinis* (R. et S.) DC. ... 236
alpestris K.Sch. spec. non satis nota cf. *caespitosa* var. *subpedunculata*
amaniensis K. Krause = *Kohautia caespitosa* var. *amaniensis*

amatymbica (Eckl. et Zeyh.) O. Ktze = *Kohautia amatymbica*
amboensis Schinz = *Kohautia amboensis*
6. *anagallis* Brem. ... 199
4. *angolensis* K.Sch. ... 195
— — in errore apud de Wild. et Th. Dur. cf. *goreënsis*
arborea (Roxb.) K.Sch. = *Nesohedyotis arborea*
25. *aretioides* Vierh. ... 219
aspera (Heyne ex Roth.) DC = *Kohautia aspera*
asperuliflora K.Sch. nomen = *nervosa*
auricularia (L) F. Müll. = *Exallage auricularia*
azurea Dinter et K. Krause = *Kohautia azurea*
1. *Balfourii* Brem. ... 192
benguellensis Hiern = *Amphiasma benguellense*
23. *bicornuta* (Balf. f.) Brem. ... 218
Bojeri (Klotzsch) Hiern = *Agathisanthemum Bojeri*
brachyloba (Sond.) O. Ktze = *Kohautia brachyloba*
brachyphylla K.Sch. inedit. = *cephalotes*
breviflora Chiov. = *Kohautia rigida* (forma monstrosa)
57. *caespitosa* Hiern. ... 262
var. 1. *caespitosa* ... 262
var. 4. *lanceolata* Brem. ... 264
var. 3. *major* Brem. ... 263
var. 2. *subpedunculata* (K. Sch.) Brem. ... 263
caffra Eckl. et Zeyh. = *Kohautia virgata*
var. *subsetosa* K. Sch. in sched. = prec.
caffra Eckl. et Zeyh. in errore apud Hiern. cf. *Kohautia longiflora*
calcitrapifolia Pears. in sched. = *Kohautia cynanchica*
callitrichoides Griseb. spec. cuius genus adhuc incertum. ... 269
58. *capensis* L.f. ... 265
var. 1. *capensis* ... 266
var. 2. *pleiosepala* Brem. ... 267
43. *capitata* Brem. ... 241
capitulifiora K. Krause = *Kohautia cuspidata*
3. *cephalotes* (Hochst.) O. Ktze. ... 194
20. *Chevalieri* Brem. ... 216
chlorophylla (Hochst.) O. Ktze = *Agathisanthemum chlorophyllum*
— — — in errore apud Schinz cf. *Ag. Bojeri*
cicendioides K.Sch. = *Kohautia cicendioides*
coccinea (Royle) Hook.f. = *Kohautia coccinea*
commutata Cuf. = *Kohautia caespitosa* var. *delagoensis*
confusa Hutch. et Dalz. = *Kohautia confusa*
congensis de Wild. et Th. Dur. = *angolensis*
51. *corymbosa* L. ... 254
var. 1. *corymbosa* ... 254
var. 2. *microcarpa* Brem. ... 256
var. *subpedunculata* O. Ktze. = *caespitosa* var. *subpedunculata*
crepiniana K.Sch. = *Stephanococcus crepinianus*
2. *cryptocarpa* Chiov. ... 193
crystallina Roxb. = *pumila*
cuspidata K.Sch. = *Kohautia cuspidata*
cyanea Dinter nomen cf. *Kohautia aspera*
Debeerstii de Wild. et Th. Dur. = *Kohautia coccinea*
decumbens (Hochst.) Hiern non Spreng. = *affinis*
delagoensis Schinz = *Kohautia caespitosa* var. *delagoensis*

delicatula K.Sch. spec. non satis nota cf. *linearis*
56. *densiflora* Brem. ... 261
dichotoma (Koen. ex Roth) Hook.f. = *affinis*
dichotoma (A. Rich.) Chiov. var. *papillosa* Chiov. = *herbacea* var. *papillosa*
Dinteri K. Krause = *Kohautia* spec. non satis nota cf. *raphidophylla*
divaricata Engl. = *Amphiasma divaricatum*
dolichantha Stapf = *Conostomium quadrangulare*
39. *Duemmeri* S. Moore ... 237
18. *echinulosa* K.Sch. ... 213
effusa Oliv. = *Kohautia effusa*
— — apud Hiern = *Kohautia effusa* et *K. confusa*
49. *eludens* Brem. ... 252
fasciculata Hiern = *Conostomium longitubum*
55. *fastigiata* Brem. ... 260
var. 1. *fastigiata* ... 260
var. 2. *longifolia* Brem. ... 261
filifolia K. Krause non Elmer = *Kohautia raphidophylla*
florifera de Wild. = *nervosa*
36. *flosculosa* Hiern ... 234
var. 1. *flosculosa* ... 235
var. 2. *hirtella* Brem. ... 235
11. *Friesiorum* Brem. ... 204
garuensis K. Krause spec. non satis nota cf. *Kohautia grandiflora*
59. *geminiflora* (Sond.) O. Ktze. ... 268
geminiflora K.Sch. nom. illeg. spec. non satis notae et incertae sedis
10. *geophila* Brem. ... 203
globosa (Hochst. ex A. Rich.) Hiern = *Agathisanthemum globosum*
5. *goreënsis* (DC) Summerh. ... 196
var. 1. *goreënsis* ... 197
var. 2. *trichocaula* Brem. ... 198
golungensis Hiern spec. non satis nota cf. *echinulosa*
graminifolia Chiov. = *Kohautia rigida*
grandiflora (DC) Hiern syn. *Hedyotis quartiniana* excl. = *Kohautia grandiflora*
29. *gregaria* K.Sch. ... 223
13. *Greenwayi* Brem. ... 207
Halei (T. et G.) Chapm. cf. *Pentodon pentander*
hedyotoides (Fisch. et Mey.) Boiss. = *capensis* var. *pleiosepala*
45. *herbacea* (L) Roxb. ... 244
var. *caespitosa* Bth. = *caespitosa*
var. 6. *dolichantha* Brem. ... 249
var. 3. *dolichocarpa* Brem. ... 248
var. 7. *dolichosepala* Brem. ... 249
var. 4. *flaccida* Brem. ... 248
var. 8. *Goetzei* Brem. ... 249
var. 1. *herbacea* ... 245
var. 9. *Holstii* (K. Sch.) Brem. ... 249
var. 5. *papillosa* (Chiov.) Brem. ... 249
var. 2. *suffruticosa* Brem. ... 248
Heynii G. Don. = *herbacea*
hirta A. Peter in sched. = *caespitosa* var. *major*
hirtula (Harv. ex Sond.) O. Ktze = *rupicola* var. *hirtula*
9. *Hockii* de Wild. ... 203
Holstii K.Sch. = *herbacea* var. *Holstii*

huillensis Hiern = *sipaneoides* var. *pubescens*
hymenocapsa K.Sch. spec. non satis nota
21. *hymenophylla* Brem. ... 216
44. *ichthyoderma* Cuf. ... 242
inconstans Pomel. ex Batt. et Trab. = *capensis* var. *pleiosepala*
12. *Johnstonii* (Oliv.) K.Sch. ... 205
juncoides K.Sch. = *Manostachya juncoides*
Junodii Schinz 1900 = *Borreria* spec. (cf. p. 5 et 6)
Junodii Schinz 1907 = *rupicola* var. *parvifolia*
Kaessneri S. Moore = *Dibrachionostylus Kaessneri*
Kaessneri K.Sch. et K. Krause = *Wiedemannii* var. *glabricaulis*
kimuenzae de Wild. = *Kohautia kimuenzae*
35. *lancifolia* (Schum.) DC. ... 230
var. 8. *brevipes* Brem. ... 234
var. 2. *grandiflora* Brem. ... 232
var. 1. *lancifolia* ... 231
var. 7. *longipes* Brem. ... 233
var. 3. *microcarpa* Brem. ... 232
var. 4. *rutshurensis* (de Wild.) Brem. ... 232
var. 6. *scabridula* Brem. ... 232
var. 5. *seseënsis* Brem. ... 232
lasiocarpa (Klotzsch) Hiern = *Kohautia lasiocarpa*
34. *Laurentii* de Wild. ... 229
laxiflora Bth. = *Pentodon pentander* var. *pentander*
Leclercii A. Chev. spec. nondum visa cf. *Kohautia aspera*
Ledermannii K. Krause spec. non satis nota cf. *Kohautia cuspidata*
leopoldvillensis de Wild. = *Exallage auricularia*
limnophila K.Sch. nomen = *cephalotes*
54. *linearis* DC. ... 258
var. 1. *linearis* ... 259
var. 2. *nana* Brem. ... 259
littoralis Chiov. non Mohr = *Eionitis Chiovendii*
longifolia (Schum.) DC = *lancifolia*
longifolia (Klotzsch) K.Sch. = *Kohautia longifolia*
longituba G. Beck = *Conostomium longitubum*
luzuloides K.Sch. = *Amphiasma luzuloides*
macrodonta Baker = *Kohautia coccinea*
macrophylla DC = *Pentodon pentander* var. *pentander*
malacophyton K.Sch. spec. non satis nota cf. *nervosa*
megistosiphon K.Sch. = *Conostomium quadrangulare*
merenskyana Dinter in sched. = *Amphiasma mereskyanum*
micrantha Chiov. = *Amphiasma micranthum*
32. *microcalyx* K.Sch. ... 226
40. *microcarpa* Brem. ... 238
microcoryne K.Sch. spec. non satis nota cf. *echinulosa*
53. *microphylla* de Wild. et Th. Dur. ... 257
moandensis de Wild. = *Kohautia virgata*
8. *monanthos* (Hochst. ex A. Rich.) Hiern. ... 201
15. *muscosa* Brem. ... 210
natalensis (Hochst.) O. Ktze = *Conostomium natalense*
var. *hirsuta* J. Bär = *Conostomium natalense* var. *natalense*
neglecta Schinz = *Kohautia cynanchica*
28. *nematocaulis* Brem. ... 222
19. *nervosa* Hiern ... 214

