

MATERIALS FOR A MONOGRAPH  
OF THE STROBILANTHINAE  
(ACANTHACEAE)

BY

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## INTRODUCTION.

In its present delimitation *Strobilanthes* Bl. is one of those large genera that betray their artificialness by an uncommonly wide range of variability and by vague and disputable boundary lines. A reinvestigation of its species and their nearest allies therefore appeared desirable.

The principal difficulty in the delimitation of *Strobilanthes* as defined by ANDERSON (in Journ. Linn. Soc. IX, p. 462, 1867), BENTHAM (in BENTH. et HOOK.F., Gen. Pl. II, 2, p. 1065, 1876), CLARKE (in HOOK.F., Fl. Brit. Ind. IV, p. 426, 1885) and LINDAU (in ENGL. u. PRANTL, Nat. Pflanzenfam. IV, 3 b, p. 300, 1895) lies in the close resemblance between some of its constituents and species which the same authors referred to *Hemigraphis* Nees and *Aechmanthera* Nees. The difference between *Strobilanthes* and *Hemigraphis* (the near affinity with *Aechmanthera* has apparently always been overlooked) was sought in the number of ovules: species with three or more ovules in each of the ovary cells were referred to *Hemigraphis*, the others to *Strobilanthes*. KURZ (in Journ. As. Soc. Bengal XL, p. 74, 1871) already pointed out that in this way nearly related species are separated from each other: *Strobilanthes flava* KURZ<sup>1)</sup> e.g. closely resembles *Str. crispa* (L.) Bl. and some other yellow-flowered species, but as it has not two but four ovules in each of its ovary cells it would have to be referred to *Hemigraphis*, which it does not resemble at all. CLARKE apparently was not impressed with KURZ's remarks, for abiding by ANDERSON's original conception he l.c. actually transferred *Strobilanthes flava* to *Hemigraphis*, his only concession being the creation of a new section within that genus. As he referred at the same time two species, *Strobilanthes glaucescens* Nees and *Ruellia quadrifaria* Nees, whose near affinity with *Strobilanthes flava* can hardly be overlooked, to another section, this concession appears somewhat futile. HALLIER F. (in Abh. d. Kais. Leop.-Carol. Deutschen Akad. d. Naturf. LXX, p. 197, 1897) rightly criticized CLARKE's attitude, but the way in which he himself tried to solve the difficulty was not satisfactory either: his proposal was to divide the white- and violet-flowered species over the two genera according to the number of ovules, but to refer the yellow-flowered species without exception to *Strobilanthes*. For the construction of a key this might be a useful device, but from a taxonomic point of view it is worthless, for with regard to the true nature of the difference between the two genera it leaves us completely in the dark: the latter obviously lies neither in the number of ovules nor in the colour of the corolla. However, it is not to be expected that such a general difference will ever be detected, for the genus *Strobilanthes* is in its present delimitation not a natural unit but an artificial conglomerate, and as some of the genera in which it is to be split, show a greater resemblance to *Hemigraphis* than to some of those with which they are now united, it is certainly no wonder that they do not all differ from that genus in the same way. One of these new genera comprises the yellow-flowered species whose position formed the subject of the controversy between KURZ, CLARKE and HALLIER: on account of the inside densely sericeous calyx, a character not found in any other segregate of the genus *Strobilanthes*, I will call it *Sericocalyx*.

<sup>1)</sup> As the name *Strobilanthes* was treated by its author as feminine and as there was apparently no good reason for the change of gender effected by NEES, all specific epithets used by the latter and by subsequent authors are here in accordance with art. 72 of the international rules of nomenclature (ed. 3) brought in the feminine form.

The genus *Strobilanthes* has not always been taken in the wide sense in which it was understood by ANDERSON and later botanists. C. G. NEES VON ESENBECK, to whom we owe the first comprehensive treatment of the Indian *Acanthaceae* (in WALLICH's *Plantae Asiaticae Rariores* III, pp. 70—117, 1832) and a monograph of the whole family (in DE CANDOLLE's *Prodromus* XI, pp. 46—519 and 720—732, 1847), had assumed an entirely different attitude towards these plants, for besides *Strobilanthes* Bl. he had recognized a whole series of other genera: *Aechmanthera*, *Hemigraphis*, *Stenosiphonium*, *Phlebo-phyllum*, *Endopogon*, *Leptacanthus*, *Mackenziaea*, *Buteraea*, *Adenacanthus*, *Apolepsis*, *Goldfussia* and *Triaenacanthus*. To these should be added *Ruellia* sensu Nees, for this genus consists in NEES's delimitation almost entirely of species which are now referred to *Hemigraphis*. The latter was separated from *Ruellia* on account of two mistakes: the corolla was supposed to be resupinate, and the anthers to be monothealous. ANDERSON recognized that these statements were erroneous, and that NEES's *Hemigraphis* and *Ruellia* species were in reality congeneric. However, as *Ruellia* in NEES's delimitation did not comprise LINNÉ's type species, its name had to be changed, and so it came about that the genus is now known under the rather unsuitable name *Hemigraphis*, in which survives the remembrance of a mistake made by NEES, who saw in the hair bundles beneath the anthers of the longer stamens sterilized parts of the anthers themselves. The affinity of *Mackenziaea* was misunderstood by NEES, who referred it to his tribe *Gendarusseae*, but why he put it in this group is not clear, for the stamens are correctly described as inserted at the top of the tube, and not towards its base as they ought to have been if the genus had belonged to the *Gendarusseae*. The description of the anthers is wrong: they are not monothealous, but bithealous. The plant on which the genus was founded, moreover, was not collected in America, as stated by NEES, but in Ceylon, i.e. inside the area to which this group of genera is confined. *Apolepsis* was based on a plant which BLUME erroneously had referred to *Lepidagathis* Willd. NEES recognized that it was generically distinct from the species belonging to the latter, but left it in their vicinity: in reality it is congeneric with his own *Adenacanthus acuminatus*. Shortly after the appearance of NEES's monograph two more genera were added to this group, namely *Gutzlaffia* Hance (in *Kew Journ. of Bot.* I, p. 142, 1849) and *Didyplosandra* R. Wight (*l.c.* Pl. Ind. Or. IV, Tab. 1515/6, 1849); the latter, however, was not properly described, and rejected by the author himself in the same sentence in which it was proposed.

The first three of the genera introduced by NEES: *Aechmanthera*, *Hemigraphis* and *Stenosiphonium*, are the only ones that have found general recognition; it are the genera in which the ovary cells are provided with more than two ovules. With regard to *Aechmanthera* and *Hemigraphis* this favourable disposition is all the more remarkable as the difference between these two genera is but slight: it is almost entirely confined to the shape of the anthers, which in *Aechmanthera* are crowned by a distinct mucro or awn, whereas those of *Hemigraphis* are either obtuse or at the most shortly apiculate, and further to the structure of the testa, a character to which up to now no attention has been paid. CLARKE (*l.c.* p. 388) mentions a difference in the structure of the inflorescence, which in *Hemigraphis* should be spici- and in *Aechmanthera* capituliform, but this is a mistake: in both genera the flowers are spicate.

Among the other genera created by NEES *Goldfussia* would probably have maintained itself, for it is on the whole a quite natural group, if it had not contained some rather incongruous elements, and if the first time it was seriously tested, it had not been attacked in one of its weakest spots. This happened when MIQUEL was revising the Malesian *Acanthaceae* for his „*Flora Indiae Batavae*” (Vol. II, pp. 794—804, 1858). Confronted with the three

Javanese species referred by NEES to this genus: *G. bibracteata* (Bl.) Nees, *G. peniculata* Nees and *G. filiformis* (Bl.) Nees, he could not fail to notice that these plants have but little in common, and do not form a natural group. In fact, as I will show further on, they belong to three different genera, and not one of them is a true *Goldfussia*. MIQUEL's conclusion that the removal of these species from *Strobilanthes* to *Goldfussia* was not justifiable, and his return to the standpoint of BLUME, who had recognized but one genus, were therefore comprehensible enough.

In revising the Indian species belonging to this group, ANDERSON found himself in a similar plight. However, now the trouble was not so much caused by the *Goldfussia* species, for within the confines of India the latter form a fairly uniform group, but by the plants referred by NEES to *Strobilanthes* itself. Apart from a few species occurring east of the Bay of Bengal, namely *Str. Brunoniana* Nees and its nearest allies, these plants are but distantly related to the Javanese species that are to be regarded as the true representatives of the genus (*Str. cernua* Bl. and its nearest allies). Among themselves too they show a wide range of variability, and NEES's characterization of this genus, and the way in which it was separated by him from its nearest allies are accordingly but vague and unconvincing. With MIQUEL's example as a guidance it was therefore no wonder that ANDERSON too arrived at the conclusion that it was better to ignore the separation effected by NEES. By the fusion of *Goldfussia* and *Strobilanthes* the delimitation of the latter, however, had become so wide that there was now room for almost all the other allied genera created by NEES, and it is therefore not astonishing that most of them had to follow suit. As stated above, only those genera in which the ovary cells contain more than two ovules were excepted, and that was merely due to the ill-starred notion that the number of ovules should always be regarded as a character of paramount importance.

Both MIQUEL and ANDERSON will in the main have based their criticism of NEES's classification on the latter's monograph of the family in DE CANDOLLE's *Prodromus*. That the way in which *Strobilanthes* and its nearest allies in this work are characterized is on the whole unsatisfactory, and that moreover several of the species which have been referred to these genera fit the descriptions but imperfectly, is only too true, but if these authors had paid more attention to NEES's monumental treatise on the Indian *Acanthaceae* published fifteen years earlier in WALLICH's "*Plantae Asiaticae Rariores*" they would probably have obtained a more favourable impression, for in this work, which deals with a much smaller number of species, the genera appear on the whole far more natural. It must be admitted, however, that here too the characterization of the various genera is not always convincing. Due allowance, of course, should be made for the incompleteness of the material on which NEES often had to base his conclusions, but it is all the same difficult to escape the impression that NEES had but little taste for the painstaking labour of unearthing suitable diagnostic characters, and relied too much on his undoubtedly very keen faculty for recognizing natural affinities. However, in the absence of convincing diagnostic characters his classification could not appeal to his fellow botanists, who moreover demurred against the considerable increase in the number of genera. Reluctance to increase this number still further, may have led him to the ambiguous attitude assumed in his monograph, where he squeezed in the existing genera a large number of new species, which in loyalty to his own principles he should have kept apart<sup>2)</sup>.

<sup>2)</sup> That NEES himself was well aware of this, seems to follow from a statement made on p. 47 of his monograph: "Generum seriem, paucissimis ordinis stirpibus americanis accuratius adhucdum perpensis, incompletam, etiam e nostri herbarii gazis brasiliensibus ab Acanthacearum

This belated conservatism, however, defeated its own ends, for it made his genera even vaguer than they had been before, and it was this vagueness, as I have already pointed out, which roused his successors to opposition, and caused the deplorable reaction which led to the expansion of such genera as *Strobilanthes*, *Ruellia* and *Justicia* to their present unwieldy size.

Though it is not difficult to understand why in the first years after the appearance of ANDERSON'S work on the African and Asiatic *Acanthaceae* and of BENTHAM'S revision of the family in BENTH. et HOOK.F., *Genera Plantarum*, several of the small genera created by NEES could find no favour, it is on the other hand rather surprising that the remarkable results obtained by RADLKOFER in his study of the pollen characters (in *Sitzungsber. d. K. Bay. Acad.* XIII, p. 256, 1883), in which the great importance of the latter for the identification of the genera was clearly demonstrated, did not lead to a reinvestigation of the value of ANDERSON'S and BENTHAM'S large and more or less nebulous generic concepts. It is true that on account of these characters in the following years by LINDAU a.o. a few new genera were set apart, but on the whole these studies were not pursued very seriously, and but a comparatively small part of the species were investigated.

In the genus *Strobilanthes* sensu T. And. the pollen grains are as a rule provided with meridional bands, but in a few species they proved to be echinulate. LINDAU (in *Bot. Jahrb.* XVIII, pp. 52—53, 1893 and in *ENGL. u. PRANTL, Nat. Pflanzenfam.* IV, 3 b, p. 303, 1895) referred the latter to two genera: *Lamiacanthus* O. Ktze and *Pseudostenosiphonium* Lindau. The first was a monotypic genus created by KUNTZE for a Javanese plant whose ovary cells contain but a single ovule, whereas the second, a new one, comprises a number of species found in Ceylon and Southern India, whose ovary cells are provided with the ordinary two ovules, but whose androecium consists of two instead of four stamens. In later years LINDAU seems to have lost his faith in the importance of the pollen characters, for in a note added to the description of his *Strobilanthes pateriformis* (in *Bull. Herb. Boiss.* V, p. 653, 1897) he states that this plant, although provided with echinulate pollen, should be regarded as a true *Strobilanthes*, for, he says, its ovary cells contain the normal number of ovules. As this applies to *Pseudostenosiphonium* also, it would seem that he was no longer convinced of the latter's generic validity: to its other diagnostic character, the reduction of the number of stamens, he apparently attached but little value, for in the "Natürliche Pflanzenfamilien" he had already referred some other species with two instead of four stamens to *Strobilanthes* itself. He adds that *Lamiacanthus* too is after all but dubiously distinct from *Strobilanthes*. In a reinvestigation of *Lamiacanthus viscosus* O. Ktze, VALETON (in *l.c. Bog.* IV, p. 83, Tab. 326, 1912) arrived at the same conclusion: as there are several *Strobilanthes* species in which the lower ovule remains rudimentary, and as a rudiment of this ovule is sometimes met with in *Lamiacanthus* also, the number of ovules per ovary cell can not be regarded as a character of generic importance. Further on I will show that *Lamiacanthus* indeed differs but slightly from the species which I leave in *Strobilanthes*, but that *Str. pateriformis* Lindau is a plant of far more diverging character: I refer it to a new genus *Pteroptychia*, which is easily recognizable by the presence of longitudinal wings on the staminal tube, a feature first noted by BENOIST (in *LECOMTE, Fl. Gén. de l'Indo-Chine* IV, p. 665, 1935), who used it in his key to single out a group of species of which *Str. pateriformis* is one.

Echinulate pollen grains occur also in other groups. They were found e.g.

Indicarum sospitatore augendum, perficiendam speramus". This hope has not been fulfilled: NEES, who had reached already the age of 71 when his monograph appeared, died a few years later.

by LINDAU in some African plants, which he referred to the genus *Dischistocalyx* T. And. ex Benth. As the flowers of these plants are similar to those of *Ruellia* L., this genus was placed in the latter's vicinity. The first two species described by him differed from those investigated by ANDERSON and BENTHAM in the presence of two instead of several ovules in each of the ovary cells. In this respect they agreed with BENTHAM's African *Strobilanthes* species, and CLARKE (in Fl. Trop. Afr. V, p. 62—65, 1899) transferred them therefore together with the latter to a new genus *Acanthopale*, which he regarded as nearly related to *Pseudostenosiphonium*. He admitted however (l.c. p. 60) that the pollen grains of *Dischistocalyx* s.s. too are echinulate, and with regard to the position of the species left in this genus he agreed with LINDAU: in his classification *Dischistocalyx* and *Acanthopale* are placed therefore in different groups, the first in the neighbourhood of *Ruellia* and the second in that of *Strobilanthes*. LINDAU subsequently (in Bot. Jahrb. XXXIII, p. 188, 1902) pointed out that the number of ovules is not such an important character as CLARKE assumed, and that *Acanthopale* does not belong to the *Strobilantheae*: in his opinion it would be better to unite the two genera. A reinvestigation of these plants, of which the results have been published in "ENGLER's Botanische Jahrbücher" (Vol. LXXIII, pp. 126—150, 1943), has shown that the two genera are quite distinct, but that LINDAU certainly was right when he rejected the idea of a nearer affinity between *Acanthopale* and *Pseudostenosiphonium*. The resemblance between the pollen grains of the latter and those of *Acanthopale* too proved to be rather superficial: those of *Pseudostenosiphonium* are provided with three equatorial germ pores, whereas in *Acanthopale* we find eight or twelve germ pores evenly distributed over the whole surface, an arrangement entirely unknown in the group to which the other genus belongs. In *Dischistocalyx* on the other hand there are three germ pores, and the latter are arranged in the same way as in *Pseudostenosiphonium*, but the surface of the grains is, as in those of *Ruellia*, more or less distinctly reticulate.

CLARKE l.c. referred to his genus *Acanthopale* besides a number of African species also the Asiatic *Pseudostenosiphonium Gardnerianum* (Nees) Lindau, which has four stamens, and can not belong therefore to the genus *Pseudostenosiphonium*. That he was not unaware of the dubious value of this transfer seems to follow from the rather astonishing statement with which he concludes his remarks on the genus *Acanthopale*: "The genera carved out of *Strobilanthes* on the pollen characters are artificial: the few African species of *Strobilanthes* go, however, well together." Nine years later (in Journ. As. Soc. Beng. LXXIV, p. 659, 1908) he referred nevertheless eighteen more Asiatic species to this admittedly artificial genus! Of these eighteen species one, *A. malasica* Clarke, has been removed by IMLAY (in Kew Bull. 1939, p. 112) to *Ruellia*, and of the remaining seventeen I have investigated eleven myself. In one of these, *Strobilanthes zenkeriana* (Nees) T. And., the grains proved to be shortly ellipsoidal and distinctly banded, each band bearing a row of tubercles; the grains of the ten other species were globose, and bands were either absent or but faintly indicated, but these plants proved to differ so widely among each other that I had to bring them to four different genera. Two of the latter are already recognizable by the shape and the arrangement of the excrescences on the surface of the pollen grains: in the monotypic genus *Tarphochlamys*, based on *T. affinis* (Griff.) Brem. n. comb. (*Adenosma affinis* Griff., syn.: *Strobilanthes acrocephala* T. And.), they are small and arranged in rings within the cells of a wide but rather faint reticulation, whereas in *Thelepaepale*, a new genus based on *Th. ixiocephala* (Benth.) Brem. n. comb. (*Strobilanthes ixiocephala* Benth.), they are remarkably large and at the base distinctly swollen; in the two other genera they are much smaller and lack the basal

swelling. These two genera differ conspicuously in the structure of the seed: in one of them, for which I resume the name *Didyplosandra* Wight, the latter are entirely glabrous, whereas in the other, for which I propose the name *Championella*, they are almost entirely covered with hygroscopic hairs: the first genus is confined to Ceylon and Southern India, and the second to China, Japan and Indo-China.

SPENCER LE M. MOORE (in Journ. of Bot. LXIII, p. 167, 1925) detected that the pollen of *Strobilanthes aprica* (Hance) Benth. (*Gutzlaffia aprica* Hance) too is echinulate, and as this plant has but two stamens he came to the conclusion that the names *Gutzlaffia* Hance and *Pseudostenosiphonium* Lindau must be considered synonyms, and that HANCE's generic name, as it was published in 1849 (in Kew Journ. of Bot. I, p. 142), ought to replace *Pseudostenosiphonium*, which dates from 1893. The resemblance, however, is but superficial, and both genera should be kept up: in the plants from Ceylon and Southern India which LINDAU referred to *Pseudostenosiphonium*, the corolla develops in the ordinary position, and the seeds are glabrous, whereas in *Gutzlaffia aprica* and its Chinese and Indo-Chinese allies the corolla becomes resupinate, and the seeds are areolate and outside the areola covered with annulate hairs. *Gutzlaffia exareolata* (Clarke) Lace (*Strobilanthes* Clarke), a Ceylonese plant, is a true *Pseudostenosiphonium*: as *Strobilanthes exareolata* Clarke according to ALSTON (in TRIMEN, Fl. of Ceylon VI, p. 227, 1931) is conspecific with *Stenosiphonium diandrum* Nees, it is to be called in future *Pseudostenosiphonium diandrum* (Nees) Brem. *Gutzlaffia* itself deserves our attention for another reason as well: it comprises in the same way as *Sericocalyx* not only species with two, but also species with three and four ovules in each of the ovary cells. Four ovules were found by IMLAY (in Kew Bull. 1939, p. 116) in *G. graminea* (Imlay) Brem. n. comb. (*Strobilanthes* Imlay) and by myself in *G. birmahica* Brem. n. spec. and three are present in *G. pedunculata* Craib.

From the exposition given above, the conclusion may be drawn that the plants related to *Strobilanthes* but provided with echinulate instead of banded pollen, are far too divergent in character to be referred to one or two genera. Besides the three genera *Gutzlaffia* Hance, *Lamiacanthus* O. Ktze and *Pseudostenosiphonium* Lindau, which had already been recognized, and the four new ones which proved to be represented among the Asiatic species erroneously referred by CLARKE to the African genus *Acanthopale*, to wit *Didyplosandra* Wight ex Brem., *Thelepaepale* Brem., *Tarphochlamys* Brem. and *Championella* Brem., a fifth, *Pteroptychia* Brem., had to be created for the plant described by LINDAU under the name *Strobilanthes pateriformis*. Herewith the diversity among the species with echinulate pollen is in fact not yet exhausted, and as I will show further on, at least two more genera will have to be accepted. As stated above, some of these genera are already recognizable by the size and the arrangement of the spinules or tubercles themselves. This fact is well worth considering, for it proves that the diversity in the structure of the pollen grains is greater and more important than the juxtaposition "echinulate—non-echinulate" would suggest. Evidence derived from the study of species provided with non-echinulate pollen will corroborate this view.

LINDAU was apparently well acquainted with the presence of more than one kind of pollen in the species whose inclusion in the genus *Strobilanthes* was authorized by him, i.e. those provided with non-echinulate pollen. By way of example he described and figured (in Bot. Jahrb. XVIII, p. 53, Tab. I, fig. 19, 1893) a pollen grain of *Str. brunoniana* Nees. This pollen is globose and ornamented with meridional bands, but the latter differ considerably from those found in most other species, for they are represented merely by a



marginal ridge, the whole inner part having sunk to the level of the grooves between the bands. From his remarks here and elsewhere (e.g. in FEDDE'S Repert. XIII, p. 551, 1915) it is clear that he regarded the ellipsoidal grains provided with septate bands as the typical ones. This is not quite right, for although it is probably most often met with in this circle of affinity, it is not the kind found in *Str. cernua* Bl. and its nearest allies, among whom the type of the genus must be looked for: the pollen of the latter, though provided with septate bands, is not ellipsoidal but globose. This, however, is a point of minor importance. Of much more consequence is the fact that the diversity among the pollen forms in this group is far larger than LINDAU was aware of. As the figures accompanying this paper (Tab. I—III) show, the grains may be globose or ellipsoidal, and they vary considerably in size; the number of pores, though mostly three, may be reduced to two or increased to five; the surface may be provided with excrescences or it may be banded, and both in the excrescences and in the bands there is a good deal of variability; the latter may be either smooth or punctate or ornamented with a series of knobs or with a longitudinal keel, or they may be septate or reduced to a thin and usually more or less wavy marginal ridge, they may meet each other at the poles or end blind, and they differ in number. As the genera of the *Acanthaceae* have, as a rule, but a single type of pollen, this wide range of variability is a strong argument in favour of the view that the genus *Strobilanthes* as defined by ANDERSON and later botanists is not a natural unit, but should be regarded as an artificial conglomerate.

In view of the remarkable diversity in pollen structure displayed in this group it is noteworthy that different genera may nevertheless be provided with the same kind of pollen, be it echinulate or non-echinulate. Echinulate pollen of the same type is found e.g. in the genera *Pseudostenosiphonium*, *Lamiacanthus* and *Gutzlaffia*, which otherwise have very little in common, and ellipsoidal grains decorated with septate bands occur as well in the Indian genus *Carvia* Brem., based on *C. callosa* (Nees) Brem. (*Strobilanthes* Nees), as in *Adenacanthus* Nees, *Goldfussia* Nees and several others. Ellipsoidal grains with smooth or punctate bands are typical for the genera *Hemigraphis* Nees, *Aechmanthera* Nees and *Stenosiphonium* Nees, but they are found also in a large number of species which were formerly included in *Strobilanthes*. Are these plants more nearly related to each other than to those provided with other kinds of pollen? To answer this question a detailed knowledge of the other characters displayed in this group is required, and a careful comparison of the latter therefore was necessary. Its results will be given in the second chapter of the General Part. They prove that the pollen characters may on the whole be regarded as reliable guides in investigations of this kind, but that some caution will always remain advisable: echinulate pollen of the same kind is found in genera which have but little in common, e.g. in the above-mentioned *Pseudostenosiphonium*, *Lamiacanthus* and *Gutzlaffia*, and the presence of excrescences itself proves nothing at all, for they recur, as we have seen already in our discussion of the genera *Dischistocalyx* T. And. ex Benth. and *Acanthopale* Clarke, in groups that are but distantly related; in fact, they are not even confined to this family, but show a wide and rather irregular distribution throughout the other families of the Angiosperms. The view that these excrescences are in the *Acanthaceae* only characters of secondary importance, was expressed already in my paper on the *Acanthaceae* of Surinam (In Rec. d. Trav. Bot. Néerl. XXXV, p. 166, 1938), where I contended that LINDAU'S *Phorphyrocominae*, which were separated from the other genera with imbricate aestivation of the corolla lobes on account of the echinulate pollen, form an unnatural assemblage. As this peculiar kind of relief reappears in

various groups, it looks as if it might be due either to the presence of some factor suppressing the typical relief, or else to the absence of a factor essential to the development of the latter. Not all the pollen characters, however, are necessarily affected by this factor: the number and the arrangement of the germ pores, for instance, appear to remain unchanged.

In my delimitation of the genera the structure of the pollen plays an important, but by no means exclusive part. A large number of other characters have been taken into consideration. They include: growth form; equality or inequality of the leaves inserted on the same node; structure of the inflorescence, especially size, shape and nervature of the bracts and bracteoles, and their early fall or persistence; equality or inequality of the calyx segments, and length and shape of their free parts; normal or resupinate position of the corolla, and the presence or absence of a bent between its tube and throat, further its colour, the arrangement of the hairs by which the style is retained against the upper lip, and the shape of the lobes; the protrusion or inclusion of the stamens, and the difference in length between the outer and the inner ones, further the fertility, sterility or total suppression of the inner ones, and the shape of their filaments, whether straight or incurved, the erect or horizontal position and the shape of the anthers, and the presence or absence of a mucro or awn at their tips; the number of ovules in each of the ovary cells, and the presence or absence of subulate or capitate hairs on the top of the ovary and on the style; and finally the very important structural peculiarities of the seedcoat.

The characters which ANDERSON and CLARKE had used for the subdivision of their monstrous genus were partly based on NEES's old generic distinctions and partly new. The latter, however, are very vague, and do not single out natural groups. If we realize for instance how different the hairs on the testa in this group of plants are, it is hardly to be expected that groups based on the character: seeds hairy, will have any taxonomic value, and indeed, if the classifications of ANDERSON and CLARKE are compared with the results of this far more comprehensive study, it will be seen at once that they are purely artificial. If their arrangement is after all not throughout so unsatisfactory as might be expected, this is due to the fact that within their indubitably artificial groups, the species have been adjusted according to their geographic distribution, and as the area occupied by most of the really natural subdivisions is but small, accidentally the semblance of a more or less natural classification has been obtained.

The results of my investigations are discussed in the two chapters of the General Part: the first deals with the delimitation of the group as a whole, and with its position in the system of the *Acanthaceae*; the second with the differences between the various old and new genera in which the group is to be divided. In the Special Part the genera and their species are dealt with separately; where sufficient material was available, the species of the Netherlands East Indies have been fully described, those occurring outside that area are as a rule merely enumerated: of those parts too new ones, however, have all been described; species known to me merely from descriptions have only been acknowledged when the latter left no reasonable doubt as to their taxonomic position.

The data on which my conclusions are based, were obtained for the greater part by a study of the collections preserved in the Leiden and Utrecht herbaria, and are therefore necessarily incomplete. Especially China and Indo-China, from where in the last decades a considerable number of new species have been described, are but poorly represented in these collections, and it is

therefore to be expected that several genera which are confined to those parts, still remain unrecognized. India is better represented, although the greater part of the species occurring in the Northern Provinces and in Ceylon proved to be missing. From the Malay Archipelago the material of course was very abundant, but it is to be expected that the Buitenzorg herbarium, which could not be consulted, will prove even richer. However, as it will probably take a long time before the Buitenzorg herbarium and the collections preserved elsewhere will again be accessible, and as it seems uncertain whether the author at that time will be in a position to avail himself of that opportunity, the publication of these preliminary results may be excused.

## A. GENERAL PART.

### I. The delimitation of the *Strobilanthinae* and their position in the family.

In my "Notes on the Acanthaceae of Surinam" (in Rec. d. Trav. Bot. Néerl. XXXV, pp. 130—176, 1938) I recognized in the subfamily *Acanthoideae* seven tribes: *Acantheae*, *Trichanthereae*, *Isoglosseae*, *Louteridieae*, *Ruellieae*, *Odontonemeae* and *Justicieae*. Recently, however, I have found that the kind of pollen which was considered peculiar to the *Louteridieae*, occurs also in some of the *Ruellieae*, and as no other important differences between the two tribes appear to be present, it seems inadvisable to retain the *Louteridieae* as an independent tribe. The same applies to the *Isoglosseae*, which apart from the structure of the pollen proved to differ so little from the *Justicieae* that it seems better to regard them as a subtribe of the latter. In reducing LINDAU's subfamily *Nelsonioideae* with their bithecous anthers, minute pollen grains, rudimentary retinacula and globose seeds to a mere subtribe of the *Acantheae* it seems on the other hand that I went somewhat too far: although doubtless nearly related to the other genera which have been referred to that group, they are sufficiently distinct to be regarded as an independent tribe. The reduction of the *Andrographideae* to the *Odontonemeae* proved a mistake: on account of their peculiar pollen, the presence of more than two ovules in each of the ovary cells, and the knobby seeds they are to be restored to their former rank. The position of the genus *Rhombochlamys* Lindau, which I could not yet investigate, and that of the tribe *Rhombochlamydeae* remain uncertain. Further *Whitfieldia* Hook. and the nearly allied *Stylarthropus* Baill. with globose cystoliths and lenticular diporous pollen grains, *Lepidagathis* Willd. and its nearest allies with small trisulcate pollen and mucous seeds, and *Herpetacanthus* Nees with its curious inflorescence (cf. BREMEKAMP l.c. p. 164) and finely granulated pollen grains appear also sufficiently distinct to be regarded as representing separate tribes. At present I recognize therefore in the subfamily *Acanthoideae* ten tribes: *Nelsonieae*, *Acantheae*, *Trichanthereae*, *Whitfieldieae*, *Ruellieae*, *Lepidagathideae*, *Andrographideae*, *Herpetacanthae*, *Odontonemeae* and *Justicieae*, but I have little doubt that further study will necessitate the recognition of an even larger number.

In the *Ruellieae*, the only tribe with which we are here concerned, I now include six of the tribes accepted by LINDAU, viz. his *Louteridieae*, *Hygrophileae*, *Petalidieae*, *Strobilantheae*, *Ruellieae* (with the exception of *Whitfieldia* and *Stylarthropus*) and *Barlerieae* (with the exception of *Lepidagathis* and its nearest allies), i.e. apart from the *Trichanthereae*, the *Whitfieldieae* and the *Lepidagathideae* all *Acanthoideae* with contorted or at least not ascending aestivation of the corolla lobes. LINDAU's *Haselhoffieae*, which I formerly included in this group, are now excluded, for a reinvestigation of the type species of the genus *Haselhoffia* Lindau (*Physacanthus* Benth. nom. obs.) revealed that the shoots of this plant are not provided with articulations, that it is devoid of cystoliths, and that the banded pollen grains possess no germ pores<sup>3</sup>). These negative characters prove that it can not belong to the

<sup>3</sup>) LINDAU (in Bot. Jahrb. XXIV, p. 316, 1897) described this plant under the name *Haselhoffia leucophthalma*, but as it is according to CLARKE (in Fl. Trop. Afr. V, p. 57, 1900) conspecific with *Ruellia batangana* Joh. Braun et K. Sch. (in Mitt. Deutsch. Schutzgeb. II, p. 173, 1889), LINDAU called it afterwards *Haselhoffia batangana* (Joh. Braun et K. Sch.) Lindau. Other synonyms are *Lankesteria batangana* (Joh. Braun et K. Sch.) Lindau (in

*Ruellieae*, but that it should find a place either in the neighbourhood of the *Nelsonieae* or in that of the genera now brought together in the *Acantheae*. With the latter it agrees in the monothealous anthers and in the presence of retinacula, but it differs from them in the larger number of ovules and in the subactinomorphic corolla with its contorted lobes. However, if the scope of this tribe is widened a little, and a new subtribe added to the existing ones, there is no reason why it should not be inserted here. I now recognize therefore in the *Acantheae* three subtribes differing from each other in the number of ovules and in the structure of the corolla: 1. *Haselhoffünae*, with more than two ovules in each ovary cell and with a subactinomorphic corolla; 2. *Aphelandrinae*, with but two ovules in each ovary cell and with a two-lipped corolla; and 3. *Acanthinae*, with the same number of ovules as the preceding subtribe, but with a one-lipped corolla.

As a general character of the enlarged tribe *Ruellieae* I mentioned l.c. the presence of mucous hairs on the testa, but this has proved erroneous: in some of the genera dealt with in this paper the seeds are glabrous, and in some others, where the seeds are pilose, the hairs are not mucous. It is nevertheless a fact that unicellular mucous hairs are in this tribe a very common feature. They are on the other hand not confined to the seeds of the *Ruellieae*, but are also found in the *Lepidagathideae*. In the genus *Blepharis* Juss. (*Acanthinae*) too mucous cells are present, but the latter are, as KIPPIST (in *Trans. Linn. Soc. XIX*, p. 65—68, 1845) already has shown, combined in coremial structures, i.e. they are at the base united in a cylindrical stipe, and at the top spreading; the walls of these cells appear to dissolve in water, whereby the spiral thickening is set free, and stretches itself. In the *Ruellieae* on the contrary the slime is liberated by the disconnection of the hairs, and the annular or spiral thickenings remain attached to the wall (cf. SCHAFFNIT in *Beih. Bot. Centralbl. XIX*, Abt. I, p. 471 fig. 2, p. 502 fig. 14 and p. 504 fig. 15c, 1906). According to LINDAU (in *ENGL. u. PRANTL, Nat. Pflanzenfam. IV*, 3b, p. 284, 1895) one of the *Ruellieae*, namely *Paulowilhelmia sclerochiton* (S. Moore) Lindau, should possess seeds covered with hygrosopic scales, but as neither SPENCER LE M. MOORE's original description (in *Journ. of Bot. XVIII*, p. 7, 1880) nor CLARKE's diagnosis of the genus mention these scales, their occurrence in the latter wants confirmation. As *Crossandra* Sal. (*Acanthinae*) is the only genus in which scales of this kind have been found so far, the capsules studied by LINDAU may in reality have been obtained from a plant belonging to that genus.

Although it is not improbable that the seedcoat of the *Ruellieae* may present characters which are not met with in the other tribes, no definite statement to this effect can as yet be made: to this end a much more extensive knowledge of the seed structures occurring in the other tribes is required. For the time being more satisfactory diagnostic characters are found in the structure of the pollen.

The pollen grains of the *Ruellieae* are either globose or ellipsoidal, almost always provided with more than two germ pores<sup>4</sup>), and show a relief consisting

ENGL. u. PRANTL, *Nat. Pflanzenfam. IV*, 3b, p. 311, 1895) and *Physacanthus inflatus* Clarke (l.c.) nom. illeg. LINDAU's description of the genus is rather inaccurate: the presence of the large pilose staminode has been overlooked, and the bilobate stigma is said to be undivided.

<sup>4</sup>) The only exception to this rule which so far has come to my notice is the pollen of *Lissospermum pedunculatum* (Miq.) Brem. (*Strobilanthes* Miq.), which proved to be diporous. As it is ornamented with septate bands, a character confined to the *Strobilanthinæ*, its identification offers no difficulties. CLARKE (in *Journ. As. Soc. Beng. LXXIV*, p. 652, 1908) ascribes diporous pollen to a large number of species, partly referred by him to *Strobilanthes*, and partly belonging to *Hemigraphis*, but everywhere where I was able to control his statements, I found them erroneous: in all these plants the pollen was triporous.

either of alveoles, of spinules or of equal and equidistant meridional bands; in one genus (*Blechnum* Juss.) they are globose, smooth and provided with three fissures extending to the poles. By the aid of these characters the pollen of the *Ruellieae* is almost always easily distinguishable from that of all other *Acanthaceae*.

The decision is very simple when the grains are globose and distinctly alveolate or when they are provided with septate bands, for nowhere else in this family pollen grains of these two types are found. Other banded grains offer not much difficulty either, for where banded grains occur in other tribes, the bands are either not meridional (*Thunbergioideae*) or else unequal (*Odontonemeae*) or the grains themselves are of another shape, namely not globose or ellipsoidal but doleiform, i.e. more or less truncate at the poles (*Haselhoffia*, *Rungia obcordata* Lindau; the grains of the first are moreover aporous, and those of the latter provided with a larger number of pores than that found in the banded pollen grains of the *Ruellieae*). The aberrant grains of *Blechnum* offer no difficulty: from the at first sight rather similar grains of the *Nelsonieae* they differ in the presence of germ pores. The echinulate grains are of four different kinds: alveolate ones; banded ones; grains without any other relief, provided with equatorial germ pores; and grains without other relief, but provided with germ pores evenly distributed over the whole surface. Those belonging to the first two groups offer, of course, no difficulty, and those belonging to the third group are apparently also confined to the *Ruellieae*, but sparsiporous echinulate pollen has been found in at least two plants belonging to the *Odontonemeae*<sup>5)</sup>, namely in *Asystasiella atroviridis* (T. And.) Lindau<sup>6)</sup> and in *Pseuderanthemum metallicum* Hall. f. (cf. HALLIER, in Ann. Jard. Bot. Buitenz. XV, pp. 22—36, 1898), and these grains have so far proved indistinguishable from those found in some of the *Ruellieae*. As pointed out already in the "Introduction" this convergence may be explained by assuming that the echinulate type of pollen owes its origin either to the presence of some factor by which the typical relief is suppressed, or to the absence of a factor necessary to the latter's development.

It is also possible to approach the subject from the other side, by trying to find out whether pollen structures which are typical for the other tribes return in the *Ruellieae*. In this way we come to the conclusion that the pollen of the latter always lacks the thick, two-layered exine and the equatorial slits which are characteristic for that of the *Mendoncioideae*, and the spiral groovers which are a special feature of that of the *Thunbergioideae*, that it is never aporous like that of the *Nelsonieae* and *Acantheae*, never lenticular like that of the *Trichanthereae* and *Whitfieldieae* and of the subtribe *Isoglossinae* of the *Justicieae*, never doleiform like that of the other *Justicieae* and the majority of the *Odontonemeae*, never decorated with bands of unequal width like that of

<sup>5)</sup> The globose echinulate pollen of *Stenandrium* Nees sect. *Sphaerostenandrium* Lindau is not sparsiporous, as described by LINDAU, but like that of all other *Acantheae* aporous. The swellings on the surface which LINDAU interpreted as initial pollen tubes, are in reality thickened portions of the exine!

<sup>6)</sup> The statements with regard to the number of germ pores in this plant are contradictory. In my own slides I found four meridional ones! The pollen grains of *Asystasia Neesiana* (Wall.) Nees, a plant which resembles *Asystasiella atroviridis* in many respects, e.g. in the small globose cystoliths, and was referred by LINDAU to the same genus, are ellipsoidal and show the relief characteristic for the *Odontonemeae*. It certainly does not belong to *Asystasia*, but if it is to be included in *Asystasiella*, the definition of the latter is to be changed. Several other species now included in *Asystasia* should also be removed to other genera. ANDERSON'S genus *Dicentranthera* for instance, which was united with *Asystasia* by BENTHAM, but differs considerably from the type of that genus by its compound inflorescences and large cystoliths, should certainly be revived.

the *Odontonemeae*, *Asystasiella stroviridis* (T. And.) Lindau and *Pseuderanthemum metallicum* Hall. f. excepted, that the relief is never confined to the neighbourhood of the germ pores as in the *Lepidagathideae* and *Andrographideae*, and that the surface is never divided in small polygonal discs, each crowned by a minute spinule, as in *Herpetacanthus*.

Although plants belonging to the *Ruellieae* can therefore, as the preceding paragraph shows, nearly always be distinguished by the aid of the pollen characters from those pertaining to other tribes, this does not prove that the *Ruellieae* really form a natural group. The circumstance that it are not always the same characters that are used for this distinction, on the contrary raises the question whether the great variability displayed by the pollen of this tribe really rests on a common base. If this was not so, we should have to conclude either that the pollen structures are unsuitable for the characterization of such an extensive group, which looks hardly probable as in most of the other tribes of this family the pollen always appears to correspond to a special type, or else that the *Ruellieae* as defined by me are to be regarded as a collection of groups rather than as a single one. However, by careful comparison of the various types of pollen it proved possible to detect the common base, for it appeared that the differences between them and those found in other tribes may be brought back to the following common features:

In the first place, the presence of germ pores. This is a very important point, for on account of this character and the presence of cystoliths the subfamily *Acanthoideae* may be divided into two major groups: one in which both are absent, and which comprises the *Nelsonieae* and the *Acantheae*, and one in which both are present, comprising all other tribes. As this must be regarded as a division of paramount importance, in the following only those tribes which belong to the second group will be considered.

Secondly, the dimensions of the grains. The pollen grains of the *Ruellieae* are always of medium or large size, whereas those of the *Lepidagathideae*, the *Andrographideae* and the major part of the *Justicieae* are much smaller. The small size of the pollen grains of the two first-named tribes deserves special attention, because these two tribes show a closer resemblance to the *Ruellieae* than the other ones.

Thirdly, the perfectly globose or ellipsoidal form. This should be contrasted in the first place with the lenticular shape characteristic for the *Trichanthereae*, the *Whitfieldieae* and the *Isoglossinae*, one of the subtribes of the *Justicieae*, secondly with the elongated, but also somewhat flattened grains found in most of the other *Justicieae*, and with the trigonous ones occurring in some other members of the same tribe and in all the *Odontonemeae*, and lastly with the elongated, at the poles more or less distinctly truncate shape which characterizes the pollen of all *Justicieae*, the *Isoglossinae* only excepted, and almost all *Odontonemeae*.

Fourthly, the uniform character of the surface. The latter, as stated above, may be smooth, echinulate, alveolate or banded, but whatsoever its nature may be, it is always so that any two not too small parts taken in the direction of the axis and avoiding the germ pores, show the same structure. Herein they differ conspicuously from the *Lepidagathideae*, the *Andrographideae* and the majority of the *Justicieae*, where the ornamentation is confined to comparatively narrow strips on each side of the germ pores, from the *Odontonemeae*, where the relief consists of bands and shields, and probably also from *Herpetacanthus*, though this is not quite certain, as the surface relief of its pollen is as yet but imperfectly known.

These four features may be considered the basic characters underlying the wide range of variability displayed by the pollen of the *Ruellieae*, and in them

apparently the difference in pollen structure between this tribe and the other ones is founded.

Other noteworthy characters of the *Ruellieae* are the decurrent outer stamens, the coalescence between the outer and the inner ones and sometimes between the latter too, the dithecous anthers with which at least the two outer stamens are provided, and the reduction or almost complete suppression of the posticous stigma lobe, the anticous one being long and narrow. The last mentioned character however is not a general one, for in the genus *Louteridium* Wats. the stigma lobes are subequal. In two other genera, *Lankesteria* Lindl. and *Ancylacanthus* Lindau, the stigma is said to be peltate or capitate, but the inclusion of these genera in the *Ruellieae* rests on insufficient evidence. As the outer stamens of *Lankesteria* are not decurrent, and as its pollen has been described as trigonous, this genus can hardly belong to the *Ruellieae*: it seems more probable to me that it belongs in the neighbourhood of *Pseuderanthemum* Radlk., i.e. to the *Odontonemeae*. All doubt would be removed, if the structure of the seed was known, but to this no attention seems to have been paid. *Ancylacanthus* was regarded by LINDAU (in Bot. Jahrb. L, p. 169, 1913) as related to *Lepidagathis* Willd., and would fall therefore in my *Lepidagathideae*. LINDAU states that his opinion is based on the structure of the pollen, which is globose, distinctly reticulate and sparsiporous. The pollen grains of the *Lepidagathideae*, however, are, as far as I know, always ellipsoidal, not or but indistinctly reticulate and triporous; they are moreover much smaller than that examined and figured by LINDAU, which reminds me of the pollen grains of *Ruellia australis* R. Br. and its nearest allies. The seed described and figured by LINDAU, however, shows a structure never met with in the *Ruellieae*, but on the contrary characteristic for the *Odontonemeae* and the *Justicieae*, and it is doubtless in one of these tribes that a place for LINDAU's genus is to be found. The anomalous structure of the pollen is best explained away by assuming that the grain examined by LINDAU was a contamination. As LINDAU declares that in all his material but a single corolla was to be found, and as he will have handled the latter with care, it is quite possible that he may have taken his pollen grains not from the anthers themselves but from the corolla tube, and to this a stray one, of course, may easily have found its way.

The subdivision of the enlarged tribe *Ruellieae* offers considerable difficulties, which on account of our insufficient knowledge with regard to the larger part of the genera, can not yet be fully surmounted. For this reason the tribes which had to give up their independence and were sunk by me in this one, may provisionally be retained as subtribes. However, several of the genera which are at present included in them, will have to be shifted, and even after that, their delimitation will in many respects remain vague and unsatisfactory. For the aberrant genus *Blechum* [P. Br.] Juss. I have already at an earlier occasion created a new subtribe, but I have little doubt that in future several other genera and groups of genera will have to be set apart. For the present I confine myself to the recognition of the following six subtribes: *Ruelliinae*, *Barleriinae* (*Lepidagathis* and its nearest allies excluded), *Hygrophilinae*, *Blechninae*, *Petalidiinae* and *Strobilanthinæ*.

The subtribe *Strobilanthinæ*, which forms the subject of this paper, is a well defined group comprising *Strobilanthes* Bl. and its nearest allies. It is a smaller one than LINDAU's *Strobilantheae*, for it does not include the genus *Calacanthus* T. And. nor LINDAU's genera 30—36, i.e. *Dyschoriste* Nees and its nearest allies, to which the genera *Ruelliopsis* Clarke and *Strobilanthisopsis* S. Moore published after the appearance of LINDAU's revision probably also belong. Of *Calacanthus* no material was available to me, but judging from the description and from BEDDOME's figure I see no reason why it should be retained in this



group and not returned to the neighbourhood of *Lepidagathis* Willd., to which genus the type species was originally referred. The other genera are allied to *Petalidium* Nees, and are therefore to be transferred to the subtribe *Petalidiinae*, which is characterized by the possession of banded pollen grains with the germ pores situated not between, but on the bands. The genera *Mellera* S. Moore and *Eremomastax* Lindau, which LINDAU referred to the *Hygrophileae*, should also be removed to this subtribe. *Eremomastax* moreover is according to CLARKE synonymous with *Paulowilhelmia* Hochst.

Of the genera accepted by LINDAU as belonging to the *Strobilantheae*, only six are left therefore in my *Strobilanthinae*, to wit *Aechmanthera* Nees, *Hemigraphis* Nees, *Stenosiphonium* Nees, *Pseudostenosiphonium* Lindau, *Lamiacanthus* O. Ktze and *Strobilanthes* Bl. Their main common characters may be summarized as follows:

1<sup>o</sup>. The flowers are arranged in simple or compound terminal inflorescences, and the component parts of the latter are like the simple ones either spiciform or, more rarely, narrowly racemiform. Even the at first sight rather puzzling "capitula" found in the monotypic genus *Gantelbua* Brem. (based on *Ruellia urens* Roth v. infra) appear to be of this type: they may be regarded as strongly abbreviated, compound spikes. On account of their peculiar structure they are here shortly described. The main axis of the very short spike is provided with an involucre consisting of two pairs of large ovate bracts, of which the lower ones each subtend a single flower and a short secondary spike developing from a superposed bud, and the two upper ones each either a single flower or two superposed flowers; the secondary spikes in the axils of the lower bracts are also provided with two pairs of bracts, but the latter are narrower than those of the main spike and subtend each but a single flower. This inflorescence owes its peculiar structure therefore to the development of superposed buds, and as the latter occur also in the nearly related genus *Hemigraphis* Nees, it falls in with the general plan of the group. A real exception, however, is found in the genus *Stenosiphonium* Nees, for here the bracts of the spike-like inflorescences do not subtend single flowers but triads, i.e. reduced cymes. Similar triads have also been observed in one of the species of *Sericocalyx* Brem., namely in *S. sumatranus* Brem. n. spec. and in a species of *Difflugossa* Brem., to wit in *D. ovatifolia* Brem. n. spec. In both plants the character of the inflorescence is nevertheless unchanged: it is, just as in *Stenosiphonium* a terminal spike in which some of the flowers are replaced by triads. In *Hemigraphis fruticulosa* Clarke it looks at first sight as if the flowers were subtended by ordinary leaves, i.e. as if they were axillary. The leaves of this plant, however, are small and very shortly petiolate, and as the bracts in the groups to which it comes nearest, are on the other hand often shortly petiolate and rather large, it is no wonder that there is in this species not much difference between leaves and bracts: comparison with its nearest allies shows that the flowering shoot should be regarded as a lax spike. — In the *Petalidiinae* the flowers are never arranged in spikes or racemes, but they are either axillary or, more often, arranged in axillary cymes or in panicles composed of cymous partial inflorescences. In the other tribes of the *Ruellieae* both racemose and cymose inflorescences occur, although the latter are more common.

2<sup>o</sup>. Below the incision between the two posticous corolla lobes, two rows or bundles of rather stiff hairs are inserted, by which the upper part of the style is retained against the wall of the corolla. Between these rows of hairs not rarely a shallow groove or "rugula" may be seen. The presence of the hairs has often been noted, but that they form a general feature of the whole subtribe has hitherto been overlooked. The only exception which has come to my notice is found in one of the species of *Didyplosandra* Wight ex Brem.,

where the corolla is entirely glabrous on the inside. In figures of "*Goldfussia*" and "*Strobilanthes*" species they have often been depicted, but almost always in a wrong position, namely below one of the corolla lobes instead of below the incision between two of them. This mistake, which had already attracted BENTHAM's attention (cf. BENTH. et HOOK. f., *Gen. Pl.* II (2), p. 1065, 1876), is probably due to the fact that in most of these species the corolla is resupinate, and as the artists were not acquainted with this peculiarity, they took the side on which the hairs are found for the anticous one, which of course is three-lobed.—In the other *Ruellieae* and, in fact, in all other *Acanthaceae* these hairs are always absent.

30. The filaments of the four stamens or, if the inner ones are sterile, of the two stamens and the two staminodes, are at the base united by a single membrane, on which the odd staminode, if present, forms a small triangular or oblong projection. This membrane, which is present even when the inner stamens are completely suppressed, forms a short tube, open at the ventral side and continued downwards in the form of two, usually ciliated, ridges decurrent from the outer stamens. In *Hemigraphis* this staminal tube is at the back sometimes reduced to a V-shaped ridge. — In the other subtribes of the *Ruellieae* the stamens are united in pairs, but there is neither a connecting membrane nor even a ridge between the inner stamens or staminodes, and if the odd staminode is present, it arises directly from the wall of the corolla, and not rarely at a somewhat higher level than the stamens. The decurrent ridges are, as stated already, a feature found in all *Ruellieae*. The presence of the connecting membrane between the inner stamens or staminodes is not merely a difference between the *Strobilanthinae* and the other subtribes of the *Ruellieae*, but this too distinguishes them from all other *Acanthaceae*.

40. The germ pores of the pollen grains are usually three in number, rarely two or five, and always equatorial. If the grains are of the banded type, they are always situated between the bands, and if they are of the echinulate kind, and the spinules arranged in distinct rows, between the rows of spinules. — In the *Petalidiinae*, where the pollen is always of the banded type, the germ pores lie on the bands, which at that place show an orbicular widening, and never between them. In the other subtribes of the *Ruellieae* they are found, as a rule, in a similar position as in the *Strobilanthinae*. In *Louteridium* Wats. and some other genera which are provisionally left in the *Ruelliinae* (*Acanthopale* Clarke, *Stenoschista* Brem.) they are however more numerous and evenly distributed over the whole surface. In the *Blechinae* the pollen is smooth, in the *Hygrophilinae*, where the grains are globose and banded, there are four germ pores, and in the *Ruelliinae* the surface is usually alveolate, the walls of the alveoles being strengthened by pillars, which are not rarely produced into spinules. In the *Strobilanthinae* alveolate pollen is found in one genus only (*Tarphochlamys* Brem.), and here the reticulation is but weakly developed; these grains are also echinulate, but the spinules are not inserted on the walls, as in the *Ruelliinae*, but in rings inside the wide meshes of the reticulum. In some of the *Ruelliinae* with echinulate pollen, the reticulation is vague or even completely absent, and then the distinction is not always easy; when the reticulation is entirely absent, the pollen is, however, of the sparsiporous kind.

50. As in most of the *Ruellieae* the two stigma lobes are always very unequal, the posticous one being reduced to a short tooth or a tubercle at the base of the anticous one; the latter, however, is not, as in the other *Ruellieae*, subterete or dorsiventrally flattened, but laterally compressed and more or less crossier-shaped. On the median side it contains a deep fissure in which the long stigmatic papillae are inserted. — In this character too, the *Strobilanthinae*

differ not only from the other subtribes of the *Ruellieae*, but from all other *Acanthaceae*.

Besides the characters given above, there is one other that may prove to be of general occurrence. The facts on which this claim is founded, are summarized in the following paragraph.

In his monograph of the family in DE CANDOLLE's "Prodromus" NEES mentions among the characters of *Goldfussia* a "stigma irritabile". This irritability had been discovered some years before by MORREN (in Nouv. Mém. de l'Acad. roy. de Brux. XII, 34 p., 3 pl., 1839). MORREN could show that in *G. anisophylla* Nees the stigma, which in the position of rest is recurved, stretches itself, and even curves in the opposite direction, when it is touched. His views on the nature of this reaction are now totally antiquated, and need not be discussed, but as since then no important new investigations have been carried out, we are even now but imperfectly informed with regard to this kind of irritability. The reaction has been mentioned in nearly all textbooks of plant physiology, but the source from which the information was obtained, is nowhere revealed: it seems probable that they merely quoted from each other. In the literature dealing with pollination and with the teleological interpretation of structural peculiarities, however, some observations made on related species have been recorded. TRELEASE (in Proc. Boston Soc. of Nat. Hist. XXI, p. 433, 1881) published a few observations on the irritability of what he calls the style of *G. isophylla* Nees. The same plant was studied by GOEBEL (Entfaltungsbewegungen der Pflanzen, Erste Ausg., p. 237, 1920; Zweite Ausg., p. 428, 1924), who rectified TRELEASE's mistake regarding the morphological nature of the sensitive part, and adds that he observed the reaction also in *Strobilanthes glomerata* (Nees) T. And., i.e. *Goldfussia glomerata* Nees, and in *Str. Dyeriana* Mast., i.e. *Perilepta Dyeriana* (Mast.) Brem. HARTMANN (in Flora, N. F. XVI, p. 240, 1923) found it moreover in *Hemigraphis colorata* (Bl.) Hall. f., i.e. *H. alternata* (Burm.) T. And. These results are quoted by WETTSTEIN in his "Handbuch der systematischen Botanik" (Dritte Ausg., p. 911, 1935), where the addition that in some species the irritability is not localized in the stigma but in the style is probable based on TRELEASE's communication, to whose mistaken terminology reference has already been made. In the three species which I could investigate myself: *Perilepta Dyeriana* (Mast.) Brem., *Hemigraphis alternata* (Burm.) T. And. and *H. repanda* (L.) Hall. f., the irritability proved to be strongest in the stigma, but also manifested itself in the upper part of the style. This had been noted already by HARTMANN l.c. in *H. alternata*. I extended my observations to several *Ruellinae*, but of these not a single one reacted. Of the *Petalidiinae* and the other subtribes of the *Ruellieae* unfortunately no living material was available. When the three genera in which the reaction so far has been observed, are compared, it appears that *Perilepta* Brem. and *Goldfussia* Nees are doubtless nearly related, but that the differences between these two genera and *Hemigraphis* Nees are very large, as large indeed as they could possibly be within the confines of this subtribe. It seems probable therefore that this reaction will prove to be a general character of the *Strobilanthinae*. As the number of species grown in our conservatories is but small, and as most of them moreover belong to the genera *Goldfussia* and *Hemigraphis*, reliable information will for the time being be difficult to obtain. With regard to the *Petalidiinae* and some other subtribes of the *Ruellieae* the prospects are even less hopeful as none of these plants appear to be in cultivation. It is noteworthy that irritable stigma lobes sporadically occur in some other families belonging to the *Tubiflorae*, but that they appear to be unknown outside this order.

In the following paragraphs the other characters of the *Strobilanthinae* are briefly surveyed.

In habit there is a considerable width of variation. Some are rosulate, creeping, procumbent or ascending herbs (species of *Hemigraphis*, *Gantelbua*), often with more or less profuse vegetative propagation, but the majority are erect or suberect, usually large and richly branched plants with more or less woody stems. Part of the latter need several years to reach maturity<sup>7)</sup>, and grow out to a height of two or three, and sometimes even of six meters. In our conservatories the shoots of *Perilepta Dyeriana* (Mast.) Brem. are cut down when the flowering begins to wane, and then new ones spring from the stumps, and it is said that in Southern India the strong, obliquely ascending shoots of "karvi", i.e. *Carvia callosa* (Nees) Brem., are cut to serve as stakes to which the shoots of the young vines are tied (WATTS, Commercial Products of India, p. 117, 1908), and that here too new ones are formed from the base, but it is apparently unknown whether this kind of rejuvenation also takes place when the plants are left to themselves, and it is not probable that this practice will succeed everywhere. At any rate, left to themselves most species apparently do not survive the fruiting stage.

*Carvia callosa* and the Peninsular species of *Didyplosandra* Wight ex Brem. reach a height of six meters, and are therefore the largest plants found in this subtribe. They differ moreover from its other representatives by producing their flowers on short-shoots arising either from the old wood (*Didyplosandra*) or from the axils of the leaves (*Carvia*).

Another type of presumably polycarpic plant is represented by the species belonging to the small Indian genus *Pleocaulus* Brem., based on *Pl. sessilis* (Nees) Brem. (*Strobilanthes* Nees), and by the monotypic genus *Dossifluga* Brem., founded on the Siamese *Strobilanthes suborbicularis* Imlay, plants provided with a multicapitous woody rhizome. Of the shoots of *Pleocaulus* it is known that they regularly die down, and are replaced the next year by new ones, and these plants therefore are true perennials. Of the *Pleocaulus* species it has been reported that they flower once in every five to seven years, which would mean that the shoots produced during the first four to six years of the existence of the plant are all purely vegetative ones. Although it is not unthinkable that the plant might need this period to accumulate the necessary reserves for the production of flowers and fruits, this explanation does not look very convincing: at any rate, apart from the simultaneously flowering bamboos so far no other instances of such a behaviour appear to be known. The reports therefore want confirmation.

The majority of the *Strobilanthinae* with erect or suberect stem are monocarpic, i.e. they flower but once, and die when they have ripened their fruits. Several of these are known to grow gregariously, often covering large tracts in the undergrowth of the forest with a uniform mantle of foliage, and flowering after intervals of several years simultaneously and in great profusion. Already at the time of flowering the leaves are shed, and during the comparatively long period required for the ripening of the capsules, the naked shoots lend the site a peculiar wintry aspect, and as the forest so long as the plants were in flower was filled with the humming of the bees, it is now the scene of the depredations of numerous frugivorous birds. TRIMEN (in Handb. Fl. of Ceyl. III, p. 299,

<sup>7)</sup> As the term "perennial" is usually reserved for polycarpic plants whose aerial parts regularly die down, and as there exists apparently no name for monocarpic plants of the kind most often met with in the *Strobilanthinae*, I have introduced for them in my Latin descriptions the term "plantae plietesiae", i.e. plants living several years. As it seems desirable to have also a common name for plants showing this growth form, which in tropical and subtropical regions are by no means rare, I propose to call them in future "plietesials".

1895) describes how in the forest large tracts in which the plants are all in flower or in fruit alternate with others in which they are in various less advanced stages of development. The expression "simultaneous flowering" therefore would be applicable only to definite localities and not to the whole area occupied by the species. This might explain some of the discrepancies with which one is confronted in the reports concerning this phenomenon: part of them may be unreal, e.g. when one correspondent states that a certain species flowers once in several years, and another tells us that the same species flowers yearly, the inconsistency may be due to the fact that the first confined himself to the study of a single locality, whereas the other made his observations in different localities. Other discrepancies, however, are doubtless due to misidentifications: when the information is obtained from persons not sufficiently acquainted with the plants, the "identification" may often have been based on an unreliable vernacular name.

That other species behave in the same way as those studied by TRIMEN may be inferred from a statement of WATTS (l.c. p. 123), according to which *Apis dorsata*, the Wild or Rock Bee, is in India „most prevalent in localities where species of *Strobilanthes* abound, and is reputed to move from one locality to another with the somewhat spasmodic flowering of the plants", and from the discovery by the ornithologist BARTELS (cf. BACKER in Trop. Natuur VII, p. 21, 1918) of a Javanese finch, *Serinus Estherae*, which appears to be entirely dependent for its food on the seeds of the gregarious and simultaneously flowering *Strobilanthes* species: this, of course, is only possible when there is a continuous supply of these seeds, and that would be impossible if the fruiting was simultaneous throughout the whole area.

It is, of course, not certain that the simultaneous flowering occurring in a number of genera belonging to the *Strobilanthinae*, is everywhere of the same nature, but it may be taken for granted that the behaviour of the species in which it was studied by TRIMEN, is entirely different from that of the simultaneously flowering *Bambuseae*, for in the latter the phenomenon is not restricted to certain localities where plants showing exactly the same degree of development are growing together, but extends over the whole area occupied by the species and to individuals of different age and size, young plants grown from offsets flowering for instance at the same time as the stools from which the latter were taken (cf. SUESSENGUTH, Ueber die Blüteperioden der Bambusen, in Flora N.F. XVIII/XIX, pp. 503—535, 1925). However, if the flowering of the perennial *Pleocaulus* species indeed should prove to be periodical, it is possible that it will show similar features as that of the *Bambuseae*, which are also perennial plants, i.e. that it will be simultaneous for all individuals irrespective of their age and of the place where they are growing.

The length of the periods intervening between successive outbursts of flowering is probably not for all species the same, and the life cycle is therefore not always completed in the same time. The reported values vary between four and fourteen years. However, really reliable information is scarce, and it is therefore hardly worth while to discuss these data. On the whole, periods of six or seven years appear to be most common.

In some of the genera the two leaves inserted on the same node are unequal. This "anisophylly" had been noted already by NEES, and has been the object of a special study by FIGDOR (in Ber. d. D. Bot. Ges. XXII, p. 292, 1904; also: Die Erscheinung der Anisophyllie, Leipzig u. Wien 1909; further in Ber. d. D. Bot. Ges. XXIX, p. 549, 1911; and ibidem XXX, p. 134, 1912). In some instances, e.g. in *Microstrobilus paniculatus* (Nees) Brem. (*Goldfussia* Nees) and in *Echinopaepale javanica* Brem., the smaller leaves measure

but a few millimeters in length, and as they are moreover early deciduous, they are easily overlooked. In some other species the difference is on the contrary but slight, and between these two extremes all intergrades occur. The anisophylly, moreover, is a variable character; it is, for instance, always more pronounced in the spreading lateral shoots than in the erect or suberect main one. In some species of *Goldfussia* Nees not only the opposite leaves as a whole are unequally developed, but there is also in each of them a difference in size between the right and left sides. The midrib is also affected by this unequal development, and has become concave towards the smaller side. On plagiotropic shoots the leaves arrange themselves more or less in the same plane, the larger ones forming the two orthostichies on the lower side, and the smaller ones those on the upper side of the shoot; the latter are nearer to, and the others farther from each other than the corresponding orthostichies of a radially symmetric shoot. In asymmetric leaves, e.g. in those of *G. glomerata* Nees, the smaller sides are always turned towards the top of the shoot: the leaf mosaic which is formed in this way takes the fullest possible advantage of the available space (cf. fig. 309 in TROLL, *Vergl. Morph. d. höh. Pfl.* I, p. 399, 1937).

In many plants belonging to this group the underside of the leaves is purple. Such leaves are doubtless not uncommon in the *Acanthaceae*, but as the colour is in herbarium specimens no longer recognizable, and as the labels give but seldom information on this point, their distribution is not well known. In the *Strobilanthinae* they form a common, but not a general feature, for it is known that the leaves of some species are light green or almost white on the underside. In a few species, e.g. in the often cultivated *Perilepta Dyeriana* (Mast.) Brem. and in *Sympagis maculata* (Nees) Brem., the leaves are decorated with silvery or rosy patches on the upper side. This colour pattern has also been observed in young plants of *Strobilanthes cernua* Bl. (cf. HALLIER F. in *Bull. Herb. Boiss.* VI, p. 216, 1898). KOORDERS (Fl. v. Tjibodas III, 1, p. 132, 1918) mistook these immature plants for a new species, which he described under the name *Str. picta* Kds (cf. DOCTERS v. LEEUWEN in *Verh. Kon. Akad. v. Wet. Amsterdam, Tweede Sectie XXXI*, p. 264, 1933).

The leaves of *Baphicacanthus cusia* (Nees) Brem. (*Goldfussia* Nees) yield an indigo-blue dye, which however is not identical with indigo. Its exact composition is not yet known. The plant is extensively cultivated in Southern China, in various parts of Indo-China and in Assam, and its product is an important article on the East-Asiatic market. In some other *Strobilanthinae* too, blue discolorations have been observed, e.g. in *Perilepta Dyeriana* (Mast.) Brem. and in *Goldfussia anisophylla* Nees (cf. MOLISCH in *Sitzungsber. d. Kais. Akad. d. Wiss. in Wien CVIII*, Abt. I, p. 479, 1899), and also in *Hemigraphis alternata* (Burm.) T. And., but they are probably due to entirely different substances. My own attempts to isolate these pigments were unsuccessful.

Cystoliths are always present, and in herbarium specimens usually easily discernable; sometimes, however, they are blackened, and then they are more difficult to detect. They are always obclavate, and arranged parallel to the surface. On the upper side of the leaves they are usually more numerous and more conspicuous than on the lower side, but sometimes the situation is reversed; in scabrid leaves the setules, which are the cause of the scabridity, are not rarely surrounded by a whorl of radiating cystoliths. Shoots and petioles are, as a rule, also densely strewn with cystoliths, but an even greater density is observed in organs like bracts, bracteoles and calyces, i.e. in organs in which the development is arrested at a comparatively early stage.

The spici- or, more rarely, racemiform inflorescences are developed at

the end of the main shoot and eventually of its branches, and usually also from the axils of the upper leaves. It is also possible, however, that the shoots and branches produce, instead of single spikes or racemes, panicles consisting of spikes or racemes. In *Carvia callosa* (Nees) Brem. and in the *Didyplosandra* species of the Indian Peninsula the inflorescences are found at the end of axillary short-shoots; in the latter on the defoliated part of the branches and in *Carvia* in the axils of persisting leaves. It is said, however, that here too inflorescences are occasionally found at the end of ordinary shoots. The inflorescences themselves may be elongated or abbreviated. The first are always more or less erect, but the abbreviated ones may also be cernuous. The latter occur e.g. in the genus *Strobilanthes* Bl. emend. Brem., in *Taenian-dra* Brem., in several species of *Nilgirianthus* Brem. etc.

When the inflorescences are long and slender, the bracts are usually small and often early deciduous; in abbreviated spikes they are on the other hand usually large and persistent, and these large bracts are not rarely showy, i.e. partly or entirely coloured or white. Reliable information on this point, however, is rare. The lowest pair of flowers are sometimes subtended by ordinary or somewhat reduced leaves or by bracts in which the lamina of the ordinary leaf is still plainly recognizable. A vestige of this lamina may sometimes be found at the top of the other bracts, which proves that the bract itself represents the leaf base.

Bracteoles may be present or absent. In shape and texture they are as a rule similar to the calyx segments. When the bracts are larger than the latter, the bracteoles are in shape and size often intermediary between them, but when the bracts are shorter than the calyx, the bracteoles are usually still shorter. Exceptions to these rules, however, are not rare: in genera in which the bracteoles are as a rule well developed, for instance, occasionally species are met with in which they prove to be absent or greatly reduced.

Each of the bracts subtends a rule a single flower, but in some genera, e.g. in *Triaenacanthus* Nees, one of the two bracts inserted at the same node is always sterile, and in the axils of the lower and uppermost bracts the flowers are often imperfectly developed or wanting. In *Hemigraphis* Nees the flowers are not rarely superposed instead of single. They are inserted in radial rows on the more or less patent bases of the bracts. When two flowers are developed, the inner one is the elder; when there are three, the oldest one occupies the place in the centre of the row, and the youngest one that between the latter and the axis of the spike: the development of the latter therefore brings no change in the relative position of the older ones. In the axil of the lower pair of bracts of the strongly abbreviated spikes found in the nearly related genus *Gantelbua* Brem. the inner or elder flower is, as I have mentioned already, replaced by a secondary spike. In the spikes of *Stenosiphonium* Nees and in those of *Sericocalyx sumatranus* Brem. and *Difflugossa ovatifolia* Brem. the majority of the flowers are arranged in triads consisting of an ebracteolate central flower and bracteolate lateral ones: in these plants the rudimentary buds in the axils of the bracteoles develop into flowers.

The calyx is always distinctly pentamerous: the pseudo-tetramerous condition, which in the other subtribes of the *Ruellieae* is not rarely met with, and which owes its origin to the complete or almost complete fusion between the two anticous lobes, is in the *Strobilanthinae* entirely unknown. The incisions between the calyx segments are nevertheless not always of equal depth. When they are unequal, the three posticous segments are usually united into a trilobate or trifid upper lip, whereas the two anticous ones may be either almost entirely free (NEES speaks in this case of a tripartite calyx) or united in a bifid or bilobate lower lip. If the anticous segments are almost entirely free, the median

incision is, as a rule, deeper than the incisions between them and the lateral segments, but when they are united in a bifid or bilobate lower lip, the incisions between the latter and the lateral segments are always deeper than the other ones, and in this case the calyx therefore is truly bilabiate. The segments themselves too may be more or less distinctly unequal, and then the median or posticous segment is, as a rule, larger than the others; the latter themselves may also be unequal, and in that case the lateral ones are the smallest of all. In *Adenostachya* Brem. and *Pleocaulus* Brem. the situation is reversed, for here the median or posticous segment is smaller than the other ones. In *Dossifluga* Brem. it is smaller than the anticous segments but larger than the lateral ones.

The corolla consists always of a cylindrical tube, which widens into a campanulate or infundibuliform throat, and of five subequal, in the bud sinistrorsely or, as I prefer to call it, helictically<sup>8)</sup> contorted lobes. The tube is always white, and as a rule shorter than the widened throat, but the relation may also be reversed; throat and lobes are usually white or tinted with various shades of blue or violet; in a few species they have been described as purplish or even as red, and in some genera they are yellow. The white and pale violet flowers are sometimes sprinkled with yellow bristles or marked with yellow or red nectar guides.

At the place where the tube widens into the throat, the corolla is not rarely more or less sharply recurved. When the corolla is strongly curved, it always becomes resupinate, but the resupination may also be present when the bend is but weak. The inversion is as a rule effected by a torsion of the tube, but when the corolla is but slightly curved, it is sometimes, as GOEBEL (*Die Entfaltungsbewegungen der Pflanzen*, Jena 1920, p. 245; 2nd Ed. Jena 1924, p. 306) already pointed out, accomplished by a simple curvature. The resupination is a geonastic reaction which is carried out when the corolla has already reached an advanced stage in its development. Its induction depends on the position which the flower occupied shortly before: when the spike at that time occupied a more or less normal position, the reaction will never be in abeyance, but if, for some reason or other, the spike occupies a horizontal or strongly inclined position, the corolla will, as a rule, merely curve upwards. The result, however, is always the same: when the flower opens, the posticous side of the corolla is turned downwards and the anticous side upwards.

Where the bend between tube and throat is absent or but weakly indicated, the corolla may easily be taken for actinomorphic. However, here as elsewhere in the family, the zygomorphism reveals itself in the arrangement of the main nerves. In the tube the latter are already brought together in the posticous half, which contains therefore four of the five segments, and this unequal development of the segments is even more pronounced in the lower part of the throat. As the principal function of the main nerves doubtless lies in the food supply of the androecium, it is obvious that the shifting of the latter to the posticous side and the zygomorphism of the corolla must be regarded as closely related phenomena.

The presence of two ridges descending from the outer stamens and dividing the corolla tube in a posticous and an anticous channel, of which the first

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<sup>8)</sup> I use the terms "helictic" and "antihelictic", derived from the word helix = screw, for torsions in the direction, respectively contrary to the direction, of the corkscrew, and also for spirals coiled in the direction, respectively contrary to the direction, of the spiral observed at the top of the corkscrew (not, of course, of that one which would be seen when one could look through the corkscrew in the direction of the top, for the latter would be the reflected image of the first). These terms seem to me more convenient than "clockwise" and "anticlockwise" and far better than the terms "right" and "left", which depend on the position of the observer inside or outside the torsion, and have for a long time been a source of confusion.



contains the style, and the presence on the posticous side of the throat of two bundles or rows of bristles, by which the style, when it emerges from its channel, is retained, have been mentioned already. The channel is often extended into a shallow groove running between the two rows of bristles. LINDAU (in ENGL. u. PRANTL, Nat. Pflanzenfam. IV, 3 b, p. 278 et 345, 1895) noted the presence of a similar groove, for which he introduced the name "rugula", in various *Odontonemeae* and *Justicieae*, but so far no sufficient attention has been paid to its distribution in the family.

The androecium is inserted at the posticous side of the corolla throat a little way above the latter's base. Most often it consists of four stamens, each provided with a ditheous anther. When the stamens are included, the filaments of the outer ones are always distinctly longer than those of the inner ones, and their anthers inserted above those of the latter, and sometimes slightly larger than these, but this difference between the outer and inner stamens becomes as a rule inconspicuous, when they are all exerted. The two inner ones may also be replaced by clavate or filiform staminodes, and in the genera *Phlebophyllum* Nees and *Pseudostenosiphonium* Lindau they are completely suppressed. A small triangular or oblong lobe sometimes indicates the place of the missing fifth stamen, but it is by no means always recognizable. Occasionally it develops into a fertile stamen of the same size and shape as the two inner ones: I have observed this in a flower of *Hemigraphis repanda* (L.) Hall. f., and BEDDOME (Ic. Pl. Ind. Or. I, Tab. 225, 1874) has observed and figures a similar teratological case in a plant which he thought to be *Strobilanthes adenophora* Nees, but which is in reality a different species: I have named it *Nilgirianthes Beddomei* Brem.

The four filaments are united at the base in a short, on the anticous side completely open tube. The odd staminode is inserted on the latter's rim; when it is absent, the rim is in the middle sometimes emarginate. In *Hemigraphis* Nees the tube is at the back often reduced to a mere ridge. The rim of the tube is sometimes ciliate, and in the genus *Strobilanthes* Bl. emend. Brem. its whole upper part is densely bearded. As the rim as a rule slopes towards the anticous side, the outer stamens are often inserted at a lower level than the inner ones. Between the two inner stamens the tube is always but short, but between the inner and the outer ones it expands into the two ridges which extend downwards along the wall of the tube to the top of the ovary. These ridges are usually ciliate, and they protrude so far into the interior of the tube that their cilia overlap. Upwards the rows of cilia extend as a rule over the lower part or over the whole length of the outer filaments. In the genus *Hemigraphis* Nees the filaments of the outer stamens are sometimes, e.g. in the type species, in the upper part longer and more densely ciliated than lower down, and it is to this "brush" that the genus owes its name: "*Hemigraphis*" means "for one half a brush". NEES thought that the thecae were inserted one below the other, and that the lower one had been changed into the "brush"; in reality, however, the thecae are inserted at the same height, and both are normally developed. In the genus *Pteroptychia* Brem. the ridges show on the outside a longitudinal winglike expansion. The ridges may be of some importance in the ecology of the plant, because they make it more difficult for the nectar to flow out of the corolla, when the flowers are shaken, and because the capillary suction of the nectar retained in the narrow channel, will help to restore losses when the flowers have been visited by insects.

When the stamens are exerted, the anthers are usually horizontal, and at the same height above the entrance to the throat; as the outer stamens are always inserted at a lower level than the inner ones, their filaments are nevertheless slightly longer. In all other instances the stamens are distinctly

didynamous. The filaments of the outer stamens, which are always the longer ones, are almost always erect, but those of the inner ones are in some genera slightly inclined, and in others strongly incurved. As the inner stamens are always inserted behind the outer ones, the inclination or incurvation brings their anthers more or less in the same vertical plane as those of the outer ones. When the inner stamens are merely inclined, all four anthers are erect and arranged in such a way that the lower ones reach with their top the base of the upper ones. When the inner stamens are strongly incurved, they are always very short, and their anthers nearly orbicular: by the incurvation the latter reach a horizontal position, and by a torsion of the filaments they come to face each other. The longer stamens are in these cases slightly unequal, so that their anthers, which are of the same shape as those of the inner ones, and are brought by a similar device in a horizontal position, are just one above the other. As this arrangement was first observed in the genus *Goldfussia* Nees, and as the latter is the most important of those in which it occurs, it will hereafter be called the *Goldfussia*-position.

As stated above, the anthers are always dithecous and dorsifixed; the erect ones are always elongated and at the base distinctly two-lobed; the horizontal ones are usually shorter and at the base but indistinctly two-lobed. In the oblong or linear-oblong anthers the connective is sometimes produced in a mucro or awn. The thecae are usually equal, parallel, inserted at the same height, and obtuse at the base. In the genus *Hemigraphis* Nees one of the thecae may be slightly pointed at the base: this inequality, however, is so slight that it is easily overlooked. In the elongated anthers the thecae are not rarely laterally flattened, and such anthers have occasionally been described as monothecous. In the suborbicular anthers, on the other hand, the thecae are always dorsiventrally flattened and spreading.

The pollen of the *Strobilanthinae* shows a wide range of variability (Tab. I—III). Apart from the four points in which all *Ruellieae* agree, they have but one character in common: the germ pores are always equatorial; but as this applies to most of the other subtribes too, and in fact to the large majority of the *Acanthoideae*, the value of this character is but slight.

The number of germ pores is nearly always the same, namely three. Occasionally a few grains provided with four pores may be met with in species in which normally three are present, but species in which four is the normal number are in this subtribe unknown to me. Two pores are found in the pollen of *Lissospermum pedunculatum* (Miq.) Brem., but that of the "*Strobilanthes*" and *Hemigraphis* species from the Malay Peninsula, to which CLARKE (in Journ. As. Soc. Beng. l.c.) ascribed diporous pollen, proved everywhere where material for a reinvestigation was available, triporous. Five pores were met with in *Pteroptychia Ridleyi* (Merr.) Brem. (*Strobilanthes Ridleyi* Merr. n. nom.; *Str. anceps* Ridley non Nees) (Tab. III A). As this was the only *Pteroptychia* species whose pollen I could investigate, I am unable to decide whether these five pores should be considered a general character of the genus or a peculiarity of this particular species.

The form of the pollen grains is either ellipsoidal or globose. The ellipsoidal ones, which are far more common than the globose ones, are always banded, but the bands themselves show a wide range of variability: they may be smooth, finely punctate, marbled, carunculate, echinulate, costate or septate. The globose grains are either banded or echinulate or both, in which case each of the bands bears a single row of spinules; in *Tarphochlamys affinis* (Griff.) Brem. (Taf. III B) they are faintly reticulated, and inside the wide meshes of the reticulum provided with rings of spinules; where the bands are not provided with spinules they are either septate or, by the entire suppression of the transverse ridges,

reduced to the not rarely somewhat wavy rim. In the genus *Hemigraphis*, where the grains are as a rule ellipsoidal and provided with smooth, finely punctate or granulate bands, one species was met with, *H. fruticulosa* Clarke, where they are globose: the bands of these grains are finely punctate. The diporous grains of *Lissospermum pedunculatum* (Miq.) Brem. are ellipsoidal and provided with septate bands; the pentaporous ones of *Pteroptychia Ridleyi* (Merr.) Brem. subglobose, banded and echinulate. When the echinulate pollen grains are neither banded nor reticulate, the position of the spinules is determined by the law of probability. On a flat plane this would mean that each was surrounded by six others standing at the angles of a regular hexagon, but on a spherical surface this arrangement is, of course, impossible, and here some of the spinules are surrounded by five instead of six others: irregularities, however, are not rare.

The pistil is always raised on a discoid or shortly cylindrical gynophore or torus, slightly larger in diameter than the ovary: it is usually designated by the name "disk", though it is perhaps better to reserve that term for organs that are more or less free from the pistil. Where the ovaries contain three or more ovules in each cell, and where they are therefore more or less elongated, the torus is as a rule discoid, but where the ovary cells contain not more than two ovules, and the ovary remains short, the torus is usually cylindrical.

The number of ovules in each cell varies between one (*Lamiacanthus* O. Ktze; some species of *Mackenzia* Nees emend. Brem.) and eight (some species of *Hemigraphis* Nees). In *Lamiacanthus* the fertile ovule is sometimes accompanied by a rudimentary one, and then the latter is always inserted below the fertile one. In *Strobilanthes* Bl. emend. Brem. this is the normal condition. In most of the other genera the ovary cells contain two equally developed ovules. In *Sericocalyx* Brem. and in *Gutzlaffia* Hance the number varies between two and four, but is for each species constant. In *Hemigraphis* Nees it varies in the same manner between three and eight.

The ovary is not rarely comose. The hairs of which this tuft consists are as a rule similar to those covering the style, i.e. sometimes capitate and sometimes ecapitate. When they are ecapitate, those on the top of the ovary are, however, somewhat stiffer than those on the style, and point upwards, whereas the hairs on the style are always spreading.

The peculiar shape and the irritability of the stigma have been discussed already.

The pollination of the flowers is apparently mainly effected by *Hymenoptera*. WATTS (The Commercial Products of India, p. 123, 1908) informs us: "It seems to be generally upheld in India that bee-culture is impossible in regions where species of *Strobilanthes* do not abound." Of *Apis dorsata*, the Wild or Rock Bee, he says: "It would seem to be most prevalent in localities where species of *Strobilanthes* abound, and it is reputed to move from one locality to another with the somewhat spasmodic flowering of the plants on which it seeks for its supply of honey." DOCTERS VAN LEEUWEN (Verh. Kon. Akad. v. Wet. Amsterdam, 2e Sectie XXXI, pp. 263—265, 1933) mentions as visitors of *Str. cernua* Bl. *Bombus rufipes* and *Apis indica*, and of *Str. involu-crata* Bl., i.e. *Pachystrobilus involu-cratus* (Bl.) Brem., *Bombus rufipes*.

The capsules vary in shape and size, and also in the mode of dehiscence. When a large number of seeds is present, the capsules are always more or less prismatic: two sides of the prism are formed by the backs of the valves, which are always thickened and either flat or slightly concave, and the other sides by the thin, more or less convex side-flaps. Four-seeded capsules are often fusiform, but where the seeds are inserted more or less at the same height, as in some species of *Mackenzia* Nees emend. Brem. and of *Leptacanthus* Nees,

or where their number sinks down to two, as in *Strobilanthes* Bl. emend. Brem., *Lamiacanthus* O. Ktze, most species of *Parastrobilanthes* Brem., *Carvia* Brem. and some species of *Mackenzia* and *Leptacanthus*, the capsule becomes elliptic in outline. These elliptic capsules differ also in their mode of dehiscence: by the elastic stretching of the strongly curved back the side-flaps are at the moment of dehiscence severed from the latter by rents beginning at the base. BLUME considered this mode of dehiscence, which is similar to that observed in *Blechum* Juss., *Phayloopsis* Willd., *Petalidium* Nees, *Dicliptera* Juss. and *Rungia* Nees, as a general character of all the species referred by him to *Strobilanthes*, but this is not so: in reality it is confined to those possessing two seeds per capsule.

The retinacula are always strongly developed, and either evenly bent and appressed over their whole length against the margin of the seed, or produced in a short awn. If they are entirely appressed, the top is sometimes shortly forked or bidentate.

The seeds (Tab. IV—VI) are orbicular or ovate in outline, sometimes more or less unequal at the base, and obtuse or acute at the top. Laterally they are always distinctly compressed, and some might be described as flat. The surface is either entirely glabrous or, more often, partly or almost entirely covered with hairs. The occurrence of glabrous seeds in this subtribe is noteworthy, because such seeds are found nowhere else in the *Ruellieae*. If the surface is but partly covered with hairs, it is always a more or less circular space at the base, the so-called areola, which is left vacant. The cells of the areola are, even apart from the absence of hairs, always entirely different from the other cells, for in contradistinction to the latter, which are always thin-walled, they are sclerenchymatous. The same two kinds of epidermis cells are also seen in some of the glabrous seeds, and these seeds too are therefore to be considered areolate (Tab. VI F). The seedcoat of other glabrous seeds, however, possesses but one kind of epidermis cells, and then the latter are always sclerenchymatous (Tab. IV F; Tab. VI A, B): these seeds, therefore, are provided with an areola extending over the whole flat side. To call these seeds exareolate, as CLARKE (in Hook. f., Fl. Brit. Ind. l.c.) and others have done, is apparently a misnomer: truly exareolate are only those seeds which are entirely covered with hairs. The seedcoat of the glabrous seeds with areolae extending to the very margin, is always easily separated into two halves, either because at the margin a strip of thin-walled cells are found that are easily torn, or else because the thick-walled cells are arranged in such a way that they do not cross the margin. The areola is always white, or nearly white, and shining, but the circumareolar part is always dull and not rarely yellowish or brown. This is due to the presence of a coloured resin in the cells of the epidermis. In some genera the walls of the circumareolar cells are strengthened by the same kind of annular or spiral thickenings which is found in the hairs.

The hairs on the testa show a wide range of variability. They may be classed in three main groups: thin-walled ones whose walls are usually provided with annular or spiral thickenings (Tab. IVA, C, D, E; Tab. VI E), stiff and usually pointed thick-walled ones possessing a fairly large lumen (Tab. VE, F), and very long and thin undulating ones whose walls are so strongly thickened that the lumen has almost disappeared (Tab. VI H). The stiff thick-walled hairs are as a rule but slightly hygrometric, the only part of them which reacts to changes in humidity being the less strongly thickened base, but the long and thin undulating hairs and the majority of the thin-walled ones react powerfully, and although in dry seeds often hardly conspicuous, they form a thick white layer in water. The thin-walled hairs are sometimes filled with slime, which swells in water, and is set free by the disconnection of the hairs.

More often, however, these hairs are not mucous. That the seeds nevertheless stick to objects with which they come into contact, is probably brought about in this way: in swelling the hairs carry out various movements by which they penetrate in crevices of the surface of such objects, but in shrinking they are unable to free themselves. This at least would explain why they do not adhere to perfectly smooth surfaces. The movements of the thin-walled hairs are due to changes in the water or slime content of the lumen; it are so-called cohesion movements, for when the water evaporates, the thin wall between the annular or spiral thickenings is drawn inwards, and when water is absorbed, the wall stretches itself elastically. The movements of the undulating hairs are due to the swelling or shrinking of the thick wall, and are therefore imbibition movements. These hairs are always spirally flattened, which helps to loosen the tightly packed mass of hairs when the latter begin to swell. The thin-walled ones are also as a rule distinctly flattened. The movements of the hairs on the seedcoat of *Mackenzia* (Tab. IV G) are accomplished by the aid of a very peculiar mechanism which I have not seen anywhere else. These hairs are long, straight and thick-walled and form therefore a class of their own, and the cells from which they arise are just above their insertion provided with a tubercular thickening of the outer wall, which fits into a corresponding cavity at the base of the hair: it is by the swelling of this prominence that the hairs are moved. In the genus *Ditrichospermum* Brem. (Tab. V A) two kinds of hairs are found on the seedcoat: very small ones with annular thickenings on the circum-areolar part, and slightly larger and stiffer ones arising from the marginal cells of the areola. In *Baphicacanthus* Brem. (Tab. VB) the hairs are thick-walled, but so small that they are easily overlooked.