nesaeoides Hiern = *echinulosa*
Neumannii K.Sch. ex Engl. nomen, incertae sedis
noctiflora Hiern = *Kohautia senegalensis*
obbiadensis Chiov. = *Kohautia obbiadensis*
obtusiloba Hiern = *Kohautia obtusiloba*
24. *ocellata* Brem. 219
oliveriana K.Sch. ex Engl. = *rupicola* var. *psilogyna*
omahekensis K. Krause = *Kohautia omahekensis*
paludosa K. Krause spec. non satis nota cf. *Kohautia amboënsis*
papillosa K.Sch. = *Kohautia lasiocarpa* var. *lasiocarpa*
parva J. Troch. = *caespitosa* var. *caespitosa*
parviflora (Bth.) Oliv. quoad typum *Kohautia virgata*, quoad specimen citatum *Old. taborensis*
37. *patula* Brem. 236
pedunculata K.Sch. et K. Krause = *Kohautia prolixipes*
17. *pellucida* Hiern 212
var. 1. *pellucida* 213
var. 2. *robustior* Brem. 213
peltospermum Hiern = *Sacosperma paniculatum*
pentandra (Schum.) DC non Retz. = *Pentodon pentander*
pentasoides Gillil. in sched. = *Conostomium natalense*
platyphylla K.Sch. = *Kohautia platyphylla*
50. *praetermissa* Brem. 253
procurrens K.Sch. spec. non satis nota cf. *Parapentas silvatica*
prolixipes S. Moore = *Kohautia prolixipes*
Proschii Briq. = *caespitosa* var. *caespitosa*
prostrata P. Lima non (Bl.) O. Ktze = *affinis*
psammophila Chiov. = *Eionitis psammophila*
var. *hirtella* Chiov. = *Eionitis psammophila* var. *hirtella*
26. *pulvinata* (Balf.f.) Vierh. 220
46. *pumila* (L.f.) DC 250
ramosissima Spreng. = *capensis* var. *pleiosepala*
ramosissima Dinter in sched. = *Kohautia aphylla*
retrorsa Boiss. = *Kohautia retrorsa*
rhamnoidea K.Sch. nomen (sphasm. *thamnoidea*?)
rhodesiana S. Moore nondum visa cf. *Kohautia lasiocarpa* var. *subverticillata*
rhynchotheca K.Sch. = *Conostomium longitubum*
rigida (Bth.) Hiern = *Kohautia rigida*
riparia DC = *capensis*
Rogersii S. Moore = *rupicola* var. *psilogyna*
roseiflora K.Sch. et K. Krause = *monanthos*
31. *rosulata* K.Sch. 225
var. 2. *parviflora* Brem. 225
var. 1. *rosulata* 225
rufescens Schinz = *Virectaria multiflora* (Sm.) Brem.
14. *rupicola* (Sond.) O. Ktze 208
var. 3. *hirtula* (Harv. ex Sond.) Brem. 209
var. 4. *parvifolia* Brem. 209
var. 2. *psilogyna* Brem. 209
var. 1. *rupicola* 209
rutshurensis de Wild. = *lancifolia* var. *rutshurensis*
sabulosa DC = *capensis*
saganensis Cuf. = *Kohautia caespitosa* var. *amaniensis*

sarcophylla Chiov. = *Kohautia sacrophylla*
27. *saxifragoides* Chiov. ... 221
Schaeferi K. Krause spec. non satis nota cf. *Kohautia caespitosa* var. *delagoensis* et *K. lasiocarpa*
Schimperi (Presl) T. And. = *Kohautia caespitosa* var. *Schimperi*,
— — — apud Hiern = *Kohautia caespitosa* var. diversae
— — — var. *somalensis* Baker f. nondum visa
Schlechteri Schinz = *rupicola* var. *hirtula*
Schweinfurthii Terr. = *Kohautia caespitosa* var. *caespitosa* (forma monstrosa)
60. *sclerophylla* Brem. ... 268
41. *scopulorum* Bullock ... 239
var. 2. *lanceolata* Brem. ... 240
var. 1. *scopulorum* ... 239
Seineri K. Krause spec. non satis nota cf. *Kohautia virgata*
senegalensis (C. et S.) Hiern = *Kohautia senegalensis*
setifera (DC) K.Sch. = *Kohautia virgata*
setulosa F. C. Wilson = *Kohautia lasiocarpa* var. *subverticillata*
silvatica K.Sch. = *Parapentas silvatica*
22. *sipaneoides* K.Sch. ... 217
var. *asperuloides* Hiern = *hymenophylla*
var. 2. *pubescens* Brem. ... 218
var. 1. *sipaneoides* ... 218
48. *somala* Chiov. ex Brem. ... 251
var. 2. *scabridula* Brem. ... 252
var. 1. *somala* ... 252
sordida K. Krause = *Kohautia lasiocarpa* var. *subverticillata*
spermacocina K.Sch. = *Hedythyrsus spermacocinus*
sphaerocarpa K.Sch. ex. Engl. nomen = *Johnstonii*
sphaerocephala Schinz = *cephalotes*
staëlioides K.Sch. = *Manostachya staëlioides*
— — *forma major* de Wild. = prec.
stellarioides Hiern = *Kohautia stellarioides*
stenosiphon K.Sch. ex S. Moore = *Kohautia stenosiphon*
strumosa (A. Rich.) Hiern = *Kohautia aspera*
subtilis S. Moore = *linearis*
subserrata Palisot de Beauv. in sched. = *corymbosa*
subverticillata K. Sch. = *Kohautia lasiocarpa* var. *subverticillata*
succulenta C. Wright cf. *Pentodon pentander*
38. *taborensis* Brem. ... 237
30. *tardavelina* Hiern ... 224
16. *tenella* (Hochst.) O. Ktze ... 211
tenerrima Dinter in sched. = *herbacea* var. *flaccida*
tenuissima Hiern = *caespitosa* var. *caespitosa*
thamnoidea K.Sch. = *Hedythyrsus thamnoideus*
thymifolia (Presl) O.Ktze = *Kohautia lasiocarpa* var. *thymifolia*
trichosiphon K. Sch. in sched. = *Kohautia longifolia* var. *longifolia*
trichotoma Schinz = *Amphiasma divaricatum*
trinervia Retz in errore apud Hiern et apud K.Sch. = *goreënsis*
Trothae K. Krause spec. non satis nota cf. *Kohautia aspera*
Uhligii K.Sch. et K. Krause = *Wiedemannii* var. *Wiedemannii*
47. *umbellata* L ... 251
7. *verticillata* Bullock ex Brem. ... 199
var. 2. *trichocarpa* Brem. ... 200

var. 1. *verticillata* 200
virgata (Willd.) DC = *Kohautia virgata*
violacea K.Sch. = *monanthos*
wauensis Schweinf. ex Hiern = *Thecorchus wauensis*
Welwitschii Hiern = *Kohautia brachyloba*
42. *Wiedemannii* K.Sch. 240
var. 2. *glabricaulis* Brem. 241
var. 1. *Wiedemannii* 241
xerophila Schinz = *Kohautia lasiocarpa* var. *xerophila*
zanguebariae Lour. *Kohautia* spec. non satis nota cf. *obtusiloba*
zoutpansbergensis Brem. = *Conostomium zoutpansbergense*

Otomeria

heterophylla K.Sch. spec. non satis nota cf. *Conostomium quadrangulare*

Parapentas

3. *gabonica* Brem. 54
2. *parviflora* Brem. 53
1. *silvatica* (K.Sch.) Brem. 52

Peltospermum

paniculatum Bth. = *Sacosperma paniculatum*

Pentanopsis

1. *fragans* Rendle 139

Pentas

modesta Baker = *Kohautia coccinea*
parviflora Bth. = *Sacosperma parviflorum*
quadrangularis Rendle = *Conostomium quadrangulare*
?*Thonningii* Walp. = *Pentodon pentander* var. *pentander*

Pentodon

abyssinicus Hochst. = *pentander* var. *pentander*
decumbens Hochst. = *pentander* var. *minor*
Halei (T. et G.) A. Gray cf. *pentander*
2. *laurentioides* Chiov. 180
1. *pentander* (Schum.) Vatke 176
var. 2. *minor* Brem. 179
var. 1. *pentander* 177

Sacosperma

1. *paniculatum* (Bth.) G. Tayl. 45
var. 1. *paniculatum* 45
var. 2. *pubescens* Brem. 46
2. *parviflorum* (Bth.) G. Tayl. 46

Stephanococcus

1. *crepinianus* (K.Sch.) Brem. 143

Tapinopentas

1. *cameronica* Brem..... 49

Thecorchus

1. *wauensis* (Schweinf. ex Hiern) Brem..... 55
var. 2. *scabrida* Brem..... 55
var. 1. *wauensis* 55