In the simultaneously flowering gregarious species the seed production is often enormous, and is known to attract in India as well as in Java large flights of frugivorous birds. A similar phenomenon has been observed in the vicinity of Rio de Janeiro, where the once in several years simultaneously fruiting *Bambuseae* attract large flights of small pigeons; elsewhere in South America the periodical fruiting of these plants is known to lead to an enormous increase in the number of rats and mice (cf. SUESSENGUTH, Ueber die Blütenperioden der Bambuseen, in Flora N.F. XVIII/XIX, pp. 519—522, 1925).

The *Strobilanthinae* are confined to Asia and the adjoining part of Oceania, where it is represented by a few species belonging to *Hemigraphis*. That BENTHAM's African *Strobilanthes* species, which CLARKE referred to his new genus *Acanthopale*, do not belong to this subtribe is easily shown: the style is not retained against the wall of the corolla by rows or bundles of bristles, the filaments are united in pairs and not in a single group, the pollen grains are provided with eight or more pores evenly spread over the whole surface, and the stigma is not laterally but dorsiventrally flattened. The *Strobilanthes* species recorded from Madagascar too belong elsewhere: *Str. madagascariensis* Baker to *Acanthopale*, *Str. isoglossoides* Lindau to *Mimulopsis*, and *Str. hispida* Baker (according to BENOIST) to *Dyschoriste*; of the two other species the exact position could not yet be determined. The three African species which CLARKE (in Fl. Trop. Afr. V, p. 56, 1899) referred to *Hemigraphis* can not belong to this genus either, for their inflorescences are described as axillary, their calyx segments as nearly free, their stamens as about equal in length, and their pollen grains as globose. The axillary inflorescences prove moreover that they do not belong to the *Strobilanthinae*. I have not yet seen these plants, but judging from the descriptions I think that they will belong either to *Synnema* Benth. or to some genus in the latter's vicinity.

The main conclusions of this chapter are summarized in the following Latin diagnoses of the *Ruellieae* and of the *Strobilanthinae*.

**Ruelliae** sensu auctoris tribus *Acanthoidearum* a tribus aliis qui cystolithis et polline porifero instructae sunt corollae loborum aestivatione plerumque contorta et si imbricata lobo mediano numquam externo, staminibus basi aut per paria aut omnia connatis, antheris staminum exteriorum vel omnium dithecis, polline globoso vel ellipsoideo et alveolis, fissuris aequidistantibus vel spinulis ornato, stigmate numquam capitato, seminibus nec carunculatis nec rugosis, madefactis saepe mucosis distinguenda.

Caules ramique articulati, plerumque quadrangulares. Epidermidis cellulae nonnullae cystolithis clavatis instructae. Corollae loborum aestivatio plerumque helictice (sinistrorsum sensu EICHLERI) contorta; si imbricata lobo mediano numquam ut in *Odontonemis*, *Herpetacanthaeis*, *Justicieis* externo. Stamina faucibus corollae inserta, filamentis basi per paria vel in symplegma singulum connatis et utroque latere in tubo decurrentibus; antherae staminum omnium vel exteriorum saltem dithecae. Granula pollinis semper porifera, satis magna, globosa vel ellipsoidea, superficie fissuris tribus vel pluribus aequidistantibus, alveolis polygonalibus vel spinulis ornata. Stigma lobis vel ramulis plerumque inaequalibus, posteriore plerumque minimo, anteriore elongato, numquam capitatum nec obscure bilobatum. Semina saepe margine vel fere tota pilis unicellularibus plus minusve hygrometricis et madefactis haud raro mucosis vestita, interdum tamen glabra, sed numquam carunculata nec rugosa.

Distributae in mundi totius regionibus calidioribus.

**Strobilanthinae** Brem. *Ruelliarum* sensu supra definito subtribus nova a subtribus aliis et setulorum seriebus vel fasciculis duobus infra incisuram inter corollae lobos posticos ad stylum retinendum dispositis, et filamentis basi in tubum brevem, facie antica apertum connatis, et ramulo receptivo stigmatis a latere compresso diversa; a subtribu *Petalidiinarum*, ad quem polline plerumque virgis pluribus ornato maxime accedit, semper et inflorescentiis pro parte saltem terminalibus et spici- vel anguste racemiformibus, numquam axillaribus solum nec dichasialibus, et polline poris germinativis numquam in virgis sed semper inter virgas vel spinulorum series insertis certe distinguenda.

Folia ad nodum eundem inserta aequalia vel inaequalia, lamina interdum asymmetrica. Inflorescentiae terminales et interdum insuper axillares, nunc solitariae, nunc racemose vel paniculatim dispositae, plerumque ad apicem caulis et ramulorum eo similiorum evolutae, raro a brachyblastis e parte novella vel parte defoliata caulis et ramulorum orientibus elatae, spici- vel anguste racemiformes, elongatae vel abbreviatae. Bractee variae, persistentes vel deciduae. Bracteolae duae vel nullae. Flores in axillis bractearum plerumque solitarii, interdum duo vel tres superpositi, raro in triades dispositi. Calyx 5-merus, plerumque 5-fidus vel 5-partitus; segmenta aequalia vel inaequalia, postica interdum in labium superius 3-lobatum vel 3-fidum, antica eodem tempore in labium inferius 2-lobatum vel 2-fidum connata vel sublibera. Corolla tubo albo, faucibus lobisque albis, coeruleis, violaceis, rarius purpurellis vel rubris (?), luteis, faucibus intus facie antica interdum luteo- vel rubro-notis vel pilis luteis sparsis, inter tubum et fauces haud raro recurvata, casu quo semper resupinata; tubus teres, intus a plicis lateralibus, plerumque ciliatis et in cavernam tantum eminentibus ut cilia sese tegunt, in canales duas divisus, quarum posterior stylum continet; fauces campanulatae vel infundibuliformes, facie postica seriebus vel fasciculis duobus pilorum ad stylum retinendum et inter pilos haud raro sulco longitudinali (rugula) munitae, rarissimo totae glabrae; lobi 5 aequales vel subaequales, ovati, suborbicularis, obovati, obcuneati vel obcordati. Stamina plerumque 4, exserta vel inclusa, omnia fertilia vel interiora ad staminodia filiformia vel clavata redacta, raro 2, interdum staminodio impari comitata, filamentis omnibus basi in tubum brevem, facie antica apertum connatis; tubus

staminalis ad faciem corollae posticam adnatus, corollae tubo in forma plicarum duarum, plerumque ciliatarum decurrens, facie postica interdum ad lineam transversam redactus; filamenta staminum exteriorum fere semper erecta, saepe ciliata; filamenta staminum interiorum si exteriorum subaequalia erecta, si paulo breviora inclinata, si multo breviora incurvata; antherae semper dithecae, dorsifixae, nunc erectae casu quo semper elongatae, basi bilobatae, apice interdum mucronatae vel rarissimo aristatae, nunc horizontales casu quo semper suborbiculares. Staminodium impar breviter triangulare vel oblongum, margine tubi staminalis insertum; staminodio absente tubus staminalis dorso interdum emarginatus. Granula pollinis globosa vel ellipsoidea, virgata vel echinulata; pori germinativi plerumque tres, rarissimo duo vel quinque, equatoriales et semper inter virgas vel spinulorum series inserti; granula globosa aut virgata aut echinulata; si virgata, virgae plerumque septatae vel ad marginem plus minusve undulatam redactae, rarissimo punctatae; granula ellipsoidea semper virgata sed virgae variabiles: nunc leves, minute punctatae, marmoratae, granulatae, carunculatae vel echinulatae, nunc septatae. Torus discoideus vel cylindricus, glaber. Ovarium plerumque pilis capitatis vel setulis comosum, interdum dimidio superiore puberulo-pubescent, raro totum glabrum, utroque loculo ovulis 1—8. Stylus nunc glaber, nunc pilis capitatis vel ecapitatis hirtellus. Stigma ramulo postico fere ad nihilum redacto, antico elongato, a latere compresso, facie interna sulcato et sulco pilis receptivis longis expleto. Capsula prismatica, fusiformis vel ambitu elliptica, valvis dorso incrassatis et applanatis vel concavis, lateribus tenuibus capsularum ambitu ellipticarum in dehiscentia a basi descendibus, seminibus 2—16, retinaculis hamatis nunc omnino ad semina appressis casu quo apice interdum bi- vel tri-dentatis, nunc recte et acute exeuntibus. Semina complanata, interdum areolata; areola e cellulis sclerenchymaticis composita, albida et nitens, nunc parva, nunc usque ad marginem extendens; zona circumareolaris plerumque pilosa, semper opaca et haud raro brunnea vel luteo-brunnea; pili nunc pariete tenui, plerumque annulata vel spirali firmata, nunc rigidi et plerumque acute exeuntes, nunc longissimi et undulati; pili annulati interdum mucosi.

Distributae in Asia Aequatoriali et Subaequatoriali, Nova Guinea, Oceania et Australia Calidiore.

Numerus specierum ad 400 computandus.

Genus typicum *Strobilanthes* Bl. emend. Brem.

## II. The subdivision of the *Strobilanthinae* Brem.

Although the *Strobilanthinae* were up to now not recognized as a separate unit, the near affinity of their genera has nevertheless not passed unnoticed.

In NEES'S revision of the Indian *Acanthaceae* in WALLICH, *Plantae Asiaticae Rariores* III, 1832, they form the genera XIV to XXI, XXIV and XXXIV. XIV. *Ruellia* sensu Nees (now *Hemigraphis* Nees emend. T. And.), XV. *Phlebophyllum* Nees, XVI. *Buteraea* Nees, XVII. *Adenacanthus* Nees, XVIII. *Stenosiphonium* Nees, XIX. *Strobilanthes* Bl., XX. *Aechmanthera* Nees, XXI. *Goldfussia* Nees, and XXIV. *Leptacanthus* Nees are included in the *Ruellieae*, and XXXIV. *Endopogon* Nees in the *Justicieae*, and this genus was therefore the only one whose affinity was seriously misunderstood. This mistake was corrected by NEES himself in his monograph of the family in DE CANDOLLE'S *Prodromus* XI, 1847.

On p. 75 of the revision the *Ruellieae* are according to the "degree of perfection" reached by the inflorescences divided in four "grades". In the first "grade" the flowers are axillary with a tendency to arrange themselves in spikes: this condition should occur in the genera XI. *Dyschoriste* Nees, XII.

*Dipteracanthus* Nees and XIII. *Petalidium* Nees. In the second "grade" the flowers are arranged in spikes provided with large, tightly packed bracts: this is the type of inflorescence which NEES considered characteristic for the genera XIV to XXI, i.e. for those that now form the larger part of the *Strobilanthinae*. In the third "grade" the spikes are longer, the bracts smaller and the flowers moreover, as a rule, secund: such inflorescences occur, according to NEES, in the genera XXII. *Asystasia* Bl. and XXIII. *Echinacanthus* Nees. In the fourth "grade" the inflorescence has become laxly paniculate: this degree of perfection is reached only in the genus *Leptacanthus*. The *Strobilanthinae* are therefore confined to the second and fourth groups, and in these groups no representatives of other subtribes are included!

The intercalation of the third "grade" is, of course, an awkward predicament. That *Asystasia* was included here, should however not surprise us too much, for the characters on account of which it is now referred to another tribe: the aestivation of the corolla lobes, the structure of the pollen grains and the texture of the seedcoat, were at that time either entirely overlooked or at least insufficiently appreciated, and it must be admitted that these plants with their narrow racemes of subregular flowers are habitually not unlike some of the *Strobilanthinae*: in fact, some of them were like several *Hemigraphis* species originally referred to *Ruellia*. Why *Echinacanthus* was included by NEES in the third "grade", is more difficult to see, for although this genus belongs to the *Ruellieae*, its inflorescence is totally different from that which NEES considered characteristic for this "grade". It is namely not like that of *Asystasia* of the racemose kind but consists of cymes. The two genera brought together in the third "grade" belong therefore elsewhere.

In later years NEES apparently lost his faith in the classificatory value of the "degree of perfection" reached by the inflorescence, for in his monograph the classification of the *Ruellieae* is based on entirely different principles.

In the monograph the *Ruellieae* are according to the size and shape of the calyx lobes divided in two main groups, of which the first comprises what I consider the true *Ruellieae*, and the second the *Trichanthereae* and *Whitfieldiae*. For the subdivision of the true *Ruellieae* use has been made of the number of fertile stamens, a character which may vary, as subsequent investigations have shown, within the confines of a single genus, and is therefore inappropriate for the distinction of major groups. In our case too it showed its inadequacy, for in this way part of the genera belonging to the *Strobilanthinae* strayed to the first subdivision, and part to the second.

The first subdivision comprises but three genera: XXIII. *Phlebophyllum* Nees, XXIV. *Codonacanthus* Nees and XXV. *Endopogon* Nees, of which the first and the last, as stated already, belong to the *Strobilanthinae*. The insertion of *Codonacanthus* at this place was a mistake; it is now known that this genus does not belong to the *Ruellieae* at all: the corolla is more or less distinctly bilabiate, and the aestivation of its lobes imbricate, the stamens are inserted at the base of the corolla tube, its pollen is smooth, and the stigma shortly bilobate.

In the second subdivision were placed: XXVI. *Stenosiphonium* Nees, and after a long interval: XXXIII. *Ruellia* sensu Nees, i.e. *Hemigraphis* Nees emend. T. And., and after a second interval: XXXVIII. *Triaenacanthus* Nees, XXXIX. *Leptacanthus* Nees, XL. *Aechmanthera* Nees, XLI. *Goldfussia* Nees, XLII. *Strobilanthes* Bl., XLIII. *Buteraea* Nees and XLIV. *Adenacanthus* Nees. NEES's description of the genus *Hemigraphis* is found among the "Addenda et Corrigenda" at the end of the volume. It is assigned a place between XXXII. *Dipteracanthus* Nees and XXXIII. *Ruellia*, but from the context it is plain that NEES regarded it as nearly related to the latter. Actually, the characters on account of which it was separated from *Ruellia*: the resupinate corolla, mono-



thecous anthers and echinulate seeds, have all proved chimeric. Since it is now known that the anthers are all dithecous, his supposition that the tufts of hairs below the anthers of the outer stamens would represent aborted thecae, is of course no longer tenable: these tufts are merely a special development of the rows of cilia which in this subtribe often fringe the filaments of the outer stamens and form the continuation of the cilia on the spurs descending in the corolla tube.

The position of *Stenosiphonium* at the head of the second subdivision is probably due to the circumstance that one of the species which NEES included in this genus, *St. diandrum* Nees, is provided with two instead of four fertile stamens, and further to a supposed affinity with *Endopogon*. This notion rested doubtless on the presence in both genera of species which, on account of their echinulate pollen, have since been removed to *Pseudostenosiphonium* Lindau: *Stenosiphonium diandrum* was one of these. Afterwards other species provided with but two fertile stamens were found, which proved to be true representatives of *Stenosiphonium*, so that this genus may still be quoted as one of those whose existence disproves the view that the number of fertile stamens may be regarded in this tribe as a suitable character for the delimitation of major groups. Other genera with a variable number of stamens belonging to the *Strobilanthinae* are *Nilgirianthus* Brem. and *Difflugossa* Brem.

The interpolation of the genera XXVII to XXXII between *Stenosiphonium* and *Hemigraphis*, and that of the genera XXXIV to XXXVII between *Ruellia* sensu Nees and *Triaenacanthus* is at first sight rather astonishing. The genera XXVII, *Dyschoriste* Nees, XXVIII, *Calophanes* Don, XXIX, *Homotropium* Nees, XXXI, *Petalidium* Nees and XXXVI, *Echinacanthus* Nees belong to the *Petalidiinae*; XXX, *Fabria* Mey. and XXXII, *Dipteracanthus* Nees to the *Ruelliinae*; and XXXIV, *Crabbea* Harv. to the *Barleriinae*: a closer investigation reveals that in all these genera the flowers are either axillary or arranged in axillary cymes. It appears therefore that the mistake made by NEES in mixing these genera with those belonging to the *Strobilanthinae*, may be ascribed to the circumstance that the value which in the classification of the *Ruellieae* should be assigned to the cymose and racemose types of inflorescence, was now underrated by him: in his earlier work he had, as we have seen, assumed an entirely different attitude. In the two remaining genera the inflorescences are terminal and racemose, but for their exclusion other grounds present themselves. In XXXV, *Asystasia* Bl. the aestivation of the corolla lobes is imbricate with the upper lobes inside, the pollen grains are trigonous and provided with inaequidistant grooves, and the seeds are muricate and furnished with a thick wrinkled margin, and this genus is therefore to be referred to the *Odontonemeae* (cf. BREMEKAMP, in Rec. d. Trav. Bot. Néerl. XXXV, p. 134 et 137, 1938). The position of XXXVII, *Stachyacanthus* Nees is as yet uncertain: the description of the calyx reminds one of *Siphonoglossa* Oerst. and *Streblacanthus* O. Ktze, two genera belonging to the *Odontonemeae*, but the evidence is too incomplete to allow a definite conclusion. LINDAU (in ENGL. u. PRANTL, Nat. Pflanzenfam. IV, 3 b, p. 353, 1895) suggested that it might belong to another family, but as the capsule is described by NEES as very similar to that of *Dipteracanthus*, this is improbable. As it is American, the chance that it might belong to the *Strobilanthinae* is at any rate negligible.

Two genera belonging to the *Strobilanthinae* were referred by NEES to other tribes. The first of these is *Apolepsis* Hassk., which he placed in his *Barlerieae*, but which, if his views regarding its affinities were right, would now fall into the *Lepidagathideae*. The type species of this genus was described by BLUME (Bijdr. Fl. Ned. Ind. p. 802, 1826) under the name *Lepidagathis repanda*, but the author himself had recognized already that it was quite

distinct from the other species belonging to that genus, and he had referred it therefore to a new section, which he called *Apolepsis*. HASSKARL raised this section to generic rank, describing at the same time a second species, *A. dispar*. The latter was transferred a few years later by HASSKARL himself to *Strobilanthes*. This proves that he had a better insight in the position of *Apolepsis* than either BLUME or NEES, for otherwise he would not have referred to this genus a species belonging to the *Strobilanthinae*, a group which has but little in common with *Lepidagathis* Willd. and its allies. I have not yet seen HASSKARL's specimens, but the description seems to point to a plant in the neighbourhood of *Strobilanthes cernua* Bl., and material received from the Buitenzorg Herbarium under the name *Str. dispar* actually turned out to be conspecific with *Str. cernua* itself. The type species of *Apolepsis* however has but little in common with the latter: a reinvestigation of BLUME's specimens has revealed that it belongs to *Adenacanthus* Nees.

The second genus that in NEES's monograph has strayed into a wrong tribe, is *Mackenzia* Nees. NEES thought that the specimen on which it was based, had been collected in South America, but afterwards it was found out that it came from Ceylon, and that it is conspecific with a plant described by NEES himself under the name *Strobilanthes cerinthoides*. CLARKE regards the latter as a variety of the better known *Str. sexennis* Nees, to which it is at any rate nearly related. The genus *Mackenzia* was referred by NEES to the *Gendarusseae*, but this was a strange mistake, for its corolla is correctly described as subregular, and the stamens as inserted at the top of the corolla tube, whereas in the *Gendarusseae* the corolla is always distinctly two-lipped, and the stamens spring from the base of the tube. The anthers are described as monotheous, but this is from NEES's own standpoint an error of little consequence, for to this character he attached much less importance than we know now that it deserves: in the case of *Hemigraphis* at any rate the supposed presence of anthers of this kind did not prevent him from including this genus in the *Ruellieae*. The genus *Mackenzia* is in this work revived, and it is now placed next to *Leptacanthus* Nees, which it resembles in the structure of the pollen and in the laxly paniculate inflorescence, but from which it is easily distinguishable by its sessile flowers. Both genera are confined to Ceylon and Southern India, and their species belong to those that grow gregariously, and flower simultaneously once in several years.

In the classifications of NEES's successors the affinity of the genera belonging to the *Strobilanthinae* is even more clearly expressed. In ANDERSON's revision of the Asiatic *Acanthaceae* (in Journ. Linn. Soc. IX, 1867) and similarly in BENTHAM and HOOKER's "Genera Plantarum" and in CLARKE's revision of the Indian species in HOOKER's "Flora of British India" of all the genera accepted by NEES only *Stenosiphonium*, *Hemigraphis*, *Aechmanthera* and *Strobilanthes* have been retained, but these four now follow each other without interruption. In LINDAU's monograph of the family in ENGLER und PRANTL, *Natürliche Pflanzenfamilien*, where the number of genera has increased to six, they are also arranged in an unbroken series, but in "Nachträge III" (p. 322) the sequence is interrupted by the introduction after *Hemigraphis* of a new African genus *Ruelliopsis* Clarke, whose flowers are said to be axillary, and which therefore can not belong to this subtribe.

In the preceding paragraphs it was shown that the near affinity of the plants which in this work are brought together in the *Strobilanthinae*, was recognized already in the main by NEES and more fully by his successors. Our next task will be to study the delimitation of the genera accepted by NEES and some of his successors, and to see in how far they can be regarded as natural.

Apart from the number of fertile stamens, the characters used by NEES for

the delimitation of the genera are: the degree of coalescence between the calyx segments, the number of seeds per capsule, the position and shape of the anthers, the presence or absence of pedicels, and to some extent the shape of the inflorescence.

As stated above, the first of the two subdivisions in which, on account of the number of fertile stamens, the true *Ruelliae* were divided by NEES, comprises but two genera belonging to this group: *Phlebophyllum* and *Endopogon*. With regard to the latter a distinction should be made between the species from Southern India on which the genus was founded, and those which NEES subsequently referred to it: of the latter the Ceylonese ones afterwards proved to be provided with echinulate pollen, and were therefore transferred to *Pseudostenosiphonium*, and the three species collected in the mountains of Khasya show, apart from the number of fertile stamens, but very little resemblance to the species for which the genus originally was created, and are here referred to other genera. The species on which the genus (in WALLICH'S "Plantae Asiaticae Rariores") was founded, are therefore the only ones that are to be taken into consideration. According to NEES the main difference between them and the only species which he recognized in *Phlebophyllum*, lies in the structure of the calyx: that of *Phlebophyllum* is described as 4-partite, and that of *Endopogon* as 5-partite. In reality, however, the calyx is in all these plants subequally 5-fid. Another difference should be present in the colour of the flowers: those of *Phlebophyllum* should be yellow, those of *Endopogon* blue, but this too is a mistake; in both genera the flowers are blue. The corolla of *Endopogon* is described as bilabiate, but its zygomorphism is not more pronounced than that of *Phlebophyllum*; its style is said to be embedded in a channel formed by two ciliated ridges, but this is, as I have stated in the preceding chapter, a general feature of the whole subtribe. As the differences given in NEES'S diagnoses therefore proved to be non-existent, and as the two genera agree in the complete suppression of the staminodes, the structure of the pollen, the number of ovules in the ovary cells, and the nature of the testa, they will have to be united. For the combined genus I will use the name *Phlebophyllum*. The genus in its present delimitation is confined to Southern India, and its species belong to those that grow gregariously and flower simultaneously once in several years.

*Stenosiphonium*, the first genus of the group in which four fertile stamens are found, was distinguished by NEES from the other genera mainly on account of its eight seeds and of its calyx, whose segments are halfway united. A calyx of this kind, however, is more common than NEES suspected, and occurs in several genera to which he ascribed a more deeply divided one, e.g. in *Phlebophyllum* and *Hemigraphis*. As the tissue between the segments is always very thin, the latter are easily separated, and in material that has not been handled very carefully, incisions which in reality do not go farther than halfway, may look as if they extended nearly or quite to the base. The description given by NEES therefore does not enable us to distinguish this genus from its nearest allies. Apart from the presence of more than two ovules in each of the ovary cells, the really important characters are the substitution of the solitary or superposed flowers in the axils of the bracts by triads, the resupination of the strongly recurved corolla, the insertion of the hairs by which the style is retained on two tubercles, and the presence of a large oblong areola in the seeds. NEES referred to this genus one species with two stamens, *St. diandrum* Nees, of which he writes: "Ambigit inter *Endopogones* et *Stenosiphonia*, sed calyx vix usque ad medium divisus." As it has but two ovules in each of its ovary cells, it was transferred by CLARKE (in Fl. Brit. Ind. IV, p. 432, 1884) to *Strobilanthes*. CLARKE introduced at the same time a new name

for it, to wit *Str. exareolata*, but this nomenclatural transgression was rectified by ALSTON (in TRIMEN, Handb. Fl. of Ceyl. VI, p. 227, 1931). It differs from *Stenosiphonium* not only in the number of ovules and in the supposed absence of the areola in the seeds, but also in the structure of the pollen, which is globose and echinulate, not ellipsoidal and banded. I refer it therefore to *Pseudostenosiphonium*: in fact, it is, as CLARKE l.c. stated, very similar to *Strobilanthes viscosa* (Nees) T. And. (*Endopogon* Nees), i.e. to the plant on which LINDAU based his new genus. *Stenosiphonium* comprises a small number of species occurring in Ceylon and Southern India.

The next genus to be considered is *Hemigraphis*. That the latter is not really distinct from *Ruellia* sensu Nees, was first recognized by ANDERSON, and it was he who transferred the bulk of the *Ruellia* species enumerated by NEES to *Hemigraphis*: the name *Ruellia* could no longer be used for this genus, as it did not comprise *R. tuberosa*, the species on which it had been founded by LINNÉ. The diagnosis of *Ruellia* given by NEES and applicable therefore in the first place to the *Hemigraphis* species which form its mainstay, contains two mistakes: the 5-fid calyx is described as 5-partite, and the inflorescences are in the "Conspectus Generum" said to be axillary. In his monograph the genus comprises 48 species, of which 12 need not be taken into consideration, as they are said to be "incertae sedis et parum cognitae". The other 36 are, according to their geographic distribution, divided in two groups. The species of the second group, of which one was collected in Australia and five in America, show no near affinity to those of the first, and as they do not belong to the *Strobilanthinae*, they need not trouble us here. Of the 30 species of the first group the great majority belong to *Hemigraphis*. Exceptions are: 7. *R. Jacquemontiana* Nees, a plant which according to CLARKE should be conspecific with *Strobilanthes glutinosa* Nees, which is my *Pseudaechmanthera glutinosa*; 9. *R. hirta* Vahl var. *urens* (Roth) Nees, according to the same authority identical with 11. *R. dura* Nees; *R. urens* Roth is the type of my new genus *Gantelbua*, which differs from *Hemigraphis* mainly in the peculiar structure of the inflorescence; 12. *R. punctata* Nees, below removed to my new genus *Nilgirianthus*; 13. *R. chinensis* Nees and 14. *R. quadrifaria* Nees, both below transferred to *Sericocalyx*; 15. *R. aspera* Nees, nearly related to the species of *Sericocalyx*, but on account of its elongated spikes and inside but slightly hairy, not sericeous calyx referred to a genus of its own, *Xanthostachya*; and 24. *R. trichotoma* Nees, according to HALLIER F. (Abh. d. Kais. Leop.-Carol. Akad. d. Naturf. LXX, p. 196, 1897) conspecific with *R. japonica* Thunb., which MIQUEL removed to *Strobilanthes*, but which I regard as a representative of my new genus *Championella*. The other 23 species belong probably all to *Hemigraphis*, although the identity of some of them, namely of 2. *R. ravaccensis* Nees, 28. *R. involucrata* Vahl, 29. *R. luzona* Nees and 30. *R. decipiens* Nees, could not yet be definitely established. Apart from the pluri-ovular ovary cells and the 5-fid calyx, the most distinctive features of the genus are the herbaceous habit, the spiciform inflorescences composed of solitary or superposed flowers, the small, either blue, violet-tinged or nearly white, non-resupinate corolla, the obtuse or slightly apiculate anthers, and the small areola at the base of the seed. It is the largest and most widely spread genus of the whole subtribe, for its more than sixty species cover an area extending from the Indian Peninsula to Melanesia, i.e. Ceylon in the south and the mountainous and colder regions in the north excepted, the whole area where representatives of this subtribe are found. In the region to the east of Timor and south of the Philippines it is even the sole representative of the group. In contradistinction to most of the other genera, who prefer the shade of

the mountain forests, the *Hemigraphis* species are plants growing in the hot plains.

It is somewhat surprising that the near affinity between *Hemigraphis* and *Aechmanthera* is not expressed in NEES's classification. The most plausible explanation of this defect, seems to be that NEES misinterpreted the inflorescence of *Aechmanthera*, which he described as a panicle or corymb consisting of bracteate capitula. It is rather remarkable that similar mistakes with regard to the structure of this inflorescence were made by ANDERSON and CLARKE: the latter, for instance, speaks of "clusters of flowers sessile on the branches of a trichotomous or 1-sided panicle", and contrasts in his key *Aechmanthera* and *Hemigraphis* by assigning to the first i.a. "flower-clusters separate on the cymebranches" and to the second "flowers capitate or axillary". In reality, the flowers are in both genera spicate. NEES inserted *Aechmanthera* between *Leptacanthus* and *Goldfussia*, possibly because he regarded its inflorescence as intermediate between the panicle of the first and the abbreviated bracteate spikes of the second. In the structure of the anthers he will probably have seen an indication of a nearer relationship between *Aechmanthera* and *Goldfussia*, for according to his generic diagnoses the connective ends in both genera in an awn. In *Goldfussia* aristate anthers are, however, by no means a general feature, for among the species enumerated by NEES himself, only one, *G. bibracteata* (Bl.) Nees, is provided with this kind of anthers, and this species differs in the structure both of the androecium and of the testa so conspicuously from the other ones that I refer it to another genus; in the typical representatives of *Goldfussia* the anthers are never aristate, but always very short and blunt. In the structure of the androecium, of the pollen and of the testa, and also in its non-resupinate corolla *Aechmanthera* differs so widely from *Goldfussia* that a nearer affinity between the two genera is out of question. The relationship with *Leptacanthus* is doubtless closer, but here too the resemblance is on the whole but superficial, for apart from the difference in the number of ovules in the ovary cells and from the gracefully pedicellate flowers, the *Leptacanthus* species distinguish themselves conspicuously from those of *Aechmanthera* by their mode of living: they belong, as stated above, to those that grow gregariously, covering large stretches in the undergrowth of the forests, and flowering in the same locality only once in several years, and then all simultaneously. The affinity between *Aechmanthera* and *Hemigraphis* on the other hand is so close that *Aechmanthera* can only be distinguished from the latter by its aristate anthers, by the nature of its indumentum, and by the complete absence of an areola at the base of the seed.

In the remaining genera of the *Strobilanthinae* the cells of the capsule contain but one or two seeds. However, as the insertion of *Aechmanthera* between *Leptacanthus* and *Goldfussia* proves, NEES himself laid no stress on this character. Subsequent authors, like ANDERSON, BENTHAM and CLARKE, on the other hand, were inclined to overrate the value of the number of seeds in the capsule, on account of which they divided the *Ruellieae* into two, most artificial, groups.

The monotypical genus *Triaenacanthus* (so the name is spelled in the "Conspectus Generum" p. 100; the spelling *Triaenanthus* on p. 169 is obviously a slip of the pen) is characterized by strongly flexuous spikes provided with narrow bracts, by the coalescence of the three posticous calyx segments into a 3-fid or deeply 3-lobed upper lip, by the yellow colour of the corolla, and by a truncate stigma. A reinvestigation has shown that the stigma is quite normal, and the last-named character, which, if it had been real, would have excluded the genus from the *Strobilanthinae*, is therefore to be struck out. That it heads the group of genera we are now going to discuss, is doubtless

due to its supposed affinity with *Echinacanthus* Nees, which rests on its resemblance to *E. calycinus* (Nees) Nees, but this species, as ANDERSON already pointed out, does not belong to *Echinacanthus*. ANDERSON transferred it to *Strobilanthes*, where it had to receive another specific epithet, as there existed already a *Str. calycina* Nees: it is now known as *Str. helictus* T. And. CLARKE placed it just in front of *Str. Griffithiana* (Nees) T. And., which is *Triaenacanthus Griffithianus* Nees, but as the calyx of *Str. helictus* is apparently equally 5-fid, I am, in opposition to NEES and CLARKE, by no means convinced that the two species are nearly related. *Str. helictus* might perhaps belong to the genus *Pteracanthus*, but as I had no opportunity to study this species myself, I am unable to express a more definite opinion. *Triaenacanthus Griffithianus* too is at present but imperfectly known. I have revived this genus mainly on account of the colour of the corolla, which according to CLARKE is yellow, and because its seeds are said to be covered with rigid hairs. The pollen grains are ellipsoidal and provided with septate bands. A calyx with the posticous segments united into a 3-fid or 3-lobed upper lip occurs in some other genera also, e.g. in *Adenacanthus*.

*Leptacanthus* was regarded by NEES as related to *Asystasia* Bl.: "Genus *Asystasiae* propinquum et forte, ut subgenus, isti adjudendum." This supposition is, of course, entirely unfounded, as *Asystasia* belongs to a different tribe. *Leptacanthus* is well characterized by its racemose partial inflorescences: pedicellate flowers are very rare in this subtribe, and pedicels as slender as those of *Leptacanthus* are elsewhere entirely unknown. Its pollen grains resemble those of *Phlebophyllum*, *Hemigraphis* and *Stenosiphonium*, i.e. they are ellipsoidal and provided with finely granulate bands. The seeds are said to be "shaggy", but the structure of the hairs is not yet known. The genus is confined to Ceylon and Southern India, and its species belong to those that grow gregariously, need several years to reach maturity, and flower simultaneously in great profusion. *Mackenzia* Nees is, probably, its nearest ally.

The description of *Goldfussia* is disappointing, for its really distinctive characters, the peculiar structure of the androecium and the long and thin undulating hairs with which the testa is covered, have been overlooked. The anthers are said to be ovate and nodding, and the connective should be uncinatate, but these characters exclude each other. Only one of the 24 species enumerated in the "Prodromus", namely 11. *G. bibracteata* (Bl.) Nees, is provided with uncinatate anthers, but these are neither ovate nor nodding. As this species differs moreover from the typical representatives of the genus in the structure of the hairs covering the seedcoat, I have transferred it to a new genus, for which I have chosen the name *Tetraglochidium*. As type of the genus *Goldfussia* I take *G. capitata* Nees, a species occurring in the Himalaya, and I define the genus by the aid of the following characters: spikes abbreviated and provided with imbricate bracts; corolla resupinate; filaments of the longer stamens unequal, and those of the two others very short and strongly incurved, and anthers of all four suborbicular and horizontal; pollen grains ellipsoidal and ornamented with septate bands; and exareolate seeds covered with long and thin, undulating, strongly hygroscopic and mucous white hairs. In this delimitation the genus is distributed from the southern slopes of the Himalaya through Indo-China to Java, Borneo and the Philippines. It comprises the species 3—10, 13—16 and 19—20 of the list given by NEES in the "Prodromus". The first species of this list, *G. lamiifolia* Nees, bears an illegitimate name, for it is apparently based on the same specimen as D. DON's *Ruellia rotundifolia*, which was published seven years earlier; the plant itself is unknown to me, and the descriptions are insufficient to determine its position with certainty, but it probably belongs to my new genus *Pteracanthus*. 2. *G. zenke-*

*riana* Nees and 3. *G. leschenaultiana* Nees, two species from the Indian Peninsula, belong to *Xenacanthus*, a new genus related to *Phlebophyllum* and *Pseudostenosiphonium*. 11. *G. bibracteata* (Bl.) Nees (*Strobilanthes* Bl.) is *Tetraglochidium bibracteatum* (Bl.) Brem. n. comb. v. supra. 12. *G. Myrtinia* Nees is according to CLARKE conspecific with *Strobilanthes lanceolata* Hook. ex Nees and with *Martynia lanceolata* Moon, but the latter is obviously a quite different plant, namely *Chirita Moonii* Gardn., a *Gesneriaceae*, and certainly not the "*Myrtinia lanceolata*" Macrae quoted by NEES; as it is said to be provided with four stamens and echinulate pollen, I refer it to the genus *Didyplosandra* Wight ex Brem. 17. *G. paniculata* Nees is a Javanese plant with erect anthers and seeds provided with a large areola; I have made it the type of a new genus *Microstrobilus*. The var. *alata* (Bl.) Nees (*Strobilanthes alata* Bl.) is sufficiently distinct to be retained as a separate species. In contradistinction to the *Goldfussia* species it belongs to those that grow gregariously and flower simultaneously once in several years. 18. *G. cusia* Nees is according to CLARKE conspecific with *Strobilanthes flaccidifolia* Nees. The specific epithet *cusia* has priority over *flaccidifolia*, for *G. cusia* was published already in WALLICH, *Plantae Asiaticae Rariores* III, 1832, whereas *Str. flaccidifolia* made its first appearance in the "Prodromus", i.e. in 1847 (see also IMLAY in *Kew Bull.* 1939, p. 115, where the epithet *cusia* is treated as a noun; as its meaning is apparently unknown, this decision is arbitrary, but so long as no arguments for the contrary opinion can be adduced, it will, because of its priority, have to stand). The plant has erect anthers, ellipsoidal pollen grains ornamented with marbled bands, and seeds which at first sight seem to be glabrous, but which on closer inspection reveal themselves covered with short hairs of a kind that recurs nowhere else in this subtribe: I regard it as the sole representative of a new genus *Baphicacanthus*. 21. *G. filiformis* (Bl.) Nees (*Strobilanthes* Bl.), 22. *G. divaricata* Nees, 23. *G. colorata* Nees and 24. *G. crinita* Nees come very near to the type of *Goldfussia* as outlined above, but differ in the nature of the inflorescence, which is laxly spiciform, and in the small size of the bracts. I refer them therefore to a genus of their own, for which I use the name *Diflugossa*, an anagram of *Goldfussia*. The flowers of *G. colorata* are described by NEES as capitate, but this is a mistake. CLARKE states: "they are capitate only at the tips of the younger panicle branches", but this applies to all flowers arranged in paniced spikes.

The genus *Strobilanthes* Bl. comprised already at its first appearance a number of very divergent types. Of the ten species described by BLUME, only two show a sufficient degree of similarity to be retained in the same genus: they are *Str. hirta* (Vahl) Bl. (*Ruellia* Vahl) and *Str. cernua* Bl.; the latter I choose as the type species. The name *Str. hirta* can not be retained, for VAHL's plant is a *Hemigraphis* occurring in the Indian Peninsula, and the Javanese species to which the name was applied by BLUME, is therefore nameless: I call it *Str. Blumei*. *Str. cernua* and *Str. Blumei* agree in the following characters: they belong to those that grow gregariously and flower simultaneously once in several years; they are anisophyllous; the partial inflorescences are ovoid, covered with imbricate bracts and cernuous; the corolla is non-resupinate; the stamens are subequal and exerted, and the staminal tube is at the top densely bearded; the pollen grains are globose and decorated with septate bands; the seeds are distinctly areolate, and the cells outside the areola are provided with annular thickenings and end in short and blunt annulate hairs. Among the ten species described by BLUME the nearest approach to this combination of characters is found in *Str. alata* Bl., where the spikes are rather similar although erect and provided at the base with a pair of deciduous leaves, the pollen grains shortly ellipsoidal, the cells outside the areola not provided

with annular thickenings, and the hairs much longer. As stated above, I refer it to a new genus *Microstrobilus*. The large-flowered *Str. involucrata* Bl. has distinctly didynamous, included stamens and large seeds, which are almost entirely covered with long wavy hairs; its pollen grains are subglobose and decorated with septate bands, but much larger than in the genus *Strobilanthes* sensu meo, and the bands are not united at the poles like those of the pollen of the latter; I refer it to a new genus *Pachystrobilus*. In the five following species the pollen grains are distinctly ellipsoidal and decorated with septate bands. Of these *Str. speciosa* Bl. is a true *Goldfussia* nearly related to *G. capitata* Nees, and *Str. filiformis* Bl. belongs, as stated above, to the nearly related genus *Difflugossa* Brem. *Str. bibracteata* Bl. has flattened spikes enclosed in two large bracts, erect and uncinately anthers, and exareolate seeds covered with stiff hairs: it is the type of my new genus *Tetraglochidium*. The leaves of *Str. glandulosa* Bl. are on the lower side conspicuously dotted with sessile glands, its three posticous calyx lobes are united in a 3-fid upper lip, and its seeds nearly exareolate and covered with rather stiff annulate hairs: it belongs therefore to NEES's genus *Adenacanthus*. *Str. moschifera* Bl. is a small plant provided with elongate spikes, whose filiform bracts, bracteoles and calyx lobes are all bristling with long capitate hairs, and whose distinctly areolate seeds are outside the areola covered with long flattened hairs; I refer it to a genus of its own, which I call *Adenostachya*. In the tenth species the pollen grains are like those of the five preceding ones ellipsoidal, but the bands with which they are decorated are not septate but finely punctate. With its inside densely sericeous calyx, yellow corolla (BLUME described it as blue, but this is a mistake), and seeds provided with an areola extending nearly to the margin, this *Str. crispa* (L.) Bl. (*Ruellia* L.) is the most aberrant of all BLUME's species; its position has already been discussed in the "introduction" to this work, where it was referred to a new genus *Sericocalyx*.

NEES investigated only part of BLUME's species, and these apparently but superficially, otherwise he could not have said that in this genus the stamens are either totally included or but just visible as the entrance to the throat, nor could he have called the anthers erect. Although he transferred three of BLUME's species (*Str. bibracteata*, *Str. alata* and *Str. filiformis*) to *Goldfussia*, he did not arrive at a clear-cut definition of the two genera; but this, of course, was not to be expected, for in reality each of them includes species which should have been referred to genera of their own, and some of my new genera, on the other hand, prove to be represented in both. The main difference between the two genera mentioned by NEES, is found in the shape of the capsule: that of *Goldfussia* is described as hexagonal and as bearing seeds from the base, whereas that of *Strobilanthes* is said to be tetragonous with the seeds confined to the central part. When the genera are taken in my delimitation, no objection can be raised against the description of the capsule of *Goldfussia*, but when that of *Strobilanthes* is said to be tetragonous, it is but poorly characterized, for in reality it is elliptic in outline and flattened. Among the species which NEES referred to *Strobilanthes* several however are provided with capsules which do not fit the description at all: those of *Str. involucrata* Bl. e.g. are indistinguishable from those of *Goldfussia*. The seeds of *Strobilanthes* are said to be areolate, but the structure of those of *Goldfussia* is not mentioned; if my delimitation of the genus is accepted, they may be described as exareolate and entirely covered with undulate hairs. *Strobilanthes*, however, should also be taken in the restricted sense, for the seeds of some of NEES's species, e.g. those of *Str. sexennis* Nees, are exareolate.

If my delimitation of the genus *Strobilanthes* is accepted, 60 of the 62 species enumerated in the "Prodromus" are to be excluded, the only true representa-



tives being 21. *Str. cernua* Bl. and 22. *Str. hirta* (Vahl) Bl. quoad specimina javanica, i.e. *Str. Blumei* Brem. (v. supra). Some of the other species, however, come very near to these two. The nearest ally is probably 13. *Str. parabolica* Nees, another Javanese species. As the pollen grains are provided with a different relief, the bands not being septate, but reduced to the elevated and somewhat wavy rim, and as the testa cells outside the areola, though provided with the same kind of annular thickenings, do not end in hairs, I bring it to a distinct, though doubtless nearly related genus, which I will designate with the name *Parastrobilanthes*. Very similar too is 35. *Str. imbricata* Nees, but before discussing its position, I wish to point out that its specific epithet belongs to another species. In the "Prodromus" it is applied to a specimen collected in Upper Burma, but in the original description in WALLICH, *Plantae Asiaticae Rariores* III, it includes, apart from the plant from Upper Burma, a Javanese specimen described by BLUME under the name *Str. hirta* var.  $\beta$ . As NEES definitely refers to BLUME's variety, and as the latter had been duly described, BLUME's specimen is obviously to be regarded as the type, and the specific epithet *imbricata* is therefore to be reserved for BLUME's plant, which proves to be a good species and a true *Strobilanthes*. The plant of Upper Burma, which NEES in the "Prodromus" recognized as specifically distinct from the Javanese one, is therefore nameless. Its pollen grains proved to be of the same kind as those found in my genus *Parastrobilanthes*, and also like those of *Sympagis*, a new genus comprising a number of species whose affinity had been recognized already by NEES. Its seeds are, like those of the *Sympagis* species, outside the areola covered with fairly long annulate hairs. Its inflorescences, however, are not elongate like those found in *Sympagis*, but strongly abbreviated like those of *Strobilanthes* and *Parastrobilanthes*. Because of the resemblance in some of its fundamental characters to *Sympagis*, I will call this new genus *Parasympagis*, and as the plant in the WALLICH herbarium to which NEES in the "Prodromus" applied the name *Strobilanthes imbricata*, wants a new specific epithet, I will name it *Parasympagis Wallichii* Brem. n. nom. Whether the plants from Pegu and Tenasserim described by CLARKE under the name *Strobilanthes imbricata* and by KURZ under that of *Str. pterocaulis*, belong to this genus, I do not know, but as the flowers are said to be yellow, it looks improbable to me. A new species belonging to this genus has been collected in Siam by KERR.

The same kind of pollen as in *Parastrobilanthes* and *Parasympagis* has been found in some plants whose spikes are not like those of the latter shortened and covered with imbricate bracts, but fairly long. In WALLICH, *Plantae Asiaticae Rariores*, NEES had brought these species together in a subgenus *Sympagis*, which he dropped in the "Prodromus", but which is here revived and raised to generic rank. It comprises 40. *Str. Brunoniana* Nees, 41. *Str. monadelphica* Nees, 42. *Str. petiolaris* Nees and 46. *Str. maculata* (Nees) Nees. This genus closes the row of those which may be regarded as the nearest allies of *Strobilanthes* sensu meo.

The pollen grains of 27. *Str. involuocrata* Bl. are at first sight very similar to those of the true *Strobilanthes* species. They are, however, much larger, not absolutely globose but very shortly ellipsoidal, and the bands are fewer in number and do not meet at the poles. The large flowers with their included stamens, and the exareolate seeds covered with long wavy hairs prove that its affinity with *Strobilanthes* can not be very near. Above it was referred already to a genus of its own, for which on account of the voluminous "strobili" I chose the name *Pachystrobilus*. 14. *Str. erosa* Nees is, as HOCHREUTINER (in *Candollea* V, p. 227, 1934) points out, merely a variety of this species: it agrees with BLUME's var.  $\beta$ .

Pollen grains provided with septate bands, but distinctly ellipsoidal instead of globose, are found in a number of species that for this and other reasons must be regarded as receding still further from the type of the genus. 15. *Str. echinata* Wall. ex Nees<sup>9)</sup> shows some resemblance to the genus *Pachystrobilus*, but its corolla is resupinate, and its seeds distinctly areolate; as I had no flowers of this species, its exact position could not yet be determined. A resupinate corolla is found also in the species of NEES's subgenus *Pteracanthus*, which I raise to generic rank. They are perhaps most easily recognizable by the peculiar form of the leaves, which are subsessile, but contracted towards the base in an alate pseudo-petiole. Its inflorescences are elongated and provided with small bracts. As far as we know at present it is confined to the southern slopes of the Himalaya and the neighbouring mountains. To this genus belong: 54. *Str. urophylla* Nees; 55. *Str. Wallichii* Nees, which I regard as the type; 56. *Str. attenuata* Jacquemont ex Nees; 57. *Str. alata* Nees non Bl., nom. illeg. = *Str. urticifolia* O. Ktze n. nom.; 58. *Str. reflexa* Nees; 61. *Str. atropurpurea* Nees; and 62. *Str. extensa* Nees. Larger bracts and subequal leaves that are confluent at the base, characterize a number of species which I unite in a new genus *Perilepta*. They are: 47. *Str. edgeworthiana* Nees; 48. *Str. plumulosa* Nees; 49. *Str. auriculata* Nees, which I select as the standard species of the new genus; and 50. *Str. amplexens* Nees. The following two species are isophyllous; they differ moreover from the other species dealt with in this paragraph by their geographic distribution, for they are the only ones occurring in the Indian Peninsula. The first of these two is 1. *Str. sessilis* Nees. It is a perennial herb provided with a multicipitous rhizome, from which yearly a number of erect branchless shoots are produced; its ovate or cordate leaves are sessile, and the seeds are said to be entirely covered with hairs, but the structure of these hairs is unknown. I refer it to a new genus *Pleocaulus*. The second species is 31. *Str. callosa* Nees, one of the largest plants belonging to this subtribe: its shoots are said to reach a height of six meters. The strongly abbreviated, bracteate spikes are mostly produced by axillary brachyblasts provided with a few reduced leaves. The seeds are flat and very large; they possess an oblong areola, and are outside the latter covered with annulate mucous hairs. For this species too I created a new genus, which I called *Carvia*, "karvi" being the vernacular name.

In the remaining species, so far as they are known to me, the pollen grains are either ellipsoidal and provided with smooth or granulate bands, or globose and echinulate. Those with ellipsoidal pollen fall in my classification in five different genera: *Sericocalyx*, with inside densely sericeous calyx and with yellow corolla; *Baphicacanthus*, with exareolate seeds covered with very small, easily overlooked hairs; *Phlebophyllum*, in which the two inner stamens are completely suppressed; *Nilgirianthus*, with seeds that are either entirely glabrous or provided with a narrow zone of annulate hairs along the margin; and *Mackenziaea*, with shortly pedicellate flowers, and seeds covered almost entirely with long and stiff white hairs. To *Sericocalyx* belong: 3. *Str. scabra* Nees; 4. *Str. timorensis* Nees; 5. *Str. crispa* (L.) Bl.; and 6. *Str. glaucescens* Nees. 59. *Str. flaccidifolius* Nees is conspecific with *Goldfussia cusia* Nees, the type of my new genus *Baphicacanthus*. It is a plant widely cultivated in the eastern part of the Asiatic continent on account of the blue dye extracted from its leaves ("Assam indigo" or "room"). 51. *Str? lanata* Nees has but two stamens, but this was apparently overlooked by NEES, otherwise he would have

<sup>9)</sup> The specific epithet given to this plant by NEES, was changed by ANDERSON in *pectinata* on the ground that NEES had misread the spelling of the name on WALLICH's label, but as NEES himself had quoted in the "Prodromus" *Ruellia pectinata* Wall. as a synonym, it was obviously his wish that the epithet *echinata* should be retained.

referred it to *Endopogon*. I bring it to *Phlebophyllum*: it is the same species as that afterwards described by ANDERSON under the name *Str. gossypina*. *Nilgirianthus* is represented by 7. *Str. barbata* Nees; 8. *Str. perrottetiana* Nees; 11. *Str. wightiana* Nees; 23. *Str. ciliata* Nees; 26. *Str. lupulina* Nees; 28. *Str. heyneana* Nees; and perhaps by 43. *Str. decurrens* Nees. To *Mackenziaea* belong: 9<sup>bis</sup>. *Str. cerinthoides* Nees; 36. *Str. hirsutissima* Nees; 37. *Str. sexennis* Nees; 38. *Str. homotropa* Nees and 39. *Str. arguta* Nees.

The species which afterwards proved to possess globose echinulate pollen, could not yet be classified in a satisfactory way. Some of them belong to a genus which differs from *Pseudostenosiphonium* Lindau in the presence of four fertile stamens and in the abbreviated bracteate spikes. I have adopted for this genus the name *Didyplosandra*, which was used by WIGHT in his discussion of the position of *Str. lurida* (cf. WIGHT, Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1850). It is represented by 12. *Str. vestita* Nees; 18. *Str. lanceolata* Hook. ex Nees; 20. *Str. adenophora* Nees, which CLARKE regards as synonymous with 18; and 32. *Str. Hookeri* Nees. In all these species the seeds are glabrous and shining. The seeds of 17. *Str. Walkeri* Nees are outside the areola covered with long wavy hairs: the exact position of this species could not yet be determined. The seeds of 44. *Str. anceps* Nees look so exactly like those of *Thelepaepale ixiocephala* (Benth.) Brem. (*Strobilanthes* Benth.), that I feel sure that these species will prove congeneric. The position of the other species with echinulate pollen (9, 19, 24, 29, 30, 33 and 34) is also still uncertain: of none of them material was available to me.

The foregoing remarks on the species which NEES referred to *Strobilanthes*, show that in his delimitation too the genus still retains its artificial character, and is to be regarded as an assemblage of very heterogeneous elements. Three main groups of species can be recognized among them on account of the pollen structure: 1<sup>o</sup>. species with globose pollen decorated with septate bands or with bands reduced to the elevated margin; 2<sup>o</sup>. with ellipsoidal pollen decorated with septate bands; and 3<sup>o</sup>. with ellipsoidal pollen provided with smooth or finely punctate bands (a fourth group, consisting of species provided with echinulate pollen is artificial and will therefore be left out of consideration). The second and third groups are represented also among the species which NEES referred to *Goldfussia*: in fact, *Goldfussia* sensu meo belongs to the second group. That the old genera had to be recasted, and that a considerable number of new ones had to be created, will now be clear.

Of the next genus, *Buteraea* Nees, two species are quoted, of which the second, *B. rhamnifolia* Nees, a Ceylonese plant, has since been removed to *Pseudostenosiphonium*. The type species, *B. rufescens* (Roth) D. Dietr. (syn.: *B. ulmifolia* Nees), is a plant collected in Pegu. The genus is characterized by a bipartite calyx and a peculiar rufous pubescence. It is probably nearly related to my new genus *Pyrrothrix* (v. infra), whose species also show a rufous pubescence, but a subequally 5-partite calyx. If the difference should prove to be restricted to the degree of coalescence between the various calyx segments, the two genera might better be united, but as no material of *Buteraea* was available to me, and as there are as yet several points on which we are insufficiently informed, the question can not be decided. For this reason *Pyrrothrix* is provisionally kept apart.

The last of NEES's genera belonging to our subtribe, is *Adenacanthus*. Besides the type species, *A. acuminatus* Nees, an *A. latifolius* Nees is quoted, a plant of unknown origin and very imperfectly described, which probably belongs elsewhere. The genus is characterized by the presence of rather conspicuous sessile glands on the lower side of the leaves, spiciform inflorescences and a tripartite calyx. The type species was collected in Burma, but two

other species occur in Sumatra and Java. Both were described already by BLUME, one under the name *Strobilanthes glandulosa*, and the other as *Lepidagathis repanda*. The latter is, as stated above, the type species of HASSKARL's genus *Apolepsis*. The type species of *Adenacanthus* is recorded by BENOIST (in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 665, 1935) under the illegitimate name *Strobilanthes subflaccida* Kurz as occurring in Laos, Poulo-Condor, and a var. *longispicata* R. Ben. should be found in Cambodja, but these plants will probably prove to represent one or two related species.

The good example set by NEES in singling out some of the more easily recognizable types, was in the next years, before with ANDERSON's work the reaction set in, not entirely neglected. Soon after the appearance of the monograph two more genera were created, namely *Gutzlaffia* Hance and *Didyplosandra* Wight.

*Gutzlaffia* was created by HANCE for a plant growing in the neighbourhood of Hongkong. On account of its two stamens it was compared by its author with the genera *Endopogon* and *Codonacanthus*, from which it is said to differ mainly in the greater length of the corolla tube. In this respect it differs also from *Phlebophyllum*. That the latter was not mentioned by HANCE, was doubtless due to the circumstance that NEES, as stated above, had ascribed to this genus a 4-partite calyx. BENTHAM (in Kew Journ. of Bot. V, p. 131, 1853) was apparently well aware that this was a mistake, and considering the greater length of the corolla tube unimportant, he actually transferred HANCE's plant to *Phlebophyllum*. Afterwards, when under the influence of LINDAU's monograph of the family the taxonomic importance of the pollen structure was generally recognized, CLARKE (in FYSON, Fl. Nilghiri and Pulney Hilltops, p. 311, 1915) investigated the pollen of *Gutzlaffia aprica*, and found it to be echinulate, i.e. of the same type as that of *Pseudostenosiphonium*, which, as stated above, comprises the Ceylonese species of *Endopogon*. This led CLARKE to the somewhat hasty conclusion that the two genera *Gutzlaffia* and *Pseudostenosiphonium* ought to be regarded as identical. LACE (in Kew Bull. 1915, p. 406) actually transferred one of the Ceylonese species provided with two fertile stamens (*Strobilanthes exareolata* Clarke) to *Gutzlaffia*. The difference between *Gutzlaffia* and *Pseudostenosiphonium*, however, is by no means confined to the length of the corolla tube: of more importance are the resupination of the corolla, the presence of two staminodes, and the presence of hairs on the testa in *Gutzlaffia* as compared with the non-resupinate corolla, the complete absence of staminodia, and the entirely glabrous seeds of *Pseudostenosiphonium*. *Gutzlaffia* is distributed from Southern China to Siam and Burma. *G. pedunculata* Craib differs from the type i.a. by the presence of three instead of two ovules in each of the ovary cells, and in *G. graminea* (Imlay) Brem. (*Strobilanthes* Imlay) and also in a new species to be described hereafter (*G. birmahica* Brem.) there are even four ovules in each cell. *Gutzlaffia* shows therefore the same variability in the number of ovules as *Sericocalyx* (see my remarks on that genus in the introduction to this paper).

Of the genus *Didyplosandra* Wight at this stage but little need be said. As stated before, it was proposed by WIGHT for the reception of his *Strobilanthes lurida*, but withdrawn in the same paragraph in which it was put forward. Like *Mackenzia* Nees it is in the form in which it appears in this paper in reality a new conception. That the name proposed by WIGHT was adopted, is due to the more or less accidental circumstance that it comprises *Str. lurida* Wight. WIGHT had set the latter apart from the other *Strobilanthes* species that were known to him, because of the four subequal exerted stamens, but this character is by no means confined to it, but recurs in the genera *Strobilanthes*, *Parastrobilanthes*, *Lamiacanthus*, *Sympagis* and *Parasympagis*, which apparently were

all unknown to WIGHT, and also in some species referred by me to *Nilgiri-anthus* and in the monotypic genus *Taeniandra*. I separate *Didyplosandra* from *Nilgiri-anthus* and *Taeniandra*, which it resembles i.a. in the structure of the seedcoat, on account of the echinulate pollen, and from *Pseudostenosiphonium* because of its four fertile stamens and abbreviated, not elongated spikes. *Didyplosandra*, *Xenacanthus*, *Nilgiri-anthus*, *Taeniandra* and *Pseudostenosiphonium* are, however, all very similar, and they are moreover all confined to Ceylon and Southern India.

Above a survey has been given of the genera of the *Strobilanthinae* which so far have been distinguished. It proves that, apart from *Endopogon* Nees and *Apolepsis* Hassk., all deserve to be retained, but it also shows that among the species which had been referred to these genera, a considerable number does not answer the generic descriptions.

Since NEES's endeavours to bring some order among the numerous representatives of this group, had been frustrated by ANDERSON's ill-advised eagerness for so-called simplification, the number of species, to make matters worse, has enormously increased. Among these new additions, and especially among those that have come to us from countries like Southern China, Indo-China and the Malay Archipelago, from where NEES had seen but little material, a large number of aberrant types proved to be present. For a satisfactory classification of these forms an even far more elaborate system than that of NEES, had to be created. Of the sets of characters on which this has been based, two of the principal ones were entirely unknown to NEES, and deserve therefore special attention: the structural peculiarities of the testa (Tab. IV—VI) and those of the pollen grains (Tab. I—III). Those of the testa will be considered first.

The testa of the *Strobilanthinae* forms in the vicinity of the chalaza a kind of cup several cells thick; everywhere else it is, however, rather thin, consisting in the ripe seed of three layers, each of them one cell thick. In this respect it resembles that of the other *Ruellieae*.

The cells of the inner layer show but little variability: they are always thin-walled, flattened, and somewhat irregular in outline. For classificatory purposes they are of no importance.

The cells of the central or subepidermal layer are often similar to those of the inner one, but there are noteworthy exceptions. In the genera *Hemigraphis* (series *Imbricatae*, *Serpentes*, *Nudicrues*) (Tab. IV A), *Aechmanthera*, *Sericocalyx*, *Xanthostachya*, *Adenacanthus*, *Perilepta* (Tab. V C), *Tarphochlamys* and *Gutzlaffia* (Tab. IV D) they are thick-walled, prismatic and directed perpendicularly to the surface: they form therefore a kind of thick-walled palisades. The thickening of the walls sets in at a comparatively late stage, and ripe or nearly ripe seeds are therefore required to recognize the character of this layer. Care should be taken not to confuse the small, thick-walled, in surface-view isodiametric cells of the endosperm with those of this layer, nor should these subepidermal thick-walled cells be mistaken for the epidermis, whose large and flat, in surface view elongated cells are in the genera enumerated in the preceding sentence so thin-walled that they are easily overlooked. From a taxonomic point of view it is noteworthy that the genera *Hemigraphis* and *Aechmanthera* are nearly related, and that the same applies to the genera *Sericocalyx* and *Xanthostachya*, to *Adenacanthus* and *Perilepta*, and perhaps also to the two remaining genera. In *Pachystrobilus* too the cells of the central layer are very thick-walled, but they are rather flat, and in this respect they resemble those of the genera *Goldfussia* and *Difflugosa*, where they are, however, but slightly thickened.

Of much more importance for the characterization of the genera are the structure of the epidermis cells and especially that of the hairs in which the

latter often end. In fact, it are the characters of this layer that are responsible for the wide range of variability shown by the seeds of the *Strobilanthinae*, a feature that is the more noteworthy as in most of the other tribes and subtribes of the *Acanthaceae* the seeds are strikingly uniform.

The first important difference between the seeds of the various genera lies in the presence or absence of an "areola". This is an orbicular, ovate or oblong portion of the flat side, extending from the chalaza in the direction of the margin, and differing from the surrounding tissue in its light grey or ivory colour, its shining surface and glabrousness, hairs when present being confined to the margin; it consists of more or less elongated, thick-walled cells, whose walls are, as a rule, conspicuously pitted. The cells of the circum-areolar zone, on the other hand, are thin-walled, sometimes provided with annular or spiral thickenings, not rarely filled with a dark-coloured, often hardening and brittle resin, and frequently prolonged into a hair; this part of the testa is always dull and often, on account of the dark-coloured resin, yellowish-brown or brown.

The relative size of the areola and the circum-areolar zone varies widely: sometimes it is the areola which is the larger of the two, and sometimes it is the circum-areolar zone. In the genera *Nilgirianthus* (Tab. IV F), *Xenacanthus*, *Didyplosandra*, *Pseudostenosiphonium*, *Hymenochlaena* (Tab. VI B), *Lissospermum* (Tab. VI A), and in part of the species of *Sericocalyx*, the circum-areolar zone is either entirely suppressed or so narrow that it is no longer discernible on the flat side. Up to now these seeds have been described as exareolate, but in reality it is not the areola that is absent, but the circum-areolar zone, and these seeds are therefore totally different from the true exareolate seeds that will be dealt with below. In the genera mentioned above, the two flat sides of the seedcoat are easily separated: this is due either to the presence of a narrow strip of thin-walled cells along the margin of the seed, the last vestige of the circum-areolar zone, or, when the latter is completely absent, to the circumstance that the prosenchymatous cells of the areola do not cross the margin. The absence of the thin-walled cells is difficult to prove, as the two halves of the seedcoat almost always come apart when one tries to make a section. *Lissospermum* and *Hymenochlaena* are so far the only genera where I am pretty sure that this layer really fails. The four genera occurring in Southern India: *Nilgirianthus*, *Xenacanthus*, *Didyplosandra* and *Pseudostenosiphonium*, to which *Taeniandra*, whose seeds are unknown to me, will probably have to be added, are doubtless nearly related, but the three other ones show no clear relations either with each other or with the Indian ones. The areolar cells of *Lissospermum* (Tab. VI A) differ from those found elsewhere by their enormous size.

The proportion in size between the areolar and the circum-areolar zone, although varying widely, is as a rule more or less constant for each genus. The genus *Sericocalyx* and the nearly allied *Xanthostachya*, however, are exceptions to this rule. In *Sericocalyx sumatranus* Brem. the circum-areolar zone is indiscernible on the flat side, and the seeds of this species look therefore exactly like those of *Nilgirianthus*; in *S. crispus* (L.) Brem. (Tab. IV B) it is just visible, and in *S. sublaevis* Brem. it is again slightly wider; in *S. timorensis* (Nees) Brem. and in *S. celebicus* Brem. it is about as wide as the height of the areola, whereas in *S. phyllostachyus* (Kurz) Brem., *S. glaucescens* (Nees) Brem. and *S. quadrifarius* (Nees) Brem. it is at least twice as wide as the latter. In *Xanthostachya aspera* (Decn.) Brem. its width reaches about one third of the height of the areola, whereas in *X. arborea* (Span.) Brem. it is higher than the areola.

In the true exareolate seeds the thick-walled cells that elsewhere form the areola are not entirely wanting, but they are confined to a narrow strip round

the hilum. Such seeds are characteristic for the genera *Aechmanthera*, *Pteracanthus*, *Pyrrothrix*, *Paragoldfussia*, *Tetraglochidion*, *Tetragompha*, *Goldfussia*, *Difflugossa*, *Dossifluga* and *Pachystrobilus*. The testa in these seeds is, with the exception of the narrow zone round the hilum, entirely covered with hairs. Apart from *Aechmanthera*, which belongs in the neighbourhood of *Hemigraphis*, where the areola is sometimes but little larger, the genera mentioned in this paragraph are all closely allied.

In some other genera the areola is but small (e.g. in *Mackenzia*, *Leptacanthus*, *Adenacanthus*, *Perilepta*, *Semnothyrsus*, and this reduces the taxonomic value of the antithesis areolate-exareolate. The three last-named genera belong to the group in which exareolate seeds are the rule.

The structure of the circum-areolar cells shows, apart from the hairs in which they usually are prolonged, not much diversity. In some genera they are provided with annular or spiral thickenings, which however are not confined to the epithelial part of the cell but extend into the hairs. In the genera *Strobilanthes* (Tab. VI E), *Parastrobilanthes* and *Lamiacanthus* (Tab. VI F) these thickenings are a conspicuous feature, whereas in the nearly related genera *Sympagis* (Tab. VI D), *Parasympagis* and *Listrobanthes* they are less conspicuous but nevertheless easily distinguishable. In the testa of *Thelepaepale* and *Carvia* too these thickenings are faintly visible. In some other genera, e.g. in *Sericocalyx*, they are sometimes so thin that they are difficult to detect, and elsewhere they seem to be completely absent. In the genera *Echinopaepale* (Tab. V G) and *Gutzlaffia* (Tab. IV D) the thick-walled areolar cells are provided with annular thickenings: they are so far the only genera in which areolar cells of this kind have been found.

As stated before, at least a large part of the circum-areolar cells are prolonged in hairs. A naked circum-areolar zone is found, however, in the genera *Parastrobilanthes* and *Lamiacanthus* (Tab. VI F), and in a single species of *Championella*. At first sight these seeds resemble those of *Nilgiritanthus* and the other genera enumerated above, in which the areola extends over the whole flat side of the seed, but they are much smaller, of a brownish colour, and with the exception of a circular patch at the base, dull; the shining circular patch is, of course, the areola. The seeds of *Baphicacanthus* (Tab. V B) too have been described as glabrous, but this is a mistake, for in reality the circum-areolar zone is not devoid of hairs, but the latter are very small and therefore easily overlooked. The seeds of *Tarphochlamys* lose their hairs before they are fully ripe; by the aid of the microscope the basal parts of the hairs are still recognizable on the ripe testa. In some species of *Hemigraphis* too fully ripe seeds are nearly entirely glabrous.

The hairs themselves show a most remarkable range of variability. Leaving some aberrant types for the moment out of consideration, they may be classed in three main groups: thin-walled ones with annular or spiral thickenings (Tab. IV A, C, D, E; Tab. VI E), long and thin undulating ones with an almost invisible lumen (Tab. V H), and rigid thick-walled ones tapering into a more or less sharp point (Tab. V E, F). The hairs belonging to the first group are as a rule much longer and also more numerous along the margin of the seed than towards the centre, but this is not so with those belonging to the two other groups. Part of the hairs belonging to the first group and all those belonging to the second one are strongly hygroscopic and mucous: in water they form a thick and slimy envelope round the seed. The others are never mucous and as a rule but slightly hygroscopic: those belonging to the third group are unable to change their form except at the base where the wall is thinner and sometimes provided with annular or spiral thickenings. From a morphological point of view it is noteworthy that these annular or spiral

thickenings sometimes extend into the rigid portion of the hair: it would seem therefore as if the hairs of the first and third groups were not so fundamentally different as at first sight might be supposed.

Tapering, more or less flattened, thin-walled hairs provided with annular or spiral thickenings and filled with slime, which is set free when they are shed, are characteristic for the genera *Hemigraphis* (Tab. IV A), *Gantelbua*, *Stenosiphonium* (Tab. IV C), *Sericocalyx*, *Xanthostachya*, *Carvia*, *Thelepae-pale* and *Adenostachya*; similar but non-mucous hairs are found in *Gutzlaffia* (Tab. IV D), *Championella* (Tab. IV E), *Listrobantes*, *Sympagis* (Tab. VI D), *Parasympagis*, *Perilepta* (Tab. V C), *Paragoldfussia* and *Adenacanthus*; those of the three last-named genera are however less flexible than the others, and may perhaps be regarded as another link between the hairs of the first and third groups. This is also important from a taxonomic point of view, because these genera are doubtless nearly related to genera in which hairs belonging to the third group are found. The hairs on the seeds of *Phlebophyllum* have been described as strongly hygroscopic, and they are therefore probably of the same kind as those of *Hemigraphis* and the other genera mentioned above, but as the species belonging to this genus apparently need a long time to ripen their seeds, the latter are but rarely present in herbarium material, and I have not yet been able to study them. The hairs on the seeds of *Aechmanthera* are also strongly hygroscopic, but here the annular thickenings are but weakly developed.

The hairs on the testa of the *Strobilanthes* species (Tab. VI E) are much shorter than those dealt with in the preceding paragraph, and differ from them in their cylindrical shape: instead of tapering they have everywhere the same diameter and end obtusely; in some species they are so short that they are better described as papillae. In the nearly related genera *Parastrobilanthes* and *Lamiacanthus* (Tab. VI F) the circum-areolar zone is entirely glabrous.

In the genus *Echinopaepale* (Tab. V G) the seedcoat is sprinkled with short and thin tapering hairs provided with annular thickenings, but these hairs are few in number and a much less conspicuous feature than the far more numerous capitate ones with which they are mixed. *Echinopaepale* is the only genus of the *Strobilanthinae* in which seeds of this kind occur, and it deserves special attention, for seeds covered with capitate hairs are everywhere extremely rare. They are known to occur in some genera of the *Labiatae* (cf. NETOLITZKY in LINSBAUER, Hand. d. Pflanzenanat. X, p. 279, 1926, where the literature on this subject is quoted), and they are said to be present in one of the genera belonging to the *Verbenaceae*, namely in *Holmskioldia* (PORSCH in Jahrb. f. wiss. Bot. LXIII, p. 663 and fig. 5, 1924), where they should be confined to the chalazal part, but I am afraid that this is a mistake, and that they are in reality inserted on the flap of the placenta which envelops the basal part of the ovule: this at least is the place where I found them in *Clerodendron Minahassae* Miq. (BREMELAMP in Ann. du Jard. Bot. de Buitenz., Sér. 2, XIII, p. 95 and Tab. XIII, fig. 3, 1914).

The very long, thin and wavy hairs which form the second group, are characteristic for the nearly related genera *Goldfussia* (Tab. V H), *Difflugossa* and *Dossifluga*, and for *Pachystrobilus*, all four genera with exareolate seeds, but they have also been found in plants with areolate seeds, namely in the monotypic genus *Semnothyrsus*, which is doubtless nearly related to *Goldfussia*, *Difflugossa* and *Dossifluga*, and in the Ceylonese "*Strobilanthes*" *Walkeri* Nees, of which no flowers were available to me, and whose taxonomic position I was therefore unable to determine.

The seeds of *Mackenzia* (Tab. IV G) and *Leptacanthus* have been described as "shaggy"; the only ones which I could study were those of



*Mackenzia homotropa* (Nees) Brem. They proved to be provided with a small areola and covered with long and thin, nearly straight, white hairs, so thick-walled that the lumen was nearly obliterated. The peculiar mechanism by the aid of which their hygrometric movements are carried out, has been mentioned already. They are not readily comparable to those found elsewhere in this group, which is all the more remarkable as in other respects these genera apparently do not recede very far from the other ones by which this subtribe is represented in Ceylon and Southern India.

The thick-walled, straight and but slightly hygrometric hairs of the third group are entirely confined to genera with exareolate or nearly exareolate seeds. In *Pteracanthus*, *Tetraglochidium* and *Tetragompha* they end in a sharp point, but those of *Pyrrothrix*, although gradually tapering, end obtusely. The minute hairs on the testa of *Baphicacanthus* (Tab. V B) are also obtuse. The almost entirely obliterated lumen and their diminutive size suggest that they might better be referred to a class of their own. In other respects too, the genus *Baphicacanthus* occupies a rather isolated position in the subtribe.

The hairs of *Ditrichospermum* (Tab. V A) are of two kinds: one kind belongs to the marginal cells of the areola, which is most peculiar, as the latter is nowhere else provided with hairs, whereas the others, like those found elsewhere, belong to the circum-areolar zone. The marginal cells of the areola are best described as contracted in a long stiff point, which stands out in an oblique direction. The cells of the circum-areolar zone are provided with annular thickenings and are prolonged in a short and thin hair also provided with annular thickenings, especially towards the base. *Ditrichospermum* is a monotypic genus, based on *Strobilanthes secunda* T. And., which shows a superficial resemblance to *Baphicacanthus cusia* (Nees) Brem. CLARKE was so much impressed by this, that he said of the latter: "Except as to the capsule, this looks exceedingly like a cultivated form of *S. secundus*". As *Ditrichospermum secundum* (T. And.) Brem. is apparently never cultivated, this means probably that if it were cultivated, it would look like *Baphicacanthus cusia* "except as to the capsule". CLARKE apparently imagined himself that he knew that, and in what way, cultivation would change this species, a knowledge which, if he had really possessed it, many botanists would have envied him! Apart from the shape of the capsule, there are however several other important differences, among whom those in the structure of the seed rank very high.

Looking back on the preceding paragraphs, we will come to the conclusion that the taxonomic value of the seed characters is doubtless very high. It happens but rarely that exactly the same type of seed returns in different genera, and such genera are almost always very similar in other respects too, i.e. they are nearly related; and again, if genera are nearly related, they show as a rule more or less the same kind of seed. Good examples are presented by such groups of genera as *Goldfussia*, *Disflugossa*, *Dossifluga* and *Semnothyrsus*, as *Strobilanthes*, *Parastrobilanthes* and *Lamiacanthus*, and as *Nilgirianthus*, *Xenacanthus*, *Didyplosandra* and *Pseudostenosiphonium*. The diagnostic value too is very high, as several genera like *Hymenochlaena*, *Lissospermum*, *Ditrichospermum*, *Baphicacanthus* and *Echinopaepale*, are easily recognizable by the aid of these characters. It proved, on the other hand, impossible to classify the genera of the *Strobilanthinae* on account of the structural peculiarities of the testa in a few well-defined groups, but as such a classification apparently can not be obtained by the aid of other characters either, it must be taken for granted that such groups are in reality non-existent. In view of the fact that the number of taxonomic groups whose constituents refuse to be classed in a few well-defined groups, is very considerable, and also because in other groups

such subdivisions have on closer inspection often been recognized as artificial, our failure is neither surprising nor disappointing.

Passing on to the structural peculiarities revealed by the pollen grains of the *Strobilanthinæ* (Tab. I—III), we note that these too may, in the main, be classed under three headings: first, grains provided with smooth, punctate, marbled or faintly costate bands (Tab. I B, C, D, E, H, I); secondly, those with septate bands (Tab. II A, B, C, D, F) or with bands which by the suppression of the transverse ridges have been reduced to a mere rim (Tab. II G); and thirdly, the carunculate and echinulate ones (Tab. I A, F, G, J; Tab. II E; Tab. III C, D, E). Outside these main groups we have the large ellipsoidal grains provided with keeled bands, that are confined to the genus *Tetragoga* (Tab. I K); the globose grains whose bands are ornamented with a dense row of transverse ridges (Tab. III F), found in the monotypic genus *Ctenopaepale*; the globose echinulate ones whose spinules are arranged in rings inside the meshes of a lax and faint reticulation (Tab. III B), which characterize the genus *Tarphochlamys*; and the globose echinulate ones with five instead of three equatorial germ pores, observed so far only in the genus *Pteroptychia* (Tab. III A). Less aberrant are the ellipsoidal grains provided with septate bands found in the monotypic genus *Lissospermum*, which differ from the common type in the presence of two instead of three germ pores.

The three main groups are of very different taxonomic value. The most natural one is the first, for this kind of pollen is confined to genera which in other respects too show a fair degree of similarity. With one exception these grains are always ellipsoidal. The second group is somewhat less satisfactory, for the relationship between the Indian genera *Carvia* and *Pleocaulus* with the other ones in which this kind of pollen is found, is open to doubt. The third group, which comprises the carunculate and echinulate grains, is on the other hand clearly artificial. This conclusion rests on the following considerations.

1<sup>o</sup>. Carunculate or echinulate pollen grains may occur in genera which are nearly related to those in which the pollen grains are provided with smooth, punctate, marbled or faintly costate ribs, and in one instance they have been found in a genus in which the pollen grains are as a rule of the latter type. This was in the genus *Hemigraphis*, where a number of species belonging to the series *Pubicrures* proved to be provided with grains (Tab. I A) which in shape and size are similar to those found in the other species of this series and in the other series (Tab. I B) too, but which are distinctly carunculate. Of the doubtless nearly related genera *Nilgiranthus*, *Taeniandra*, *Xenacanthus*, *Didyplosandra* and *Pseudostenosiphonium* the first two are provided with ellipsoidal pollen grains furnished with smooth or punctate bands (Tab. I E), whereas the pollen grains of *Xenacanthus* (Tab. I F, G) are, it is true, similar in shape and also distinctly banded, but differ in the nature of the bands, for the latter are either carunculate or echinulate, and those of the two last-named genera are globose and echinulate, and bands are in these grains either absent or but faintly indicated.

2<sup>o</sup>. Carunculate or echinulate pollen grains may also occur in genera in which the pollen grains are sometimes provided with septate bands, or in genera that are closely related to others in which the pollen grains are provided either with septate bands or with bands which by the suppression of the transverse septa have been reduced to the elevated rim. In the genus *Adenostachya* the pollen of the type species is ellipsoidal and provided with septate bands, whereas that of the only other species which so far has been discovered, *A. parvifolia* Brem., though in shape and size not unlike that of the first, is furnished with carunculate bands. In the type species of the genus *Pachystro-*

*bilus* the pollen grains (Tab. II D) are very shortly ellipsoidal and provided with septate bands, but in the only other species, *P. hirsutus* Brem., they are globose and echinulate, but still distinctly banded (Tab. II E). The genera *Strobilanthes*, *Parastrobilanthes* and *Lamiacanthus* are doubtless nearly related, but their pollen grains, although agreeing in shape and size, show a different relief: those of *Strobilanthes* (Tab. II F) are provided with septate bands, those of *Parastrobilanthes* (Tab. II G) by bands reduced to a mere rim, whereas those of *Lamiacanthus* (Tab. III C) are not banded at all, but evenly sprinkled with spinules. The monotypic genus *Psacadopaepale* has ellipsoidal pollen grains provided with carunculate bands (Tab. I J), which are in general aspect not unlike those of *Adenostachya parvifolia*; on account of its anisophylly, abbreviated spikes and resupinate corolla it will have to be located in the neighbourhood of such genera as *Paragoldfussia* and *Tetraglochidium*, i.e. of genera in which the pollen grains are provided with septate bands. The genus *Thelepaepale*, whose echinulate pollen (Tab. III E) differs somewhat from the usual kind by the large size of the spinules and by the swollen base of the latter, has the same kind of seeds as *Carvia*, and may be nearly related to that genus, which however possesses pollen provided with septate bands.

As the preceding considerations with regard to the occurrence of echinulate pollen in this subtribe, already have acquainted us with a number of genera whose affinities, notwithstanding the aberrant nature of their pollen, could not be misunderstood, a brief note on the remaining genera provided with this kind of pollen, those namely whose affinities are not so obvious, is perhaps most properly added at this place. After that we will pass on to the genera in which the two other kinds of pollen occur.

Globose echinulate pollen grains with the spinules evenly distributed over the surface, but not provided with any other relief: grains therefore that are hardly distinguishable from those found in several of the genera whose affinities were discussed in the preceding paragraphs, are met with in the two nearly related genera *Championella* and *Parachampionella*, and in *Gutzlaffia* (Tab. III D), and echinulate pollen of a more or less aberrant type in *Tarphochlamys* (Tab. III B) and in *Pteroptychia* (Tab. III A).

The species belonging to the genera *Championella* and *Parachampionella* are small ascending herbs with isophyllous shoots, a non-resupinate corolla and fusiform 4-seeded capsules provided with small seeds, not unlike those found in the genus *Hemigraphis*. It is not impossible that the group of genera to which the latter belongs may be regarded as the nearest allies of these two genera. Our knowledge of the latter is, however, still very incomplete.

The genus *Gutzlaffia* deserves our attention in the first place because the number of ovules in the ovary cells varies between two and four, a peculiarity also observed in the genus *Sericocalyx*. Its species are, like those of the latter, isophyllous plants, but in other respects there are considerable differences: the corolla, for instance, is resupinate, and the inner stamens are reduced to filiform staminodes. The resupination of the corolla suggests affinity with *Stenosiphonium*, but in *Gutzlaffia* the flowers are never arranged in triads, and the hairs on the seedcoat are not mucous. The structure of the seeds reminds one of *Championella* and *Parachampionella* and of *Hemigraphis*, but more striking is its resemblance with *Tarphochlamys*, which will be dealt with hereafter. A nearer relation with some of the genera whose pollen grains are provided with septate bands, seems improbable: in these genera the number of ovules in the ovary cells is never more than two, and most of the species belonging to them are moreover distinctly anisophyllous.

In the pollen grains of *Tarphochlamys* (Tab. III B) the spinules are not evenly distributed over a uniform surface, like those on the pollen grains of the

genera dealt with above, nor are they arranged in rows in the middle of meridional bands, like those on the grains of *Xenacanthus* and of *Pteroptychia*, but they form rings inside the meshes of a lax reticulation. This arrangement deserves our attention for two reasons: in the first place because reticulate pollen does not occur anywhere else in the *Strobilanthinae*, and in the second place because in those *Ruelliae* where the pollen is both reticulate and echinulate, the spinules are never inserted inside the meshes but always on the reticulum itself. Apart from the peculiar structure of the pollen, there are other features in which the genus differs from the other *Strobilanthinae* or at least from most of them. The most important ones are found in the seeds. The latter are best described as biconvex, i.e. they are not so strongly compressed as is usual in this subtribe: in this respect they resemble those of the *Gutzlaffia* species, with which they agree also in some other points, namely in the structure of the central layer of the testa with its strongly thickened walls and in the presence of annulate hairs. In *Tarphochlamys* the latter, however, are shed before the seed is fully ripe, a phenomenon which is also observed in the seeds of several species of *Hemigraphis* section *Nudicrures*. Other characters which deserve our attention are its isophylly, the resupinate corolla, and the exerted stamens: herein too the genera *Tarphochlamys* and *Gutzlaffia* resemble each other. This was apparently overlooked by CLARKE, to whom the position of the species on which the genus *Tarphochlamys* is founded, accordingly appeared even more isolated. In a remark added to the description of this plant, which he records under the name *Strobilanthes acrocephala* T. And., he states: "A species not very closely allied to any other in the genus." His description however hardly bears this out.

Of the genus *Pteroptychia* so far but one species, *Pt. Ridleyi* (Merr.) Brem., could be investigated. The pollen grains of this plant (Tab. III A) proved to be shortly ellipsoidal, distinctly banded, and provided with five equatorial germ pores. The presence of five equatorial germ pores and that of wings on the ridges descending from the outer stamens, are peculiarities met nowhere else in this subtribe, but its anisophylly suggests affinity with the genera whose pollen is provided with septate bands. The structure of the seed, from which valuable indications with regard to the affinities of the genus may be expected, is unfortunately still unknown, and its other characters are unable to give us a clue. The spiciform inflorescences resemble those of *Pteracanthus* and *Semnostachya*, genera provided with septate pollen, but as a similar inflorescence recurs in *Ditrichospermum*, a genus which shows no clear relations with the other ones, this does not mean much. For the present the affinities of *Pteroptychia* are therefore to be regarded as obscure.

The pollen grains provided with smooth, punctate, marbled or faintly ridged bands are in other respects rather similar, and the differences in the sculpture of the bands are apparently of little taxonomic importance. The grains are almost always ellipsoidal: in fact, so far but one exception to this rule has come to my notice. It occurs in the genus *Hemigraphis*, where the pollen grains of *H. fruticulosa* Clarke proved to be globose. This species forms a section of its own, but in the other sections of this genus too, the quantitative relation between length and diameter of the grains proved to be a character of diagnostic importance. In the size of the grains there is also some variability: those of *Nilgiranthus* (Tab. I E) and *Sericocalyx* are for instance always much larger than those of *Hemigraphis* (Tab. I A, B) and *Stenosiphonium*. In *Baphicacanthus* (Tab. I J) the bands are ornamented with two wavy ridges which remind one of the wavy rim to which in *Sympagis*, *Parasympagis* and *Parastrobilanthes* the bands are reduced, but as the surface between the ridges is raised above the level of the fissures and punctate in *Baphicacanthus*, and

sunken to the level of the fissures and smooth in the other genera, the resemblance is after all but superficial. In *Mackenzia homotropa* (Nees) Brem. (Tab. I H) and in *M. arguta* (Nees) Brem. I found the bands ornamented with a single wavy ridge, whereas those of *M. integrifolia* (Dalz.) Brem. proved to be smooth, and this difference may be of some taxonomic importance, as the latter differs in other respects also from the two other species and, in fact, from the rest of the genus. In *Phlebophyllum* (Tab. I D, E), *Nilgirianthus* (Tab. I F) and *Xenacanthus* (Tab. I G) the bands are not rarely antihelictically twisted, i.e. they show a torsion whose direction is opposite to that of the corkscrew thread. The constant direction of this torsion is the more remarkable as this direction was found to be variable in the pollen grains of *Thunbergia* Retz. (cf. BREMEKAMP in Rec. d. Trav. Bot. Néerl. XXXV, p. 143 and fig. 2, 1938), where helictically and antihelictically twisted grains were found in the same anther. Grains provided with septate bands may also be twisted, e.g. those of *Adenostachya moschifera* (Bl.) Brem., and here too the direction of the torsion is constantly antihelictic, but the torsion is not so strong as in the genera mentioned above. On the whole, the character is rather variable, and has therefore but little diagnostic value.