Theyodis

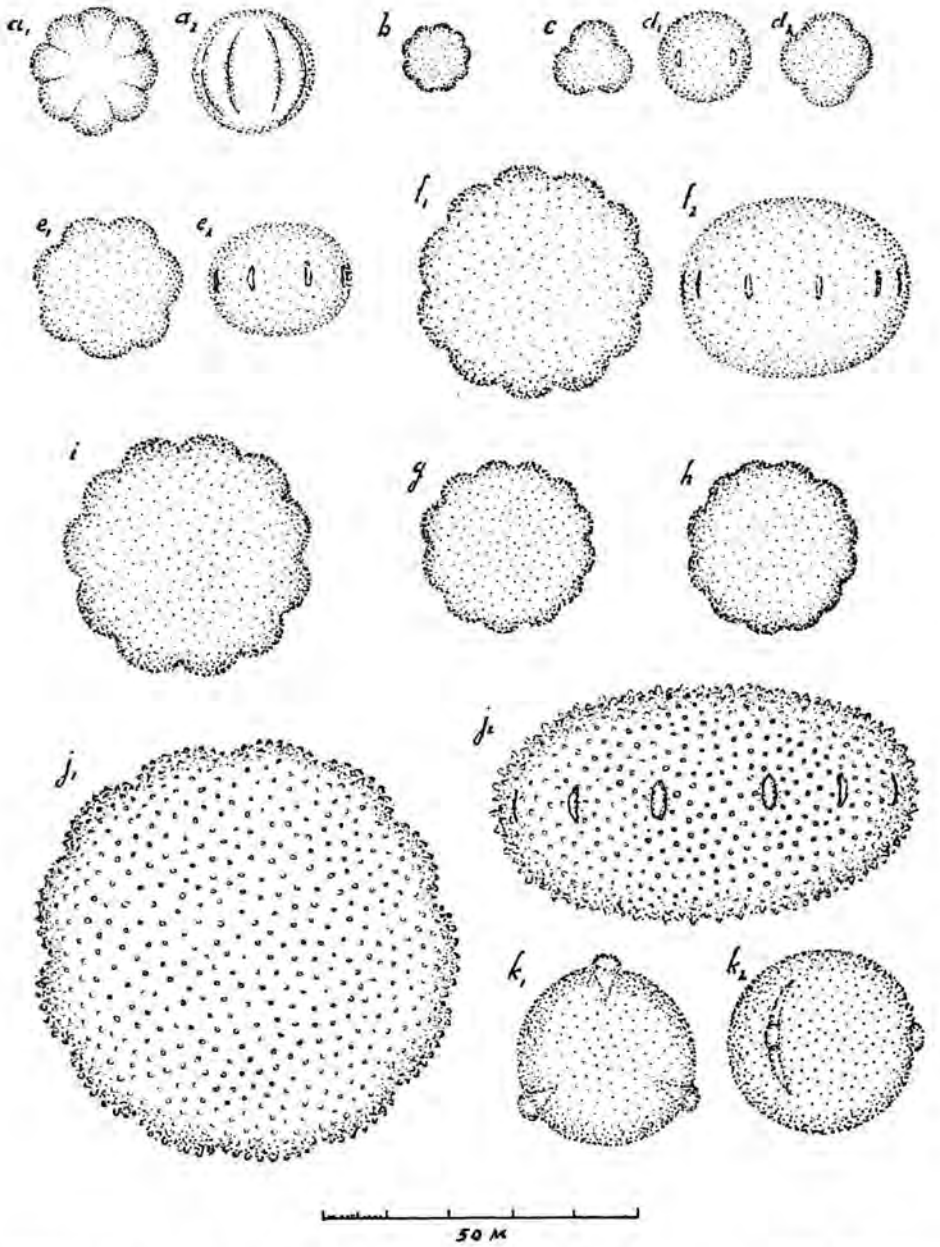
octodon A. Rich = *Oldenlandia capensis* var. *pleiosepala*

Virecta

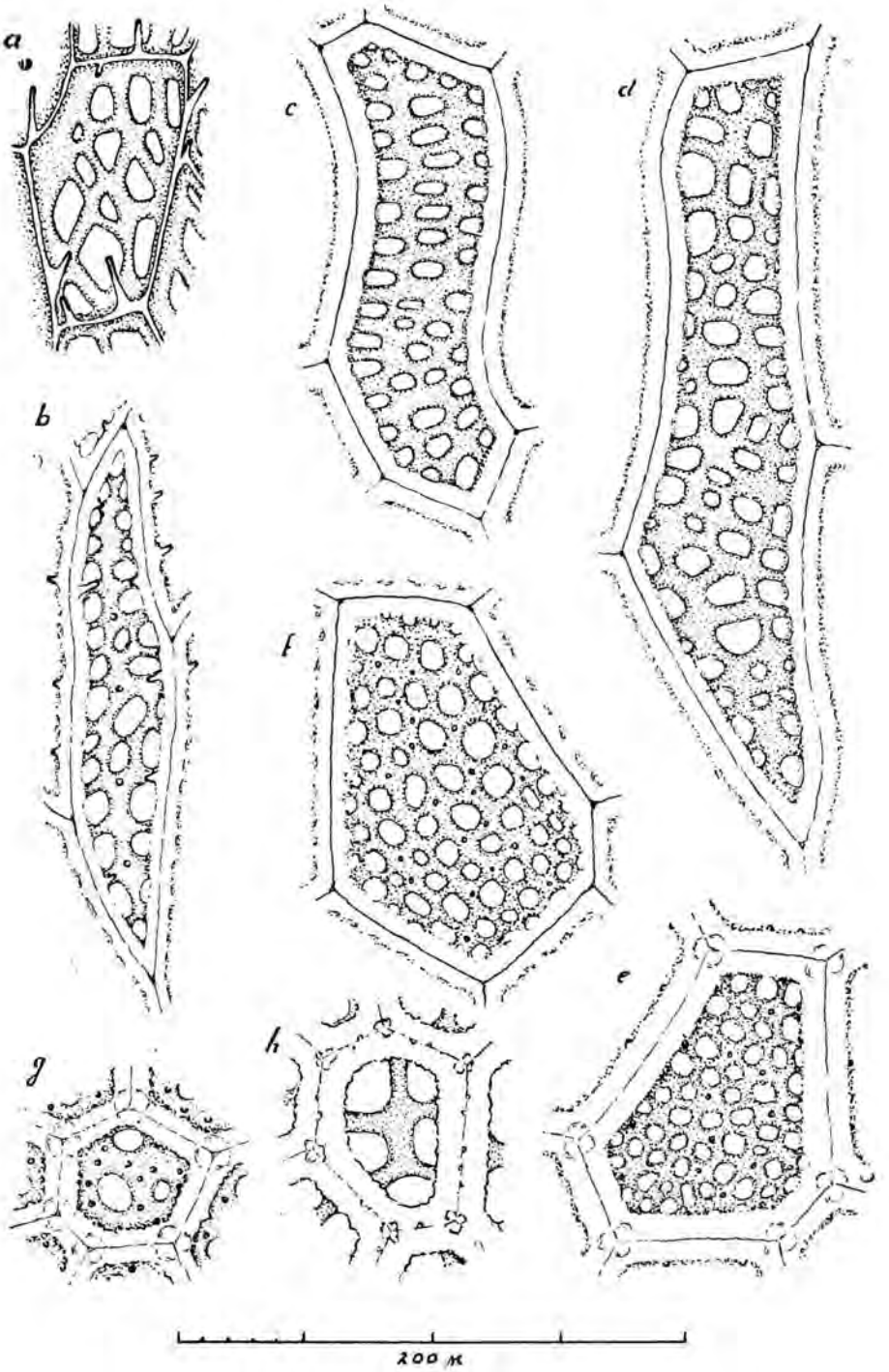
?*obscura* K.Sch. = *Parapentas silvatica*

Virectaria

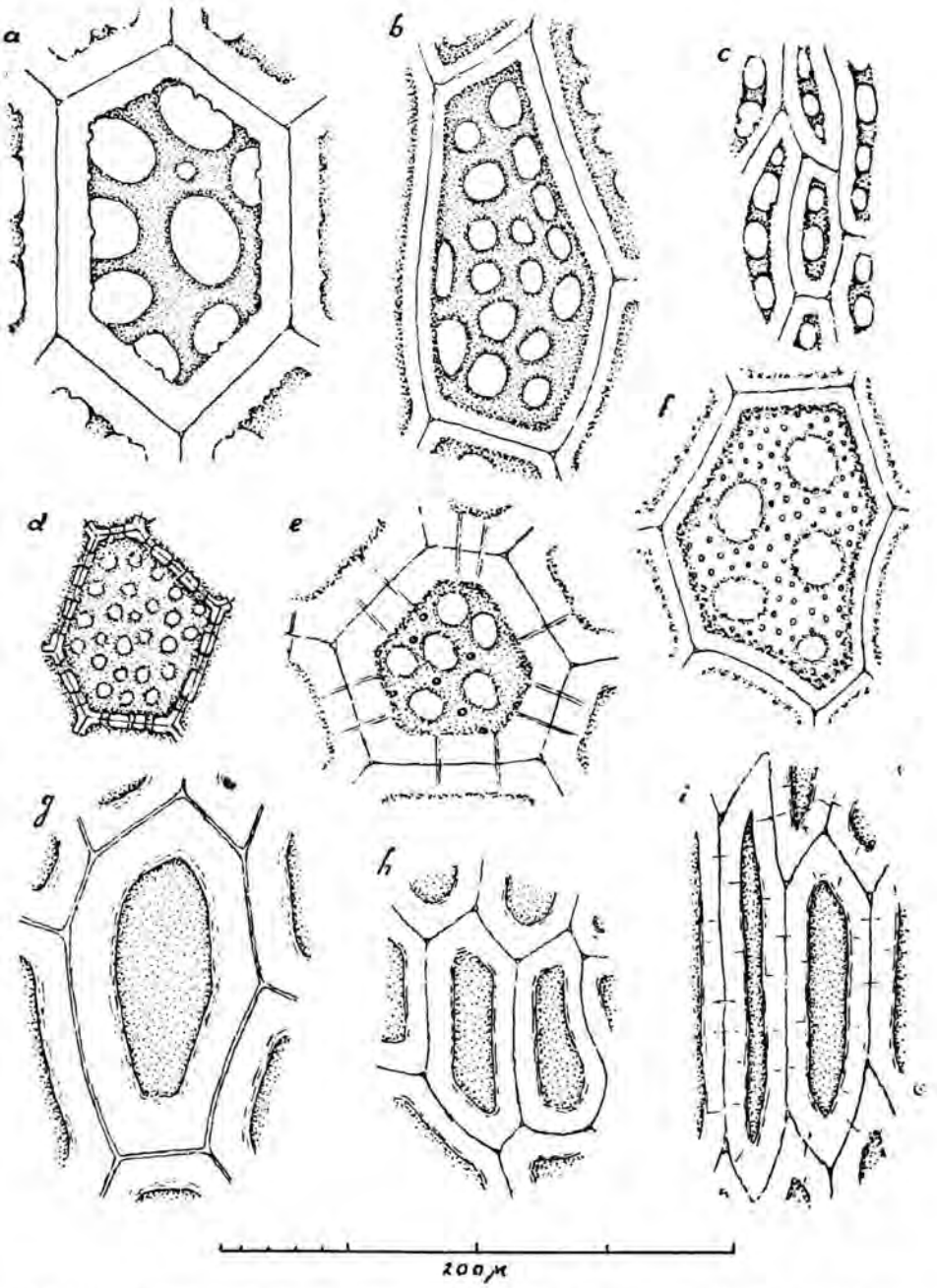
enumeratio specierum cf p. 21.



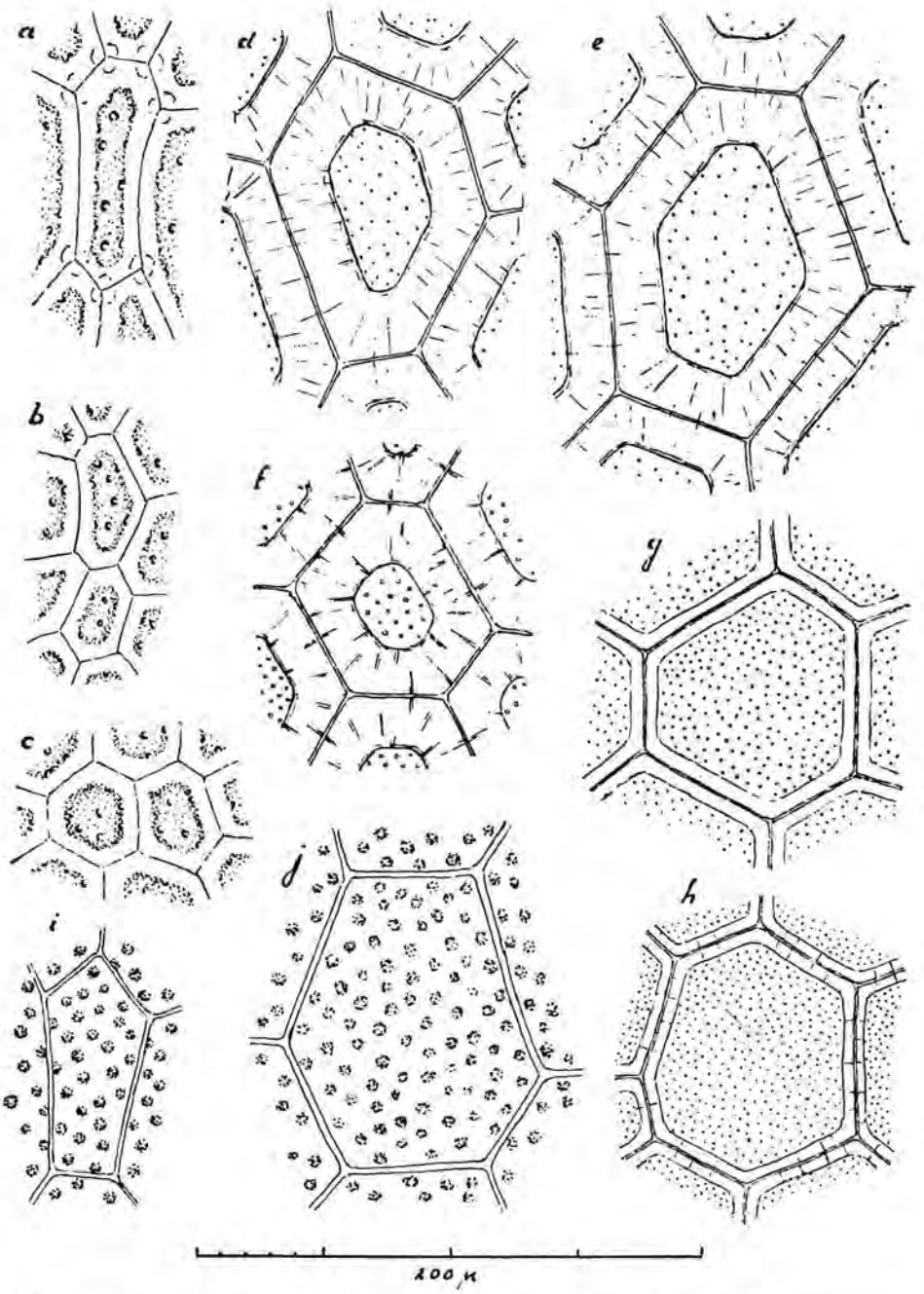
Tab. I. Pollen grains of: a. *Galium mollugo* L; b. *Spermacoce confusa* Rendle; c. *Borreria ocimoides* (Burm.f.) DC var. *bisepala* Brem.; d. dito var. *ocimoides*; e. *B. suaveolens* G. F. W. Mey.; f. *B. xanthophylla* Brem.; g. *Mitracarpus discolor* Miq.; h. *Staëlia lanigera* (DC) K. Sch.; i. *Diodia hyssopifolia* (H.B.K.) C. et S.; j. *Richardia grandiflora* (C. et S.) Steud.; k. *Perama dichotoma* Poep et Endl.



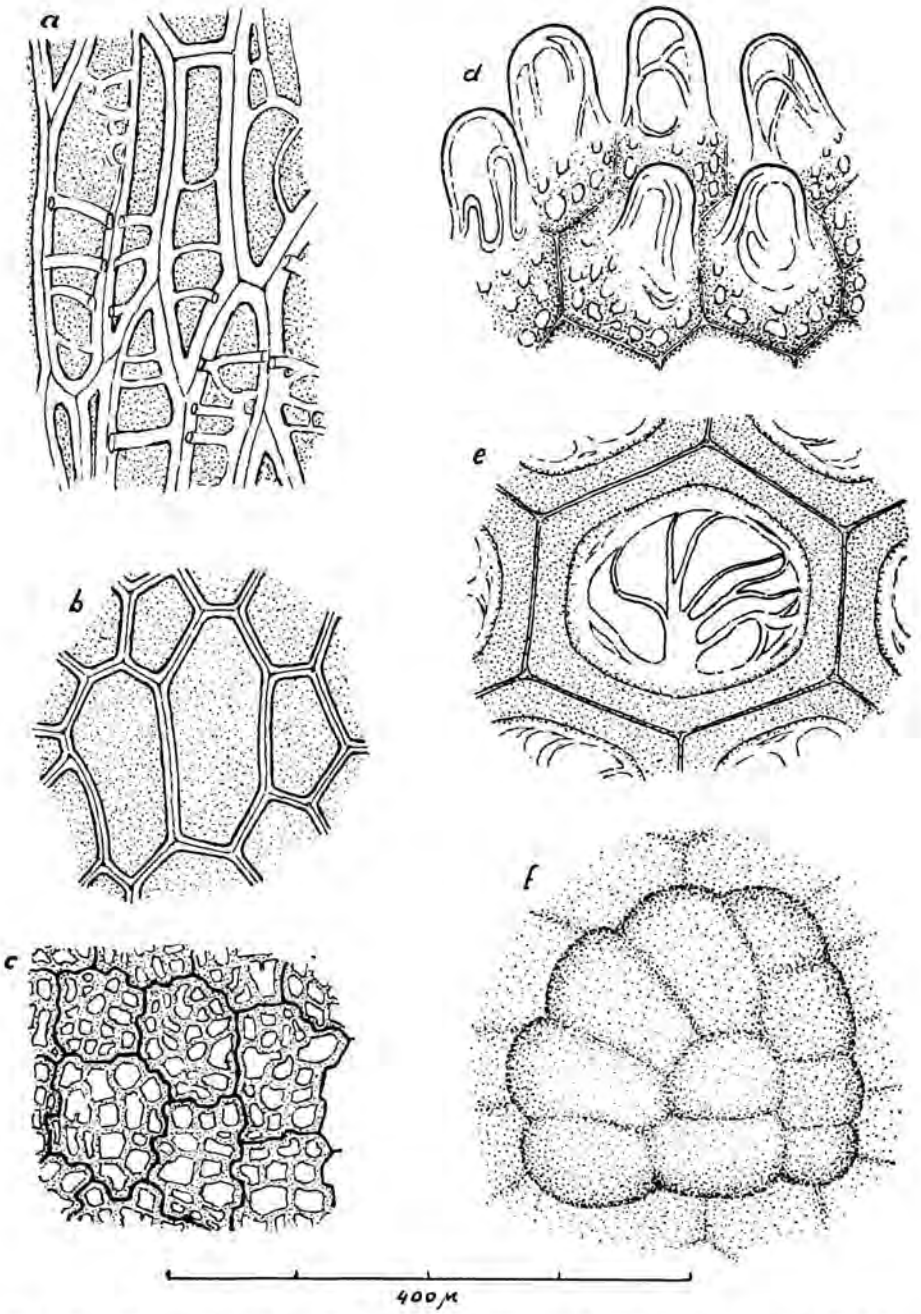
Tab. II. Testa cells of: a. *Cinchona cordifolia* Mut.; b. *Bathysa Nicholsonii* K.Sch.; c. *Eleagia utilis* Wedd.; d. *Chimarrhis turbinata* DC; e. *Limnosipanea Schomburgkii* Hook.f.; f. *Neurocalyx* (sect. *Thyrsoideae*) spec. indescr. (J. et M. S. Clemens 20949 BZ); g. *Sipanea hispida* Bth. ex Wernham; h. *S. biflora* (L.f.) C. et S.