Whereas the pollen grains provided with smooth, punctate, marbled or faintly ridged bands are with a single exception ellipsoidal, those provided with septate bands are not rarely globose, and those where the transverse septa are suppressed and the bands therefore reduced to a mere rim are even, like the echinulate ones found in the related genera, always globose. It appears, however, that the globose pollen is confined to a single group of genera, namely to *Strobilanthes* sensu meo and its nearest allies: *Parastrobilanthes*, *Lamiacanthus*, *Parasympagis*, *Sympagis* and *Listrobanthes*. The grains of *Strobilanthes* (Tab. II F) and *Listrobanthes* are provided with septate bands; in the bands of *Parastrobilanthes* (Tab. II G), *Parasympagis* and *Sympagis* the transverse septa are suppressed; and the pollen of *Lamiacanthus* (Tab. III C) is echinulate. In the genus *Microstrobilus*, which is perhaps the nearest ally of this group of genera, the grains (Tab. II B, C) are ellipsoidal and the bands septate, but in one species, *M. alatus* (Bl.) Brem., the difference in length between the axis and the equatorial diameter is so small that the grains might easily be taken for globose. This applies also to the large grains of *Pachystrobilus involucratus* (Bl.) Brem. (Tab. II D), in which the septate bands moreover do not as elsewhere meet at the poles.

Most of the genera provided with ellipsoidal pollen decorated with septate bands are nearly related: they comprise more or less distinctly anisophyllous plants whose corollas are usually resupinate and whose seeds are covered either with stiff or with long and thin wavy hairs. However, there are some exceptions to this rule. The two genera, *Carvia* and *Pleocaulus*, occurring in Southern India, i.e. outside the main area of this group, are isophyllous and provided with a non-resupinate corolla, and in *Carvia* the seeds too are of an entirely different type, for outside the large areola they are covered with mucous hairs of the annulate kind. The seeds of *Pleocaulus* are unfortunately unknown to me: according to COOKE (Fl. Bombay II, p. 366, 1905), they are entirely covered with hygroscopic hairs, but whether the latter are of the annulate kind remains uncertain. It seems to me that these genera show a greater resemblance to the other representatives of this subtribe occurring in Southern India than to the rest of the genera whose pollen grains are provided with septate bands. For the moment the best solution of the difficulty appears to be to keep them apart. The genus *Adenostachya* shows in the structure of its seeds some resemblance to *Carvia*, and its corolla is like that of the latter straight and non-resupinate. It is also isophyllous, but as it are but small, erect and little branched herbs, this does not mean much.

The globose grains of the monotypic genus *Ctenopaepale* (Tab. III F) are banded, but the bands are neither septate nor echinulate, as in the other genera provided with globose pollen, but ornamented with transverse ridges. The plant is slightly anisophyllous, its corolla becomes resupinate, and the stamens show the *Goldfussia* position. As the seeds are still unknown, the exact position of the genus can not yet be determined.

The strongly keeled grains of the two *Tetragoga* species (Tab. I K) are not matched anywhere else: by their large size and elongate form they remind me however of the grains found in some of the genera whose pollen is provided with septate bands. The anisophylly, the resupinate corolla and the large seeds with their comparatively small areola, lend support to the idea of a nearer affinity with those genera.

Beside the structural peculiarities of the testa and of the pollen, the isophylly or anisophylly and the normal or resupinate position of the corolla, have shown themselves valuable guides in the labyrinth of relations existing between the various genera.

The taxonomic importance of the anisophyllous condition reveals itself in the circumstance that it is confined to those genera in which pollen grains provided with septate bands are the rule, and to some aberrant ones, like *Tetragoga* and *Ctenopaepale*, of which we may safely assume they are related to the latter. As a diagnostic character its value is somewhat diminished by the fact that it is rather variable in degree, and therefore not always easily recognizable: erect or but slightly inclined shoots do not show it, and in a but little branched plant like *Pachystrobilus involucratus* (Bl.) Brem., in which we should expect it on account of the position of the genus, it remains sometimes in abeyance; in strongly branched plants it is on the other hand often a conspicuous feature. In the genera *Carvia*, *Pleocaulus* and *Adenostachya* it is wanting, but in all three its absence may be due to a special cause: in *Pleocaulus* the shoots are all erect and unbranched; in *Carvia* the shoots are apparently but slightly inclined, and though long and vigorous, but little branched; and the *Adenostachya* species are but small and little-branched plants.

The resupinate corolla is a feature of the same group of genera in which the anisophylly occurs and where the pollen is, as a rule, provided with septate bands. In a comparatively large number of genera belonging to this group it is however always absent, and it recurs on the other hand in four genera which are but distantly related, and of whom three moreover do not show a very near affinity to each other, namely in *Stenosiphonium*, *Xenacanthus*, *Gutzlaffia* and *Tarphochlamys*. It is correlated with the presence of a bent between the tube and the throat: where the latter is absent, as in the genera *Listrobanthes*, *Sympagis*, *Parasympagis*, *Strobilanthes*, *Parastrobilanthes* and *Lamiacanthus*, and further in *Microstrobilus*, *Pachystrobilus*, *Adenostachya*, *Carvia* and *Pleocaulus*, the corolla always develops in the normal position. From a practical point of view, it is a drawback that this character can be studied only in fully developed flowers, for the latter are easily shed, and therefore in herbarium material not always present.

Gregarious growth and locally simultaneous flowering once in a period of several years, might also be used as a taxonomically important character, if we were better informed with regard to their occurrence. As far as we know at present, they are found in some genera confined to Ceylon and the Indian Peninsula, namely in *Mackenzia*, *Leptacanthus*, *Phlebophyllum*, *Taeniandra* and *Xenacanthus* as a general phenomenon, and in *Nilgirianthus*, *Didyplosandra* and *Pseudostenosiphonium* as a phenomenon confined to part of the species, and further in the Malesian genus *Strobilanthes* and probably in the nearly related genera *Parastrobilanthes* and *Lamiacanthus* and in at least one of the

species belonging to *Microstrobilus*. Outside these widely separated areas and apart from these two groups of genera which show but little affinity, they are said to occur in the Himalayan "*Strobilanthes*" *echinata* Nees (cf. COWAN and COWAN, Trees of Northern Bengal, Calcutta 1929, p. 98) and *Pteracanthus alatus* (Nees) Brem. (cf. NEES in Prodrromus XI, p. 193, 1847). Of "*Strobilanthes*" *gregalis* Collett et Hemsl., a species collected in Upper Burma, gregarious growth has been reported, but as nothing is said about its flowering, it is uncertain whether the latter is locally simultaneous and takes place once in several years, or yearly and more erratic.

As the other characters used for the subdivision of the group are all of minor importance, I will not discuss them separately; an idea of their significance can be obtained by comparing the diagnoses given in the "Conspectus Generum".

Not to make these diagnoses too cumbersome, parts which present themselves as a rule in the same guise, are mentioned only when they occur in an unusual form. Unless the contrary is expressly stated, it is understood therefore: 1<sup>o</sup>. that the flowers are solitary in the axils of the bracts and sessile; 2<sup>o</sup>. that the corolla is either white, blue, violet or purplish; 3<sup>o</sup>. that the hairs by which the style is retained against the wall of the corolla are arranged in two rows; 4<sup>o</sup>. that four fertile stamens are present, and that they are included and didynamous; 5<sup>o</sup>. that the anthers are erect and elongate; 6<sup>o</sup>. that the connective is not produced in a mucro or awn; 7<sup>o</sup>. that the pollen grains are provided with three germ pores; 8<sup>o</sup>. that the seeds are discoid; and 9<sup>o</sup>. that the cell walls of the central layer of the testa are not conspicuously thickened.

### CONSPECTUS GENERUM.

A. Plantae isophyllae. Inflorescentia elongata vel abbreviata, bracteis persistentibus munita. Flores in axillis bractearum nunc solitarii, nunc duo vel tres superpositi quorum unus interdum a spica secundaria substitutus. Calyx subaequaliter 5-merus. Corolla non resupinata. Stamina inclusa vel subinclusa, antheris muticis, mucronulatis vel aristatis. Granula pollinis (Tab. I A, B) ellipsoidea vel rarissimo globosa, virgis levibus, punctatis, marmoratis vel carunculatis ornata. Ovula utroque loculo 3—8. Semina parvo-areolata vel exareolata, zona circumareolari brunnea et pilis haud raro mucosis, distincte vel raro indistincte annulatis vestita; cellulae strati subepidermalis haud raro parietibus incrassatis instructae. — Genera *Zeylania* et regione septentrionali subtropicali exceptis per totam subtribus aream distributa.

1. *Hemigraphis* Nees emend. T. And. — Herbae. Inflorescentia elongata vel abbreviata. Flores in axillis bractearum nunc solitarii, nunc duo vel tres superpositi. Calyx 5-fidus vel raro 5-lobatus. Antherae muticae vel vix distincte mucronulatae. Semina (Tab. IV A) distincte areolata, pilis annulatis, interdum mucosis vestita. — *Zeylania* et regione septentrionali subtropicali exceptis per totam subtribus aream distributum; regiones altiores fugiens.
2. *Gantelbua* Brem. n. gen. — Herbae setosae. Inflorescentia abbreviata, bracteis quattuor magnis involucreta; bractee involucrentes ovatae, crassae, costa et margine chondraceis et setosis, inferiores florem et spicam abbreviatam secundariam flori superpositam, superiores florem singulum vel flores duos superpositos suffulciantes; bractee spicarum secundariarum angustiores. Calyx 5-partitus. Antherae muticae. Semina vix areolata, pilis annulatis mucosis vestita. — In Peninsulae Indicae partibus calidioribus.

3. *Aechmanthera* Nees. — Plantae basin versus lignosae. Inflorescentiae elongatae, paniculatim dispositae. Flores in axillis bractearum solitariae. Calyx 5-partitus. Antherae aristatae. Semina exareolata, pilis vix distincte annulatis vestita. — In montibus Indiae Septentrionalis et Birmaniae.
- B. Plantae isophyllae. Inflorescentia elongata vel plus minusve abbreviata, bracteis persistentibus munita. Flores interdum breviter pedicellati. Corolla non resupinata. Granula pollinis globosa echinulata, haud virgata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. IV E) parvo-areolata. — China, Japonia, Indo-China.
4. *Championella* Brem. n. gen. — Herbae ascendentes. Inflorescentia spiciformis, plus minusve abbreviata. Bractee foliaceae, penninerviae. Calyx subaequaliter 5-partitus. Ovarium comosum et stylus hirtellus. Semina pilis annulatis vestita, raro papillosa. — China, Japonia, Indo-China.
5. *Parachampionella* Brem. n. gen. — Herbae ascendentes. Inflorescentia spici- vel racemiformis, elongata. Bractee nunc foliaceae, nunc squamaceae. Calyx 3-partitus. Ovarium et stylus glabri. Semina pilis rigidulis haud annulatis vestita. — Formosa.
- C. Plantae isophyllae. Inflorescentia elongata, bracteis persistentibus munita. Flores in axillis bractearum in triades dispositi. Calyx aequaliter 5-fidus. Corolla inter tubum gracilem et fauces fortiter recurvata, resupinata; pili stylum retinentes in tuberculis duobus fasciculati. Stamina exteriora exserta; interiora inclusa vel ad staminodia clavata redacta. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovula utroque loculo 3—4. Semina (Tab. IV C) albida, magno-areolata, circum areolam pilis annulatis mucosis vestita. — Zeylaniam et Peninsulam Indicam.
6. *Stenosiphonium* Nees.
- D. Plantae isophyllae. Inflorescentia plus minusve abbreviata, bracteis persistentibus munita. Calyx segmentis tribus posticis fere totis, lateralibus cum anticis usque ad medium, anticis inter se basi solum connatis. Corolla resupinata. Stamina exteriora subexserta, antheris ovoideis vel oblongis instructa; interiora ad staminodia filiformia vel baculiformia redacta. Granula pollinis (Tab. III D) globosa echinulata, haud virgata. Ovula utroque loculo 2—4. Capsula fusiformis. Semina (Tab. IV D) luteo-brunnea, biconvexa, areolata, circum areolam pilis annulatis vestita; cellulae strati subepidermalis parietibus incrassatis instructae. — China Australi et Indo-China.
7. *Gutzlaffia* Hance.
- E. Plantae isophyllae. Inflorescentia elongata, bracteis imbricatis persistentibus oblecta. Calyx subaequaliter 5-partitus. Corolla resupinata. Stamina omnia exserta, subaequilonga. Granula pollinis (Tab. III B) globosa, vix distincte reticulata et in maculis reticuli spinulis annulatim dispositis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina brunnea, bi-convexa, parvo-areolata, fere tota pilis annulatis, ante maturitatem deciduis instructa; cellulae strati subepidermalis parietibus incrassatis instructae. — Assamia.
8. *Tarphochlamys* Brem.
- F. Plantae isophyllae. Folia setulis hamatis scabrida vel scabridula. Inflorescentia abbreviata vel elongata, bracteis persistentibus munita. Calyx



subaequaliter 5-partitus, intus nunc appresse pubescens, nunc ad basin dense et longe albo-sericeus. Corolla lutea, non resupinata. Stamina exteriora vel omnia subexserta, didynamia tamen. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovula utroque loculo 2—4. Capsula fusiformis. Semina (Tab. IV B) albida, areolata, areola interdum usque ad marginem expansa, casu quo tota glabra, alioquin zona circumareolari pilis annulatis mucosis vestita; cellulae strati subepidermalis in zona circumareolari parietibus incrassatis instructae. — China Australi, Indo-China, Sumatra, Java, terra Celebica, Insulis Sundaicis Minoribus.

9. *Sericocalyx* Brem. n. gen. — Herbae robustiores. Inflorescentia plus minusve abbreviata. Bractee ovatae vel lanceolatae. Flores in axillis bractearum plerumque solitarii, interdum in triades dispositi. Calyx intus ad basin dense et longe albo-sericeus. Ovarium comosum et stylus hirtellus. — China Australi, Indo-China, Sumatra, Java, terra Celebica, Insulis Sundaicis Minoribus; alibi cultum et interdum e cultura evadens.
  10. *Xanthostachya* Brem. n. gen. — Plantae ramosae, interdum arborescentes. Inflorescentia elongata. Bractee lineari-lanceolatae. Calyx intus appresse pubescens. Antherae interdum apiculatae. Ovarium glabrum vel puberulum; stylus glaber. — Insulis Rotti et Timor dictis.
- G. Plantae isophyllae, plietesiae, haud raro gregariae et pluribus interjectis annis uno tempore florentes, rarius frutices cauli- et ramiflori. Inflorescentia elongata vel abbreviata, bracteis persistentibus instructa. Calyx subaequaliter 5-merus. Corolla interdum resupinata. Stamina nunc omnia exserta et aequilonga, nunc inclusa casu quo interiora breviora et interdum ad staminodia redacta vel tota suppressa. Granula pollinis nunc ellipsoidea et virgis punctatis, carunculatis vel echinulatis munita, nunc globosa et echinulata. Ovula utroque loculo 2. Capsula fusiformis. Semina areolata, areola haud raro usque ad marginem expansa, zona circumareolari nisi suppressa pilis probabiliter semper annulatis vestita. — Zeylaniam et Peninsula Indica.
11. *Phlebophyllum* Nees. — Plantae gregariae, pluribus interjectis annis uno tempore florentes. Inflorescentia elongata vel abbreviata. Calyx 5-fidus. Corolla non resupinata. Stamina 2, inclusa vel breviter exserta; staminodia nulla. Granula pollinis (Tab. I C, D) ellipsoidea, virgis punctatis ornata. Semina areolata dicta, circum areolam pilis probabiliter annulatis vestita, tarde maturantia. — Peninsula Indica.
  12. *Nilgirianthus* Brem. n. gen. — Plantae aliae pluribus interjectis annis uno tempore florere dictae, aliae quotannis. Inflorescentia abbreviata. Bractee nunc penninerviae, nunc 3-vel plurinerviae. Calyx 5-partitus vel 5-fidus. Corolla non resupinata, calyce multo longior. Stamina exserta vel inclusa, subaequalia vel didynamia; interiora interdum ad staminodia redacta; filamenta staminum exteriorum ad basin vel tota hirtella. Granula pollinis (Tab. I E) ellipsoidea, virgis punctatis ornata. Ovarium glabrum vel pilis capitatis comosum; stylus glaber vel hirtellus. Semina glabra (Tab. IV F) vel ad marginem pilis mucosis instructa. — Peninsula Indica.
  13. *Taeniandra* Brem. n. gen. — Planta pluribus interjectis annis uno tempore florere dicta. Inflorescentia abbreviata. Bractee penninerviae. Calyx 5-partitus. Corolla non resupinata, calyce brevior; lobi brevissimi, reflexi. Stamina longe exserta; filamenta liguliformia, glabra;

lobuli interstaminales staminodio impari similiores. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovarium et stylus glabri. Semina glabra dicta. — Peninsula Indica.

14. *Xenacanthus* Brem. n. gen. — Plantae pluribus interjectis annis uno tempore florentes. Inflorescentia abbreviata. Bracteae e basi 3-nerviae. Calyx 5-fidus. Corolla resupinata. Stamina inclusa; filamenta ad basin solum hirtella. Granula pollinis (Tab. I F, G) ellipsoidea, virgis carunculatis vel echinulatis ornata. Ovarium pilis capitatis comosum; stylus glaber vel ad basin pilis capitatis hirtellus. Semina ad marginem pilis annulatis instructa. — Peninsula Indica.
  15. *Didyplosandra* Wight ex Brem. n. gen. — Frutices cauli- et ramiflori. Inflorescentia abbreviata. Bracteae e basi interdum 3-nerviae, ceterum penninerviae. Calyx 5-partitus. Corolla non resupinata. Stamina exserta, aequalia vel subaequalia; filamenta glabra vel subglabra. Granula pollinis globosa echinulata. Semina glabra. — Peninsula Indica et forsitan Zeylaniam.
  16. *Pseudostenosiphonium* Lindau. — Plantae pluribus interjectis annis uno tempore florentes. Inflorescentia elongata. Calyx 5-fidus vel 5-lobatus. Corolla non resupinata. Stamina 2 inclusa vel subexserta; staminodia nulla. Granula pollinis globosa echinulata. Ovarium glabrum et stylus glaber vel hirtellus. Semina glabra, tarde maturantia. — Zeylaniam.
- H. Plantae isophyllae, plietesiae, gregariae et pluribus interjectis annis uno tempore florentes. Inflorescentiae elongatae, paniculatim dispositae. Bracteae persistentes. Flores interdum graciliter pedicellati. Calyx subaequaliter 5-partitus. Corolla non resupinata. Granula pollinis (Tab. I H) ellipsoidea, virgata; virgae punctatae et interdum insuper costa meandrina ornatae. Ovarium pilis capitatis comosum et stylus hirtellus. Ovula utroque loculo 1—2. Capsula 2-vel 4-seminalis. Semina (Tab. I G) vix areolata, pilis longis rigidulis, pariete crassa instructis vestita. — Zeylaniam et Peninsula Indica.
17. *Mackenzia* Nees emend. Brem. — Bracteolae calyce longiores. Flores sessiles. Corollae lobi emarginati. — Zeylaniam et Peninsula Indica.
  18. *Leptacanthus* Nees. — Bracteolae calyce breviores vel nullae. Flores graciliter pedicellati. Corollae lobi rotundati. — Zeylaniam et Peninsula Indica.
- I. Plantae isophyllae, perennes, caulibus quotannis e rhizomate multicipiti renovatis, foliis sessilibus ovatis vel cordatis. Inflorescentia abbreviata, bracteis imbricatis persistentibus munita. Flores ebracteolati. Calyx subaequaliter 5-partitus; lobus medianus aliis minor. Corolla non resupinata. Stamina exteriora subexserta. Granula pollinis ellipsoidea, virgis septatis ornata. Ovula utroque loculo 2. Capsula fusiformis et 4-seminalis dicta. Semina exareolata dicta et tota pilis hygrometricis vestita, tarde maturantia. — Peninsula Indica.
19. *Pleocaulus* Brem. n. gen.
- J. Frutex isophyllus. Inflorescentiae abbreviatae, brachyblastis axillaribus elatae, bracteis penninerviis persistentibus imbricatae. Flores ebracteolati. Calyx subaequaliter 5-partitus, lobis imbricatis. Corolla non resupinata.

Granula pollinis ellipsoidea, virgis septatis ornata. Ovula utroque loculo 2. Capsula ambitu elliptica, 2-seminalis. Semina albida, magno-areolata, circum areolam pilis annulatis mucosis vestita. — Peninsula Indica.

20. *Carvia* Brem. n. gen.

- K. Planta isophylla vel paulum anisophylla, plietesia. Inflorescentiae abbreviatae, paniculatim dispositae, bracteis penninerviis persistentibus imbricatae. Flores bracteolati. Calyx 5-fidus, aestivatione loborum reduplicativa. Corolla non resupinata. Granula pollinis (Tab. III E) globosa echinulata, spinulis basi incrassatis. Ovula utroque loculo 2. Capsula plerumque 2-seminalis, ambitu elliptica. Semina albida, magno-areolata, circum areolam pilis annulatis mucosis vestita. — Peninsula Indica et forsitan Zeylaniam.

21. *Thelepaepale* Brem. n. gen.

- L. Planta isophylla, probabiliter plietesia. Rami villosi et folia utrimque pubescentia. Inflorescentia elongata, bracteis foliaceis persistentibus instructa. Calyx 5-partitus, lobis obtusis, utrimque pilis capitatis hirtellis. Corolla non resupinata. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovula utroque loculo 2. Capsula pilis capitatis vestita, 4-seminalis. Semina areolata, circum areolam pilis annulatis rigidulis vestita. — Himalaya.

22. *Pseudaechmanthera* Brem. n. gen.

- M. Planta isophylla, probabiliter plietesia. Inflorescentia elongata, bracteis parvis, mox deciduis instructa. Calyx subaequaliter 5-partitus. Corolla non resupinata, lutea; pili stylum retinentes in fasciculos duos aggregati. Stamina omnia filamentis dense hirtellis. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovarium puberulum et stylus hirtellus. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V A) parvo-areolata; areolae cellulae marginales in pilos rigidos exeuntes; cellulae zonae circumareolaris annulatae, partim in pilos breves, basi annulatos contractae. — Assamia.

23. *Ditrichosperum* Brem. n. gen.

- N. Planta isophylla, plietesia. Inflorescentia elongata, bracteis parvis deciduis instructa. Calyx inaequaliter 5-partitus, lobo mediano aliis majore. Corolla non resupinata. Stamina filamentis glabris; antherae mucronulatae. Granula pollinis (Tab. I J) ellipsoidea, virgis punctatis et insuper costis duabus meandrinis ornatis instructa. Ovarium apicem versus pilis capitatis vestitum; stylus glaber. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V B) parvo-areolata, pilis vix conspicuis sparsa. — In Assamia spontaneum dictum, in China Australi et in Indo-China cultum solum.

24. *Baphicacanthus* Brem. n. gen.

- O. Plantae isophyllae, herbaceae. Inflorescentia elongata, bracteis persistentibus instructa. Bracteae bracteolaeque filiformes, pilis capitatis longis ciliatae. Calyx inaequaliter 5-partitus; lobi filiformes bracteis bracteolisque similiores; medianus aliis minor. Corolla non resupinata. Antherae interdum mucronulatae. Granula pollinis ellipsoidea, nunc virgis septatis, nunc virgis carunculatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina magno-areolata, zona circumareolari pilis annulatis mucosis vestita. — Java.

25. *Adenostachya* Brem. n. gen.

- P. Plantae plerumque anisophyllae, plietesiae. Inflorescentia elongata vel abbreviata, bracteis persistentibus vel deciduis instructa. Calyx plerumque inaequaliter partitus, interdum tamen subaequaliter vel inaequaliter fissus vel lobatus. Corolla brevītuba, resupinata. Stamina exteriora interdum subexserta. Granula pollinis ellipsoidea, virgis septatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V C, E, F) luteo-brunnea vel brunnea, parvo-areolata vel exareolata, tota vel fere tota pilis rigidis vel rigidulis, interdum annulatis vestita. — A clivis Himalayae usque ad Archipelagum Malayanum.
26. *Perilepta* Brem. n. gen. — Folia sessilia, basin versus angustata et ad insertionem plus minusve auriculata. Inflorescentia elongata; bractee obovatae vel obcuneatae, apice cuspidatae, e basi plurinerviae, glanduloso-pubescentes, persistentes. Calyx 2-partitus, i.e. segmentis tribus posticis in labium superius 3-fidum, anticis in labium inferius 2-fidum connatis. Stamina exteriora interdum subexserta; antherae interdum mucronulatae. Semina (Tab. V C) pilis rigidulis annulatis vestita; cellulae strati subepidermalis pariete incrassata instructae. — India Centrali et Septentrionali, Indo-China et China Australi.
27. *Adenacanthus* Nees. — Folia petiolata, subtus vel utrimque glandulis sessilibus luteis vel rubro-brunneis punctata. Inflorescentia brevis vel elongata; bractee oblongae vel anguste obovatae, penninerviae, persistentes. Calyx 3-partitus, i.e. segmentis tribus posticis in labium superius 3-fidum connatis, anticis subliberis. Semina distinctius areolata, pilis rigidulis annulatis vestita; cellulae strati subepidermalis pariete incrassata instructae. — Indo-China, Sumatra, Java.
28. *Pteracanthus* (Nees) Brem. n. gen. (*Strobilanthes* Bl. subgen. *Pteracanthus* Nees). — Folia sessilia vel subsessilia, basin versus in pseudopetiolum alatum contracta, margine serrata. Inflorescentia elongata; bractee calyce breviores, deciduae. Calyx subaequaliter 5-partitus. — Himalaya.
29. *Triaenacanthus* Nees. — Inflorescentia elongata, flexuosissima, floribus ad nodos solitariis; bractee anguste triangulares, obtusae tamen, penninerviae, persistentes. Calyx 3-partitus. Corolla lutea, rubro-notata. Semina pilis rigidis vestita. — Assamia.
30. *Semnostachya* Brem. n. gen. — Folia petiolata, margine plerumque callosodenticulata. Inflorescentia elongata, floribus ad nodos binis, interdum breviter pedicellatis; bractee angustae, plerumque 3-nerviae, calyci aequilongae vel eo paulo breviores, persistentes. Calyx 5-partitus. Antherae interdum mucronulatae. Semina (Tab. V E) exareolata, pilis rigidis vestita. — Sumatra, terra Borneënsi, Insulis Philippinis.
31. *Pyrrhothrix* Brem. n. gen. — Partes omnes indumento rufo hirsuto vestitae. Inflorescentia elongata vel plus minusve abbreviata; bractee lineari-oblongae vel spatulatae, penninerviae, persistentes. Calyx subaequaliter 5-partitus. Semina exareolata, pilis rigidis vestita. — Assamia, Peninsula Malayana, Sumatra.
32. *Buteraea* Nees. — Partes omnes indumento rufo hirsuto vestitae. Inflorescentia plus minusve abbreviata; bractee persistentes. Calyx 2-partitus, labo superiore 3-lobato, inferiore 2-lobato, lobo mediano emarginato, aliis obtusis. Semina exareolata, pilis madefactis elasticis erigentibus vestita. — Birmania.

33. *Paragoldfussia* Brem. n. gen. — Folia subtus minutissime glanduloso-punctata. Inflorescentia abbreviata; bractee ovatae vel lanceolatae, integrae, e basi plurinerviae, appressae, persistentes. Calyx aequaliter 5-fidus. Semina parvo-areolata, fere tota pilis rigidulis annulatis vestita. — Sumatra.
34. *Tetragompha* Brem. n. gen. — Inflorescentia abbreviata; bractee subpatentes, pauci-dentatae, e basi 3-nerviae, persistentes. Calyx 3-partitus. Antherae aristatae. Semina (Tab. V F) exareolata, pilis rigidis vestita. — Sumatra, terra Borneënsi, insula Palawan dicta.
35. *Tetraglochidium* Brem. n. gen. — Inflorescentia abbreviata, tota vel fere tota bracteis infimis inclusa; bractee ovatae, ovato-oblongae vel oblongae, dentatae, e basi plurinerviae, persistentes. Calyx subaequaliter vel inaequaliter 5-lobatus vel 5-fidus, ultimo bilabiatis partitus. Antherae apiculatae. Semina parvo-areolata, pilis rigidulis vestita. — Peninsula Malayana, Sumatra, Java, terra Borneënsi.
- Q. Planta paulum anisophylla, plietesia. Inflorescentia abbreviata; bractee rhomboideae, e basi plurinerviae, apice plerumque in appendicem foliosam productae, basi in petiolum concavum, florem pro parte amplectentem contractae. Calyx 5-partitus. Corolla resupinata. Stamina longiora exserta; breviora inclusa. Granula pollinis (Tab. I J) ellipsoidea, virgis carunculatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V D) luteo-brunnea, parvo-areolata, circum areolam pilis rigidulis annulatis vestita. — Sumatra.
36. *Psacadopaepale* Brem. n. gen.
- R. Plantae paulum anisophyllae, plietesiae. Inflorescentia abbreviata; bractee magnae, apicem versus dentatae, e basi pluri-nerviae, persistentes. Calyx aequaliter 5-partitus, lobis ad apicem pauci-dentatis. Corolla non resupinata, tubo faucibus multo breviora. Granula pollinis nunc (Tab. II D) breviter ellipsoidea, virgis septatis, in polis non cohaerentibus ornata, nunc (Tab. II E) globosa et virgis carunculatis instructa. Ovula utroque loculo 2. Capsula fusiformis. Semina brunnea, exareolata, pilis longissimis meandrinis vestita. — Java.
37. *Pachystrobilus* Brem. n. gen.
- S. Plantae anisophyllae vel isophyllae, plerumque plietesiae. Inflorescentia elongata vel abbreviata, bracteis persistentibus vel deciduis, floribus interdum breviter pedicellatis. Calyx subaequaliter 5-partitus. Corolla resupinata vel non resupinata, tubo faucibus multo breviora. Stamina exteriora paulum inaequalia, erecta; interiora aequalia, brevissima et fortiter incurvata, raro tota suppressa; antherae horizontales, subglobosae vel ovoideae. Granula pollinis (Tab. II A) ellipsoidea, virgis septatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V H) luteo-brunnea vel brunnea, parvo-areolata vel exareolata, fere tota pilis longissimis meandrinis vestita. — Ab India Septentrionali usque ad Archipelagum Malayanum.
38. *Goldfussia* Nees. — Plantae anisophyllae. Inflorescentia abbreviata; bractee imbricatae, e basi 3- vel 5-nerviae, plerumque persistentes. Corolla resupinata; lobi rotundati. Semina (Tab. V H) exareolata. — India Septentrionali, Indo-China, Sumatra, Java, terra Borneënsi, Insulis Philippinis.
39. *Dossifluga* Brem. n. gen. — Planta isophylla, foliis sessilibus vel subsessilibus parvis. Inflorescentia abbreviata; bractee ovatae vel obovatae, persistentes. Corolla resupinata; lobi emarginati. Semina exareolata. — Siamia.

40. *Difflugossa* Brem. n. gen. — Plantae anisophyllae. Inflorescentiae elongatae, plerumque paniculatim dispositae; bracteae 1-nerviae, parvae, plerumque mox deciduae; flores interdum breviter pedicellati Corolla recta et non resupinata; lobi rotundati vel emarginati. Stamina interiora interdum tota suppressa. Semina exareolata. — India Septentrionali, Indo-China, Sumatra, Java, terra Celebica.
41. *Semnothyrsus* Brem. n. gen. — Plantae anisophyllae. Inflorescentia elongata; bracteae ovato-lanceolatae, e basi 5-nerviae, persistentes; flores breviter pedicellati. Corolla resupinata. Tubus staminalis inter stamina in lobulos recurvatos productus. Semina parvo-areolata. — Sumatra.
- T. Planta paulum anisophylla, plietesia. Inflorescentia abbreviata, bracteis parvis et angustis persistentibus instructa. Calyx subaequaliter 5-partitus. Corolla resupinata. Stamina exteriora paulum inaequalia, erecta; interiora aequalia, brevissima et fortiter incurvata; antherae horizontales, ovoideae. Granula pollinis (Tab. III F) globosa, virgis cristis transversis dense artatis ornata. Ovula utroque loculo 2. Capsula nondum nota. — Java.
42. *Ctenopaepale* Brem. n. gen.
- U. Plantae anisophyllae, plietesiae. Inflorescentia abbreviata, erecta, internodio longo pedunculi instar sed apice foliis plus minusve redactis munito elata; bracteae bracteolaeque similiores, lineari-lanceolatae, obtusae, dense ciliolatae. Calyx 5-partitus; lobi bracteis bracteolisque similiores, imbricatae. Corolla non resupinata; pili stylum retinentes in fasciculos duos aggregati. Stamina exteriora exserta; interiora inclusa vel subexserta. Granula pollinis (Tab. II B, C) ellipsoidea vel subglobosa, virgis septatis ornata. Ovula utroque loculo 2. Semina (Tab. VI C) luteo-brunnea, areolata, extra areolam pilis applanatis pariete tenui, non annulata instructis vestita. — Sumatra, Java.
43. *Microstrobilus* Brem. n. gen.
- V. Plantae plerumque anisophyllae, raro plus minusve isophyllae, plietesiae. Inflorescentia elongata vel abbreviata, bracteis persistentibus instructa. Calyx plerumque 5-partitus, raro 3- vel 2-partitus. Corolla non resupinata. Stamina plerumque omnia exserta, raro interiora ad staminodia redacta et inclusa; antherae interdum mucronulatae. Granula pollinis (Tab. II F, G; Tab. III C) semper globosa, plerumque virgis septatis vel septis suppressis margine elevata solum cognoscendis ornata, raro echinulata. Ovula utroque loculo 2 quorum inferius interdum rudimentarium, vel 1. Semina (Tab. VI D, E, F) areolata, extra areolam pilis annulatis vestita vel tota glabra. — Himalaya, Assamia, Birmania, Siamia, Sumatra, Java, Insulis Sundaicis Minoribus, terra Celebica.
44. *Listrobanthes* Brem. n. gen. — Inflorescentia elongata; bracteae ellipticae vel oblongae, penninerviae, hirsutae. Calyx lobis apicem versus attenuatis, apice callosis. Stamina interiora ad staminodia capitata redacta. Granula pollinis virgis septatis ornata. Capsula fusiformis. Semina albida, extra areolam pilis annulatis longis, sensim attenuatis vestita. — Assamia.
45. *Sympagis* (Nees) Brem. n. gen. (*Strobilanthes* Bl. subgen. *Sympagis* Nees). — Plantae vix ramosae, plus minusve isophyllae. Inflorescentia elongata, floribus ad nodos solitariis, secundis; bracteae oblongae, 3- vel 5-nerviae, obtusae. Calyx lobis linearibus, subobtusis. Tubus staminalis inter stamina in lobulos recurvatos productus. Granula

- pollinis virgis ad marginem redactis ornata. Capsula fusiformis. Semina (Tab. VI D) albida, extra areolam pilis annulatis longis, sensim attenuatis vestita. — Himalaya et montibus Assamiae.
46. *Parasympagis* Brem. n. gen. — Inflorescentia abbreviata; bracteae oblongae, concavae, 3- vel 5-nerviae, ciliatae, apice lamina rudimentaria instructae. Calyx lobis linearibus, apice ciliatis. Pili stylum retinentes in series duas breves dispositi. Tubus staminalis supra hirtellus. Granula pollinis virgis ad marginem redactis ornata. Capsula fusiformis. Semina albida, extra areolam pilis longis, sensim attenuatis vestita. — Birmania, Siamia.
47. *Strobilanthes* Bl. emend. Brem. — Plantae gregariae, pluribus interjectis annis uno tempore florentes. Inflorescentiae abbreviatae, plerumque cernuae, plerumque paniculatim vel racemose dispositae, raro aliquae solitariae; bracteae ovatae vel orbiculares, concavae, e basi plurinerviae, fere totae albae. Calyx lobis linearibus vel anguste triangularibus. Pili stylum retinentes in fasciculos duos aggregati. Tubus staminalis supra hirtellus. Granula pollinis (Tab. II F) virgis septatis ornata. Ovula utroque loculo 2 quorum inferius rudimentarium. Capsula 2-seminalis, ambitu elliptica, tegmentis lateralibus in dehiscentia a dorso discendentibus. Semina (Tab. VI E) luteo-brunnea, extra areolam pilis annulatis brevibus vel papillis obtusis e cellulis annulatis orientibus vestita. — Sumatra, Java.
48. *Parastrobilanthes* Brem. n. gen. — Inflorescentiae abbreviatae, solitariae, capitatae, racemosae vel paniculatae, semper erectae; bracteae ellipticae, ovatae, obovatae vel obcuneatae, e basi 3- vel 5-nerviae, ad apicem glandulis stipitatis instructae. Calyx lobis linearibus vel anguste lanceolatis. Pili stylum retinentes in fasciculos duos aggregati. Antherae interdum mucronulatae. Granula pollinis (Tab. II G) virgis ad marginem redactis ornata. Ovula utroque loculo 2 quorum inferius interdum rudimentarium. Capsula nunc fusiformis, nunc ambitu elliptica. Semina luteo-brunnea, glabra. — Sumatra, Java.
49. *Lamiacanthus* O. Ktze. — Inflorescentiae abbreviatae; bracteae parte basali florem amplectentes, parte apicali patente, dorso pilis capitatis vestitae. Calyx nunc aequaliter 5-partitus, nunc 3- vel 2-partitus; lobi lineares obtusi, dorso apicem versus pilis capitatis vestiti. Pili stylum retinentes in fasciculos duos aggregati. Granula pollinis (Tab. III C) echinulata. Ovula utroque loculo 2 quorum inferius rudimentarium vel 1. Capsula ambitu elliptica. Semina (Tab. VI F) luteo-brunnea, glabra. — Java, Insulis Sundaicis Minoribus, forsitan terra Celebica.
- W. Planta valde anisophylla, foliis minoribus fere ad nihilum redactis et mox deciduis, plietesia. Inflorescentia subelongata, bracteis parvis, mox deciduis instructa. Calyx subaequaliter 5-partitus. Corolla resupinata. Stamina exteriora exserta, interiora inclusa. Granula pollinis globosa echinulata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. V G) luteo-brunnea, parvo-areolata, extra areolam pilis capitatis cum pilis annulatis parvis paucioribus mixtis sparsa; cellulae areolae annulatae. — Java.
50. *Echinopaepale* Brem. n. gen.
- X. Plantae anisophyllae, plietesiae. Inflorescentia abbreviata, basi bracteis quattuor latioribus, apice in appendicem foliaceam exeuntibus involucreta; bracteae omnes e basi plurinerviae, persistentes. Calyx aequaliter 5-partitus. Corolla resupinata. Granula pollinis (Tab. I K) ellipsoidea, pro subtribu

magna (80—100  $\mu$  longa), virgis carinatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. VI G) brunnea, parvo-areolata, extra areolam pilis annulatis rigidulis, curvatis tamen, vestita. — Birmania, Sumatra.

51. *Tetragoga* Brem. n. gen.

- Y. Plantae paulum anisophyllae, plietesiae. Folia utrimque glandulis aureis punctata. Inflorescentia elongata; bracteae oblongae, usque ad nodum praecedentem vel ultra decurrentes, penninerviae, post anthesin scariosae. Calyx subaequaliter 5-fidus. Corolla probabiliter non resupinata, tubo brevissimo instructa. Stamina exteriora inaequalia, subexserta; interiora ad staminodia clavata redacta; antherae horizontales, suborbiculares, utroque extremo emarginatae. Granula pollinis ellipsoidea, virgis septatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. VI B) albida, glabra et nitentia, areola usque ad marginem expansa. — Assamia, Peninsula Malayana.

52. *Hymenochlaena* Brem. n. gen.

- Z. Planta valde anisophylla, foliis superioribus insuper ab inferioribus forma ovata vel cordata et absentia petioli diversis, plietesia. Inflorescentia elongata, bracteis parvis deciduis instructa. Calyx aequaliter 5-partitus, lobis acutis, aestivatione valvatis. Corolla resupinata. Granula pollinis ellipsoidea, 2-pora, virgis septatis ornata. Ovula utroque loculo 2. Capsula fusiformis. Semina (Tab. VI A) albida, glabra et nitentia, areola usque ad marginem expansa, e cellulis magnis, 10—18  $\mu$  diametentibus composita. — Sumatra, Java.

53. *Lissospermum* Brem. n. gen.

- AA. Plantae anisophyllae, plietesiae. Inflorescentia elongata, bracteis parvis deciduis vel subpersistentibus instructa. Calyx subaequaliter 5-partitus. Corolla resupinata. Tubus staminalis utroque latere alatus. Granula pollinis (Tab. III A) breviter ellipsoidea, 5-pora, virgata et echinulata. Ovula utroque loculo 2. Capsula nondum nota. — China Australi, Indo-China, Sumatra.

54. *Pteroptychia* Brem. n. gen.

#### Key to the Genera of the *Strobilanthinae*.

For the construction of the following key use has been made, in the first place, of the pollen characters, and as some of the pollen forms recur in different groups, the sequence in which the genera appear, can obviously lay no claim on naturalness. The characters of the seedcoat, that come next in diagnostic importance, could not always be used to their full extent, because there are still a number of genera of which the seeds are not yet available or have not been sufficiently studied. I have no doubt that the key would have gained in lucidity if these characters could have been used more freely, but it would, on the other hand, not have been much more serviceable, as the failing seeds are apparently nearly always difficult to obtain.

A glance at the key will show that some genera are found in two or even three different places. This is sometimes due to the fact that in these genera more than one kind of pollen occurs, or that the number of ovules varies, but this is not always the reason. When the pollen is very shortly ellipsoidal and may therefore easily be taken for globose, it was found desirable to make the



genus accessible along two roads: one starting from the right interpretation of the shape, and the other one from the very excusable mistake that the grains are globose. Notes at the foot of the page draw the attention to these cases. In one genus where the pollen grains are provided with septate bands, the depressions are in one species so shallow as to be easily overlooked: this genus too can be found in two ways, namely also by assuming that the bands are smooth.

1. Pollen grains ellipsoidal . . . . .	2
: Pollen grains globose . . . . .	45
2. Pollen grains provided with smooth, punctate, marbled, keeled or septate bands; the punctate bands sometimes with one or two wavy ridges . . . . .	3
: Pollen grains carunculate or echinulate (Tab. I A, F, G, J, Tab. III A)	41
3. Bands of the pollen grains smooth, punctate or marbled; the punctate ones sometimes with one or two wavy ridges (Tab. I B, C, D, E, H, I)	4
: Bands of the pollen grains keeled or septate (Tab. I K, Tab. II A, B, C, D)	20
4. Ovary cells with more than two ovules . . . . .	5
: Ovary cells with one or two ovules . . . . .	10
5. Corolla resupinate. The hairs which retain the style against the wall of the corolla inserted on two papilliform excrescences. — Ceylon and Indian Peninsula . . . . . 6. <i>Stenosiphonium</i> Nees	
: Corolla non-resupinate. The hairs which retain the style against the wall of the corolla disposed in two rows . . . . .	6
6. Calyx inside glabrous. Corolla white, blue or violet . . . . .	7
: Calyx inside either entirely appressed pubescent or towards the base densely silky. Corolla yellow <sup>10)</sup> . . . . .	9
7. Inflorescence a capituliform compound spike surrounded by four large ovate bracts; the two lower bracts each subtending a flower and a superposed strongly contracted spike provided with two pairs of narrow bracts, and the two upper ones each one or two flowers. — Indian Peninsula . . . . . 2. <i>Gantelbua</i> Brem.	
: Inflorescence a more or less distinctly elongated simple spike provided with but one kind of bracts . . . . .	8
8. Connective awned. Seeds exareolate. — Himalaya . . . . .	
. . . . . 3. <i>Aechmanthera</i> Nees	
: Connective sometimes slightly produced but never awned. Seeds provided with a small areola. — Indian Peninsula to Australia and Melanesia . . . . . 1. <i>Hemigraphis</i> Nees emend. T. And. <sup>11)</sup>	
9. Calyx inside towards the base densely silky. Inflorescence dense; bracts imbricate. — South China and Indo-China . . . . .	
. . . . . 9. <i>Sericocalyx</i> Brem. <sup>12)</sup>	
: Calyx inside appressed pubescent. Inflorescence lax; bracts narrow. Timor . . . . . 10. <i>Xanthostachya</i> Brem. <sup>13)</sup>	

<sup>10)</sup> The flowers of some *Sericocalyx* species occurring in China and Indo-China and belonging to those that are provided with three or four ovules in each of the ovary cells, are said to be blue or purple, but these statements are probably unfounded.

<sup>11)</sup> In this genus the bands of the pollen grains are either smooth, finely punctate or carunculate; in one species the grains are globose.

<sup>12)</sup> The number of ovules per ovary cell varies between two and four, but the species with more than two are confined to China and Indo-China. The whole area occupied by the genus extends southwards as far as the Lesser Sunda Islands.

<sup>13)</sup> In *X. aspera* (Decne) Brem. the number of ovules per ovary cell varies between two and three. In the only other species, *X. arborea* (Span.) Brem. from the island Rotti, there are apparently always two ovules per ovary cell.

10. Outer stamens slightly unequal; the inner ones very short and strongly incurved; anthers horizontal, ovoid. — Java . . . . . 40. *Difflugossa* Brem.<sup>14)</sup>  
 : Outer stamens equal; the inner ones sometimes staminodial or entirely suppressed, but never strongly incurved; anthers erect, elongated . . . 11
11. Flowers yellow . . . . . 12  
 : Flowers white, blue, violet or purplish . . . . . 14
12. Calyx inside glabrous. The hairs which retain the style against the wall of the corolla arranged in two bundles. Seeds (Tab. V A) with two kinds of hairs: the marginal cells of the areola contracted in a long and stiff point, and the annulate cells outside the areola in a short and thin, partly annulate hair. — Assam . . . . . 23. *Ditrichospermum* Brem.  
 : Calyx inside either entirely appressed pubescent or towards the base densely silky. The hairs which retain the style against the wall of the corolla in two rows. Seeds either glabrous or outside the areola covered with annulate mucous hairs . . . . . 13
13. Calyx inside towards the base densely silky. Inflorescence dense; bracts imbricate. — Northern India to China, Indo-China, Sumatra, Java, the Lesser Sunda Islands and Celebes . . . . . 9. *Sericocalyx* Brem.<sup>15)</sup>  
 : Calyx inside appressed pubescent. Inflorescence lax; bracts narrow. — Timor and Rotti . . . 10. *Xanthostachya* Brem.
14. Seeds either entirely glabrous or only with a fringe of usually fugacious hairs along the margin, yellowish and shining, i.e. the areola extending to the margin . . . . . 15  
 : Seeds areolate or exareolate, but the areola never extending to the margin; partly or almost entirely covered with hairs, but the latter sometimes minute and easily overlooked: these subglabrous seeds are recognizable by their brown colour and dull aspect . . . . . 16
15. Corolla much longer than the calyx. Filaments filiform. — Indian Peninsula . . . . . 12. *Nilgirianthus* Brem.  
 : Corolla shorter than the calyx. Filaments strap-shaped. — Indian Peninsula . . . . . 13. *Taeniandra* Brem.
16. Inner stamens completely suppressed. Calyx 5-fid. — Indian Peninsula . . . . . 11. *Phlebophyllum* Brem.  
 : Inner stamens normally developed. Calyx 5-partite . . . . . 17
17. Bracts deciduous. Bands of the pollen grains (Tab. 1 I) with two wavy ridges. Hairs on the seedcoat (Tab. V B) small and difficult to see. — Assam, South China, Indo-China; mostly cultivated . . . . . 24. *Baphicacanthus* Brem.  
 : Bracts persistent. Bands of the pollen grains either with a single wavy ridge or merely punctate. Seeds distinctly hairy . . . . . 18
18. Shoots villous and leaves on both sides pubescent. Calyx lobes on both sides hirtellous. Hairs on the seedcoat annulate. — Himalaya . . . . . 22. *Pseudaechmanthera* Brem.  
 : Shoots never villous and leaves never on both sides pubescent. Calyx lobes at least inside glabrous. Hairs on the seedcoat thick-walled . . 19
19. Flowers sessile or subsessile. Bracteoles at least as long as the calyx.

<sup>14)</sup> In this genus the bands of the pollen grains are in reality septate, but in one species, *D. filiformis* (Bl.) Brem., the depressions are so shallow that they are easily overlooked.

<sup>15)</sup> cf. notes <sup>10)</sup> and <sup>12)</sup>; one species was collected in Ambon, where it is apparently a recent introduction.

- Corolla lobes emarginate. — Ceylon and Indian Peninsula . . . . .
- : Flowers provided with a slender pedicel. Bracteoles either much shorter than the calyx or entirely suppressed. Corolla lobes rounded. — Ceylon and Indian Peninsula . . . . .
17. *Mackenzia* Nees emend. Brem.
- 20(3). Bands of the pollen grains keeled (Tab. I K). The grains themselves at least 80  $\mu$  long. Inflorescence a capituliform spike surrounded by an involucre consisting of two pairs of decussate bracts ending in spreading foliaceous appendages. — Birma, Sumatra . . . . .
51. *Tetragoga* Brem.
- : Bands of the pollen grains septate (Tab. II A, B, C, D). The grains themselves less than 80  $\mu$  long. Inflorescences sometimes capituliform, but the bracts not ending in spreading foliaceous appendages . . . . . 21
21. Seeds completely glabrous, yellowish and shining, i.e. the areola extending to the margin . . . . . 22
- : Seeds areolate or exareolate, but the areola never extending to the margin, and the surface at least partly covered with hairs and dull . . . . . 23
22. Bracts decurrent along the axis of the spike, and like the leaves glandular-punctate; in fruiting specimens scarious. Inner stamens reduced to clavate staminodes. Pollen grains with 3 pores. — Assam, Malay Peninsula . . . . . 52. *Hymenochlaena* Brem.
- : Bracts small and early deciduous, not glandular-punctate. Stamens all fertile. Pollen grains with 2 pores. — Sumatra, Java . . . . .
53. *Lissospermum* Brem.
23. Calyx lobes with a few teeth near the top. Pollen grains (Tab. II D) nearly globose; the bands not meeting at the poles. — Java . . . . .
37. *Pachystrobilus* Brem.<sup>16)</sup>
- : Calyx lobes entire. Pollen grains (Tab. II A, B, C) distinctly ellipsoidal; the bands always meeting at the poles . . . . . 24
24. Outer stamens slightly unequal; the inner ones very short and strongly incurved or, rarely, entirely suppressed; anthers horizontal and ovoid. Seeds (Tab. V H) covered with long and thin, wavy hairs . . . . . 25
- : Outer stamens equal and the inner ones never incurved; anthers erect and elongated. Hairs on the seedcoat never long, thin and wavy . . . . . 28
25. Inflorescence capituliform . . . . . 26
- : Inflorescence elongated . . . . . 27
26. Isophyllous plant with small, sessile or subsessile, ovate-orbicular leaves. Bracts much shorter than the calyx. — Siam . . . . .
39. *Dossifluga* Brem.
- : Usually anisophyllous plants with large, usually petiolate, never ovate-orbicular leaves; if isophyllous, then provided with linear-lanceolate leaves. Bracts usually longer than the calyx. — Himalaya, Assam, Indo-China, Sumatra, Java, Borneo, Philippines . . . . .
38. *Goldfussia* Nees
27. Bracts deciduous. Corolla not resupinate. Inner stamens sometimes suppressed. Seeds exareolate. — Himilaya, Indo-China, Sumatra, Java, Celebes . . . . . 40. *Difflugossa* Brem.
- : Bracts persistent. Corolla resupinate. Seeds provided with a small areola. — Sumatra . . . . . 41. *Semnothyrsus* Brem.
28. Perennial herb with a multicipitous rhizome and erect shoots provided

<sup>16)</sup> Of this genus two species are known; the pollen grains of the other one are globose and echinulate.

- with sessile, ovate or cordate leaves. — Indian Peninsula . . . . .
- . . . . . 19. *Pleocaulis* Brem.
- : Shoots not yearly rejuvenated from a multicapitose rhizome; when there are more than one, then all oblique. Leaves sometimes sessile, but then, at least on the lower part of the shoot, neither ovate nor cordate . . . . . 29
29. Seeds with an areola extending over more than a third of the distance between the base and the top . . . . . 30
- : Areola much smaller or absent . . . . . 32
30. Inflorescence elongated. Bracts, bracteoles and calyx lobes filiform and bristling with long capitate hairs. — Java . . . . .
- . . . . . 25. *Adenostachya* Brem.<sup>17)</sup>
- : Inflorescences capituliform or at least strongly abbreviated. Bracts and calyx lobes neither filiform nor bristling with long capitate hairs . . 31
31. Inflorescences at the end of short-shoots arising from the axils of ordinary leaves and provided with strongly reduced leaves. Bracts ovate-orbicular; bracteoles absent; calyx lobes linear. Large plant with several oblique shoots and strongly abbreviated voluminous spikes. — Indian Peninsula . . . 20. *Carvia* Brem.
- : Inflorescences at the end of ordinary shoots. Bracts, bracteoles and calyx lobes all linear-lanceolate, obtuse and densely ciliolate. Strongly ramified plants with a single main-shoot. Capitula with a pair of strongly reduced, often early deciduous leaves at the base and preceded by a long peduncle-like internode. — Sumatra, Java . . . . .
- . . . . . 43. *Microstrobilus* Brem.
32. Calyx in the bud equally or subequally 5-partite, 5-fid or 5-lobed; the 5-fid and 5-lobed ones in the open flower sometimes 2-partite . . 33
- : Calyx already in the bud 2- or 3-partite . . . . . 37
33. Calyx 5-partite. Inflorescence elongated . . . . . 34
- : Calyx 5-fid or 5-lobed, in the open flower sometimes 2-partite. Inflorescences capituliform . . . . . 36
34. Leaves contracted in an alate pseudo-petiole. Bracts shorter than the calyx, early deciduous; bracteoles minute. Filaments glabrous. — Himalaya . . . . . 28. *Pteracanthus* (Nees) Brem.
- : Leaves provided with a true petiole. Bracts about as long as the calyx, and the bracteoles but slightly shorter, persistent. Filament at least of the outer stamens hirtellous . . . . . 35
35. Plants rufous-hirsute. Bracts penninerved. — Assam, Malay Peninsula, Sumatra . . . . . 31. *Pyrrothrix* Brem.
- : Plants never rufous-hirsute. Bracts 1-, 3- or 5-nerved. — Sumatra, Borneo, Philippines . . . 30. *Semnostachya* Brem.
36. Capitula entirely enclosed between the lowest pair of bracts. Bracts dentate. Anthers apiculate. — Malay Peninsula, Sumatra, Java, Borneo . . . . . 35. *Tetraglochidium* Brem.
- : Capitula not completely enclosed between the lowest pair of bracts. Bracts entire. Anthers obtuse. — Sumatra . . . . .
- . . . . . 33. *Paragoldfussia* Brem.
37. The two anticous calyx segments united in a 2-fid or 2-lobed lower lip; the three posticous ones in a 3-fid or 3-lobed upper lip . . . . 38
- : The two anticous calyx segments separated nearly to the base; the three posticous ones united in a 3-fid or 3-lobed upper lip . . . . 39

<sup>17)</sup> Of this genus two species are known; the pollen grains of the other one are provided with carunculate bands.

38. Plants rufous-hirsute. Leaves petiolate. — Birma . . . . .  
 . . . . . 32. *Buteraea* Nees  
 : Plants never rufous-hirsute. Leaves sessile, in the lower half cuneate,  
 but at the base subauriculate. — Central and Northern India, Indo-  
 China and South-China 26. *Perilepta* Brem.
39. Inflorescence abbreviated. Anthers aristate. — Sumatra, Borneo,  
 Palawan . . . . . 34. *Tetragompha* Brem.
40. Leaves beneath or on both sides dotted with yellow or red (in dried  
 material reddish-brown) glands. Inflorescence straight, with two  
 flowers at each node. Bracts subimbricate. Corolla white. — Indo-  
 China, Sumatra, Java . . . . . 27. *Adenacanthus* Nees  
 : Leaves not dotted with yellow or red glands. Inflorescence strongly  
 flexuous, with a single flower at each node. Bracts remote. Corolla  
 yellow. — Assam . . . . . 29. *Triaenacanthus* Nees
- 41 (2). Pollen grains (Tab. III A) provided with 5 germ pores. Staminal tube  
 winged. — Indo-China, Sumatra . . . . .  
 . . . . . 54. *Pteroptychia* Brem.<sup>18)</sup>  
 : Pollen grains (Tab. I A, F, G, J) provided with 3 germ pores. Staminal  
 tube not winged . . . . . 42
42. Ovary cells with four or more ovules. — Malay Peninsula, Malay  
 Archipelago . . . . . 1. *Hemigraphis* Nees emend. T. And.<sup>19)</sup>  
 : Ovary cells with two ovules . . . . . 43
43. Seeds yellowish, glabrous and shining, i.e. the areola extending to  
 the margin. — Indian Peninsula . . . . .  
 . . . . . 14. *Xenacanthus* Brem.  
 : Seeds brown, partly covered with annulate hairs and dull . . . . . 44
44. Inflorescence capituliform; the bracts enveloping with their concave  
 base the lower part of the flower. — Sumatra . . . . .  
 . . . . . 36. *Psacadopaepale* Brem.  
 : Inflorescence elongated. Bracts, bracteoles and calyx lobes filiform  
 and bristling with long capitate hairs. — Java . . . . .  
 . . . . . 25. *Adenostachya* Brem.<sup>20)</sup>
- 45 (1). Pollen grains provided with bands which may show various kinds of  
 relief but which are never carunculate nor echinulate . . . . . 46  
 : Pollen grains with or without bands, but always distinctly carunculate  
 or echinulate . . . . . 54
46. Bands of the pollen grains punctate. Ovary cells with 6 ovules. —  
 Philippines . . . . . 1. *Hemigraphis* Nees emend. T. And.<sup>21)</sup>  
 : Bands of the pollen grains either transversely ridged (Tab. III F) or  
 septate (Tab. II D, F) or consisting of the raised margin only  
 (Tab. II G). Ovary cells with one or two ovules . . . . . 47
47. Bands of the pollen grains transversely ridged (Tab. III F). Outer  
 stamens slightly unequal; inner ones very short and strongly incurved.  
 — Java . . . . . 42. *Ctenopaepale* Brem.

<sup>18)</sup> The pollen grains of the only species which I could study, *Pt. Ridleyi* (Merr.), are shortly ellipsoidal. Those of other species have been described as globose, but this may prove erroneous; the number of germ pores of the latter is unknown.

<sup>19)</sup> The greater part of the species belonging to this genus possess pollen grains provided with smooth or punctate bands; cf. note <sup>11)</sup>.

<sup>20)</sup> This genus consists of two species; the other one possesses pollen grains provided with septate bands; cf. note <sup>17)</sup>.

<sup>21)</sup> Globose pollen grains are found in one species only, the Philippine *H. fruticulosa* Clarke; everywhere else they are ellipsoidal; cf. notes <sup>11)</sup> and <sup>19)</sup>.

- : Bands of the pollen grains either septate (Tab. II D, F) or consisting of the raised margin only (Tab. II G). Outer stamens equal; inner ones never strongly incurved . . . . . 48
48. Bands of the pollen grains septate (Tab. II D, F) . . . . . 49
- : Bands of the pollen grains consisting only of the raised, often more or less wavy rim (Tab. II G) . . . . . 52
49. Bands of the pollen grains not meeting at the poles (Tab. II D). Pollen grains at least 60  $\mu$  in diam. Stamens included. Seeds exareolate and covered with long and thin, wavy hairs. — Java . . . . . 37. *Pachystrobilus* Brem.<sup>22)</sup>
- : Bands of the pollen grains always meeting at the poles (Tab. II F). Pollen grains about 50  $\mu$  in diam. Stamens all or at least the outer ones exserted. Seeds areolate, outside the areola covered with long or short annulate hairs or papillae . . . . . 50
50. Inflorescence elongated. Inner stamens reduced to staminodia. — Assam . . . . . 44. *Listrobanthes* Brem.
- : Inflorescences capituliform. All stamens fertile . . . . . 51
51. Inflorescences erect, preceded by a pair of more or less strongly reduced leaves and a long winged internode. Bracts, bracteoles and calyx lobes all linear-lanceolate, obtuse and densely ciliolate. Corolla blue. Seeds (Tab. VI C) covered with long and tapering annulate hairs. — Java . . . . . 43. *Microstrobilus* Brem.<sup>23)</sup>
- : Inflorescences usually nodding, paniculate. Bracts ovate or orbicular and much wider than the bracteoles and calyx lobes; the latter acute. Corolla white. Seeds (Tab. VI E) covered with short and blunt annulate hairs or with annulate papillae. — Sumatra, Java . . . . . 47. *Strobilanthes* Bl. emend. Brem.
52. Inflorescence elongated. Isophyllous plants. — Himalaya, mountains of Assam . . . . . 45. *Sympagis* (Nees) Brem.
- : Inflorescences abbreviated or capituliform. Anisophyllous plants . . 53
53. Capsule 4-seeded. Seeds outside the areola covered with annulate hairs. — Birma, Siam . . . . . 46. *Parasympagis* Brem.
- : Capsule 2- or, rarely, 3-seeded. Seeds entirely glabrous. — Sumatra, Java . . . . . 48. *Parastrobilanthes* Brem.
- 54 (45). Pollen grains (Tab. III A) provided with 5 germ pores. Staminal tube winged. — Indo-China, Sumatra . . . . . 54. *Pteroptychia* Brem.<sup>24)</sup>
- : Pollen grains (Tab. II E, Tab. III B, C, D, E) provided with 3 germ pores. Staminal tube not winged . . . . . 55
55. Pollen grains (Tab. III B) faintly reticulate, with a ring of spinules inside each of the meshes. — Assam . . . . . 8. *Tarphochlamys* Brem.
- : Pollen grains (Tab. II E; Tab. III C, D, E) never reticulate and the the spinules never in rings . . . . . 56
56. All stamens fertile . . . . . 57
- : Inner stamens reduced to staminodia or entirely suppressed . . . . 63
57. Strongly anisophyllous plant: the small leaves but a few millimeters

<sup>22)</sup> The pollen grains of the type species of this genus are shortly ellipsoidal, but may easily be taken for globose; in the only other species they are, it is true, globose, but here the bands are carunculate.

<sup>23)</sup> In this genus the pollen grains are ellipsoidal, but in one species, *M. alatus* (Bl.) Brem., they may easily be taken for globose.

<sup>24)</sup> The pollen grains of *Pt. Ridleyi* (Merr.) Brem., the only species available to me, are shortly ellipsoidal, cf. note <sup>18)</sup>.

- long and early deciduous. Bracts and bracteoles early deciduous. Seeds (Tab. V G) sprinkled with short-stalked capitate hairs mixed with a few small annulate ones. — Java . . . . . 50. *Echinopaepale* Brem.
- : Isophyllous or anisophyllous plants, but the small leaves at least half as long as the large ones, and shed at the same time as the latter. Bracts and bracteoles persistent. Seeds never sprinkled with capitate hairs . . . . . 58
58. Seeds yellowish and shining, i.e. the areola extending to the margin. Large plants with the inflorescences often on the old wood. — Indian Peninsula, Ceylon . . . 15. *Didyplosandra* Wight ex Brem.
- : Seeds exareolate or areolate, but the areola never extending to the margin; if glabrous, then yellow-brown or brown and dull. Inflorescences never on the old wood . . . . . 59
59. Seeds nearly white, with a large areola and long annulate mucous hairs. Calyx 5-fid; the lobes in the bud reduplicate. — Indian Peninsula, ?Ceylon . . . . . 21. *Thelepaepale* Brem.
- : Seeds yellowish-brown or brown. Calyx 5- or, rarely, 2- or 3-partite; the lobes in the bud never reduplicate . . . . . 60
60. Seeds exareolate, entirely covered with long wavy hairs. Calyx lobes with a few teeth near the top. Pollen grains distinctly banded. — Java . . . . . 37. *Pachystrobilus* Brem.<sup>25)</sup>
- : Seeds areolate, outside the areola hairy or entirely glabrous. Calyx lobes entire. Pollen grains not distinctly banded . . . . . 61
61. Stamens exserted. The hairs which retain the style against the wall of the corolla in two bundles. Seeds (Tab. VI F) completely glabrous. Anisophyllous plants. — Java, Lombok, Celebes . . . . . 49. *Lamiacanthus* O.Ktze
- : Stamens included. The hairs which retain the style against the wall of the corolla in two rows. Seeds outside the areola hairy or papillate. Isophyllous plants . . . . . 62
62. Calyx subequally 5-partite. Seeds papillate or covered with short annulate hairs (Tab. IV E). — Japan, China, Indo-China . . . . . 4. *Championella* Brem.
- : Calyx 3-partite. Seeds covered with fairly long and stiff thick-walled hairs. — Formosa . . . 5. *Parachampionella* Brem.
63. Inner stamens reduced to filiform staminodia. Corolla resupinate. Seeds (Tab. IV D) outside the areola covered with annulate hairs. — South China and Indo-China . . . . . 7. *Gutzlaffia* Hance
- : Inner stamens entirely suppressed. Corolla non resupinate. Seeds glabrous and shining, i.e. with the areola extending to the margin. — Ceylon . . . . . 16. *Pseudostenosiphonium* Lindau

<sup>25)</sup> Of this genus two species are known; the pollen grains of the other one are very shortly ellipsoidal and provided with septate bands, cf. notes <sup>18)</sup> and <sup>22)</sup>.

## B. SPECIAL PART.

In the following pages the genera of the *Strobilanthinae* are dealt with monographically, i.e. of each of them a full description is given followed by a discussion of its affinities and by a list of the species with their main synonyms. In the same way as in the "Conspectus Generum" the genera are divided over 27 groups, and when the latter contain more than one genus, a discussion of their delimitation and affinities precedes the treatment of the individual genera. Descriptions of the groups are omitted, as these would have been mere repetitions of the diagnoses given in the "Conspectus Generum". However, to facilitate comparison it seemed advisable to repeat these group characters in the description of each of the constituent genera.

Special attention is paid to the genera and species occurring in the Malay Archipelago, and for the identification of these species keys are provided. Moreover, where sufficient material was available, they are fully described.

### GROUP A.

The genera *Hemigraphis* Nees emend. T. And., *Gantelbua* Brem. and *Aechmanthera* Nees, brought together in group A, are in habit and in the structure of the flower and of the seed not unlike those of group B (*Championella* Brem. and *Parachampionella* Brem.), from which they differ, however, conspicuously in pollen structure and in the presence of three to eight ovules in the ovary cells. In estimating the value of these differences, it should be borne in mind that in the groups D (*Gutzlaffia* Hance) and F (*Sericocalyx* Brem. and *Xanthostachya* Brem.) the number of ovules varies between two and four per ovary cell, and that globose echinulate pollen not unlike that found in group B, occurs in group G (*Didyplosandra* Wight ex Brem., *Pseudostenosiphonium* Lindau) side by side with ellipsoidal banded grains (*Phlebophyllum* Nees, *Nilgirianthus* Brem., *Taeniandra* Brem.) similar to those of *Hemigraphis* and its nearest allies.

With group C (*Stenosiphonium* Nees) group A agrees in its isophylly, the nature of the pollen and in the number of ovules. *Stenosiphonium* differs however rather conspicuously from the genera belonging to group A by the structure of the inflorescence with its triads of flowers, by its strongly recurved resupinate corolla, by the fascicled instead of serial arrangement of the hairs by which the style is retained against the wall of the corolla, and by the large size of the areola.

In the only genus of group D (*Gutzlaffia* Hance) the ovary cells contain, at least in some species, more than two ovules, and in habit these plants are not unlike those belonging to the groups A and B. The structure of its pollen is the same as that of group B, but in the rectangularly bent corolla and in the reduction of the inner stamens to staminodia it differs rather conspicuously from both.

Group E (*Tarphochlamys* Brem.) differs very notably from all other groups belonging to the *Strobilanthinae* by the structure of the pollen with its faintly reticulated surface and spinules arranged in rings. In other respects it shows a rather marked resemblance to group D (*Gutzlaffia*); the stamens, however, are all four fertile. If *Tarphochlamys* is at all related to group A, it would be through the intermediary of group D.



In group F (*Sericocalyx* Brem. and *Xanthostachya* Brem.) the ovary cells contain sometimes more than two ovules, and in habit there is also some resemblance with group A, but the calyx is inside either silky at the base or appressed pubescent, the corolla is probably always yellow and the seeds are much larger; the areola too is more strongly developed.

The plants belonging to the groups G (*Phlebophyllum* Nees, *Nilgirianthus* Brem., *Taeniandra* Brem., *Xenacanthus* Brem., *Didyplosandra* Wight ex Brem., *Pseudostenosiphonium* Lindau) and H (*Mackenzia* Nees emend. Brem., *Leptacanthus* Brem.) are isophyllous, but much larger than those belonging to group A: they always need several years to reach maturity. Their ovary cells contain never more than two ovules, and their capsules and seeds are much larger. In group H the seeds are moreover covered with an entirely different kind of hairs. Apart from those genera in which the pollen is globose and echinulate (*Didyplosandra* and *Pseudostenosiphonium*), the structure of the pollen is everywhere the same as in group A; the grains, however, are larger.

The monotypic groups I (*Pleocaulus* Brem.) and J (*Carvia* Brem.) resemble in some respects the genera belonging to group G, but differ conspicuously from them in the nature of the pollen, which is provided with septate bands. Their affinities remain for the time being uncertain. The same applies to the monotypic group K (*Thelepaepale* Brem.) with globose echinulate pollen, whose spinules are remarkable for their large size and swollen base.

The monotypic group L (*Pseudaechmanthera* Brem.) is still imperfectly known. Its only species resembles, as the generic name indicates, the species of *Aechmanthera* Nees, from which it is at once recognizable by the presence of but two ovules in each of the ovary cells, and by the larger size of the pollen grains. It is not impossible that this genus belongs to the nearest allies of group A.

In the monotypic groups M (*Ditrichospermum* Brem.) and N (*Baphicacanthus* Brem.) the same kind of pollen is found as in group A, and the representatives of these groups are isophyllous plants, but in other respects the resemblance is but slight. It are both rather isolated groups.

Group O (*Adenostachya* Brem.) is in habit not unlike *Hemigraphis*, but the pollen grains are, at least in one of its two species, provided with septate bands. It occupies apparently a rather isolated position in the subtribe.

The remaining groups comprise plants of an entirely different aspect: they are nearly all anisophyllous, the corolla is mostly resupinate, the pollen grains are either provided with septate bands or globose and echinulate, the ovary cells contain never more than two ovules, and the capsules and seeds are almost always much larger.

Reviewing the results of this discussion, it appears that all those groups which show a more or less distinct affinity to group A, are composed of isophyllous plants, and that their pollen is either ellipsoidal and provided with smooth, punctate, marbled, carunculate or echinulate bands or else globose and echinulate, and for reasons set forth in the general part of this paper, to the last-named type no taxonomic value is to be assigned. In one plant only (*Hemigraphis fruticulosa* Clarke) the pollen grains are globose and provided with finely punctate bands, but this exception may perhaps be explained by assuming that here too the grains are in reality very shortly ellipsoidal. If on these characters a more comprehensive group was to be founded, the groups I (*Pleocaulus*), J (*Carvia*) and O (*Adenostachya*) would on account of the septate bands with which their pollen grains are ornamented, have to be excluded. But as the position of the groups K—N, notwithstanding their pollen shows the right kind of sculpture, would also remain dubious, it seems better to content ourselves for the moment with a number of smaller groups.

Of the three genera included in group A, *Gantelbua* differs from *Hemigraphis* in the peculiar structure of the inflorescence with its two kinds of bracts, whereas *Aechmanthera* is characterized by awned or mucronate anthers and completely exareolate seeds; unlike *Hemigraphis* and *Gantelbua*, whose species are inhabitants of the lowlands, it is found only at greater height. On the whole the difference between these three genera is but slight: *Aechmanthera* and *Gantelbua* may be regarded as aberrant members of the group, whereas the bulk of the species, those provided with the less striking characters, are brought together in *Hemigraphis*. With its probably more than a hundred species and an area extending from the Indian Peninsula to tropical Australia and Melanesia, the latter is the largest and most widely spread genus of the subtribe. The greater number of species are found in the eastern part of the Malay Archipelago. In Ceylon it is unknown, and the African species referred to this genus, belong to another subtribe. The small genus *Aechmanthera* is endemic in the Himalaya and the neighbouring mountains, and the monotypic *Gantelbua* in the Indian Peninsula.

1. *Hemigraphis* Nees in DC., Prodr. XI, p. 722, 1847; emend. T. And. in Journ. Linn. Soc. VII, p. 114, 1864; id. op. cit. IX, p. 461, 1867, *H. dura* et *H. quadrifaria* excl.; Kurz in Journ. As. Soc. Beng. XL, p. 74, 1871; Benth. in Benth. et Hook. f., Gen. Pl. II, p. 1086, 1876; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 426, 1884, *H. dura*, *H. quadrifaria*, *H. glaucescens* et *H. flava* excl.; Lindau in Engl. u. Prantl, Nat. Pflanzenfam. IV, 3 b, p. 303, 1895, *H. dura* et *H. flava* excl.; Hallier f. in Nov. Act. Acad. Nat. Cur. LXX, p. 197, 1897; Boerl., Handl. Fl. Ned. Ind. II, p. 630 et 658, 1899; Th. Cooke, Fl. Bombay II, p. 357, 1905, *H. dura* excl.; Clarke apud King et Gamble, Mat. Fl. Mal. Pen. in Journ. As. Soc. Beng. LXXIV, p. 652, 1908; Gamble, Fl. Madras II, p. 1017, 1923, *H. dura* excl.; Ridl., Fl. Mal. Pen. II, p. 568, 1923; Benoist in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 651, 1935, spec. 4 et 6—10 excl.; Lemée, Dict. Pl. Phan. III, p. 522, 1931, spec. africanis excl.; non Clarke in Thiselton-Dyer, Fl. Trop. Afr. V, p. 58, 1899; — *Ruellia* L. sensu Nees in Wall., Pl. As. Rar. III, p. 75 et 82, 1832, spec. 4 et 6 excl.; id. in DC., Prodr. XI, p. 100 et 143, 1847, § 1 solum et hic spec. 11—15 et 24 excl.; Miq., Fl. Ind. Bat. II, p. 785, 1858, spec. 1, 18, 21 et 22 excl.

Herbae isophyllae subrosulares et stolonibus vagantes, repentes, ascendentes et e parte decumbente haud raro renascentes, vel erectae. Inflorescentiae spiciformes, nunc elongatae, nunc plus minusve contractae, terminales et interdum insuper axillares. Bractae persistentes, 1-nerviae vel penninerviae, raro e basi 3-nerviae; bracteolae plerumque nullae, interdum tamen evolutae, immo calyci subaequilongae. Flores in axillis bractearum solitarii vel 2—3 superpositi. Calyx aequaliter vel subaequaliter 5-fidus vel 5-lobatus, raro bilabiatus casu quo labio superiore 3-, labio inferiore 2-fido; lobi triangulares vel, raro, filiformes, plerumque ciliati vel ciliolati. Corolla coerulea, dilute violacea vel alba casu quo interdum lineis violaceis notata, recta et non resupinata, faucibus campanulatis tubo subaequilongis, pilis stylum retinentibus in series duas dispositis, lobis aequalibus et ovatis, orbicularibus vel obcordatis, flore aperto haud raro recurvatis. Stamina 4, inclusa; filamenta staminum exteriorum quam interiorum fere bis longiora, saepe unifariam hirtella, interdum sub antheris pilis longioribus et crebrioribus barbata, alibi ad basin solum hirtella vel tota glabra; filamenta breviora glabra vel ad basin parce hirtella; antherae erectae, muticae vel apiculatae, a latere complanatae, thecis basi plerumque muticis, interdum tamen una vel ambabus acutis. Staminodium impar plerumque nullum et membrana connectiva haud raro inter stamina interiora emarginata et semper ad rimam redacta. Granula pollinis (Tab. I A, B) ellipsoidea, rarissimo globosa,

semper virgata, virgis nunc glabris vel minute punctatis, nunc uni- vel biseriatis carunculatis. Ovarium pilis capitatis vel ecapitatis comosum vel dimidio superiore puberulo-pubescentis, utroque loculo ovulis 3—8. Stylus basin versus vel totus hirtellus. Capsula elongata, retinaculis acutis parvis. Semina (Tab. IV A) 6—16, parvo-areolata; areola plerumque grisea; zona circumareolaris brunnea et pilis annulatis interdum mucosis vestita; parietes cellularum strati subepidermalis interdum incrassatae.

Distributum a Peninsula Indica usque ad Melanesiam et Australiam Tropicalem; regiones altiores fugiens; numerus specierum ad 100 computandus.

Typus generis: *H. latebrosa* (Heyne ex Roth) Nees.

As stated in the general part of this paper, *Hemigraphis* owes its origin to two mistakes made by NEES in the analysis of the type species: its corolla was regarded as resupinate, and its anthers as monotheous; in other respects his description agreed with the one he gave of *Ruellia*. ANDERSON recognized the identity of the two genera, but as *Ruellia* in NEES's delimitation did not comprise LINNÉ's type species, he was compelled to accept for this genus the rather unsuitable name *Hemigraphis*. KURZ and afterwards HALLIER F. pointed out that the yellow-flowered species which NEES had referred to *Ruellia* and ANDERSON to *Hemigraphis*, can not be regarded as congeneric with the other ones: they differ from the latter not only in the colour of the corolla but also in the inside hairy calyx, the larger size of the seeds and the nature of the areola. In this work they are removed to two new genera *Sericocalyx* and *Xanthostachya*. A further rounding off was effected by the creation of a new genus *Gantelbua* for the aberrant *Hemigraphis dura* (Nees) T. And.

The *Hemigraphis* species are herbs. Some of them are probably annual, but the majority are provided with means of vegetative propagation. The latter is very profuse in the creeping species, e.g. in *H. alternata* (Burm. f.) T. And., a completely sterile garden plant, which is propagated only in this way. The subrosulate *H. primulifolia* (Nees) F. Vill. forms stolons, and of several other species, e.g. *H. sumatrensis* (Roth) Brem., the flowering shoots sink down when the fruits are ripe, strike roots from the nodes and form new shoots from the axils of the leaves.

The inflorescences vary in length and in the size of the bracts. The latter are as a rule penninerved, but when they are very narrow, the lateral nerves become inconspicuous, and when they are wide, the first pair of the lateral nerves are often more strongly developed than the others and ascendent, so that these bracts may be described as 3-nerved. Bracteoles are mostly small or absent, but in some species they are nearly as long as the calyx.

The flowers in the axils of the bracts are either single or accompanied by one or two superposed ones, and in that case they are inserted on the more or less patent base of the bract, the first accessory flower on the outside, the second on the inside of the main one.

The calyx is as a rule equally or subequally 5-fid. but in *H. rosmarinifolia* the lobes are shorter than the tube, and in *H. brunelloides* (Lam.) Brem. and *H. dentata* Brem. the incisions between the anticus and lateral segments extend into the lower half, so that in these plants the calyx may be described as two-lipped. The lobes are usually triangular, but in the series *Tenuispicae* they are so narrow that they should be called filiform.

The corolla is always small and straight and develops in the normal position. In the species occurring in the Indian Peninsula, the Northern Provinces of India and Birma it is blue, but in those occurring eastwards of this area it is either dilute violet or white.

The stamens are always included and distinctly didynamous. The filaments

are sometimes entirely glabrous and sometimes hirtellous, and then the hairs may be confined to the base or they may in the longer ones extend on one side along the whole length of the filament. If the band of cilia extends to the top, the upper ones are sometimes longer and more densely set than the others. Such bearded filaments occur for instance in *H. latebrosa* (Heyne ex Roth) Nees, the type species of the genus, where the "brushes" were interpreted by NEES as rudimentary anther cells. As the anthers are ditheous, this interpretation is of course erroneous. The connecting membrane between the inner stamens is always very short and not rarely more or less emarginate.

The pollen grains vary in shape between slenderly ellipsoidal and globose, but exactly globose ones are apparently very rare: they were found by me only in *H. fruticulosa* Clarke. The surface is always ornamented with bands, which are either smooth, finely punctate or granulate, or else carunculate. The latter are confined to a single species belonging to the series *Nudicrures*, namely *H. diversifolia* Elm., and to the series *Pubicrures*, where they are characteristic for the species occurring in the western part of the area; in the species found in the eastern part of the area (Celebes, Philippines) the bands are usually punctate or granulate, except in *H. linearifolia* Brem., *H. mediocris* Brem. and *H. cumingiana* (Nees) F. Vill., where they are more or less distinctly carunculate. The number of bands also varies: in the series *Imbricatae* and in *H. hirta* (Vahl) T. And. there are always 15 bands, but in the other groups the number is larger; in the series *Nudicrures* sometimes as many as 27 bands are counted.

The capsule is always elongated, but its shape varies of course somewhat according to the number of seeds. The latter are always rather small, and apart from the small grey areola dull and brown. The hairs are always of the annulate kind and sometimes mucous. In the series *Nudicrures* they are sometimes already shed before the seeds are fully ripe, and in the series *Tenuispicae* and *Rosmarinifoliae* they are extremely short. In the series *Nudicrures* the central layer of the seedcoat consists of thick-walled cells.

The Indian species of *Hemigraphis* differ from those found further eastwards i.a. in the blue colour of the corolla. They belong to two groups.

The first of these Western groups comprises *H. latebrosa* (Heyne ex Roth) Nees and its nearest allies, all diffusely branched herbs provided with numerous very short, few-flowered spikes and possessing a somewhat longer corolla than is usual in this genus, densely bearded stamens, and pollen grains decorated with 18 punctate bands. *H. latebrosa* itself, *H. rupestris* T. And. and *H. crenata* (Benth.) Brem. n. comb. (*Ruellia* Benth.) occur in the Deccan Peninsula, whereas *H. flaccida* (Kurz) Clarke and *H. crossandra* (Steud.) Brem. n. comb. (*Ruellia* Steud.) are found in Birma.

The introduction of the new combination *H. crossandra* requires a few words of explanation. The species to which it refers, was up to now known as *H. elegans* (Hook.) Nees, but this combination is illegitimate, for it dates from 1847, and at that time the plant was legitimately known as *Ruellia crossandra*, a name introduced by STEUDEL (Nomencl. ed. 2, II, p. 481, 1841) because the name *R. elegans*, under which the plant had been described by HOOKER (in Bot. Mag. LXII, Tab. 3389, 1835) was invalidated by *R. elegans* Poir. (Encycl. Suppl. IV, p. 727, 1816). An older name for the same species is *R. diffusa* Wall. ex Nees (in Wall., Pl. As. Rar. III, p. 83, 1832), but the epithet *diffusa* too is illegitimate, for it had already been used in the same combination by VELLOZO (Fl. Flum. VI, Tab. 94, 1827) for a Brazilian plant. *Strobilanthes burmanica* Kurz is, according to CLARKE, another synonym. As I did not see KURZ's specimen, I am unable to express an opinion on this identification, but it can hardly be doubted that CLARKE's reduction of *Ruellia crenata* Benth. to

a mere variety of the species under discussion, is a mistake: the discontinuity of the areas in which these plants occur, makes their conspecificity highly improbable, and the description of *R. crenata* seems to exclude such a near affinity.

The other group of Indian species is represented by *H. hirta* (Vahl) T. And., a densely hairy procumbent plant with short internodes and small, nearly sessile leaves, a small corolla with a widely campanulate throat, filaments, which are in the upper half glabrous, and pollen grains provided with 15 finely punctate bands; one of its most aberrant characters is the absence of hairs in the central part of the circum-areolar zone of the seedcoat, and their great length in the marginal part. KOORDERS-SCHUHMACHER cites this species as occurring in the mountains of East Java, but although I did not see KOORDERS's specimen, I have no doubt that this record is based on a misidentification, for the *Hemigraphis* species never reach the altitude (2400 m) on which this plant was found. Another specimen subsequently collected by KOORDERS in the mountains of East Java, and distributed under the same name (KOORDERS 43511) proved to be *Justicia simplex* Don.

Of the species found in South China and Indo-China no material was available to me, and as it proved impossible to base an opinion of their taxonomic position on the rather scanty descriptions, they will be left out of consideration.

Most of the species from the Malay Peninsula could not be studied either, but judging from the descriptions it seems probable that they all belong to the same series as those from the Malay Archipelago. The plant which NEES referred as var.  $\beta$  to his *Ruellia confinis* proved conspecific with specimens from Java belonging to *Hemigraphis brunelloides* (Lam.) Brem. n. comb. (*Justicia* Lam.). *H. brunelloides* is the correct name for the Javanese plant originally described by VAHL (Symb. Bot. I, p. 122, 1790 et II, p. 3, 1791) under the name *Justicia hirsuta*. VAHL's specific epithet, however, is invalid, for it had been used already in 1760 by JACQUIN (Enum. Pl. Carib., p. 11) in the same combination for an American species. The name *Ruellia hirsuta* Nees (in DC., Prodr. XI, p. 148, 1847) too is illegitimate, not only because this combination had been used for three other species, but also because the plant had already a legitimate name, to wit *Justicia brunelloides* Lam. (Ill. Gen. I, p. 40, ante 1797), and the latter's specific epithet, therefore, should have been used. The combination *Hemigraphis hirsuta* T. And. is to be rejected for the same reason. It might perhaps be objected that LAMARCK's plant had been transferred by KUNTZE (Rev. Gen. Pl. I, p. 493, 1892) to *Nelsonia* R. Br. He did this in the following form: "*Nelsonia brunelloides* OK (*Justicia br.* Lam. 1891 = *J. hirsuta* Vahl 1805 = *N. campestris* R. Br. 1810), but the identification which is expressed in this sentence, and which was accepted by LINDAU (in ENGL. u. PRANTL, Nat. Pflanzenfam. IV, 3 b, p. 289, 1895), is a strange mistake. LAMARCK's type was collected in Java, where *Nelsonia campestris* R. Br. has never been found. KUNTZE probably copied from ROEMER et SCHULTES (Syst. I, p. 172, 1817) who transferred *Justicia hirsuta* Vahl to *Nelsonia*, but this error had long ago been corrected by NEES.

The plants of the Malay Peninsula referred by CLARKE to *H. alternata* (Burm. f.) T. And. are not conspecific with BURMAN's type. As Prof. HOCHREUTINER has informed me (cf. BREMEKAMP in Blumea V, p. 239, 1942), and as BURMAN's description bears out, BURMAN's type is conspecific with *H. colorata* (Bl.) Hall. f., a well-known garden plant in tropical countries, and frequently cultivated in our hothouses. The plant from the Malay Peninsula described by CLARKE on the other hand is *H. sumatrensis* (Roth) Brem., and belongs to another series as *H. alternata* (Burm. f.) T. And. The confusion has probably arisen in the following way: When ANDERSON transferred

BURMAN's *Ruellia alternata* to *Hemigraphis*, he quoted *R. discolor* Nees and *R. Blumeana* Nees as synonyms. As these species differ conspicuously not only from BURMAN's type, but also among themselves, the first being conspecific with *H. brunelloides* (Lam.) Brem., a species belonging to the series *Imbricatae*, and the second with *H. sumatrensis* (Roth) Brem., which is one of the *Pubicrures*, it is highly improbable that ANDERSON's view was based on an actual study of these species. In reducing *R. discolor* to *H. alternata*, he probably relied on NEES's authority, who had quoted *R. alternata* as a synonym of his *R. discolor*. The addition of *R. blumeana* may be due to the circumstance that RUMPHIUS's *Prunella Molucca silvestris alba* was considered by NEES conspecific with his *R. blumeana*, and that a variety of RUMPHIUS's plant was quoted by the same author under *R. discolor*, whereas *Prunella Molucca silvestris rubra* was according to BURMAN identical with his *R. alternata*. As both BURMAN and NEES had identified *R. alternata* and *R. blumeana* with plants which according to RUMPHIUS were mere varieties of *Prunella Molucca silvestris*, ANDERSON may have thought that the difference between them could not be of any importance. In reality, however, the interpretation of RUMPHIUS's species and varieties by BURMAN and NEES is totally wrong, for they correspond neither with *R. alternata* nor with one of the two other species (v. infra *H. Rumphii* Brem. n. spec.). ANDERSON published the new combination *H. alternata* (Burm. f.) T. And. in his paper on the *Acanthaceae* of LINNÉ's herbarium, but to which of the three species LINNÉ's specimen belongs, is at the moment impossible to make out: as it is not the actual type, this, however, is a question of minor importance. CLARKE, who had not seen BURMAN's type and was not acquainted with *R. discolor*, apparently accepted *R. blumeana* on ANDERSON's authority as representing the type of *R. alternata*, for the plants from the Malay Peninsula which he referred to the latter, belong to *R. blumeana* or, to use the correct name, to *H. sumatrensis* (Roth) Brem.