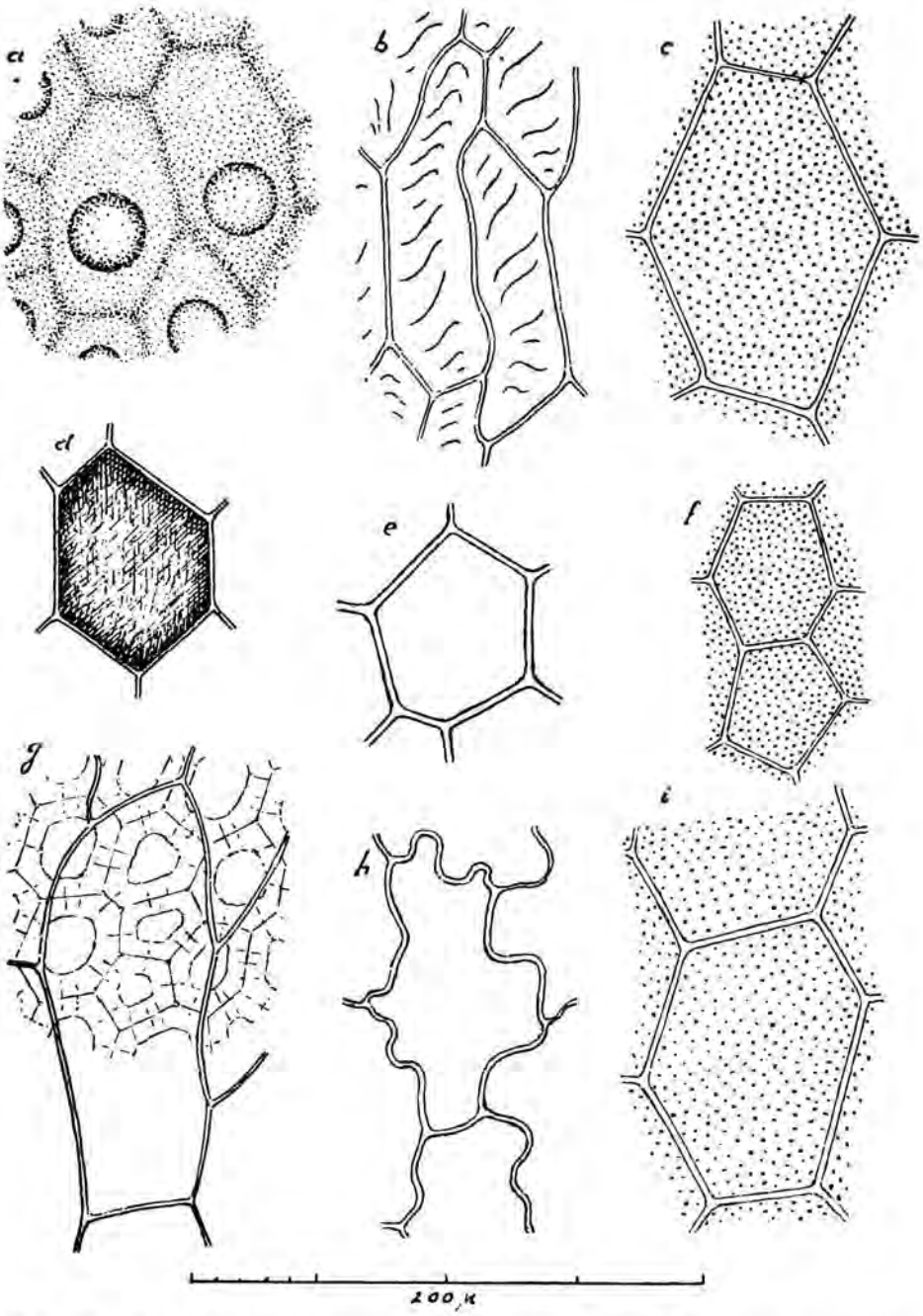
Tab. III. Testa cells of: a. *Rondeletia correifolia* Griseb.; b. *R. odorata* Jacq.; c. *Sabicea aspera* Aubl.; d. *Gonzalagunia dioica* C. et S.; e. *Isertia coccinea* (Aubl.) Gmel.; f. *Greenia* spec. indescr. (Endert 2766 BZ); g. *Coccocypselum guianense* (Aubl.) K. Sch.; h. *Lucinaea montana* Korth.; i. *Schradera polycephala* DC.



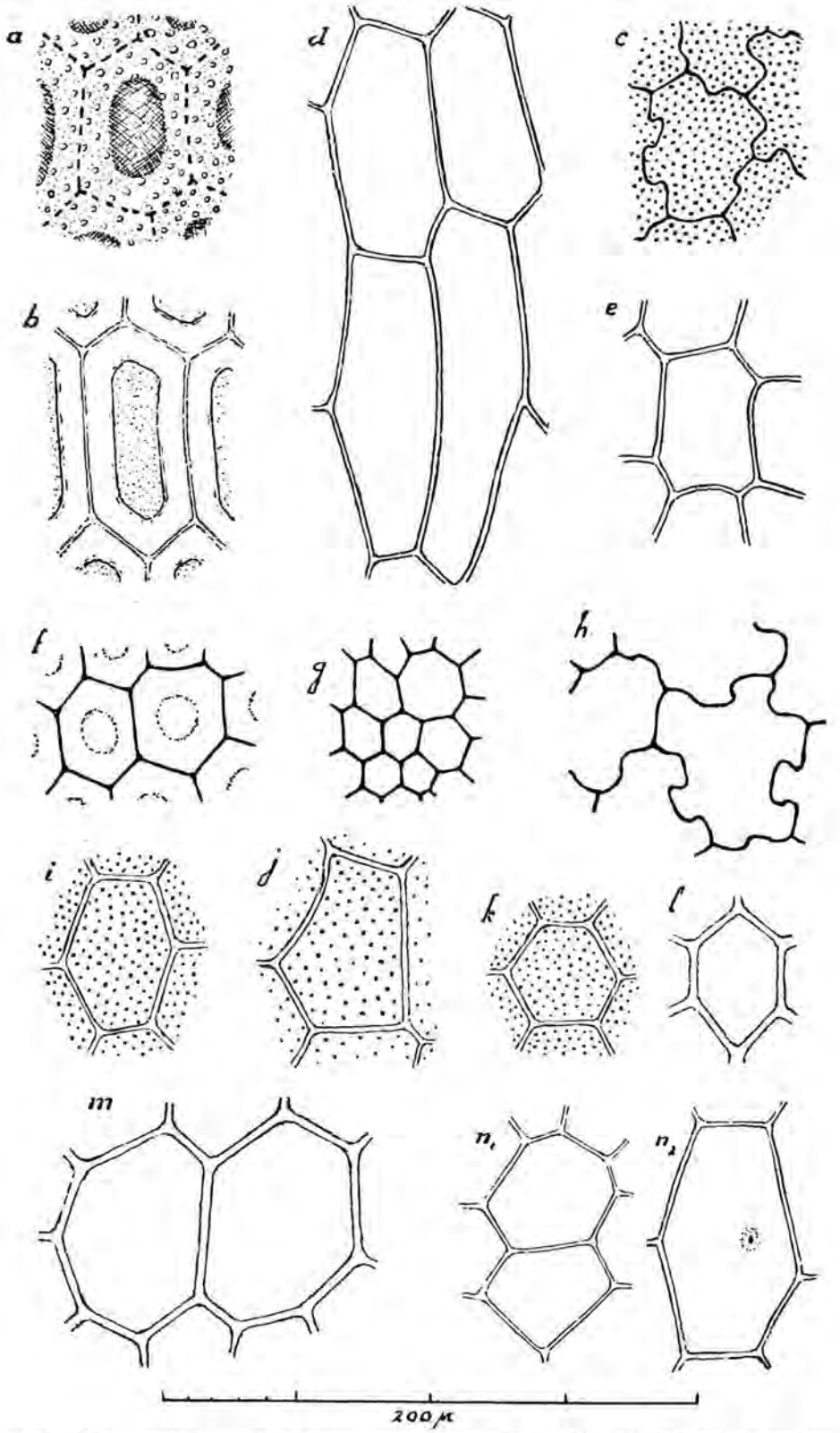
Tab. IV. Testa cells of: a. *Virectaria multiflora* (Sm.) Brem.; b. *Spiradiclis caespitosa* Bl.; c. *Ophiorrhiza nerterifolia* Brem.; d. *Maschalocorymbus corymbosus* (Bl.) Brem.; e. *Pleiocarpidia lanaensis* Merr.; f. *Pamplethantha viridiflora* (Schweinf. ex Hiern) Brem.; g. *Urophyllum arboreum* (Bl.) Korth.; h. *Pauridiantha pyramidata* (K. Krause) Brem.; i. *Pomazota scabiosiflora* Brem.; j. *Lerchea longicauda* L.



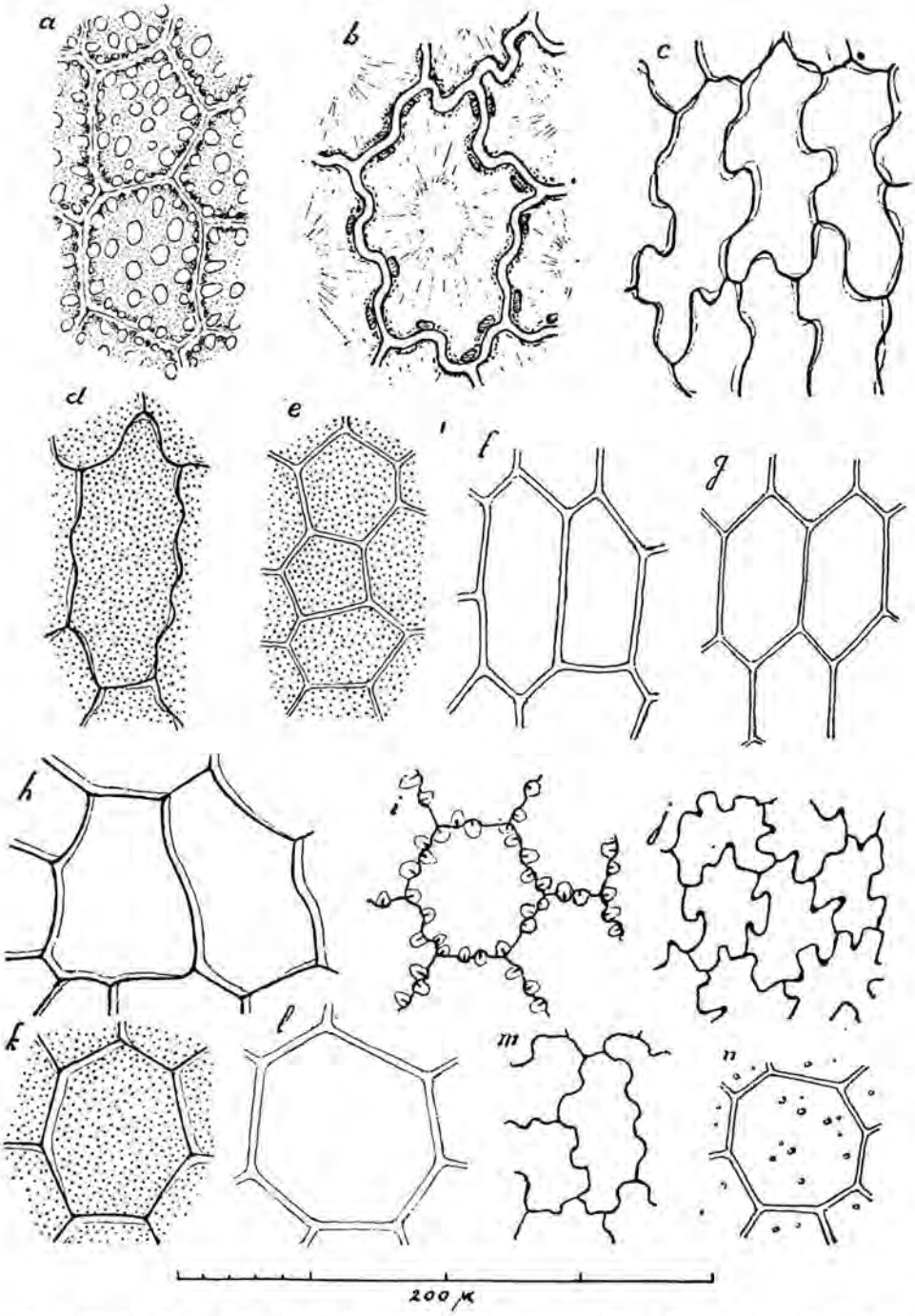
Tab. V. Testa cells of: a. *Hillia tubiflora* Cham.; b. *Sickingia tinctoria* K. Sch.; c. *Henriquezia verticillata* Bth.; d. *Platycarpum orinocense* H.B.K.; e. *Gleasonia uaupensis* Ducke; f. *G. macrocalyx* Ducke.



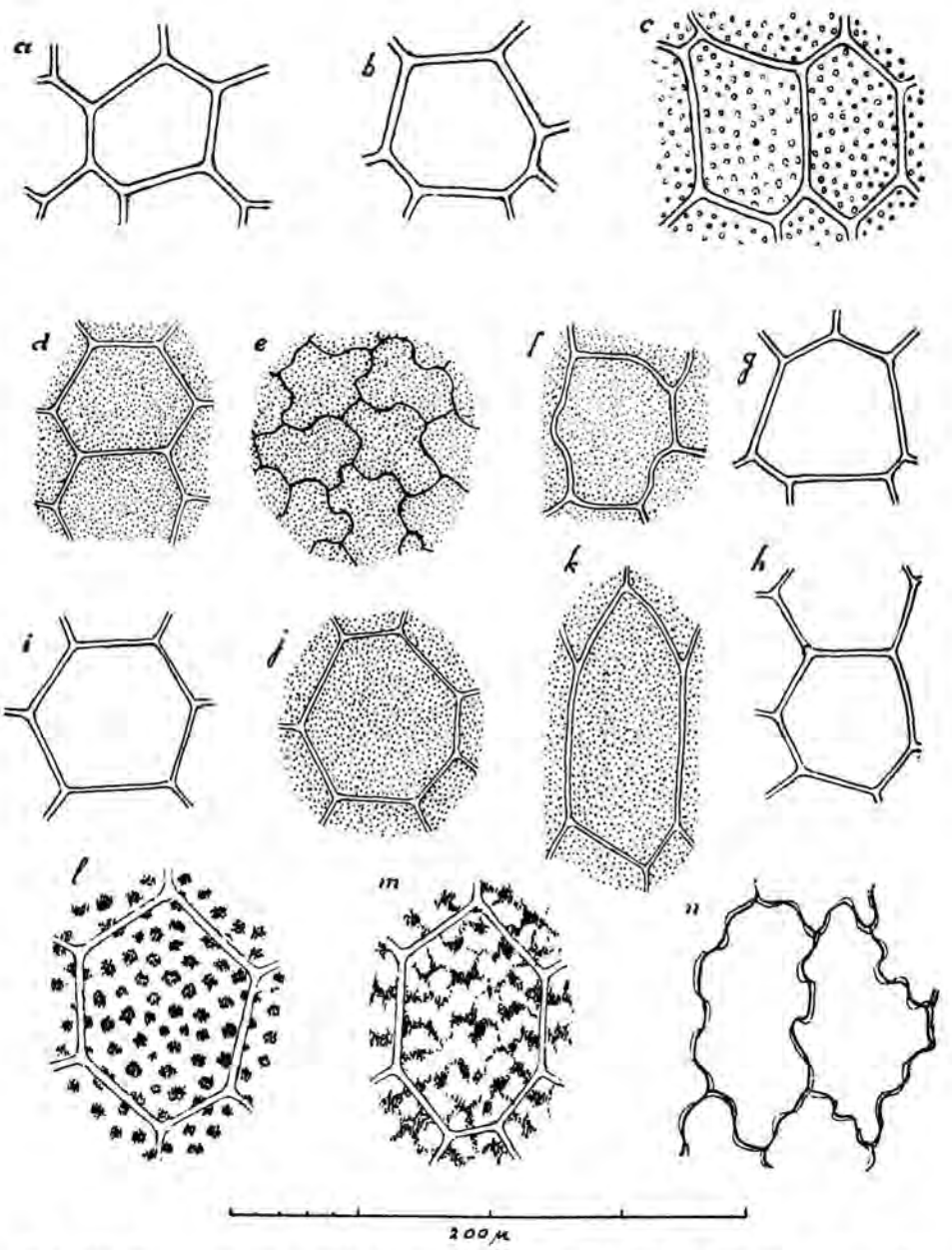
Tab. VI. Testa cells of: a. *Argostemma boragineum* Bl.; b. *Manettia coccinea* Aubl.; c. *Hamelia axillaris* Sw.; d. *Hindsia longiflora* Bth. (filled with a dark-coloured gum); e. *Mycetia cauliflora* (Reinw.) Miq.; f. *Xanthophyllum* spec. indescr. (Amdjah 329 BZ); g. *Houstonia coerulea* L.; h. *Otomeria graciliflora* K. Sch. ex de Wild.; i. *Anotis hirsuta* (L.f.) Miq. ex Boerl.