In the Malay Archipelago and New Guinea the genus is represented by a very large number of species, some of which resemble each other rather closely. Up to now they had been difficult to classify. Suitable characters for the establishment of natural groups, however, were found in the shape of the pollen grains and in the number and design of the bands with which the latter are provided, in various characters of the seedcoat, namely in the structure and extension of the areola, in the shape and size of the hairs on the circumareolar part, and in the nature of the cells of the subepidermal layer, and also in the arrangement of the flowers, the presence or absence of capitate hairs on the bracts and on the outside of the calyx, the relative length of the bracts in comparison with the calyx, the presence or absence of bracteoles, the depth of the incisions between the calyx segments, and the bearded or not bearded filaments of the outer stamens.

The number of bands with which the pollen grains are provided, is not always easily determined. In the first place the grains should be fertile and mature, for if they are immature, the surface relief is not sufficiently developed, and if they are sterile, the relief remains always indistinct. Two of the species dealt with below, *H. alternata* (Burm. f.) T. And. and *H. repanda* (L.) Hall. f., are always completely sterile, and in some of the latter's nearest allies only a small part of the pollen grains is fertile. But even in mature, well developed pollen grains the number of bands is not always easily determined. If the axis of the grain is directed perpendicular to the surface of the slide, the counting offers no difficulties, for in this position the bands are all simultaneously visible. If the grains are globose or shortly ellipsoidal, some of them will always be directed in this way, but if they are very slender, like those of *H. serpens* (Nees) Boerl., they will nearly always place themselves parallel to the surface

of the slide, and even among hundreds of grains not a single one may be found in a suitable position: in such cases the number of bands lying between two germ pores was counted, but as the surface of the grain is often somewhat depressed in the neighbourhood of the pores, the bands which are nearest to the latter are apt to overlap, and it is therefore often difficult to see them.

That the species are sometimes very similar, was known already to RUMPHIUS, who in his description of *Prunella Molucca silvestris* (Herb. Ambon. Vol. VI, Lib. X, p. 32) remarks: "Plures eius fingi possint species, quae in scopulis et ad litus crescunt, sed sunt tantum prioris Varietates, unde est inutile eas describere". In several instances, however, these varieties are doubtless good species, of which several have been described below. Their number would even have been much larger, if lack of suitable material had not compelled me to retain some of the old species, e.g. *H. primulifolia* (Nees) F. Vill. and *H. cumingiana* (Nees) F. Vill., in a delimitation which is admittedly too wide.

Some species of *Hemigraphis* are often cultivated, e.g. *H. alternata* (Burm. f.) T. And. and *H. repanda* (L.) Hall. f. These two are now mainly grown for ornamental purposes, but like several of their nearest allies they were doubtless taken into cultivation for their supposed medicinal or magical properties, on which the work of RUMPHIUS l.c. and HEYNE'S "Nuttige Pflanzen van Nederlandsch Indië" ed. 2, Vol. II, p. 1376, 1927, should be consulted. *H. alternata* and *H. repanda* are always propagated in a vegetative way; they do not produce well developed pollen and are apparently completely sterile; their country of origin is unknown, but as they belong to a group which has its main distribution in the eastern part of the Malay Archipelago, it is probably there that their wild-growing relatives, if they are still in existence, will be found. Some other species belonging to the same group, e.g. *H. petola* Hall. f., *H. buruensis* Hall. f., *H. lanceolata* Merr., *H. angustifolia* Hall. f. and *H. novoguineënsis* Brem. n. spec., are provided with pollen of which a large part is always abortive, and these plants produce but little seed. It is not improbable that the material of these species preserved in our herbaria was mainly or even entirely obtained from cultivated plants: that *H. angustifolia* is often grown in the gardens of the natives, was mentioned already by RUMPHIUS l.c., who described this plant under the name *Prunella domestica angustifolia*. According to RUMPHIUS too, fruits are but rarely developed.

The following key may serve to give some insight in the relations between the numerous Malesian species and in the delimitation of the series over which they have been divided. Details are given further on. Some species from the Philippines and from New Guinea of which I have seen no material, and which I was unable to locate on account of the incomplete descriptions, could of course not be included in the key. The latter is followed by a general survey of the series with the species belonging to them. Where suitable material was available, the latter have been fully described; with regard to the other ones I have confined myself as a rule to references to the literature; occasionally, however, a few critical remarks have been added.

#### Key to the Malesian species of *Hemigraphis*.

1. Most of the flowers subtended by ordinary leaves. Pollen grains globose. — Philippines (f. *Axilliflorae*) . . . . . 36
  - : Flowers spicate; the lowest pair sometimes subtended by ordinary leaves. Pollen grains ellipsoidal . . . . . 2
2. Pollen grains more than twice as long as wide. Creeping plants. — Java and, perhaps, the Malay Peninsula . . . . . 12
  - . . . . . (b. *Serpentes*) . . . . . 12
  - : Pollen grains always less than twice as long as wide and, as a rule,

- less than one and a half time as long as wide. Rarely creeping, but if so, then always easily distinguishable from the species belonging to the series *Serpentes* either because the filaments are glabrous or else because of the total absence of bracteoles . . . . . 3
3. Pollen grains provided with 15 bands. Bracts and outside of the calyx densely covered with soft capitate or, more rarely, ecapitate hairs. — Indo-China, Sumatra, Java, Borneo; one species in Luzon and two in the Lesser Sunda Islands (Timor and Wetar) . . . . . 7
- : . . . . . (a. *Imbricatae*) . . . . . 7
- : Pollen grains provided with 18 or more bands. Bracts and outside of the calyx either entirely glabrous or else ciliate along the margin and on the midrib, but never densely covered with soft hairs . . . . . 4
4. Filaments of the longer stamens entirely glabrous or the hairs confined to the lower part. Central layer of the seedcoat composed of thick-walled cells. — One species in Borneo, four or five in Celebes, the other ones in the Philippines, the Moluccas and New Guinea with the neighbouring islands . . . . . (g. *Nudicrures*) . . . . . 37
- : The rows of hairs on the filaments of the longer stamens extending to the top. Central layer of the seedcoat composed of thin-walled cells . . . . . 5
5. Spikes elongated. Bracts not more than half as long as the calyx. Calyx lobes filiform. — Philippines . . . . . (d. *Tenuispicae*) . . . . . 33
- : Spikes with short internodes. Bracts at least as long as the calyx. Calyx lobes triangular . . . . . 6
6. Calyx lobes shorter than the calyx tube. Seedcoat covered with hairs that are shorter than the epidermis cells to which they belong. — Philippines . . . . . (e. *Rosmarinifoliae*) . . . . . 35
- : Calyx lobes as long as the calyx tube. Seedcoat covered with hairs that are much longer than the epidermis cells to which they belong. — Malay Peninsula, Sumatra, Java, Borneo, Celebes and Philippines . . . . . (c. *Pubicrures*) . . . . . 13

a. *Imbricatae*.

7. Bracteoles nearly as long as the calyx. Filaments of the longer stamens with a row of hairs extending to the top. — Erect plant with on the upper side scabridulous and on the lower side scabrid leaves. — Luzon . . . . . 1. *H. rhytiphylla* (Nees) F. Vill. . . . . 8
- : Bracteoles not more than two third the length of the calyx; sometimes entirely suppressed. Filaments of the longer stamens with a few hairs at the base or entirely glabrous. — Ascending herbs; leaves on the lower side never scabrid . . . . . 8
8. Bracteoles absent. Style entirely hirtellous. — Plants with scabrid leaves . . . . . 9
- : Bracteoles present and from about half to two third the length of the calyx. Style towards the top glabrescent . . . . . 10
9. Leaves crenate. Hairs on the bracts and calyx capitate. — Timor . . . . . 2. *H. decaisneana* (Nees) T. And. . . . . 10
- : Leaves subentire. Hairs on the bracts and calyx ecapitate. — Wetar . . . . . 3. *H. wetarensis* Brem. n. spec. . . . . 10
10. Leaves scabrid. Calyx subequally 5-fid. — Java . . . . . 4. *H. javanica* Brem. n. spec. . . . . 11
- : Leaves at first softly pubescent, afterwards glabrescent. Calyx bilabiate, i.e. the three posticous segments united in a 3-lobed upper lip and the two anticous ones in a 2-fid lower lip . . . . . 11



11. Leaves and bracts dentate. Flowers solitary in the axils of the bracts.  
 — Java . . . . . 5. *H. dentata* Brem. n. spec.  
 : Leaves crenate or subentire; bracts entire. Flowers usually in pairs or  
 threes superposed. — Malay Peninsula, Java and Borneo . . . . .  
 . . . . . 6. *H. brunelloides* (Lam.) Brem. n. comb.  
 a. Leaves lanceolate, 5—10 cm × 2.2—4.0 cm, obtuse. Bracts subobtusely . . . . . b  
 : Leaves linear-lanceolate, 5.5—8 cm × 1.3—1.9 cm, subcaudate. Bracts acute. —  
 Borneo . . . . . var. *angustifolia* Brem. n. var.  
 b. Leaves membranaceous, always subglabrous. — Java and Borneo . . . . .  
 . . . . . var. *subglabra* Brem. n. var.  
 : Leaves subcoriaceous, at first more or less densely pubescent. — Malay Peninsula,  
 Java and Borneo . . . . . var. *vahliana* Brem. n. var.

b. *Serpentes*.

12. Young shoots patently hairy. Calyx hirsute. Ovary cells with 4 ovules.  
 — Java . . . . . 7. *H. serpens* (Nees) Boerl. ex Backer  
 : Young shoots strigose. Calyx softly pubescent. Ovary cells with 6  
 ovules. — Java . . . . . 8. *H. nemorosa* (Zoll.) Boerl. ex Brem.  
 n. comb. <sup>26)</sup>

c. *Pubicrures*.

13. Pollen grains always provided with 18 strongly carunculate bands.  
 Species from the Malay Peninsula, Sumatra, Java, Borneo and Palawan 14  
 : Pollen grains with 18 or more punctate, rarely (*H. cumingiana*)  
 slightly carunculate bands. Species from Celebes and the Philippines 21  
 14. Leaves lanceolate or linear-lanceolate; base acute . . . . . 15  
 : Leaves lanceolate-ovate, ovate or elliptic, rounded at the base, except  
 in the vicinity of the petiole, where they are suddenly contracted . . . . . 20  
 15. Ovary cells with 5 or 6 ovules . . . . . 16  
 : Ovary cells with 4 ovules . . . . . 17  
 16. Inflorescence shortly pedunculate; the peduncle of about the same  
 length as the preceding internode. — Malay Peninsula, Sumatra, Java  
 and Borneo . . . . . 9. *H. sumatrensis* (Roth) Boerl. ex Brem.  
 n. comb.  
 a. Hairs on the shoots and peduncles acroscopic. — Sumatra, Java and Borneo . . . . .  
 . . . . . var. *rothiana* Brem. n. var.  
 : Hairs on the shoots and peduncles patent or basiscopic . . . . . b  
 b. Upper side of the leaves scabrid; lower side sprinkled with minute bristles;  
 2.5—5 cm × 9—18 mm. Bracts sparsely hirsute. — Sumatra and Java . . . . .  
 . . . . . var. *scabrida* Brem. n. var.  
 : Upper side of the leaves scabridulous; lower side softly pubescent; 4.5—9.5 cm ×  
 19—43 mm. Bracts rather densely hirsute. — Sumatra and Java . . . . .  
 . . . . . var. *latifolia* Brem. n. var.  
 : Inflorescence long-pedunculate; the peduncle much longer than the  
 preceding internode. — West Borneo . . . . .  
 . . . . . 10. *H. gracilipes* Brem. n. spec.  
 17. Inflorescence long-pedunculate; the peduncle much longer than the  
 preceding internode. Bracts ovate, 10 mm × 7 mm. — South-East  
 Borneo . . . . . 11. *H. longipedunculata* Brem. n. spec.  
 : Inflorescence shortly pedunculate; the peduncle of about the same  
 length as the preceding internode. Bracts linear, linear-lanceolate or  
 oblanceolate . . . . . 18  
 18. Shoots and petioles hispid. Leaves on the upper side sparsely hispid.

<sup>26)</sup> As the pollen of this species is unknown, its position in this series is not yet quite certain.

- Bracts linear, 9—11 mm  $\times$  2.5—3.0 mm. Dried specimens yellowish-green. — South-East Borneo . . . . . 12. *H. hispida* Brem. n. spec.
- : Shoots and petioles scabridulous or pubescent, usually soon glabrescent. Leaves on the upper side sparsely scabridulous or entirely glabrous. Bracts either much longer or wider than those of the preceding species. Dried specimens olivaceous or brown . . . . . 19
19. Leaves 2—5 cm  $\times$  5—13 mm, on the upper side scabridulous. Bracts oblanceolate, subacuminate, 7—8 mm  $\times$  3—3.5 mm. — East Borneo . . . . . 13. *H. parva* Brem. n. spec.
- : Leaves 3—10 cm  $\times$  1.2—2.7 cm, on the upper side glabrous. Bracts linear, very acute, 18 mm  $\times$  4 mm. — Natuna Islands . . . . . 14. *H. natunensis* Brem. n. spec.
20. Leaves ovate or elliptic, 2—4.5 cm  $\times$  1.2—2.2 cm; on the upper side scabridulous. Creeping plant. — Palawan (Culion) . . . . . 15. *H. culionensis* Brem. n. spec.
- : Leaves ovate-lanceolate to ovate, 9—15 cm  $\times$  3.7—6 cm; on the upper side glabrous. Erect plant. — West Java . . . . . 16. *H. bicolor* (Bl.) Hall. f.
- 21 (13). Upper leaves much narrower than the lower ones . . . . . 22
- : Upper and lower leaves not conspicuously different in shape . . . . . 24
22. Hairs on the shoots and peduncles acroscopic. Bracts ovate or elliptic, 10—12 mm  $\times$  8—8.5 mm. Erect plant provided with leaves varying between ovate and linear-obcuneate and drying with a yellowish-green colour. — Luzon . . . . . 17. *H. viridis* Merr.
- : Hairs on the shoots and peduncles basiscopic. Bracts linear-lanceolate, lanceolate or linear-oblong. Plants drying with a brownish colour . . . . . 23
23. Leaves varying between ovate and linear-obcuneate; the ovate ones usually less than 2 cm long. Bracts lanceolate or lanceolate-oblong, 12.5 mm  $\times$  5.5 mm. — Luzon . . . . . 18. *H. proteus* Brem. n. spec.
- : Leaves varying between elliptic and lanceolate; the elliptic ones usually about 9.5 cm long. Bracts linear-lanceolate, 8—10 mm  $\times$  2—2.5 mm. — Mindoro . . . . . 19. *H. halconensis* Brem. n. spec.
24. Leaves linear, 3.5—10 cm  $\times$  3—9 mm . . . . . 25
- : Leaves absolutely and relatively wider . . . . . 26
25. Bracts narrowly ovate-lanceolate, 11 mm  $\times$  3 mm, on the upper side sparsely strigose, beneath on the midrib rather densely and elsewhere sparsely scabrid. — Mindanao . . . . . 20. *H. linearifolia* Brem. n. spec.
- : Bracts linear or narrowly spatulate, 12—20 mm  $\times$  2 mm, apart from the marginal cilia glabrous. — Luzon . . . . . 21. *H. simulans* Brem. n. spec.
26. Leaves narrowly ovate-oblong, 2—4 cm  $\times$  9—15 mm, obtuse. Bracts 7—9 mm  $\times$  3.5—5 mm. — Luzon . . . . . 22. *H. mediocris* Brem. n. spec.
- : Leaves linear-lanceolate, lanceolate or lanceolate-elliptic, always much larger than in the preceding species and towards the top contracted. Bracts also larger . . . . . 27
27. Bracts on the upper side densely covered with long yellowish hairs. Leaves on the upper side scabrid. — Luzon . . . . . 23. *H. benguetensis* Brem. n. spec.
- : Bracts not covered with yellowish hairs, but fringed with white cilia. Leaves on the upper side scabridulous or glabrescent . . . . . 28

28. Bracts oblong; cilia very long and dense. — Luzon . . . . . 24. *H. oblongibractea* Brem. n. spec.  
 : Bracts lanceolate, ovate or obovate; cilia neither very long nor very dense . . . . . 29
29. Upper side of the leaves shining; epidermis cells with straight walls; lower side scabrid. — Luzon . . . . . 25. *H. pachyphylla* Merr.  
 : Upper side of the leaves dull; epidermis cells with meandering walls; lower side softly pubescent or glabrescent . . . . . 30
30. Lower side of the leaves and especially the midrib and nerves densely pubescent. Bracts lanceolate, 12—17 mm  $\times$  4.5—5 mm. — Samar . . . . . 26. *H. samarensis* Brem. n. spec.  
 : Lower side of the leaves subglabrous. Bracts ovate . . . . . 31
31. Leaves more or less sinuous. Pollen grains slightly carunculate. Bracts 10 mm  $\times$  6 mm, subobtuse. — Luzon, Panay, Mindanao . . . . . 27. *H. cumingiana* (Nees) F. Vill.  
 : Leaves repando-dentate. Pollen grains with punctate bands. Bracts acute . . . . . 32
32. Leaves with several small teeth and 5—6 pairs of nerves. Bracts 10 mm  $\times$  6 mm. Pollen grains 41  $\mu$   $\times$  25  $\mu$ . Ovary cells with 4 ovules. — Celebes . . . . . 28. *H. celebica* Brem. n. spec.  
 : Leaves coarsely toothed and provided with 3—4 pairs of nerves. Bracts 14 mm  $\times$  6 mm. Pollen grains 52  $\mu$   $\times$  32  $\mu$ . Ovary cells with 6 ovules. — Celebes . . . . . 29. *H. mandarensis* Brem. n. spec.

d. *Tenuispicae*.

33. Shoots and petioles subglabrous. Leaves at the base acute or contracted 34  
 : Shoots and petioles softly pubescent. Leaves at the base subobtuse. — Panay, Mindoro . . . . . 30. *H. panayensis* (Merr.) Brem. n. comb.  
 a. Leaves all oblong or elliptic, 4—10 cm  $\times$  1.7—5 cm. — Panay, Mindoro . . . . . var. *Merrillii* Brem. n. var.  
 : The majority of the leaves linear or oblanceolate, 3—5 cm  $\times$  0.8—1.2 cm, but sometimes mixed with a few oblong ones. — Panay . . . . . var. *angustifolia* Brem. n. var.
34. Ovary cells with 6 ovules. Leaves oblong, acuminate, membranaceous. — Mindoro . . . . . 31. *H. mindorensis* Brem. n. spec.  
 : Ovary cells with 7 or 8 ovules. Leaves lanceolate, obtuse, subcoriaceous. — Catanduanes . . . . . 32. *H. tenuispica* Brem. n. spec.

e. *Rosmarinifoliae*.

35. Only one species: an ascending, almost completely glabrous plant with stiff linear leaves. — Luzon . . . . . 33. *H. rosmarinifolia* Brem. n. spec.

f. *Axilliflorae*.

36. Only one species: a small ascending herb with thin shoots and very small, shortly petiolate, ovate leaves. — Luzon . . . . . 34. *H. fruticulosa* Clarke

g. *Nudicrures*.

37. Leaves usually ovate or oblong; sometimes lanceolate or linear-lanceolate, but then always subentire. Ovary cells with 4—6 ovules . . . . . 38

- : Leaves lanceolate, linear-lanceolate or linear, always coarsely toothed or lobed. Ovary cells always with 6 ovules . . . . . 55
38. Creeping, procumbent or subrosulate plants. Ovary cells with 4—6 ovules . . . . . 39
- : Erect or suberect plants. Ovary cells always with 6 ovules . . . . . 54
39. Shoots patently hairy or villous. Peduncles always thinner than the shoots and strigose . . . . . 40
- : Shoots pubescent or glabrescent, sometimes patently hairy, but then the peduncles of the same diameter as the preceding internodes and covered with the same kind of hairs . . . . . 41
40. Creeping plant. Leaves rounded at the base. Ovary cells with 6 ovules. — East Borneo . . . . . 35. *H. villosa* Brem. n. spec.
- : Subrosulate plant. Leaves emarginate at the base. Ovary cells with 5 ovules. — Celebes, Philippines, Moluccas . . . . . 36. *H. primulifolia* (Nees) F. Vill.
41. Leaves linear-lanceolate, lanceolate or linear-oblong, occasionally mixed with a few oblong ones . . . . . 42
- : Leaves obtuse, oblong, ovate, cordate or elliptic . . . . . 43
42. Leaves less than 2.5 cm long and provided with 3—4 pairs of nerves. Calyx 5.5 mm long. — Luzon . . . . . 37. *H. tayabensis* Brem. n. spec.
- : Leaves more than 3 cm long and usually provided with 5 pairs of nerves. Calyx 8 mm long. — Moluccas . . . . . 38. *H. ceramensis* Brem.
43. Upper leaves ovate-lanceolate, obtuse or linear-obtuse; the lower ones ovate or ovate-orbicular . . . . . 44
- : All leaves more or less of the same shape . . . . . 45
44. Bracts in the middle of the spike 5 mm long. Bands of the pollen grains carunculate. — Luzon . . . . . 39. *H. diversifolia* Elm.
- : Bracts in the middle of the spike 10 mm long. Bands of the pollen grains punctate. — Luzon . . . . . 40. *H. subtinctoria* Elm.
45. Shoots, peduncles and petioles patently hairy. Leaves thin, lanceolate-ovate or ovate and coarsely toothed or lobed. — Negros, Leyte, Samar . . . . . 41. *H. sublobata* Elm.
- : Shoots, peduncles and petioles never patently hairy. Leaves usually crenate or subentire; if coarsely toothed, then subcoriaceous and obovate . . . . . 46
46. Upper side of the leaves as well as the shoots and petioles scabrid. — Mindanao . . . . . 42. *H. lanaënsis* Brem. n. spec.
- : Upper side of the leaves, shoots and petioles sometimes scabrid or scabridulous, but never at the same time: if the upper side of the leaves is scabrid or scabridulous, then the shoots and petioles are softly pubescent, and if the latter are scabridulous, then the leaves are glabrous on the upper side . . . . . 47
47. Bracts coarsely toothed. Leaves obovate. — Mindanao . . . . . 43. *H. baractanensis* Elm.
- : Bracts entire. Leaves ovate, ovate-oblong or cordate . . . . . 48
48. Leaves less than 3.5 cm long . . . . . 49
- : Leaves more than 4 cm long . . . . . 52
49. Peduncles more than 1 cm long . . . . . 50
- : Peduncles less than 1 cm long . . . . . 51

50. Ovary cells with 4 ovules. Calyx 6.5 mm long. Corolla 1 cm long. —  
 Celebes . . . . . 44. *H. chamaedrys* Brem. n. spec.  
 : Ovary cells with 5 ovules. Calyx 9 mm long. Corolla 1.5 cm long. —  
 Kei Islands . . . . . 45. *H. keiensis* Brem. n. spec.
51. Ovary cells with 4 or 5 ovules. Pollen grains  $38 \mu \times 29 \mu$ . Bracts  
 linear-oblancoelate, 6—8 mm  $\times$  2 mm. — Talaud . . . . .  
 . . . . . 46. *H. undulata* Brem.  
 : Ovary cells with 6 ovules. Pollen grains  $45 \mu \times 32 \mu$ . Bracts obovate-  
 oblanceolate, 8—8.5 mm  $\times$  3—4 mm. — Moluccas . . . . .  
 . . . . . 47. *H. moluccana* Brem. n. spec.
52. Leaves cordate, regularly crenate. — Country of origin unknown;  
 often cultivated . . . . . 48. *H. alternata* (Burm. f.) T. And.  
 : Leaves ovate-oblong or ovate, indistinctly and irregularly crenate or  
 sinuous . . . . . 53
53. Petioles 1 cm long. Leaves completely glabrous above and sparsely  
 pubescent on the midrib and nerves beneath. Bracts oblanceolate,  
 12 mm  $\times$  3.5 mm. — Aru Islands . . . . .  
 . . . . . 49. *H. prostrata* Hall. f.  
 : Petioles 1.2—4.5 cm long. Leaves at first sparsely scabridulous above  
 and rather densely pubescent on the midrib and nerves beneath. Bracts  
 oblong, 8—12 mm  $\times$  4—5 mm. — Moluccas . . . . .  
 . . . . . 50. *H. Robinsonii* Brem. n. spec.
- 54 (38). Flowers in the axils of the lower and middle bracts in pairs or threes  
 superposed. Bracts obtuse, fugaciously ciliate. Filaments completely  
 glabrous. — Moluccas . . . . . 51. *H. Rumphii* Brem.  
 a. Leaves glabrescent above, sparsely and shortly pubescent on the midrib and  
 nerves beneath. — Moluccas . . . . . var. *glabrescens* Brem. n. var.  
 : Leaves on the upper side sprinkled with minute bristles; on the lower side on  
 midrib and nerves densely and between the nerves sparsely pubescent. — Talaud  
 . . . . . var. *pubescens* Brem.  
 : Flowers solitary in the axils of the bracts. Bracts acute, conspicuously  
 and persistently ciliate. Filaments of the longer stamens in the lower  
 half hirtellous. — New Guinea . . . . .  
 . . . . . 52. *H. Ledermannii* Brem. n. spec.
- 55 (37). Leaves lanceolate or linear-lanceolate . . . . . 56  
 : Leaves linear . . . . . 61
56. Leaves lanceolate, 1.5—7.5 cm  $\times$  0.6—3.2 cm . . . . . 57  
 : Leaves linear-lanceolate, 6—15 cm  $\times$  1.1—3 cm, rarely up to 4 cm wide 59
57. Bracts denticulate. Bracteoles present; those of the lower flowers half  
 as long as the calyx; the other ones smaller. Leaves with 3—4 pairs of  
 nerves. — Ceram . . . . . 53. *H. petola* Hall. f.  
 : Bracts entire. Bracteoles either absent or confined to the lowest pair  
 of flowers. Leaves with 5 or 6 pairs of nerves . . . . . 58
58. Peduncles subglabrous. Spikes short. Filaments of the longer stamens  
 up to the middle hirtellous. — New Ireland . . . . .  
 . . . . . 54. *H. novomegapolitana* (Lindau)  
 Brem. n. comb.  
 : Peduncles more or less densely covered with basispic hairs. Spikes  
 elongated. Filaments of the longer stamens with a few hairs at the  
 base. — Buru . . . . . 55. *H. buruensis* Hall. f.
59. Peduncles densely covered with basispic hairs. Bracts on the back  
 entirely covered with small bristles. — Celebes, Philippines, Northern  
 Moluccas . . . . . 56. *H. lanceolata* Merr.  
 : Peduncles subglabrous. Bracts only along the margin and on the  
 midrib provided with small bristles . . . . . 60

60. Flowers in the axils of the lower and middle bracts superposed. Filaments of the longer stamens provided with a few capitate hairs. Leaves with 4—6 pairs of nerves. — Moluccas . . . . .  
 . . . . . 57. *H. angustifolia* Hall. f.  
 : Flowers always solitary in the axils of the bracts. Filaments of the longer stamens in the lower half hirtellous. Leaves with 7—9 pairs or nerves. — New Guinea . . . . .  
 . . . . . 58. *H. novoguineënsis* Brem. n. spec.
61. Erect plant. Leaves 4—15 cm  $\times$  5—15 mm. — Celebes . . . . .  
 . . . . . 59. *H. stenophylla* Hall. f.  
 : Procumbent plant. Leaves 2—7 cm  $\times$  4—12 mm. — Country of origin unknown; often cultivated . . . . .  
 . . . . . 60. *H. repanda* (L.) Hall. f.

#### Series a. *Imbricatae*.

Herbae ascendentes vel erectae. Caulis ramique primum dense pubescentes. Folia lanceolata, ovato-lanceolata vel elliptico-lanceolata, raro ovata vel elliptica, margine dentata, crenata vel subintegra. Spicae densae et latiores; pedunculus internodio precedenti similior; bracteae imbricatae, subtus pilis mollibus, haud raro capitatis vestitae; bracteolae plerumque evolutae. Flores in axillis bractearum interdum duo vel tres superpositi. Calyx extus pilis mollibus, haud raro capitatis vestitus, subaequaliter 5-fidus vel bilabiatus casu quo labio superiore 3-fido vel 3-lobato, labio inferiore 2-fido vel 2-lobato. Filamenta staminum longiorum nunc tota glabra, nunc basi vel tota hirtella. Granula pollinis breviter ellipsoidea, virgis levibus 15 ornata, 36—42  $\mu$  longa et 24—28  $\mu$  diametentia (Tab. I B). Ovarium utroque loculo ovulis 4. Semina (Tab. IV A) areola plures cellulas alta munita; zona circumareolaris pilis mucosis, marginem versus longioribus et numerosioribus vestita; parietes cellularum subepidermalium incrassatae.

Distributae is Indo-China, Sumatra, Java, Insulis Sundaicis Minoribus, terra Borneënsi, Insulis Philippinis.

The *Imbricatae* are a small, but wide-spread group. Apart from the species of the Malay Archipelago, it comprises *H. griffithiana* (Nees) T. And. and *H. confinis* (Nees) T. And. The first was collected in Birma and is mentioned in the "Flore Générale de l'Indo-China" (IV, p. 653) from Cochinchina, but this record requires confirmation, as the bracts of the Cochinchina specimens are described as non-glandular, whereas they are glandular in the type. *H. confinis* was based on specimens collected in the Malay Peninsula. I have seen no authentic material of NEES's var. *a*, but a duplicate of the type of his var.  *$\beta$*  (CUMING n. 2354) proved indistinguishable from *H. brunelloides* (Lam.) Brem., and the affinity between the latter and *H. confinis* will therefore probably turn out to be very near: the differences mentioned by NEES are all of little importance and might easily fall inside the range of ordinary intraspecific variability. *H. confinis* (Nees) T. And. var. *hirsuta* (Vahl) Ridl. is a synonym of *H. hirsuta* (Vahl) T. And., which, as I have shown above, is an illegitimate name of *H. brunelloides*. BENOIST described in the "Flore Générale de l'Indo-Chine" under the varietal name adopted by RIDLEY some plants collected in Laos, Cambodja and Cochinchina, but as he states that their bracteoles are about as long as the calyx, they probably belong to another species, for in *H. brunelloides* they are but two third the length of the calyx. Among the species known to me, the Philippine *H. rhytiphylla* (Nees) F. Vill. is the only one in which they are as long as the calyx.

1. *Hemigraphis rhytiphylla* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3: Novis. App., p. 153, 1880; Vidal, Phan. Cuming. Philipp., p. 133, 1885; id., Rev. Pl. Vasc. Filip., p. 204, 1886; Merr., Enum. Philipp. Pl. III, p. 473, 1923 p.p. (cf. *H. benguetensis* Brem.); *Ruellia rhytiphylla* Nees in DC., Prodr. XI, p. 150, 1847; Miq., Fl. Ind. Bat. II, p. 789, 1858.

Herba erecta. Caulis ramique primum scabrido-pubescentes, mox glabrescentes, deinde cortice levi griseo-brunneo vestiti. Folia petiolo 1—5 mm longo, profunde canaliculato munita; lamina lanceolata vel elliptico-lanceolata, 2.5—8 cm longa et 1.4—3 cm lata, apice subobtusata, basi acuta vel subacuta, haud raro conduplicata, margine repando-dentata et interdum crispata, subcoriacea, supra nitidula et setulis minutis scabridula, subtus costa nervisque scabrida, cystolithis satis magnis supra conspicue lineolata, nervis utroque latere costae 4—6. Spicae breves, subsessiles; rhachis lanuginosa, lana tamen cum pilis capitatis mixta. Bracteae elliptico-lanceolatae, 10—11 mm longae et 5 mm latae, acutae, utrimque pilis capitatis subtus et praesertim margine cum pilis tenuibus longis mixtis vestitae, e basi 3-nerviae, ceterum penninerviae. Bracteolae lineari-lanceolatae, 10 mm longae et 1.2 mm latae, penninerviae, indumento eodem quo bracteae vestitae. Flores in axillis bractearum solitarii. Calyx 10—11 mm longus, extus pilis capitatis vestitus, subaequaliter 5-fidus vel ultra medium partitus, segmentis carinatis et carina pilis longis tenuibus ciliatis, lobis acutis, margine etiam pilis longis ciliatis. Corolla 17 mm longa, faucibus intus pilis longis sparsa. Stamina longiora filamentis praesertim apicem versus dense hirtellis; breviora filamentis glabris; antherae obtusae, thecis paulum inaequalibus, basi mucronulatis. Ovarium apicem versus pilis capitatis breviter comosum. Stylus basin versus hirtellus. Capsula fere tota puberula, ad apicem insuper pilis capitatis comosa, 8-seminalis.

Habitat insulam Philippinam Luzon dictam.

Philippines: Luzon: Ilocos Norte, CUMING 1016 L (exemplum typi); District of Lepanto, VIDAL 1658 L; *ibid.*, RAMOS B. Sc. 7030 L.

This species is easily distinguishable from the other members of this series by the large size of the bracteoles, the extension of the rows of cilia on the filaments of the longer stamens to the top, the comparatively large cystoliths and the scabridity of the lower side of the leaves.

Apart from its morphological characters, *H. rhytiphylla* deserves our attention because of its geographic distribution: it is the only species of this series occurring in the Philippines, and its area is therefore separated by a wide gap from that occupied by the other species. It is true that *H. decaisneana* (Nees) T. And. and *H. wetarensis* Brem. too are found rather far from the main area of the series, but the isolation of these species may be due to the circumstance that the flora of the Lesser Sunda Islands is but imperfectly known: it is not impossible that subsequent investigations will show that the *Imbricatae* are in this region more generally distributed. The isolation of *H. rhytiphylla*, however, is probably real. As it occupies on account of the hairy filaments of the longer stamens an isolated position within the series, this geographic isolation is a noteworthy fact.

2. *Hemigraphis decaisneana* (Nees) T. And. in Journ. Agr. Hort. Soc. Ind., New Ser. I, p. 270, 1868, quoad typum; non Backer, Onkruidfl. Suikerrietgronden, p. 648, 1934, quae est *H. javanica* Brem.; ? *H. decaisneana* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899, quoad specimina timorensia; *Ruellia decaisneana* Nees n. nom. in DC., Prodr. XI, p. 150, 1847, quoad specimina timorensia = *Strobilanthes hirsuta* Decne in Nouv. Ann. du Mus. III, p. 386, 1834, syn. excl.; id., Herb. Timor., p. 58, 1835; Spanoghe in Linnaea XV, p. 328, 1841; — *Strobilanthes involucreta* Bl. in errore apud Spanoghe in

Hooker's Comp. to the Bot. Mag. I, p. 349, 1835, non Bl., Bijdr. Fl. Ned. Ind., p. 799, 1828 (cf. *Pachystrobilus involucratus*); — *Str. aspera* Decne in errore apud Hochreutiner in Candollea V, p. 226, 1934, non Decne in Nouv. Ann. du Mus. III, p. 385, 1834 (cf. *Xanthostachya aspera*); — *Adenosma Brownii* Zip. in sched. Herb. Lugd.; — *Ruellia viscida* Bl. in sched. Herb. Lugd.

Herba ascendens. Caulis ramique primum pilis capitatis dense hirtello-pubescentes, deinde glabrescentes. Folia in petiolum 2—7 mm longum, pilis capitatis dense hirtello-pubescentem contracta; lamina lanceolata, 2—7 cm longa et 1—2 cm lata, apice obtusa, basi contracta, margine crispato-crenata, supra pilis basi bulbosis scabrida, subtus inter nervos sparse, costa nervisque densius pubescens, supra cystolithis parvis dense lineolata, nervis utroque latere costae plerumque 5. Spicae 1.5—3.5 cm longae; pedunculus pilis capitatis dense hirtello-pubescentibus. Bractee oblongae, 12 mm longae et 5 mm latae, acutae, marginatae, supra pilis aliquibus longioribus sparsae, costa basin versus dilatata utroque latere pilis longis ciliata, subtus pilis capitatis sparsae, costa sicut margine insuper pilis ecapitatis longioribus ciliatae, penninerviae. Bracteolae nullae. Flores in axillis bractearum solitarii. Calyx 9 mm longus, extus apicem versus pilis capitatis pubescens, margine nervisque insuper pilis ecapitatis longioribus ciliatus, subaequaliter 5-fidus, lobis anguste triangularibus acutissimis. Corolla 13 mm longa, dilute violacea, lobis submarginatis. Stamina filamentis glabris. Membrana connectiva inter stamina breviora emarginata. Ovarium vix comosum. Stylus totus hirtellus. Capsula subglabra, 8-seminalis.

Habitat insulam Timor dictam.

Lesser Sunda Islands: Timor: s.l. ZIPPELIUS 17/6 L ("Adenosma Brownii Zip.", "Ruellia viscida Bl."); GAUDICHAUD? 7 (ex Herb. Mus. Par.) L; SPANOGHE s.n. ("*Strobilanthes involucrata* Bl."); TEYSMANN H. B. 8875 et 8895 L.

The oldest name for *H. decaisneana* is *Strobilanthes hirsuta* Decne. When NEES transferred this species to *Ruellia*, he was compelled to rename it, because he had used the epithet *hirsuta* for the species described by VAHL under the name *Justicia hirsuta*. ANDERSON was unaware of the fact that the name *Justicia hirsuta* Vahl was illegitimate, otherwise he might have used DECAISNE's specific epithet when he transferred his plant to *Hemigraphis*, but as he followed NEES's example in applying the name *hirsuta* to VAHL's species, he had to accept the epithet introduced by NEES for DECAISNE's species.

How SPANOGHE could have confused this species with *Strobilanthes involucrata* Bl. is difficult to see, for the resemblance between these two species is very slight.

HOCHREUTINER (in Candollea V, p. 226, 1934) mentions this species under the name *Strobilanthes aspera* Decne, but this is obviously a slip of the pen.

A specimen collected in Timor by TEYSMANN (H.L.B. 897. 280. 360) represents apparently a related species. Its leaves are much larger and entirely glabrous, and the bracts too are different. The material, however, is too incomplete to serve as base for the description of a new species. I mention this specimen because it might prove conspecific with the Timorese plant which NEES referred to his *Ruellia hirsuta*: the occurrence of the latter in Timor is very improbable.

*H. decaisneana* (Nees) T. And. and *H. wetarensis* Brem. differ from all other species belonging to the series *Imbricatae* by the hairyness of the style, by the complete absence of bracteoles and by the structure of the bracts, where no difference is seen between the first pair of lateral nerves and the remaining ones. From *H. wetarensis* it is easily distinguishable by the glandular pubescence of the shoots and petioles and also by the crenate leaves.



3. *Hemigraphis wetarensis* Brem. n. spec.; typus: ELBERT 4427 L.

Herba suberecta. Caulis ramique primum pilis ecapitatis dense hirtello-pubescentes, deinde glabrescentes. Folia in petiolum 2—12 mm longum, pilis ecapitatis hirtello-pubescentem contracta; lamina lanceolata, 2.5—6.5 cm longa et 1.2—2.2 cm lata, apice subacuta, basi acuta, margine subintegra, supra nitidula et pilis basi bulbosis scabridula, subtus inter nervos sparse, costa nervisque densius pubescens, supra cystolithis parvis dense lineolata, nervis utroque latere costae 4—7. Spicae 1.5—2.5 cm longae; pedunculus pilis ecapitatis dense hirtello-pubescentibus. Bracteae infimae ovato-lanceolatae, usque ad 17 mm longae et 7 mm latae; aliae ovato-oblongae, circ. 12—14 mm longae et 5—6 mm latae, subobtusae, marginatae, utraque facie hirtae, margine dense et longe ciliatae, costa basin versus dilatata, subtus utroque latere longe ciliata, penninerviae. Bracteolae nullae. Flores in axillis bractearum solitarii. Calyx 7 mm longus, subaequaliter 5-fidus, lobis anguste triangularibus acutis, margine et costa carinata longe ciliatis. Corolla 12.5 mm longa. Stamina filamentis glabris. Membrana connectiva inter stamina breviora emarginata. Ovarium dimidio superiore pilis partim capitatis dense comosum. Stylus totus hirtellus. Capsula dimidio superiore sparse puberulo-pubescentibus, 8-seminalis.

Habitat insulam Wetar dictam.

Lesser Sunda Islands: Wetar: Ilwaki, in *Eucalyptus* bush, alt. 150—550 m. ELBERT 4427 L, typus; Tihusces, in *Eucalyptus* forest, alt. 485—500 m, ELBERT 4548 L.

The differences between this species and the preceding one as well as those between these two and the other species belonging to the series *Imbricatae* have already been given under *H. decaisneana*.

4. *Hemigraphis javanica* Brem. n. spec.; — *Ruellia decaisneana* Nees in DC., Prodr. XI, p. 150, 1847, quoad specimina javanica; eodem modo: Miq., Fl. Ind. Bat. II, p. 789, 1858; *Hemigraphis decaisneana* (Nees) T. And. in Journ. Agr. Hort. Soc. Ind., New Ser. I, p. 270, 1868, quoad specimina javanica; Backer, Onkruidfl. Suikerrietgronden, p. 648, 1934; ? *H. decaisneana* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899, quoad specimina javanica; — *Ruellia blumeana* Nees var.  $\beta$  Nees in DC., Prodr. XI, p. 150, 1847; — in Horto Bogoriensi quondam culta et inde distributa sub nomine falso *Ruellia blumeana* Nees; typus: JUNGHUHN s.n. (Prambanan).

Herba ascendens. Caulis ramique primum pilis brevioribus cum aliquibus longioribus patentibus mixtis dense vestiti, deinde glabrescentes. Folia in petiolum 5—10 mm longum, eodem indumento cum caule vestitum contracta; lamina lanceolata vel ovato-lanceolata, 3.5—6 cm longa et 1.5—2.7 cm lata, apice acuta, basi contracta, margine crenata vel crenato-dentata, supra saturate viridis, subtus dilute viridis vel griseo-viridis, supra pilis basi bulbosis scabrida, subtus inter nervos sparse, costa nervisque densius pubescens, supra cystolithis parvis dense lineolata, nervis utroque latere costae circ. 7. Spicae breviter pedunculatae vel subsessiles, 1.5—5 cm longae. Bracteae lineari-oblongae, 9—15 mm longae et 3—5 mm latae, subobtusae, dilute virides, violaceo-marginatae, supra pilis longioribus subappressis sparse villosae, subtus pilis capitatis dense pubescentes, costa et margine insuper pilis ecapitatis ciliatae, e basi 3-nerviae. Bracteolae lineares, 6 mm longae et 1 mm latae, eodem indumento quo bracteae vestitae. Flores in axillis bractearum plerumque solitarii. Calyx 9 mm longus, dilute viridis, lobis apice purpureis, extus pilis capitatis dense vestitus, subaequaliter 5-fidus, lobis linearibus acutis. Corolla dilute violacea, 15 mm longa. Stamina filamentis glabris, antheris apice obtusis. Ovarium dimidio superiore dense sed breviter comosum. Stylus dimidio inferiore hirtellus. Capsula ad basin glabra, ceterum densius pubescens, 8-seminalis.

Habitat Javam; parte occidentali rara, partibus centrali et orientali communis; a litore usque ad 800 m ascendens (BACKER l.c.).

Central Java: Surakarta Res.: Prambanan, JUNGHUHN s.n. L ("*Ruellia decaisneana* Nees var.  $\beta$ "), typus.

East Java: Surabaya Res.: Island Bawean, G. Besar, DORGELO 133 PAS; between Tjermé and Krian, DORGELO 1977 PAS; Malang Res.: Pasuruan, alt. 4 m, BACKER 36991 PAS; below Nongko Djadjar, alt. 600 m, BACKER 37254 PAS; Mt. Tengger, between Gerbo and Pogol, alt. 600—650 m, MOUSSET 862 L; Besuki Res.: Sumber Waru, alt. 100 m, KOORDERS 47977 et 43876 L; East Java, s.l.: ZOLLINGER 2697 BD.

Java, s.l.: ZOLLINGER 661 U; DE VRIESE s.n. L.

This species has up to now been confused with the Timorese *H. decaisneana* (Nees) T. And., which it resembles i.a. in the scabrid, crenate leaves. It is however easily distinguishable from that species by the absence of the glandular pubescence on the shoots and petioles, and from both *H. decaisneana* and its near ally *H. wetarensis* Brem. by the 3-nerved bracts, the presence of bracteoles and the absence of hairs on the upper part of the style. From *H. wetarensis*, whose shoots and petioles lack the glandular pubescence of *H. decaisneana*, it differs also in the crenate leaves.

*H. javanica* appears to be confined to Java, whereas *H. decaisneana* is known only from Timor, and *H. wetarensis* only from Wetar.

5. *Hemigraphis dentata* Brem. n. spec.; typus: KOORDERS 20403 L.

Herba ascendens. Caulis ramique primum molliter pubescentes, deinde glabrescentes. Folia in petiolum pubescentem contracta; lamina lanceolata, foliorum superiorum 4 cm longa et 1.2 cm lata, foliorum aliorum nondum nota, utroque extremo attenuata, margine dentata, primum utrumque molliter pubescens, deinde plus minusve glabrescens, costa tamen utrumque pilis persistentibus hirta, utrumque sordide purpurea vel viridis, cystolithis parvis utrumque dense lineolata, nervis utroque latere costae 4—5. Spicae 6—8 cm longae; rhachis pilis capitatis dense pubescens. Flores in axillis bractearum solitarii; infimi ab aliis remoti et foliis sessilibus parvis suffulti; bracteae florum aliorum obovatae, 11 mm longae et 5 mm latae, acutae, sordide purpureae, utrumque pilis ecapitatis et capitatis mixtis molliter pubescentes, margine callosodentatae, e basi 3- vel 5-nerviae, ceterum penninerviae. Bracteolae lineares, 7.5 mm longae et 0.6 mm latae, pilis partim capitatis dense pubescentes. Calyx 9—10 mm longus, extus pilis partim capitatis sparse pubescens, segmentis 3 posticis tertia parte connatis, 2 anticis paulo profundius separatis, lobis linearibus acutis, margine pilis partim capitatis dense ciliatis. Corolla 12 mm longa. Stamina longiora filamentis basi hirtellis; breviora filamentis glabris; antherae apice obtusae, thecis basi muticis. Stamodium pro genere conspicuum. Ovarium pilis capitatis breviter comosum. Stylus subglaber. Capsula pilis capitatis comosa, 8-seminalis.

Habitat Javam Orientalem.

East Java: Surabaya Res.: Wonokitri, DORGELO 3107 PAS, co-typus florifer; Besuki Res.: Puger, alt. 10 m, KOORDERS 20403 L, typus fructifer.

The species described above comes very near to *H. brunelloides* (Lam.) Brem., but is easily distinguishable by its dentate leaves and bracts, the long spikes, the single, not superposed flowers, and the longer and narrower bracteoles.

6. *Hemigraphis brunelloides* (Lam.) Brem. n. comb.; *Justicia brunelloides* Lam., Ill. Gen. I, p. 40, ante 1797; *Nelsonia brunelloides* (Lam.) O. Ktze, Rev. Gen. Pl. I, p. 493, 1892, quoad typum, haud quoad specimina citata quae ad

*N. campestris* R. Br. pertinent; non Lindau in Engl. u. Prantl, Nat. Pflanzenfam. IV, 3 b, p. 289 et fig. 114, 1895 quae est *N. campestris* R. Br.; — *Justicia hirsuta* Vahl, Symb. Bot. I, p. 122, 1790; II, p. 3, 1891, non *J. hirsuta* Jacq., Enum. Pl. Carib., p. 11, 1760; *Nelsonia hirsuta* (Vahl) Roem. et Schult. (comb. illeg.), Syst. Pl. I, p. 172, 1817; Willd. ex Dietr., Syn. Pl. I, p. 419, 1839; *Ruellia hirsuta* (Vahl) Nees (comb. illeg.) in DC., Prodr. XI, p. 148, 1847, quoad specimina javanica; eodem modo: Miq., Fl. Ind. Bat. II, p. 787, 1858; non *R. hirsuta* Ell., Sketch II, p. 109, 1824; nec *R. hirsuta* Vell., Fl. Flum. VI, Tab. 96, 1827; nec *R. hirsuta* Roxb., Fl. Ind. III, p. 51, 1832; *Hemigraphis hirsuta* (Vahl) T. And. (comb. illeg.) in Journ. Agr. Hort. Soc. Ind., New Ser. I, p. 270, 1868, quoad typum; non Clarke in Philipp. Journ. Sc. I, Suppl. p. 247, 1906, nam specimina hic et in Merr., Enum. Philipp. Pl. III, p. 473, 1923 citata ad seriem *Pubicrures* pertinent; Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1908, quoad typum; Koorders, Exkursionsfl. v. Java III, p. 216, 1912, syn. Hassk. et Decne excl.; Backer, Onkruidfl. Suikerrietgronden, p. 649, 1934; ? *H. hirsuta* (Vahl) Boerl. (comb. illeg.), Handl. Fl. Ned. Ind. II, p. 658, 1899, quoad specimina javanica; non *H. hirsuta* (Vahl) T. And. var. *crenata* Elm., Leaf. Philipp. Bot. V, p. 1693, 1913, quae ad seriem *Pubicrures* pertinet; *H. confinis* (Nees) T. And. var. *hirsuta* Ridl., Fl. Mal. Pen. II, p. 570, 1923, quoad typum; Benoist in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 654, 1935, quoad typum; — *Ruellia tetragona* Reinw. ex Bl., Cat. Gew. Buitenzorg, p. 85, 1823, non *R. tetragona* Link, Enum. Hort. Berol. II, p. 133, 1822; anne *R. tetragona* Thunb., Florula Javanica, p. 22, 1825, adhuc incertum, sed probabile; *R. Blumei* Steud. n. nom., Nomencl. ed. 2, II, p. 480, 1841; — *R. venosa* Bl., Bijdr. Fl. Ned. Ind., p. 795, 1826; — *R. confinis* Nees certe quoad var.  $\beta$  Nees in DC., Prodr. XI, p. 149, 1847; *Hemigraphis confinis* (Nees) T. And. in Journ. Linn. Soc. IX, p. 463, 1867, p.p.; eodem modo Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 et Koorders, Exkursionsfl. v. Java III, p. 215, 1912; — *Ruellia discolor* Nees in DC., Prodr. XI, p. 149, 1847, syn. excl.; Miq., Fl. Ind. Bat. II, p. 789, 1858, syn. et specim. extra Javam lect. excl.; ? *Hemigraphis discolor* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899.

Habitat Peninsulam Malayanam, Javam et terram Borneensem.

Species haec solvenda est in varietates tres quarum duae novae. Forma typica a me vocatur:

*H. brunelloides* (Lam.) Brem. var. *vahlia* Brem.; — *H. hirsuta* (Vahl) T. And. var. *genuina* Hochr. in Candollea V, p. 225, 1934<sup>27)</sup>.

Herba ascendens. Caulis ramique primum molliter pubescentes, deinde glabrescentes. Folia in petiolum primum pubescentem, deinde glabrescentem, 7—10 mm longum contracta; lamina lanceolata, 5—10 cm longa et 2.2—4 cm lata, utroque extremo attenuata, apice ipso obtusa, margine subintegra vel crenata, interdum crispata, discolor, primum utrumque molliter pubescens, deinde glabrescens, costa nervisque subtus tamen pilis persistentibus appresse pubescens, cystolithis parvis utrumque sed praesertim supra lineolata, nervis utroque latere costae plerumque 6. Spicae 1.5—5 cm longae; pedunculus pilis partim capitatis dense et molliter pubescens. Flores in axillis bractearum plerumque 2, interdum 3 superpositi; infimi nunc foliis magnitudine redactis nunc bracteis lanceolatis suffulti; bractee florum aliorum obovatae, 10—12 mm longae

<sup>27)</sup> With regard to the use of terms like *typicus*, *genuinus originarius* etc. I agree on the whole with Drs HARMS, MATTFELD and PILGER (in Notizbl. Bot. Gard. Berlin XIII, p. 530, 1938) and Dr SPRAGUE (in Kew Bull. 1939, p. 320): these terms should be considered "merely words not intended as names" in the sense of the articles 67 and 68 of the International Rules of Botanical Nomenclature, but I do not see why these terms "should be retained for the groups concerned, unless it is proved that these groups do not include the type" (SPRAGUE l.c.). As they have no nomenclatural value, they may in my opinion certainly be replaced by genuine, transferable epithets.

et 7 mm latae, subobtusae, pilis ecapitatis praesertim basin versus cum pilis capitatis mixtis dense pubescentes, margine integrae, parte basali longe ciliatae, e basi 3-nerviae, ceterum penninerviae. Bracteolae lineari-lanceolatae, circ. 5 mm longae et 1 mm latae, dense pubescentes. Calyx 7—8 mm longus, extus pilis capitatis dense pubescens, segmentis 3 posticis usque ad medium connatis, 2 anticis profundius separatis, lobis linearibus acutis, margine ciliatis. Corolla alba vel dilute violacea, 14.5 mm longa. Stamina filamentis basin versus hirtellis, antheris apice vix conspicue mucronulatis, thecis basi muticis. Ovarium pilis capitatis breviter comosum. Stylus totus glaber vel basi interdum pilis aliquibus capitatis sparsus. Capsula pilis capitatis comosa, 8-seminalis.

Habitat Peninsulam Malayanam, Javam et terram Borneensem.

Malay Peninsula: Malacca, CUMING 2354 L (exemplum typi *Ruelliae confinis* Nees var.  $\beta$ ).

Java: Bantam Res.: Lebak Kidool, G. Kantjana, KOORDERS 41245 L; Batavia Res.: Batavia, BLUME 1906 L; Buitenzorg Res.: Buitenzorg, BLUME s.n. L ("*Ruellia venosa* Bl."); ibid., KUHL et V. HASSELT s.n. L; ibid., BOERLAGE s.n. L; Buitenzorg, Pakantjilan, alt. 250 m, BAKHUIZEN v. D. BRINK 3256 L et U; Tegal Sapi, BAKHUIZEN v. D. BRINK JR. 963 U; id. 2627 U; G. Batu, RAAP 562 L; Tji Kissarua, id. 914 L; Kampong Baru, BOERLAGE 6. X. 1888; Turook Mooksa, REINWARDT s.n. L ("*Ruellia tetragona* Reinw."); G. Tjibodas near Tjampea, alt. 320 m, RAAP 299 L; Depok, KOORDERS 31328 L; Banjumas Res.: Seraju, KIEVITS 54 PAS; Surabaya Res.: Sidoardjo, Sf. Buduran, JESWIET a<sup>o</sup> 1913 U; Malang Res.: Pasuruan, alt. 5 m, BACKER 37377 PAS; Java, s.l.: PLOEM s.n. L; coll. ign. 324 L; NAGLER s.n. BD.

Borneo: South-east Borneo: Bandjermassin, KORTHALS s.n. L; Doosoon, id. s.n. L; between Slimahan and Simpapak, WINKLER 2988 a L.

*H. brunelloides* (Lam.) Brem. var. *subglabra* Brem. n. var.; typus: REINWARDT? s.n. H.L.B. 897.278.242.

Varietas caulibus mox glabrescentibus et foliis tenuioribus, fere omnino glabris a forma typica recedens.

Habitat Javam et terram Borneensem.

Java: s.l., REINWARDT? s.n. H.L.B. 897.278.242, typus varietatis.

Borneo: Serawak: G. Tieng, J. et M. S. CLEMENS 20535 BD.

*H. brunelloides* (Lam.) Brem. var. *angustifolia* Brem. n. var.; typus: WINKLER 2237 L.

Varietas foliis lineari-lanceolatis, 5.5—8 cm longis et 1.3—1.9 cm latis, subcaudatis et acutis, bracteis acutis a forma typica recedens.

Habitat terram Borneensem.

Borneo: South-east Borneo: Hayoop, WINKLER 2237 L, typus varietatis; BD, dupl. typi.

It is not impossible that the plant described above as type of the variety *subglabra* has wrongly been labelled: so far I have seen no other Javanese specimens referable to it.

The plant collected by WINKLER in South-east Borneo and described above as var. *angustifolia*, differs rather conspicuously from the type. When more material becomes available, it may prove advisable to raise it to specific rank.

The type of LAMARCK's *Justicia brunelloides* is a specimen collected by COMMERSON in Java. I have not been able to study this specimen, but according to NEES l.c. it is conspecific with the plant described by VAHL under the illegitimate name *J. hirsuta*. As it is not likely that COMMERSON should have collected one of the rarer species, I have no doubt that this identification is correct, for there is apart from *H. brunelloides* but one species among the more common Javanese ones which answers more or less LAMARCK's description, and

this plant, *H. sumatrensis* (Roth) Brem., is excluded because its bracts are of about the same length as the calyx, whereas LAMARCK states that they are longer than the calyx.

VAHL had received the specimen on which he based his *Justicia hirsuta* from THOUIN, and as the latter stood in close connection with LAMARCK, it is not at all improbable that it may have been part of the material collected by COMMERSON on which LAMARCK himself based his *J. brunelloides*. VAHL's type too was inaccessible to me, but the description bears out that it is conspecific with the plants described above. The presence of setaceous bracteoles proves that it belongs to the series *Imbricatae*, and here the choice is not difficult: *H. dentata* Brem. is excluded because the bracts are described as "integerrimae", and *H. javanica* Brem., because no mention is made of the scabridity of the leaves, a character which could not have escaped VAHL's attention. By ROEMER and SCHULTES it was confused with *Nelsonia campestris* R. Br., with which it shows a superficial resemblance. *Nelsonia campestris*, however, is unknown from Java.

The plants from the Malay Peninsula described by CLARKE under the name *H. hirsuta* and by RIDLEY under that of *H. confinis* var. *hirsuta*, do not agree with those described above, for their leaves are said to be "hairy all over", and they belong therefore either to an as yet undescribed variety or to another species. It is, on the other hand, not improbable that some of the specimens referred by these authors to *H. confinis* may in reality belong to *H. brunelloides*.

From Sumatra I have as yet seen no specimens which could be referred to this species.

The plants collected by ELMER in the island Palawan and distributed under the names *H. hirsuta* (Vahl) T. And. and *H. hirsuta* (Vahl) T. And. var. *crenata* Elm. (cf. ELMER, Leaflet, Philipp. Bot. V, p. 1693, 1913), show an unmistakable resemblance to some of the Bornean species of the series *Pubicrures*. As the specimens at my disposal had no flowers, their exact position could not be determined, but as they lack the capitate hairs which form such a prominent feature of *H. brunelloides*, they can at any rate not belong to this species.

The Philippine plant identified by CLARKE as *H. hirsuta* (Vahl) T. And., is unknown to me, but other specimens distributed under this name by the Bureau of Science, Manila, turned out to belong to species of the series *Pubicrures*, and as these plants were doubtless identified by comparison with the specimen named by CLARKE, the latter too will belong to that series.

NEES l.c. described of his *Ruellia hirsuta* a var. *latifolia*, which HOCHREUTNER (in Candollea V, p. 225, 1934) transferred in the same rank to *Hemigraphis hirsuta*. As I have not seen the type of this variety, and as the description does not reveal characters by the aid of which it could easily be recognized, I am unable to express an opinion on its identity.

Of *H. discolor* (Nees) Boerl. I have seen no authentic material either, but as the description does not show any really important differences between this species and *H. brunelloides*, I have followed the example given by several of my predecessors who considered them identical.

#### Series b. *Serpentes*.

Herbae repentes. Caulis obtuse quadrangularis, primum pilis basiscopis strigosus. Folia longe petiolata, elliptica, ovata vel subcordata, margine crenata vel crenato-dentata. Bracteeae oblongae vel spathulatae, margine ciliatae vel ciliolatae. Flores in axillis bractearum solitarii; infimi bibracteolati; alii plerumque omnes ebracteolati; bracteolae florum infimorum calyce dimidio vel plus breviores. Stamina longiora filamentis hirtellis; breviora filamentis glabris. Granula pollinis anguste ellipsoidea, virgis 18 ornata, 55—60  $\mu$  longa et

25—30  $\mu$  lata. Semina areola plures cellulas alta munita; zona circumareolaris pilis annularis vestita; parietes cellularum subepidermalium haud incrassatae. Distributae in Java et forsitan in Peninsula Malayana.

The *Serpentes* are as yet insufficiently known, for complete material was available of only one species, *H. serpens* (Nees) Boerl. ex Backer. Authentic material of *H. nemorosa* (Zoll.) Boerl. ex Brem. was not at my disposal, but the specimens on which the description given below was based, answer the original diagnosis quite well. Unfortunately they possessed no flowers, so that the pollen structure could not be ascertained. As it shows in other respects an unmistakable resemblance to *H. serpens*, its position in this series appears sufficiently assured.

The dimensions of the pollen grains of *H. Ridleyi* Clarke are similar to those of *H. serpens*, and it is therefore not improbable that this species too will prove to belong to the series *Serpentes*. CLARKE compared it to the plant described by NEES under the name *Ruellia ravaccensis*, but the latter was collected in the island Lawak on the North coast of New Guinea, and as all other *Hemigraphis* species found in those parts belong to the series *Nudicrures*, there is no reason to expect that this one, if it really belongs to the genus, will make an exception. *H. Ridleyi*, however, can not belong to this series, for its flowers are said to be bracteolate, and its filaments to be hairy, whereas the flowers of the *Nudicrures* are almost always ebracteolate and their filaments always glabrous. The area occupied by this series moreover does not extend further westwards than the Eastcoast of Borneo. *H. Ridleyi* was collected in Pahang (Malay Peninsula) and is, like *H. serpens* and *H. nemorosa*, a creeping plant. Its pollen grains are said to be provided with 12 to 16 bands and two germ pores, but these details are not to be trusted. CLARKE'S technique was apparently inadequate, for he ascribes the same number of germ pores to all species of *Hemigraphis* and in fact to the whole group of the *Strobilanthinæ*, whereas in reality pollen grains with two germ pores are in this subtribe almost entirely unknown: the only species in which I have found pollen grains with this number of germ pores, is *Lissospermum pedunculatum* (Miq.) Brem.

7. *Hemigraphis serpens* (Nees) Boerl. ex Backer, Onkruidfl. Suikerrietgronden, p. 560, 1934; *Ruellia serpens* Nees in DC., Prodr. XI, p. 145, 1847; ? *Hemigraphis serpens* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899; — *Lepidagathis setigera* Bl., Bijdr. Fl. Ned. Ind., p. 802, 1826, nom. conf. v. infra; Miq., Fl. Ind. Bat. II, p. 816, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 660, 1899; Koorders, Exkursionsfl. v. Java III, p. 220, 1912.

Caulis primum pilis basiscopis dense et longe albo-pubescentibus, deinde sparse griseo-pubescentibus. Folia in caule repente majora quam in ramulis floriferis; petiolus 7—15 mm longus, primum pilis longis partim basiscopis dense albo-pubescentibus, postea sparsius griseo-pubescentibus; lamina ovata, 2.5—4.5 cm longa et 1.7—2.4 cm lata, apice acuta, basi nunc subacuta, nunc rotundata casu quo prope petiolum subito contracta, margine crebre crenato-dentata, supra pilis basi bulbosis sparsis, costa nervisque sparse hirtis, subtus inter nervos sparse pubescentibus, costa nervisque ut supra hirtis, discolor, supra cystolithis interdum difficiliter distinguendis sparsis, nervis utroque latere costae 4—6. Ramuli floriferi ascendentes, foliis minoribus, pro rato latioribus, apice interdum obtusis muniti. Spicae plerumque solitariae, compactae, pedunculo internodio precedenti similiore, floribus plerumque 3-paris. Flores infimi plerumque foliis magnitudine redactis suffulti; bractee florum paris secundi spathulatae, 10 mm longae et 4.5 mm latae, crenato-dentatae, basin versus pilis longis tenuibus albo-ciliatae, costa subtus basin versus etiam albo-pilosa; bractee supremae lineares, subintegrae. Bracteolae florum infimorum setiformes, 1.6 mm longae, margine

ciliatae; flores alii plerumque ebracteolati. Calyx extus hirtus, 6 mm longus, subaequaliter 5-fidus, lobis triangularibus acutis, praesertim ad marginem pilis longis tenuibus vestitis. Corolla 14 mm longa. Stamina longiora filamentis hirtellis; breviora filamentis glabris. Granula pollinis  $57 \mu$  longa et  $26 \mu$  diam. Staminodium minutum. Ovarium apicem versus breviter pubescens, utroque loculo ovulis 4. Stylus brevissime hirtellus. Capsula apicem versus puberula, 8-seminalis.

Habitat Javam Occidentalem et Centralem, a litore usque ad 600 m (BACKER l.c.).

West Java: Bantam Res.: Kandang Sapi, KORTHALS s.n. L; Batavia Res.: Krawang, KORTHALS s.n. L; Tji Kao (the exact locality is unknown to me: the Tji Kao has its source on the Burangrang, and runs therefore partly through the Priangan Res.; after passing Purwakarta it unites itself with the Tji Taroom; near this junction lies a place called Tji Kao Bandoong), BLUME 1228 L (type of *Lepidagathis setigera* Bl.); Buitenzorg Res.: Tji Seureuh, BLUME s.n. L (duplicate of the type); Priangan Res.: Telaga Bodas, coll. ign. s.n. L.

The name *Lepidagathis setigera* Bl. is older than *Ruellia serpens* Nees, but as the description has been based partly on the plant described above and partly on a true *Lepidagathis* with which it had been mixed on the sheets, the name is to be regarded as a "nomen confusum". The *Lepidagathis* with which it had been mixed, is neither creeping nor hirsute, and does not answer therefore BLUME's description. It is probably an undescribed species.

8. *Hemigraphis nemorosa* (Zoll.) Boerl. ex Brem. n. comb.; *Ruellia nemorosa* Zoll. in Nat. en Geneesk. Arch. II, p. 574, 1845; id. in Flora XXX, p. 599, 1847; id. in Walpers Annales I, p. 540, 1848/9; Miq., Fl. Ind. Bat. II, p. 786, 1858; ? *Hemigraphis nemorosa* (Zoll.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899.

Caulis primum pilis basiscopis strigosus, deinde glabrescens. Folia in caule repente majora quam in ramulis floriferis; petiolus 3—40 mm longus, pilis brevibus strigosus et interdum pilis aliquibus longioribus parce hirsutus; lamina foliorum majorum elliptica, foliorum minorum ovata vel subcordata, majorum usque ad 6.5 cm longa et 3.7 cm lata, minorum ab 1.5 cm longa et 0.9 cm lata, apice obtusa, basi in foliis majoribus subito in petiolum contracta, in foliis minoribus rotundatis vel subcordatis, margine crenata, utrimque cystolithis dense lineolata, supra costa nervisque setulis acroscopis strigosa, inter nervos pilis basi bulbosis scabrida, subtus similior, sed costa nervisque insuper pilis minoribus basiscopis vestita, nervis utroque latere costae 3—6. Ramuli floriferi ascendentes. Spicae solitariae, primum densae, deinde laxiusculae, ramulos floriferos terminantes et interdum insuper aliquae ex axillis foliorum caulis repentis orientes. Bractearum pares usque ad 7; bracteae infimae aliis majores, sed ceterum ab eis vix diversae; omnes oblongae et subobtusae, indumento eodem quo folia vestitae, margine tamen breviter ciliatae, penninerviae; infimae usque ad 1.7 cm longae, aliae circ. 1.2 cm longae. Bracteolae florum inferiorum calyce dimidio breviores, lineares, acutae, margine breviter ciliatae, 1-nerviae; flores superiores ebracteolati. Calyx 9 mm longus, 5-fidus, lobo mediano quam aliis circ. 1 mm longiore, lobis omnibus acutis, extus pilis ecapitatis cum paucis pilis capitatis mixtis pubescentibus. Corolla matura nondum visa. Ovarium pilis partim capitatis mixtis comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula subglabra, 12-seminalis. Semina areola plures cellulas alta munita; zona circum-areolaris pilis annulatis vestita; parietes cellularum subepidermalium haud incrassatae.

Habitat Javam Occidentalem.

E a s t J a v a : s.l. "in sylvis umbrosis regionis calcareae" ZOLLINGER 2374, typus, n.v.; id. 2698 BD; Kediri Res.: Popoh, DORGELO 1766 PAS.

In the descriptions of the two Javanese species referred to this series, some of the characters which have already been mentioned in the diagnosis of the series, have been repeated. This has been done in the first place to facilitate a comparison between the two species, and also because the description of *H. nemorosa* can now be removed as a whole to another series if the pollen structure and the nature of the filaments should prove to be different from those of *H. serpens*.

The description of *H. nemorosa* was based partly on ZOLLINGER 2698 BD, and partly on DORGELO 1766 PAS (fruit and seed). As the type was not available for comparison, and as the original description is rather meagre, the identification of these specimens is not absolutely certain, but as they answer the description quite well, and as DORGELO 1766 has probably been collected in the same region as the type (Popoh lies in the neighbourhood of lime hills which may be the same as those mentioned in the original description), the chance that they have been misidentified is but small.

*H. nemorosa* is in habit not unlike some species belonging to the series *Nudicrures*, and KOORDERS (Exkursionsfl. v. Java III, p. 215) actually reduced it to *H. colorata* (Bl.) Hall. f., the plant to which, as stated above, the name *H. alternata* (Burm. f.) T. And. should be applied. This, however, is certainly wrong, for the leaves of the latter are cordate, and it is completely sterile; the area of the series *Nudicrures*, moreover, does not extend as far westwards as Java. In the structure of the seedcoat too *H. nemorosa* differs conspicuously from the species belonging to the *Nudicrures*.

*H. nemorosa* is easily distinguishable from *H. serpens* by the larger number of ovules, the larger size of the leaves, the greater length of the spikes and the absence of the long white hairs by which the young shoots and the bracts and calyces of the latter are covered.

#### Series c. *Pubicrures*.

Herbae repentes, ascendentes vel erectae. Caulis ramique novelli plerumque pilis basiscopis vestiti. Folia margine integro vel vix distincte repandó-dentato, raro lobato-dentato. Flores in axillis bractearum semper solitarii. Bracteae integrae, longe ciliatae. Bracteolae nullae. Calyx subaequaliter 5-fidus; lobi ciliati. Filamenta staminum longiorum usque ad apicem ciliata. Granula pollinis ellipsoidea, virgis 18 vel 21, nunc carunculatis (Tab. I A), nunc punctatis ornata. Semina areola plures cellulas alta munita; zona circumareolaris pilis annulatis satis longis, haud mucosis vestita; parietes cellularum subepidermalium haud incrassatae.

Distributae in Peninsula Malayana, Sumatra, Java, terra Borneënsi, terra Celebica, Insulis Philippinis.

This series resembles the preceding one as well as the three following ones in the structure of the seedcoat and in the extension of the rows of cilia on the filaments of the longer stamens to the top, but differs from them in the distinctly ciliate bracts, from the *Serpentes* moreover in the shorter length of the pollen grains, from the *Axilliflorae* in the distinctly spicate flowers and in the ellipsoidal, not globose pollen grains, from the *Tenuispicae* in the greater length of the bracts and in the greater width of the calyx lobes, and from the *Rosmarinifoliae* by the smaller size of the pollen grains and by the greater length of the hairs covering the seedcoat. The main points of difference between this series and the *Imbricatae* lie in the presence of 18 or 21 instead of 15 bands on



the surface of the pollen grains, and in the non-mucous hairs of the testa. From the *Nudicrures* the species belonging to this series are easily distinguishable by the hairy filaments of the longer stamens.

According to the structure of the pollen grains the species of this series fall into two groups whose areas, though contiguous, do not overlap. In the western group, which comprises the species 9—16, the bands of the pollen grains are strongly carunculate (Tab. I A). They are found in the Malay Peninsula, Sumatra, Java and Borneo, the most eastern representative being *H. culionensis* Brem., which was collected in one of the islands of the Palawan Archipelago. In the eastern group, which comprises the species 17—28 and is confined to Celebes and the Philippines, the bands of the pollen grains are punctate or, rarely (*H. linearifolia*, *H. mediocris*, *H. cumingiana*), slightly carunculate. However, as I have not been able to find other points of difference, I do not attach much value to this distinction.

CLARKE mentions in his revision of the *Acanthaceae* occurring in the Malay Peninsula (in Journ. As. Soc. Beng. LXXIV, p. 653, 1908) five species of *Hemigraphis*, of which the fourth and perhaps the fifth also, belong to the series *Pubicrures*. The fourth species is called by CLARKE *H. alternata* (Burm. f.) T. And., but as stated above, this name belongs to the plant which until now was known as *H. colorata* (Bl.) Hall. f.; as he quotes *Ruellia blumeana* Nees as a synonym, and refers to ZOLLINGER n. 343 and n. 660, the plants investigated by him must belong to *H. sumatrensis* (Heyne ex Roth) Boerl. ex Brem. v. infra. His fifth species, *H. platycarpus* Clarke, may also belong to this series. CLARKE compares it with "*H. blumeana*", stating that it has broader bracts, and is more softly hairy and less hispid, but as he gives no information with regard to the structure of the pollen grains, this affinity can not be regarded as satisfactorily established.

### I. Species Occidentales.

9. *Hemigraphis sumatrensis* (Heyne ex Roth) Boerl. ex Brem. n. comb.; *Ruellia sumatrensis* Heyne ex Roth, Nov. Sp. Pl., p. 311, 1821; Nees in DC., Prodr. XI, p. 149, 1847; Miq., Fl. Ind. Bat. II, p. 788, 1858; ?*Hemigraphis sumatrensis* (Heyne ex Roth) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899; — *Ruellia repanda* L. in errore apud Houttuyn, Nat. Hist. Ite deel, IXe stuk, p. 575 et Tab. LIX, fig. 1, 1778 et apud Bl., Bijdr. Fl. Ned. Ind., p. 794, 1826, non L., Spec. Pl. ed. 2, p. 886, 1763; *R. blumeana* Nees n. nom. in DC., Prodr. XI, p. 149, 1847, syn. Rumph. et var.  $\beta$  excl.; Miq., Fl. Ind. Bat. II, p. 788, 1858, syn. Rumph. excl.; *Hemigraphis blumeana* (Nees) K. Sch. in K. Sch. et Hollr., Fl. Kais. Wilh. Land, p. 124, 1889, quoad typum, nam specimen citatum ad seriem *Nudicrures* pertinet; ?*H. blumeana* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899; — *H. alternata* (Burm. f.) T. And. in Journ. Linn. Soc. VII, p. 114, 1864, quoad syn. *Ruellia blumeana*, haud quoad typum; Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1908, quoad specimen citata, syn. *R. discolor* Nees excl.; Koorders, Exkursionsfl. v. Java III, p. 215, 1912, syn. *R. discolor* excl.; Ridl., Fl. Mal. Pen. II, p. 570, 1923.

Habitat Peninsulam Malayanam, Sumatram, Javam, terram Borneensem.

Species haec solvenda est in varietates tres quarum duae novae. Forma typica a me vocatur:

*H. sumatrensis* (Heyne ex Roth) Boerl. ex Brem. var. *rothiana* Brem.

Caulis ramique primum ascendentes vel suberecti, post anthesin decumbentes et e nodis radicanibus caules novos emittentes. Caulis ramique graciles, primum pilis patentibus vel basiscopis densius albido-hirtelli, deinde sparse hirtelli et pilis brevioribus acroscopis antea sub aliis latentibus scabridi, ultimo plus

minusve glabrescentes. Folia petiolo 5—13 mm longo, densius scabridopubescente munita; lamina lanceolata vel lineari-lanceolata, 2.5—5 cm longa et 9—18 mm lata, utroque extremo subacuta, margine vix distincte repandodentata, in foliis veterioribus recurvata, subcoriacea, discolor, sicc. brunnea, supra cystolithis gracilibus lineolata, costa setulis aliquibus albis sparsa, ceterum setulis aliquibus primum scabridula, deinde plerumque glabrescens, margine densius ciliolata, subtus ubique sed praesertim costa nervisque setulis albis sparsa, nervis utroque latere costae 4—5. Spica pedunculo densius hirsuto, usque ad 1.5 cm longo munita. Bractee ovato-lanceolatae, 11 mm longae et 3.5 mm latae, acutae, margine densius et longe ciliatae, dorso sparse hirsutae, ventro subglabrae. Calyx 10 mm longus, lobis anguste triangularibus, longe ciliatis, mediano quam aliis longiore. Corolla alba vel dilute violacea, circ. 1.5 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis 18 carunculatis ornata, 42—45  $\mu$  longa et 27—30  $\mu$  diam. (Tab. I A). Ovarium apice comosum, utroque loculo ovulis 5—6. Stylus sparse hirtellus. Capsula apice parce comosa, seminibus 10—12.

Habitat Peninsulam Malayanam, Sumatram, Javam, terram Borneensem. Sumatra: s.l., HEYNE s.n. BD, typus.

Java: Buitenzorg Res.: Djasinga, ZIPPELIUS s.n. L; Tji Kaniki, BLUME s.n. L ("Ruellia repanda" et „R. blumeana Nees”); G. Parang, BLUME 1231 L; Depok, alt. 90 m, BAKHUIZEN v. D. BRINK 1342 L; Tji Petir near Tji Omas, alt. 350 m, BAKHUIZEN v. D. BRINK JR. 547 U; Banjumas Res.: Sf. Kaliredjo, KIEVITS 2480 PAS; Java, s.l. ZOLLINGER 343 et 660 L; NAGLER 222 BD.

Borneo: Serawak: Upper Redjang River, Gat, J. et M. S. CLEMENS 21552 BD.

**H. sumatrensis** (Roth) Boerl. ex Brem. var. **latifolia** Brem. n. var.; typus: KORTHALS s.n. L (G. Singalang).

Varietas foliis bracteisque majoribus, spicis longioribus, bracteis longius ciliatis, granulis pollinis 48  $\mu$  longis et 32  $\mu$  diam. a forma typica recedens.

Habitat Sumatram et partem Javae occidentalem.

Sumatra: West Coast Res.: G. Singalang, KORTHALS s.n. L, typus var.; G. Indrapura, id. s.n. L.

West Java: Priangan Res.: G. Patuha, KORTHALS s.n. L.

**H. sumatrensis** (Heyne ex Roth) Boerl. ex Brem. var. **scabrida** Brem. n. var.; *Rungia sumatrana* Miq., Fl. Ind. Bat., Suppl., p. 567, 1866; typus: PLOEM s.n. L.

Varietas caule ramisque pilis basiscopis hirsutis, foliis supra scabridis, granulis pollinis 49—52  $\mu$  longis et 29—30  $\mu$  diam. a forma typica recedens.

Habitat Sumatram et partes Javae occidentalem et centralem.

Sumatra: Lampongs, s.l., TEYSMANN HB 4484 U (type of *Rungia sumatrana* Miq.).

Java: Priangan Res. s.l., PLOEM s.n. L, typus var.; Banjumas Res.: Sf. Kaliredjo, KIEVITS 2697 PAS.; Java, s.l., NAGLER 221 BD.

*Rungia sumatrana* Miq. proved to be identical with the plant described above under the name *Hemigraphis sumatrensis* var. *scabrida*, but as the plant on which MIQUEL had based his new species was deprived of flowers, it was not used as type for this variety, the specimen collected by PLOEM being more suitable.

Two sheets in the Leiden Herbarium contain specimens collected by KORTHALS, which are smaller and less hairy than those referred above to *H. sumatrensis*. They represent either a new variety or else a new species. The specimens on one of the sheets should have been collected on the G. Tjikoraj

in Java, those on the other one on the banks of the river Tewe in Borneo, but as they are very similar and moreover both covered with the same kind of mud, it seems to me that one of the sheets must have been wrongly labelled. As they show a striking resemblance to the Bornean *H. parva* Brem., I suppose that the specimens have all been collected in Borneo. However, as the material is very incomplete, the question of their taxonomic position can not be decided.

A remarkable feature of *H. sumatrensis* are the ovary cells with 5 or 6 ovules. The only other species of this series with ovary cells containing more than 4 ovules are *H. gracilipes* Brem. and *H. mandarensis* Brem. The Bornean *H. gracilipes* resembles *H. sumatrensis* in the nature of the pollen, but is easily distinguishable by its long-pedunculate spikes. The pollen grains of *H. mandarensis*, a species collected in Celebes, are provided with punctate bands; it is a much larger plant with coarsely dentate leaves.

In habit, in the shape of the leaves and in the shortly pedunculate spikes *H. sumatrensis* resembles *H. hispida* Brem. and the above mentioned *H. parva* Brem., two species collected in Borneo, and *H. natunensis* Brem., an inhabitant of the Natuna Islands to the west of Borneo. *H. hispida*, however, is a much more hispid plant with coriaceous leaves and narrower bracts, which dry with a peculiar yellowish-green colour; *H. parva* is a much smaller plant provided with oblanceolate bracts; and *H. natunensis* has larger, on the upper side completely glabrous leaves, a laxer spike and narrower bracts, which apart from the cilia with which they are fringed, are completely glabrous.

10. *Hemigraphis gracilipes* Brem. n. spec.; typus: DELMAAR 1966 L.

Herba suberecta. Caulis primum pilis basiscopis minimis vix conspicue hirtellus, deinde glabrescens. Folia superiora (alia non visa) in petiolum breviter pubescentem, usque ad 7 mm longum contracta; lamina lineari-lanceolata, 3—6 cm longa et 8—22 mm lata, apice subobtusa, margine vix conspicue repanda et recurvata, supra glabra, subtus costa nervisque sparse scabrido-pubescentem, subcoriacea, cystolithis utrimque sed praesertim supra conspicue lineolata, nervis utroque latere costae 4—5. Spicae terminales et in axillis foliorum superiorum solitariae, longe pedunculatae. Pedunculus gracilis, 2.5—7 cm longus. Bracteae infimae ab aliis remotiores, lineari-lanceolatae, 15—20 mm longae et 3—5 mm latae; aliae anguste ovato-lanceolatae, 15 mm longae et 3—4.5 mm latae; omnes acutae, scabrido-pubescentes, margine ciliatae, e basi 3-nerviae sed ceterum penninerviae, costa utraque facie prominente. Calyx 8 mm longus, segmento mediano quam aliis paulo longiore, lateralibus paulo brevioribus, omnibus carinatis, carina scabridis, cystolithis conspicue lineolatis; lobi acuti, margine ciliati. Corolla 1.3 cm longa. Stamina antheris apice obtusis, thecis vix conspicue inaequalibus, basi acutis. Granula pollinis virgis 18 carunculatis ornata, 45  $\mu$  longa et 28  $\mu$  diam. Ovarium dimidio superiore breviter pubescens, ovulis utroque loculo 5. Stylus hirtellus. Capsula vix conspicue comosa, 10-seminalis.

Habitat terrae Borneënsis partem occidentalem.

West Borneo: District Simpang, S. Miri, Pegetan, DELMAAR 1966 L, typus, U, dupl. typi.

*H. gracilipes* and *H. longipedunculata* Brem. are two nearly related species, the first collected in West Borneo and the other one in East and South-east Borneo, which distinguish themselves from the other species belonging to this series by the great length of the peduncles. *H. gracilipes* differs from *H. longipedunculata* in the number of ovules in the ovary cells, the narrower leaves and the longer and narrower, conspicuously costate bracts.

11. **Hemigraphis longipedunculata** Brem. n. spec.; typus: RUTTEN 140 U.

Herba suberecta, simplex vel parce ramosa. Caulis primum pilis basicopsis hirtellus, deinde glabrescens. Folia basi longissime contracta et lamina ergo a petiolo hirtello vix distinguenda; lamina lineari-lanceolata vel interdum lanceolata, plerumque 7.0—8.5 cm longa et 2—2.8 cm lata, interdum tamen usque ad 14 cm longa et 6 cm lata, utroque extremo longe attenuata, margine irregulariter repando-dentata et recurvata, tenuis, vivo supra saturate viridis, subtus purpurascens, supra sparsissime scabridula, subtus costa nervisque densius, inter nervos sparse scabridula, cystolithis plerumque vix conspicuis, supra interdum nigrescentibus, nervis utroque latere costae 6—8. Spicae terminales et in axillis foliorum superiorum haud raro duae vel tres superpositae, longe pedunculatae. Pedunculus gracilis, 1.5—10 cm longus. Bractae infimae ab aliis remotiores, lanceolato-oblongae, 1.5 cm longae et 4.5 mm latae; aliae ovatae, 10 mm longae et 7 mm latae; omnes subacutae et mucronatae, margine ciliatae, costa haud prominente, glabra vel in bracteis inferioribus subtus scabridopubescente. Calyx 7 mm longus, segmentis subaequalibus carinatis, lobis triangularibus acutis, margine parce sed longe ciliatis, ceterum glaber. Corolla dilute violacea vel alba, 1.6 cm longa. Stamina antheris obtusis, theca altera basi subacuta. Granula pollinis virgis 18 carunculatis ornata, 45  $\mu$  longa et 28  $\mu$  diam. Ovarium breviter comosum, utroque loculo ovulis 4. Stylus hirtellus. Capsula glabra, 8-seminalis.

Habitat partes terrae Borneënsis austro-orientalem et orientalem.

East Borneo: Bulongan, near the S. Sadjau, RUTTEN 124 U; Samarinda, Pamaluan, RUTTEN 140 U, typus; Montang, RUTTEN 228 U.

South-east Borneo: between Mt Uja and Koondim Baru, WINKLER 2673 BD; between Koondim Baru and Batu Babi, WINKLER 2750 BD; Kuman, WINKLER 2934 BD; between Simpokak and Seundroong, WINKLER 2990 BD.

Somewhat different in the shape of the leaves but otherwise similar in habit is ELMER 21036, collected at Tawao, Elphinstone Province, British North Borneo. MERRILL (in Univ. Calif. Publ. XV, p. 272, 1929) identified it as *H. cumingiana* (Nees) F. Vill., but it differs from this species, which is confined to the Philippines, in the greater length of the peduncles and in the nature of its indumentum. As the specimens which I could study, had no flowers, I am unable to express a definite opinion with regard to their position.

As stated in the note attached to the description of *H. gracilipes*, that species and *H. longipedunculata* are very similar.

12. **Hemigraphis hispida** Brem. n. spec.; typus: WINKLER 3051 L.

Herba parva, e basi repente ascendens. Caulis gracilis, pilis longis patentibus et brevioribus basicopsis quam aliis longius persistentibus hispidus. Folia petiolo hispido, 2—7 mm longo munita; lamina lanceolata vel foliorum minorum oblonga, 1.7—4.2 cm longa et 7—16 mm lata, apice obtusa, basi acuta vel subcontracta, margine integro recurvato, coriacea, sicc. luteo-viridis, supra sparse hispida et nitidula, costa appresse pilosa, cystolithis magnis lineolata, subtus costa densius, ceterum sparse hirsuta, nervis utroque latere costae 3—4. Spicae nunc longius pedunculatae casu quo flores infimi foliis magnitudine paulum redactis suffulti, nunc breviter pedunculatae. Bractae lineares, 9—11 mm longae et 2.5—3 mm latae, subacutae, dorso costa et margine dense hispido-ciliatae, ceterum sparse hispidulae, supra pilis aliquibus longis et tenuibus sparsae. Calyx 6.5 mm longus, segmentis carinatis, lobis anguste triangularibus, costa et margine hispido-ciliatis. Corolla dilute violacea, 1.8 cm longa. Stamina antheris apice obtusis. Granula pollinis virgis 18 carunculatis ornata, 46  $\mu$  longa et 28  $\mu$  diam. Ovarium apice parce et breviter comosum,

utroque loculo ovulis 4. Stylus basin versus breviter hirtellus. Capsula glabra, 8-seminalis.

Habitat partem terrae Borneënsis austro-orientalem.

South-east Borneo: Between S. Tarok and Kuaru, WINKLER 3051 L, typus, BD, dupl. typi. "Trockene Stellen im Buschwald; den Boden stellenweise ganz überziehend. Kronenrohre weiss; Zipfel lila mit feinem rotbraunen Mittelstrich."

Although never so slender as the peduncles of *H. gracilipes* and *H. longipedunculata*, those of this species are nevertheless occasionally fairly long, but as in that case the lowest pair of flowers are always subtended by ordinary leaves, it is not clear whether this internode may be regarded as the true peduncle. If the internode between this pair of leaves and the lowest pair of flowers subtended by bracts is considered the true peduncle, the latter does not differ in length from the peduncles of spikes in which all flowers are subtended by bracts.

*H. hispida* is easily distinguishable from its nearest allies by the nature of its indumentum and by the peculiar yellowish-green colour it assumes in drying. It differs moreover from *H. parva* Brem., the species which it resembles most, in the shape and texture of the leaves, in the longer but relatively narrower bracts and in the larger size of the flowers; from *H. sumatrensis* in habit, in the number of ovules in the ovary cells and in the narrower bracts; from *H. gracilipes* and *H. longipedunculata* in habit and in the much shorter peduncles.

### 13. *Hemigraphis parva* Brem. n. spec.; typus: RUTTEN 114 U.

Herba parva, e basi repente ascendens. Caulis gracilis, sulcis primum pilis basicopsis scabridulus, deinde totus glabrescens. Folia in petiolum primum scabridulum, 4—7 mm longum contracta; lamina lineari-lanceolata, 2—5 cm longa et 5—13 mm lata, utroque extremo attenuata, apice tamen obtusa, margine repanda, subrecurvata, cystolithis supra numerosis, nigrescentibus et inde interdum vix conspicuis, supra setulis aliquibus scabridula, subtus costa nervisque dense scabridulo-pubescentibus, inter nervos sparse scabridula, nervis utroque latere costae plerumque 4. Spicae terminales et interdum axillares, longius pedunculatae. Pedunculus gracilis, 1—2 cm longus. Bractee infimae ab aliis remotiores, oblanceolatae, 6—11 mm longae et 2—2.5 mm latae; aliae lanceolato-ovatae vel lanceolato-obovatae, 7—8 mm longae et 3—3.5 mm latae, mucronatae, margine ciliatae. Calyx 5 mm longus, segmentis subaequalibus carinatis; lobi pilis longis cum brevioribus mixtis ciliati; costae parce et breviter ciliolatae. Corolla alba, 1.2 cm longa. Stamina antheris obtusis, thecis paulum inaequalibus, altera basi subacuta. Granula pollinis virgis 18 carunculatis ornata, 51  $\mu$  longa et 32  $\mu$  diam. Ovarium parce comosum, utroque loculo ovulis 4. Stylus hirtellus. Capsula glabra, 8-seminalis.

Habitat partem terrae Borneënsis orientalem.

East Borneo: Samarinda, above Pamaluan, on stones in the bed of the river, RUTTEN 114 U, typus.

The two sets of specimens collected by KORTHALS, whose identity was discussed in the note following the description of the three varieties of *H. sumatrensis*, might perhaps belong in the neighbourhood of *H. parva*. Their mud-caked leaves suggest a habitat similar to that in which the latter was collected.

*H. parva* is easily distinguishable from its nearest allies by the small size of its leaves, bracts and flowers and by its slightly larger pollen grains. The pollen grains of *H. sumatrensis* var. *scabrida*, however, are of about the same size, but these grains are of a slightly different shape.

14. **Hemigraphis natunensis** Brem. n. spec.; typus: v. STEENIS 1248 L.

Herba e basi repente ascendens. Caulis gracilis, primum pilis basiscopis sparse scabrida, mox glabrescens. Folia petiolo sparse pubescente, 8—13 mm longo munita; lamina lanceolata vel lineari-lanceolata, 3—10 cm longa et 1.2—2.7 cm lata, utroque extremo attenuata, apice ipso obtusa tamen, margine subintegra, recurvata, discolor, supra tota glabra, margine scabrida, subtus costa nervisque densius, inter nervos sparse scabrida, supra cystolithis densius lineolata, nervis utroque latere costae plerumque 4. Spicae usque ad 2 cm longae, laxiores, pedunculo ab internodio precedenti haud diverso. Bractee lineares, 18 mm longae et 4 mm latae, acutae, margine et facie costae inferiore scabridociliatae, ceterum glabrae. Calyx 10 mm longus, extus glaber, lobis margine solum ciliatis, mediano quam aliis paulo longiore. Corolla 1.5 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis 18 carunculatis ornata, 42  $\mu$  longa et 28  $\mu$  diam. Ovarium vix comosum, utroque loculo ovulis 4. Stylus hirtellus. Capsula glabra, 8-seminalis.

Habitat Archipelagum Natunensem.

Natuna Archipelago: P. Boonguran or Great Natuna, G. Ranai, alt. 200 m, v. STEENIS 1248 L, typus.

This species is in habit very similar to *H. sumatrensis*, but it has larger, on the upper side completely glabrous leaves, laxer spikes, narrower and longer bracts, which apart from the cilia along the margin and on the midrib, are completely glabrous, and in each of the ovary cells but 4 ovules.

15. **Hemigraphis culionensis** Brem. n. spec.; typus: MERRILL 536 BD.

Herba repens. Caulis gracilis, primum dense, deinde sparse hirsuta. Folia petiolo primum dense, deinde sparse hirsuto, 4—10 mm longo munita; lamina ovata vel elliptica, 2—4.5 cm longa et 1.2—2.2 cm lata, apice obtusa vel rotundata, basi prope petiolum subito contracta, margine subintegra, paulum recurvata, discolor, supra cystolithis densius lineolata et setulis albis densius hirsuta, subtus costa nervisque densius, inter nervos sparsius albido-pubescentis, margine densius ciliolata, nervis utroque latere costae plerumque 3. Spicae solitariae vel ternae. Pedunculus 3—5 mm longus, hirsutus. Bractee 3- vel 4-parae, oblongae, 7 mm longae et 2.8 mm latae, subobtusae, longe et dense ciliatae, supra pilis aliquibus albis sparsae, subtus costa albo-ciliatae, infimae insuper utroque latere costae pilis brevioribus sparsae. Calyx 8 mm longus, lobo mediano quam aliis paulo longiore; lobi omnes anguste triangulares, longe ciliati, costa etiam pilis aliquibus longis instructi. Corolla dilute violacea, 1.3 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis 18 carunculatis ornata, 37—40  $\mu$  longa et 25—27  $\mu$  diam. Ovarium vix conspicue comosum, utroque loculo ovulis 4. Stylus breviter hirtellus. Capsula apice vix conspicue comosa, 8-seminalis.

Habitat Archipelagum Palawanensem.

Palawan Archipelago: Island Culion, MERRILL 536 BD, typus, "in damp thickets; flowers pale-purple".

*H. culionensis* is easily distinguishable from the other species of this series which are provided with distinctly carunculate pollen, by its habit and by the shape and size of the leaves. It shows, however, a fairly strong resemblance to *H. mediocris* Brem., one of the eastern species whose pollen grains are provided with slightly carunculate bands. The leaves of *H. mediocris*, a plant collected in Luzon, are somewhat narrower, its spikes longer and its bracts wider.

16. **Hemigraphis bicolor** (Bl.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, 1897; *Ruellia bicolor* Bl., Bijdr. Fl. Ned. Ind., p. 795, 1826; Nees in DC.,

Prodr. XI, p. 148, 1847; Miq., Fl. Ind. Bat. II, p. 787, 1858; ? *Hemigraphis bicolor* (Bl.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899.

Herba erecta, simplex vel parce ramosa. Caulis appresse pubescens, demum glabrescens. Folia petiolo appresse pubescente, marginibus parce hispido, 2.5—3 cm longo munita; lamina ovato-lanceolata, 9—15 cm longa et 3.7—6 cm lata, apice acuta, basi rotundata, prope petiolum tamen subito et breviter contracta, margine integra, plerumque recurvata, supra subglabra et cystolithis satis magnis dense lineolata, subtus costa nervisque dense sed breviter scabrido-pubescentis, inter nervos sparse scabridula, vivo supra saturate viridis, subtus purpurea, nervis utroque latere costae 6—7. Spicae terminalis et axillares, elongatae. Pedunculus usque ad 1 cm longus. Bracteae lanceolatae, 18 mm longae et 6 mm latae, subobtusae, margine et facie costae inferiore longe ciliatae, supra subglabrae, subtus apicem versus sparse pubescentes, foliaceae, nervis utroque latere costae 3. Calyx 1 cm longus, segmentis carinatis, lobis margine et costa dense ciliolatis et apicem versus paucis ciliis longis instructis. Corolla 2.5 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis 18 carunculatis ornata, 51  $\mu$  longa et 30  $\mu$  diam. Ovarium dimidio superiore pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula subglabra, 8-seminalis.

Habitat Javam Occidentalem.

West Java: Buitenzorg Res.: Leuwiliang, KUHLE et v. HASSELT s.n. L; Angsana near Tjampea, alt. 500 m, BAKHUIZEN v. D. BRINK 5015 L; Salak, BLUME s.n. L, typus; Buitenzorg, BOERLAGE 16/II/'89 L; Tji Badak on the G. Halimoon, alt. 600 m, BAKHUIZEN v. D. BRINK 3123 L.

*H. bicolor* is easily distinguishable from the other species occurring in the western half of the Archipelago, by the large size of its leaves, their rounded base and long petioles. On the whole it looks much more like some of the species of this series occurring in the eastern part of the Archipelago, from which it differs in the distinctly carunculate pollen grains. It should not be forgotten, however, that at least one of the large-leaved species belonging to the eastern group, namely *H. cumingiana* (Nees) F. Vill., is provided with pollen grains whose bands might be regarded as carunculate. This species resembles *H. bicolor* in general aspect and in the presence of a few long bristles at the top of the calyx lobes, but differs in the shape of its leaves, which are contracted at the base and provided with a much shorter petiole and fewer nerves, and also by its ovate bracts.

## II. Species Orientales.

17. *Hemigraphis viridis* Merr. in Philipp. Journ. of Sc. XIII, Bot., p. 59, 1918; id., Enum. Philipp. Fl. Pl. III, p. 474, 1923.

Herba erecta, parce ramosa. Caulis subglaber, sulcis pilis acroscopicis scabridulus. Folia petiolo scabrido-pubescente, 5—8 mm longo munita; lamina foliorum inferiorum ovata, 5 cm longa et 2 cm lata, foliorum superiorum linear-obcuneata, 6—7.5 cm longa et 1—2 cm lata, foliorum omnium apice subobtusata, basi rotundata sed prope petiolum contracta, margine subintegra et recurvata, sicc. luteo-viridis, supra nitidula, subglabra vel setulis aliquibus sparsa, cystolithis pro genere magnis lineolata, cellulis epidermalibus circ. 110  $\mu$  longis, subtus costa nervisque setulis appressis vestita, ceterum glabra, nervis utroque latere costae 4—5. Spicae racemose vel paniculatim dispositae. Pedunculus 5—10 mm longus, pilis acroscopicis breviter pubescens. Rhachis usque ad 5 cm longa. Bracteae ovatae vel ellipticae, 10—12 mm longae et 8—8.5 mm latae, acutae, margine ciliatae, dorso breviter et vix conspicue pubescentes, costa hic tamen densius et longius pubescente. Calyx 8 mm longus, extus pubescens,

segmentis carinatis, lobis triangularibus acutis, costa et margine ciliatis. Corolla matura nondum visa. Stamina antheris apice obtusis, thecis basi obtusis. Granula pollinis virgis 18 punctatis ornata,  $47 \mu$  longa et  $31 \mu$  diam. Ovarium comosum, utroque loculo ovulis 4. Stylus basin versus hirtellus. Capsula apice puberulo-pubescentis, seminibus 6—8.

Habitat Insulas Philippinas.

Luzon: Prov. of Ilocos Norte, Bangui, RAMOS B. Sc. 27587 L, exemplum typi.

The lower and upper leaves of *H. viridis* show a remarkable difference in shape. This phenomenon returns in the next two species, *H. proteus* Brem. and *H. halconensis* Brem., and also in two species belonging to the series *Nudicrures*, namely in *H. diversifolia* Elm. and *H. subtinctoria* Elm. From all these plants *H. viridis* is easily distinguishable by its broad bracts and by the peculiar yellowish-green tint it assumes in drying. From the two species belonging to the *Pubicrures* it differs moreover by the acroscopic hairs on the shoots and peduncles, from *H. proteus* also by the large size of the epidermis cells and of the cystoliths, and from *H. halconensis* in the totally different shape of the leaves.

18. *Hemigraphis proteus* Brem. n. spec.; typus: RAMOS B.Sc. 20480 L; *H. strigosa* (Nees) F. Vill. in errore apud Merr., Enum. Philipp. Fl. Pl. III, p. 474, 1923, quoad specimen infra descriptum.

Herba simplex vel parce ramosa, suberecta vel e basi repente ascendens. Caulis primum pilis basicopis dense pubescens, deinde plus minusve glabrescens. Folia forma et magnitudine valde variabilia; inferiora petiolo 2—7 mm longo munita, lamina ovata, 1.0—1.8 cm longa et 0.8—1.4 cm lata, obtusa, prope petiolum subcontracta, nervis utroque latere costae 2 vel 3; superiora petiolo 7—10 mm longo, lamina obcuneata vel sublineari, usque ad 7 cm longa et 1.6 cm lata, nervis utroque latere costae usque ad 8; folia omnia tenuiora, margine subintegra, supra setulis aliquibus sparsa, subtus costa nervisque pubescentia, sicc. brunnescentia, cystolithis utrimque sed praesertim supra distinguendis, facie superiore cellululis epidermalibus  $70 \mu$  longis. Spicae plerumque solitariae, interdum tamen in triades dispositae. Pedunculus pilis basicopis dense pubescens, 1—5 mm longus. Bractae infimae interdum semi-foliae, i.e. dimidio basali ut bractae aliae longe ciliatae, apicem versus eciliatae; bractae aliae lanceolatae, 12.5 mm longae et 5.5 mm latae, subacutae, basi contractae, margine longe ciliatae, subtus costa brevius sed densius setulosae, ceterum brevissime hirtellae, supra setulis aliquibus sparsae; costa basin versus dilatata et immersa, marginibus elevatis instructa. Calyx subaequaliter 5-fidus, extus sparse pubescens, segmentis vix carinatis, lobis anguste triangularibus acutis, margine et costa ciliatis. Corolla non visa. Ovarium apicem versus pubescens, utroque loculo ovulis 3. Stylus basin versus hirtellus. Capsula ad apicem sparse puberulo-pubescentis, 6-seminalis.

Habitat Insulas Philippinas.

Luzon: Prov. of Laguna, San Antonio, RAMOS B. Sc. 20480 L, typus.

A specimen collected in the same locality (RAMOS B. Sc. 20392 L) is almost certainly conspecific, for its bracts, calyx and capsule are exactly like those of the type specimen; its leaves, however, are somewhat differently shaped, for they are acute at the base and their petioles reach a length of 1.5 cm.

As no flowers were available, the presence or absence of hairs on the filaments and the structure of the pollen grains could not be made out; the position of the species remains, therefore, somewhat uncertain. I refer it to the series *Pubicrures* on account of its resemblance to *H. viridis*, from which it differs apparently in minor points only: the basicopic, not acroscopic hairs on



the shoots and peduncles, the smaller size of the epidermis cells on the upper side of the leaves, the narrower bracts and the brown colour it assumes in drying. The remarkable variability in the shape of the leaves returns in *H. diversifolia* Elm. and *H. subtinctoria* Elm., two species belonging to the series *Nudicrures*. As the ovary cells of these species contain six ovules, a nearer affinity with *H. proteus* does not look probable.

The specific epithet *proteus* was chosen on account of the great variability shown by this plant. Some of the specimens collected by RAMOS flowered at an early stage, before the obtuse or sublinear leaves were formed, and these plants show a very different aspect from the larger ones collected at the same time: if they had been found in different localities, their identity might easily have been overlooked.

19. *Hemigraphis halconensis* Brem. n. spec.; typus: RAMOS et EDAÑO B. Sc. 40687 L.

Herba erecta, apicem versus ramosa. Caulis primum sulcis pilis basiscopis parce scabridulus, ceterum glaber. Folia forma et magnitudine variabilia; inferiora petiolo glabro circ. 2 cm longo munita, lamina elliptica, 9.5 cm longa et 3.8—4.2 cm lata, utroque latere costae nervis plerumque 6 instructa; superiora brevius petiolata vel subsessilia, lamina lanceolata, circ. 4 cm longa et 1 cm lata, nervis utroque latere costae 3 vel 4; lamina foliorum omnium herbacea, discolor, utroque extremo paulum attenuata, apice calloso-mucronata, margine vix conspicue repanda, cystolithis utrimque distinguendis sed supra numerosioribus et magis conspicuis, subtus costa sparse et breviter pubescens, ceterum glabra. Spicae terminales et insuper ex axillis foliorum superiorum laterales; spicae axillares haud raro duae superpositae vel a ramo florifero superposito comitatae. Pedunculus glaber, plerumque circ. 2 cm longus, interdum longior casu quo flores infimi foliis ordinariis suffulti et ab aliis remotiores. Bractee aliae lineari-lanceolatae, 8—10 mm longae et 2—2.5 mm latae, acutae, longe et conspicue ciliatae, costa pilis brevibus appressis vestitae, ceterum glabrae. Calyx subaequaliter 5-fidus, 8—10 mm longus, segmentis carinatis, mediano quam anticis paulo longiore, lateralibus paulo brevioribus, lobis pilis brevibus cum paucis longioribus mixtis ciliatis. Corolla 1.5 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis 21 punctatis ornata, 40  $\mu$  longa et 29  $\mu$  diam. Ovarium dimidio superiore dense pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula glabra, 8-seminalis.

Habitat Insulas Philippinas.

Mindoro: Mt Halcon, RAMOS and EDAÑO B. Sc. 40687 L, typus.

The specimen described above was distributed under the name *H. setosa* Elm., but its leaves are larger, provided with more nerves and a longer petiole, its bracts smaller and its corolla shorter than they are in that species; the filaments moreover are densely bearded and the capsule contains eight seeds. *H. setosa* is said to be provided with glabrous filaments, and belongs therefore to the series *Nudicrures*: although I have seen no material referable to this species, I have little doubt that it belongs in the neighbourhood of *H. lanceolata* Merr.

*H. halconensis* resembles the two preceding species in the presence of differently shaped leaves on the same plant, but in other respects it differs widely from them, e.g. in the shape and size of the leaves, the narrow bracts, the unequal calyx lobes and from *H. viridis* also by the shape and size of the pollen grains.

20. *Hemigraphis linearifolia* Brem. n. spec.; typus: MERRILL 8237 L.

Herba simplex vel parce ramosa, e basi repente ascendens. Caulis primum

pilis basiscopis densius vestitus, deinde glabrescens. Folia petiolo primum pilis partim acroscopis, partim basiscopis densius vestito, 3—7 mm longo munita; lamina linearis, 5—7 cm longa et 4.5—6 mm lata, apice obtusa, basi acuta et leviter conduplicata, margine integra et scabrida, supra primum setulis aliquibus sparsa, subtus costa dense, ceterum sparse scabridulo-pubescentis, cystolithis utrimque, sed praesertim supra conspicuis, nervis lateralibus vix distinguendis. Spicae terminales et insuper ex axillis foliorum superiorum laterales, hae solitariae. Pedunculus pilis basiscopis dense vestitus, 4 mm longus. Rhachis pedunculo subaequilonga. Bractee 3-parae, anguste ovato-lanceolatae, 11 mm longae et 3 mm latae, subacutae, margine longe ciliatae, supra sparse strigosae, subtus costa densius, ceterum sparse et brevissime scabrido-pubescentes. Calyx subaequaliter 5-fidus, segmentis carinatis, 8 mm longis, lobis anguste triangularibus, acutis, margine et costa ciliatis. Corolla matura non visa. Stamina antheris apice subobtusis, thecis basi obtusis. Ovarium apice pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula apice sparse pubescens, 8-seminalis.

Habitat Insulas Philippinas.

Mindanao: Distr. of Zamboanga, MERRILL 8237 L, typus.

The type specimen was distributed under the name *H. lanceolata* Clarke. The description of that species has never been published, but as the epithet *lanceolata* was applied by MERRILL to a species belonging to the series *Nudicrures*, it can not be used for the plant described above.

As no mature anthers were available to me, the description makes no mention of the pollen characters. The unripe pollen grains proved to be muricate, and resembled unripe grains of *H. cumingiana* (Nees) F. Vill.

*H. linearifolia* is not the only species of this series provided with linear leaves. *H. simulans* Brem., a Luzon plant, looks at first sight almost exactly like *H. linearifolia*, but is nevertheless easily distinguishable by its linear or linear-spathulate, not ovate-lanceolate bracts, which apart from the cilia along the margin are completely glabrous. Another plant with linear leaves was collected in Alabat Island (MERRILL n. 10453), and belongs probably to an undescribed species, MERRILL referred it to *H. strigosa* (Nees) F. Vill., a species of which I have seen no authentic material, but which apparently resembles *H. pachyphylla* Merr. The resemblance between the Alabat plant and the latter, however, is but slight.

21. *Hemigraphis simulans* Brem. n. spec.; typus: RAMOS B. Sc. 22084 L.

Herba parce ramosa, e basi breviter repente ascendens. Caulis primum sulcis pilis basiscopis et nodis pilis acroscopis instructus, mox glabrescens. Folia petiolo primum marginibus pilis basiscopis vestito, mox glabrescente, 2—5 mm longo; lamina linearis, 3.5—10 cm longa et 3—9 mm lata, apice obtusa, basi acuta et interdum conduplicata, margine integro, supra glaberrima vel interdum setulis perpauca sparsa, subtus costa et margine sparse et vix conspicue setulosa et utroque latere costae vix conspicue puberula, cystolithis utrimque conspicuis, nervis lateralibus plerumque vix distinguendis, utroque latere costae circ. 6. Spicae terminales et insuper ex axillis foliorum supremorum laterales; hae solitariae. Pedunculus subglaber vel sulcis basin versus pilis basiscopis vestitus, 3—7 mm longus. Rhachis pedunculo subaequilonga. Bractee 3-parae, lineares vel lineari-spathulatae; infimae 1.5—2 cm longae et 1.5—2 mm latae, obtusae, parce ciliatae; aliae breviores, 1.2 cm longae et 2 mm latae, sed densius ciliatae, ciliis brevibus tamen, ceterum glabrae. Calyx subaequaliter 5-fidus, segmentis carinatis, 7 mm longis, fructu usque ad 11 mm accrescentibus, lobis anguste triangularibus, margine et costa ciliatis. Corolla matura non visa. Stamina antheris apice subobtusis, thecis basi obtusis. Ovarium apice comosum, utroque

loculo ovulis 4. Stylus hirtellus. Capsula rostro breviter comoso instructa, 8-seminalis.

Habitat Insulas Philippinas.

Luzon: Camarines, Mt Isarog, RAMOS B. Sc. 22084 L, typus (distributed under the name *Justicia Loheri* Clarke).

The differences between this species and *H. linearifolia* have been given already in the note attached to the description of the latter.

22. *Hemigraphis mediocris* Brem. n. spec.; typus: MC GREGOR B. Sc. 11351 L.

Herba parva, simplex vel parce ramosa, probabiliter e basi repente ascendens. Caulis pilis erecto-patentibus scaber. Folia petiolo scabrido-pubescente, 1—3 mm longo munita; lamina anguste ovato-oblonga, 2—4 cm longa et 0.9—1.5 cm lata, obtusa, basi rotundata, margine integra et recurvata, coriacea, supra setulis aliquibus sparsa, subtus costa nervisque scabrido-pubescentis, inter nervos setulis minimis densius sparsa, margine scabrida, cystolithis supra conspicuis, nervis utroque latere costae 3—4. Spicae plerumque solitariae. Pedunculus dense scabrido-pubescentis, 5—10 mm longus. Rhachis usque ad 2.5 cm longa. Bractee pluri-parae, ellipticae, 7—9 mm longae et 3.5—5 mm latae, acutae, basin versus contractae, supra glabrae vel setulis paucis sparsae, costa immersa, margine ciliatae, subtus costa ciliatae, ceterum puberulo-pubescentes. Calyx 6 mm longus, extus pubescens, subaequaliter 5-fidus, lobis anguste triangularibus acutis, margine et costa carinata ciliatis. Corolla matura nondum visa. Stamina antheris apice obtusis, thecis basi mucronulatis. Granula pollinis virgis 18 muriculatis ornata, 46  $\mu$  longa et 30  $\mu$  diam. Ovarium apicem versus pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula dimidio superiore puberulo-pubescentis, 8-seminalis.

Habitat Insulas Philippinas.

Luzon: Prov. of Nueva Vizcaya, vicinity of Dupax, MC GREGOR B. Sc. 11351 L, typus, BD, dupl. typi: the leaves of these specimens are on the lower side bluish black; Prov. of Bontoc, Bontoc, RAMOS and EDAÑO B. Sc. 38139 L: in this specimen the leaves are on the lower side olive-green; it represents perhaps a variety.

This species is easily distinguishable from the other members of this series by the small size and ovate-oblong shape of the leaves.

23. *Hemigraphis benguettensis* Brem. n. spec.; typus: ELMER 8469 L.

Herba erecta, ramosa: Caulis ramisque sulcis puberulo-pubescentes, ceterum glabri vel setulis paucis sparsi. Folia petiolo marginibus hirtis, 2—5 mm longo munita; lamina lanceolata vel lineari-lanceolata, 2.5—9 cm longa et 0.7—2.2 cm lata, apice subobtusa, basi acuta, margine subintegra vel repando-dentata, recurvata, utrimque scabridula, cystolithis utrimque distinguendis, nervis utroque latere costae 3—5. Spicae plerumque solitariae, subsessiles. Flores infimi foliis magnitudine redactis suffulti; bractee florum aliorum ovato-lanceolatae, 9—13 mm longae et 4.5—6.5 mm latae, subacutae, basi contractae, supra et praesertim ad marginem pilis luteolis longissimis hirsutae, subtus costa pilis longis, ceterum pilis brevibus sparsae. Calyx 10 mm longus, extus puberulo-pubescentis, subaequaliter 5-fidus, lobis acutis margine et costa longe ciliatis. Corolla 12 mm longa. Stamina antheris apice obtusis, thecis basi obtusis. Granula pollinis virgis 21 punctatis ornata, 25—38  $\mu$  longa et 24—26  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 4. Stylus hirtellus, apicem versus glaber. Capsula comosa, 8-seminalis.

Habitat Insulas Philippinas.

Luzon: Prov. of Benguet, Baguio, ELMER 8469 L, typus; ibid., Bued River,

MERRILL 4302 L; *ibid.*, Sablang, FÉNIX B Sc. 12737 L; *ibid.*, Mt Santo Tomas, MERRILL 11723 L.

*H. benguetensis* has up to now been confused with *H. rhytiphylla*, a species belonging to the series *Imbricatae*, from which it is easily distinguishable by the nature of its bracts, which lack the glandular pubescence found in the other species, by the absence of bracteoles, and by the presence of 21 instead of 15 bands in the pollen grains. The specimen collected by FÉNIX was distributed under the name *H. hirsuta* (Vahl) T. And., which is a synonym of *H. brunelloides* (Lam.) Brem. This species belongs to the same series as *H. rhytiphylla*, and differs from *H. benguetensis* in the same characters as the latter; it lacks moreover the scabrid pubescence of *H. rhytiphylla* and *H. benguetensis*.

Among the species belonging to the *Pubicrures* the species described above is easily recognizable by the long yellowish hairs on the upper side and especially along the margin of the bracts and by the scabrid upper side of the leaves. A rather remarkable feature is the presence of a rudimentary flower below the normally developed one, for superposed flowers are in this series unknown.

24. *Hemigraphis oblongibractea* Brem. n. spec.; *typus*: MC GREGOR B. Sc. 11188 L.

Herba suberecta, parce ramosa. Caulis ramique primum pilis basiscopis pubescentes, deinde glabrescentes. Folia petiolo pubescente, circ. 1 cm longo munita; lamina anguste lanceolata, 7—12 cm longa et 2.3—3.4 cm lata, utroque extremo attenuata, apice ipso tamen obtusa, margine grande repandodentata et recurvata, subcoriacea, discolor, supra glabra et nitidula, costa tamen pilis appressis paucis sparsa, subtus costa nervis venulis scabridopubescentis, cystolithis supra numerosis et conspicuis, subtus paucis et vix distinguendis, nervis utroque latere costae 5—6. Spicae terminales et axillares, densae. Pedunculus vix 5 mm longus. Bractee oblongae, 10 mm longae et 4.5 mm latae, utroque extremo obtusae, margine longe et conspicue albociliatae, subtus costa et interdum nervis pubescentes. Calyx 7 mm longus, extus puberulo-pubescentis, subaequaliter 5-fidus, segmentis carinatis, carinis et lorum marginibus pilis brevibus cum paucis longissimis mixtis ciliatis. Corolla 15 mm longa. Stamina antheris apice obtusis, thecis basi obtusis. Granula pollinis virgis punctatis ornata, 47  $\mu$  longa et 30  $\mu$  diam., sed vix matura. Ovarium comosum, utroque loculo ovulis 4. Stylus hirtellus. Capsula apice breviter et vix conspicue puberula, 8-seminalis.

Habitat Insulas Philipinas.

Luzon: Prov. of Nueva Vizcaya, vicinity of Dupax, MC GREGOR B. Sc. 11188 L, *typus*.

The species 23 to 27 are all very similar, but nevertheless easily distinguishable: the outstanding feature of *H. oblongibractea* is the oblong bract with its fringe of long white bristles.

25. *Hemigraphis pachyphylla* Merr. in Philipp. Journ. Sc. XX, p. 453, 1922; *id.*, Enum. Philipp. Fl. Pl. III, p. 471, 1923; — *anne H. strigosa* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3, Nov. App., p. 153, 1880; *Ruellia strigosa* Nees in DC., Prodr. XI, p. 148, 1847?

Herba erecta, sparse ramosa. Caulis ramique primum sulcis setulis basiscopis scabridi, deinde glabrescentes. Folia in petiololum pilis acroscopis scabridum, 0.5—2 cm longum contracta; lamina lanceolata vel elliptico-lanceolata, usque ad 15 cm longa et 6 cm lata, plerumque tamen pro rato angustior, apice

subobtusa, basi contracta, margine grosse repanda et recurvata, coriacea, supra glabra et nitida, cellulis epidermalibus a parietibus rectis circumdatis, subtus costa nervisque densius, inter nervos sparsius scabrida, cystolithis supra valde conspicuis, nervis utroque latere costae 5—6. Spicae in triades terminales dispositae. Pedunculus dense hirtellus, 8—15 mm longus. Bractee infimae lanceolatae, usque ad 16 mm longae et 6 mm latae; aliae obovatae, 12 mm longae et 6 mm latae, acutae, margine ciliatae, facie costae inferiore setulosae, ceterum subtus puberulae. Calyx 6 mm longus, fructu vix accrescens, extus totus pubescens, aequaliter 5-fidus, segmentis vix carinatis, lobis margine pilis brevibus cum paucis longioribus mixtis ciliatis. Corolla matura nondum visa. Capsula puberula, 6-seminalis.

Habitat Insulas Philippinas.

Luzon: Prov. of Tayabas, Tagcanayan, RAMOS B. Sc. 13342 et 13353 L.  
Panay: Dumarao, MERRILL 6696 L.

Several of the *Hemigraphis* sheets distributed by the Bureau of Science, Manila, have been labelled *H. strigosa* (Nees) F. Vill., but although they belong to various species, not one of them fully answers the description given of this species by NEES. The only one whose leaves are "supra confertissime lineolata, subtus scabra", belongs to the species which MERRILL described under the name *H. pachyphylla*; the capsule however is 6-seeded, whereas NEES describes that of his *Ruellia strigosa* as "8—10-sperma". The identity of the two species therefore remains questionable. Examination of the type specimen of *R. strigosa* would of course remove all doubts on this point, but the latter is at present unavailable to me.

*H. pachyphylla* is easily recognizable by its large and thick, on the upper side shining and on the lower side scabrid leaves. It comes nearest to *H. cumingiana* (Nees) F. Vill., which it resembles i.a. in the shape of the bracts. It differs however from that species not only in the leaf characters mentioned above but also in the shape of the epidermis cells on the upper side of the leaves, whose walls do not show the meandering course so often observed in these cells, but are perfectly straight. In the genus *Hemigraphis* it is so far the only species in which epidermis cells of this kind have been found.

#### 26. *Hemigraphis samarensis* Brem. n. spec.; typus: JAGOR 962 BD.

Herba simplex, erecta, circ. 30 cm alta. Caulis acute quadrangularis, primum dense hirto-pubescens, deinde ad angulos glabrescens, internodiis usque ad 9 cm longis. Folia in petiolum dense hirto-pubescentem, 2—4.5 cm longum contracta; lamina ovato-lanceolata, 8.5—19.5 cm longa et 3—6 cm lata, apicem acutum versus sensim contracta, basin versus celerius diminuta, prope petiolum subito contracta et in petiolum plus minusve decurrens, margine irregulariter repanda vel crenata, herbacea, discolor, cystolithis utraque facie distinguendis, supra conspicuis, utraque facie setulis parvis sparsa, supra costa basin versus et subtus costa nervisque totis dense pubescens, nervis utroque latere costae 5—6. Spicae terminales et axillares; haec foliis linearilanceolatis, magnitudine multo redactis, subsessilibus suffultae. Pedunculus dense pubescens, 7—18 mm longus. Rhachis 1.5—2.5 cm longa, etiam dense pubescens. Bractee lanceolatae, 12—17 mm longae et 4—5.5 mm latae, apicem subacutum versus contractae, longe ciliatae, supra pilis longis, subtus pilis multo brevioribus sed numerosioribus, partim capitatis sparsae. Flores plerumque ebracteolati, interdum tamen bracteola una, calyce triplo brevior instructi. Calyx 6 mm longus, 5-fidus, lobis lateralibus quam aliis paulo brevioribus, omnibus anguste triangularibus, carinatis, longe ciliatis, dorso pubescentibus. Corolla 2.5 cm longa. Stamina antheris apice vix distincte mucronulatis, theca altera basi acuta. Granula pollinis virgis 21 punctatis

ornata, 52  $\mu$  longa et 29  $\mu$  diam. Ovarium dimidio superiore pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula puberulo-pubescens, 8-seminalis.

Habitat Insulas Philippinas.

Samar: s.l., JAGOR 962 BD, typus.

By its large, especially below on midrib and nerves densely pubescent leaves easily distinguishable from its allies. Other important characters are the lanceolate bracts and the large size of the pollen grains.

27. *Hemigraphis cumingiana* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3, Nov. App., p. 153, 1880; Vidal, Phan. Cuming. Philipp., p. 132, 1885; id., Rev. Pl. Vasc. Philipp., p. 791, 1886; Merrill, Enum. Philipp. Fl. Pl. III, p. 471, 1923; non Koorders-Schumacher, Syst. Verz. III, § 1, p. 117, 1914 (cf. *H. celebica*); nec Merrill in Univ. Calif. Publ. XI, p. 293, 1929 (cf. *H. longipedunculata*); *Ruellia cumingiana* Nees in DC., Prodr. XI, p. 148, 1847; Miq., Fl. Ind. Bat. II, p. 791, 1858; — *Strobilanthes bulusanensis* Elm. in Philipp. Leaflet X, p. 2678, 1939.

Herba erecta, parce ramosa. Caulis ramique primum puberulo-pubescentes, deinde glabrescentes. Folia petiolo gracili, puberulo-pubescente, 5—15 mm longo munita; lamina lanceolata, 8.5—12 cm longa et 3—4.2 cm lata, apice acuta vel subcontracta, cacumine extremo tamen plerumque obtusiusculo, basi contracta, margine haud profunde sinuosa et vix recurvata, tenuis, discolor, supra glabra et nitidula, subtus glabra vel costa nervisque puberula, cystolithis utrimque numerosis sed supra magis conspicuis, nervis utroque latere costae 4—5. Spicae terminales et in axillis foliorum superiorum plerumque solitariae. Pedunculi 3—20 mm longi, inferiores quam superiores longiores, omnes puberulo-pubescentes. Rhachis subglabra. Bractee infimae ovato-lanceolatae, 15 mm longae et 5.5 mm latae; aliae ovatae, 10 mm longae et 6 mm latae, subobtusae, margine parce ciliatae, ceterum utrimque subglabrae. Calyx 7 mm longus, fructu vix accrescens, subaequaliter 5-fidus, segmentis carinatis, lobis anguste triangularibus acutis, costa et margine pilis brevibus, apicem versus cum paucis longis mixtis ciliatis. Corolla 1.8 cm longa. Stamina antheris apice obtusis, theca altera basi acutiuscula. Granula pollinis virgis 18 leviter carunculatis ornata, 45—48  $\mu$  longa et 30—32  $\mu$  diam. Ovarium dimidio superiore pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula subglabra, 8-seminalis.

Habitat Insulas Philippinas.

Luzon: Cagayan Prov., CUMING 1310 L, exemplum typi; Laguna Prov., Los Baños, Mt Maguiling, ELMER 18282 L; Tayabas Prov., Kabibihan, RAMOS B. Sc. 13283 L; Sorsogon Prov., Mt Bulusan, ELMER 16884 L (type of *Strobilanthes bulusanensis* Elm.).

Panay: Capiz Prov., Jamindan, RAMOS et EDAÑO B. Sc. 31062 L.

Plants collected in Mindanao (e.g. Distr. Cotabatu, ROBINSON 11635 L; Agusan, Cabadbaran, ELMER 13366 L) are slightly different; the material, however, is too incomplete for a description.

*H. cumingiana* resembles *H. benguetensis*, *H. oblongibractea*, *H. pachyphylla*, *H. samarensis*, the two Celeban species: *H. celebica* and *H. mandarenensis*, and also, though less distinctly, the Javanese *H. bicolor*. Its relation to the latter has been discussed already. From *H. benguetensis* and *H. pachyphylla* it is easily distinguishable by the non-scabrid leaves, from the first moreover by the absence of the yellowish hairs on the bracts, and from the second by the shape of the epidermis cells on the upper side of the leaf; from *H. oblongibractea* it differs in the shape of the bracts and in their less abundant and shorter ciliation; from *H. samarensis* in the absence of the soft

pubescence on the shoots, petioles and nerves; from *H. mandarensis* in the presence of 4, not 6, ovules in each of the ovary cells; and from *H. celebica*, with which it shows a very striking resemblance, it is nevertheless sharply defined by the nature of the pollen grains: those of *H. cumingiana* are decorated with muricate bands, those of *H. celebica* with finely punctate ones.

28. *Hemigraphis celebica* Brem. n. spec.; typus: NOORKAS 380 L.

Herba suberecta, ramosa. Caulis ramique primum breviter et sparse pubescentes, sulcis pilis basicopis scabriduli, mox glabrescentes. Folia petiolo sparse pubescente, 5—15 mm longo munita; lamina elliptico-lanceolata, lanceolata vel lineari-lanceolata, 6—10 cm longa et 2.6—4.3 cm lata vel 6—12 cm longa et 1.4—2.6 cm lata, apice subacuta, basi acuta et in petiolum contracta, margine repando-dentata et recurvata, supra nitidula et glaberrima, cystolithis dense lineolata, subtus costa nervisque breviter pubescens et inter nervos sparsissime scabridula, cystolithis minus numerosis quam supra, nervis utroque latere costae 5—6. Spicae terminales et in axillis foliorum superiorum solitariae. Pedunculus usque ad 8 mm longus. Rhachis pubescens, usque ad 2 cm longa. Bractee infimae interdum ovato-lanceolatae, 12 mm longae et 5 mm latae; aliae ovatae, 10 mm longae et 6 mm latae, acutae, margine ciliatae, ceterum glabrae. Calyx 8 mm longus, extus glaber, aequaliter 5-fidus, segmentis carinatis, lobis anguste triangularibus acutis, margine et costa pilis brevibus cum paucis longis mixtis ciliatis. Corolla 1.2 cm longa. Stamina antheris apice obtusis, theca altera basi acuta. Granula pollinis virgis 21 punctatis ornata, 43  $\mu$  longa et 27  $\mu$  diam. Ovarium apicem versus pubescens, utroque loculo ovulis 4. Stylus hirtellus. Capsula subglabra, 8-seminalis.

Habitat terram Celebicum.

Celebes: South-east Celebes: Kampong Kusoong, NOORKAS (Exp. v. VUUREN) 380 L, typus, U, dupl. typi; Membulu, Penango, alt. 75—300 m, ELBERT 3177 L; Bontok Parang, alt. 50 m, BÜNNEMEYER 10664 L; Central Celebes: Lagih-lagih, RACHMAT (Exp. v. VUUREN) 259 L; Pasaeran, id. 299 L (with very narrow leaves); South-west Celebes: Maros, ravine of Bantimuroong, WARBURG 16277 BD.

The material referred to this species is rather variable, and it is therefore not impossible that further study based on more complete and better material will reveal the existence of more than one species.

As stated above *H. celebica* shows apart from the difference in the relief of the pollen grains a striking resemblance to *H. cumingiana*. There are, however, several minor differences: the scabridulous lower side of the leaves, the 5—6 instead of 4—5 pairs of nerves, the shorter peduncle and the smaller flowers.

The plants quoted by KOORDERS-SCHUHMACHER (Syst. Verz. III, § 1, p. 117, 1914) under the name *H. cumingiana*, could not be investigated, but I have little doubt that they will prove to belong either to *H. celebica* or else to a nearly related, as yet undescribed species.

29. *Hemigraphis mandarensis* Brem. n. spec.; typus: RACHMAT 172 L.

Herba erecta, simplex vel parce ramosa, 30 cm alta. Caulis primum sulcis pilis basicopis sparse scabridulus, mox glabrescens. Folia petiolo pubescente et marginibus scabridulo, 5—15 mm longo munita; lamina lanceolata, 3—9 cm longa et 0.7—2.6 cm lata, sensim in caudam exeuns, basi cuneata et sensim in petiolum contracta, margine grosse repando-dentata, supra costa primum dense, deinde sparsius appresse setulosa, ceterum glabra, subtus costa nervisque appresse setulosa, inter nervos primum sparse setulosa, deinde glabrescens, cystolithis utraque facie distinguendis et supra conspicuis, nervis utroque latere costae 3 vel 4. Spicae in triades terminales dispositae vel apice ramulo-

rum solitariae. Pedunculus puberulo-pubescent, 2—5 mm longus. Rhachis plerumque circ. 1 cm longa. Bracteae infimae lineari-lanceolatae, 17 mm longae et 4.5 mm latae, obtusae, margine haud ciliatae; aliae ovatae, 14 mm longae et 6 mm latae, subacutae, margine longe ciliatae, ceterum glabrae. Calyx 9 mm longus, extus glaber, subaequaliter 5-fidus, lobo mediano quam aliis tamen paulo longiore, lobis omnibus margine satis longe ciliatis. Corolla 1.6 cm longa. Stamina antheris apice obtusis, thecis basi acutis. Granula pollinis virgis probabiliter 21 punctatis ornata, 52  $\mu$  longa et 32  $\mu$  diam. Ovarium ad apicem pubescens, utroque loculo ovulis 6. Stylus hirtellus. Capsula apice puberulo-pubescent, 8-seminalis.

Habitat terram Celebicam.

Celebes: Central Celebes; Mandar, Pasang Kaju, RACHMAT (Exp. v. VUUREN) 172 L, typus.

This species differs from the preceding one in the larger size of the pollen grains and in the six instead of four ovules per ovary cell. The shape of the leaves and the size of the bracts are also different.

#### Series d. *Tenuispicae*.

Herbae ascendentes vel suberectae. Folia oblonga, lineari-oblonga vel lanceolata, margine repanda vel repando-dentata. Spicae longe et graciliter pedunculatae, remotiflorae. Bracteae lineares, acutae, calyce dimidio breviores. Flores in axillis bractearum solitarii, ebracteolati. Calyx subaequaliter 5-fidus, lobis angustissimis et acutissimis, parce ciliolatis. Stamina longiora filamentis hirtellis. Granula pollinis virgis 21 punctatis ornata. Ovarium utroque loculo ovulis 5—8. Stylus hirtellus. Capsula seminibus 10—16. Semina areola plures cellulas alta munita, circum areolam pilis brevibus vestita; cellulae strati subepidermalis parietibus haud incrassatis.

Distributae in Insulis Philippinis.

The series *Tenuispicae* is confined to the Philippines. It is a small group of very similar plants looking more or less like species of *Aporuella* Clarke or *Staurogyne* Wall. The structure of the pollen grains, the presence of two rows of hairs retaining the style against the wall of the corolla, and the lateral flattening of the stigma prove that they belong to *Hemigraphis*. From *Staurogyne* they are moreover easily distinguishable by the presence of cystoliths, by the shape of the anthers and by the characters of the capsule and of the seeds.

Although the plants belonging to this series are habitually very unlike those belonging to the preceding one, the differences are in reality not very important, for they are mainly confined to the shape of the inflorescence with its remote flowers and small bracts, to the filiform calyx lobes and the small size of the hairs covering the seedcoat.

30. *Hemigraphis panayensis* (Merr.) Brem. n. comb.; *Ruellia panayensis* Merr. in Philipp. Journ. of Sc. X, p. 347, 1915; id., Enum. Philipp. Fl. Pl. III, p. 476, 1923.

Habitat Insulas Philippinas Panay et Mindoro dictas.

Species haec solvenda est in varietates duas quarum altera nova. Forma typica a me vocatur:

*H. panayensis* (Merr.) Brem. var. *Merrillii* Brem.

Herba ascendens, simplex vel sparse ramosa. Caulis sympodialis, primum pilis basiscopis hirtus, deinde glabrescens. Folia petiolo pubescente, 4—8 mm



longo munita; lamina oblonga vel elliptico-oblonga, 4—10 cm longa et 1.7—5 cm lata, apice obtusa vel subacuta, basi subobtusa, margine irregulariter repando-crenata et recurvata, subcoriacea, supra glabra, costa primum tamen sparse pilosa, subtus costa nervisque appresse pubescens, inter nervos sparse scabridula vel subglabra, cystolithis supra conspicuis, nervis utroque latere costae plerumque 6. Spicae interdum ramificatae, ad anthesin ramo axillari restituta. Pedunculus puberulo-pubescens, usque ad 6 cm longus. Rhachis pedunculo subaequilonga. Bractee usque ad 5 mm longae, puberulo-pubescentes. Calyx 10 mm longus, extus puberulo-pubescens. Corolla calyce vix longior, sed matura non visa. Granula pollinis 47  $\mu$  longa et 32  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 5—6. Stylus hirtellus. Capsula puberulo-pubescens, seminibus 10—12.

Habitat Insulas Philippinas Panay et Mindoro dictas.

Panay: Capiz Prov., Libacao, MARTELLINO and EDAÑO B. Sc. 35486 L; Mt Romblon, ESCRITOR B. Sc. 21236, typus, n.v.

Mindoro: Mt Calavite, RAMOS B. Sc. 39400 L.

**H. panayensis** (Merr.) Brem. var. **angustifolia** Brem. n. var.; typus: MARTELLINO et EDAÑO B. Sc. 35499 L.

Varietas foliis lineari-oblongis vel lineari-oblongis, 3—5 cm longis et 0.8—2 cm latis, plerumque circ. 4.5 cm longis et 1 cm latis, inflorescentiis brevioribus et floribus paucioribus instructis a forma typica recedens.

Habitat Insulam Philippinam Panay dictam.

Panay: Capiz Prov., Libacao, MARTELLINO and EDAÑO B. Sc. 35499 L. typus var.

This species resembles in its habit *Ruellia flagelliformis* Roxb. and *R. napifera* Zoll., two species which on account of their terminal spikes should be referred to *Aporuella* Clarke<sup>28</sup>), and it was probably on account of this resemblance that *H. panayensis* was described by MERRILL as a *Ruellia*.

*H. panayensis* differs from the two other representatives of this series by the softly pubescent shoots and petioles and by the subobtuse base of the leaves. From *H. mindorensis* Brem., which it resembles most, it differs moreover in the size of the pollen grains and in the obtuse or subacute, not caudate leaves.

31. **Hemigraphis mindorensis** Brem. n. spec.; typus: MERRILL 1785 BD.

Herba probabiliter erecta. Rami primum sulcis puberuli, deinde glabrescentes. Folia petiolo primum puberulo, mox glabrescente, 7—11 mm longo munita; lamina lanceolata vel oblonga, 5—14 cm longa et 2.2—4.5 cm lata, apicem versus sensim caudato-attenuata, basi acuta, margine repanda, tenuiter herbacea, discolor, cystolithis utraque facie conspicuis, subtus costa nervisque puberulo-pubescens, ceterum glabra, nervis utroque latere costae 5—6. Spicae solitariae vel interdum binae. Pedunculus glaber, 2—3 cm longus; rhachis 1—2 cm longa, glabra. Bractee 3.5 mm longae, sparsissime pubescentes.

<sup>28</sup>) *Aporuella flagelliformis* (Roxb.) Clarke and *A. napifera* (Zoll.) Brem. n. comb. are in habit more like some species of *Staurogyne* than like the *Ruellia* species found in the Malay Archipelago, which on account of their axillary flowers should be returned to the genus *Dipteracanthus* Nees. That on the other hand species of *Staurogyne* may be confused with plants resembling *Aporuella flagelliformis*, is shown by *Ruellia nudispica* Clarke: the absence of cystoliths, the small spreading thecae and small globose pollen grains prove that this plant is a *Staurogyne*: its name therefore should be *Staurogyne nudispica* (Clarke) Brem. n. comb. The peculiar kind of scabridity shown by the leaves, is a character which returns in many species belonging to this genus. ELMER transferred this species to *Gymnostachyum* Nees, which it resembles in habit. Two more species referred to this genus by ELMER, *G. subcordatum* Elm. and *G. palawanense* Elm., proved to belong to *Staurogyne*. Their names should be: *Staurogyne subcordata* (Elm.) Brem. n. comb. and *St. palawanensis* (Elm.) Brem. n. comb.

Calyx 10 mm longus, subaequaliter 5-fidus, fructu fere ad basin partitus, lobis parvissime ciliatis et pubescentibus. Corolla 15 mm longa. Granula pollinis 35—37  $\mu$  longa et 25—26  $\mu$  diam. Ovarium pilis capitatis comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula 12-seminalis, valvis dorso puberulo-pubescentibus.

Habitat Insulam Philippinam Mindoro dictam.

Mindoro: Baco River, MERRILL 1785 BD, typus.

The differences between this species and the preceding one have been enumerated above; from the next species it is easily distinguishable by the number of ovules and by the shape and texture of the leaves.

32. *Hemigraphis tenuispica* Brem. n. spec.; typus: RAMOS et EDAÑO B. Sc. 75387 U.

Herba basi repens, ramis floriferis ascendentibus. Rami ad nodos primum puberulo-pubescentes, ceterum glabri. Folia in petiolum glabrum, 5—10 mm longum contracta; lamina lineari-oblonga, 4—6.5 cm longa et 0.9—1.4 cm lata, subobtusata, basi contracta, margine repando-dentata et recurvata, subcoriacea, supra glabra, subtus costa nervisque puberula, cystolithis supra conspicuis, subtus minoribus et ad nervos venulosque solum distinguendis, nervis utroque latere costae 7—9. Spicae interdum ramificatae, ad anthesin ramulo axillari restitutae. Pedunculus glaber, 3—6 cm longus; rhachis usque ad 10 cm longa, glabra. Bracteae 4 mm longae. Pedicelli usque ad 1 mm longi. Calyx 8 mm longus, subglaber, lobis vix conspicue ciliolatis. Corolla nondum visa. Capsula 14—16 semina continens.

Habitat Insulam Philippinam Catanduanes dictam.

Catanduanes (east of Luzon); Ramos and Edaño B. Sc. 75387 U, typus.

The specimen on which this new species is based, was distributed under the name *H. setosa* Elm., but this is apparently a misidentification, for its bracts are much smaller than those ascribed to that species, and they lack the latter's conspicuous fringe of cilia. Although its flowers are unknown, it can hardly be doubted that it is a *Hemigraphis* and belongs to the same group as the two preceding species, from which it is easily distinguishable, however, by the larger number of nerves in the leaves, the shortly pedicellate flowers and the larger number of ovules. The structure of the seedcoat seems to rule out the possibility that it might be an *Aporuella*.

#### Series e. *Rosmarinifoliae*.

Herba ascendens. Folia linearia, coriacea, margine integra et conspicue incrassata. Spicae solitariae. Bracteae oblongo-lanceolatae, calyce paulo longiores, fugaciter ciliatae. Flores in axillis bractearum solitariae, ebracteolatae. Calyx lobato-fissus; lobi ciliolati, apice ciliis paucis longioribus coronati. Stamina longiora filamentis dense barbatis. Granula pollinis pro genere magna, virgis 21 marmoratis ornata. Ovarium utroque loculo ovulis 4. Stylus ad basin hirtellus. Capsula 8-seminalis. Semina areola plures cellulas alta munita, circum areolam pilis brevissimis puberula; cellulae strati subepidermalis parietibus haud incrassatis.

Habitat Insulam Philippinam Luzon dictam.

Of this series so far but a single species is known. It is doubtless nearly related to the two preceding series, from which it differs mainly in the large size of the pollen grains and the shortness of the hairs on the testa; the shortness of the calyx lobes is perhaps also worth mentioning.

33. *Hemigraphis rosmarinifolia* Brem. n. spec.; typus: FOXWORTHY et RAMOS B. Sc. 13207 L.

Herba ramosa, e basi repente ascendens. Rami ad nodos primum puberulo-pubescentes, mox toti glabri. Folia in petiolum glabrum, 2—3 mm longum contracta; lamina linearis, 2.5—3.5 cm longa et 3—4.5 mm lata, obtusa, basin versus attenuata, margine conspicue incrassata, integra, rigida, tota glabra, cystolithis supra conspicuis, nervis utroque latere costae 3—4, vix conspicuis. Spicae pedunculo glabro, 5—10 mm longo munitae; rhachis glabra, 1—1.5 cm longa. Bracteae 3- usque ad 6-parae, oblongo-lanceolatae, 6—8 mm longae et 3 mm latae, obtusae, basi acutae, coriaceae, margine incrassatae, fugaciter ciliatae. Calyx 5 mm longus, segmentis carinatis, mediano quam aliis paulo longiore, lobis triangularibus tubo paulo brevioribus, margine setulis minimis ciliolatis, apice in ciliis 1—3 exeuntibus, ceterum glaber. Corolla probabiliter circ. 7 mm longa. Stamina antheris apice obtusis, thecis basi subacutis. Granula pollinis  $54\mu$  longa et  $37\mu$  diam. Ovarium glabrum. Capsula glabra.

Habitat Insulam Philippinam Luzon dictam.

Luzon: Prov. of Tayabas, Quinacutan, FOXWORTHY and RAMOS B. Sc. 13207 L, typus.

This species is easily distinguishable from all its allies by its rigid and shining linear leaves.

#### Series f. *Axilliflorae*.

Herba ascendens. Folia ovata, margine integra, parva. Flores plurimi foliis ordinariis suffulti, inferiores solitarii ad nodos, alii oppositi, superiores foliis paulum redactis suffulti et congesti, omnes ebracteolati. Calyx subaequaliter 5-fidus, lobis margine setulosus. Stamina longiora filamentis dense hirtellis. Granula pollinis globosa, virgis 21 punctatis ornata. Ovarium utroque loculo ovulis 6. Stylus vix conspicue hirtellus. Capsula 12-seminalis. Semina areola plures cellulas alta munita, circum areolam pilis longis vestita; cellulae strati subepidermalis parietibus haud incrassatis.

Habitat Insulam Philippinam Luzon dictam.

Of this series too so far but a single species is known. From the three preceding series, to which it is apparently nearly related, it differs conspicuously in the globose pollen grains and in the nature of the inflorescence. The flowers are not subtended by bracts but by normal or, towards the top of the shoots, slightly reduced leaves. As the leaves however are all very small, they are not very different from bracts, and as all the upper nodes bear flowers, the ends of the shoots are more or less spike-like.

34. *Hemigraphis fruticulosa* Clarke in Philipp. Journ. of Sc. I, Suppl. p. 247, 1906; Merrill, Enum. Philipp. Fl. Pl. III, p. 471, 1923.

Herba e basi repente ascendens. Caules gracillimi, 0.7 mm diam., pilis basicopis sparse strigosi, internodiis 1.5—3.5 cm longis. Folia petiolo strigoso vel ad apicem hirtello, 1—2 mm longo munita; lamina ovata, 10—15 mm longa et 6—9 mm lata, obtusa, basi rotundata, margine integra et subrecurvata, supra subglabra vel setulis minimis sed numerosis scabridula et setis paucis sparsa, subtus costa nervisque densius, inter nervos sparse scabridula, cystolithis supra valde conspicuis, nervis utroque latere costae 3. Flores foliis ordinariis suffulti, superiores congesti. Calyx 7.5 mm longus, fructu usque ad 9 mm accrescens, segmentis carinatis, lobis extus ubique sed margine et carina densius setulosus. Corolla 14 mm longa. Stamina antheris apice obtusis, thecis basi obtusis. Granula pollinis  $40\mu$  diam. Ovarium comosum. Capsula comosa, ceterum puberula vel glabra.

Habitat Insulam Philippinam Luzon dictam.

Luzon: Cagayan, RAMOS B. Sc. 7427 BD; Benguet, Sablang, FÉNIX B. Sc. 12635 L; Rizal, Mt Canumay, RAMOS B. Sc. 13790 L et BD.

The various specimens differ somewhat in the hairyness of the leaves, and it might perhaps be possible to distinguish on account of this character some varieties.

Why CLARKE chose for this species the epithet *fruticulosa* is difficult to see, for it is evidently a herbaceous plant. By its axillary flowers and globose pollen grains it is easily distinguishable from all other species.

Some of the pollen grains obtained from RAMOS 13790 L, were unusually large and provided with more than 21 bands; the latter moreover, were arranged in a somewhat irregular pattern, and germ pores could not be detected. As these abnormal grains were  $55 \mu$  in diam., their volume was about twice as large as that of the normal ones.

### Series g. *Nudicrures*.

Herbae subrosulares, repentes, ascendentes vel erectae. Caulis ramique primum plerumque pilis basicopis vestiti. Folia longius petiolata, margine integra, grosse dentata vel sublobulata. Spicae plerumque distincte pedunculatae. Flores in axillis bractearum haud raro 2 vel 3 superpositi. Bracteeae integrae, ciliatae vel ciliolatae. Bracteolae plerumque nullae, parte basali spicarum tamen interdum evolutae. Calyx subaequaliter 5-fidus; segmenta carinata; lobi sparse ciliati. Filamenta staminum omnium glabra vel staminum longiorum interdum dimidio inferiore hirtella. Granula pollinis breviter ellipsoidea, summum  $40 \mu$  longa, virgis 21—27 punctatis, raro subcarunculatis ornata. Semina areola unam vel paucas cellulas alta munita; zona circumareolaris pilis annulatis interdum fugacibus instructa; parietes cellularum subepidermalium incrassatae.

Distributae praecipue in Insulis Philippinis et Moluccanis, Nova Guinea et Melanesia; species aliquae in terra Celebica, una in terra Borneënsi.

The series *Nudicrures* is well characterized by the absence of hairs in the upper half of the filaments and by the at the most  $40 \mu$  long, shortly ellipsoidal pollen grains provided with 21—27 bands. The small areola and the thickened walls of the subepidermal cells of the seedcoat are also important features.

The presence of a species belonging to this predominantly eastern series in East Borneo, is rather remarkable. The Bornean plant is stated to grow epiphytically, and this too is unusual, for the *Hemigraphis* species are, as a rule, weeds or road-side plants, and where they grow in the jungle, they confine themselves to sandy river banks and to open spaces in the woods. However, one species, *H. parva* Brem., was found on rocks in a river bed, and these may perhaps be regarded as stepping stones to a epiphytic life. It is, of course, possible that the Bornean species is but an incidental epiphyte.

The *Nudicrures* are by far the largest series in this genus. A subdivision into smaller groups, however, proved unsuccessful, as most of the species are rather similar. The nearest approach to a natural group is shown by the species 53—60: these plants are all provided with rather narrow, coarsely toothed or lobulate leaves.

#### 35. *Hemigraphis villosa* Brem. n. spec.; typus: RUTTEN 441 U.

Herba e basi repente ascendens, epiphytica dicta. Caulis primum dense, postea sparsius villosus. Folia petiolo dense villosa, 5—10 mm longo munita; lamina oblonga, 3.5—4.5 cm longa et 1.7—2.0 cm lata, utroque extremo rotundata, basi interdum paulum inaequalis, herbacea, discolor i.e. supra saturate viridis, sicc. saturate olivaceo-brunnea, subtus purpurea, sicc. dilute brunnea,

margine irregulariter repando-dentata, cystolithis sicc. supra immersis et nigrescentibus, difficiliter distinguendis, supra costa nervisque strigosa et inter nervos scabridula, subtus costa densius, ceterum sparsius villosa, nervis utroque latere costae 4—5. Spica pauciflora. Pedunculus gracilis, pilis basicopis strigosus, 2—5 cm longus; rhachis 1.2—2 cm longa. Flores in axillis bractearum solitarii, ebracteolati. Bracteae lineari-oblancoolatae, in petiolum brevissimum contractae, 7—12 mm longae et 1—2 mm latae, dorso breviter pubescentes, costa et margine ciliatae. Calyx 10 mm longus, segmentis inaequalibus, mediano quam aliis paulo longiore, lateralibus paulo brevioribus, lobis costa et margine ciliatis. Corolla alba, 1.5 cm longa. Stamina antheris ovoideis, thecis basi obtusis. Granula pollinis virgis 21 ornata, 38  $\mu$  long et 28  $\mu$  diam. Ovarium dimidio superiore pubescens, utroque loculo ovulis 6. Stylus hirtellus. Capsula glabra, 12-seminalis.

Habitat partem terrae Borneënsis orientalem.

E a s t B o r n e o : Bontang, alt. 20 m, in primeval forest, epiphytcal, RUTTEN 441 U, typus.

Apart from the fact that the pollen grains are less shortly ellipsoidal than those of the other species belonging to the *Nudicrures*, I find no characters in this plant disagreeing with the diagnosis of this series. Notwithstanding its occurring outside the main area, it must be regarded therefore as a true representative of the *Nudicrures*.

*H. villosa* is one of the few species of this series in which the indumentum of the shoots does not consist of basicopic hairs. That the latter, however, are not entirely absent, is seen in the peduncles.

By the nature of the indumentum this species shows some resemblance to *H. sublobata* Elm., where the peduncle, however, is covered with the same kind of hairs as the shoots and petioles; the peduncle is, moreover, shorter than in *H. villosa*.

36. *Hemigraphis primulifolia* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3, Nov. App., p. 153, 1880; Merr., Enum. Philipp. Fl. Pl. III, p. 473, 1923; *Ruellia primulifolia* Nees in Nov. Act. Acad. Nat. Cur. XIX, Suppl. I, p. 382, 1843; id. in DC., Prodr. XI, p. 144, 1847; Miq., Fl. Ind. Bat. II, p. 785, 1858; *Hemigraphis reptans* (Forst.) T. And. var. *primulifolia* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 208, Tab. IX fig. 4, 1897, p.p.; Merr., Fl. Manilla, p. 443, 1912; — *Ruellia parabolica* Nees in DC., Prodr. XI, p. 144, 1847; Miq., Fl. Ind. Bat. II, p. 786, 1858; *Hemigraphis parabolica* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3, Nov. App., p. 153, 1880; Vidal, Phan. Cuming. Philipp., p. 132, 1885; id., Rev. Pl. Vasc. Philipp., p. 204, 1886; Merr. in Philipp. Journ. of Sc. I, Suppl. p. 125, 1906; id., Enum. Philipp. Fl. Pl. III, p. 472, 1923; — *H. reptans* (Forst.) T. And. var. *gracilis* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 209, 1897, p.p.; — *H. rapifera* Hall. f. ex Merr. in Philipp. Journ. of Sc. I, Suppl. p. 125, 1906; id., Enum. Philipp. Fl. Pl. III, p. 473, 1923; — *H. oblongifolia* Merr. in Philipp. Journ. of Sc. XI, Bot., p. 204, 1916; id., Enum. Philipp. Fl. Pl. III, p. 472, 1923.

Herba subrosularis, stolonibus vagans. Caulis primum dense pubescens, postea plus minusve glabrescens. Folia petiolo primum pubescente, usque ad 3 cm longo, interdum tamen multo breviora munita; lamina oblonga, usque ad 5 cm longa et 2 cm lata, obtusa, basi plerumque subcordata, interdum obtusa vel subobtusa, margine subintegra vel repando-crenata, cystolithis utrimque conspicuis, supra semper setulis sparsa, sed numero setulorum valde variabili, subtus costa nervisque densius et inter nervos sparse pubescens, nervis utroque latere costae plerumque 5. Spicae pedunculo pubescente vel glabrescente, nunc satis longo, nunc breviora munitae. Bracteae primum congestae, deinde remo-

tiore, oblanceolatae, plerumque circ. 12 mm longae et 3—4 mm latae, obtusae, basi in petiolum brevem contractae. Flores in axillis bractearum plerumque 2 vel 3 superpositi, ebracteolati. Calyx 9 mm longus, extus sparse pubescens, lobis margine et costa ciliatis. Corolla 13 mm longa. Stamina longiora filamentis ad basin parce hirtellis; antherae apice obtusae, thecis basi obtusis. Granula pollinis virgis 21 ornata, 37  $\mu$  longa et 31  $\mu$  diam. Ovarium apicem versus pubescens, utroque loculo ovulis 5. Stylus basin versus hirtellus. Capsula apice puberula, 10-seminalis.

Habitat Insulas Philippinas et Moluccanas, terram Celebicam.

#### Philippines:

Luzon: Prov. of Nueva Vizcaya, Vicinity of Dupax, MC GREGOR B. Sc. 14153 L; Prov. of Pampanga, Camp Stotsenburg, Mt Pinatubo, ELMER 22349 L; Prov. of Tayabas, EDAÑO B. Sc. 26920 L; vicinity of Manilla, MERRILL 757 U; Prov. of Laguna, Los Baños, Mt Maguiling, ELMER 18130 L et U; Prov. of Sorsogon, Irosin, Mt Bulusan, ELMER 15894 L et U; Island Hali-hali near Manilla, MEYEN, typus n.v.

Samar: Catubig River, RAMOS B. Sc. 24240 L (type of *H. oblongifolia* Merr.).

Leyte: Mt Abucayan, EDAÑO B. Sc. 41713 L.

Camotes Islands: RAMOS B. Sc. 41605 L.

Mindanao: Prov. of Zamboanga, San Ramon, HALLIER 4065 a L et 4669 a L; Subprov. of Bukidnon, near Tanculas, FÉNIX B. Sc. 26012 L; Prov. of Surigao, Surigao, PIPER 232 L; Subprov. Butuan, Cabadbaran, PIPER 333 L. Philippines, s.l., CUMING 571, typus of *Ruellia parabolica* Nees n.v.

#### Moluccas:

Halmahera: Tidore, G. Mala-mala, alt. 800 m, LAM 3685 BZ.

Banda: s.l., coll. ign. 1375 L; coll. ign. s.n. L.

Ceram: South-east Ceram, Undur, alt. 0 m, KORNASSI (Exped. RUTTEN) 923 L; West Ceram, Loki, alt. 0—100 m, id. 1201 L et U.

#### Celebes:

South Celebes: Makassar, ZIPPELIUS s.n. L; *ibid.*, Kp Bisoi, NOORKAS (Exped. v. VUUREN) 31 L; Kalas, DOCTERS v. LEEUWEN 1497 U.

*H. primulifolia* comprises a great number of forms of which several may deserve specific rank, but which on account of the poor state of our material could not yet be separated. It is, however, not so variable as some authors have made it, and the material collected outside the area delimited above, e.g. in New Guinea, belongs indubitably to other species. The descriptions of *Ruellia primulifolia* and *R. parabolica* given by NEES l.c. do not reveal differences of any importance, and the same applies to those given by HALLIER of *H. reptans* var. *primulifolia* and var. *gracilis*. What the exact position of *H. reptans* var. *glaucescens* Hall. f. op. cit. p. 207 may be, is difficult to decide, but as HALLIER quotes specimens collected as far apart as Ambon in the Moluccas and Finschhafen in Eastern New Guinea, it can hardly be expected that it will prove to be a natural conception.

The name *H. rapifera* Hall. f., quoted first by KOORDERS and afterwards by MERRILL, owes its origin to a mistake. Some of the specimens collected by KOORDERS in the Minnahasa (Northern Celebes) were referred by HALLIER to *Ruellia rapifera* Zoll., which he transferred to the genus *Hemigraphis*. None of them really belong to this species, but some appear to be conspecific with the nearly related *Aporuella flagelliformis* (Roxb.) Clarke (*Ruellia flagelliformis* Roxb.), as was already recognized by VALETON (in Ic. Bog. III, p. 131, Tab. 253, 1908). Two of HALLIER's determinations were quite obviously wrong, and as the name on the labels was not very clearly written, it is not strange that it was misread by KOORDERS (in Meded. 's Lands Plantent. XIX, p. 515, 1897): in this way the name *Hemigraphis rapifera* Hall. f. came into being. HALLIER

soon afterwards recognized his mistake: in Nov. Act. Acad. Nat. Cur. LXX, p. 199, 1897, the two specimens (KOORDERS n. 15833 and n. 15838) are correctly referred to *H. repanda* (L.) Hall. f. This correction was apparently overlooked by KOORDERS, for in KOORDERS-SCHUHMACHER, Syst. Verz. III § 1, p. 117, 1914, the two numbers are again quoted under the still-born name *H. rapifera*. The confusion with *H. primulifolia* came about in another way: part of the specimens collected by KOORDERS under the number 15823, which belong either to *H. primulifolia* or to a species very nearly related to it, were, apparently by the mistake of a clerk who misread the number, distributed under the name *H. rapifera*! Whether the plants referred by MERRILL to *H. rapifera* are really conspecific with *H. primulifolia*, and if not, whether the Philippine plants are identical with those collected in various parts of Celebes, is a problem for whose decision more material both from the Philippines and from Celebes will have to be awaited. For the moment I prefer to consider them all conspecific with *H. primulifolia*.

*H. primulifolia* as defined above, is recognizable by its subrosulate habit, its pubescent shoots and petioles, its long-petiolate, oblong, at the base usually emarginate leaves, and five ovules per ovary cell.

The position of *Ruellia ravaccensis* Nees (in DC., Prodr. XI, p. 144, 1847) remains dubious. It is based on a plant collected in the island Lawak (not Rawak) at the north coast of New Guinea, and was placed by NEES between his *R. primulifolia* and *R. parabolica*. Subsequent authors too have always accepted it as a near relation of these plants, but if NEES's description is to be trusted, it can not belong to *Hemigraphis*, for its inflorescences are said to be axillary ("pedunculis axillaribus") and cymous ("Flores in pedunculo trifloro, duo oppositi, tertius paulo altior, terminalis").

*H. reptans* (Forst.) T. And. (ex Hemsley, Botany Challenger I, part 4, p. 273, 1885) was collected in the island Tanna, New Hebrides. According to HALLIER l.c. it occurs also in New Guinea and in New Britain, but the capsules of the New Guinean specimens which I have seen, were all provided with 10 instead of 6—8 seeds, and lacked the spreading calyx lobes ascribed to *H. reptans*. The latter, therefore, will probably prove to be specifically distinct from the plants collected in New Guinea, and there is certainly no reason to regard *H. primulifolia* as a variety of this species. The plant collected in New Britain, to which HALLIER l.c. refers, was originally described under the name *Strobilanthes Naumanni* Engl. As I have no doubt that it is specifically distinct both from *H. reptans* and from *H. primulifolia*, I will name it *H. Naumanni* (Engl.) Brem. n. comb. The new Guinean specimens which I have seen, belong certainly to more than one species, and not one is apparently conspecific with *H. primulifolia*, but as the material at my disposition is rather poor, I am unwilling to use it as basis for the description of new species.

37. ***Hemigraphis tayabensis*** Brem. n. spec.: typus: FOXWORTHY et RAMOS B. Sc. 13103 L.

Herba parva, basi repens, ramis floriferis ascendentibus. Caulis ramique gracillimi, 0.6 mm diam., primum hispidi, deinde glabrescentes. Folia petiolo sparse hispido, 2.5—5 mm longo munita; lamina lineari-oblonga, 1.5—2 cm longa et 5—8 mm lata, obtusa, basi acuta, margine subrepanda vel integra, supra sparse hispida, subtus costa nervisque hispidula et inter nervos sparse hispidula, supra cystolithis parvis dense lineolata, nervis utroque latere costae 3—4. Spicae solitariae. Pedunculus sparse hispidulus vel subglaber, 1—3.5 cm longus; rhachis primum brevissima, deinde usque ad 1.5 cm elongata. Bracteeae 3-parae; infimae lineari-oblancoolatae vel spatulatae, 7 mm longae et 1.2 mm latae, obtusae, supra hispida, subtus hispidula; aliae minores et basin versus haud conspicue attenuatae. Flores in axillis bractearum solitarii, ebracteolati.

Calyx extus sparse scabrido-pubescentis, 5.5 mm longus; lobi acuti pilis paucis longioribus ciliati. Corolla 10 mm longa. Stamina antheris apice obtusis, thecis basi obtusis. Granula pollinis virgis 21 ornata, 42  $\mu$  longa et 32  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 5. Stylus hirtellus. Capsula glabra, 10-seminalis.

Habitat Insulam Philippinam Luzon dictam.

Luzon: Prov. of Tayabas, Guinayangan, FOXWORTHY and RAMOS B. Sc. 13103 L, typus; Kabibihan, RAMOS B. Sc. 13276 L.

This species differs from *H. primulifolia* in its habit, the internodes between the leaf pairs being of normal length, by the shorter petiolate, narrower and smaller leaves, and the small flowers. It comes perhaps nearer to the following species, from which it differs mainly in its smaller size and in the larger pollen grains.

The type specimen is accompanied by another small *Acanthacea*. The latter belongs to the genus *Gymnostachyum* Nees and comes very near to *G. affine* Nees.

38. *Hemigraphis ceramensis* Brem. in *Blumea* V, p. 239, 1942; — *H. Rumphii* Brem. var. *angustifolia* Brem. l.c., p. 241.

Herba e basi repente ascendens. Caulis ramique primum pilis basiscopis dense hispidi, deinde plus minusve glabrescentes. Folia petiolo pilis subrectis primum dense hispido, 5—15 mm longo munita; lamina lanceolata, 3—5 cm longa et 0.6—1.2 cm lata, subacuta, basi acuta vel subcontracta, margine integra, supra praesertim costa setulis paucis, mox deciduis sparsa, subtus costa nervisque setulis parvis scabridula, margine etiam scabridula, cystolithis utrimque sed praesertim supra conspicuis, nervis utroque latere costae plerumque 5. Spicae solitariae, plerumque mox a ramulis uno vel duobus ex axillis foliorum supremorum orientibus superatae. Pedunculus gracillimus, subglaber, 3—6 cm longus; rhachis ultimo usque ad 4.5 cm longa. Bractee 4- vel 5-parae, lineariblancheolatae; infimae usque ad 2 cm longae; aliae 1 cm longae et 2 mm latae, subobtusae, margine et costa setulis paucis ciliolatae, ceterum glabrae. Flores in axillis bractearum plerumque solitarii, semper ebracteolati. Calyx 8 mm longus, subglaber, lobis margine ciliolatis. Corolla 13 mm longa. Stamina antheris apice obtusis, thecis basi muticis. Granula pollinis virgis 21 ornata, 35  $\mu$  longa et 27  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 5. Stylus hirtellus. Capsula 10-seminalis.

Habitat Insulas Moluccanas.

Ceram: in the northern part of the island at Wai Tuhu, alt. 80 m, KORNASSI (Exped. RUTTEN) 60 U, typus, L, dupl. typi; Koloa, alt. 80 m, id. 132 L (type of *H. Rumphii* var. *angustifolia*); in the south-eastern part at Kotta, alt. 100—200 m, id. 1014 U.

Talau Archipelago: Island Karakelang, southern slope of G. Duatan, alt. 50 m, LAM 2712 BZ; east of Beo, alt. 100 m, id. 2669 BZ.

This species resembles the preceding one in several respects, but is easily distinguished by the larger size of the subacute, not obtuse, and less hairy leaves, by the larger and more numerous flowers, and by the smaller size of the pollen grains.

39. *Hemigraphis diversifolia* Elm. in *Leaf. Philipp. Bot.* X, p. 3673, 1939.

Herba parva, e basi repente ascendens, caulibus parce ramosis. Caulis ramique primum pilis basiscopis densius puberulo-pubescentes, deinde plus minusve glabrescentes. Folia forma et magnitudine valde variabilia; omnia subito in petiolum contracta, tenuia, subobtusata, margine subintegra, cystolithis supra conspicuis, supra setulis perpaucis sparsa, subtus costa nervisque densius pubescentia, nervis utroque latere costae 3; inferiora petiolo laminae subaequi-



longo; lamina ovato-orbicularis, 1.2—3 cm longa et 8—11 mm lata; superiorum petiolus lamina semper multo brevior et haud raro etiam petiolo foliorum inferiorum brevior; lamina ovato-lanceolata, 7—15 mm longa et 3—5 mm lata. Spicae pedunculo puberulo-pubescente, 5—15 mm longo; rhachis pedunculo brevior. Bractee 2- vel 3-parae, anguste rhomboideae; infimae haud raro floribus longiores; mediae 5 mm longae et 3 mm latae, subacutae, margine vix ciliatae, indumento eodem ut folia vestitae. Flores in axillis bractearum solitarii, ebracteolati. Calyx 5—8 mm longus, extus breviter pubescens; lobi margine et costa breviter ciliati, apice insuper pilis 1—2 longis coronati. Corolla 10 mm longa. Stamina longiora filamentis basi parce ciliatis; antherae obtusae, thecis basi muticis. Granula pollinis virgis 24 carunculatis ornata, 40  $\mu$  longa et 30  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 6. Stylus basin versus hirtellus. Capsula praesertim apicem versus breviter pubescens, plerumque 7-seminalis.

Habitat Insulam Philippinam Luzon dictam.

Luzon: Prov. of Sorsogon, Irosin, Mt Bulusan, ELMER 15398 L, exemplum typi.

This species is very similar to the next one, from which it differs mainly in the carunculate pollen grains and in the somewhat smaller size of the bracts. The living plants are, according to ELMER l.c., easily distinguishable.

In the variability of the leaf shape these two species resemble three of the species belonging to the series *Pubicrures*, namely *H. viridis* Merr., *H. proteus* Brem. and *H. halconensis* Brem., v. supra.

40. *Hemigraphis subtinctoria* Elm. in Leaflet. Philipp. Bot. X, p. 3674, 1939.

Herba parva, e basi repente ascendens, caulibus parce ramosis. Caulis ramique primum pilis basiscopis densius puberulo-pubescentes, deinde plus minusve glabrescentes. Folia forma et magnitudine valde variabilia; omnia subito in petiolum 5—9 mm longum contracta, tenuia, subobtusata, margine subintegra vel vix distincte repanda, supra setulis perpaucis sparsa, subtus costa nervisque densius pubescentia, sicc. subtus viridi-coerulescentia; inferiora ovata, 2 cm longa et 1.2 cm lata, cystolithis supra solum distinguendis, nervis utroque latere costae 3; superiora obcuneata vel lineari-obcuneata, circ. 4 cm longa et 1.1—1.6 cm lata, cystolithis utrimque conspicuis, nervis utroque latere costae plerumque 4. Spicae terminales et insuper ex axillis foliorum supremorum laterales, hae solitariae; pedunculus 1.1 cm longus, pilis basiscopis puberulo-pubescentibus. Bractee infimae lineares, usque ad 1.5 cm longae et 2 mm latae; aliae 1 cm longae et 3 mm latae, margine vix conspicue ciliatae, indumento foliis similes. Flores in axillis bractearum solitarii, ebracteolati. Calyx 7 mm longus. Corolla 1 cm longa. Granula pollinis virgis 24 punctatis ornata, 40  $\mu$  longa et 30  $\mu$  diam. Capsula apice sparse pubescens, seminibus paucis.

Habitat Insulam Philippinam Luzon dictam.

Luzon: Prov. of Sorsogon, Irosin, Mt Bulusan, ELMER 15430 L, exemplum typi.

The difference between this species and the at first view almost indistinguishable *H. diversifolia* has been discussed already. The presence of carunculate and smooth-banded pollen grains in species so nearly related as these two, is a noteworthy fact. The small number of well-developed seeds found in the capsules of these two species is also rather remarkable, as the fertility is in this genus as a rule very large, only those species in which a considerable part of the pollen grains are imperfectly developed forming exceptions.

41. *Hemigraphis sublobata* Elm., Leaflet. Philipp. Bot. II, p. 591, 1909; Merr., Enum. Philipp. Fl. Pl. III, p. 474, 1923.

Herba parva repens, ramis floriferis brevibus ascendentibus. Caulis ramique

graciles, primum pilis patentibus dense vestiti, deinde interdum plus minusve glabrescentes. Folia petiolo gracili, primum pilis patentibus dense pubescente, supra solum glabro, 5—10 mm longo munita; lamina ovato-lanceolata vel ovata, 1.5—3 cm longa et 0.6—1.3 cm lata, obtusa, basi prope petiolum subito contracta, margine irregulariter pauci- et grosse-dentata vel repanda, tenuis, cystolithis utrimque distinguendis, supra saturate, subtus dilute viridis, supra setulis sparsa, subtus costa nervisque dense pubescens, inter nervos setulis parvis sparsa, nervis utroque latere costae 3—4. Spicae pedunculo pubescente, 1.2—1.5 cm longo, gracili instructae; rhachis pubescens, 0.5—1.0 cm longa. Flores infimi plerumque foliis parvis suffulti; bractee florum aliorum linear-oblongae, 10 mm longae et 3 mm latae, obtusae, basi contractae, utrimque setulis parvis sparsae. Flores in axillis bractearum solitarii, ebracteolati. Calyx 8 mm longus, extus puberulus; lobi margine et costa setulis parvis ciliati. Corolla 14 mm longa. Stamina longiora filamentis basi hirtellis; antherae apice obtusae, thecis basi muticis. Granula pollinis matura nondum visa. Ovarium comosum, utroque loculo ovulis 6. Stylus basin versus hirtellus. Capsula glabra vel apice pilis paucis sparsa; semina usque ad 12.

Habitat Insulas Philippinas.

Negros Oriental: Dumaguete, ELMER 9665 L, exemplum typi.

Leyte: Mt Abucayan, EDAÑO B. Sc. 41701 L; Cábalian, RAMOS B. Sc. 41524 L.

Samar: Catubig River, EDAÑO B. Sc. 24185 L (distributed as *H. oblongifolia* Merr.).

I have seen no specimens from Mindanao which could be referred with certainty to this species, but HALLIER n. 4690 L, collected at San Ramon in the province of Zamboanga, comes near to it. The material, however, is too incomplete to allow a definite conclusion.

*H. sublobata* is easily recognizable by its coarsely toothed leaves and patently hairy shoots and petioles. The only species with which it shows some resemblance is *H. villosa*, but in this Bornean species the peduncle is strigose, not patently hairy.

#### 42. *Hemigraphis lanaënsis* Brem. n. spec.; typus: M. S. CLEMENS s.n. BD.

Herba basi repens, caulibus floriferis ascendentibus. Caulis pilis basiscopis primum dense, deinde sparse scabridi. Folia petiolo pilis basiscopis et pilis aliquibus longioribus patentibus scabridi, 3—10 mm longo munita; lamina oblonga, ovata vel obovata, 1.8—5.0 cm longa et 0.9—2.0 cm lata, obtusa, basi subacuta, margine repanda et recurvata, cystolithis supra conspicuis, supra nitidula, inter nervos plus minusve bullata, scaberrima, subtus costa nervisque dense pubescens, inter nervos sparse scabrido-pubescentis, nervis utroque latere costae 4—5. Spicae terminales et axillares, longe pedunculatae. Pedunculus 3—4 cm longus; rhachis usque ad 2.5 cm longa. Bractee paribus 4—6; infimae interdum plus minusve foliaceae, i.e. supra scaberrima, usque ad 18 mm longae et 5.5 mm latae; aliae oblongae, 9 mm longae et 4.5 mm latae, obtusae, margine ciliatae, ceterum glabrae. Flores in axillis bractearum infimarum interdum duo superpositi, in axillis bractearum aliarum solitarii, omnes ebracteolati. Calyx 8 mm longus, lobis margine et costa ciliatis. Corolla 12—14 mm longa. Stamina filamentis omnibus glabris, antheris apice obtusis, theca altera basi acuta. Granula pollinis matura nondum visa. Ovarium parce et breviter comosum, utroque loculo ovulis 5. Stylus breviter hirtellus. Capsula apice parce et breviter comosa, seminibus 8—10.

Habitat Insulam Philippinam Mindanao dictam.

Mindanao: Lake Lanao, Camp Keithley, M. S. CLEMENS s.n., March 1907 BD, typus.

The pollen grains were not yet sufficiently developed to show their surface relief, but their small size and proportionally large diameter prove that they are of the same kind as those of the other species belonging to this series.

*H. lanaënsis* differs from the other species of the *Nudicrures* in the scabridity of the shoots and petioles and of the upper side of the leaves.

43. *Hemigraphis baractanensis* Elm., Leafl. Philipp. Bot. VII, p. 2543, 1915; Merr., Enum. Philipp. Fl. Pl. III, p. 471, 1923.

Herba basi repens, caulibus floriferis parce ramosis ascendentibus. Caules primum pilis basiscopis scabrido-pubescentes, deinde plus minusve glabrescentes. Folia petiolo primum pilis erectis scabrido-pubescente, 4—15 mm longo munita; lamina obovata, 4.5—5.5 cm longa et 1.7—3.3 cm lata, obtusa, basi cuneata, margine grosse-dentata, cystolithis utrimque sed praesertim supra conspicuis, cellulis epidermalibus supra magnis, sub lente faciliter distinguendis, supra costa solum setulis perpaucis, mox deciduis sparsa, subtus costa nervisque densius et inter nervos sparse setulis parvis scabridula, nervis utroque latere costae plerumque 5. Spicae terminales et axillares, pedunculo pilis basiscopis scabrido, 5—9 mm longo instructae; rhachis usque ad 4 cm longa. Bractee anguste ovato-lanceolatae, 8.5—9 mm longae et 3—3.5 mm latae, subobtusae, dimidio superiore utroque latere dentibus duobus munitae, margine ciliatae, utraque facie setulis paucis sparsae, in petiolum brevem contractae. Flores in axillis bractearum 2 vel 3 superpositi, ebracteolati. Calyx 7 mm longus, extus subglaber; lobi margine et costa breviter ciliati, apice uno vel duobus pilis longis coronati. Corolla matura non visa. Stamina antheris apice obtusis, thecis basi muticis. Granula pollinis matura nondum visa. Ovarium comosum, utroque loculo ovulis 6. Stylus ad basin hirtellus. Capsula subglabra, 12-seminalis.