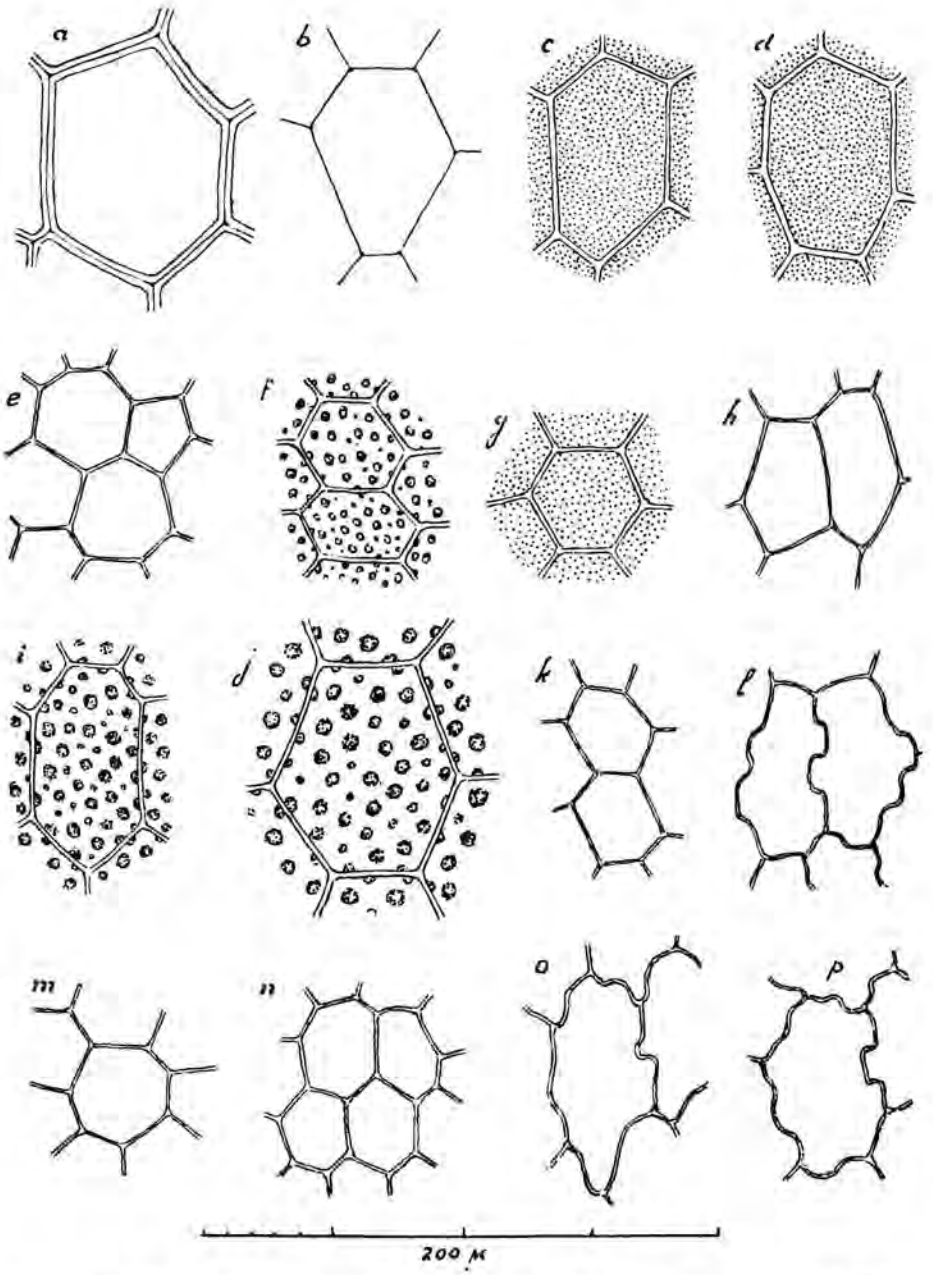
Tab. VII. Testa cells of: a. *Sarcosperma paniculatum* (Bth.) G. Taylor; b. *Bertiera breviflora* Hiern; c. *Parapentas gabonica* Brem.; d. *Thecorchus wauensis* (Schweinf. ex Hiern) Brem.; e. *Kohautia obtusiloba* (Hiern) Brem.; f. *K. aspera* (Heyne ex Roth) Brem.; g. *K. raphidophylla* Brem.; h. *K. virgata* (Willd.) Brem.; i. *Conostomium longitubum* (Beck) Cuf.; j. *C. quadrangulare* (Rendle) Cuf.; k. *C. natalense* (Hochst.) Brem.; l. *Pentanopsis fragrans* Rendle; m. *Exallage auricularia* (L) Brem.; n. *Stephanococcus crepinianus* (K. Sch.) Brem. (two cells from the ventral and one from the dorsal side of the seed).



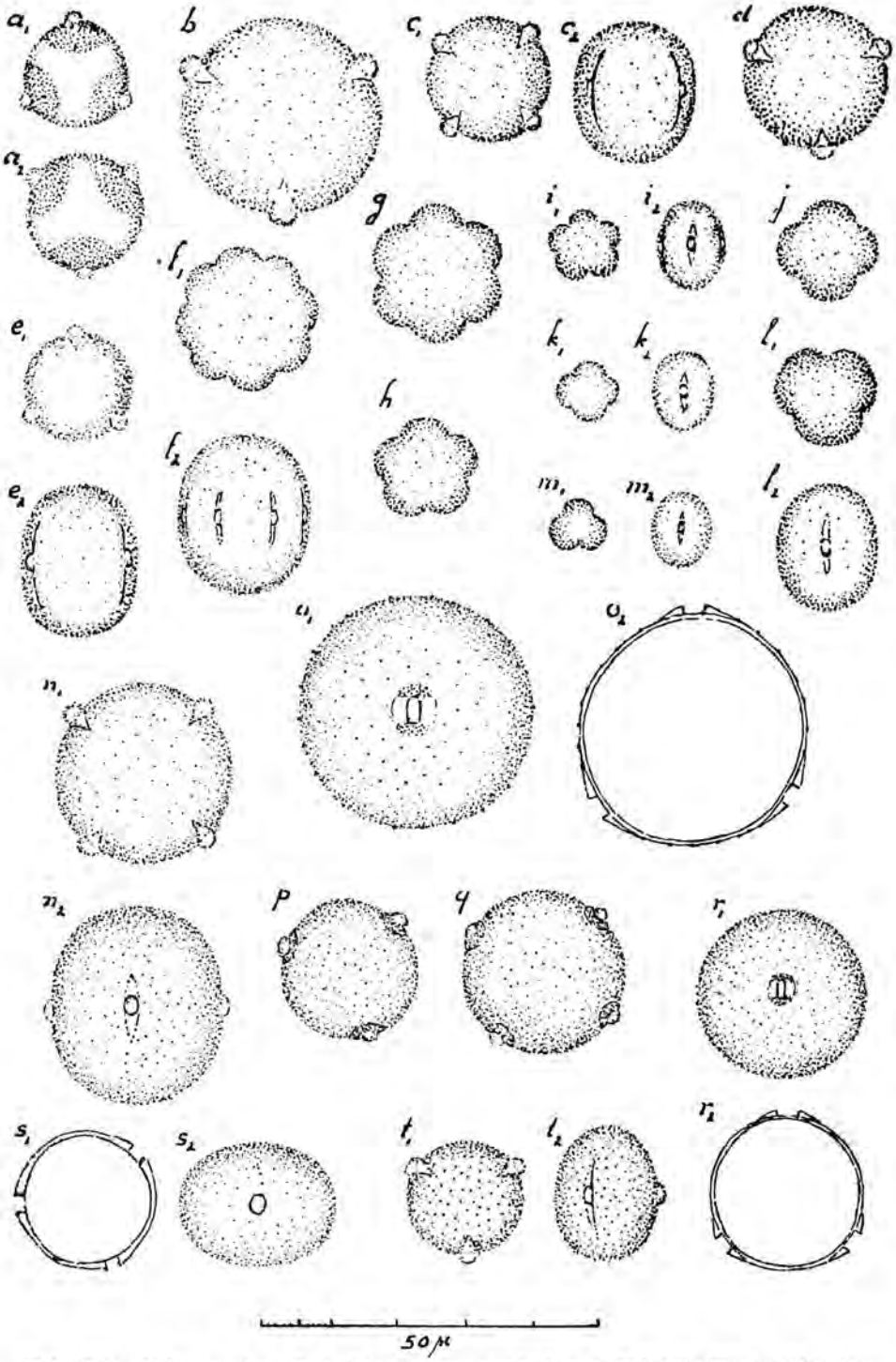
Tab. VIII. Testa cells of: a. *Manostachya staëlioides* (K. Sch.) Brem.; b. *Diotocranus Lebrunii* Brem.; c. *Hedythyrsus spermacocinus* (K. Sch.) Brem.; d. *Agathisanthemum chlorophyllum* (Hochst.) Brem.; e. *A. quadrangulare* Brem.; f. *Dibrachionostylus Kaessneri* (S. Moore) Brem.; g. *Eionitis Chiovendii* Brem.; h. *Amphiasma benguellense* (Hiern) Brem.; i. *Pentodon pentander* (Schum.) Vatke; j. *P. laurentioides* Chiov.; k. *Lelya osteocarpa* Brem.; l. *Oldenlandia Balfourii* Brem.; m. *O. Sieberi* Baker; n. *O. cryptocarpa* Chiov.



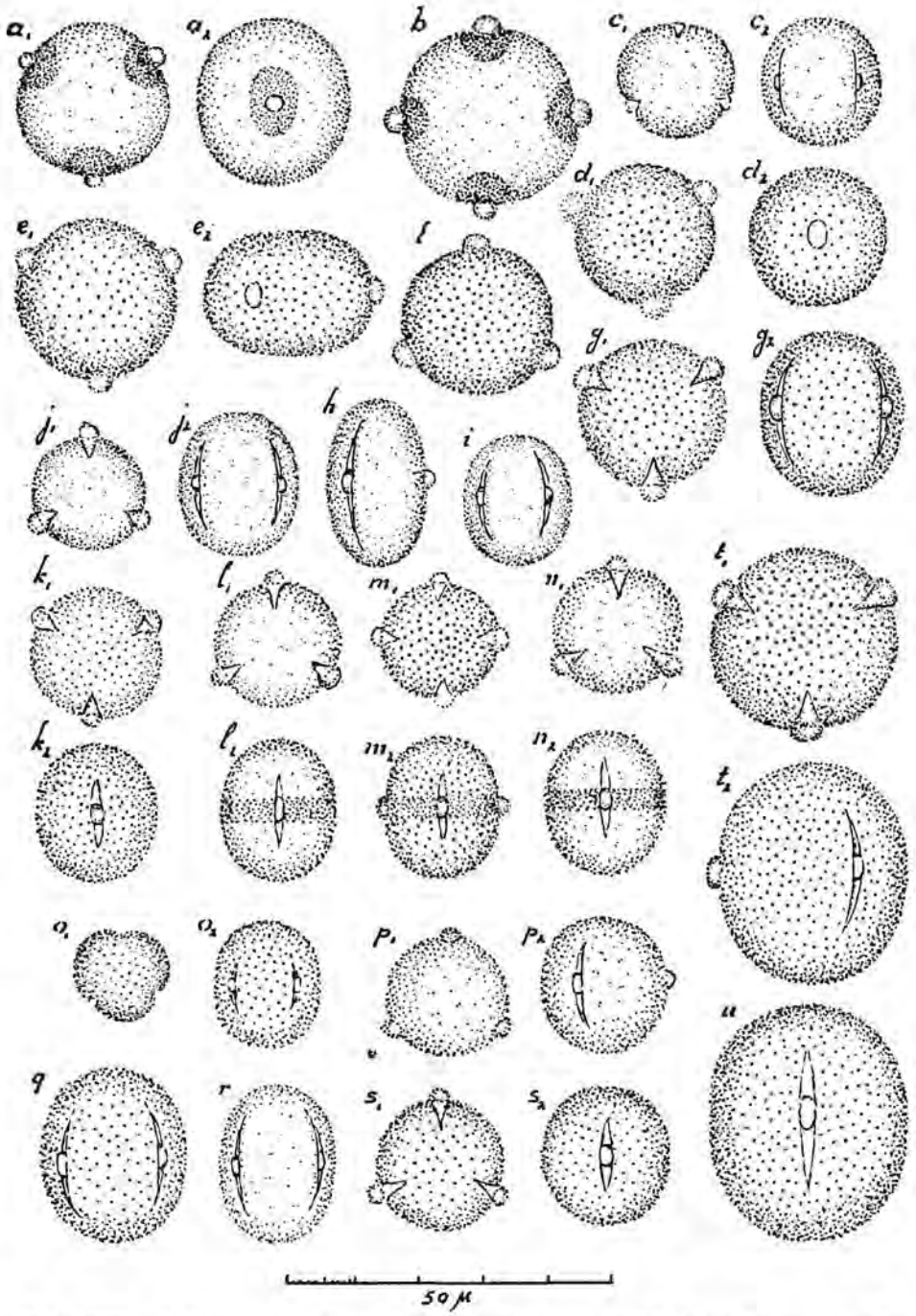
Tab. IX. Testa cells of: a. *Oldenlandia pulvinata* (Balf.f.) Vierh.; b. *O. saxifragoides* Chiov.; c. *O. tardavellina* Hiern; d. *O. goreënsis* (DC) Summerh.; e. *O. verticillata* Bullock ex Brem.; f. *O. cephalotes* (Sond.) O.Ktze; g. *O. monanthos* (Hochst. ex A. Rich.) Hiern; h. *O. Hockii* de Wild.; i. *O. geophila* Brem.; j. *O. Friesiorum* Brem.; k. *O. Johnstonii* (Oliv.) K. Sch.; l. *O. rupicola* (Sond.) O. Ktze; m. *O. Greenwayi* Brem.; n. *O. pellucida* Hiern.