Habitat Insulam Philippinam Mindanao dictam.

M i n d a n a o : District of Davao, Todaya, Mt Apo, ELMER 11070 L, exemplum typi.

*H. baractanensis* is easily recognizable by its dentate bracts, a character found also in *H. petola* Hall. f., but nowhere else in the series *Nudicrures*; outside this series they recur in *H. dentata*, one of the species of the series *Imbricatae*. *H. baractanensis* differs from *H. petola* in the obovate leaves and superposed flowers; *H. dentata* is easily distinguishable from *H. baractanensis* by its glandular pubescence. Characters in which *H. baractanensis* differs from the other species of the *Nudicrures* are, apart from the dentate bracts, the obovate, on the lower side scabridulous leaves.

44. *Hemigraphis chamaedrys* Brem. n. spec.; typus: FORSTEN 85 L.

Herba parva, e basi repente ascendens. Caules graciles, vix 1 mm diam., primum pilis basiscopis dense, deinde sparse pubescentes. Folia petiolo pubescente, 5—10 mm longo munita; lamina ovata, 1.5—2 cm longa et 1.2—1.5 cm lata, obtusa, basi prope petiolum subito et breviter contracta, margine repando-crenata, supra setulis paucis longioribus et brevioribus numerosis scabrida, subtus costa nervisque densius, inter nervos sparse et breviter scabrido-pubescentis, cystolithis supra numerosis et conspicuis, subtus vix distinguendis, nervis utroque latere costae plerumque 4. Spicae terminales et ex axillis foliorum superiorum interdum laterales. Pedunculus 1—2.5 cm longus, dense pilis basiscopis vestitus; rhachis circ. 1 cm longa, eodem modo strigosa. Bractee plerumque 3-parae, oblanceolatae; infimae interdum usque ad 12 mm longae, margine utroque latere crenulis 2 vel 3 munitae; aliae plerumque 8 mm longae et 2 mm latae, integrae; omnes obtusae, margine et costa subtus ciliatae. Flores in axillis bractearum nunc 2—3 superpositi, nunc solitarii, omnes ebracteolati. Calyx 6.5 mm longus, fructu usque ad 8 mm accrescens, subglaber, lobis margine

et costa ciliatis. Corolla 1 cm longa. Stamina omnia filamentis glabris, antheris apice obtusis, thecis basi muticis. Granula pollinis virgis 21 ornata,  $35 \mu$  longa et  $26 \mu$  diam. Ovarium breviter comosum, utroque loculo ovulis 4. Stylus ad basin hirtellus. Capsula apice puberula, 8-seminalis.

Habitat partem terrae Celebicae septentrionalem.

Celebes: Minahassa, near Menado, FORSTEN 85 L, typus; *ibid.*, Belang, alt. 10 m, LAM 2455 BZ.

It is not improbable that KOORDERS n. 15822, quoted by HALLIER (in Nov. Act. Acad. Nat. Cur. LXX, p. 202, 1897) under the name *H. prostrata* Hall. f., and by KOORDERS-SCHUHMACHER (Syst. Verz. III § 1, p. 117, 1914) under that of *H. reptans* (Forst.) T. And., will prove to belong to the species described above. The occurrence of *H. prostrata* in Celebes is improbable: this species is apparently confined to the Aru Islands; and that *H. reptans*, a species known with certainty from the New Hebrides only, would be found as far westwards as Celebes, seems excluded.

*H. chamaedrys* resembles *H. primulifolia*, but it is not subrosulate, its leaf pairs being separated by well developed internodes; the leaves themselves are smaller, ovate and not emarginate at the base, and the peduncle is about as long as the preceding internode. The resemblance between this species and *H. cardiophylla* Quisumb. (in Philipp. Journ. of Sc. XLI, p. 359, fig. 24, 1930) is probably still greater; the leaves of the latter, however, are cordate, not ovate, and less distinctly repando-crenate; it is known to me only from the description.

45. *Hemigraphis keiensis* Brem. n. spec.; typus: HJ. JENSEN 147 L.

Herba e basi repente ascendens. Caules graciles, vix 1 mm diam., primum pilis basicopis sparse pubescentes, deinde glabrescentes, internodiis 2,8 cm longis. Folia petiolo subtus pubescente, 5—10 mm longo munita; lamina ovata vel ovato-oblonga, 1.7—3.4 cm longa et 1.0—2.0 cm lata, obtusa vel subacuminata, basi rotundata, margine crenata vel repanda, supra tota glabra vel setulis paucis praesertim costa insitis scabridula, subtus costa nervisque dense et inter nervos sparse pubescens, supra minute albo-punctata, cystolithis supra conspicuis, nervis utroque latere costae 3—4. Spicae terminales et interdum axillares. Pedunculus sparse pubescens, 1—3 cm longus; rhachis primum vix 1 cm longa. Bractee 3-parae, oblanceolatae vel spathulatae; infimae 12 mm longae et 2.4 mm latae; mediae 7 mm longae et 2.8 mm latae; supremae minores; omnes subobtusae, margine ciliolatae, ceterum glabrae. Flores in axillis bractearum solitarii vel interdum duo superpositi, omnes ebracteolati. Calyx 9 mm longus, extus sparse et vix conspicue pubescens, lobis margine ciliolatis. Corolla dilute violacea, 13—17 mm longa. Stamina omnia filamentis glabris, antheris apice obtusis, thecis basi muticis. Granula pollinis virgis 24 ornata,  $35 \mu$  longa et  $28 \mu$  diam. Ovarium comosum, utroque loculo ovulis 5. Stylus hirtellus. Capsula seminibus 8—10.

Habitat Archipelagum Kei dictum.

Kei Islands: Great Kei, G. Daäg, alt. 300 m, HJ. JENSEN 113 L; Elat, near the coast, *id.* 147 L, typus.

*H. keiensis* resembles *H. chamaedrys*, but is easily distinguishable from the Celeban species by its 5 instead of 4 ovules per ovary cell, and by its larger flowers.

*H. prostrata* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 202, Tab. IX fig. 3, 1897, comes very near to *H. keiensis*, but is a much larger plant with almost entirely glabrous leaves and more distinctly ciliate bracts. The type specimen was collected in the Aru Islands; it was unfortunately not available

to me, and as the description is in various respects incomplete, it is not worth repeating it. The specimens from elsewhere quoted by HALLIER, belong to other species: FORBES n. 3275 from Ambon to *H. moluccana* Brem., TEYSMANN n. 5024 to *H. Rumphii* Brem. and KOORDERS n. 15822 from the Minahassa probably to *H. chamaedrys* Brem. (v. supra).

46. *Hemigraphis undulata* Brem. in Blumea V, p. 242, 1942.

Herba repens, ramis floriferis ascendentibus. Caulis ramique graciles, vix 1.5 mm diam., subteretes, primum densius, deinde sparse pubescentes, internodiis usque ad 5 cm longis. Folia petiolo densius et longe pubescente, 4—20 mm longo munita; lamina foliorum majorum ovata, foliorum minorum apice ramorum congestorum ovato-orbicularis, 10—28 mm longa et 8—17 mm lata, obtusa, basi rotundata vel subcordata, margine crenata et conspicue undulata, supra setulis basi bulbosis scabridula, subtus costa nervisque densius et inter nervos sparse pubescens, cystolithis vix conspicuis, vivo utrimque laete viridis, nervis subtus tamen subviolaceis, nervis utroque latere costae 4—5. Spicae pedunculo 3 mm longo munitae; rhachis 0.7—1.2 cm longa. Bractee infimae foliaceae, ellipticae, circ. 8 mm longae, basi acutae, nervis utroque latere costae 3 instructae; aliae lineari-oblongatae, 6—8 mm longae et 2 mm latae, margine longe sed appresse ciliatae, supra pilis similioribus sparsae, subtus costa breviter pubescentes. Flores in axillis bractearum solitarii, ebracteolati. Calyx 8 mm longus, lobis ciliatis. Corolla alba, 10 mm longa. Stamina omnia filamentis glabris, antheris apice obtusis, thecis basi muticis. Granula pollinis virgis 24 ornata, 39  $\mu$  longa et 29  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 4—5. Stylus sparse hirtellus. Capsula nondum visa.

Habitat archipelagum Talaud dictum.

Talaud Islands: Island Miangas, G. Soro, alt. 60 m, on a grassy slope, LAM 3398 BZ, typus.

Peduncles as short as those found in this species are in the *Nudicrures* an uncommon feature; they recur, however, in *H. moluccana* Brem. *H. undulata* differs from the latter in the smaller size of the pollen grains, the narrower bracts and the presence of 4—5 instead of 6 ovules per ovary cell.

47. *Hemigraphis moluccana* Brem. n. spec.; typus: Hort. Bot. Bog. cult. XI B XIV 148; — probabiliter *H. reptans* (Forst.) T. And. var. *glaucescens* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 207, 1897.

Herba repens, ramis floriferis ascendentibus. Caules ramique graciles, circ. 1 mm diam., primum pilis basiscopis dense, deinde sparse pubescentes, internodiis 2—9 cm longis. Folia petiolo canaliculato, subtus dense pubescente, 4—10 mm longo munita; lamina ovata, 1.6—2.8 cm longa et 1.1—2.0 cm lata, obtusa, basi rotundata vel subcordata, margine crenata et recurvata, interdum undulata, supra densius scabrida, costa nervisque densius strigosis, subtus costa nervisque dense et inter nervos sparse scabridula, supra minute sed dense albo-punctata, cystolithis supra valde numerosis, nervis utroque latere costae 3—4. Spicae terminales, pedunculo pubescente, 5—10 mm longo munitae, mox a ramulo axillari restitutae; rhachis vix 1 cm longa. Bractee infimae foliaceae, margine crenatae; aliae obovatae vel oblongatae, 8—8.5 mm longae et 3—4 mm latae, obtusae, margine sparse pilis longis cum pluribus brevioribus mixtis ciliatae, utraque facie brevissime pilosae. Flores in axillis bractearum plerumque solitarii, semper ebracteolati. Calyx 9 mm longus, extus vix conspicue pubescens, lobis margine eodem modo ut bractee ciliatis. Corolla 16 mm longa. Stamina omnia filamentis glabris, antheris apice obtusis, thecis basi muticis. Granula pollinis virgis 21 ornata, 47  $\mu$  longa et 32  $\mu$  diam.

Ovarium dimidio superiore pubescens, utroque loculo ovulis 6. Stylus hirtellus. Capsula nondum visa.

Habitat Insulas Moluccanas.

Moluccas: s.l., in Hort. Bogor. culta sub XI B XIV 148 (cf. DAKKUS in Bull. Jard. Bot. de Buitenz. Sér. 3, Suppl. I, p. 157, 1930) exsicc. vidi in herb. PAS., typus; Ambon, FORBES 3275 L.

The last-named specimen was quoted by HALLIER (in Nov. Act. Acad. Nat. Cur. LXX, p. 202, 1897) under *H. prostrata* Hall. f., from which it differs however conspicuously by its hairyness and in the shortness of its peduncles. *H. reptans* (Forst.) T. And. var. *glaucescens* Hall. f. is known to me only from the description, which does not reveal any important differences with the species described above.

*H. moluccana* differs from *H. keiensis* and *H. undulata*, the two species to which it comes nearest, in the greater width of the bracts, the 6 instead of 4—5 ovules in each of the ovary cells, and in the larger size of the pollen grains; from *H. keiensis* moreover in the shortness of its peduncles.

48. *Hemigraphis alternata* (Burm. f.) T. And. in Journ. Linn. Soc. VII, p. 114, 1864, syn. excl.; Brem. in Blumea V, p. 239, 1942; non apud Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1907, nec apud auctores alios qui postea nomine hoc usi sunt, nam species quae eis in animo erat est *H. sumatrensis* (Roth) Brem.; *Ruellia alternata* Burm. f., Fl. Ind. p. 135, 1768, syn. Rumph. et Rheed. excl.; — *Ruellia colorata* Bl., Bijdr. Fl. Ned. Ind. p. 795, 1826; Nees in DC., Prodr. XI, p. 145, 1847, syn. Rumph. excl.; Miq., Fl. Ind. Bat. II, p. 787, 1858, syn. Rumph. excl.; non Vell., Fl. Flum. VI, Tab. 99, 1827; *Goldfussia colorata* (Bl.) Zoll. et Mor., Syst. Verz. p. 47, n. 544, 1846, non *G. colorata* Nees in Wall., Pl. As. Rar. III, p. 89, 1832; *Hemigraphis colorata* (Bl.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 199, Tab. IX fig. 1 et 2, 1897; Koorders, Exkursionsfl. v. Java III, p. 215, 1912, syn. *Ruellia nemorosa* Zoll. excl.; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 42, 1912; ? *Hemigraphis colorata* (Bl.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899.

Herba ramosa, e basi repente ascendens. Caules vivo saturate violacei, puberulo-pubescentes. Folia petiolo vivo saturate violacea, 2—4.5 cm longo munita; lamina cordata, 4—7 cm longa et 2.5—5 cm lata, acuta, margine crenata, discolor, vivo supra griseo-viridis et ad costam nervosque saturate viridis, subtus purpureo-violacea, cystolithis sicc. supra conspicuis, supra primum setulis paucis scabridula, deinde glabrescens, subtus costa nervisque puberulo-pubescentis, nervis utroque latere costae plerumque 5. Spicae solitariae vel ternae. Pedunculus puberulo-pubescentis, usque ad 1 cm longus; rhachis 2—10 cm longa. Bractee ovato-lanceolatae, 8—10 mm longae et 3—5 mm latae, acutae, margine hispido-ciliolatae, dorso puberulae, vivo dorso sordide violacea. Flores in axillis bractearum infimarum plerumque duo superpositi, in axillis bractearum aliarum solitarii, plerumque ebracteolati sed interdum inferiores bracteolis setaceis calyce multo brevioribus instructi. Calyx 7—8 mm longus, extus subglaber, vivo violaceo-punctatus, lobis margine hirtello-ciliolatis, costa interdum puberulis. Corolla alba, 14—15 mm longa. Stamina longiora filamentis basi hirtellis, ceterum pilis capitatis minutis obtectis; breviora filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis semper sterilia. Ovarium comosum, utroque loculo ovulis 5. Stylus brevissime hirtellus, vivo apicem versus violascens. Capsula numquam evoluta.

In India Aquosa et ultra saepe culta. Patria ignota.

Sumatra, Java, Borneo, Celebes, Moluccas, Philippines.

As this species is everywhere in the Malay Archipelago, and sometimes

in other tropical countries also, used for edging in flower beds, it is so well known that it seems superfluous to quote specimens. In temperate countries it is a well-known stove plant.

As stated above, its country of origin is unknown, but as it belongs to the series *Nudicrures*, it probably came from the eastern part of the Malay Archipelago. It is noteworthy, however, that it is not one of the species dealt with in RUMPHIUS's "Herbarium Amboinense".

The "Flore Générale de l'Indo-Chine records its occurrence in Annam and Cochinchina, but without mentioning whether it was found wild or cultivated. As the corolla of these plants is described as yellowish-white, I am not convinced that the specimens really belong to this species.

Fruits are never produced, and the pollen is apparently completely sterile. It is always propagated vegetatively. KOORDERS's statement l.c. that it occurs in Java both cultivated and wild, may be due to a confusion with *H. nemorosa*, which he quotes as a synonym.

How ANDERSON l.c. could have confused this very characteristic species with the totally different *Ruellia blumeana* Nees, i.e. *Hemigraphis sumatrensis* (Roth) Brem., is difficult to see. As I have already mentioned in *Blumea* V, p. 239, 1942, the real identity of BURMAN's species was first established by Prof. HOCHREUTINER.

HALLIER l.c. distinguishes a forma *umbrosa* and a forma *aprica*, but the difference between these two forms is irrelevant.

49. *Hemigraphis prostrata* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 202, Tab. IX fig. 3, 1897, quoad typum.

Foliis majoribus a *H. chamaedryde* Brem., *H. keiensi* Brem., *H. undulata* Brem., *H. moluccana* Brem., foliis nec cordatis nec regulariter crenatis a *H. alternata* (Burm. f.) T. And., foliis supra glaberrimis, subtus costa nervisque pubescentibus, petiolis brevioribus, bracteis oblanceolatis a *H. Robinsonii* Brem. diversa.

Habitat archipelagum Aru dictum.

Aru Islands: Wokam, TREUB s.n. BZ. n.v.; Hort. Bogor. cult. n.v.

As I have seen no material of this species, I have confined myself to an enumeration of the points of difference existing, according to HALLIER's description, between this species and its nearest allies. The lower flowers are said to be provided with minute bracteoles, a feature which, according to HALLIER, is also met with in *H. alternata*, where it is, however, by no means general.

As stated above, the specimens collected outside the Aru Islands belong to other species; the plants collected by TEYSMANN in Ambon to *H. Rumphii*, that collected by FORBES in the same island to *H. moluccana*, and KOORDERS n. 15822 from the Minahassa perhaps to *H. chamaedrys*.

50. *Hemigraphis Robinsonii* Brem. n. spec.; typus: KORNASSI (Exped. RUTTEN) 1132 L; — *H. Rumphii* Brem. var. *gracilis* Brem. in *Blumea* V, p. 241, 1942; — *H. reptans* (Forst.) T. And. var. *glaucescens* Hall. f. in errore apud Merrill, Interpret. Herb. Amb., p. 471, 1917 et Robinson in schedula "Plantae Rumphianae Amboinenses n. 100".

Herba e basi procumbente ascendens. Caulis ramique primum dense puberulo-pubescentes, deinde plus minusve glabrescentes. Folia petiolo gracili, densius puberulo-pubescente, 1.2—4.5 cm longo munita; lamina ovata vel ovato-oblonga, 3.5—9 cm longa et 1.8—4.6 cm lata, obtusa vel subacuta, basi ad petiololum brevissime et vix distincte contracta, margine indistincte crenata et incurvata, subcoriacea, discolor, supra primum sparse scabridula, ultimo plus

minusve glabrescens, opaca, subtus costa nervisque densius pubescens sed ceterum glabra, cystolithis utrimque numerosis, sed supra majoribus et magis conspicuis, nervis utroque latere costae 5—6. Spicae plerumque in triades dispositae, densae et multiflorae. Pedunculus gracilis, pilis basiscopis dense puberulo-pubescens, 0.5—1.0 cm longus; rhachis pedunculo similior. Bracteae 3- vel 4-parae, oblongae, 8—12 mm longae et 4—5 mm latae, subobtusae, margine pilis longis ciliatae, dorso puberulo-pubescentes. Flores in axillis bractearum solitarii, ebracteolati. Calyx 8 mm longus, fructu accrescens, subglaber; lobi margine pilis brevibus cum paucis longioribus mixtis ciliati. Corolla alba, 17 mm longa. Stamina omnia filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis virgis 21 ornata, 32—35  $\mu$  longa et 25—27  $\mu$  diam. Ovarium apicem versus hirtellum, utroque loculo ovulis 6. Stylus hirtellus. Capsula apicem versus breviter hirtella, seminibus pluribus abortivis.

Habitat Insulas Moluccanas.

A m b o n : Wai Batu Gantung, alt. 0—100 m, KORNASSI (Exped. RUTTEN) 1132 L typus, U, dupl. typi; s.l., ROBINSON "Plantae Rumphianae Amboinenses n. 100".

C e r a m : South-eastern part of the island, Hatu Metem, alt. 0 m, KORNASSI (Exped. RUTTEN) 817 L et U; Boano (island near Ceram), alt. 0—200 m. ID. 1294 U.

B a n d a : s.l., coll. ign. s.n. L.

T a l a u d I s l a n d s : Salebabu, G. Ajambana, alt. 100 m, LAM 3058 BZ.

In Blumea V, p. 241, I described this species as a variety of *H. Rumphii*, but pointed out that further study might show that it should be regarded as specifically distinct. It differs from *H. Rumphii* in its procumbent shoots, indistinctly crenate leaves, smaller bracts, which subtend as a rule but a single flower, smaller flowers and smaller pollen grains, and from *H. prostrata* in the much longer petioles, the rather densely pubescent midrib and nerves on the lower side of the leaves, and the greater width of the bracts.

51. *Hemigraphis Rumphii* Brem. in Blumea V, p. 240, 1942, var. *angustifolia* Brem. quae est *H. ceramensis* Brem. et var. *gracili* Brem. quae est *H. Robinsonii* Brem. excl.; *Prunella silvestris rubra* Rumphius, Herb. Ambon. X, p. 32, Tab. XIII, fig. 3.

Habitat Insulas Moluccanas.

Species haec solvenda est in varietates duas; forma typica a me vocatur:

*H. Rumphii* Brem. var. *subglabra* Brem.

Herba ascendens vel suberecta. Caulis ramique primum breviter et sparse pubescentes, deinde glabrescentes. Folia petiolo gracili, sparse et breviter pubescente munita; lamina ovata, 4—12 cm longa et 2.2—5.5 cm lata, obtusa, basi ad petiolum subito contracta, margine irregulariter grande repando-dentata et incurvata, subcoriacea, supra vivo saturate viridis, subtus rubro-violacea, supra primum sparse scabridula, mox glabrescens, nitidula, subtus costa nervisque sparse et breviter pubescens sed ceterum glabra, cystolithis utrimque numerosis, sed supra majoribus et magis conspicuis, nervis utroque latere costae 5—6. Spicae plerumque in triades dispositae, densae et multiflorae. Pedunculus gracilis, 1—2 cm longus, pilis brevibus cum aliquibus longioribus mixtis vestitus; rhachis subglabra. Bracteae ovatae vel ovato-lanceolatae, 10—15 mm longae et 4—8 mm latae, subobtusae, margine et interdum costa pilis longis fugaciter ciliatae, ceterum glabrae. Flores in axillis bractearum infimarum plerumque 3, in axillis bractearum mediarum 2 superpositi, in axillis supremarum solitarii; omnes ebracteolati. Calyx 9 mm longus, fructu accrescens, glaber;



lobi margine et costa pilis brevibus cum paucis longioribus mixtis ciliati. Corolla alba, 21 mm longa. Stamina omnia filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis virgis 21 ornata, 40  $\mu$  longa et 30  $\mu$  diam. Ovarium dimidio superiore pubescens, apice comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula subglabra, seminibus 10—12.

Habitat Insulas Moluccanas.

Ambon: Wai, TEYSMANN s.n. L, typus; Saparua, id. H.B. 5024 U.

Ceram: Kaibobo, FORSTEN s.n. L; s.l., DE VRIESE et TEYSMANN s.n. L.

Tidore: B. Mala-mala, alt. 850 m, LAM 3752 BZ.

Ternate: s.l., FORSTEN s.n. L.

*H. Rumphii* Brem. var. *pubescens* Brem. l.c. p. 242.

Varietas caulibus petiolisque primum densissime, deinde satis dense pubescentibus, foliis vivo subtus viridibus, supra setulis persistentibus sparse, subtus costa nervisque dense et inter nervos minus dense pubescentibus, bracteis et calyce ectus densius pubescentibus a forma typica recedens.

Habitat Insulam Moluccanam Morotai dictam.

Morotai: Pilowo—Guguti, alt. 20—330 m, LAM 3560 L, typus, dupl. BZ.

The two varieties left in the species seem to be nearly related, for their differences are apparently confined to the nature of the indumentum and to the presence or absence of anthocyanin in the epidermis of the lower side of the leaves.

The type specimen of this species was referred by HALLIER (in Nov. Act. Acad. Nat. Cur. LXX, p. 203, 1897) to *H. prostrata*, but it differs conspicuously from that species in habit, in the coarsely repando-dentate leaves and in the greater width of the bracts.

The var. *subglabra* answers the description of RUMPHIUS's *Prunella silvestris rubra* better than any other species hitherto found in the island Ambon, and I have therefore no doubt that it represents that species.

52. *Hemigraphis Ledermannii* Brem. n. spec.; typus: LEDERMANN 8395 BD.

Herba suberecta, 50—80 cm alta. Caulis ramique primum pilis partim basiscopis dense, deinde sparsius pubescentes. Folia petiolo gracili, densius pubescente et pilis longioribus parce hirtis, 0.5—2.5 cm longo munita; lamina ovata, 4.5—10.5 cm longa et 1.9—4.5 cm lata, subacuta, basi ad petiolum subito contracta, margine irregulariter repando-crenata et subincurvata, herbacea, discolor, cystolithis utrimque dense lineolata, supra pilis paucis sparsa, subtus costa nervisque densius puberulo-pubescentibus, inter nervos scabridula, nervos utroque latere costae 6—7. Spicae plerumque in triades dispositae. Pedunculus gracilis, breviter pubescens, 1—2.5 cm longus. Bractee ovatae vel ellipticae, 10—13 mm longae et 6—7.5 mm latae, subacutae, margine densius ciliatae, dorso pilis brevioribus praesertim costa sparsae. Flores in axillis bractearum solitarii, ebracteolati. Calyx 9 mm longus; lobi costa et margine pilis brevibus et apicem versus pilis longis ciliati. Corolla alba, 16 mm longa. Stamina longiora filamentis dimidio inferiore hirtellis, breviora filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis virgis 21 ornata, 36  $\mu$  longa et 27  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula apice breviter pubescens, 12-seminalis.

Habitat Novam Guineam.

New Guinea: Hunsteinspitze, Quellenlager, alt. 700 m, LEDERMANN 8395 BD, typus.

This species resembles *H. Rumphii*, but is easily distinguishable by the shape of the leaves, which are suddenly contracted near the petiole, the longer and more numerous cilia of the bracts, the presence of but a single flower in the

axil of each of the bracts, and above all by the up to the middle hirtellous filaments of the longer stamens.

53. *Hemigraphis petola* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 206, Tab. X fig. 1, 1897; Merrill, Interpret. Rumph. Herb. Amb. p. 470, 1917.

Herba e basi repente ascendens, ramosa. Caulis ramique sulcis interdum sparse pubescentes, ad nodos setulis paucis ciliati, ceterum glaberrimi. Folia petiolo marginibus ciliato, 2.5—15 mm longo munita; lamina ovato-lanceolata vel rhomboidea, 1.5—7 cm longa et 6—30 mm lata, subobtusata, basi acuta vel subcontracta, margine serrato-dentata, supra primum setulis paucis sparsa, mox glabrescens, subtus costa nervisque strigosa et inter nervos glabra, margine sparse ciliata, subtus vivo rubra maculis luteo-viridibus variegata, supra cystolithis dense lineolata, nervis utroque latere costae 3—4. Spicae breves et pauciflorae, haud raro in triades dispositae. Pedunculus glaber, 2—5 mm longus. Bractee lineari-lanceolatae, 7.5 mm longae et 2.5 mm latae, subobtusatae, dimidio superiore dentatae, supra sparse hispidae, margine ciliatae, costa strigosae. Flores in axillis bractearum solitarii, infimi bracteolati, alii saepe ebracteolati. Bracteolae florum infimorum lineares, usque ad 3 mm longae, ciliatae, florum aliorum minores vel nullae. Calyx 6 mm longus, lobo mediano quam alii paulo longiore, utroque latere denticulo munito, lobis anticis interdum uno latere denticulo munitis, omnibus margine et costa ciliatis. Corolla 14 mm longa. Stamina longiora filamentis basi hirtellis; antherae apice emarginatae, thecis basi muticis. Granula pollinis 32  $\mu$  longa et 25  $\mu$  diam., sterilia. Ovarium apicem versus pubescens, utroque loculo ovulis 6. Stylus breviter hirtellus. Capsula numquam evoluta.

Habitat Insulam Moluccanam Ceram dictam.

Ceram: Northern part of the island, Wahai, TEYSMANN BZ n.v.; s.l. TREUB s.n. BZ, Hort. Bogor. cult. L, exemplum typi.

The pollen grains remain white and do not show a well-developed surface relief: they are evidently sterile. The dimensions of the grains given above are therefore of little value.

Apart from the variegation of the leaves, a character which in herbarium material is no longer recognizable, this species is easily distinguishable from its nearest allies by its lanceolate or rhomboid leaves. Dentate bracts occur in this series also in *H. baractanensis*, but denticulate calyx lobes are confined to this species. Bracteolate flowers are sometimes found in *H. alternata*, *H. prostrata* and *H. buruensis*.

HALLIER l.c. identified this species with the *Lire petola* mentioned by RUMPHIUS (Herb. Amb. X, p. 31).

54. *Hemigraphis novomegapolitana* (Lindau) Brem.; *Strobilanthes novomegapolitana* Lindau in Engl., Bot. Jahrb. L, p. 166, 1913.

Herba ascendens, usque ad 60 cm alta; specimina examinata tamen circ. 30 cm alta. Caulis ramique subglabri, ad nodos primum ciliati, ultimo toti glabrescentes. Folia in petiolum gracilem, subglabrum, 5—25 mm longum contracta; lamina lanceolata, 2.5—7.5 cm longa et 1.0—3.2 cm lata, subacuta, basi acuta et in petiolum contracta, margine grosse crenato-dentata et undulata, discolor, supra glabra, subtus costa nervisque sparse pilosa, cystolithis utraque facie distinguendis, supra albidis, subtus nigrescentibus, nervis utroque latere costae 5. Spicae terminales et axillares, breves. Pedunculus gracilis, subglaber, circ. 1 cm longus. Bractee 5-parae; infimae quam aliae majores, foliaceae, i.e. margine grosse crenato-dentatae, subobtusatae; aliae lanceolatae, 7—10 mm longae et 3—3.5 mm latae, acutae, margine integrae, ciliatae, costa subtus pilis brevioribus vestitae. Flores in axillis bractearum solitarii, ebracteolati. Calyx

10 mm longus, lobis margine et costa ciliolatis. Corolla alba, 15 mm longa. Stamina longiora filamentis usque ad medium hirtellis; breviora filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis virgis 24 ornata, 30  $\mu$  longa et 23  $\mu$  diam. Ovarium comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula nondum nota.

Habitat Novam Irlandiam.

New Ireland: Namatoni, PEEKEL 731 BD, typus.

A remarkable feature of this plant are the up to the middle hirtellous filaments of the longer stamens. This character is also met with in *H. Ledermannii*, *H. novoguineensis* and *H. lanceolata*, and might be an indication of a nearer affinity between these species. In general aspect *H. novomegapolitana* resembles *H. petola* and *H. buruensis*; from the first it differs in the complete absence of bracteoles and the entire bracts; from the second in the subglabrous peduncles and shorter spikes; from both in the up to the middle hirtellous filaments of the longer stamens.

55. *Hemigraphis buruensis* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 204, Tab. XI, 1897, var. excl.; — *Strobilanthes bogoriensis* Lindau in Fedde, Repert. XIII, p. 551, 1915.

Herba erecta, ramosa. Caulis ramique primum puberuli, mox glabrescentes, ad nodos sparse ciliati. Folia in petiolum subtus primum puberulo-pubescentem, 2—10 mm longum contracta; lamina lanceolata, 3—7 cm longa et 1.2—3 cm lata, plerumque utroque extremo contracta, apice interdum subobtusata, basi interdum acuta, margine grosse repando-dentata vel repando-crenata, supra vivo laete viridis, subtus saturate purpurea, supra setulis brevibus parce sparsa, subtus costa nervisque puberulo-pubescentem et inter nervos glabra, cystolithis supra conspicue lineolata, nervis utroque latere costae 5—6. Spicae in triades vel racemose dispositae. Pedunculus pilis basiscopis densius puberulo-pubescentem, 1—3.5 cm longus; rhachis 3—6 cm longa. Bracteae lanceolatae, 10—13 mm longae et 3—3.5 mm latae, subacutae, supra subglabrae, subtus breviter et sparse pubescentes, margine et costa ciliatae, margine integrae. Flores in axillis bractearum plerumque duo superpositi; infimi interdum bracteolati. Calyx 9—10 mm longus, extus puberulo-pubescentem, lobis margine et costa ciliatis. Corolla 15 mm longa. Stamina longiora filamentis basi hirtellis; antherae mucronulatae, thecis basi muticis. Granula pollinis sterilia, 32  $\mu$  longa et 25  $\mu$  diam. Ovarium apicem versus pubescens, utroque loculo ovulis 6. Stylus breviter hirtellus. Capsula numquam evoluta.

Habitat Insulam Moluccanam Buru dictam.

Buru: Kajeli, TEYSMANN et BINNENDIJK s.n. BZ n.v.; Hort. Bogor. cult. L, typus; Hort. Bogor., WARBURG 1627 BD (type of *Strobilanthes bogoriensis* Lindau).

LINDAU l.c. gives the dimensions of the pollen grains as 46  $\mu$  long and 34—35  $\mu$  diam., but this is a mistake. LINDAU's measurements are very often wrong and apparently always in the same sense: the figures given above, are but one example out of a very large number.

HALLIER l.c. states that the lower bracts subtend dichasia provided with "bracteoles". What he means with the term "bracteoles" is not clear, but I suppose that it refers to the bracts of the lateral flowers. In the specimens at my disposition dichasia were never present, but the lower flowers were occasionally provided with bracteoles. It is not impossible that the spikes investigated by HALLIER were abnormal.

The sterility of the pollen makes it probable that *H. buruensis* is not a wild species, but is known only as a cultivated plant. HALLIER l.c. mentions

two specimens collected by KOORDERS in the Minahassa (Celebes) which he regards as a variety of *H. buruensis*. In KOORDERS-SCHUHMACHER, Syst. Verz. III § 1, p. 117, 1914, these plants (KOORDERS n. 15827 et n. 15846) are referred to *H. borneënsis* Hall. f., a species which has never been described. I have not seen these specimens, but as they are said to differ from the true *H. buruensis* in the size of the bracts and of the leaves, I suppose that they belong to the next species, *H. lanceolata* Merr., of which I have seen specimens actually collected in the Minahassa.

*H. buruensis* resembles *H. petola* and *H. novomegapolitana* in its coarsely dentate lanceolate leaves, but is easily distinguishable from both: from the first by its entire bracts and from the second by its almost entirely glabrous filaments.

56. *Hemigraphis lanceolata* Merr. in Philipp. Journ. of Sc. XX, p. 452, 1922; Brem. in Blumea V, p. 240, 1942.

Herba erecta, ramosa. Caulis ramique fastigiati, sulcis puberulo-pubescentes, ceterum glabrescentes. Folia petiolo profunde canaliculato, 1.2—2.5 cm longo, marginibus scabrido-hirsuto munita; lamina lineari-lanceolata, 6—11 cm longa et 1.7—2.7 cm lata, sensim in caudam contracta, basi acuta sed prope petiolum subito contracta, margine grande repando-dentata, supra primum setulis paucis scabrida, postea glabrescens, subtus costa nervisque ut margine setulis primum dense, deinde sparse scabrida, cystolithis utrimque sed praesertim supra conspicue lineolata, nervis utroque latere costae 5—6. Spicae solitariae vel ternae. Pedunculus dense pubescens, 1—2 cm longus; rhachis usque ad 6 cm longa. Bracteae infimae lineares, 2—3 cm longae et 3—4 mm latae, caudatae; aliae lanceolatae, 1.5 cm longae et 4 mm latae, acutae; omnes margine et costa ciliatae, ceterum dorso scabridulae. Flores in axillis bractearum haud raro duo superpositi, ebracteolati. Calyx 10 mm longus, breviter scabridulus, lobis margine et costa ciliatis, mediano quam aliis paulo longiore. Corolla 2 cm longa. Stamina longiora filamentis basi hirtellis; antherae obtusae, thecis basi acutis. Granula pollinis virgis 21 ornata, 37  $\mu$  longa et 30  $\mu$  diam. Ovarium dimidio superiore pubescens, utroque loculo ovulis 6. Stylus hirtellus. Capsula puberulo-pubescentis.

Habitat terram Celebicam, Insulas Philippinas, archipelagum Talaud dictum. Celebes: Minahassa, Tondano, FORSTEN s.n. L; Wongso, KOORDERS 19728 L (distributed under the name *H. cumingiana* (Nees) F. Vill., cf. Koorders-Schuhmacher, Syst. Verz. III § 1, p. 117, 1914.

Philippines: Negros Occidentalis, Cadiz, CELESTINO B. Sc. 7330 BD. Talaud Islands: P. Salebabu, G. Ajumbana, alt. 100 m, LAM 3059 BZ.

I am not quite certain whether *H. lanceolata* is a wild-growing or a cultivated species. Although I did not find ripe capsules, and all the pollen grains were white and imperfectly developed, there were a number of young capsules which looked normal.

Filaments which are hirtellous up to the middle, are found also in *H. novomegapolitana*, *H. novoguineënsis* and *H. Ledermannii*. In the case of *H. lanceolata* this character helps us to distinguish this species from *H. buruensis*, from which it differs also in the narrower leaves.

57. *Hemigraphis angustifolia* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, Tab. X fig. 2, 1897; Merrill, Interpret. Rumph. Herb. Amb. p. 470, 1917; — *Prunella domestica angustifolia* Rumphius, Herb. Amb. X, p. 30, Tab. XIII fig. A et B.

Herba e basi procumbente ascendens, ramosa. Caulis ramique sulcis primum pilis basiscopis scabriduli, deinde glabrescentes. Folia in petiolum primum

pubescentem, deinde glabrescentem, 0.8—5 cm longum contracta; lamina lineari-lanceolata, 6—15 cm longa et 1.2—4 cm lata, irregulariter et grande repando-crenata vel remote sublobata, apice sensim in caudam obtusam contracta, supra primum setulis paucis scabridula, mox tota glabrescens, nitidula, subtus costa nervisque strigosis, ceterum glabra, vivo violaceo-purpurea, sicc. interdum coerulescens, cystolithis utrimque sed praesertim supra conspicue lineolata, nervis utroque latere costae 4—6. Spicae solitariae vel in triades dispositae. Pedunculus sparse et breviter pubescens, 1.5 cm longus. Bractee infimae lanceolatae, 2 cm longae et 0.7 cm latae, obtusae, margine sparse et breviter ciliatae, dorso costa pubescentes; aliae ovatae, 1.7 cm longae et 0.7 cm latae, obtusae, margine ciliatae, costa scabrido-pubescentes. Flores in axillis bractearum plerumque duo superpositi, ebracteolati. Calyx 10 mm longus, lobis margine et costa ciliatis. Corolla alba, 18 mm longa. Stamina omnia filamentis pilis capitatis minimis sparsis; antherae obtusae, thecis basi subacutis. Granula pollinis virgis 21 ornata, 38  $\mu$  longa et 35  $\mu$  diam., majore parte sterilia et minora. Ovarium basi glabrum, ceterum pubescens, utroque loculo ovulis 6—7. Stylus hirtellus. Capsula dimidio superiore breviter pubescens, seminibus 12—14, pluribus semper vacuis.

Habitat Insulas Moluccanas.

Amboin: TREUB s.n. BZ, n.v., Hort. Bogor. XV K VIII 11 cult. L, exemplum typi; s.l., ROBINSON "Plantae Rumphianae Amboinenses n. 99" L; ZIPPELIUS 46 C L.

Ceram: Toluarang River, alt. 100 m, KORNASSI (Exped. RUTTEN) 87 L. Batjan: s.l., WARBURG 18062 BD.

Ternate: DE VRIESE s.n. L.

*H. angustifolia* resembles *H. lanceolata* and *H. novoguineënsis* in general aspect, but differs from both in the absence of cilia on the lower half of the filaments of the longer stamens and in the presence on all four filaments of small capitate hairs. From the first it differs moreover in the greater width of the bracts and from the second in the smaller number of nerves in the leaves and in the presence of superposed flowers.

*H. angustifolia* was already in the days of RUMPHIUS grown in the gardens of the natives for its supposed medicinal or magical virtues. As the specimens quoted above show but little fertility, it is not impossible that they were all cultivated plants.

58. *Hemigraphis novoguineënsis* Brem. n. spec.; typus: KOCH s.n. L; — anne *H. Weinlandii* K. Sch. ex Lindau in K. Sch. et Laut., Nachtr. Fl. Deutsch. Schutzgeb. Südsee, p. 385, 1905?

Herba erecta, circ. 40 cm alta, subsimplex. Caulis sulcis primum pilis basiscopis parce pubescens, mox totus glabrescens. Folia in petiolum canaliculatum, primum pubescentem sed mox glabrescentem, 1—3 cm longum contracta; lamina linearis, 7.5—15 cm longa et 1.1—2.2 cm lata, apicem versus sensim attenuata, apice ipso obtusa, basin versus attenuata, margine repando-lobata, lobis obtusis, discolor, supra tota glabra, subtus costa nervisque setulis appressis scabridula, margine etiam scabridula, cystolithis utrimque conspicue lineolata, nervis utroque latere costae 7—9. Spicae solitariae. Pedunculus subglaber, 2 cm longus; rhachis 1.5 cm longa. Bractee infimae 16 mm longae et 6 mm latae; aliae 12 mm longae et 5 mm latae; omnes obtusae, margine et costa subtus ciliatae. Flores in axillis bractearum solitarii, ebracteolati. Calyx 10 mm longus, lobis margine et costa ciliatis. Corolla 15 mm longa. Stamina longiora filamentis dimidio inferiore hirtellis; breviora filamentis glabris; antherae apice obtusae, thecis basi subacutis. Granula pollinis virgis 21 ? munita, 46  $\mu$  longa et 26  $\mu$

diam., probabiliter maxima parte sterilia. Ovarium apice pubescens, utroque loculo ovulis 6. Stylus hirtellus. Capsula nondum visa.

Habitat Novam Guineam.

New Guinea: Merauke, KOCH s.n. L, typus.

The type of *H. Weinlandii* K. Sch. ex Lindau was collected near Finschhafen. According to the description it agrees fairly well with the specimen described above; the number of nerves however is apparently larger. As the description of *H. Weinlandii* is rather unsatisfactory, and the plant moreover was collected in an entirely different part of New Guinea, it seems for the moment better to keep the two species apart. The type specimen of *H. novoguineënsis* was first studied by VALETON, who suggested in a note on the label that it might be *H. Weinlandii*, but LINDAU afterwards added another label with the remark "*H. Weinlandii* kenne ich nicht"! As he had apparently not taken the trouble to look up where and by whom this species had been described, this conclusion must have been based on a comparison with the material of the Berlin-Dahlem herbarium, and this would mean that at that time already the type specimen of *H. Weinlandii* was lost.

*H. novoguineënsis* differs from *H. angustifolia* in the filaments of the longer stamens, which are up to the middle hirtellous, a character which it shares with *H. Ledermannii*, *H. novomegapolitana* and *H. lanceolata*, and in the greater number of nerves in the leaves. From *H. stenophylla* and *H. repanda* it differs in the larger size and especially in the greater width of the leaves. From *H. lanceolata* it is distinguishable by the narrower leaves, which are provided with a larger number of nerves, and by the shorter and wider bracts.

The large percentage of sterile pollen suggests that this species too is cultivated.

59. *Hemigraphis stenophylla* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, Tab. X fig. 3, 1897; KOORDERS-SCHUHMACHER, Syst. Verz. III § 1, p. 117, 1914; Brem. in Blumea V, p. 242, 1942.

Herba erecta, circ. 80 cm alta, ramosa. Caulis ramique fastigiati, sulcis puberulo-pubescentes, ceterum glabri. Folia sensim in petiolum usque ad 2 cm longum, marginibus ciliolatum contracta; lamina linearis, 4—15 cm longa et 0.5—1.5 cm lata, obtusa, margine remote et grande repanda, subtus vivo purpureo-violacea, supra setulis parce scabridula, postea glabrescens, subtus costa nervisque sparse hirtella, margine etiam hirtella, cystolithis utrimque sed praesertim supra conspicue lineolata, nervis utroque latere costae 5—8. Spicae solitariae vel in triades dispositae. Pedunculus usque ad 2.5 cm longus; rhachis elongata. Bractee infimae lineares, usque ad 23 mm longae et 4 mm latae, obtusae; aliae usque ad 14 mm longae et 5 mm latae, anguste ovato-lanceolatae, subacutae, sordide virides, ad nervos tamen violascentes, margine et costa breviter ciliolatae. Flores in axillis bractearum solitarii, ebracteolati. Calyx 10 mm longus, lobis minute ciliolatis. Corolla (fide HALLIER l.c.) ut in *H. angustifolia*. Pollen ignotus. Capsula glabra.

Habitat terram Celebicum et Insulas Moluccanas.

Celebes: Minahassa, KOORDERS 15841 L, exemplum typi, "Lire papua". Morotai: Guguti, alt. 40 m, LAM 3623 BZ.

HALLIER l.c. quotes also a specimen collected in Buru. The leaves of the plant collected in Morotai are on the lower side green. As flowers of the type specimen were not available for comparison, the identification of this specimen is not quite certain. The name "lire papua" quoted by KOORDERS, was known already to RUMPHIUS, but whether it was applied by him to the same species, is dubious.

In the shape and size of the leaves *H. stenophylla* is intermediate between *H. angustifolia* and *H. repanda*. I have little doubt that this species too is known only as a cultivated plant.

60. ***Hemigraphis repanda*** (L.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 198, 1897; Koorders, Exkursionsfl. v. Java III, p. 215, 1912; *Ruellia repanda* L., Sp. pl. ed. 2, p. 886, 1763; Burm. f., Fl. Ind. p. 134, Tab. XL fig. 2, 1768; Nees in DC., Prodr. XI, p. 144, 1847, syn. excl.; Miq., Fl. Ind. Bat. II, p. 786, 1858, syn. excl.; non Houttuyn, Nat. Hist. Ite deel. IXe stuk, p. 575 et Tab. LIX, fig. 1, 1778 nec Bl., Bijdr. Fl. Ned. Ind. p. 794, 1826, quae est *H. sumatrensis* (Roth) Brem.; ? *Hemigraphis repanda* (L.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899; — *H. rapifera* Hall. f. ex. Koorders-Schuhmacher, Syst. Verz. III § 1, p. 117, 1914, nomen; non ex Merrill, Enum. Philipp. Fl. Pl. III, p. 472, 1923, quae est *H. primulifolia* (Nees) F. Vill. vel species ei valde affinis; nec ex Koorders in Meded. 's Lands Plantent. XIX, p. 515, 1898, nomen (sphalmate = *rapifera*) quae est *Aporuella flagelliformis* (Roxb.) Clarke.

Herba procumbens, ramosa. Caules graciles, vivo saturate violacei, basi radicanter, pilis basiscopis sparse pubescentes. Folia petiolo gracili, sparse pubescente, 7—10 mm longo munita; lamina linearis, 2—7 cm longa et 4—12 mm lata, subobtusata, basi contracta, margine repando-dentata et sinuata, supra glabra, vivo saturate viridis, subtus costa et margine sparse pilosa, vivo saturate rubro-violacea, supra cystolithis conspicue lineolata, nervis utroque latere costae 5—9. Spicae pedunculo 1—4 cm longo instructae; rhachis 1—3 cm longa. Bractee lineari-spathulatae; infimae usque ad 18 mm longae et 2 mm latae; aliae 10 mm longae et 1 mm latae; omnes vivo saturate violaceae. Flores in axillis bractearum solitarii vel interdum duo superpositi, ebracteolati. Calyx 10 mm longus, vivo saturate violaceus, lobis apice pilis 1—3 coronatis, mediano quam aliis longiore. Corolla alba, 15 mm longa. Stamina longiora filamentis basi hirtellis; breviora filamentis glabris; antherae apice obtusae, thecis basi muticis. Granula pollinis sterilia, 32  $\mu$  longa et 26  $\mu$  diam. Ovarium vix comosum, utroque loculo ovulis 6. Stylus hirtellus. Capsula numquam evoluta.

In India Aquosa ubique culta. Patria ignota.

As this species is everywhere in the Malay Archipelago a common garden plant, and as it is in temperate countries often grown in the conservatories of botanical gardens, it seems superfluous to quote specimens. Like *H. alternata* it is completely sterile.

In one specimen I found a flower provided with 5 stamens, the odd staminal node being developed into a stamen of the same size as the shorter ones.

KOORDERS l.c. quotes for this species the vernacular name "lire papua", i.e. the same name which he noted for *H. stenophylla*.

*H. repanda* is an easily recognizable species, both by its habit and by the narrowness of its leaves.

The following species may provisionally find a place in the series *Nudicrues*. It was collected in the Solomon Islands.

***Hemigraphis solomonensis*** Brem. n. spec.; typus: BRASS 2597 L.

Herba procumbens vel subrepens. Caules internodiis 2—12.5 cm, sed plerumque 5—8 cm longis, pilis basiscopis primum sparse sed molliter pubescentes, deinde glabrescentes, purpurei. Folia in petiolum primum sparse pubescentem, deinde glabrescentem, 1—2.5 cm longum contracta; lamina ovato-elliptica, 2.4—5 cm longa et 1.5—2.7 cm lata, apice subobtusata, prope basin contracta,

margine crenata, utrimque cystolithis lineolata, supra setulis perpaucis sparsa, subtus costa nervisque appresse pubescens, discolor, i.e. sicc. supra saturate olivacea, subtus viridis, nervis utroque latere costae plerumque 4. Spicae terminales, mox innovationibus haud raro duabus superatae. Pedunculus gracilis, 1.5—2 cm longus; rhachis 7 mm longa. Bracteae lineari-spathulatae vel spathulatae; inferiores 12 mm longae et 4 mm latae; aliae minores et praesertim breviores; omnes subglabrae, margine et costa tamen parce ciliolatae. Flores in axillis bractearum haud raro duo superpositi, ebracteolati. Calyx 5-fidus, 8 mm longus, lobis anguste triangularibus, margine et costa ciliolatis, ceterum subglaber. Corolla dilute lavandula dicta, 16 mm longa, lobis orbicularibus 4 mm longis. Stamina longiora filamentis basi parce hirtellis; antherae utroque extremo obtusae. Granula pollinis virgis punctatis 18 ornata, 38  $\mu$  longa et 32  $\mu$  diam. Ovarium vix conspicue comosum, utroque loculo ovulis 6—7. Stylus sparse hirtellus. Capsula glabra, 1 cm longa, seminibus 10—14.

Habitat Insulas Solomonenses.

Solomon Islands: San Cristoval Island, Waimamura, BRASS 2597 L, typus; Ngela Group, Navotana Island, id. 3238 L.

The last quoted specimen has shorter internodes, smaller and somewhat more bristly leaves varying from elliptic to obovate, 1.2—3 cm long and 0.8—1.7 cm wide and provided with 3—4 pairs of nerves, and smaller and somewhat wider bracts.

In general aspect this plant differs conspicuously from the other species of the *Nudicrures*, but apart from the 18 instead of 21—27 bands of the pollen grains, the analysis does not reveal important differences, so that there seems to be no reason to refer it to a new series. Its most aberrant feature is probably the development of the buds in the axils of the uppermost leaves to new flowering shoots overtopping the old inflorescence.

### Index Specierum.

- abyssinica* (Nees) Clarke in Dyer, Fl. Trop. Afr. V, p. 58, 1899  
(*Polyechma* Nees) = ? *Synnema abyssinicum* (Nees) Brem. n. comb.
48. *alternata* (Burm. f.) T. And. in Journ. Linn. Soc. VII, p. 114, 1864, syn. excl. (*Ruellia* Burm. f.) — culta; patria ignota —  
*alternata* (Burm. f.) T. And. in errore apud Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1908; apud Koorders, Exkursionsfl. v. Java III, p. 215, 1912; apud Ridl., Fl. Mal. Pen. II, p. 570, 1923 = *sumatrensis*
57. *angustifolia* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, Tab. X fig. 2, 1897 — Insulis Moluccanis —  
*aspera* (Decne) Benth. in Benth. et Hook. f., Gen. Pl. II, p. 1086, 1876  
(*Strobilanthes* Decne) = *Xanthostachya aspera* (Decne) Brem. n. comb.  
? *aspera* (Decne) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Strobilanthes* Decne) = prec.
- Bakeri* Merr. in Philipp. Journ. of Sc. X, Bot., p. 348, 1915 — Luzon, Samar — n.v.
43. *baractanensis* Elm., Leaflet Philipp. Bot. VII, p. 2543, 1915 — Mindanao —
23. *benguettensis* Brem. n. spec. — Luzon —  
? *bicolor* (Bl.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Bl.) = seq.
16. *bicolor* (Bl.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, 1897  
(*Ruellia* Bl.) — Java —



- blumeana* (Nees) K. Sch. in K. Sch. et Hollr., Fl. Kaiser-Wilhelmsland, p. 124, 1889 (*Ruellia* Nees) quoad typum = *sumatrensis*; quoad specimina citata = species and seriem *Nudicrures* pertinens, n.v.
- blumeana* (Nees) K. Sch. var. *grandiflora* K. Sch. l.c. = species ad seriem *Nudicrures* pertinens, n.v.
- borneensis* Hall. f. ex Koorders-Schuhmacher, Syst. Verz. III § 1, p. 117, 1914, nomen; n.v. cf. *buruensis* var.
6. *brunelloides* (Lam.) Brem. n. comb. (*Justicia* Lam.) — Peninsula Malayana, Java, Borneo —
- brunelloides* (Lam.) Brem. var. *angustifolia* Brem. n. var. — Borneo —
- brunelloides* (Lam.) Brem. var. *subglabra* Brem. n. var. — Java, Borneo —
- brunelloides* (Lam.) Brem. var. *vahliana* Brem. n. nom. = var. typ.
55. *buruensis* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 204, Tab. XI, 1897 — Buru —
- buruensis* Hall. f. var. Hall. f. l.c. forsitan = *lanceolata*
- cardiophylla* Quisumb. in Philipp. Journ. of Sc. XLI, p. 359, fig. 24, 1930 — Insulis Suluensibus — n.v.
- caudigera* S. Moore in Trans. Linn. Soc., Bot. IX, p. 134, 1916 — Nova Guinea — n.v.
28. *celebica* Brem. n. spec. — Celebes —
38. *ceramensis* Brem. in Blumea V, p. 239, 1942 — Insulis Moluccanis —
44. *chamaedrys* Brem. n. spec. — Celebes —
- chinensis* (Nees) T. And. ex Hemsl. in Journ. Linn. Soc. XXVI, p. 238, 1891 (*Ruellia* Nees) = *Sericocalyx chinensis* (Nees) Brem. n. comb.
- ciliata* S. Moore in Journ. of Bot. LVIII, p. 191, 1920 — Nova Guinea — n.v.
- ? *colorata* (Bl.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Bl.) = seq.
- colorata* (Bl.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 199, Tab. IX fig. 1 et 2, 1897 (*Ruellia* Bl.) = *alternata*
- confinis* (Nees) T. And. in Journ. Linn. Soc. IX, p. 463, 1867 (*Ruellia* Nees) — Peninsula Malayana — n.v.
- confinis* (Nees) T. And. var. *hirsuta* (Vahl) Ridl. in Fl. Mal. Pen. II, p. 570, 1923 (*Justicia hirsuta* Vahl) quoad typum = *brunelloides*; quoad specimina descripta = spec. prob. indescrib.
- crenata* (Benth.) Brem. n. comb. (*Ruellia* Benth.) — Peninsula Indica —
- crispa* (L.) T. And. in Journ. Linn. Soc. VII, p. 113, 1864 (*Ruellia* L.) = *Sericocalyx crispus* (L.) Brem. n. comb.
- crossandra* (Steud.) Brem. n. comb. (*Ruellia* Steud.) — Birmania —
15. *culionensis* Brem. n. spec. — Insulis Palawanensibus —
27. *cumingiana* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App., p. 153, 1880 (*Ruellia* Nees) — Insulis Philippinis —
2. *decaisneana* (Nees) T. And. in Journ. Agr. Hort. Soc. Ind., New Ser. I, p. 270, 1868 (*Ruellia* Nees) — Timor —
- decaisneana* (Nees) T. And. in errore apud Backer, Onkruidfl. Suikerrietgronden, p. 648, 1934 = *javanica*
- ? *decaisneana* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1898, p.p. = *decaisneana*; p.p. = *javanica*
- ? *decipiens* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App., p. 153, 1880 (*Ruellia* Nees) = spec. incertae sedis, n.v.
5. *dentata* Brem. n. spec. — Java —
- ? *discolor* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Nees) = *brunelloides*
39. *diversifolia* Elm., Leafl. Philipp. Bot. X, p. 3673, 1939 — Luzon —
- dorensis* S. Moore in Gibbs, Phytogeogr. and Pl. Arfak Mts, p. 219, 1917 — Nova Guinea — n.v.

- drymophila* Diels in Notes Bot. Gard. Edin. V, p. 163, 1912 — China — n.v., anne huius generis?
- dura* (Nees) T. And. in Journ. Linn. Soc. IX, p. 461, 1867 (*Ruellia* Nees) = *Gantelbua urens* (Roth) Brem.
- ebracteolata* (Dalz.) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 424, 1884 (*Ruellia ebracteata* Dalz.) — *latebrosa* var. *ebracteata*
- elegans* (Hook.) Nees in DC., Prodr. XI, p. 722, 1847 (*Ruellia elegans* Hook. 1835, non Poir. 1816) = *crossandra*
- elegans* (Hook.) Nees var. *crenata* (Benth.) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 425, 1884 (*Ruellia crenata* Benth.) = *crenata*
- flaccida* (Kurz) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 424, 1884 (*Ruellia* Kurz) — Birmania —
- flava* (Kurz) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 426, 1884 (*Strobilanthes* Kurz) = *Sericocalyx flavus* (Kurz) Brem. n. comb.
- fluviatilis* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, 182, 1918 = *Sericocalyx fluviatilis* (Clarke ex W. W. Smith) Brem. n. comb.
- Forrestii* Rolfe in Notes Bot. Gard. Edin. VIII, p. 27, 1913 — China — n.v., anne huius generis?
34. *fruticulosa* Clarke in Philipp. Journ. of Sc. I, Suppl. p. 247, 1906 — Luzon —
- glandulosa* T. And. ex Kurz, Andam. Rep., App. B, p. 13; = species incertae sedis, forsitan ad genus *Sericocalyx* pertinens — Insulis Andamanensibus —
- glaucescens* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 415, 1884 (*Strobilanthes* Nees) = *Sericocalyx glaucescens* (Nees) Brem. n. comb.
10. *gracilipes* Brem. n. spec. — Borneo —
- griffithiana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 463, 1867 (*Ruellia* Nees) — Birmania —
19. *halconensis* Brem. n. spec. — Mindoro —
- hirsuta* (Vahl) T. And. in Journ. Agr. Hort. Soc. Ind., New Ser. I, p. 270, 1868 (*Justicia hirsuta* Vahl 1790, non Jacq. 1760) = *brunelloides*
- hirsuta* (Vahl) T. And. in errore apud Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1908 = species affinis nondum nuncupata
- hirsuta* (Vahl) T. And. in errore apud auctores qui de flora Philippina tractaverunt = species ad seriem *Pubicrures* pertinentes
- hirsuta* (Vahl) T. And. var. *crenata* Elm., Leaf. Philipp. Bot. V, p. 1693, 1913 = species ad seriem *Pubicrures* pertinens
- hirsuta* (Vahl) T. And. var. *genuina* Hochr. in Candollea V, p. 223, 1934 = *brunelloides* var. *vahliana*
- hirsuta* (Vahl) T. And. var. *latifolia* (Nees) Hochr. l.c. (*Ruellia hirsuta* var. *latifolia* Nees) = prec. ? n.v.
- hirsutissima* Merr. in Philipp. Journ. of Sc. XIII, Bot., p. 60, 1918 — Luzon —
- hirta* (Vahl) T. And. in Journ. Linn. Soc. IX, p. 462, 1867 (*Ruellia* Vahl) — Peninsula Indica —
- hirta* (Vahl) T. And. in errore apud Koorders-Schuhmacher, Syst. Verz. I § 1, p. 43, 1912 = species prob. ad genus alium pertinens
12. *hispida* Brem. n. spec. — Borneo —
- hispidula* Craib in Kew Bull. 1913, p. 203 = *Sericocalyx hispidulus* (Craib) Brem. n. comb.
4. *javanica* Brem. n. spec. — Java —
- ? *junghuhniana* (Miq.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Miq.) = *Difflugosa filiformis* (Bl.) Brem.
45. *keiensis* Brem. n. spec. — Archipelago Keiensi —
- Klossii* S. Moore in Transact. Linn. Soc., Bot. IX, p. 133, 1916 — Nova Guinea — n.v.

42. *lanaënsis* Brem. n. spec. — Mindanao —
56. *lanceolata* Merr. in Philipp. Journ. of Sc. XX, p. 452, 1922 — Celebes, Insulis Philippinis et Moluccanis —
- \* *latebrosa* (Heyne ex Roth) Nees in DC., Prodr. XI, p. 723, 1847 (*Ruellia* Heyne ex Roth) — Peninsula Indica —
- latebrosa* (Heyne ex Roth) Nees var. *Beddomei* Clarke ex Gamble, Fl. Madras II, p. 1919, 1921 — Peninsula Indica —
- latebrosa* (Heyne ex Roth) Nees var. *ebracteata* (Dalz.) Th. Cooke, Fl. Bombay II, p. 353, 1905 (*Ruellia ebracteata* Dalz.) — Peninsula Indica —
- latebrosa* (Heyne ex Roth) Nees var. *heyneana* Brem. n. nom. = var. typ.
- latebrosa* (Heyne ex Roth) Nees var. *incana* Gamble, Fl. Madras II, p. 1019, 1921 — Peninsula Indica —
- latebrosa* (Heyne ex Roth) Nees var. *rupestris* (T. And.) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 424, 1884 = *rupestris*
52. *Ledermannii* Brem. n. spec. — Nova Guinea —
20. *linearifolia* Brem. n. spec. — Mindanao —
- lithophila* Laut. et K. Sch., Fl. Deutsche Schutzgeb. Südsee, p. 544, 1901 — Nova Guinea — n.v.
11. *longipedunculata* Brem. n. spec. — Borneo —
- longipetiolata* Merr. in Philipp. Journ. of Sc. XXIX, p. 428, 1926 — Bohol — n.v.
- ? *luzona* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App. p. 153, 1880 (*Ruellia* Nees) = species incertae sedis, n.v.
29. *mandarensis* Brem. n. spec. — Celebes —
22. *mediocris* Brem. n. spec. — Luzon —
31. *mindorensis* Brem. n. spec. — Mindoro
- modesta* R. Ben. in Bull. Mus. Paris XXXIII, p. 108, 1927 — Cambodia — n.v.
47. *moluccana* Brem. n. spec. — Insulis Moluccanis —
- napifera* (Zoll.) Hall. f. ex Koorders-Schuhmacher, Syst. Verz. III § 1, p. 117, 1914 (*Ruellia* Zoll.) quoad typum = *Aporuella napifera* (Zoll.) Brem. n. comb.; quoad specimina citata = *Aporuella flagelliformis* (Roxb.) Clarke ex Brem. n. comb. (*Ruellia* Roxb.)
- napiformis* Hall. f. ex Val. in Bull. Dép. Agric. Indes Néerl. X, p. 60, 1907, nomen = *Ruellia scabrifolia* Val.
14. *natunensis* Brem. n. spec. — Archipelago Natunensi —
- Naumannii* (Engl.) Brem. n. comb. (*Strobilanthes* Engl.) — Nova Britannia — n.v.
- ? *nemorosa* (Zoll.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Zoll.) = seq.
8. *nemorosa* (Zoll.) Boerl. ex Brem. n. comb. (*Ruellia* Zoll.) — Java —
58. *novoguineënsis* Brem. n. spec. — Nova Guinea —
54. *novomegapolitana* (Lindau) Brem. n. comb. (*Strobilanthes* Lindau) — Nova Scotia —
- nummulariifolia* Merr. in Philipp. Journ. of Sc. XIV, p. 455, 1919 — Luzon — n.v.
24. *oblongibractea* Brem. n. spec. — Luzon —
- oblongifolia* Merr. in Philipp. Journ. of Sc. XI, Bot., p. 204, 1916 = *primulifolia*
- Okamotoi* Masamune in Trans. Nat. Hist. Soc. Formosa XXV, p. 248, 1935 — Liukiu — n.v.
- origanoides* Lindau in Engl. Bot. Jahrb. XLIII, p. 351, 1909 = *Synnema origanoides* (Lindau) Brem. n. comb.
25. *pachyphylla* Merr. in Philipp. Journ. of Sc. XX, p. 453, 1922 (anne *strigosa*?) — Luzon —

- pacifica* Hokosawa in Trans. Nat. Hist. Soc. Formosa XXV, p. 127, 1935  
— Palau — n.v.
- palauana* Hokosawa in Trans. Nat. Hist. Soc. Formosa XXV, p. 127, 1935  
— Palau — n.v.
30. *panayensis* (Merr.) Brem. n. comb. (*Ruellia* Merr.) — Panay, Mindoro —  
*panayensis* (Merr.) Brem. var. *angustifolia* Brem. n. var. — Panay —  
*panayensis* (Merr.) Brem. var. *Merrillii* Brem. n. nom. = var. typ.  
*parabolica* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App., p. 153,  
1880 (*Ruellia* Nees) = *primulifolia*
13. *parva* Brem. n. spec. — Borneo —  
*pauciflora* Merr. in Philipp. Journ. of Sc. XIII, Bot., p. 61, 1918 — Luzon  
— n.v.  
*pavala* (Roxb.) Kurz in Journ. As. Soc. Beng. XXXIX, p. 78, 1870  
(*Ruellia* Roxb.) = *latebrosa*
53. *petola* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 206, Tab. X fig. 1,  
1897 — Ceram —  
*platycarpus* Clarke in Journ. As. Soc. Beng. LXXIV, p. 653, 1908 —  
Peninsula Malayana —
35. *primulifolia* (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App.,  
p. 153, 1880 — Celebes, Insulis Philippinis et Moluccanis —  
*procumbens* Merr. in Philipp. Journ. of Sc. XV, p. 256, 1919 = *Barleria*  
*procumbens* (Merr.) Merr.
49. *prostrata* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 202, Tab. IX  
fig. 3, 1897 — Archipelago Aruensi —
18. *proteus* Brem. n. spec. — Luzon —  
*prunelloides* S. Moore in Journ. Linn. Soc. XXXVII, p. 459, 1906 =  
*Synnema prunelloides* (S. Moore) Brem. n. comb.  
*quadrifaria* (Nees) T. And. in Journ. Linn. Soc. IX, p. 463, 1867 (*Ruellia*  
Nees) = *Sericocalyx quadrifarius* (Nees) Brem. n. comb.  
*rapifera* Hall. f. ex Koorders in Meded. 's Lands Plantent. XIX, p. 515, 1898, nomen,  
sphalmate = *napiifera*  
*rapifera* Hall. f. ex Koorders in errore apud Koorders-Schuhmacher, Syst. Verz. III § 1,  
p. 117, 1914 = *repanda*; apud auctores qui de flora Philippina tractaverunt  
= *primulifolia* vel species ei valde affinis  
? *ravaccensis* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Nees) =  
species incertae sedis, n.v.
60. *repanda* (L.) Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 198, 1897  
(*Ruellia* L.) — *culta*; patria ignota —  
*repanda* (L.) Lindau in K. Sch. et Laut., Nachtr. Fl. Deutsches Schutzgeb.  
Südsee, p. 385, 1905 = *prec.*  
*repens* (L.) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App., p. 154, 1880  
(*Ruellia repens* L. in errore apud Blanco, Fl. Philipp. ed. 1, p. 493,  
1837) forsitan = *primulifolia*
- reptans* (Forst.) T. And. ex Hemsl., Voy. Chall., Bot. I, 3, p. 173, 1885  
(*Ruellia* Forst.) — Novis Hebridis —  
*reptans* (Forst.) T. And. ex Hemsl. var. *glaucescens* Hall. f. in Nov. Act. Acad. Nat.  
Cur. LXX, p. 207, 1897, prob. = *moluccana* sed n.v.  
*reptans* (Forst.) T. And. ex Hemsl. var. *glaucescens* Hall. f. apud Merrill, Interpret.  
Herb. Amb., p. 471, 1917 = *Robinsonii*  
*reptans* (Forst.) T. And. ex Hemsl. var. *gracilis* Hall. f. l.c. p. 209 = *primulifolia*  
*reptans* (Forst.) T. And. ex Hemsl. var. *primulifolia* (Nees) Hall. f. l.c. p. 208 (*Ruellia*  
*primulifolia* Nees) = *primulifolia*
- reptans* (Forst.) Engl. in Bot. Jahrb. VII, p. 474, 1886, quoad typum =  
*reptans*; quoad specimen citatum = species alia nondum bene  
cognita  
*reptans* (Forst.) K. Sch. in Bot. Jahrb. IX, p. 219, 1888, ut *prec.*

1. **rhytiphylla** (Nees) F. Vill. in Blanco, Fl. Philipp. ed. 3; Nov. App., p. 153, 1880 (*Ruellia* Nees) — Luzon —  
**Ridleyi** Clarke in Journ. As. Soc. Beng. LXXIV, p. 652, 1908 — Peninsula Malayana —  
**rivularis** Merr. in Philipp. Journ. of Sc. XXIX, p. 488, 1925 — Bohol — n.v.
50. **Robinsonii** Brem. n. spec. — Ambon —
33. **rosmarinifolia** Brem. n. spec. — Luzon —
51. **Rumphii** Brem. in Blumea V, p. 240, 1942 — Insulis Moluccanis —  
*Rumphii* Brem. var. *angustifolia* Brem. l.c. = **ceramensis**  
*Rumphii* Brem. var. *gracilis* Brem. l.c. = **Robinsonii**  
*Rumphii* Brem. var. *pubescens* Brem. l.c. — Insula Morotai dicta  
*Rumphii* Brem. var. *subglabra* Brem. n. nom. = var. typ.  
**rupestris** Heyne ex T. And. in Journ. Linn. Soc. IX, p. 462, 1867 — Peninsula Indica —
26. **samarensis** Brem. n. spec. — Samar —  
*Schomburgkii* Craib in Kew Bull. 1911, p. 435 = **Sericocalyx Schomburgkii** (Craib) Brem. n. comb.  
*Schweinfurthii* Clarke in Dyer, Fl. Trop. Afr. V, p. 58, 1899 = **Synnema Schweinfurthii** (Clarke) Brem. n. comb.  
? *serpens* (Nees) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Nees) = seq.  
**serpens** (Nees) Boerl. ex Backer, Onkruidfl. Suikerrietgronden, p. 650, 1934 (*Ruellia* Nees) — Java —  
**setosa** Elm., Leafl. Philipp. Bot. I, p. 438, 1908 — Insulis Philippinis (Leyte, Samar, Panay) — n.v.
21. **simulans** Brem. n. spec. — Luzon —  
**solomonensis** Brem. n. spec. — Insulis Solomonensibus —  
**sordida** S. Moore in Journ. of Bot. LVIII, p. 190, 1920 — Nova Britannia — n.v.
59. **stenophylla** Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 203, 1897 — Celebes, Insulis Moluccanis —  
**strigosa** (Nees) F. Vill. in Blanco, Fl. Philipp. ed 3; Nov. App., p. 153, 1880 (*Ruellia* Nees) — Luzon — n.v., cf. **pachyphylla**
41. **sublobata** Elm., Leafl. Philipp. Bot. II, p. 591, 1909 — Luzon —  
**suborbicularis** S. Moore in Journ. of Bot. LVIII, p. 190, 1920 — Nova Britannia — n.v.
40. **subtinctoria** Elm., Leafl. Philipp. Bot. X, p. 3674, 1939 — Luzon —  
? *sumatrensis* (Roth) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Roth) = seq.
9. **sumatrensis** (Heyne ex Roth) Boerl. ex Brem. n. comb. (*Ruellia* Heyne ex Roth) — Peninsula Malayana, Sumatra, Java Occidentali, Borneo —  
**sumatrensis** (Heyne ex Roth) Boerl. ex Brem. var. **latifolia** Brem. n. var. — Sumatra, Java —  
**sumatrensis** (Heyne ex Roth) Boerl. ex Brem. var. **rothiana** Brem. n. nom. = var. typ.  
**sumatrensis** (Heyne ex Roth) Boerl. ex Brem. var. **scabrida** Brem. n. var. — Sumatra, Java —  
**szechuanica** Batalin in Act. Hort. Petrop. XIII, p. 384, 1894 — China — n.v., an huius generis?
37. **tayabensis** Brem. n. spec. — Luzon —  
**tenera** (Lindau) Clarke in Dyer, Fl. Trop. Afr. V, p. 58, 1899 (*Dyschoriste* Lindau) = **Synnema tenerum** (Lindau) Brem. n. comb.
32. **tenuispica** Brem. n. spec. — Luzon —

- tonkinensis* Lindau in Bull. Herb. Boiss. V, p. 649, 1897 = *Hygrophila polysperma* (Roxb.) T. And.  
 ? *trichotoma* (Nees) Boerl., Handl. Fl. Ned. II, p. 659, 1899 (*Ruellia* Nees) = *Championella japonica* (Thunb.) Brem.  
*turnerifolia* R. Ben. in Bull. Mus. Hist. Nat. Par. XXXII, p. 108, 1927 — Tonkin —  
 46. *undulata* Brem. in Blumea V, p. 242, 1942 — Archipelago Talaudensi —  
*venosa* Clarke n. nom. in Hook. f., Fl. Brit. Ind. IV, p. 423, 1884 (*Ruellia crispata* L. in errore apud Nees in Wall., Pl. As. Rar. III, p. 83, 1832) — Peninsula Indica —  
 35. *villosa* Brem. n. spec. — Borneo —  
 17. *viridis* Merr. in Philipp. Journ. of Sc., Bot., XIII, p. 59, 1908 — Luzon —  
*Weinlandii* K. Sch. ex Lindau in K. Sch. et Laut., Nachtr. Fl. Deutsch. Schutzgeb. Südsee, p. 385, 1905 — Nova Guinea — n.v.  
 3. *wetarensis* Brem. n. spec. — Wetar —  
*Whitei* S. Moore in Journ. of Bot. LVIII, p. 190, 1920 — Nova Guinea — n.v.

### Index Iconum.

- alternata* (Burm. f.) T. And. in Nov. Act. Acad. Nat. Cur. LXX, Tab. IX fig. 1 et 2, 1897 (sub nomine *H. colorata* (Bl.) Hall. f. f. *umbrosa* Hall. f. et f. *aprica* Hall. f.)  
*angustifolia* Hall. f. in Rumphius, Herb. Amboin. T. VI, Lib. X, Tab. XIII fig. A et B, 1750 (sub nomine *Prunella domestica angustifolia*); in Nov. Act. Acad. Nat. Cur. LXX, Tab. X fig. 2, 1897  
*buruensis* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, Tab. XI, 1897  
*cardiophylla* Quisumb. in Philipp. Journ. of Sc. XLI, p. 359, fig. 24, 1930  
*colorata* (Bl.) Hall. f. cf. *alternata*  
*crossandra* (Steud.) Brem. in Bot. Mag. LXII, Tab. 3389, 1835 (sub nomine *Ruellia elegans* Hook.)  
*hirta* (Vahl) T. And. in Vahl, Symb. Bot. III, Tab. LXVII, 1794 (sub nomine *Ruellia hirta* Vahl)  
*latebrosa* (Heyne ex Roth) Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1504, 1849  
*petola* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, Tab. X fig. 1, 1897  
*primulifolia* (Nees) F. Vill. in Nov. Act. Acad. Nat. Cur. LXX, Tab. IX fig. 4, 1897 (sub nomine *H. reptans* (Forst.) T. And. ex Hemsl. var. *primulifolia* (Nees) Hall. f.)  
*prostrata* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, Tab. IX fig. 3, 1897  
*repanda* (L.) Hall. f. in Burman, Fl. Ind., Tab. XL, 1768 (sub nomine *Ruellis repanda* L.)  
*reptans* (Forst.) T. And. ex Hemsl. var. *primulifolia* (Nees) Hall. f. cf. *primulifolia*  
*Rumphii* Brem. in Rumphius, Herb. Amboin. T. VI, Lib. X, Tab. XIII fig. 3, 1750 (sub nomine *Prunella molucca silvestris rubra*)  
*rupestris* Heyne ex T. And. in Wawra Itin. Princ. S. Coburg. I, Tab. VIII, 1883 (sub nomine *Ruellia satpoorensis* Wawra)  
*stenophylla* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, Tab. X fig. 3, 1897  
*sumatrensis* (Roth) Brem. in Houttyun, Nat. Hist. Ile deel, IXe stuk, Tab. LIX fig. 1, 1778 (sub nomine *Ruellia repanda* L.).

**Index Specierum quae uno tempore in *Ruellia nuncupatae* nunc ad genera diversa Strobilanthinarum translatae sunt.**

- alata* Wall. ex Nees in Wall., Pl. As. Rar. I, p. 26, Tab. 31, 1830 = **Pteracanthus alatus** (Wall. ex Nees) Brem. n. comb.
- alternata* Burm. f., Fl. Ind., p. 135, 1768 = **Hemigraphis alternata** (Burm. f.) T. And.
- amplectens* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = **Perilepta amplectens** (Nees) Brem. n. comb.
- ampliata* Edgew. ex Nees in DC., Prodr. XI, p. 193, 1847 in syn. *Strobilanthes Wallichii* var.  $\beta$ , nomen = **Pteracanthus alatus** (Wall. ex Nees) Brem.
- amygdalifolia* Hort. ex Steud., Nom. ed. 2, II, p. 480, 1841 = **Goldfussia anisophylla** (Wall. ex Lodd.) Nees
- anisophylla* Wall. ex Lodd., Bot. Cab. XI, Tab. 1070, 1825 = **Goldfussia anisophylla** (Wall. ex Lodd.) Nees
- anisophylla* Wall. ex Hook., Exot. Fl. III, Tab. 191, 1827 = prec.
- aspera* (Decne) Nees in DC., Prodr. XI, p. 147, 1847 (*Strobilanthes* Decne) = **Xanthostachya aspera** (Decne) Brem. n. comb.
- attenuata* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 83, 1832 = **Pteracanthus attenuatus** (Wall. ex Nees) Brem. n. comb.
- biceps* (Nees) Steud., Nom. ed. 2, II, p. 480, 1841 = **Goldfussia biceps** Nees
- bicolor* Bl., Bijdr. Fl. Ned. Ind. p. 795, 1826 = **Hemigraphis bicolor** (Bl.) Hall. f.
- blumeana* Nees in DC., Prodr. XI, p. 149, 1847 = **Hemigraphis sumatrensis** (Heyne ex Roth) Brem.
- blumeana* Nees var.  $\beta$  Nees l.c. = **Hemigraphis javanica** Brem.
- Blumei* Steud., Nom. ed. 2, II, p. 480, 1841, n. nom. (*tetragona* Bl. 1823, non Link 1822) = **Hemigraphis brunelloides** (Lam.) Brem.
- capitata* D. Don, Prodr. Fl. Nep. p. 120, 1825, nom. conf., p.p. = **Goldfussia capitata** Nees; p.p. = **G. penstemonoides** Nees
- chinensis* Nees in DC., Prodr. XI, p. 147, 1847 = **Sericocalyx chinensis** (Nees) Brem. n. comb.
- colorata* Bl., Bijdr. Fl. Ned. Ind. p. 795, 1826 = **Hemigraphis alternata** (Burm. f.) T. And.
- comosa* Roxb., Fl. Ind. III, p. 43, 1832 (non Vell., Fl. Flum. VI, Tab. 91, 1827) = **Buteraea rufescens** (Roxb.) Dietrich
- confinis* Nees in DC., Prodr. XI, p. 148, 1847 = **Hemigraphis confinis** (Nees) T. And.
- confinis* Nees var.  $\beta$  Nees l.c. = **Hemigraphis brunelloides** (Lam.) Brem.
- cordifolia* Vahl, Symb. Bot. III, p. 84, 1794 = **Stenosiphonium cordifolium** (Vahl) Alston
- crenata* Benth. ex Hohen. in Flora XXXII, p. 558, 1849 = **Hemigraphis crenata** (Benth.) Brem. n. comb.
- crispa* L., Sp. Pl. p. 653, 1753 = **Sericocalyx crispus** (L.) Brem. n. comb.
- crispa* L. in errore apud Nees in Wall., Pl. As. Rar. III, p. 83 = **Hemigraphis venosa** Clarke
- crossandra* Steud., Nom. ed. 2, II, p. 481, 1841, n. nom. (*R. diffusa* Wall. ex Nees 1832, non Vell. 1827; *R. elegans* Hook. 1835, non Poir. 1816) = **Hemigraphis crossandra** (Steud.) Brem. n. comb.
- cumingiana* Nees in DC., Prodr. XI, p. 148, 1847 = **Hemigraphis cumingiana** (Nees) F. Vill.

- decaisneana* Nees in DC., Prodr. XI, p. 150, 1847, n. nom. (*Strobilanthes hirsuta* Decne) = **Hemigraphis decaisneana** (Nees) T. And.
- decipiens* Nees in Wall., Pl. As. Rar. III, p. 83, 1832 = ? *Hemigraphis decipiens* (Nees) F. Vill., species incertae sedis
- diffusa* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 83, 1832 (non Vell., Fl. Flum. VI, Tab. 94, 1827) = **Hemigraphis crossandra** (Steud.) Brem.
- discolor* Nees in DC., Prodr. XI, p. 149, 1847 = **Hemigraphis brunelloides** (Lam.) Brem.
- dura* Nees in Hook., Comp. Bot. Mag. II, p. 311, 1836 = **Gantelbua urens** (Roth) Brem.
- ebracteata* Dalz. in Hook., Kew Journ. II, p. 342, 1850 = **Hemigraphis latebrosa** (Heyne ex Roth) Nees var. *ebracteata* (Dalz.) Th. Cooke
- ebracteolata* Dalz. ex T. And. in Journ. Linn. Soc. IX, p. 462, 1867 (in syn. *Hemigraphis rupestris*) = prec.
- elegans* Hook. in Bot. Mag. LXII, Tab. 3389, 1835 (non Poir., Encycl. Suppl. IV, p. 727, 1816) = **Hemigraphis crossandra** (Steud.) Brem.
- eucoma* Steud., Nom. ed. 2, II, p. 481, 1841, n. nom. (*comosa* Roxb. 1832, non Vell. 1827) = **Buteraea rufescens** (Roth) Dietr.
- extensa* (Nees) Steud., Nom. ed. 2, II, p. 481, 1841 (*Goldfussia* Nees) = **Pteracanthus extensus** (Nees) Brem. n. comb.
- flaccida* Kurz in Journ. As. Soc. Beng. XLII, p. 91, 1873 = **Hemigraphis flaccida** (Kurz) Clarke
- flava* Roxb., Fl. Ind. III, p. 43, 1832 (non Pers., Syn. II, p. 177, 1807) = **Sericocalyx flavus** (Kurz) Brem.
- gossypina* Nees in Wall., Pl. As. Rar. I, p. 38, Tab. 42, 1830 = **Aechmanthera gossypina** (Nees) Nees
- griffithiana* Nees in DC., Prodr. XI, p. 149, 1847 = **Hemigraphis griffithiana** (Nees) T. And.
- hamiltoniana* Steud., Nom. ed. 2, II, p. 481, 1841, n. nom. (*Goldfussia colorata* Nees; non *Ruellia colorata* Bl. 1826) = **Difflugossa colorata** (Nees) Brem.
- hirsuta* (Vahl) Nees in DC., Prodr. XI, p. 148, 1847 (*Justicia* Vahl) (non Ell., Sketch II, p. 109, 1824; nec Vell., Fl. Flum. VI, Tab. 96, 1827; nec Roxb., Fl. Ind. III, p. 51, 1832) = **Hemigraphis brunelloides** (Lam.) Brem.
- hirta* D. Don, Prodr. Fl. Nep. p. 119, 1825 (non Vahl, Symb. Bot. III, p. 84, 1794) = **Goldfussia nutans** Nees
- hirta* Vahl, Symb. Bot. III, p. 84, Tab. 67, 1794 = **Hemigraphis hirta** (Vahl) T. And.
- hirta* Vahl var. *urens* (Roth) Nees in DC., Prodr. XI, p. 146, 1847 (*Ruellia urens* Roth) = **Gantelbua urens** (Roth) Brem.
- indigofera* Griff., Travels p. 237, 1837/38 = **Baphicacanthus cusia** (Nees) Brem.
- indigotica* Fortune, Resid. Chin. p. 158, 1857 = prec.
- isophylla* (Nees) Steud., Nom. ed. 2, II p. 482, 1841 = **Goldfussia isophylla** Nees
- jacquemontiana* Nees in DC., Prodr. XI, p. 145, 1847 = **Pseudaechmanthera glutinosa** (Nees) Brem.
- japonica* Thunb., Fl. Jap. p. 254, 1784 = **Championella japonica** (Thunb.) Brem. n. comb.
- junghuhniana* Miq., Fl. Ind. Bat. II, p. 790, 1858 = **Difflugossa filiformis** (Bl.) Brem.



- latebrosa* Heyne ex Roth, Nov. Pl. Sp. p. 307, 1821 = **Hemigraphis latebrosa** (Heyne ex Roth) Nees  
*latebrosa* Roxb., Fl. Ind. III, p. 46, 1832, forsitan = **Hemigraphis hirta** (Vahl) T. And.  
*longifolia* Thunb. ex Nees in DC., Prodr. XI, p. 182, 1847, in syn. **Strobilanthes cernua**  
 Bl. (non *longifolia* Rich. in Act. Soc. Hist. Nat. Par. I, p. 110, 1792)  
*luzona* Nees in DC., Prodr. XI, p. 151, 1847 = ? **Hemigraphis luzona**  
 (Nees) F. Vill.  
*maculata* Wall., Pl. As. Rar. III, p. 33, Tab. 250, 1832 = **Sympagis maculata** (Wall.) Brem. n. comb.  
*monadelpha* (Nees) Steud., Nom. ed. 2, II, p. 482, 1841 (**Strobilanthes**  
 Nees) = **Sympagis monadelpha** (Nees) Brem. n. comb.  
*nemorosa* Zoll. in Nat. en Geneesk. Arch. Ned. Indië II, p. 574, 1845 =  
**Hemigraphis nemorosa** (Zoll.) Boerl. ex Brem. n. comb.  
*nutans* (Nees) Steud., Nom. ed. 2, II, p. 482, 1841 = **Goldfussia nutans**  
 Nees  
*obliqua* Pers., Syn. II, p. 177, 1807, forsitan = **Sericocalyx crispus** (L.)  
 Brem.  
*obovata* Bl. ex Steud., Nom. ed. 2, II, p. 482, 1841, nomen, n.v.  
*panayensis* Merr. in Philipp. Journ. of Sc. X, p. 347, 1915 = **Hemigraphis panayensis**  
 (Merr.) Brem. n. comb.  
*parabolica* Nees in DC., Prodr. XI, p. 144, 1847 = **Hemigraphis primu-**  
**lifolia** (Nees) F. Vill.  
*pavala* Roxb., Fl. Ind. III, p. 47, 1832 = **Hemigraphis latebrosa** (Heyne  
 ex Roth) Nees  
*persicifolia* Lindl. in Bot. Reg. XI, Tab. 955, 1826 = **Goldfussia aniso-**  
**phylla** (Wall. ex Lodd.) Nees  
 ? *punctata* Nees in DC., Prodr. XI, p. 147, 1847 = **Nilgirianthus punctatus**  
 (Nees) Brem.  
*quadrifaria* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 83, 1832 =  
**Sericocalyx quadrifarius** (Wall. ex Nees) Brem. n. comb.  
*ravaccensis* Nees in DC., Prodr. XI, p. 144, 1847 = ? **Hemigraphis ravac-**  
**ensis** (Nees) Boerl.  
*repanda* L., Sp. Pl. ed. 2, p. 886, 1763 = **Hemigraphis repanda** (L.)  
 Hall. f.  
*repanda* L. in errore apud Houttuyn, Nat. Hist. Ite deel, IXe stuk, p. 575, Tab. LIX  
 fig. 1, 1778 et apud Bl., Bijdr. Fl. Ned. Ind. p. 794, 1826 = **Hemigraphis**  
**sumatrensis** (Heyne ex Roth) Boerl. ex Brem.  
*repens* L. in errore apud Blanco, Fl. Philipp. ed. 1, p. 493, 1837, fide Merrill = **Hemi-**  
**graphis cumingiana** (Nees) F. Vill.  
*reptans* Forst., Prodr. p. 44, 1786 = **Hemigraphis reptans** (Forst.) T. And.  
 ex Hemsl.  
*rhytiphylla* Nees in DC., Prodr. XI, p. 150, 1847 = **Hemigraphis rhyti-**  
**phylla** (Nees) F. Vill.  
*rotundifolia* D. Don, Prodr. Fl. Nep. p. 120, 1825 = ? **Pteracanthus**  
**rotundifolius** (D. Don) Brem. n. comb.  
*rufescens* Roth, Nov. Pl. Spec. p. 304, 1821 = **Buteraea rufescens** (Roth)  
 Dietr.  
*sabiniana* Wall. ex Lindl. in Bot. Reg. XV, Tab. 1238, 1829 = species ad  
 genus *Strobilanthinorum* adhuc incertum pertinens  
*sarmentosa* Nees in Wall., Pl. As. Rar. III, p. 83, 1832 = **Hemigraphis**  
**hirta** (Vahl) T. And.  
*sarmentosa* Nees var. *urens* (Heyne ex Roth) Nees l.c. = **Gantelbua urens** (Heyne ex  
 Roth) Brem.  
*satpoorensis* Wawra in Oest. Bot. Zeitschr. XXXI, p. 281, 1881 = **Hemi-**  
**graphis rupestris** Heyne ex T. And.

- serpens* Nees in DC., Prodr. XI, p. 145, 1847 = **Hemigraphis serpens** (Nees) Boerl. ex Backer
- spicata* Roth, Nov. Pl. Sp. p. 310, 1821 = **Phlebophyllum spicatum** (Roth) Brem. n. comb.
- strigosa* Nees in DC., Prodr. XI, p. 148, 1847 = **Hemigraphis strigosa** (Nees) F. Vill.
- sumatrensis* Heyne ex Roth, Nov. Pl. Sp. p. 311, 1821 = **Hemigraphis sumatrensis** (Heyne ex Roth) Brem. n. comb.
- tetragona* Reinw. ex Bl., Cat. Gew. Buitenzorg 1823 (non Link, Enum. Hort. Berol. II, p. 133, 1822) = **Hemigraphis brunelloides** (Lam.) Brem.
- tetragona* Thunb., Florula Javan. p. 22, 1825, prob. = prec.
- tetrasperma* Champ. ex Benth. in Kew Journ. V, p. 132, 1853 = **Championella tetrasperma** (Champ. ex Benth.) Brem. n. comb.
- trichotoma* Nees in DC., Prodr. XI, p. 149, 1847 = **Championella japonica** (Thunb.) Brem.
- urens* Heyne ex Roth, Nov. Pl. Sp. p. 302, 1821 = **Gantelbua urens** (Heyne ex Roth) Brem. n. comb.
- variegata* Lubbers, Cat. Pl. Rar. San-Donato p. 13, 1880 = **Sympagis maculata** (Nees) Brem.
- venosa* Bl., Bijdr. Fl. Ned. Ind. p. 795, 1826 = **Hemigraphis brunelloides** (Lam.) Brem.
- viscida* Bl. in sched. = **Hemigraphis decaisneana** (Nees) T. And.

**Icones Specierum sub nomine *Ruellia* depictarum, sed ad genera  
Strobilanthinarum pertinentium.**

- alata* Wall. ex Nees in Wall., Pl. As. Rar. I, Tab. 31, 1830 = **Pteracanthus alatus** (Wall. ex Nees) Brem.
- anisophylla* Wall. ex Lodd., Bot. Cab. XI, Tab. 1070, 1825 et ex Hook., Exot. Fl. III, Tab. 191, 1827 = **Goldfussia anisophylla** (Wall. ex Lodd.) Nees
- elegans* Hook. in Bot. Mag. LXII, Tab. 3389, 1835 et in Hort. van Houtt. II, Tab. 5 fig. H, 1846 = **Hemigraphis crossandra** (Steud.) Nees
- hirta* Vahl, Symb. Bot. III, Tab. 67, 1794 = **Hemigraphis hirta** (Vahl) T. And.
- japonica* Thunb., Ic. Pl. Jap. V, Tab. 9, 1805 = **Championella japonica** (Thunb.) Brem.
- maculata* Wall. ex Nees in Wall., Pl. As. Rar. III, Tab. 250, 1832 = **Sympagis maculata** (Wall. ex Nees) Brem.
- persicifolia* Lindl. in Bot. Reg. XI, Tab. 955, 1826 = **Goldfussia anisophylla** (Wall. ex Lodd.) Nees
- repanda* L. in Burman, Fl. Ind. Tab. 40, 1768 = **Hemigraphis repanda** (L.) Hall. f.
- repanda* L. in errore apud Houttuyn, Nat. Hist. Ite deel, IXe stuk, Tab. LIX fig. 1, 1778 = **Hemigraphis sumatrensis** (Roth) Brem.
- sabiniana* Wall. ex Lind. in Bot. Reg. XV, Tab. 1238, 1829; in Lodd., Bot. Cab. XVIII, Tab. 1712, 1831; in Geel. Sert. Bot. Tab. 14, 1832 et in Reichenbach, Fl. Exot. III, Tab. 210, 1835 = species ad genus *Strobilanthinarum* adhuc incertum pertinens
- satpoorensis* Wawra in Wawra, Itin. Princ. S. Coburg I, Tab. 8, 1883 = **Hemigraphis rupestris** Heyne ex T. And.

*Hemigraphidis* Species sub nominibus genericis aliis nuncupatae.

- Justicia brunelloides* Lam., Ill. Gen. I, p. 40, ante 1797 = **Hemigraphis brunelloides** (Lam.) Brem. n. comb.
- Justicia hirsuta* Vahl, Symb. Bot. I, p. 122, 1790 (non Jacquin, Enum. Pl. Carib. p. 11, 1760) = prec.
- Nelsonia brunelloides* (Lam.) O. Ktze, Rev. Gen. Pl. I, p. 493, 1892 (*Justicia* Lam.), quoad typum = **Hemigraphis brunelloides** (Lam.) Brem.; quoad specimina citata = *Nelsonia campestris* R. Br.
- Nelsonia hirsuta* (Vahl) Roem. et Schult., Syst. Pl. I, p. 172, 1817 (*Justicia* Vahl) = **Hemigraphis brunelloides** (Lam.) Brem.
- Rungia sumatrana* Miq., Fl. Ind. Bat., Suppl. p. 567, 1866 = **Hemigraphis sumatrensis** (Heyne ex Roth) Boerl. ex Brem. var. *scabrida* Brem.
- Strobilanthes bogoriensis* Lindau in Fedde, Repert. XIII, p. 531, 1915 = **Hemigraphis buruensis** Hall. f.
- Strobilanthes bulusanensis* Elm., Leaflet Philipp. Bot. X, p. 2678, 1939 = **Hemigraphis cumingiana** (Nees) F. Vill.
- Strobilanthes burmanica* Kurz in Journ. As. Soc. Beng. XLIII, p. 92, 1873 = **Hemigraphis crossandra** (Steud.) Brem.
- Strobilanthes hirsuta* Decne in Nouv. Ann. Mus. Par. III, p. 386, 1834 = **Hemigraphis decaisneana** (Nees) T. And.
- Strobilanthes hirta* (Vahl) Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826 (*Ruellia* Vahl), quoad typum = **Hemigraphis hirta** (Vahl) T. And.; quoad specimina citata = **Strobilanthes Blumei** Brem. n. nom.
- Strobilanthes involucrata* Bl. in errore apud Span. in Hook., Comp. Bot. Mag. I, p. 349, 1835 = **Hemigraphis decaisneana** (Nees) T. And.
- Strobilanthes Naumannii* Engl. in Engl., Bot. Jahrb. VII, p. 474, 1886 et in Forschungsreise Gazelle p. 44, 1886 = **Hemigraphis Naumannii** (Engl.) Brem. n. comb.
- Strobilanthes novomegapolitana* Lindau in Engl., Bot. Jahrb. L, p. 166, 1913 = **Hemigraphis novomegapolitana** (Lindau) Brem. n. comb.

2. **Gantelbua** Brem. n. gen.; typus: *G. urens* (Heyne ex Roth) Brem. n. comb. (*Ruellia* Heyne ex Roth); Nees in DC., Prodr. XI, p. 146, 1847 sub *Ruellia*; T. And. in Journ. Linn. Soc. IX, p. 461, 1876 sub *Hemigraphis*.

Herba procumbens, isophylla. Rami novelli setis basi bulbosis hirti; veteriores basibus pilorum pustulati. Folia in petiolum brevem contracta, utraque facie dense pubescentia et hirta, margine et costa subtus setis basi bulbosis sparsa, supra cystolithis magnis lineolata. Inflorescentiae ramos ramulosque terminantes, capituliformes. Bractee principales 2-parae, ovatae, crassae, costa basin versus dilatata et sicut margine chondracea, ceterum foliis similiores; infimae florem et capitulum secundarium ei superpositum suffulcientes, capitulo secundario bracteis 2-paris angustioribus munito, 4-floro; bractee superiores florem singulum vel flores duos superpositos suffulcientes. Flores ebracteolati. Calyx aequaliter 5-partitus, lobis anguste linearibus acutis, extus et margine hirtis. Corolla violacea, recta et non resupinata, tubo tereti, faucibus campanulatis tubo subaequilongis, pilis stylum retinentibus in series duas dispositis, lobis aequalibus, obovatis. Stamina 4, omnia erecta et subinclusa; filamenta staminum exteriorum quam interiorum paulo longiora, basi solum hirtella; antherae erectae, muticae, thecis patentibus, basi muticis. Granula pollinis ellipsoidea, virgis 15 glabris ornata. Staminodium nullum. Ovarium glabrum, utroque loculo ovulis 4. Stylus ad basin pilis capitatis, ceterum pilis ecapitatis hirtellus. Capsula fusiformis, glabra, seminibus 6—8 instructa, retinaculis parvis. Semina luteo-brunnea, vix areolata, pilis annulatis, valde applanatis et mucosis vestita; cellulae strati subepidermalis parietibus haud incrassatis instructae.

Genus monotypicum in Peninsula Indica endemicum.

Species unica: *G. urens* (Heyne ex Roth) Brem. n. comb. (*Ruellia* Heyne ex Roth).

The genus *Gantelbua* was separated from *Hemigraphis* on account of the peculiar structure of the inflorescence, but it distinguishes itself also from that genus by the deeply divided calyx and by the small size of the areola. The name is a latinization of the vernacular name of the type species (cf. Cooke, Fl. Bombay II, p. 357, 1905).

1. *Gantelbua urens* (Heyne ex Roth) Brem. n. comb.; *Ruellia urens* Heyne ex Roth, Nov. Pl. Sp. p. 302, 1821; *R. sarmentosa* Nees var. *urens* (Roth) Nees in Wall., Pl. As. Rar. III, p. 83, 1832; *R. hirta* Vahl var. *urens* (Roth) Nees in DC., Prodr. XI, p. 146, 1847; — *R. dura* Nees in Hook., Comp. Bot. Mag. II, p. 311, 1836; id. in DC., Prodr. XI, p. 146, 1847; *Hemigraphis dura* (Nees) T. And. in Journ. Linn. Soc. IX, p. 461, 1867, syn. *R. crispa* Nees non L. excl.; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 422, 1884; Cooke, Fl. Bombay II, p. 357, 1905.

Habitat Peninsulam Indicam.

I have not seen the type of ROTH's *Ruellia urens*, but according to CLARKE l.c. it is conspecific with that of *R. dura* Nees, and as ROTH's epithet is 26 years older than that of NEES, it deserves preference.

3. *Aechmanthera* Nees in Wall., Pl. As. Rar. III, p. 75 et 87, 1832; id. in DC., Prodr. XI, p. 100 et 170, 1847; T. And. in Journ. Linn. Soc. IX, p. 485, 1867; Benth. in Benth. et Hook. f., Gen. Pl. II, p. 1088; 1876; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 388 et 428, 1884, p.p.; Lindau in Engl. u. Prantl, IV 3b, p. 303, 1895, p.p.; Lemée, Dict. Pl. Phan. I, p. 90, 1929.

Herbae ramosae, basi lignescentes, isophyllae. Folia petiolata, facie inferiore ut rami pubescentia. Inflorescentiae spiciformes; spicae satis laxae, paniculatum dispositae. Bracteae persistentes, lineares, calyci subaequilongae. Bracteolae bracteis similiores. Flores in axillis bractearum solitarii. Calyx subaequaliter 5-partitus, lobis linearibus subacutis. Corolla coerulea, recta et non resupinata, tubo tereti, faucibus campanulatis tubo subaequilongis, pilis stylum retinentibus in series duas dispositis, lobis aequalibus, orbicularibus. Stamina 4, omnia erecta et inclusa; filamenta staminum exteriorum unifariam hirtella, interiorum glabra; antherae erectae, apice mucronatae vel aristatae, thecis basi muticis. Granula pollinis ellipsoidea, virgis 18 punctatis ornata. Staminodium nullum. Ovarium dense comosum, utroque loculo ovulis 3—4. Stylus parce hirtellus. Capsula anguste fusiformis, retinaculis robustioribus. Semina 6—8, exareolata, pilis indistincte annulatis vestita; parietes cellularum strati subepidermalis incrassatae.

Distributum in regione temperata Himalayae et in montibus regionis Chittagong dictae. Species probabiliter tres.

Typus generis: *A. gossypina* (Nees) Nees.

The genus *Aechmanthera* is still imperfectly known. The inflorescence was both by ANDERSON and by CLARKE wrongly described, for the flowers are not clustered on the branchlets of the panicle but laxly spicate: this mistake had been rectified already by LINDAU. With regard to the structure of the anther there is some difference of opinion. I myself found the connective always excurrent, but CLARKE described it as non-excurrent in *A. tomentosa*; however, it is not impossible that this statement is due to confusion with another Himalayan species, namely with *Pseudaechmanthera glutinosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees), which shows a superficial but nevertheless rather deceptive resemblance to *A. tomentosa* and whose anthers are merely subacute.

Apart from the structure of the anthers, the most important difference between *Aechmanthera* and *Hemigraphis* lies probably in the nature of the testa, for there is no indication of an areola in the seeds of *Aechmanthera*.

The seeds of CLARKE's *A. leiosperma* have been described as thicker than those of the type species and completely glabrous. If this should prove a normal feature, the plant will have to be transferred to another genus, but it may have been a malformation. As I have seen no material of this species, I will leave it out of consideration. The Chittagong specimens quoted by CLARKE under *A. tomentosa* Nees var. *Wallichii* (Nees) Clarke belong probably to an undescribed species.

The two species accepted below are those on which the genus was founded. Afterwards NEES reduced them to varietal rank, and this view was accepted by CLARKE l.c., but it seems to me that the differences are of sufficient importance to justify a return to NEES's original standpoint. However, as the material which I could investigate was but scanty, the question should not be regarded as definitely settled.

#### Index Specierum.

- \* *gossypina* (Nees) Nees in Wall., Pl. As. Rar. III, p. 87, 1832 (*Ruellia* Nees)  
— in montibus Indiae Septemtrionalis —
- leiosperma* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 429, 1884 = species incertae sedis
- tomentosa* Nees in Wall., Pl. As. Rar. III, p. 87, 1832 — in montibus Indiae Septemtrionalis —
- tomentosa* Nees var. *Wallichii* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 428, 1884 (*Aechmanthera Wallichii* Nees) specim. in Chittagong lectis excl. = *gossypina*
- Wallichii* Nees in DC., Prodr. XI, p. 170, 1847, n. nom. illeg. = *gossypina*
- Wallichii* Nees var. *tomentaria* Nees l.c. = *gossypina*
- Wallichii* Nees var. *gossypina* (Nees) Nees l.c. = *gossypina*
- Wallichii* Nees var. *leuconeura* Nees l.c. = *tomentosa*
- Wallichii* Nees var. *tomentosa* (Nees) Nees l.c. = *tomentosa*.

#### Icon.

*gossypina* (Nees) Nees in Wall., Pl. As. Rar. I, Tab. 42, 1830 (sub nomine *Ruellia gossypina* Nees).

*Aechmantherae* species sub nomine generico alio nuncupata.

*Ruellia gossypina* Nees in Wall., Pl. As. Rar. I, p. 38, Tab. 42, 1830 = *Aechmanthera gossypina* (Nees) Nees.

#### GROUP B.

This group comprises a number of species occurring in China, Japan, Formosa and Tonkin, which I refer provisionally to two genera, *Championella* and *Parachampionella*. It are isophyllous herbs with a non-resupinate corolla, included stamens, globose echinulate pollen and seeds (Tab. IV E) provided with a small areola. In their herbaceous growth, isophylly, non-resupinate corolla and seeds provided with a small areola, they resemble *Hemigraphis*, from which they differ however in the globose echinulate pollen and in the presence of but two ovules in each of the ovary cells. From *Gutzlaffia*, with which they agree in the structure of the pollen, they differ in the non-resupinate corolla and the fertility of the inner stamens.

The two genera *Championella* and *Parachampionella* differ from each other in the length of the inflorescence, the degree of coherence between the calyx segments, the presence or absence of hairs on the style and at the top of the ovary, and in the nature of the hairs covering the testa.

4. *Championella* Brem. n. gen.; typus: *Ch. tetrasperma* (Champ. ex Benth.) Brem. n. comb. (*Ruellia* Champ. ex Benth.); *Strobilanthes* species auctorum aliorum.

Herbae ascendentes, isophyllae. Folia petiolata vel subsessilia. Inflorescentiae spiciformes, primum abbreviatae, deinde plus minusve elongatae, terminales. Bractee foliaceae, penninerviae, calyce longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, calyci subaequilongae vel eo breviores, persistentes. Calyx subaequaliter 5-partitus, lobis linearibus acutis. Corolla violacea, dilute rosea, luteola vel alba, non resupinata, tubo recto sensim in fauces infundibuliformes ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus obcordatis. Stamina 4, omnia erecta et inclusa; filamenta staminum exteriorum quam interiorum bis longiora, hirtella; staminum interiorum glabra; antherae erectae, elongatae, apice obtusae, thecis patentibus. Staminodium subnullum. Granula pollinis globosa echinulata, echinulis in series meridionales dispositis. Ovarium comosum, utroque loculo ovulis 2. Stylus dense hirtellus. Capsula fusiformis, 4-seminalis, retinaculis in aciculam exeuntibus. Semina (Tab. IV E) parvo-areolata, extra areolam pilis annulatis brevibus vel papillis vestita; cellulae strati subepidermalis parietibus crassis instructae.

Distributum in Japonia, China, Tonkin. Species adhuc notae 4.

Species typica: *Championella tetrasperma* (Champ. ex Benth.) Brem. n. comb. (*Ruellia* Champ. ex Benth.).

#### Index Specierum.

- ? *Dalzielii* (W. W. Smith) Brem. n. comb. (*Acanthopale* W. W. Smith); syn.: *Strobilanthes Dalzielii* (W. W. Smith) R. Ben. var. excl. — China —  
*debilis* (Hemsl.) Brem. n. comb. (*Strobilanthes* Hemsl.) — China —  
*japonica* (Thunb.) Brem. n. comb. (*Ruellia* Thunb.); syn.: *Strobilanthes japonica* (Thunb.) Miq.; *Ruellia trichotoma* Nees — Japonia —  
*oligantha* (Miq.) Brem. n. comb. (*Strobilanthes* Miq.); syn.: *Acanthopale oligantha* (Miq.) Clarke ex W. W. Smith — Japonia et China —  
 \* *tetrasperma* (Champ. ex Benth.) Brem. n. comb. (*Ruellia* Champ. ex Benth.); syn.: *Strobilanthes tetrasperma* (Champ. ex Benth.) Druce; *Str. radicans* T. And.; *Acanthopale radicans* (T. And.) Clarke ex R. Ben. — China, Tonkin —  
 ? *xanthantha* (Diels) Brem. (*Strobilanthes* Diels) — China —

#### Index Iconum.

- japonica* (Thunb.) Brem. in Thunb., Ic. Pl. Jap. V, Tab. 9, 1805 (sub nomine *Ruellia japonica* Thunb.); in Yatabe, Ic. Fl. Jap. I, Tab. 14, 1891 et in Somoku Dzusetsu, ed. Makino XI, Tab. 64, 1912 (sub nomine *Strobilanthes japonica* Miq.)  
*oligantha* (Miq.) Brem. in Somoku Dzusetsu, ed. Makino XI, Tab. 63, 1912 (sub nomine *Strobilanthes oligantha* Miq.).

*Championellae* species sub nominibus genericis aliis nuncupatae.

- Acanthopale Dalzielii* W. W. Smith in Notes Edinb. Bot. Gard. XI, p. 193, 1919 = ? *Championella Dalzielii* (W. W. Smith) Brem. n. comb.  
*Acanthopale oligantha* (Miq.) Clarke ex W. W. Smith l.c. (*Strobilanthes* Miq.) = *Championella oligantha* (Miq.) Brem.  
*Acanthopale radicans* (T. And.) Clarke ex R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 673, 1935, in syn. *Strobilanthes radicantis* T. And. = *Championella tetrasperma* (Champ. ex Benth.) Brem.  
*Ruellia japonica* Thunb., Fl. Jap. p. 254, 1784 = *Championella japonica* (Thunb.) Brem. n. comb.

- Ruellia tetrasperma* Champ. ex Benth. in Kew Journ. V, p. 132, 1853 = **Championella tetrasperma** (Champ. ex Benth.) Brem. n. comb.  
*Ruellia trichotoma* Nees in DC., Prodr. XI, p. 149, 1847 = **Championella japonica** (Thunb.) Brem.  
*Strobilanthes Dalzielii* (W. W. Smith) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 679, 1935 (*Acanthopale* W. W. Smith), var. excl. = ? **Championella Dalzielii** (W. W. Smith) Brem.  
*Strobilanthes debilis* Hemsl. in Journ. Linn. Soc. XXVI, p. 239, 1890 = **Championella debilis** (Hemsl.) Brem. n. comb.  
*Strobilanthes japonica* (Thunb.) Miq. in Ann. Mus. Bot. Lugd.-Bat. II, p. 124, 1866 (*Ruellia* Thunb.) = **Championella japonica** (Thunb.) Brem.  
*Strobilanthes oligantha* Miq. in Ann. Mus. Bot. Lugd.-Bat. II, p. 124, 1866 = **Championella oligantha** (Miq.) Brem. n. comb.  
*Strobilanthes radicans* T. And. ex Benth., Fl. Hongk., p. 262, 1861 = **Championella tetrasperma** (Champ. ex Benth.) Brem.  
*Strobilanthes tetrasperma* (Champ. ex Benth.) Druce in Rep. Bot. Exch. Club Brit. Isles 1916, p. 649, 1917 (*Ruellia* Champ. ex Benth.) = **Championella tetrasperma** (Champ. ex Benth.) Brem.  
*Strobilanthes xanthantha* Diels in Notes Bot. Gard. Edinb. V, p. 163, 1912 = ? **Championella xanthantha** (Diels) Brem. n. comb.

5. **Parachampionella** Brem. n. gen.; typus: *P. rankanensis* (Hayata) Brem. n. comb. (*Strobilanthes* Hayata); *Strobilanthes* species auctore Hayata.

Herbae ascendentes, isophyllae. Folia petiolata. Inflorescentiae terminales, spici- vel racemiformes, elongatae. Bractea haud raro foliaceae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, calyce paulo breviores, persistentes. Calyx 3-partitus; labium superius 3-lobatum vel 3-fidum; segmenta omnia acute exeuntia. Corolla colore ignoto, non resupinata, tubo brevi sensim in fauces infundibuliformes ampliata, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus obcordatis. Stamina 4, omnia erecta et inclusa; filamenta staminum exteriorum quam interiorum bis longiora, glabra vel hirtella; staminum interiorum semper glabra; antherae erectae, apice obtusae, thecis patentibus. Staminodium late triangulare. Granula pollinis globosa echinulata, spinulis in series meridionales dispositis. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, glabra, 4-seminalis, retinaculis basi satis crassis, apice in aciculam brevem exeuntibus. Semina parvo-areolata, extra areolam pilis longioribus, haud annulatis vestita; cellulae strati subepidermalis parietibus crassis instructae.

Distributum in Insula Formosa. Species adhuc notae 2.

Species typica: *P. rankanensis* (Hayata) Brem. n. comb. (*Strobilanthes* Hayata).

This new genus does not comprise all Formosan species which have been referred to *Strobilanthes*, but those which do not belong to *Parachampionella* can not yet be located, as they are insufficiently known.

#### Index Specierum.

- \* **rankanensis** (Hayata) Brem. n. comb.; *Strobilanthes rankanensis* Hayata, Ic. Pl. Formos. IX, p. 84, 1920 — Formosa —
- Tashiroi** (Hayata) Brem. n. comb.; *Strobilanthes Tashiroi* Hayata, Ic. Pl. Formos. IX, p. 85, 1920 — Formosa —

#### GROUP C.

*Stenosiphonium* Nees, the only genus belonging to this group, occupies a rather isolated position. In habit it is not unlike *Pseudostenosiphonium* Lindau,

and one of the species which NEES had referred to it, actually turned out to belong to the latter. This species, *St. diandrum* Nees, was referred by CLARKE (in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884, where it is mentioned under the illegitimate name *Strobilanthes exareolata* Clarke) to *Strobilanthes* sensu T. And. subgenus *Endopogon*, which roughly corresponds to NEES's genus *Endopogon*, and NEES himself had already suggested that it might be regarded as intermediate between *Stenosiphonium* and the latter. The naked seeds and echinulate pollen grains, however, leave no doubt with regard to its real position. *Stenosiphonium* differs moreover from *Pseudostenosiphonium* in several other respects: the flowers are not found singly in the axils of the bracts but in triads, the corolla is resupinate, the hairs which retain the style against the wall of the corolla are inserted on two papilliform excrescences, and the ovary cells contain 3 or 4 ovules. The resemblance between these two genera is therefore but superficial.

The presence of two papillae on which the hairs that retain the style against the wall of the corolla, are inserted, is a character confined to *Stenosiphonium*: it gives us therefore no clue to the affinities of this genus. It is true that in some other genera these hairs are arranged in bundles instead of in rows, and one might be inclined to regard this arrangement as similar to that found in *Stenosiphonium* and as an indication of a nearer affinity, but these genera (*Ditrichospermum* Brem., *Strobilanthes* Bl. emend. Brem. and its nearest allies) are in other respects so unlike *Stenosiphonium* that a nearer affinity appears to be excluded.

Among the genera which resemble *Stenosiphonium* both in the structure of the seeds and in that of the pollen grains, a resupinate corolla is nowhere found. It is present however in *Gutzlaffia* Hance, a genus provided with the same kind of seeds but with globose echinulate instead of ellipsoidal and banded pollen grains. It is noteworthy that in some species of this genus the ovary cells contain 3 or 4 ovules.

Among the groups possessing seeds covered with annulate hairs and pollen grains provided with punctate bands, but differing from group C because the corolla develops in the normal position, ovary cells containing three or more ovules are found in A (*Hemigraphis* and its nearest allies) and F (*Sericocalyx* and *Xanthostachya*). Group F deserves special attention, because the flowers are in one of the *Sericocalyx* species arranged in triads and also because of the large areola with which the seeds are provided. In group A the areola is either small or absent.

6. *Stenosiphonium* Nees in Wall., Pl. As. Rar. III, p. 75 et 84, 1832; id. in DC., Prodr. XI, p. 99 et 105, 1847, *St. diandro* Nees excl.; T. And. in Journ. Linn. Soc. IX, p. 464, 1867; Benth. et Hook. f., Gen. Pl. II, p. 1086, 1876; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 426, 1884; Trimen, Handb. Fl. Ceylon III, p. 298, 1895; Lindau in Engl. u. Prantl, Nat. Pflanzenfam. IV, 3 b, p. 300 et 303, 1895; Gamble, Fl. Madras Pres. II, p. 1019, 1923; Alston in Trimen, Handb. Fl. Ceylon VI, p. 226, 1931; Lemée, Dict. Pl. Phan. VI, p. 296, 1935.

Plantae ramosae, basi lignescentes, isophyllae. Folia inferiora ovata vel elliptica, petiolata; superiora subcordata, sessilia; omnia acuminata. Inflorescentiae spiciformes, in caule ramisque terminales et insuper axillares, laxae, pilis capitatis sparsae. Bractae angustae, apice recurvatae, calyci subaequilongae, persistentes. Flores in axillis bractearum plurium in triades dispositi; laterales bracteis anguste triangularibus vel ovatis suffulti et bibracteolati; centralis ebracteolatus. Calyx aequaliter 5-fidus, lobis anguste triangularibus acutis. Corolla faucibus limboque coerulea, faucibus maculis saturatoribus notata, resupinata, tubo gracili, apice recurvato et in fauces campanulatas



ampliato, faucibus facie antica sparse pilosis, pilis stylum retinentibus in exrescentiis papilliformibus duabus aggregatis, lobis subaequalibus obtusis. Stamina longiora exserta; breviora inclusa, nunc antheris minoribus munita, nunc ad staminodia filiformia, apice incrassata redacta; filamenta glabra; antherae erectae, oblongae, muticae, thecis patentibus. Staminodium impar nullum. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovarium glabrum vel pilis capitatis sparse et breviter comosum, utroque loculo ovulis 3—4. Stylus glaber. Capsula fusiformis, acuta, glabra, seminibus 6—8 instructa; retinacula crassa, acuta. Semina (Tab. IV C) albida, areolata, extra areolam magnam pilis annulatis mucosis longis vestita.

Distributum in Peninsula Indica et Zeylania. Species 6.

Species typica: *St. russellianum* Nees.

The main area of this genus lies in the Indian Peninsula, where the six species which below are recognized, have all been found. *St. russellianum* Nees, however, is said to occur in Ceylon too, but as nearly all or perhaps even all the other *Strobilanthinae* occurring in that island are confined to it, I doubt whether the identity of the Ceylon plant is so well established as has hitherto been assumed. However, as no Ceylon material was available to me, I am unable to express a definite opinion. NEES recorded its occurrence in Nepal, but this record has not been confirmed by later authors and must be regarded as improbable. ANDERSON l.c. combined *St. russellianum* with *St. subsericeum* Nees, but it seems to me that the two species are sufficiently distinct to be kept apart. *St. subsericeum* is an illegitimate name for the plant described by VAHL under the name *Ruellia cordifolia*.

#### Index Specierum.

- confertum** Nees in DC., Prodr. XI, p. 105, 1847 — Peninsula Indica —  
**cordifolium** (Vahl) Alston in Trimen, Handb. Fl. Ceyl. VI, p. 226, 1931  
 (*Ruellia* Vahl); syn.: *subsericeum* Nees — Peninsula Indica —  
**diandrum** Nees in DC., Prodr. XI, p. 105, 1847 = **Pseudostenosiphonium**  
**diandrum** (Nees) Brem. n. comb.  
*diandrum* Nees in errore apud Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 = **Wightii** Brem.  
 n. nom.  
*diandrum* Wight ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 426, 1884 = prec.  
**parviflorum** T. And. in Journ. Linn. Soc. IX, p. 464, 1867 — Peninsula Indica —  
 • **russellianum** Nees in Wall., Pl. As. Rar. III, p. 84, 1832 — Peninsula Indica  
 et forsitan Zeylania —  
*russellianum* Nees var. *subsericea* (Nees) T. And. in Journ. Linn. Soc. IX, p. 464, 1867  
 (*St. subsericeum* Nees) = **cordifolium**  
**setosum** T. And. in Journ. Linn. Soc. IX, p. 464, 1867 — Peninsula Indica —  
*subsericeum* Nees in Wall., Pl. As. Rar. III, p. 84, 1832 = **cordifolium**  
**Wightii** Brem. n. nom. (*diandrum* Nees in errore apud Wight, Ic. Pl. Ind. Or.  
 IV, Tab. 1512, 1849) — Peninsula Indica —  
*zeylanicum* T. And. in Thwaites, Enum. Pl. Zeyl., p. 225, 1864; syn.: *Strobi-*  
*lanthes exserta* Clarke n. nom. (non *Str. zeylanica* T. And.) = species  
 incertae sedis, polline globoso echinulato munita.

#### Index Iconum.

- confertum** Nees in Wight, Ic. Pl. Ind. Or. III, Tab. 873, 1843/5 (sub nomine  
*St. russellianum* Nees)  
*diandrum* Nees in errore apud Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 =  
**Wightii**  
**russellianum** Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1503, 1849

*russellianum* Nees in errore apud Wight, Ic. Pl. Ind. Or. III, Tab. 873, 1843/45  
= *confertum*

*Wightii* Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 (sub nomine  
*St. diandrum* Nees).

*Stenosiphonii* species sub nomine generico alio nuncupata.

*Ruellia cordifolia* Vahl, Symb. Bot. III, p. 84, 1794 = *Stenosiphonium cordifolium* (Vahl) Alston.

#### GROUP D.

*Gutzlaffia* Hance, the only genus of this group, is provided with a resupinate corolla. This is among the isophyllous genera a comparatively rare phenomenon, for it is confined to this genus and the two genera belonging to the preceding and following groups, to wit *Stenosiphonium* Nees and *Tarphochlamys* Brem. From the first it differs both in the structure of the inflorescence, the bracts always subtending a solitary flower, and in the globose echinulate pollen, and with the latter, which it resembles also in the thick-walled subepidermal cells of the testa (Tab. IV D), it disagrees in the arrangement of the spinules on the surface of the pollen grains, and in the persistence of the hairs on the testa. In habit and in the structure of the seeds it shows also some resemblance with the genera belonging to the groups A, B and F (*Sericocalyx* Brem. and *Xanthostachya* Brem.). The number of ovules in each of the ovary cells varies between 2 and 4 and reminds one therefore of group F, where the same variability is found, but it differs conspicuously from the genera belonging to this group in the inside glabrous calyx and the violet corolla, and from those belonging to all three groups in the resupination of the corolla, the reduction of the inner stamens to filiform staminodia and in the globose echinulate pollen.

7. *Gutzlaffia* Hance in Kew Journ. of Bot. I, p. 142, 1849; S. Moore in Journ. of Bot. LXIII, p. 167, 1925, p.p.; Lemée, Dict. Pl. Phan. III, p. 378, 1931, p.p.; *Strobilanthes* sensu T. And. subgen. *Gutzlaffia* Clarke in Fyson, Fl. Nilghiri and Pulney Hill-tops, p. 311, 1915, quoad typum.

Plantae parce ramosae, isophyllae. Folia plerumque petiolata. Inflorescentiae breviter spiciformes, terminales et axillares. Bracteae calyci subaequilongae vel eo longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calyce paulo breviores, persistentes. Calyx zygomorphus, segmentis tribus posticis fere totis, posticis cum anticis usque ad medium, anticis inter se basi solum connatis. Corolla violacea, resupinata, tubo tereti torso apice recurvato, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus ovatis. Stamina exteriora solum fertilia, subexserta, aequilonga, filamentis basi hirtellis, antheris ovoideis vel oblongis, utroque extremo obtusis vel emarginatis, horizontalibus, thecis patentibus; stamina interiora ad staminodia filiformia vel baculiformia, hirtella redacta. Staminodium impar inconspicuum. Granula pollinis globosa echinulata (Tab. III D). Ovarium comosum, utroque loculo ovulis 2—4. Stylus hirtellus. Capsula fusiformis, seminibus 4—8 instructa; retinacula brevia et crassa. Semina (Tab. IV D) luteo-brunnea, biconvexa, areolata; areola e cellulis annulatis composita; zona circumareolaris pilis annulatis vestita; cellulae strati subepidermalis parietibus crassis instructae.

Distributum in China Australi et Indo-China. Species adhuc notae 9.

Species typica: *G. aprica* Hance.

#### Index Specierum.

*anisandra* (R. Ben.) Brem. n. comb. (*Strobilanthes* R. Ben.) — China —

- \* **aprica** Hance in Hook., Kew Journ. of Bot. I, p. 142, 1849; syn.: *Phlebophyllum apricum* (Hance) Benth.; *Strobilanthes aprica* (Hance) T. And.; *Str. Cavallieri* Leveillé — China —
- birmanica** Brem. n. spec. v. infra — Birmania —
- dielsiana** (W. W. Smith) S. Moore in Journ. of Bot. LXIII, p. 167, 1925 (*Strobilanthes* W. W. Smith) — China —
- exareolata** (Clarke) Lace in Kew Bull. 1915, p. 406 in adnot. (*Strobilanthes* Clarke) = *Pseudostenosiphonium diandrum* (Nees) Brem.
- Forrestii** S. Moore in Journ. of Bot. LXIII, p. 167, 1925 — China —
- glandulosa** Lace in Kew Bull. 1915, p. 406 — Birmania —
- graminea** (Imlay) Brem. n. comb. (*Strobilanthes* Imlay) — Siamia —
- Henryi** (Hemsl.) Clarke ex S. Moore in Journ. of Bot. LXIII, p. 167, 1925 (*Strobilanthes* Hemsl.) — China —
- pedunculata** Craib in Kew Bull. 1911, p. 436; syn.: *Strobilanthes aprica* (Hance) T. And. var. *pedunculata* (Craib) R. Ben. — Siamia —

*Gutzlaffiae* species sub nominibus genericis aliis nuncupatae.

- Phlebophyllum apricum* (Hance) Benth. in Hook., Kew Journ. of Bot. V, p. 131, 1853 = **Gutzlaffia aprica** Hance
- Strobilanthes anisandra* R. Ben. in Bull. Mus. Hist. Nat. Paris XXVII, p. 190, 1922 = **Gutzlaffia anisandra** (R. Ben.) Brem. n. comb.
- Strobilanthes aprica* (Hance) T. And. ex Benth., Fl. Hongk., p. 262, 1861 = **Gutzlaffia aprica** Hance
- Strobilanthes aprica* (Hance) T. And. var. *pedunculata* (Craib) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 666, 1935 = **Gutzlaffia pedunculata** Craib
- Strobilanthes Cavallieri* Leveillé in Fedde, Repert. XII, p. 18, 1913 = **Gutzlaffia aprica** Hance (cf. R. Benoist in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 666, 1935)
- Strobilanthes dielsiana* W. W. Smith in Notes Bot. Gard. Edin. VIII, p. 207, 1914 = **Gutzlaffia dielsiana** (W. W. Smith) S. Moore
- Strobilanthes graminea* Imlay in Kew Bull. 1939, p. 116 = **Gutzlaffia graminea** (Imlay) Brem. n. comb.
- Strobilanthes Henryi* Hemsl. in Journ. Linn. Soc. XXVI, p. 240, 1890 = **Gutzlaffia Henryi** (Hemsl.) Clarke ex S. Moore.

The following new species was found among the unnamed *Strobilanthinae* which I received from the Berlin-Dahlem herbarium:

**Gutzlaffia birmanica** Brem. n. spec.; typus: EHRENREICH s. n. BD.

Habitus ignotus. Ramus florifer apicem versus praesertim in sulcis arachnoideo-villosus, basin versus glabrescens, internodiis bisulcatis. Folia in petiolum canaliculatum, sparse arachnoideo-villosum, 6 mm longum contracta; lamina lanceolata, usque ad 7 cm longa et 2.7 cm lata, apice subacuta vel leviter contracta, basi cuneata, margine recurvata, supra scabrida et insuper primum arachnoidea sed pilis tenuibus mox deciduis et inde postea nitida, cystolithis dense lineolata, subtus arachnoideo-villosa, nervis utroque latere costae 5—6. Spica brevis. Pedunculus pilis maximam partem capitatis dense hirsutus, circ. 1 cm longus, basi foliis linearibus utraque facie dense arachnoideo-villosis et subtus insuper pilis capitatis et ecapitatis hirsutis instructus. Bracteeae 4-parae, anguste ovato-lanceolatae, 1—1.5 cm longae et 2.5—4 mm latae, acutae, 3-nerviae, dorso pilis capitatis et ecapitatis dense hirsutae, intus glabrae. Bracteolae calyci subaequilongae, usque ad 13 mm longae et 1.5 mm latae, ceterum ut bracteeae. Calyx 13 mm longus, basin versus glabrescens, apicem versus ut bracteeae bracteolaeque pilis capitatis et ecapitatis mixtis dense hirsutus. Corolla 2.6 cm longa, extus glabra, tubo 9 mm longo, 1.8 mm diam., faucibus 1 cm

longis, 8.5 mm diam., lobis ovatis retusis 7 mm longis. Stamina fertilia filamentis 13 mm longis, antheris 3.2 mm longis; staminodia parva sed crassiora. Granula pollinis (Tab. III D) 45  $\mu$  diam. Ovarium utroque loculo ovulis 4. Capsula ignota.

Habitat Birmaniam.

Burma: Kabwet on the Irawaddy, EHRENREICH s. n. BD.

This species is easily recognizable by the cobwebby-villous underside of the leaves. In the presence of 4 ovules in each of the ovary cells it resembles *G. graminea* (Imlay) Brem., from which it differs conspicuously in other respects: the leaves, for instance, are not sessile and linear, but distinctly petiolate and lanceolate. From *G. pedunculata* Craib, whose ovary cells are provided with 3 ovules, it differs in the much shorter peduncle and in the glandular spike. In fact, in general aspect it is more like some of the species provided with 2 ovules in the ovary cells.

### GROUP E.

This group too contains but a single genus. On account of the seeds which lose their mantle of hairs at an early stage, I have named it *Tarphochlamys*.

The most striking feature of *Tarphochlamys* lies in the structure of the pollen grains (Tab. III B). As in many other genera belonging to this subtribe, they are globose and echinulate, but they show a faint reticulation, and the spinules are arranged in rings inside the meshes of the reticulum, and these are peculiarities which recur nowhere else. The reticulation reminds one of the pollen grains of the *Ruelliinae*, but the meshes are very large and their walls much lower than in that subtribe, and the spinules are not connected with the walls but quite free.

The seeds are biconvex and provided with a very small areola. At first they are covered with rather short annulate hairs, but the latter are already shed before the seeds are fully ripe. The subepidermal layer consists of thick-walled cells.

In its isophylly, resupinate corolla, biconvex seeds and in the thick-walled subepidermal layer of the testa *Tarphochlamys* resembles *Gutzlaffia*, but in the subequally 5-partite calyx, 4 fertile stamens, erect anthers and reticulated pollen grains it differs considerably from that genus. Its position is rather isolated.

8. *Tarphochlamys* Brem. n. gen.; typus: *T. affinis* (Griff.) Brem. n. comb. (*Adenosma* Griff.); *Strobilanthes* species T. ANDERSON et CLARKE.

Planta parce ramosa, isophylla. Folia petiolata. Inflorescentiae spiciformes, satis longae, terminales et axillares. Bracteae ovatae, obtusae, e basi plurinerviae, calyce paulo longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calycis lobis similiores sed breviores, obtusae, 1-nerviae, persistentes. Calyx 5-partitus, lobis oblanceolatis, subobtusis, mediano quam aliis paulo majore. Corolla purpurella dicta, resupinata, tubo tereti torso apice rectangulariter recurvato in fauces infundibuliformes tubo subaequilongas ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, omnia exserta; filamenta staminum exteriorum quam interiorum paulo longiora, basi parce hirtella; filamenta staminum interiorum tota glabra; antherae erectae, apice subobtusae, thecis subcomplanatis. Staminodium parvum. Granula pollinis (Tab. III B) globosa, leviter grande-reticulata, echinulata, spinulis intra reticuli spatia in circulos dispositis. Ovarium comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, apice pubescens, 4-seminalis, retinaculis recte et acute exeuntibus. Semina brunnea, biconvexa, parvo-areolata, extra areolam primum pilis annulatis vestita, ad

maturitatem glabrescentia; cellulae strati subepidermalis parietibus crassis instructae.

Distributum in Khasyae montibus.

Species unica: *T. affinis* (Griff.) Brem. n. comb. (*Adenosma* Griff.).

1. *Tarphochlamys affinis* (Griff.) Brem. n. comb.; *Adenosma affinis* Griff., Notulae IV, p. 133, 1854; — *Strobilanthesacrocephala* T. And. in Journ. Linn. Soc. IX, p. 473, 1867; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 454, 1884.

Habitat Assamiam.

BENOIST (in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 668, 1935) has described a var. *glabrior* occurring in Tonkin, but as he states that the spinules on the surface of the pollen grains are arranged in rows extending from one pole to the other, his plant can not belong to this genus.

### GROUP F.

The isophyllous yellow-flowered species belonging to the two genera brought together in this group, resemble each other closely. They come perhaps nearest to the genera of group A, i.e. *Hemigraphis* and its allies, but differ very conspicuously from them in the yellow colour of the corolla, the larger size of the seeds, the inside hairy calyx and the exerted stamens; the number of ovules is a character of less importance, for it varies in group A between 3 and 8, and here between 2 and 4 per ovary cell. The seeds (Tab. IV B) are not unlike those (Tab. IV F) of the genera belonging to group G, i.e. to *Nilgirianthus* and its allies, but as very similar seeds are found also in the by no means nearly related genera *Hymenochlaena* and *Lissospermum*, the value of this character should not be overrated. Some of the genera of group G however are provided with the same kind of pollen as those belonging to group F. Gregarious growth and simultaneous flowering after several years of preparation, on the other hand, are unknown in this group. In group D, *Gutzlaffia*, the number of ovules per ovary cell varies in the same way as in *Sericocalyx* and *Xanthostachya*, but in other respects, for instance in the resupinate corolla, the reduction of the inner stamens and the globose echinulate pollen grains, *Gutzlaffia* differs considerably from the genera of group F.

The two genera belonging to group F are easily distinguishable: in *Sericocalyx* the bracts are imbricated and the calyx inside densely sericeous, whereas the bracts of *Xanthostachya* are narrow and further apart, and its calyx inside appressed pubescent.

9. *Sericocalyx* Brem. n. gen.; typus: *S. crispus* (L.) Brem. n. comb. (*Ruellia* L.); *Strobilanthes* et *Hemigraphis* species auctorum aliorum.

Herbae erectae et ramosae, isophyllae, Folia sessilia vel petiolata, utraque facie vel saltem subtus setulis hamatis scabrida vel scabridula, supra cystolithis satis magnis lineolata. Inflorescentiae breves vel satis longae, bracteis magnis imbricatae, terminales et axillares, haud raro plus minusve paniculatae. Bracteae virides, e basi plerumque 3-nerviae, ceterum penninerviae, calyce longiores, persistentes. Flores in axillis bractearum solitarii vel raro aliqui in triades dispositi, bracteolati vel ebracteolati. Bracteolae lineares, setaceae vel nullae. Calyx 5-partitus, lobis linearibus vel anguste triangularibus, mediano aliis majore, intus basin versus dense et longe albo-sericeis. Corolla lutea, recta et non resupinata, tubo tereti in fauces late infundibuliformes eo paulo longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, exserta; filamenta staminum exteriorum quam interiorum fere bis longiora, ad basin hirtella; antherae erectae, apice obtusae vel mucro-

natae, thecis a latere complanatis. Staminodium minutum vel nullum. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovarium pilis capitatis comosum, utroque loculo ovulis 2—6. Stylus hirtellus. Capsula fusiformis, pilis capitatis nunc comosa nunc tota pubescens, seminibus 4—12; retinacula appressa, apice bidentata. Semina (Tab. IV B) luteola, areola interdum usque ad marginem expansa, interdum a zona pilis annulatis vestita circumdata.

Distributum a Bengalia, Assamia et China Australi usque ad Insulas Sundaicas Minores. Species adhuc notae 15, quarum 5 in Archipelago Malayano endemicae.

Species typica: *S. crispus* (L.) Brem. n. comb. (*Ruellia* L.).

The most aberrant species of *Sericocalyx* known to me, are *S. phyllostachyus* (Kurz) Brem., *S. durus* Brem., *S. chinensis* (Nees) Brem., *S. glaucescens* (Nees) Brem. and *S. quadrifarius* (Nees) Brem., whose fruits contain more than 4 seeds and whose seeds are provided with a comparatively small areola. Further study may show that these species, and perhaps also some of the other ones found in China and Indo-China, of which the seeds are not yet known, are better referred to one or two genera of their own, but for the present it seemed advisable to unite them with the better known species from the Malay Archipelago in one genus. The flower colour is not always known; the corolla of *S. quadrifarius*, which is perhaps the most aberrant species (rather long spikes, 12-seeded capsules), is said to be blue, but confirmation of this statement is urgently required.

#### Key to the Species of the Malay Archipelago.

1. Bracts either eciliate or provided with ecapitate cilia. Seeds either entirely glabrous or with a narrow zone of hairs along the margin . . . 2
  - : Bracts with capitate cilia. Seeds with a hairy zone about half as wide as the areola . . . . . 4
2. Leaves on the upper side completely glabrous. Bracts caudate. Some of the bracts subtending triads. Seeds almost completely glabrous. — Sumatra . . . . . 1. *S. sumatranus* Brem. n. spec.
  - : Leaves on both sides scabridulous or scabrid. Bracts never distinctly caudate. Flowers always solitary in the axils of the bracts. Seeds with a narrow but quite conspicuous hairy zone along the margin . . . . . 3
3. Leaves on both sides scabridulous. Bracts subglabrous. — Java . . . . . 2. *S. sublaevis* Brem. n. spec.
  - : Leaves on both sides scabrid. Bracts long and softly ciliate. — Java; in the Moluccas probably introduced . . . . . 3. *S. crispus* (L.) Brem. n. comb.
4. Leaves scabrid. Bracts lanceolate. Bracteoles present and about 5 mm long. — Java and Lesser Sunda Islands . . . . . 4. *S. timorensis* (Nees) Brem. n. comb.
  - a. Ovary cells with 2 ovules. — Java and Lesser Sunda Islands . . . . . var. *quadriovulatus* Brem. n. nom.
  - : Ovary cells with 3 ovules. — Sumbawa and Timor . . . . . var. *sexovulatus* Brem. n. var.
  - : Leaves scabridulous. Bracts ovate but prolonged in a narrow tail. Bracteoles absent. — South-west Celebes . . . . . 5. *S. celebicus* Brem. n. spec.
    - a. Tail of the bract about as long as the ovate base. — South-west Celebes . . . . . var. *caudatus* Brem. n. nom.
    - : Tail of the bract more than twice as long as the ovate base. — South-west Celebes . . . . . var. *calcitrapa* Brem. n. var.

1. *Sericocalyx sumatranus* Brem. n. spec.; typus: KORTHALS s. n. L.

Caulis ramiq̄ue obtuse quadrangulares, primum pubescentes, mox glabrescentes, internodiis bisulcatis, sulcis pubescentia scabridula persistente instructis. Folia subsessilia, basin versus tamen longius et anguste contracta, lanceolata vel oblanceolata, 12.5—16 cm longa et 4.5—6 cm lata, apice in caudam obtuse exeuntem contracta, margine repanda vel irregulariter crenata, revoluta, supra glabra et nitidula, subtus setulis vix conspicuis scabridula, sicc. grisea, nervis utroque latere costae 5—6. Spicae 3 cm longae et 2.5 cm diam., in paniculas terminales et in triades axillares dispositae, panicula terminali cum triadibus axillaribus in paniculam ampliorem confluenta. Bracteae 4- usque ad 8-parae. Flores in axillis bractearum plerumque in triades dispositi. Bracteae infimae interdum ab aliis diversae, casu quo lanceolatae; aliae semper ovatae; omnes 2—3 cm longae et 1—1.3 cm latae, apice in caudam longam contractae, costa lignescente straminea, margine in parte basali longe ciliatae, ceterum utraque facie villosae. Bracteae florum lateralium triadis lineares, 12 mm longae et 1.2 mm latae, acutae, 1-nerviae, margine pilis longis, partim ramosis ciliatae, ceterum sparse villosae. Flos centralis triadis ebracteolatus; flores laterales bracteolis filiformibus hirtellis, interdum fere ad nihilum redactis instructi; bracteolae florum solitariorum similiores sed plerumque minores. Calyx tubo 1 mm longo, lobo mediano 13 mm, lobis aliis 12 mm longis, omnibus 1.8 mm latis, e basi lineari sensim attenuatis, carinatis, margine et carina pilis longis ecapitatis cum brevioribus capitatis mixtis ciliatis, 1-nerviis. Corolla extus puberula, matura nondum nota. Antherae staminum exteriorum quam interiorum paulo longiores. Staminodium setaceum. Granula pollinis 40  $\mu$  longa et 27  $\mu$  diam., probabiliter virgis 18 instructa. Ovarium utroque loculo ovulis 2. Capsula 11 mm longa et 3 mm lata, apice obtusa, pilis capitatis comosa, 4-seminalis. Semina glabra, margine tamen praesertim basin versus pilis paucis instructa, 3 mm longa et 2.5 mm lata.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: G. Singalang, KORTHALS s. n. L, typus.

In general aspect this species is not unlike the Javanese *S. crispus*, but its leaves are on the upper side entirely glabrous, its bracts caudate and provided with a yellow midrib, most of its flowers arranged in triads in the axils of the bracts, and its seeds almost entirely glabrous. From *S. sublaevis* it differs in the same way and moreover in the greater number of spikes and in the presence of long cilia along the margin of the bracts.

2. *Sericocalyx sublaevis* Brem. n. spec.; typus: WINCKEL 1504 L, dupl. U.

Caulis ramiq̄ue quadrangulares, scabriduli vel subglabri, internodiis bisulcatis. Folia in petiolum usque ad 3 cm longum contracta; lamina elliptica, usque ad 18 cm longa et 8.5 cm lata, utroque extremo contracta, apice acutius exeuns, margine repando-crenata, supra nitida, utrimque scabridula, setulis tamen oculo inarmato haud distinguendis, sicc. olivacea, nervis utroque latere costae plerumque 7. Spicae primum circ. 2.5 cm longae, post anthesin usque ad 6 cm accrescentes, solitariae vel in triades caulem ramulosque terminantes, paucae. Bracteae plurimae. Flores in axillis bractearum semper solitarii. Bracteae infimae plerumque steriles, anguste ovato-lanceolatae; aliae ovatae, primum circ. 16 mm longae et 8 mm latae, deinde usque ad 25 mm longitudine et 14 mm latitudine accrescentes; omnes ad basin breviter pubescentes, ceterum subglabrae, haud ciliatae. Bracteolae anguste lineares, 7 mm longae, pilis capitatis brevibus vestitae, margine longe et molliter ciliatae. Calyx tubo brevi, lobo mediano 11 mm, lobis aliis 9.5 mm longis, omnibus densissime pilis capitatis vestitis et pilis longis parce ciliatis, post anthesin accrescentibus. Corolla extus glandulosa, matura nondum nota. Granula pollinis 44  $\mu$  longa et 32  $\mu$  diam., virgis probabiliter 18

instructa. Ovarium utroque loculo ovulis 2. Capsula 13.5 mm longa et 5 mm lata, fere tota pilis capitatis brevibus vestita, 4-seminalis. Semina ad marginem pilis annulatis instructa, 3.2 mm longa et lata.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.; Pabangbon on the Tji Langluban, South-west of Leuwiliang, alt. 450 m, BAKHUIZEN v. D. BRINK 7798 L; Priangan Res.: Tjidadap near Tjibeber, Tjadas Malang, alt. 1000 m, WINCKEL 1504 L, typus, U, dupl. typi; ibidem, G. Karang, alt. 1000 m, id. 173 L; West Java, s. l., PLOEM s. n. L.

This species is easily recognizable by the eciliate bracts. From *S. crispus* it differs moreover in the minute size of the setules on both sides of the leaves and in the glandular pubescent bracteoles and calyx lobes, and from *S. sumatranus* in the ecaudate bracts, the solitary flowers and the presence of a quite conspicuous hairy zone along the margin of the seed.

3. *Sericocalyx crispus* (L.) Brem. n. comb.; *Ruellia crispata* L., Sp. Pl. p. 635, 1753; non apud Nees in Wall., Pl. As. Rar. III, p. 83, 1832, nec in DC., Prodr. XI, p. 146, 1847, quae est *Hemigraphis venosa* Clarke; *Strobilanthes crispata* (L.) Bl., Bijdr. Fl. Ned. Ind. p. 798, 1826; Nees in DC., Prodr. XI, p. 178, 1847; Miq., Fl. Ind. Bat. II, p. 796, 1858; non T. And. in Journ. Linn. Soc. IX, p. 467, 1867, quae est *Sericocalyx phyllostachyus* (Kurz) Brem.; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 218, 1912; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 44, 1912; Heyne, Nuttige Planten v. Ned. Ind. II, p. 1376, 1927; non Hochreutiner in Candollea V, p. 227, 1934, quae est *Hemigraphis* spec.; — *Str. crispata* (L.) Bl. var. *citrina* O. Ktze, Rev. Gen. Pl. II, p. 499, 1892; — *Str. spec.* G. Koorders-Schuhmacher l.c. p. 46.

Caulis rami quadrangulares, pilis retrorsis interdum parce strigosi et haud raro setulis incurvatis scabriduli. Folia sessilia vel in petiolum brevem contracta, lanceolata, 9—18 cm longa et 3.2—6.4 cm lata, utroque extremo contracta, apice tamen obtuse exeuntia, margine repanda vel inaequaliter crenata, supra haud raro nitida, utrimque setulis sparsis scabrida, subtus interdum insuper molliter pubescentia, sicc. griseo-olivacea, nervis utroque latere costae 6—9. Spicae solitariae vel in triades dispositae, caulem ramosque et ramulos foliis multo redactis instructos terminantes et in paniculam amplam confluentes, circ. 3.5 cm longae et diam., bractearum paribus 5—9 instructae, floribus in axillis bractearum omnium solitariis. Bracteae infimae ovato-lanceolatae, 2.5 cm longae et 0.9 cm latae; aliae ovatae vel ovato-rhomboideae, longitudine usque ad 2 cm decrescente, latitudine contra primum usque ad 1.4 cm increscente, deinde ad magnitudinem originalem decrescente; infimae foliaceae et praesertim apicem versus scabridae, ad basin pilis aliquibus longis ciliatae; aliae parte foliacea gradatim decrescente et ultimo carentes, margine et facie costae inferiore contra longe et molliter ciliatae; supremae dorso molliter pubescentes. Bracteolae anguste lineares, 8 mm longae et 0.3 mm latae, 1-nerviae, margine et costa subtus longe et molliter ciliatae, intus pilis brevibus sparsae. Calyx tubo 1 mm longo, lobo mediano 10.5 mm longo, aliis 9.5 mm longis, omnibus carinatis, margine et carina longe et molliter ciliatis. Corolla 15—20 mm longa, extus puberulo-pubescentis, tubo 4.5—6 mm, faucibus 7—9 mm, lobis 3.5—5 mm longis. Stamina externa filamentis 4.5 mm, interna filamentis 2.5 mm longis. Granula pollinis 47  $\mu$  longa et 30  $\mu$  diam., virgis 15 ornata. Ovarium utroque loculo ovulis 2. Capsula 11 mm longa et 3 mm lata, apice pilis capitatis breviter comosa, 4-seminalis. Semina ad marginem solum pilis annulatis instructa, 3 mm longa et 2.4 mm lata.

Habitat Javam et Maduram ab aequore usque ad 1000 m alt.; specimen in Amboina lecta probabiliter introductum.



West Java. Batavia Res.: Lembur Tjikandang near G. Parang, alt. 350 m; BAKHUIZEN v. D. BRINK 4907 L et U; Buitenzorg Res.: between Tjisarua and Tjibodas, RAAP 879 L; Tegal Selassi, BLUME 1295 L.

Central Java. Pekalongan Res.: between Dara and Petung Kriana, alt. 600 m, BACKER 15733 L et U; Djocjakarta Res.: Rongkop, JUNGHUHN s.n. L; Kedu Res.: G. Sumbing, alt. 1000 m, LOERZING 492 BD.

East Java. Madiun Res.: G. Wilis, Ngebel, alt. 833 m, RANT s.n. L; Kediri Res.: Bumi Aju near Wlingi, alt. 450 m, BARKMEYER 98 PAS; Kediri, Gadungan-Alanggis, alt. 250—300 m, KOORDERS 22862 L; Malang Res.: G. Tenger, alt. 600 m, BUYSMAN 492 L; Besuki Res.: G. Idjen, Pantjur, KOORDERS 28483 L.

Madura. Between Bangkalan and Boorni, RANT et COERT 168 PAS.

Amboin. Kampong Paradijs, KORNASSI (Exped. RUTTEN) 1119 L et U.

The occurrence of this species in Ambon is rather puzzling. It is not mentioned by RUMPHIUS and it is not included in the collection made by Dr. ROBINSON. As it was found in a village, I suppose that it is a recent introduction: the plant is sometimes grown for its medicinal properties.

BLUME described this species as blue-flowered, but this is a mistake: its flowers are always yellow. His description is based on a specimen which he had collected himself at Tegal Selassi, and which is now in the Leiden herbarium. He was not fully sure that his species was identical with *Ruellia crispata* L, but as the latter is based on a specimen collected by OSBECK, it is fairly certain that it is a Javanese plant, and in that case it must be the species described by BLUME. KUNTZE's variety *citrina* owes its origin apparently to BLUME's mistake with regard to the flower colour: as the flowers of KUNTZE's specimen were yellow, and as they ought to have been blue according to BLUME's description, KUNTZE thought that he had found a new variety.

*S. crispus* varies considerably, especially in the nature of its indumentum, and it is not impossible that further study will show that it comprises a number of well-defined varieties, but for the present it seems better to treat them as one.

*S. scaber* (Nees) Brem. n. comb. (*Strobilanthes* Nees) has been found in the neighbourhood of Buitenzorg as a garden escape. It has larger and less numerous spikes than *S. crispus*, and its bracts are much narrower.

4. *Sericocalyx timorensis* (Nees) Brem. n. comb.: *Strobilanthes timorensis* Nees in DC., Prodr. XI, p. 178, 1847; Miq., Fl. Ind. Bat. II, p. 796, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; — *Str. spec. H*, Koorders-Schuhmacher, Syst. Verz. I § 1, p. 46, 1912.

Habitat Javam et Insulas Sundanas Minores.

Species haec solvenda est in varietates duas numero ovulorum solum diversas. Forma typica a me vocatur:

*S. timorensis* (Nees) Brem. var. *quadriovulatus* Brem.

Caulis ramique ad basin subteretes, apicem versus acute quadrangulares, hispiduli, internodiis brevibus (sumum 3.5 cm longis), in caule et ramis crassioribus tumidis. Folia inferiora in petiolum longum hispidulum angustata, lamina lanceolata, 10 cm longa et 3.3 cm lata, acuminata, margine repando-crenata, supra nitida, utrimque scabridissima, nervis utroque latere costae plerumque 7; superiora gradatim minora et praesertim angustiora, margine minus distincte repando-crenata; suprema linearia et integra. Spicae 12—13 mm longae, solitariae, caulem ramosque et ramulos saepe uno pari foliorum solum munitos terminantes et in paniculam amplam confluentes, bractearum paribus 6—7 instructae, floribus in axillis bractearum solitariis. Bracteae anguste lan-

ceolatae, obtusae; infimae 11 mm longae et 2.2 mm latae, costa crassa instructae, apicem versus foliaceae et hispidulae, parte basali pilis capitatis vestitae; aliae redactione partis foliaceae gradatim breviores. Bracteolae anguste lineares, 5 mm longae et 0.8 mm latae, pilis pro parte capitatis vestitae. Calyx tubo brevissimo, lobo mediano 8 mm longo et ad basin 0.8 mm lato, aliis 6 mm longis et angustioribus, omnibus ad apicem utrimque pilis capitatis vestitis, extus basin versus pubescentibus. Corolla 13 mm longa, extus pilis partim capitatis puberulo-pubescentibus, tubo 5 mm, faucibus 4.5 mm, lobis 3.5 mm longis. Stamina externa filamentis 3.5 mm, antheris 2 mm; interna filamentis 2 mm, antheris 1.6 mm longis. Granula pollinis 43  $\mu$  longa et 29  $\mu$  diam., virgis 15 ornata. Ovarium utroque loculo ovulis 2. Capsula 8.5 mm longa et 2.2 mm lata, acuta, pilis capitatis comosa et dimidio superiore pubescens, 4-seminalis. Semina 2 mm longa et lata, zona marginali pilis annulatis vestita, quam areola dimidio angustiore.

Habitat Javam et Insulas Sundanas Minores.

West Java. Buitenzorg Res.: Batu Tulis near Buitenzorg, along the road, BAKHUIZEN v. D. BRINK 5393 L et U; as this species has not been mentioned by the earlier authors, it is perhaps in West Java a recent introduction.

East Java. Besuki Res.: Ardjasa, east of Situbondo, BACKER 24748 L; G. Idjen, Pantjur, alt. 500 m, KOORDERS 20444 et 28484 L.

Bali. Tjandi Kusuma, alt. 20 m, SARIP (Exped. MAIER) 183 L.

Timor, s.l., ZIPPELIUS s.n. L.

*S. timorensis* (Nees) Brem. var. *sexovulatus* Brem. n. var.; typus var.: WARBURG 17113 BD.

Varietas ovulis utroque loculo 3 a typo recedens.

Habitat Insulas Sundanas Minores.

Sumbawa. Bima, Donggo, alt. 100—500 m, ELBERT 3504 et 3596 L; Sambon, alt. 800 m, WARBURG 17113 BD, typus var.

Timor, s.l., DECAISNE n. 8/6 L.

As NEES referred this species to the genus *Strobilanthes*, I suppose that the ovary cells of the type specimen contain 2 ovules. If it should prove to be otherwise, the position of the two varieties would have to be reversed.

*S. timorensis* is easily recognizable by its exceedingly scabrid leaves and glandular-hairy, obtuse bracts.

5. *Sericocalyx celebicus* Brem. n. spec.; typus: BÜNNEMEYER 12429 L.

Habitat terrae Celebicae partem austro-occidentalem.

Species haec solvenda est in varietates duas. Forma typica a me vocatur:

*S. celebicus* Brem. var. *caudatus* Brem.

Caulis ramique obtuse quadrangulares vel subteretes, glabrescentes. Folia in pseudopetiolum anguste alatum, usque ad 5 cm longum contracta; lamina sine pseudopetiole elliptico-lanceolata, usque ad 19 cm longa et 8 cm lata, apice caudata, basi contracta, margine repanda et revoluta, sicc. griseo-viridis, nunc utraque facie costa nervisque et interdum inter nervos setulis hamatis vix conspicuis scabridula, nunc sublaevis, supra nitidula, nervis utroque latere costae 6—8. Spicae in paniculas terminales et laterales dispositae; ramuli paniculae foliis aliquibus lineari-lanceolatis, longe caudatis, usque ad 2 cm longis instructi, apicem versus pilis longissimis hirsuti. Bracteeae 4- vel 5-parae; infimae et supremae steriles vel flores rudimentarios subtendentes; aliae flores solitarios; supremae e basi lineari caudatae; aliae e basi ovata longe caudatae, circ. 17 mm longae et 6.5 mm latae, cauda parti basali subaequilonga vel ea paulo brevior.

marginē pilis partim capitatis longe ciliatae, extus pilis capitatis dense hirsutae, intus subglabrae, cauda tamen utrimque scabridulae, 3-nerviae. Bracteolae nullae. Calyx tubo 2 mm longo, lobis linearibus, mediano 8 mm longo, acuto, aliis 6.5 mm longis, subobtusis vel obtusis, omnibus 1 mm latis, margine et costa pilis capitatis et ecapitatis longe ciliatis, carinatis, 1-nerviis. Corolla 18 mm longa, lobis extus puberulis, tubo 8 mm, faucibus 5 mm, lobis 5 mm longis. Stamina externa filamentis 5 mm, interna filamentis 2.5 mm longis; antherae 2 mm longae. Granula pollinis 52  $\mu$  longa et 32  $\mu$  diam., virgis 18 ornata. Ovarium utroque loculo ovulis 2. Capsula 10 mm longa et 3 mm lata, dorso vix conspicue puberula, ceterum glabra, acuta, 4-seminalis, retinaculis in aciculam rectam exeuntibus. Semina zona marginali pilis annulatis vestita, quam areola dimidio angustiore instructa, 2.5 mm longa et 2.2 lata.

Habitat terrae Celebicae partem austro-occidentalem.

S. W. Celebes. Tanette, alt. 450 m, BÜNNEMEYER 12429 L, typus; G. Bonthain, TEYSMANN H. B. 14108 L.

*S. celebicus* Brem. var. *calcitrata* Brem. n. var.; typus var.: BÜNNEMEYER 11753 L.

Varietas spicis multo minoribus et praesertim bracteis cauda quam parte basali plus quam bis longiore munitis a typo recedens.

Habitat terrae Celebicae partem austro-occidentalem.

S. W. Celebes. Tanette, alt. 400 m, BÜNNEMEYER 11753 L, typus var.

The var. *calcitrata* differs at first sight conspicuously from the type, but the differences appear to be confined to those given in the diagnosis.

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5. *celebicus* Brem. n. spec. — Celebes —
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  - celebicus* Brem. var. *caudatus* Brem. n. nom. — Celebes —
  - chinensis* (Nees) Brem. n. comb. (*Ruellia* Nees); syn.: *Hemigraphis chinensis* (Nees) T. And. ex Hemsl. — China et Indo-China Orientali —
3. \* *crispus* (L.) Brem. n. comb. (*Ruellia* L.); syn. *Strobilanthes crispa* (L.) Bl.: *Hemigraphis crispa* (L.) T. And. — Java —
  - durus* Brem. n. spec. (*Strobilanthes phyllostachya* Kurz var. *dura* Clarke) — Birmania —
  - flavus* (Kurz) Brem. n. comb. (*Strobilanthes* Kurz); syn.: *Ruellia flava* Roxb. non Pers.; *Hemigraphis flava* (Kurz) Clarke — Birmania —
  - fluviatilis* (Clarke ex W. W. Smith) Brem. n. comb. (*Hemigraphis* Clarke ex W. W. Smith) — China —
  - glaucescens* (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Hemigraphis glaucescens* (Nees) Clarke — Indo-China Occidentali —
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  - quadrifarius* (Wall. ex Nees) Brem. n. comb. (*Ruellia* Wall. ex Nees); syn.: *Hemigraphis quadrifaria* (Wall. ex Nees) T. And. — Indo-China Occidentali —
  - scaber* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — India Septentrionali et Assamia —
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**scaber** (Nees) Brem. in Bot. Reg. XXVII, Tab. 32, 1841 (sub nomine: *Strobilanthes scabra* Nees).

*Sericocalycis* species sub nominibus genericis aliis nuncupatae.

- Hemigraphis chinensis* (Nees) T. And. ex Hemsl. in Journ. Linn. Soc. XXVI, p. 238, 1891 (*Ruellia* Nees) = **Sericocalyx chinensis** (Nees) Brem.  
*Hemigraphis crispa* (L.) T. And. in Journ. Linn. Soc. VII, p. 113, 1864 (*Ruellia* L.) = **Sericocalyx crispus** (L.) Brem.  
*Hemigraphis flava* (Kurz) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 426, 1884 (*Strobilanthes* Kurz) = **Sericocalyx flavus** (Kurz) Brem.  
*Hemigraphis fluviatilis* Clarke ex W. W. Smith in Notes Bot. Gard. Edinb. X, p. 182, 1918 = **Sericocalyx fluviatilis** (Clarke ex W. W. Smith) Brem. n. comb.  
*Hemigraphis glaucescens* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 415, 1884 (*Strobilanthes* Nees) = **Sericocalyx glaucescens** (Nees) Brem.  
*Hemigraphis hispidula* Craib in Kew Bull. 1913, p. 203 = **Sericocalyx hispidulus** (Craib) Brem. n. comb.  
*Hemigraphis quadrifaria* (Nees) T. And. in Journ. Linn. Soc. IX, p. 463, 1867 (*Ruellia* Nees) = **Sericocalyx quadrifarius** (Nees) Brem.  
*Hemigraphis Schomburgkii* Craib in Kew Bull. 1911, p. 435 = **Sericocalyx Schomburgkii** (Craib) Brem. n. comb.  
*Ruellia chinensis* Nees in DC., Prodr. XI, p. 147, 1847 = **Sericocalyx chinensis** (Nees) Brem. n. comb.  
*Ruellia crispa* L., Sp. Pl., p. 653, 1753 = **Sericocalyx crispus** (L.) Brem. n. comb.  
*Ruellia flava* Roxb., Fl. Ind. III, p. 43, 1832 (non Pers., Syn. II, p. 177, 1807) = **Sericocalyx flavus** (Kurz) Brem. (*Strobilanthes* Kurz)  
*Ruellia obliqua* Pers., Syn. II, p. 177, 1807, forsitan = **Sericocalyx crispus** (L.) Brem.  
*Ruellia quadrifaria* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 83, 1832 = **Sericocalyx quadrifarius** (Wall. ex Nees) Brem. n. comb.  
*Strobilanthes crispa* (L.) Bl., Bijdr. Fl. Ned. Ind. p. 798, 1826 (*Ruellia* L.) = **Sericocalyx crispus** (L.) Brem.  
*Strobilanthes crispa* (L.) Bl. var. *citrina* O. Ktze, Rev. Gen. Pl. II, p. 499, 1892 = **Sericocalyx crispus** (L.) Brem.  
*Strobilanthes crispa* (L.) Bl. in errore apud T. And. in Journ. Linn. Soc. IX, p. 467, 1867 = **Sericocalyx phyllostachyus** (Kurz) Brem.  
*Strobilanthes dolichophylla* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 546, 1921 = **Sericocalyx Schomburgkii** (Craib) Brem.  
*Strobilanthes flava* Kurz in Journ. As. Soc. Beng. XXXIX, p. 78, 1870 (*Ruellia flava* Roxb. non Pers.) = **Sericocalyx flavus** (Kurz) Brem. n. comb.  
*Strobilanthes glaucescens* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = **Sericocalyx glaucescens** (Nees) Brem. n. comb.  
*Strobilanthes phyllostachya* Kurz in Journ. As. Soc. Beng. XL, p. 75, 1871 = **Sericocalyx phyllostachyus** (Kurz) Brem. n. comb.  
*Strobilanthes phyllostachya* Kurz var. *dura* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 446, 1884 = **Sericocalyx durus** Brem. n. spec.

*Strobilanthes scabra* Nees in Wall., Pl. As. Rar. III, p. 84, 1832 = *Sericocalyx scaber* (Nees) Brem. n. comb.

*Strobilanthes timorensis* Nees in DC., Prodr. XI, p. 178, 1847 = *Sericocalyx timorensis* (Nees) Brem. n. comb.

10. *Xanthostachya* Brem. n. gen.; typus: *X. aspera* (Decne) Brem. (*Strobilanthes* Decne); *Strobilanthes* species auctorum aliorum.

Plantae valde ramosae, caule lignescente, isophyllae. Folia in petiolum brevem contracta, utrimque setulis hamatis scabrida vel scabridula, supra cystolithis lineolata. Inflorescentiae terminales et axillares, spiciformes, satis longae, in paniculas terminales et laterales confluentes; spicae axillares foliis valde redactis vel bracteae angustis suffultae; bracteae florales quobque nodo aequales vel inaequales, angustae, calyci subaequilongae, penninerviae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae angustae, calyce fere dimidio breviores, persistentes. Calyx extus pilis capitatis vestitus, intus basin versus strigosus, tubo facie postica altiore quam facie antica, lobo mediano quam aliis semper majore, lobis lateralibus brevioribus et angustioribus quam anticis. Corolla lutea, non resupinata, faucibus tubo longioribus, pilis stylum retinentibus in series binas dispositis. Stamina 4, didynamia, exserta vel inclusa, omnia vel longiora solum filamentis parce hirtellis; antherae erectae, apice interdum productae, thecis a latere complanatis. Staminodium nullum. Granula pollinis ellipsoidea, virgis punctatis ornata. Ovarium glabrum vel puberulum, utroque loculo ovulis 2 vel 3. Stylus glaber. Capsula fusiformis, glabra vel puberula, seminibus 4—6, retinaculis acutissime exeuntibus. Semina luteola vel dilute luteo-brunnea, areola magna instructa, extra areolam pilis tenuibus annulatis vel non-annulatis vestita.

Distributum in Insulis Sundaicis Minoribus Timor et Rotti. Species 2.

Species typica: *X. aspera* (Decne) Brem. (*Strobilanthes* Decne).

*Xanthostachya* and *Sericocalyx* resemble each other in the scabrid or scabridulous leaves, the yellow corolla, the structure of the pollen grains, in the number of ovules per ovary cell and in the structure of the testa, but they are easily distinguishable by the length of the spikes and the shape of the bracts and by the nature of the indumentum which covers the inside of the calyx.

#### Key to the Species.

1. Leaves lanceolate, up to 8 cm long and 3 cm wide. Opposite bracts of equal size; both as a rule subtending a flower. Stamens included; anthers at the top uncinulate. — Timor . . . . .
  1. *X. aspera* (Decne) Brem. n. comb. . . . .
  - a. Shoots never pubescent; the pubescence on the underside of the leaves confined to the midrib and the nerves. — Timor . . . . .
    - var. *subglabra* Brem. n. nom. . . . .
    - : Shoots at first pubescent; leaves on the underside everywhere densely pubescent. — Timor . . . . . var. *pubescens* Brem. n. var.
  - : Leaves elliptic, usually more than 8 cm long and 3 cm wide. Opposite bracts unequal; the smaller ones sterile. Stamens exserted; anthers obtuse. — Rotti . . . . . 2. *X. arborea* (Span.) Brem. n. comb.

1. *Xanthostachya aspera* (Decne) Brem. n. comb.; *Strobilanthes aspera* Decne in Nouv. Ann. du Mus. III, p. 385, 1834; id., Herb. Timor. p. 57, 1835; an apud Span. in Linnaea XV, p. 328, 1841, dubiosum, syn. *Str. crispa* Bl. certe excl.; Miq., Fl. Ind. Bat. II, p. 795, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; non *Str. aspera* Wight, Ic. Pl. Ind. Or. IV, Tab. 1518, 1850, nom. illeg.; nec Clarke in Hook. f., Fl. Brit. Ind. IV, p. 452, 1884; nec Cooke, Fl. of

Bombay II, p. 371, 1905; nec Gamble, Fl. of Madras II, p. 1041, 1921; *Ruellia aspera* (Decne) Nees in DC., Prodr. XI, p. 147, 1847, syn. *Strobilanthes scabra* Nees var.  $\beta$  et speciminibus in Assamia lectis excl.; *Hemigraphis aspera* (Decne) Benth. in Benth. et Hook. f., Gen. Pl. II, p. 1086, 1876; ? *Hemigraphis aspera* (Decne) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899.

Habitat Insulam Timor dictam.

Species haec solvenda est in varietates duas. Forma typica a me vocatur:

**X. aspera** (Decne) Brem. var. **subglabra** Brem. n. nom.

Caulis ramique primum scabriduli, postea glabrescentes, obtuse quadrangulares vel subteretes. Folia in petiolum canaliculatum, ubique sed praesertim marginibus scabridum, usque ad 1 cm longum contracta; lamina lanceolata, usque ad 8 cm longa et 3 cm lata, caudato-acuminata, basi contracta, margine repando-dentata vel crenata, utrimque scabrida, subtus costa nervisque densius pilosa, nervis utroque latere costae 4—9. Spicae bracteis lineari-lanceolatis, usque ad 2 cm longis, margine integris suffultae; pedunculus et rhachis acute quadrangulares, pilis capitatis sparsi. Bractee florales oppositae aequales et utraeque plerumque florem subtendentes, lineari-oblongae, 8.5—10 mm longae et 2.5 mm latae, subobtusae, utrimque sed praesertim extus pilis capitatis vestitae, margine pilis longioribus ciliatae. Bracteolae lanceolatae, 4.5 mm longae et 1.2 mm latae, acutae, extus pilis capitatis vestitae, intus subglabrae, margine longe ciliatae. Calyx tubo facie postica 2.5 mm, facie antica 1.5 mm alto, segmento mediano 8—10.5 mm longo et 1.1 mm lato, segmentis lateralibus 5.5—8.5 mm longis et 0.7 mm latis, segmentis anticis 7—9.5 mm longis et 0.9 mm latis, lobo mediano subobtusato, aliis acutis, mediano et anticis pilis longis parce ciliatis; post anthesin vix accrescens. Corolla 2.5 cm longa, extus subglabra, tubo 6 mm, faucibus 14 mm, lobis 5 mm longis, faucibus intus sparse villosis. Stamina inclusa; externa filamentis sparse hirtellis, 4 mm longis; interna filamentis glabris, 1.5 mm longis; antherae 2.5 mm longae, connectivo apice in uncinulam incurvatam producto. Granula pollinis 67  $\mu$  longa et 37  $\mu$  diam., virgis 15 ornata. Ovarium utroque loculo ovulis plerumque 2, rarius 3. Capsula puberula, 12 mm longa et 3 mm lata, acuta, seminibus plerumque 4, rarius 6. Semina 2.5 mm longa et 2.2 mm lata, extra areolam pilis annulatis vestita.

Habitat Insulam Timor dictam.

T i m o r. s.l., DECAISNE s.n.L (ex herb. Mus. Par.), exemplum typi; TEYSMANN H. B. 8899 L; Naibaün?, id. H. B. 8907 L; cult. in hort. bogor. sub II. C. 3.

**X. aspera** (Decne) Brem. var. **pubescens** Brem. n. var.; typus varietatis: TEYSMANN H. B. 8906 L.

Varietas ramis novellis non solum scabridis sed etiam pubescentibus, foliis subtus et scabridis et ubique densius pubescentibus a typo recedens.

Habitat Insulam Timor dictam.

T i m o r. Kupang, TEYSMANN H. B. 8906 L, typ. var.; R. Brown s.n. L (ex herb. Mus. Brit.).

2. **Xanthostachya arborea** (Span.) Brem. n. comb.; *Strobilanthes? arborea* Span. in Linnaea XV, p. 328, 1841; Miq., Fl. Ind. Bat. II, p. 799, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899.

Planta valde robusta, caule basi crassitie brachii humani dicto. Caulis ramique primum obtuse quadrangulares, internodiis bisulcatis, postea subteretes, subglabri. Folia in petiolum canaliculatum, marginibus scabridum, usque ad 2 cm longum contracta; lamina elliptica, usque ad 17 cm longa et 8 cm lata, caudato-acuminata, basi contracta, margine repando-dentata, supra scabridula, subtus costa nervisque primum scabrida, deinde vix distincte scabridula, nervis utroque latere costae 5—12. Spicae foliis valde redactis vel bracteis suffultae; pedun-

culus et rhachis pilis partim capitatis pubescentes. Bracteae florales oppositae inaequales; major 10 mm longa et 2.2 mm lata, florem subtendens; minor 6.5 mm longa et 1.8 mm lata, sine flore; omnes lineari-lanceolatae, subacutae, intus basin versus pilis capitatis sparsae, ceterum utrimque pubescentes. Bracteolae lineari-lanceolatae, 6.5 mm longae et 1.7 mm latae, acutae, 1-nerviae, utrimque pilis capitatis sparsae. Calyx tubo ubique 2 mm alto, segmento mediano ad anthesin 15 mm longo et 1.8 mm lato, post anthesin usque ad 20 mm longo et 2.1 mm lato; segmentis lateralibus ad anthesin 10 mm longis et 1.1 mm latis, postea usque ad 15 mm longis et 1.2 mm latis; segmentis anticis ad anthesin 11 mm longis et 1.2 mm latis, postea usque ad 16 mm longis et 1.5 mm latis; lobis omnibus linearibus subacutis. Corolla 16 mm longa, extus lobis parce pubescens, tubo 4 mm, faucibus 7 mm, lobis 5 mm longis, faucibus intus pilis stylum retinentibus exceptis glabris. Stamina exserta; filamenta omnia hirtella, staminum exteriorum 8.5 mm, interiorum 5 mm longa; antherae staminum exteriorum 2.7 mm, interiorum 2.2 mm longae, connectivo haud producto. Granula pollinis 44  $\mu$  longa et 33  $\mu$  diam., virgis 18 ornata. Ovarium utroque loculo ovulis 2. Capsula glabra, 12.5 mm longa et 4 mm lata, acuta, 4-seminalis. Semina 3 mm longa et 2 mm lata, extra areolam pilis tenuibus, haud annulatis vestita.

Habitat insulam Rotti dictam.

R o t t i (island in the neighbourhood of Timor). Near Baã, SPANOGHE s.n. L, typus.

The two *Xanthostachya* species are but distantly related. Apart from the differences given in the key, they disagree in the shape of the pollen grains, those of *X. aspera* being elongated and those of *X. arborea* shortly ellipsoidal. It is rather remarkable that a similar difference is found between the pollen grains of various *Sericocalyx* species: those of the Malayan species described above are all of the same shape as those of *X. arborea*, whereas those of *S. chinensis* agree with those of *X. aspera*.

#### Index Specierum.

2. *arborea* (Span.) Brem. n. comb. (*Strobilanthes*? Span.) — Rotti —  
 1. \* *aspera* (Decne) Brem. n. comb. (*Strobilanthes* Decne); syn.: *Ruellia aspera* (Decne) Nees; *Hemigraphis aspera* (Decne) Benth.; ? *H. aspera* (Decne) Boerl. — Timor —

*aspera* (Decne) Brem. var. *subglabra* Brem. n. nom. = var. typ.

*aspera* (Decne) Brem. var. *pubescens* Brem. n. var. — Timor —

#### *Xanthostachya* species sub nominibus genericis aliis nuncupatae.

*Hemigraphis aspera* (Decne) Benth. in Benth. et Hook. f., Gen. Pl. II, p. 1086, 1876 = *Xanthostachya aspera* (Decne) Brem.

? *Hemigraphis aspera* (Decne) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 = prec.

*Ruellia aspera* (Decne) Nees in DC., Prodr. XI, p. 147, 1847 = *Xanthostachya aspera* (Decne) Brem.

? *Strobilanthes arborea* Span. in Linnaea XV, p. 328, 1841 = *Xanthostachya arborea* (Span.) Brem. n. comb.

*Strobilanthes aspera* Decne in Nouv. Ann. du Mus. III, p. 385, 1834 = *Xanthostachya aspera* (Decne) Brem. n. comb.

#### GROUP G.

The majority of the *Strobilanthinae* of the Indian Peninsula and a large part of those found in Ceylon belong to group G, but outside this area the latter

is entirely unknown. It are all isophyllous plants provided with pollen grains which are either ellipsoidal and decorated with punctate or carunculate bands or else globose and echinulate, and ovary cells with two ovules. The seeds are either entirely glabrous, i.e. furnished with an areola extending to the margin, or else partly covered with hygroscopic hairs: seeds of this kind occur in the genus *Phlebophyllum*, but as they were not available to me, I am unable to describe the structure of these hairs. The capsules of *Phlebophyllum* and *Pseudostenosiphonium* take, like those of *Pleocaulus*, a long time to ripen, and fully developed seeds are therefore in herbarium specimens seldom present.

The relations between this group and group A (*Hemigraphis* and its allies) have already been discussed. With the genera belonging to group H (*Mackenzia* Nees and *Leptacanthus* Nees) there is a noteworthy similarity in habit, for in both groups gregarious growth and simultaneous flowering are found; in the structure of the seeds on the other hand, there are important differences. Perhaps more significant are the points of resemblance with group F: especially in the structure of the pollen and in that of the seedcoat the resemblance is very marked; both groups moreover consist of isophyllous plants and in both the corolla develops in the normal position. In group F the corolla, however, is always yellow and in group G never, and in the latter the calyx is on the inside glabrous, whereas it is in group F strigose or silky. The relations with group K (*Thelepaepale* Brem.) will be considered further on.