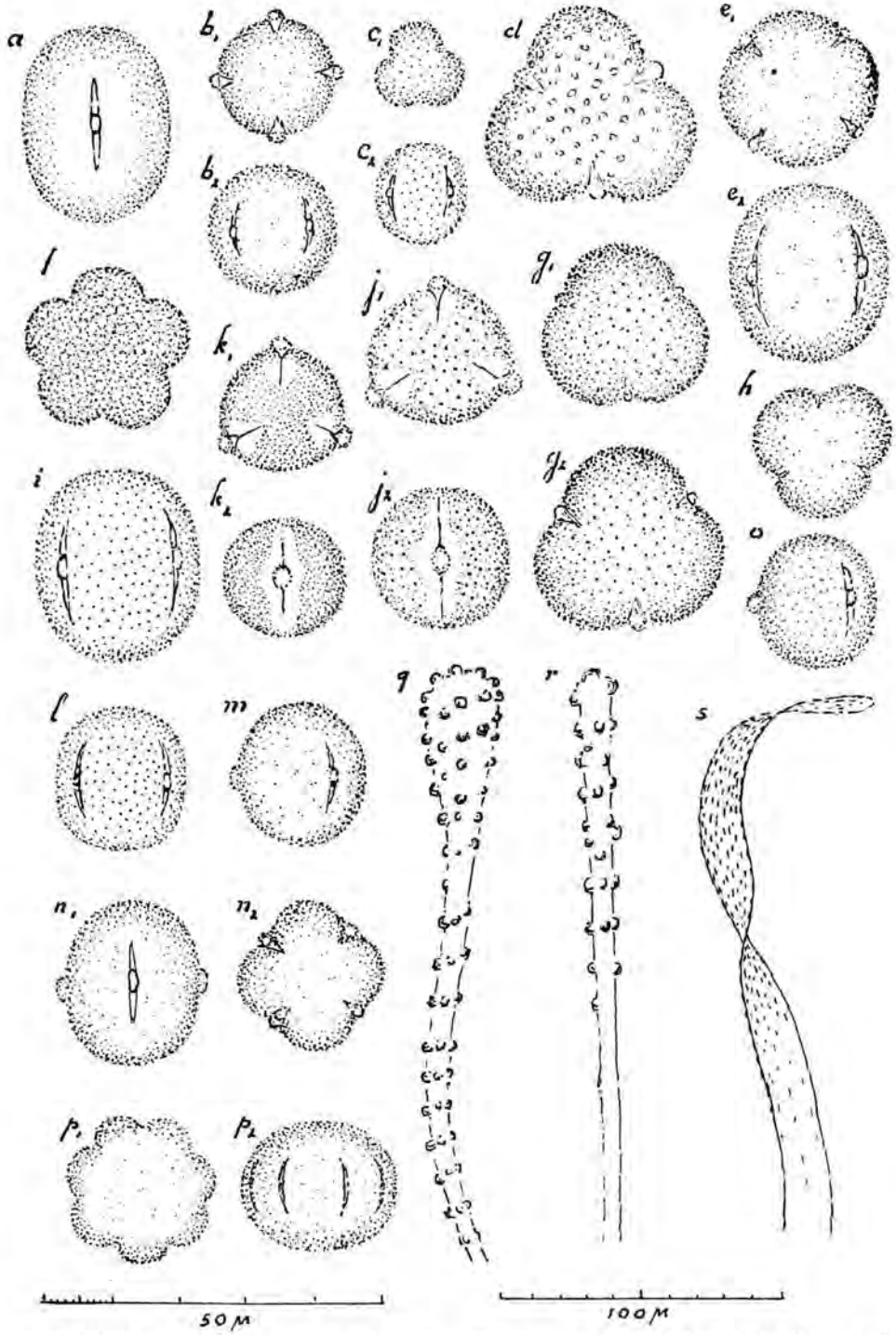
Tab. X. Testa cells of: a. *Oldenlandia rosulata* K. Sch.; b. *O. affinis* (R. et S.) DC; c. *O. lancifolia* (Schum.) DC; d. *O. diffusa* (Willd.) Roxb.; e. *O. flosculosa* Hiern; f. *O. microcarpa* Brem.; g. *O. scopulorum* Bullock; h. *O. Wiedemannii* K. Sch.; i. *O. herbacea* (L) Roxb. var. *herbacea*; j. dito var. *Holstii* (K. Sch.) Brem.; k. *O. somala* Chiov. ex Brem.; l. *O. corymbosa* L; m. *O. linearis* DC; n. *O. fastigiata* Brem.; o. *O. caespitosa* Hiern; p. *O. capensis* L.f.



Tab. XI. Pollen grains of: a. *Sarcosperma paniculatum* (Bth.) G. Taylor (dolicho- and brachystylous form); b. *Chamaepentas Greenwayi* Brem.; c. *Tapinopentas cameronica* Brem.; d. *Parapentas silvatica* (K. Sch.) Brem.; e. *Thecorchus wauensis* (Schweinf. ex Hiern) Brem.; f. *Kohautia longifolia* Klotzsch var. *vestita* Brem.; g. dito var. *longifolia*; h. *K. obtusiloba* (Hiern) Brem.; i. *K. socotrana* Brem.; j. *K. virgata* (Willd.) Brem.; k. *K. grandiflora* DC; l. *K. omahekensis* (K. Krause) Brem.; m. *K. raphidophylla* Brem.; n. *Pentanopsis fragrans* Rendle; o. *Conostomium quadrangulare* (Rendle) Cuf.; p. *C. longitubum* (Beck) Cuf.; q. *C. brevirostrum* Brem.; r. *C. natalense* (Hochst.) Brem.; s. *Exallage auricularia* (L) Brem.; t. *Stephanococcus crepinianus* (K. Sch.) Brem.



Tab. XII. Pollen grains of: a. *Manostachya juncoides* (K. Sch.) Brem.; b. *M. staelioides* (K. Sch.) Brem.; c. *Diotocranus Lebrunii* Brem.; d. *Hedythyrsus spermacocinus* (K. Sch.) Brem.; e. *Agathisanthemum chlorophyllum* (Hochst.) Brem.; f. *Dibrachionostylus Kaessneri* (S. Moore) Brem.; g. *Eionitis Chiovendii* Brem.; h. *Amphiasma benguellense* (Hiern) Brem.; i. *A. luzuloides* (K. Sch.) Brem.; j. *Pentodon pentander* (Schum.) Vatke; k. *Lelya osteocarpa* Brem.; l. *Oldenlandia Balfourii* Brem.; m. *O. anagallis* Brem.; n. *O. goreënsis* (DC) Summerh.; o. *O. angolensis* K. Sch.; p. *O. monanthos* (Hochst. ex A. Rich.) Hiern; q. *O. Friesiorum* Brem.; r. *O. geophila* Brem.; s. *O. pellucida* Hiern; t. *O. rupicola* (Sond.) O. Ktze; u. *O. Greenwayi* Brem.



Tab. XIII. Pollen grains of: a. *Oldenlandia pulvinata* (Balf.f.) Vierh.; b. *O. saxifragoides* Chiov.; c. *O. tardavelina* Hiern.; d. *O. gregaria* K. Sch.; e. *O. rosulata* K. Sch.; f. *O. microcalyx* K. Sch.; g. *O. affinis* (R. et S.) DC (dolicho- and brachystylous form); h. *O. lancifolia* (Schum.) DC; i. *O. flosculosa* Hiern; j. *O. scopulorum* Bullock; k. *O. Wiedemannii* K. Sch.; l. *O. herbacea* (L) Roxb.; m. *O. corymbosa* L; n. *O. caespitosa* Hiern; o. *O. capensis* L.f.; p. "*O.*" *callitrichoides* Griseb.
Hairs from the corolla throat of: q. *O. pulvinata* (Balf.f.) Vierh.; r. *O. ocellata* Brem.; s. *O. saxifragoides* Chiov.