Of the six genera belonging to group G, *Phlebophyllum* is probably the most aberrant one: as stated above, it differs from the other genera in the structure of the seedcoat. In the complete suppression of the inner stamens and in the tardily maturing capsules it resembles *Pseudostenosiphonium*. The four other genera, *Nilgirianthus*, the monotypic *Taeniandra*, *Xenacanthus* and *Didyplosandra*, are doubtless nearly related and might perhaps be united: *Taeniandra* differs from the other genera by its very short corolla and flattened filaments, *Xenacanthus* by its resupinate corolla and *Didyplosandra* by the globose pollen grains. The delimitation of *Nilgirianthus* and *Didyplosandra* is not yet entirely satisfactory and it is not impossible that further study will reveal the existence of differences within the limits of these genera which will make a further division desirable.

11. *Phlebophyllum* Nees in Wall., Pl. As. Rar. III, p. 75 et 83, 1832; id. in DC., Prodr. XI, p. 99 et 102, 1847; Benth. in Hook., Kew Journ. V, p. 131, 1853, p.p.: — *Endopogon* Nees in Wall., Pl. As. Rar. III, p. 76 et 99, 1832; id. in DC., Prodr. XI, p. 99 et 103, 1847, quoad species in Peninsula Indica lectas.

Plantae plietesiae, gregariae et pluribus interjectis annis uno tempore florentes, isophyllae. Folia subtus haud raro villosa, Inflorescentiae spiciformes, plerumque breviores, terminales et axillares. Bractee ovatae vel lanceolatae, plerumque imbricatae, calyce longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae angustae, calyci subaequilongae vel eo breviores, persistentes. Calyx 5-fidus, lobis aequalibus triangularibus acutis. Corolla coerulea, dilute coerulea vel alba, haud resupinata, tubo faucibus brevior vel eis subaequilongo, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis ovatis vel lanceolatis, subacutis. Stamina 2, inclusa vel breviter exserta; filamenta tota vel ad basin solum hirtella; antherae erectae, apice obtusae, thecis patentibus. Staminodia nulla. Granula pollinis (Tab. I C, D) ellipsoidea, virgata, virgis punctatis et haud raro tortis. Ovarium comosum, utroque loculo ovulis 2. Stylus conspicue vel vix conspicue hirtellus. Capsula clavata et 4-seminalis dicta. Semina dicuntur areolata et extra areolam pilis hygroscopicis vestita, tarde maturantia.



Distributum in Peninsula Indica. Species 8.

Typus generis: *Phl. kunthianum* Nees.

In NEES's monograph *Phlebophyllum* was separated from *Endopogon* on account of the presumably 4-partite calyx, but as the calyx is in reality 5-fid and in no wise different from that of the species on which the genus *Endopogon* was founded, there is no reason to keep these two genera apart.

The taxonomic value of the reduction or suppression of the inner stamens, has often been overestimated. NEES included in *Endopogon* on account of this character a number of species collected outside the Indian Peninsula which have but little in common with those found inside that region, and a similar mistake was made by BENTHAM when he transferred *Gutzlaffia aprica* Hance to *Phlebophyllum*. On account of important differences, e.g. in the structure of the pollen and of the seedcoat, these plants had to be removed to other groups, but even in the structure of the androecium they differ from *Phlebophyllum*, for in the species collected outside the Indian Peninsula the inner stamens are never completely suppressed but merely changed in staminodes.

#### Index Specierum.

*angustifolium* Benth. in schedula Pl. Hohenack. n. 1178, nomen = *kunthianum*  
*apricum* (Hance) Benth. in Hook., Kew Journ. V, p. 131, 1853 = *Gutzlaffia*  
*aprica* Hance

*canaricum* (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —  
*humile* (Gamble) Brem. n. comb. (*Strobilanthes* Gamble); syn.: *Endopogon*  
*viscosus* Nees var. *humilis* Nees; *Strobilanthes consanguinea* (Nees)  
T. And. var. *hypoleuca* (Nees) Clarke (haud quoad typum) — Penin-  
sula Indica —

*jeyporensis* (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —  
• *kunthianum* Nees in Wall., Pl. As. Rar. III, p. 83, 1832; syn.: *Strobilanthes*  
*kunthiana* (Nees) T. And. — Peninsula Indica —

*lanatum* (Nees) Brem. n. comb. (? *Strobilanthes* Nees); syn.: *Strobilanthes*  
*gossypina* T. And. — Peninsula Indica —

*Lawsonii* (Gamble) Brem. n. comb. (*Strobilanthes* Gamble) — Peninsula  
Indica —

*spicatum* (Roth) Brem. n. comb. (*Ruellia* Roth); syn.: *Endopogon consanguinea*  
Nees; *Strobilanthes consanguinea* (Nees) T. And. — Peninsula Indica —

*spicatum* (Roth) Brem. var. *amomum* (Nees) Brem. n. comb. (*Endopogon amomum* Nees);  
syn.: *Strobilanthes consanguinea* (Nees) T. And. var. *amomum* (Nees) Clarke —  
Peninsula Indica —

*spicatum* (Roth) Brem. var. *hypoleucum* (Nees) Brem. n. comb. (*Endopogon hypoleucus*  
Nees); syn.: *Strobilanthes consanguinea* (Nees) T. And. var. *hypoleuca* (Nees) Clarke  
quoad typum — Peninsula Indica —

*spicatum* (Roth) Brem. var. *Rothii* Brem. n. nom. = var. typ.

*versicolor* (Wight) Brem. n. comb. (*Endopogon* Wight); syn.: *Endopogon*  
*cuspidatum* Benth.; *Strobilanthes cuspidata* (Benth.) T. And. — Penin-  
sula Indica —

#### Index Iconum.

*canaricum* (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 215, 1874 (sub  
nomine *Strobilanthes canarica* Bedd.)

*humile* (Gamble) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1498, 1849 (sub  
nomine *Endopogon viscosus* Nees var. *humilis* Nees)

*jeyporensis* (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 214, 1874 (sub  
nomine *Strobilanthes jeyporensis* Bedd.)

- kunthianum** Nees in Wight, Ic. Pl. Ind. Or. II, Tab. 448, 1843; in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 206, 1915 (sub nomine *Strobilanthes kunthiana* T. And.)
- lanatum** (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 198, 1874 (sub nomine *Strobilanthes gossypina* T. And.); in Bot. Mag. CCXII, Tab. 7790, 1901 (sub nomine *Str. gossypina* T. And.)
- spicatum** (Roth) Brem. var. **amomum** (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 216, 1874 (sub nomine *Strobilanthes consanguinea* T. And.)
- versicolor** (Wight) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1497, 1849 et III. Ind. Bot. Tab. 164 bis, 1850 (sub nomine *Endopogon versicolor* Wight); in Bedd., Ic. Pl. Ind. Or. I, Tab. 221, 1874 et in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 207, 1915 (sub nomine *Strobilanthes cuspidata* T. And.).

**Index Specierum in genere *Endopogone* nuncupatarum.**

- amomum** Nees in Wall., Pl. As. Rar. III, p. 99, 1832 = **Phlebophyllum spicatum** (Roth) Brem. var. **amomum** (Nees) Brem. n. comb.
- argutus** Nees in DC., Prodr. XI, p. 104, 1847 = **Pseudostenosiphonium argutum** (Nees) Lindau
- capitatus** Wight, Ic. Pl. Ind. Or. IV, Tab. 1499, 1849 = **Nilgirianthus foliosus** (Wight) Brem.
- \* **consanguineus** Nees in Wall., Pl. As. Rar. III, p. 99, 1832 = **Phlebophyllum spicatum** (Roth) Brem.
- cuspidatus** Benth. in Linnaea XXIV, p. 646, 1851 = **Phlebophyllum versicolor** (Wight) Brem.
- decurrens** Nees in DC., Prodr. XI, p. 105, 1847 = **Hymenochlaena decurrens** (Nees) Brem. n. comb. v. infra
- digitalis** Nees in DC., Prodr. XI, p. 104, 1847 = **Pseudostenosiphonium digitale** (Nees) Brem. n. comb.
- foliosus** Wight, Ic. Pl. Ind. Or. IV, Tab. 1501, 1849 = **Nilgirianthus foliosus** (Wight) Brem. n. comb. v. infra
- gardnerianus** Nees in DC., Prodr. XI, p. 723, 1847 = species incertae sedis
- hypoleucus** Nees in Wall. Pl. As. Rar. III, p. 99, 1832 = **Phlebophyllum spicatum** (Roth) Brem. var. **hypoleucum** (Nees) Brem. n. comb.
- integrifolius** Dalz. in Hook., Kew Journ. II, p. 342, 1850 = **Mackenzia integrifolia** (Dalz.) Brem. n. comb. v. infra
- khasyanus** Nees in DC., Prodr. XI, p. 104, 1847 = **Listrobanthes khasyanus** (Nees) Brem. n. comb. v. infra
- macrostegius** Nees in DC., Prodr. XI, p. 104, 1847 = species incertae sedis
- rhamnifolius** (Nees) Wight, Ic. Pl. Ind. Or. IV, Tab. 1521, 1849 (*Buteraea* Nees) = **Pseudostenosiphonium rhamnifolium** (Nees) Lindau
- Ridleyi** Clarke in Journ. As. Soc. Beng. LXXIV, p. 654, 1908 = **Hymenochlaena Ridleyi** (Clarke) Brem. n. comb. v. infra
- strobilanthes** Wight, Ic. Pl. Ind. Or. IV, Tab. 1500, 1849 = **Xenacanthus zenkerianus** (Nees) Brem.
- versicolor** Wight, Ic. Pl. Ind. Or. IV, Tab. 1497, 1849 = **Phlebophyllum versicolor** (Wight) Brem. n. comb.
- viscosus** Arn. ex Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau
- viscosus** Arn. ex Nees var. **hispidus** Nees l.c. = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau var. **hispidum** (Nees) Brem. n. comb. v. infra
- viscosus** Arn. ex Nees var. **humilis** Nees in DC., Prodr. XI, p. 104, 1847 = **Phlebophyllum humile** (Gamble) Brem.

- viscosus* Arn. ex Nees var. *microphyllum* Nees l.c. = *Pseudostenosiphonium viscosum* Arn. ex Nees) Lindau var. *microphyllum* (Nees) Brem. n. comb. v. infra  
*viscosus* Arn. ex Nees var. *viscosissimus* Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = *Pseudostenosiphonium viscosum* (Arn. ex Nees) Lindau var. *viscosissimus* (Nees) Brem. n. comb. v. infra  
*vitellinus* (Roxb.) Nees in DC., Prodr. XI, p. 723, 1847 (*Justicia* Roxb.) = *Phlogacanthus vitellinus* (Roxb.) T. And.

Icones Specierum sub nomine generico *Endopogono delineatarum.*

- capitatus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1499, 1849 = *Nilgirianthus foliosus* (Wight) Brem.  
*foliosus* Wight, op. cit. Tab. 1501 = *Nilgirianthus foliosus* (Wight) Brem.  
*rhamnifolius* (Nees) Wight, op. cit. Tab. 1521 = *Pseudostenosiphonium rhamnifolium* (Nees) Lindau  
*strobilanthes* Wight, op. cit. Tab. 1500 = *Xenacanthus zenkerianus* (Nees) Brem.  
*versicolor* Wight, op. cit. Tab. 1497 = *Phlebophyllum versicolor* (Wight) Brem.  
*viscosus* Arn. ex Nees var. *humilis* Nees in Wight, op. cit. Tab. 1498 = *Phlebophyllum humile* (Gamble) Brem.

*Phlebophylli species sub nominibus Ruellia et Strobilanthe nuncupatae.*

- Ruellia spicata* Roth, Nov. Pl. Sp. p. 310, 1821 = *Phlebophyllum spicatum* (Roth) Brem. n. comb.  
*Strobilanthes consanguinea* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 (*Endopogon* Nees) = *Phlebophyllum spicatum* (Roth) Brem.  
*Strobilanthes consanguinea* (Nees) T. And. var. *amomum* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 435, 1884 (*Endopogon amomum* Nees) = *Phlebophyllum spicatum* (Roth) Brem. var. *amomum* (Nees) Brem. n. comb.  
*Strobilanthes consanguinea* (Nees) T. And. var. *hypoleuca* (Nees) Clarke op. cit. p. 436 (*Endopogon hypoleucus* Nees), quoad typum = *Phlebophyllum spicatum* (Roth) Brem. var. *hypoleucum* (Nees) Brem. n. comb.; quoad syn. *Endopogon viscosus* Nees var. *humilis* Nees = *Phlebophyllum humile* (Gamble) Brem.  
*Strobilanthes cuspidata* (Benth.) T. And. in Journ. Linn. Soc. IX, p. 465, 1867 (*Endopogon* Benth.) = *Phlebophyllum versicolor* (Wight) Brem.  
*Strobilanthes gossypina* T. And. in Journ. Linn. Soc. IX, p. 466, 1867 = *Phlebophyllum lanatum* (Nees) Brem.  
*Strobilanthes humilis* Gamble, Fl. Madras II, p. 1026 et 1035, 1927 (*Endopogon viscosus* Nees var. *humilis* Nees) = *Phlebophyllum humile* (Gamble) Brem. n. comb.  
*Strobilanthes jeyporensis* Bedd., Ic. Pl. Ind. Or. I, p. 50, Tab. 214, 1874 = *Phlebophyllum jeyporensis* (Bedd.) Brem. n. comb.  
*Strobilanthes kunthianum* (Nees) T. And. ex Benth., Fl. Hongk., p. 262 in nota, 1861 = *Phlebophyllum kunthianum* Nees  
? *Strobilanthes lanata* Nees in DC., Prodr. XI, p. 191, 1847 = *Phlebophyllum lanatum* (Nees) Brem. n. comb.  
*Strobilanthes Lawsonii* Gamble in Kew Bull. 1923, p. 374 = *Phlebophyllum Lawsonii* (Gamble) Brem. n. comb.

12. *Nilgirianthus* Brem. n. gen.; typus: *N. wightianus* (Nees) Brem. n. comb. (*Strobilanthes* Nees); *Strobilanthes* species auctorum aliorum.

Plantae plietesiae, plures gregariae dicuntur et pluribus interjectis annis uno

tempore florentes, isophyllae. Folia longius petiolata. Inflorescentiae spiciformes abbreviatae, terminales et axillares, interdum cernuae. Bracteae lineari-oblongae, oblongae, ovatae vel obovatae, imbricatae, nunc penninerviae, nunc e basi 3-vel plurinerviae, calyce longiores, persistentes. Flores in axillis bractearum solitarii, plerumque bracteolati. Bracteolae anguste lineares, 1- vel interdum indistincte 3-nerviae, calyce breviores, persistentes, raro nullae. Calyx 5-partitus vel 5-fidus, lobis triangularibus acutis vel obtusis, 3-nerviis, interdum paulum inaequalibus casu quo mediano longiore, lateralibus brevioribus. Corolla coerulea, raro alba, non resupinata, tubo tereti in fauces campanulatas tubo breviores vel longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis ovatis, subacutis, rotundatis vel emarginatis. Stamina plerumque 4, didynamia vel subaequalia, nunc omnia exserta, nunc longiora solum exserta, nunc omnia inclusa, raro interiora ad staminodia redacta; filamenta filiformia, nunc omnia tota hirtella, nunc basi solum hirtella, nunc omnia glabra; antherae erectae, interdum subacutae, a latere complanatae. Staminodium impar parvum vel nullum. Granula pollinis (Tab. 1 E) breviter ellipsoidea, virgata, virgis punctatis. Ovarium pilis capitatis vel ecapitatis comosum, raro glabrum, utroque loculo ovulis 2. Stylus glaber vel hirtellus. Capsula fusiformis, plerumque 4-seminalis. Semina (Tab. IV F) albida, glabra et nitida, margine interdum pilis mucosis instructa, areolis usque ad marginem expansis.

Distributum in Peninsula Indica. Species minimum 19.

Species typica: *Nilgirianthus wightianus* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

The delimitation of *Nilgirianthus* is as yet, owing to our imperfect knowledge of several of the species, not fully satisfactory. As there is a considerable width of variation, for instance in the structure of the bracts and of the flower, it seems probable that continued study will lead to a further division. The presence of species growing gregariously and flowering simultaneously once in several years together with species which flower yearly, is also an indication that the delimitation of the genus is still too wide, for in all other genera in which this behaviour has been observed, it was always found to be present in all the species. In *Nilgirianthus* an arrangement of the species according to this character, however, did not lead to the establishment of natural groups. This result is so unexpected that I am inclined to ascribe it to the unreliability of the available data.

On account of the structure of the inflorescence and of the corolla and the androecium, some apparently natural groups may be singled out. In *N. barbatus*, *N. ciliatus* and *N. warreënsis* the corolla tube is longer than the widely campanulate throat, and the stamens are exserted. In *N. neilgherrensis*, *N. papillosus* and *N. foliosus* the lower bracts are provided with a leafy appendage, and in *N. lupulinus*, *N. heyneanus* and *N. campanulatus* the spikes are ovoid, the bracteoles minute or absent and the seeds fringed with mucous hairs.

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**barbatus** (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes tetraptera* Dalz. — Peninsula Indica —

**Beddomei** Brem. n. nom. (*Strobilanthes adenophora* Nees in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 53, Tab. 225, 1874) — Peninsula Indica —

**campanulatus** (Wight) Brem. n. comb. (*Strobilanthes* Wight); syn.: *Strobilanthes heyneana* Nees var. *campanulata* (Wight) Clarke — Peninsula Indica —

**ciliatus** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Peninsula Indica —

- circarensis** (Gamble) Brem. n. comb. (*Strobilanthes* Gamble) — Peninsula Indica —
- decurrens** (Nees) Brem. n. comb. (? *Strobilanthes* Nees); syn.: *Goldfussia decurrens* (Nees) Wight; *Strobilanthes pallida* T. And. — Peninsula Indica —
- foliosus** (Wight) Brem. n. comb. (*Endopogon* Wight); syn.: *Strobilanthes foliosa* (Wight) T. And.; *Endopogon capitatus* Wight — Peninsula Indica —
- heyneanus** (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes rugosa* Wight — Peninsula Indica —
- heyneanus** (Nees) Brem. var. *fuscus* (Clarke) Brem. n. comb. (*Strobilanthes heyneana* Nees var. *fusca* Clarke) — Peninsula Indica —
- heyneanus** (Nees) Brem. var. *Neesii* Brem. n. nom. = var. typ.
- heyneanus** (Nees) Brem. var. *viridis* (Clarke) Brem. n. comb. (*Strobilanthes heyneana* Nees var. *viridis* Clarke) — Peninsula Indica —
- lupulinus** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Peninsula Indica —
- Meeboldii** (Craib) Brem. n. comb. (*Strobilanthes* Craib) — Peninsula Indica —
- membranaceus** (Talb.) Brem. n. comb. (*Strobilanthes* Talb.) — Peninsula Indica —
- neilgherrensis** (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —
- papillosus** (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Peninsula Indica —
- perrottetianus** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Peninsula Indica —
- punctatus** (Nees) Brem. n. comb. (*Ruellia* Nees); syn.: *Strobilanthes microstachya* Benth.; *Str. anceps* Nees var. *microstachya* (Benth.) Clarke — Peninsula Indica —
- reticulatus** (Stapf) Brem. n. comb. (*Strobilanthes* Stapf) — Peninsula Indica —
- urceolaris** (Gamble) Brem. n. comb. (*Strobilanthes* Gamble) — Peninsula Indica —
- warreënsis** (Dalz.) Brem. n. comb. (*Strobilanthes* Dalz.); syn.: *Strobilanthes parviflora* Bedd. — Peninsula Indica —
- \* **wighteanus** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Peninsula Indica —

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- barbatus** (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 212, 1874 (sub nomine *Strobilanthes barbata* Nees)
- Beddomei** Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 225, 1874 (sub nomine falso *Strobilanthes adenophora* Nees)
- campanulatus** (Wight) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1562, 1849 (sub nomine *Strobilanthes campanulata* Wight)
- ciliatus** (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 211, 1874 (sub nomine *Strobilanthes ciliata* Nees)
- decurrens** (Nees) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1522, 1849 (sub nomine *Goldfussia decurrens* Wight)
- foliosus** (Wight) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1499, 1849 (sub nomine *Endopogon capitatus* Wight) et ibid. Tab. 1501 (sub nomine *Endopogon foliosus* Wight); in Fyson, Fl. Nilgiri and Pulney Hill-tops III, p. 451, 1920 (sub nomine *Strobilanthes foliosa* T. And.)
- heyneanus** (Nees) Brem. var. *Neesii* Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1619, 1850 (sub nomine *Strobilanthes rugosa* Wight)
- membranaceus** (Talb.) Brem. in Talb., For. Fl. Bombay II, p. 327, 1911 (sub nomine *Strobilanthes membranacea* Talb.)

- neilgherrensis* (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 196, 1874 (sub nomine *Strobilanthes neilgherrensis* Bedd.)  
*perrottetianus* (Nees) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1513, 1849 et in Wight, Spicil. Neilgherr. II, Tab. 178/9, 1851 (sub nomine *Strobilanthes perrottetiana* Nees)  
*punctatus* (Nees) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1563, 1849 (sub nomine *Ruellia? punctata* Nees)  
*reticulatus* (Stapf) Brem. in Talbot, For. Fl. Bombay II, p. 324, 1911 (sub nomine *Strobilanthes reticulata* Stapf)  
*warreënsis* (Dalz.) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1518, 1849 (sub nomine *Strobilanthes aspera* Wight) *dubiosum*; in Bedd., Ic. Pl. Ind. Or. I, Tab. 197, 1874 (sub nomine *Strobilanthes parviflora* Bedd.)  
*wighteanus* (Nees) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1514, 1849 (sub nomine *Strobilanthes wighteana* Nees).

*Nilgirianthi species sub nominibus genericis aliis nuncupatae.*

- Endopogon capitatus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1499, 1849 = *Nilgiri-anthus foliosus* (Wight) Brem.  
*Endopogon foliosus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1501, 1849 = *Nilgiri-anthus foliosus* (Wight) Brem. n. comb.  
*Goldfussia decurrens* (Nees) Wight, Ic. Pl. Ind. Or. IV, Tab. 1522, 1849 (*Strobilanthes* Nees) = *Nilgiri-anthus decurrens* (Nees) Brem.  
? *Ruellia punctata* Nees in DC., Prodr. XI, p. 147, 1847 = *Nilgiri-anthus punctatus* (Nees) Brem. n. comb.  
*Strobilanthes adenophora* Nees in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 53, Tab. 225 = *Nilgiri-anthus Beddomei* Brem. n. nom.  
*Strobilanthes anceps* Nees var. *microstachya* (Benth.) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 442, 1884 (*Strobilanthes microstachya* Benth.) = *Nilgiri-anthus punctatus* (Nees) Brem.  
*Strobilanthes barbata* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgiri-anthus barbatus* (Nees) Brem. n. comb.  
*Strobilanthes campanulata* Wight, Ic. Pl. Ind. Or. IV, Tab. 1562, 1849 = *Nilgiri-anthus campanulatus* (Wight) Brem. n. comb.  
*Strobilanthes ciliata* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgiri-anthus ciliatus* (Nees) Brem. n. comb.  
*Strobilanthes circarensis* Gamble in Kew Bull. 1923, p. 373 = *Nilgiri-anthus circarensis* (Gamble) Brem. n. comb.  
*Strobilanthes decurrens* Nees in DC., Prodr. XI, p. 189, 1847 = *Nilgiri-anthus decurrens* (Nees) Brem. n. comb.  
*Strobilanthes foliosa* (Wight) T. And. in Journ. Linn. Soc. IX, p. 467, 1867 (*Endopogon* Wight) = *Nilgiri-anthus foliosus* (Wight) Brem.  
*Strobilanthes heyneana* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgiri-anthus heyneanus* (Nees) Brem. n. comb.  
*Strobilanthes heyneana* Nees var. *campanulata* (Wight) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 444, 1884 (*Strobilanthes campanulata* Wight) = *Nilgiri-anthus campanulatus* (Wight) Brem.  
*Strobilanthes heyneana* Nees var. *fusca* Clarke l.c. = *Nilgiri-anthus heyneanus* (Nees) Brem. var. *fuscus* (Clarke) Brem. n. comb.  
*Strobilanthes heyneana* Nees var. *viridis* Clarke l.c. = *Nilgiri-anthus heyneanus* (Nees) Brem. var. *viridis* (Clarke) Brem. n. comb.  
*Strobilanthes lupulina* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgiri-anthus lupulinus* (Nees) Brem. n. comb.  
*Strobilanthes Meeboldii* Craib in Kew Bull. 1910, p. 278 = *Nilgiri-anthus Meeboldii* (Craib) Brem. n. comb.

- Strobilanthes membranacea* Talb., Trees and Shrubs Bombay, ed. 2, p. 261, 1902 = *Nilgirianthus membranaceus* (Talb.) Brem. n. comb.  
*Strobilanthes microstachya* Benth. in Flora XXXII, p. 557, 1849 = *Nilgirianthus punctatus* (Nees) Brem.  
*Strobilanthes neilgherrensis* Bedd., Ic. Pl. Ind. Or. I, p. 45, Tab. 196, 1874 = *Nilgirianthus neilgherrensis* (Bedd.) Brem. n. comb.  
*Strobilanthes pallida* T. And. in Journ. Linn. Soc. IX, p. 470, 1867 = *Nilgirianthus decurrens* (Nees) Brem.  
*Strobilanthes papillosa* T. And. in Journ. Linn. Soc. IX, p. 468, 1867 = *Nilgirianthus papillosus* (T. And.) Brem. n. comb.  
*Strobilanthes parviflora* Bedd., Ic. Pl. Ind. Or. I, p. 45, Tab. 197, 1874 = *Nilgirianthus warreënsis* (Dalz.) Brem.  
*Strobilanthes perrottetiana* Nees in DC., Prodr. XI, p. 179, 1847 = *Nilgirianthus perrottetianus* (Nees) Brem. n. comb.  
*Strobilanthes reticulata* Stapf in Kew Bull. 1894, p. 347 = *Nilgirianthus reticulatus* (Stapf) Brem. n. comb.  
*Strobilanthes rugosa* Wight, Ic. Pl. Ind. Or. IV, Tab. 1619, 1849 = *Nilgirianthus heyneanus* (Nees) Brem.  
*Strobilanthes tetraptera* Dalz. in Hook., Kew Journ. of Bot. II, p. 342, 1850 = *Nilgirianthus barbatus* (Nees) Brem.  
*Strobilanthes urceolaris* Gamble in Kew Bull. 1923, p. 374 = *Nilgirianthus urceolaris* (Gamble) Brem. n. comb.  
*Strobilanthes warreënsis* Dalz. in Hook., Kew Journ. of Bot. II, p. 345, 1850 = *Nilgirianthus warreënsis* (Dalz.) Brem. n. comb.  
*Strobilanthes wighteana* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = *Nilgirianthus wighteanus* (Nees) Brem. n. comb.

13. *Taeniandra* Brem. n. gen.; typus; *T. micrantha* (Wight) Brem. n. comb. (*Strobilanthes* Wight).

Planta plietesia, gregaria, pluribus interjectis annis uno tempore florens, isophylla. Folia petiolata. Inflorescentiae spiciformes, breves et cernuae, terminales et axillares. Bractee ovato-lanceolatae, calyce fere bis longiores, penninerviae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, calyce paulo longiores, 1-nerviae, persistentes. Calyx aequaliter 5-partitus, lobis lanceolatis, acutissimis. Corolla colore ignoto, non resupinata, recta, calyci vix aequilonga, tubo tereti brevi, faucibus campanulatis, pilis stylum retinentibus in series duas breves dispositis, lobis late ovatis acutis, ad anthesin reflexis. Stamina 4 aequalia, longius exserta; filamenta liguliformia, glabra, apicem versus attenuatis; antherae erectae, apice obtusae, thecis basi obtusis. Staminodium triangulare. Lobuli interstaminales staminodio similiores. Plicae in tubo decurrentes glabrae. Granula pollinis ellipsoidea, virgata, virgis punctatis. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber. Capsula non visa. Semina glabra dicuntur.

Genus monotypicum in Peninsula Indica endemicum.

Species unica: *T. micrantha* (Wight) Brem. n. comb. (*Strobilanthes* Wight).

1. *Taeniandra micrantha* (Wight) Brem. n. comb.; *Strobilanthes micrantha* Wight, Ic. Pl. Ind. Or. IV, Tab. 1519, 1849; T. And. in Journ. Linn. Soc. IX, p. 468, 1867; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 444, 1884; Gamble, Fl. Madras II, p. 1031, 1927.

Habitat Peninsulam Indicam.

This new genus was separated from *Nilgirianthus* on account of the short corolla, the exserted stamens and the strap-shaped filaments; to the latter it owes its name. As these characters are found nowhere else in the *Strobilanthinae*,

their diagnostic value should not be underrated. As the genus is doubtless nearly related to *Nilgirianthus*, their taxonomic value is on the other hand but small, and they form therefore a good illustration of the thesis that the diagnostic value of a character is not necessarily a gage of its taxonomic importance.

Seeds of this species were not available, but GAMBLE l.c. describes them as glabrous: they are therefore probably of the same nature as those of *Nilgirianthus*, *Xenacanthus*, *Didyplosandra* and *Pseudostenosiphonium*.

14. *Xenacanthus* Brem. n. gen.; typus: *X. zenkerianus* (Nees) Brem. (*Goldfussia* Nees); *Strobilanthes* species auctorum aliorum.

Plantae plietesiae, gregariae, pluribus interjectis annis uno tempore florentes, isophyllae. Folia longius petiolata. Inflorescentiae spiciformes, breves, terminales et axillares. Bractee oblongae obtusae, e basi 3-nerviae, calyce longiores, persistentes; infimae haud raro in laminam satis magnam exeuntes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, calyce paulo longiores, persistentes. Calyx aequaliter 5-fidus, lobis linearibus obtusis, parce ciliatis. Corolla resupinata, tubo faucibus aequilongo, torto, apice rectangulariter recurvato et in fauces campanulatas ampliato, pilis stylum retinentibus in series duas dispositis, lobis ovatis subacutis. Stamina 4, didynamia, omnia erecta et inclusa; filamenta omnia basi hirtella; antherae erectae, apice obtusae, a latere complanatae. Staminodium nullum. Granula pollinis (Tab. I F, G) ellipsoidea, virgata, virgis carunculatis vel echinulatis. Ovarium pilis capitatis comosum, utroque loculo ovulis 2. Stylus glaber vel basin versus hirtellus. Capsula 4-seminalis dicta. Semina glabra dicta.

Distributum in Peninsula Indica, Species 4.

Species typica: *X. zenkerianus* (Nees) Brem. n. comb. (*Goldfussia* Nees).

This genus is as first sight almost indistinguishable from *Nilgirianthus*, but a more careful investigation reveals the presence of important differences: the corolla appears to be strongly recurved and resupinate and the pollen grains (Tab. I F, G) are provided with carunculate or echinulate bands. This divergence is expressed in the generic name.

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- heteromallus* (T. And. ex Clarke) Brem. n. comb. (*Strobilanthes* T. And. ex Clarke); syn.: *Strobilanthes scabra* Nees var.  $\gamma$  (Wall. Cat. 2377 et Herb. Wight) — Peninsula Indica —
- leschenaultianus* (Nees) Brem. n. comb. (*Goldfussia* Nees) — Peninsula Indica —
- pulneyensis* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Indica —
- \* *zenkerianus* (Nees) Brem. n. comb. (*Goldfussia* Nees); syn.: *Strobilanthes zenkeriana* (Nees) T. And.; *Endopogon strobilanthes* Wight — Peninsula Indica —

#### Icones.

- zenkerianus* (Nees) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1500, 1849 (sub nomine *Endopogon strobilanthes* Wight) et forsitan op. cit. Tab. 1517 (sub nomine *Strobilanthes ciliata* Nees).

*Xenacanthi* species sub nominibus genericis aliis nuncupatae.

- Endopogon strobilanthes* Wight, Ic. Pl. Ind. Or. IV, Tab. 1500, 1849 = *Xenacanthus zenkerianus* (Nees) Brem.



- Goldfussia leschenaultiana* Nees in DC., Prodr. XI, p. 172, 1847 = *Xenacanthus leschenaultianus* (Nees) Brem. n. comb.  
*Goldfussia zenkeriana* Nees in DC., Prodr. XI, p. 172, 1847 = *Xenacanthus zenkerianus* (Nees) Brem. n. comb.  
*Strobilanthes heteromalla* T. And. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 437, 1884 = *Xenacanthus heteromallus* (T. And. ex Clarke) Brem. n. comb.  
*Strobilanthes pulneyensis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 438, 1884 = *Xenacanthus pulneyensis* (Clarke) Brem. n. comb.  
*Strobilanthes scabra* Nees var.  $\gamma$  Nees in Wall., Pl. As. Rar. III, p. 84, 1832 = *Xenacanthus heteromallus* (T. And. ex Clarke) Brem.  
*Strobilanthes scabra* Nees var.  $\beta$  Nees in DC., Prodr. XI, p. 178, 1847 = prec.  
*Strobilanthes zenkeriana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 467, 1867 (*Goldfussia* Nees) = *Xenacanthus zenkerianus* (Nees) Brem.

15. *Didyplosandra* Wight ex Brem. n. genus; typus: *D. lurida* (Wight) Brem. n. comb. (*Strobilanthes* Wight).

Frutices isophyllae, interdum gregariae sed florentes quotannis. Folia longius petiolata. Inflorescentiae spiciformes, breves, terminales et axillares, interdum ramulos abbreviatos e parte defoliata ramorum orientes terminantes. Bracteae orbiculares vel ovatae, calyci aequilongae vel eo longiores, penninerviae, e basi tamen interdum 3-nerviae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, calyci subaequilongae, obtusae, interdum indistincte penninerviae, persistentes. Calyx aequaliter 5-partitus, lobis lanceolatis acutis, indistincte penninerviis. Corolla plerumque alba, tubo interdum luteola et nervis purpurellis, raro tota luteola vel lurida, non resupinata, tubo brevi, faucibus late campanulatis, pilis stylum retinentibus in series binas dispositis, lobis ovatis subacutis. Stamina 4 aequalia vel subaequalia, exserta; filamenta glabra et in plicas glabras decurrentia; antherae erectae, apice obtusae. Stamodium parvum vel nullum et membrana connectiva inter stamina interiora interdum emarginata. Granula pollinis globosa echinulata. Ovarium glabrum vel comosum, interdum ad apicem appendicibus peltatis obtectum, utroque loculo ovulis 2. Capsula fusiformis, glabra, 4-seminalis. Semina glabra, areolis usque ad marginem expansis, a basi usque ad centrum cellulis minoribus compositis.

Distributum in Peninsula Indica et forsitan in Zeylania. Species peninsulares 3; species zeylanicae dubiosae 4.

Species typica; *D. lurida* (Wight) Brem. n. comb. (*Strobilanthes* Wight).

As I have stated already in the general part of this paper, the name *Didyplosandra* was not validly published by WIGHT, but merely mentioned in the description of his *Strobilanthes lurida* (Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1849).

The genus is still very imperfectly known, the material at my disposition being inadequate. The Ceylonese species which tentatively have been included in this genus differ from the Peninsular ones in habit: in the latter the inflorescences are found on the defoliated part of the branches, but in the Ceylonese plants they develop at the end of ordinary leafy shoots, and it might therefore be better to refer the latter to a genus of their own. The Ceylonese species provided with echinulate pollen and four stamens, are on the whole still very imperfectly known. Some of them may belong to *Thelepaepale*, but as no material was available I am unable to give a definite opinion.

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*Andersonii* (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —  
*bolumpattiana* (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —

- ? *Hookeri* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Zeylanica —  
 ? *lanceolata* (Hook. ex Nees) Brem. n. comb. (*Strobilanthes* Hook. ex Nees);  
 syn.: *Strobilanthes adenophora* Nees; *Goldfussia myrtinia* Nees —  
 Zeylanica —  
 ? *laxa* (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Zeylanica —  
 • *lurida* (Wight) Brem. n. comb. (*Strobilanthes* Wight) — Peninsula Indica —  
 ? *vestita* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Zeylanica —

#### Index Iconum.

- Andersonii* (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 208, 1874 (sub  
 nomine *Strobilanthes Andersonii* Bedd.)  
*bolumpattiana* (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 200, 1874 (sub  
 nomine *Strobilanthes bolumpattiana* Bedd.)  
 ? *Hookeri* (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 262, 1874 (sub nomine  
*Strobilanthes Hookeri* Nees)  
 ? *laxa* (T. And.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 223, 1874 (sub nomine  
*Strobilanthes laxa* T. And.)  
*lurida* (Wight) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1849; in  
 Wight, Spicil. Neilgherr, II, Tab. 178/9, 1851; in Fyson, Fl. Nilgiri and  
 Pulney Hill-tops III, p. 453, 1920 (omnes sub nomine *Strobilanthes*  
*lurida* Wight)  
 ? *vestita* (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 260, 1874 (sub nomine  
*Strobilanthes vestita* Nees)

#### *Didyplosandrae* species sub nominibus genericis aliis nuncupatae.

- Goldfussia myrtinia* Nees in DC., Prodr. XI, p. 174, 1847 = ? *Didyplosandra*  
*lanceolata* (Hook. ex Nees) Brem.  
*Strobilanthes adenophora* Nees in DC., Prodr. XI, p. 182, 1847 = ? *Didyplo-*  
*sandra lanceolata* (Hook. ex Nees) Brem.  
*Strobilanthes Andersonii* Bedd. in Madras Journ. of Sc., Ser. 3, I, p. 55, 1864  
 = *Didyplosandra Andersonii* (Bedd.) Brem. n. comb.  
*Strobilanthes bolumpattiana* Bedd., Ic. Pl. Ind. Or. I, p. 46, Tab. 200, 1874 =  
*Didyplosandra bolumpattiana* (Bedd.) Brem. n. comb.  
*Strobilanthes Hookeri* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 =  
 ? *Didyplosandra Hookeri* (Nees) Brem. n. comb.  
*Strobilanthes lanceolata* Hook. ex Nees in DC., Prodr. XI, p. 181, 1847 =  
 ? *Didyplosandra lanceolata* (Hook. ex Nees) Brem. n. comb.  
*Strobilanthes laxa* T. And. in Thwaites. Enum. Pl. Zeyl., p. 228, 1860 =  
 ? *Didyplosandra laxa* (T. And.) Brem.  
*Strobilanthes lurida* Wight, Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1849 = *Didy-*  
*plosandra lurida* (Wight) Brem. n. comb.  
*Strobilanthes vestita* Nees in DC., Prodr. XI, p. 180, 1847 = ? *Didyplosandra*  
*vestita* (Nees) Brem. n. comb.

16. *Pseudostenosiphonium* Lindau in Bot. Jahrb. XVIII, p. 52, 1893, p. p.;  
 id. in Engl. u. Prantl, Nat. Pflanzenfam. IV 3 b, p. 303, 1895, p. p.; Lemée,  
 Dict. Pl. Phan. V, p. 620, 1934; — *Pseudostomium* O. Ktze in Post, Lex.  
 p. 465, 1903, n. nom. illeg.

Plantae plietesiae, probabiliter omnes gregariae et pluribus interjectis annis  
 uno tempore florentes, isophyllae. Folia petiolata. Inflorescentiae spiciformes,  
 elongatae, terminales et axillares. Bractee imbricatae vel subimbricatae, calyce  
 longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Brac-  
 teolae calycis segmentis similiores, persistentes. Calyx subaequaliter 5-fidus  
 vel 5-lobatus, lobis triangularibus acutis. Corolla alba vel purperella, forsitan

resupinata, tubo angusto, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis orbicularibus. Stamina 2, exserta vel subexserta; filamenta hirtella vel glabra; antherae erectae, apice obtusae. Staminodia nulla. Granula pollinis globosa echinulata. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber vel hirtellus. Capsula fusiformis vel rhomboidea, 4- vel 2-seminalis. Semina glabra, areolis usque ad marginem expansis, tarde maturantia.

Distributum in Zeylania. Species 9.

Species typica: *Ps. viscosum* (Nees) Lindau.

LINDAU severed *Pseudostenosiphonium* from *Strobilanthes* on account of the pollen structure, and mentioned as a further diagnostic the presence of two instead of four stamens, but as two of the five species which he referred to the new genus are provided with four stamens, the value which he attached to this character was apparently not large. The pollen structure, however, is, as I have shown in the general part of this paper, by itself insufficient for the characterization of the genera, and additional characters therefore are urgently needed. As defined above, the genus rests, apart from the pollen structure, on the complete suppression of the inner stamens, its isophylly, the tardily ripening capsules and the entirely glabrous seeds. The corolla is provided with a narrow tube and may be resupinate, but as no material was available, I am not sure of this. The reports on the gregarious growth and the simultaneous flowering once in several years, are somewhat contradictory, but it is not unlikely that this mode of life is met with in all species enumerated below. The position of *Ps. rhytispermum* is still somewhat dubious, as its pollen has not yet been studied; the seeds, however, have been described as glabrous. Whether *Strobilanthes stenodon* Clarke and *Str. deflexa* T. And. belong to this genus, is uncertain.

### Index Specierum.

- argutum** (Nees) Brem. n. comb. (*Endopogon* Nees); syn.: *Strobilanthes viscosa* (Nees) T. And. var. *arguta* (Nees) Clarke — Zeylania —
- zeylanicum** (T. And.) Lindau sphalm. cf. *zeylanicum*
- diandrum** (Nees) Brem. n. comb. (*Stenosiphonium* (Nees)); syn.: *Strobilanthes exareolata* Clarke; *Gutzlaffia exareolata* (Clarke) Lace; *Strobilanthes diandra* (Nees) Alston — Zeylania —
- diandrum** (Nees) Brem. var. **densum** (Clarke) Brem. n. comb. (*Strobilanthes exareolata* Clarke var. *densa* Clarke) — Zeylania —
- digitale** (Nees) Brem. n. comb. (*Endopogon* Nees); syn.: *Strobilanthes viscosa* (Nees) T. And. var. *digitalis* (Nees) Clarke — Zeylania —
- gardnerianum** (Nees) Lindau in Bot. Jahrb. XVIII, p. 52, 1893 (*Endopogon* Nees); syn.: *Strobilanthes gardneriana* (Nees) T. And. = species incertae sedis
- nigrescens** (T. And.) Lindau in Bot. Jahrb. XVIII, p. 52, 1893 (*Strobilanthes* T. And.) — Zeylania —
- Nockii** (Trimen) Brem. n. comb. (*Strobilanthes* Trimen) — Zeylania —
- rhamnifolium** (Nees) Lindau in Bot. Jahrb. XVIII, p. 52, 1893 (*Buteraea* Nees); syn.: *Endopogon rhamnifolius* (Nees) Wight; *Strobilanthes rhamnifolia* (Nees) T. And. — Zeylania —
- rhytispermum** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Zeylania —
- **viscosum** (Nees) Lindau in Bot. Jahrb. XVIII, p. 52, 1893 (*Endopogon* Nees); syn.: *Strobilanthes viscosa* (Nees) T. And. — Zeylania —
- viscosum** (Nees) Lindau var. **hispidum** (Nees) Brem. n. comb. (*Endopogon viscosus* Nees var. *hispidus* Nees) — Zeylania —

- viscosum** (Nees) Lindau var. **microphyllum** (Nees) Brem. n. comb. (*Endopogon viscosus* Nees var. *microphyllus* Nees); syn.: *Strobilanthes viscosa* (Nees) T. And. var. *microphylla* (Nees) Clarke — *Zeylanica* —  
**viscosum** (Nees) Lindau var. **viscosissimum** (Nees) Brem. n. comb. (*Endopogon viscosus* Nees var. *viscosissimus* Nees = var. typ.  
*zeylanicum* (T. And.) Lindau (*sphalm. ceylanicum*) in Bot. Jahrb. XVIII, p. 52, 1893 (*Strobilanthes* And.) = species incertae sedis.

### Index Iconum.

- nigrescens** (T. And.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 217, 1874 (sub nomine *Strobilanthes nigrescens* T. And.)  
**Nockii** (Trimen) Brem. in Trimen, Fl. Ceyl., Atlas III, Tab. 70, 1895 (sub nomine *Strobilanthes Nockii* Trimen)  
**rhamnifolium** (Nees) Lindau in Wight, Ic. Pl. Ind. Or. IV, Tab. 1521, 1849 (sub nomine *Endopogon rhamnifolius* Wight)  
**viscosum** (Nees) Lindau in Bot. Jahrb. XVIII, p. 40, fig. 2 C, 1893 et in Engl. u. Prantl, Nat. Pflanzenfam. IV 3 b, p. 282, fig. 111 C, 1895 (pollen).

### *Pseudostenosiphonii* species sub nominibus genericis aliis nuncupatae.

- Buteraea rhamnifolia* Nees in DC., Prodr. XI, p. 725, 1847 = **Pseudostenosiphonium rhamnifolium** (Nees) Lindau  
*Endopogon argutus* Nees in DC., Prodr. XI, p. 104, 1847 = **Pseudostenosiphonium argutum** (Nees) Brem. n. comb.  
*Endopogon digitalis* Nees in DC., Prodr. XI, p. 104, 1847 = **Pseudostenosiphonium digitale** (Nees) Brem. n. comb.  
*Endopogon rhamnifolius* (Nees) Wight, Ic. Pl. Ind. Or. IV, Tab. 1521, 1849 (*Buteraea* Nees) = **Pseudostenosiphonium rhamnifolium** (Nees) Lindau  
*Endopogon viscosus* Arn. ex Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau  
*Endopogon viscosus* Arn. ex Nees var. *hispidus* Nees l.c. = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau var. *hispidum* (Nees) Brem. n. comb.  
*Endopogon viscosus* Arn. ex Nees var. *microphyllus* Nees in DC., Prodr. XI, p. 104, 1847 = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau var. *microphyllum* (Nees) Brem. n. comb.  
*Endopogon viscosus* Arn. ex Nees var. *viscosissimus* Nees in Hook., Comp. Bot. Mag. II, p. 113, 1836 = **Pseudostenosiphonium viscosum** (Arn. ex Nees) Lindau var. *viscosissimum* (Nees) Brem. n. comb.  
*Gutzlaffia exareolata* (Clarke) Lace in Kew Bull. 1915, p. 406 in adnot. (*Strobilanthes* Clarke) = **Pseudostenosiphonium diandrum** (Nees) Brem.  
*Stenosiphonium diandrum* Nees in DC., Prodr. XI, p. 105, 1847 = **Pseudostenosiphonium diandrum** (Nees) Brem. n. comb.  
*Strobilanthes diandra* (Nees) Alston in Trimen, Handb. Fl. Ceyl. VI, p. 227, 1931 (*Stenosiphonium* Nees) = **Pseudostenosiphonium diandrum** (Nees) Brem.  
*Strobilanthes exareolata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884 = **Pseudostenosiphonium diandrum** (Nees) Brem.  
*Strobilanthes exareolata* Clarke var. *densa* Clarke l.c. = **Pseudostenosiphonium diandrum** (Nees) Brem. var. *densum* (Clarke) Brem. n. comb.  
*Strobilanthes nigrescens* T. And. in Thwaites, Enum. Pl. Zeyl. p. 226, 1860 = **Pseudostenosiphonium nigrescens** (T. And.) Lindau  
*Strobilanthes Nockii* Trimen, Handb. Fl. Ceylon III, p. 301, 1895 et Atlas Tab. 70 = **Pseudostenosiphonium Nockii** (Trimen) Brem. n. comb.  
*Strobilanthes rhamnifolia* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl. p. 226, 1860 (*Buteraea* Nees) = **Pseudostenosiphonium rhamnifolium** (Nees) Lindau

- Strobilanthes rhytisperma* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884  
= *Pseudostenosiphonium rhytispermum* (Clarke) Brem. n. comb.
- Strobilanthes viscosa* (Nees) T. And. in Thwaites Enum. Pl. Zeyl., p. 226,  
1860 (*Endopogon* Nees) = *Pseudostenosiphonium viscosum* (Nees)  
Lindau
- Strobilanthes viscosa* (Nees) T. And. var. *arguta* (Nees) Clarke in Hook. f., Fl. Brit. Ind.  
IV, p. 432, 1884 (*Endopogon argutus* Nees) = *Pseudostenosiphonium argutum* (Nees)  
Brem.
- Strobilanthes viscosa* (Nees) T. And. var. *digitalis* (Nees) Clarke l.c. (*Endopogon digitalis*  
Nees) = *Pseudostenosiphonium digitale* (Nees) Brem.
- Strobilanthes viscosa* (Nees) T. And. var. *microphylla* (Nees) Clarke l.c. (*Endopogon vis-*  
*cosus* Arn. ex Nees var. *microphyllus* Nees) = *Pseudostenosiphonium viscosum* (Arn.  
ex Nees) Lindau var. *microphyllum* (Nees) Brem.

### GROUP H.

This group, which comprises the genera *Mackenzia* Nees and *Leptacanthus* Nees, is, like the preceding one, confined to Ceylon and the Indian Peninsula, and consists of isophyllous plants, growing gregariously and flowering simultaneously once in several years. A remarkable feature are the comparatively large capsules containing in each cell a single or two overlapping flat seeds, which have been described as "silky" or "shaggy". In *Mackenzia homotropa* (Nees) Brem. n. comb. (*Strobilanthes* Nees), the only species of which seeds were available to me, I found them (Tab. IV G) exareolate and covered with fairly long, straight and pointed, thickwalled, white hairs, which proved to be hygrometric, the movements being carried out by the aid of a peculiar mechanism consisting of a globular swelling of the underlying wall which fits into a cavity at the base of the hair itself. In the other Ceylonese and Indian *Strobilanthinae* the seeds are always distinctly areolate and either glabrous or outside the areola covered with annulate hairs, the only other exceptions being the genus *Pleocaulus*, whose seeds are said to be exareolate, and some species like "*Strobilanthes*" *Walkeri* Nees, where they are areolate but covered with the same kind of hairs as those of *Goldfussia* and its nearest allies: as no flowers were available, the position of these plants could not yet be determined, but they belong doubtless to a new group.

The difference between *Mackenzia* and *Leptacanthus* is but slight, and lies mainly in the structure of the inflorescence: in *Mackenzia* the flowers are spicate and the bracteoles longer than the calyx; in *Leptacanthus* on the other hand the flowers are gracefully pedicellate and the bracteoles are either shorter than the calyx or entirely suppressed. It is not impossible, however, that further study will reveal the presence of other points of difference.

The pollen grains of *Mackenzia integrifolia* (Dalz.) Brem. n. comb. (*Endopogon* Dalz.; syn.: *Leptacanthus alatus* Wight and *Strobilanthes perfoliata* T. And.) differ rather conspicuously from those of the other *Mackenzia* species: in the latter they are fairly long and the bands are decorated with a wavy ridge, whereas in this species they are much shorter and the bands are merely punctate. In this respect *M. integrifolia* resembles the *Leptacanthus* species: in the structure of the inflorescence, however, it agrees with the other *Mackenzia* species. In its auriculate leaves and mucronulate anthers it possesses characters which are not met elsewhere in this group, so that it is not impossible that further study will show that it deserves generic rank. Seeds of this species were unfortunately not available.

#### 17. *Mackenzia* Nees in DC., Prodr. XI, p. 308, 1847; hic emendata.

Plantae plietesiaie, gregariae et pluribus interjectis annis uno tempore florentes, isophyllae. Folia petiolata vel sessilia. Inflorescentiae spiciformes, elon-

gatae, in paniculam terminalem confluentes. Bracteeae decussatae vel subdecussatae, omnes plerumque flores subtendentes, penninerviae, plerumque persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calyci subaequilongae vel eo longiores. Calyx 5-partitus, lobis angustis, mediano aliis plerumque paulo longiore. Corolla alba, coerulea vel violacea, non resupinata, tubo brevi, faucibus longe campanulatis, pilis stylum retinentibus in series duas dispositis, lobis obcordatis. Stamina 4 inclusa, didynamia, omnia erecta; filamenta staminum longiorum basin versus hirtella; antherae erectae, apice obtusae vel mucronulatae. Staminodium subnullum. Granula pollinis (Tab. I H) ellipsoidea, virgis plerumque costa meandrina instructis, raro solum punctatis. Ovarium pilis capitatis comosum, utroque loculo ovulis 1—2. Stylus pilis plerumque ecapitatis hirtellus. Capsula obovoidea vel oblonga, acuta vel mucronata, e basi seminibus 2—4 instructa. Semina (Tab. IV G) exareolata, pilis rigidis et acutis albo-sericea.

Distributum in Zeylania et Peninsula Indica. Species 9.

Species typica: *M. sessilis* Nees.

The genus *Mackenzia*, as defined above, is based on the same type as NEES's original conception, but has otherwise very little in common with the latter. In fact, there can be little doubt that the genus owes its origin to a misinterpretation of the characters of the type specimen, which, as CLARKE has shown, is conspecific with NEES's own *Strobilanthes cerinthoides*. As the generic name, however, was legitimately published, it had to be accepted for the new conception.

With the exception of *M. integrifolia*, whose isolated position has already been discussed, the species are all nearly related. Some of them were regarded by CLARKE as mere varieties, but as the differences are by no means confined to a few characters, but show themselves in nearly every aspect, they deserve in my opinion specific rank.

#### Index Specierum.

- arguta** (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes sexennis* Nees var. *arguta* (Nees) Clarke — Zeylania —
- gracilis** (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.); syn.: *Strobilanthes Beddomei* T. And. — Peninsula Indica —
- hirsutissima** (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes sexennis* Nees var. *hirsutissima* (Nees) Clarke — Zeylania —
- homotropa** (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes interrupta* Benth. nomen — Peninsula Indica —
- integrifolia** (Dalz.) Brem. n. comb. (*Endopogon* Dalz.); syn.: *Strobilanthes integrifolia* (Dalz.) O. Ktze; *Leptacanthus alatus* Wight; *Strobilanthes perfoliata* T. And. — Peninsula Indica —
- Newii** (Bedd. ex Clarke) Brem. n. comb. (*Strobilanthes* Bedd. ex Clarke) — Peninsula Indica —
- \* **sessilis** Nees in DC., Prodr. XI, p. 308, 1847; syn.: *Strobilanthes cerinthoides* Nees in op. cit. p. 724; *Str. sexennis* Nees var. *cerinthoides* (Nees) Clarke — Zeylania —
- sexennis** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Zeylania —
- violacea** (Bedd.) Brem. n. comb. (*Strobilanthes* Bedd.) — Peninsula Indica —

#### Index Iconum.

- gracilis** (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 207, 1874 (sub nomine *Strobilanthes gracilis* Bedd.)

- homotropa** (Nees) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 206, 1874 (sub nomine falso *Strobilanthes sexennis* Nees)  
**integrifolia** (Dalz.) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1527, 1849 (sub nomine *Leptacanthus alatus* Wight)  
**Newii** (Bedd. ex Clarke) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 202, 1874 (sub nomine falso *Strobilanthes extensa* Nees)  
**violacea** (Bedd.) Brem. in Bedd., Ic. Pl. Ind. Or. I, Tab. 205, 1874 (sub nomine *Strobilanthes violacea* Bedd.).

*Mackenzieae* species sub nominibus genericis aliis nuncupatae.

- Endopogon integrifolius* Dalz. in Hook., Kew Journ. of Bot. II, p. 342, 1850 = **Mackenzia integrifolia** (Dalz.) Brem. n. comb.  
*Leptacanthus alatus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1527, 1849 = **Mackenzia integrifolia** (Dalz.) Brem.  
*Strobilanthes arguta* Nees in DC., Prodr. XI, p. 188, 1847 = **Mackenzia arguta** (Nees) Brem. n. comb.  
*Strobilanthes Beddomei* T. And. in Journ. Linn. Soc. IX, p. 482, 1867 = **Mackenzia gracilis** (Bedd.) Brem.  
*Strobilanthes cerinthoides* Nees in DC., Prodr. XI, p. 724, 1847 = **Mackenzia sessilis** Nees  
*Strobilanthes extensa* Nees in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 47, Tab. 252, 1874 = **Mackenzia Newii** (Bedd. ex Clarke) Brem.  
*Strobilanthes gracilis* Bedd. in Madras Journ. of Sc., Ser. 3, I, p. 55, 1864 = **Mackenzia gracilis** (Bedd.) Brem. n. comb.  
*Strobilanthes hirsutissima* Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = **Mackenzia hirsutissima** (Nees) Brem. n. comb.  
*Strobilanthes homotropa* Nees in DC., Prodr. XI, p. 187, 1847 = **Mackenzia homotropa** (Nees) Brem. n. comb.  
*Strobilanthes integrifolia* (Dalz.) O. Ktze, Rev. Gen. Pl. II, p. 499, 1891 (*Endopogon* Dalz.) = **Mackenzia integrifolia** (Dalz.) Brem.  
*Strobilanthes interrupta* Benth. in Pl. Hohenacker. nomen = **Mackenzia homotropa** (Nees) Brem.  
*Strobilanthes Newii* Bedd. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 471, 1884 = **Mackenzia Newii** (Bedd. ex Clarke) Brem. n. comb.  
*Strobilanthes perfoliata* T. And. in Journ. Linn. Soc. IX, p. 471, 1867 = **Mackenzia integrifolia** (Dalz.) Brem.  
*Strobilanthes sexennis* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 = **Mackenzia sexennis** (Nees) Brem. n. comb.  
*Strobilanthes sexennis* Nees var. *arguta* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 474, 1884 (*Strobilanthes arguta* Nees) = **Mackenzia arguta** (Nees) Brem.  
*Strobilanthes sexennis* Nees var. *cerinthoides* (Nees) Clarke l.c. (*Strobilanthes cerinthoides* Nees) = **Mackenzia sessilis** Nees  
*Strobilanthes sexennis* Nees var. *hirsutissima* (Nees) Clarke l.c. (*Strobilanthes hirsutissima* Nees) = **Mackenzia hirsutissima** (Nees) Brem.  
*Strobilanthes violacea* Bedd., Ic. Pl. Ind. Or. I, p. 48, Tab. 205, 1874 = **Mackenzia violacea** (Bedd.) Brem. n. comb.

18. **Leptacanthus** Nees in Wall., Pl. As. Rar. III, p. 75 et 90, 1832; id. in DC., Prodr. XI, p. 100 et 169, 1847.

Plantae plietesiae, gregariae et pluribus interjectis annis uno tempore florentes, isophyllae. Folia petiolata. Inflorescentiae racemiformes in paniculam terminalem confluentes. Flores ad nodos solitarii, graciliter pedicellati. Bracteae decussatae, persistentes. Bracteolae parvae vel nullae. Calyx 5-partitus, lobis angustis, mediano interdum quam aliis paulo longiore. Corolla alba, rosea vel

roseo-violacea, non resupinata, tubo brevi, faucibus longe campanulatis, pilis stylum retinentibus in series duas dispositis, lobis orbicularibus. Stamina 4 inclusa, didynamia, omnia erecta; filamenta staminum longiorum basin versus hirtella; antherae erectae, obtusae. Staminodium nullum. Granula pollinis ellipsoidea, virgata, virgis minute punctatis. Ovarium pilis capitatis comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula ovoidea, acuta, parce pubescens, seminibus 2—4. Semina exareolata, pilis rigidis acutis albo-sericea.

Distributum in Zeylania et Peninsula Indica. Species 5.

Species typica: *L. rubicundus* Nees.

I have not been able to study the seeds of *Leptacanthus*, and I do not know therefore whether they differ from those of *Mackenzia*, but as they have been described by various authors in the same terms, I suppose that they are similar. For the time being the main difference between the two genera lies in the structure of the inflorescence. In the structure of the pollen grains the *Leptacanthus* species resemble *Mackenzia integrifolia*, a species which WIGHT had referred to *Leptacanthus*. As stated above, the seeds of this plant too were unavailable, but like those of various other species of *Mackenzia* and *Leptacanthus*, they have been described as "shaggy" and almost exareolate.

#### Index Specierum.

*alatus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1527, 1849 = *Mackenzia integrifolia* (Dalz.) Brem.

*amabilis* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Indica —  
*helicoides* Nees in DC., Prodr. XI, p. 170, 1847; syn.: *Strobilanthes helicoides* (Nees) T. And. — Zeylania —

*paniculatus* Brem. n. nom. (*Strobilanthes paniculata* T. And. 1867, non Miq. 1858) — Zeylania —

\* *rubicundus* Nees in Wall., Pl. As. Rar. III, p. 90, 1832; syn.: *Strobilanthes rubicunda* (Nees) T. And. — Peninsula Indica —

*Walkeri* Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836; syn.: *Strobilanthes pulcherrima* T. And. — Zeylania —

*Walkeri* Nees in errore apud Wight, Ic. Pl. Ind. Or. IV, Tab. 1507, 1849 = *amabilis*.

#### Index Iconum.

*alatus* Wight, Ic. Pl. Ind. Or. IV, Tab. 1527, 1849 = *Mackenzia integrifolia* (Dalz.) Brem.

*amabilis* (Clarke) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1507, 1849 (sub nomine falso *Leptacanthus Walkeri*)

*helicoides* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 220, 1874 (sub nomine *Strobilanthes helicoides* T. And.)

*rubicundus* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 199, 1874 (sub nomine falso *Strobilanthes paniculata* T. And.)

*Walkeri* Nees in errore apud Wight, Ic. Pl. Ind. Or. IV, Tab. 1507, 1849 = *amabilis* (Clarke) Brem.

*Leptacanthi* species sub nomine generico *Strobilanthe nuncupatae*.

*amabilis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 476, 1884 = *Leptacanthus amabilis* (Clarke) Brem. n. comb.

*helicoides* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860 = *Leptacanthus helicoides* Nees

*paniculata* T. And. in Journ. Linn. Soc. IX, p. 483, 1867 (non Miq., Fl. Ind. Bat. II, p. 802, 1858) = *Leptacanthus paniculatus* Brem. n. nom.



- pulcherrima* T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860, n. nom. =  
**Leptacanthus Walkeri** Nees  
*rubicunda* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860 =  
**Leptacanthus rubicundus** Nees.

### GROUP I.

The only genus of this group comprises three very similar species, which have often been regarded as mere varieties. They are perennial herbs provided with a multicapitous rhizome, from which yearly new shoots are produced, and they show therefore a mode of living which is quite exceptional among the *Strobilanthinæ*. The generic name *Pleocaulus* refers to their habit.

*Pleocaulus* resembles the genera belonging to the preceding groups in its isophylly and non-resupinate corolla, but it differs from all of them by the structure of the pollen grains, which are provided with septate bands. In this respect it agrees with the large group or heterophyllous genera in which the corolla as a rule is resupinate, but also with *Carvia* Brem. and *Adenostachya* Brem. It differs, however, from both in its habit and in the structure of the testa. Seeds of *Pleocaulus* were not available to me, but according to COOKE (Fl. Bombay II, p. 366, 1905) they are exareolate and totally covered with hygrometric hairs; those of *Carvia* and *Adenostachya*, on the other hand, are provided with a very conspicuous areola.

19. ***Pleocaulus*** Brem. n. gen.; typus: *Pl. sessilis* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

Herbae perennes, caulibus e caudice multicapiti orientibus simplicibus, erectis. Folia sessilia, ovata vel cordata. Inflorescentiae spiciformes, squarrosae, terminales et axillares. Bractee ovatae, margine calloso-denticulatae et ciliatae, costa basin versus dilatata et supra bifariam ciliata instructae, penninerviae, calyce longiores, imbricatae, persistentes. Flores in axillis bractearum solitarii, ebracteolati. Calyx subaequaliter 5-partitus, lobis lanceolatis, apice callosomucronatis, mediano angustiore. Corolla purpurella, non resupinata, recta, tubo tereti faucibus brevior, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus obcordatis. Stamina 4, didynamia, omnia inclusa vel longiora interdum exserta; filamenta staminum longiorum tota vel basin versus hirtella, breviorum glabra, omnia erecta; antherae erectae, apice obtusae, a latere complanatae. Staminodium parvum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium pilis capitatis breviter comosum, utroque loculo ovulis 2. Stylus parce hirtellus. Capsula fusiformis, glabra vel pilis capitatis comosa, 4-seminalis. Semina brunnea, exareolata dicta, tota pilis madefactis elastice erigentibus vestita.

Distributum in Peninsula Indica. Species minimum tres.

Species typica: *Pl. sessilis* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

### Index Specierum.

- Ritchei** (Clarke) Brem. n. comb. (*Strobilanthes sessilis* Nees var. *Ritchei* Clarke) — Peninsula Indica —  
 • **sessilis** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Peninsula Indica —  
**sessiloides** (Wight) Brem. n. comb. (*Strobilanthes* Wight); syn.: *Strobilanthes sessilis* Nees var. *sessiloides* (Wight) Clarke — Peninsula Indica —

### Index Iconum.

- sessilis** (Nees) Brem. in Bot. Mag. LXVIII, Tab. 3902, 1841; in Wight, Ic. Pl. Ind. Or. IV, Tab. 1511, 1849 et in Spicil. Neilgherr. II, Tab. 176, 1851;

in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 209, 1915 (omnes sub nomine *Strobilanthes sessilis* Nees)  
*sessiloides* (Wight) Brem. in Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 (sub nomine *Strobilanthes sessiloides* Wight).

*Pleocauli* species sub nomine generico *Strobilanthe* nuncupatae.

*sessilis* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Pleocaulus sessilis* (Nees) Brem. n. comb.  
*sessilis* Nees var. *Ritchei* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 452, 1884 = *Pleocaulus Ritchei* (Clarke) Brem. n. comb.  
*sessilis* Nees var. *sessiloides* (Wight) Clarke l.c. (*Strobilanthes sessiloides* Wight) = *Pleocaulus sessiloides* (Wight) Brem.  
*sessiloides* Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 = *Pleocaulus sessiloides* (Wight) Brem. n. comb.

GROUP J.

Group J consists of a single monotypic genus, for which I have coined the name *Carvia*: in the vernacular the plant on which it is based, is known as "karvi". *Carvia callosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees) is said to grow gregariously. It are large plants provided with several slightly slanting, unbranched or but little branched shoots, which reach a height of several meters and produce their thick ovoid inflorescences at the end of axillary short-shoots. In the presence of these axillary short-shoots it resembles the Peninsular species of *Didyplosandra*, but the short-shoots do not spring from the old wood as in that genus, but from the axils of the leaves in the upper part of the shoots. It differs, moreover, fundamentally from *Didyplosandra* in the structure of the testa and in that of the pollen grains. Its real affinities are as yet uncertain. In some respects, e.g. in the pollen structure and in the absence of bracteoles, it resembles *Pleocaulus*, from which it differs however in habit and in the structure of the testa with its conspicuous areola. In the structure of the testa it resembles *Thelepaepale* (Group K), whose flowers are bracteolate and whose pollen is globose and echinulate.

20. *Carvia* Brem. n. gen.; typus: *Carvia callosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

Planta plietesia, gregaria, isophylla vel paulum anisophylla. Folia in petiolum contracta, supra setulis basi a cellulis cystolithigeris radiatim dispositis circumdata scabrída, margine dense ciliata. Inflorescentiae spiciformes breves et crassae, ramulos abbreviatos, foliis multo redactis instructos, ex axillis foliorum orientes terminantes. Bracteae ovato-orbiculares, concavae, margine densius ciliolatae, penninerviae, calyce longiores, persistentes, Flores in axillis bractearum solitarii, ebracteolati. Calyx aequaliter 5-partitus, lobis linearibus obtusis imbricatis. Corolla violacea, non resupinata, tubo tereti brevi, faucibus campanulatis tubo longioribus, pilis stylum retinentibus in series duas dispositis, lobis orbicularibus subaequalibus magnis. Stamina 4 didynamia, inclusa; filamenta staminum longiorum hirtella, breviorum glabra; omnia erecta; antherae erectae, apice obtusae, a latere complanatae. Staminodium parvum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium subglabrum, utroque loculo ovulis 2. Stylus hirtellus, pilis basi insertis capitatis. Capsula ambitu elliptica, compressa, acuta, glabra, 2-seminalis. Semina albida, valde complanata, areola magna instructa, circum areolam pilis annulatis mucosis vestita.

Distributum in Peninsula Indica. Genus adhuc monotypicum.

Species unica: *Carvia callosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

1. *Carvia callosa* (Nees) Brem. n. comb.; *Strobilanthes callosa* Nees in Wall., Pl. As. Rar. III, p. 85, 1832; *Str. grahamiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1520, 1849.

Habitat Peninsulam Indicam.

Species haec solvenda est in varietates duas. Forma typica a me vocatur: *C. callosa* (Nees) Brem. var. *Neesii* Brem. n. nom.

Varietas a CLARKE distincta:

*C. callosa* (Nees) Brem. var. *hispida* (Clarke) Brem. n. comb.; *Strobilanthes callosa* Nees var. *hispida* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 451, 1884.

#### Icones.

Wight, Ic. Pl. Ind. Or. IV, Tab. 1520, 1849 (sub nomine *Strobilanthes grahamiana* Wight); Bot. Mag. CXXIII, Tab. 7538, 1897 et in Talbot, For. Fl. Bombay II, p. 336, 1911 (sub nomine *Strobilanthes callosa* Nees).

### GROUP K.

Like the two preceding groups, group K contains but a single genus, which I have called *Thelepaepale*, a name referring to the nipple-like spinules on the pollen grains. On the whole it is not unlike the Ceylonese species which I have tentatively referred to *Didyplosandra*, but apart from the less numerous and more robust spinules on the surface of the pollen grains, it differs from them in the structure of the seeds, which are not entirely glabrous but partly covered with mucous hairs, in the 5-fid, not 5-partite calyx, and in the reduplicative aestivation of its lobes.

Of the genus *Thelepaepale* so far only one species is known: *Th. ixiocephala* (Benth.) Brem. n. comb. (*Strobilanthes* Benth.), but it is not improbable that *Str. scrobiculata* Dalz. ex Clarke may prove to belong to this genus (cf. CLARKE in HOOK.F., Fl. Brit. Ind. IV, p. 445, 1884). As the seeds of the Ceylonese *Str. anceps* Nees are very similar to those of *Th. ixiocephala*, it is not unlikely that this species too belongs to *Thelepaepale*, but as no flowers were available to me, I am unable to express a more definite opinion. Some of the other Ceylonese species which could not yet be located, *Str. arnottiana* Nees, *Str. asperrima* Nees, *Str. calycina* Nees, *Str. exserta* Clarke (syn.: *Stenosiphonium zeylanicum* T. And.), *Str. gardneriana* (Nees) T. And., *Str. punctata* Nees, *Str. trifida* Nees and *Str. zeylanica* T. And., might also belong to this genus, but as I could not investigate these species myself, this remains for the present mere hypothesis.

21. *Thelepaepale* Brem. n. gen.; typus: *Th. ixiocephala* (Benth.) Brem. n. comb. (*Strobilanthes* Benth.).

Planta plietesia, isophylla vel paullum anisophylla. Inflorescentiae spiciformes breves, terminales et reductione ramulorum in paniculam confluentes. Bracteae ovato-lanceolatae, penninerviae, calyce multo longiores, persistentes; infimae semper oppositae, aliae interdum alternantes, 4-fariam dispositae tamen. Flores in axillis bractearum solitarii, bracteolati. Bracteolae angustae, calyce paulo breviores. Calyx subaequaliter 5-fidus, lobis anguste lanceolatis, apice callosis, aestivatione reduplicativa. Corolla alba, non resupinata, tubo tereti faucibus subaequilongo, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus, ovatis, satis magnis. Stamina 4, didynamia, inclusa; filamenta staminum exteriorum quam interiorum plus quam bis longiora, basi parce hirtella; filamenta staminum breviorum incurvata; antherae erectae tamen, oblongae, apice retusae, thecis patentibus. Staminodium nullum. Granula pollinis (Tab. III E) globosa echinulata, echinulis mamilliformibus, magnis. Ovarium pilis capitatis brevissime comosum, utroque loculo

ovulis 2. Stylus vix conspicue hirtellus. Capsula ellipsoidea, plerumque 2-seminalis. Semina albida, areola magna instructa, circum areolam pilis annulatis mucosis vestita.

Distributum in Peninsula Indica et forsitan in Zeylania. Numerus specierum adhuc ignotus.

Species typica: *Th. ixiocephala* (Benth.) Brem. n. comb. (*Strobilanthes* Benth.).

1. *Thelepaepale ixiocephala* (Benth.) Brem. n. comb.; *Strobilanthes ixiocephala* Benth. in Flora XXXII, p. 557, 1849; *Str. eriocephala* Benth. sphalm. apud T. And. in Journ. Linn. Soc. IX, p. 466, 1867; — *Str. Neesiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1523, 1849.

Habitat Peninsulam Indicam.

#### Icones.

Wight, Ic. Pl. Ind. Or. IV, Tab. 1523, 1849 (sub nomine *Strobilanthes Neesiana* Wight); Bedd., Ic. Pl. Ind. Or. I, Tab. 203, 1874 et Talbot, For. Fl. Bombay II, p. 329, 1911 (sub nomine *Str. ixiocephala* Benth.).

#### GROUP L.

The affinities of this monotypic group are difficult to establish. In habit the plant on which it is founded, it not unlike *Aechmanthera* Nees, but in the large size of the flowers and of the pollen grains and in the 4-seeded capsules it deviates considerably from the latter and the other genera belonging to group A. More important perhaps is the resemblance with group F, from which it differs however in the nature of the indumentum and in the colour of the corolla. From group G and from the two following ones, M and N, it differs in the structure of the testa, and from the two preceding groups in that of the pollen grains. On the whole its characters are of a more or less negative kind; the only positive character being the obtuse, on both sides glandular-hirtellous calyx lobes.

22. *Pseudaechmanthera* Brem. n. gen.; typus: *Ps. glutinosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

Planta probabiliter plietesia, isophylla. Rami villosi. Folia petiolata, utraque facie pubescentia. Inflorescentia spiciformis. Bractee foliaceae, inferiores calyce longiores, aliae breviores, decussatae et persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calyce dimidio breviores. Calyx 5-partitus, lobis linearibus obtusis, utrimque pilis partim capitatis hirtellis. Corolla coerulea, non resupinata, tubo tereti faucibus aequilongo, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis emarginatis. Stamina 4, vix conspicue didynamia, inclusa, omnia erecta; filamenta glabra; antherae erectae, lineares, subacutae. Staminodium oblongum truncatum. Granula pollinis magna, breviter ellipsoidea, virgata, virgis punctatis. Ovarium dense pilis capitatis vestita, utroque loculo ovulis 2. Stylus hirtellus. Capsula pilis capitatis vestita, 4-seminalis. Semina areolata, circum areolam pilis annulatis satis rigidis vestita.

Genus monotypicum in clivis Himalayae endemicum.

Species unica: *Ps. glutinosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

1. *Pseudaechmanthera glutinosa* (Nees) Brem. n. comb.; *Strobilanthes glutinosa* Nees in Wall., Pl. As. Rar. III, p. 86, 1832; id. in DC., Prodr. XI, p. 194, 1847; T. And. in Journ. Linn. Soc. IX, p. 476, 1867; Clarke in Hook.f., Fl. Brit. Ind. IV, p. 458, 1884; — *Ruellia jacquemontiana* Nees in DC., Prodr. XI, p. 145, 1847.

Habitat Himalayae clivos.

## GROUP M.

The two genera forming the groups M and N resemble those belonging to the preceding groups in their isophylly, non-resupinate corolla and ellipsoidal pollen grains provided with punctate bands, but they differ from them in the small size and deciduousness of the bracts. Group M differs from group N in the yellow colour of the corolla, in the reduction of the rows of hairs by which the style is retained to two bundles, in the hairy filaments and in the two kinds of hairs found on the testa.

23. *Ditrichospermum* Brem. n. gen.; typus: *D. secundum* (T. And.) Brem. (*Strobilanthes* T. And.).

Planta probabiliter plietesia, isophylla. Folia petiolata. Inflorescentiae spiciformes longae, terminales et axillares, bracteis bracteolisque parvis, plerumque mox deciduis instructae, floribus quoque nodo oppositis. Calyx subaequaliter 5-partitus, lobis anguste triangularibus acutis. Corolla lutea, non resupinata, extus puberulo-pubescentis, tubo tereti faucibus brevioris, faucibus anguste campanulatis, pilis stylum retinentibus subfasciculatis, lobis emarginatis. Stamina 4, didynamia, inclusa, omnia erecta; filamenta omnia dense hirtella; antherae erectae, apice obtusae, thecis subpatentibus. Staminodium nullum. Granula pollinis ellipsoidea, virgata, virgis punctatis. Ovarium totum puberulo-pubescentis, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, 4-seminalis. Semina (Tab. V A) vix conspicue areolata; areola margine in pilos rigidos exeuns; zona circumareolaris cellulis annulatis partim in pilos brevissimos exeuntibus composita.

Distributum in Assamia et Birmania. Genus adhuc monotypicum.

Species unica: *D. secundum* (T. And.) Brem. n. comb. (*Strobilanthes* T. And.).

1. *Ditrichospermum secundum* (T. And.) Brem. n. comb.; *Strobilanthes secunda* T. And. in Journ. Linn. Soc. IX, p. 480, 1867; Clarke in Hook.f., Fl. Brit. Ind. IV, p. 468, 1884.

Habitat Assamiam et Birmaniam.

Another species which might belong to this genus, is *Strobilanthes pterygorrhachis* Clarke. The figure given by CLARKE (in Journ. Linn. Soc., Bot. XXV, Tab. 25, 1889) shows a rather striking resemblance to the type of my new genus, and the flowers are described as yellow. As a similar habit, however, is found also in some of the genera belonging to the groups in which the pollen grains are echinulate or ornamented with septate bands, and as yellow flowers too occur in those groups, its position can not be made out, before the structure of the pollen grains has been studied. The pollen grains of *Str. panichanga* (Nees) T. And. look exactly like those of the species described above, but of this plant the seeds are unknown to me.

## GROUP N.

The genus *Baphicacanthus* founded on the plant which yields the "Assam indigo" or "room", is nearly related to *Ditrichospermum*. It differs from the latter in the colour of the corolla, the length of the rows of hairs by which the style is retained, the glabrous filaments, the relief on the bands with which the pollen grains (Tab. I. I) are decorated, and the structure of the testa (Tab. V B). CLARKE'S remark (in HOOK.F., Fl. Brit. Ind. IV, p. 468, 1884) that "Except as to the capsule, this looks exceedingly like a cultivated form of *S. secundus*" is therefore rather surprising.

24. **Baphicacanthus** Brem. n. gen.; typus: *B. cusia* (Nees) Brem. n. comb. (*Goldfussia* Nees); *Strobilanthes* species Nees et auctorum aliorum.

Planta plietesia, isophylla. Folia petiolata. Inflorescentiae spiciformes longae, terminales et axillares, bracteis bracteolisque deciduis, floribus quoque nodo oppositis. Bractee foliaceae, in petiolum brevem contractae, obovatae, apice rotundatae, penninerviae; infimae calyce multo longiores; aliae gradatim magnitudine decrescentes. Bracteolae florum infimorum calyce paulo breviores; florum aliorum gradatim magnitudine decrescentes; florum supremorum minutae. Calyx inaequaliter 5-partitus, lobis linearibus subacutis, mediano aliis longiore et latiore. Corolla violacea, rosea vel alba, non resupinata, leviter curvata tamen, tubo tereti brevi, faucibus anguste campanulatis tubo fere bis longioribus, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus obcordatis. Stamina 4, didynamia, inclusa, omnia erecta; filamenta glabra; antherae erectae, apice mucronatae, a latere complanatae. Staminodium nullum et membrana connectiva inter stamina interiora emarginata. Granula pollinis (Tab. I. I) magna, ellipsoidea, virgata, virgis punctatis et insuper costis duabus meandrinis ornatis. Ovarium dimidio superiore pilis capitatis obtectum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, glabra, 4-seminalis. Semina (Tab. V B) parvo-areolata, extra areolam pilis vix conspicuis sparsa.

Distributum in China Australi, Indo-China et India Septemtrionali, sed vulgo cultum solum. Genus adhuc monotypicum.

Species typica: *B. cusia* (Nees) Brem. n. comb. (*Goldfussia cusia* Nees).

1. **Baphicacanthus cusia** (Nees) Brem. n. comb.; *Goldfussia cusia* Nees in Wall., Pl. As. Rar. III, p. 88, 1832; id. in DC., Prodr. XI, p. 175, 1847; *Strobilanthes cusia* (Nees) O. Ktze, Rev. Gen. Pl. II, p. 499, 1891; *Str. cusia* (Nees) Imlay in Kew Bull. 1939, p. 115; — *Ruellia indigofera* Griff., Travels p. 237, 1847; — *Strobilanthes flaccidifolia* Nees in DC., Prodr. XI, p. 194, 1847; T. And. in Journ. Linn. Soc. IX, p. 481, 1867; Clarké in Hook.f., Fl. Brit. Ind. IV, p. 468, 1884; Benoist in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 678, 1935; — *Dipteracanthus? calycinus* Champ. in Hook., Kew Journ. of Bot. V, p. 133, 1853; *Strobilanthes Championi* T. And. ex Benth., Fl. Hongk. p. 261, 1861; — *Ruellia indigotica* Fortune, Resid. China p. 158, 1857; Balfour, Cyclop. Ind. IV, 1873; — *Strobilanthes flaccidus* G. Mann, Assam For. Rep. par. 135, 1877; Gamble, Man. Ind. Timb. 280, 1877; Kurz, For. Fl. II, p. 239, 1877; — *Str. Balansae* Lindau in Bull. Herb. Boiss. Sér. 2, V, p. 652, 1897.

Culta in India Septentrionali, China Australi et Indo-China.

*Baphicacanthus cusia* was formerly grown on a large scale for the indigoblue dye obtained from its leaves. The country of origin is unknown. The specific epithet *cusia* was first used by HAMILTON in the combination *Ruellia cusia* for a specimen which is now in the Wallich herbarium and which served NEES as type for his new species. The meaning of the word is unknown to me. IMLAY l.c. treated it as a substantive, and as I have no opinion of my own in this matter, I have followed his example. On the cultivation of this plant and the way in which the dye is obtained and used cf. WATTS, Dictionary of the Economic Products of India II (3), p. 375, 1893, and The Commercial Products of India, p. 678 and 1051, 1908, and the literature quoted in these works.

#### Icon.

Bot. Mag. CXIII, Tab. 6947, 1887 (sub nomine *Strobilanthes flaccidifolia* Nees).

#### GROUP O.

The only genus belonging to this group comprises two species, both, so far as we know at present, confined to Java. In most respects they are rather

similar, but in one point, the structure of the pollen, they show a most remarkable divergency. In both species the pollen is ellipsoidal and banded, but whereas the bands in the type species are septate, those of the other one are carunculate. Such a difference in the pollen structure of species belonging to the same genus, is not unmatched: we have met it already in the genus *Hemigraphis*, and we will be confronted with this kind of dimorphism once more in the genus *Pachystrobilus*.

Notwithstanding the fact that the pollen grains in one of the two species are provided with septate bands, the affinity of the genus *Adenostachya* Brem. with the following groups, in which pollen grains of this type are the rule, remains somewhat dubious. That the *Adenostachya* species are not like the majority of the plants belonging to those groups, distinctly anisophyllous, is no serious obstacle, for they are both small herbs with more or less orthotropic shoots, and in such plants the anisophylly does not show itself so well as in the plagiotropic branches of larger plants. More important is the difference in the structure of the seeds, for the latter are in *Adenostachya* distinctly areolate and surrounded by a dense fringe of mucous hairs. In this respect the genus differs fundamentally from *Pyrothrix* Brem., with which it shows a superficial resemblance, but reminds one of group J (*Carvia*) and group K (*Thelepaepale*). From these genera *Adenostachya* differs however in its small size and in its lax spiciform inflorescences with their filiform bracts, bracteoles and calyx lobes, all bristling with long capitate hairs. Another peculiarity of this genus is the small size of the median calyx lobe: when the lobe are unequal in the *Strobilanthinæ*, it is almost always the median lobe that is stronger developed than the other ones, but the calyx of *Adenostachya* and that of *Pleocaulis* form exceptions to this rule.

25. *Adenostachya* Brem. n. gen.; typus: *A. moschifera* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.).

Herbae parvae, non distincte anisophyllae, caule basi lignescente. Folia parva, petiolata vel sessilia. Inflorescentiae terminales et interdum aliquae in axillis foliorum supremorum laterales, sessiles vel breviter pedunculatae, spiciformes, laxae, bracteis oppositis nunc ambabus fertilibus, nunc altera sterili. Bracteae bracteolaeque filiformes, pilis capitatis longe ciliatae, calyci subaequilongae, persistentes. Calyx subaequaliter 5-partitus, lobis anticis tamen quam lateralibus paulo longioribus, mediano aliis brevior, omnibus filiformibus et pilis capitatis longe ciliatis. Corolla colore ignoto, non resupinata, recta, tubo tereti brevi, faucibus campanulatis tubo multo longioribus, pilis stylum retinentibus in series duas dispositis, lobis rotundatis subaequalibus. Stamina 4, didynamia, omnia erecta et inclusa; filamenta glabra; antherae erectae, apice obtusae vel mucronatae. Staminodium nullum. Granula pollinis ellipsoidea, virgata, virgis nunc septatis, nunc carunculatis. Ovarium pilis capitatis parce comosum, utroque loculo ovulis 2. Stylus basin versus parce hirtellus. Capsula fusiformis, 4-seminalis, retinaculis totis appressis, obtusis. Semina distincte areolata, marginem versus pilis mucosis annulatis et fortiter applanatis dense vestita.

Distributum in insula Java. Species adhuc notae 2.

Species typica: *A. moschifera* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.).

As stated above, the two species of this genus are very similar and might have passed for mere varieties if they had not shown such a striking difference in the relief of the pollen grains.

It is noteworthy that the arrangement of the tubercles on the bands of the pollen grains of *A. parvifolia* Brem. is different from that found elsewhere in this subtribe: they are namely not arranged in a single or double file in

the middle of the bands, but along their margin; in fact, they mark the spots where the septa, which are occasionally faintly recognizable, are attached to the rim. In *A. moschifera* the rim is at these places produced in minute excrescences which are only distinguishable when seen in profile, i.e. near the margin of the grain. Apart from this, there is also a difference in the number of bands: the pollen grains of *A. moschifera* are provided with 12 bands, which is the smallest number observed so far in the whole subtribe, whereas those of the other species are provided with a larger number, probably 15, but as the grains at my disposal were not yet fully mature, the number of bands could not be made out with absolute certainty.

Both species are apparently extremely rare plants. *Adenostachya moschifera* is in the Leiden and Utrecht herbaria represented only by the specimens collected more than a century ago by BLUME, and of the other species I have seen but a single specimen in the herbarium of the Experimental Station of the Sugarcane Growers Association at Pasuruan.

#### Key to the Species.

1. Leaves distinctly petiolate, caudate-acuminate; midrib and nerves on the underside densely appressed pubescent. Pollen grains with 12 septate bands. — West Java . . . . . 1. *A. moschifera* (Bl.) Brem. n. comb.
2. Leaves sessile, subacuminate; midrib and nerves on the underside rather densely hirsute. Pollen grains with a larger number (probably 15) of carunculate bands. — Central Java . . . . . 2. *A. parvifolia* Brem. n. spec.

1. *Adenostachya moschifera* (Bl.) Brem. n. comb.; *Strobilanthes moschifera* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826; Miq., Fl. Ind. Bat. II, p. 801, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 217, 1912.

Herba ramosior. Caulis ramique graciles, internodiis bisulcatis, sulcis primum dense pubescentes, ceterum breviter appresse pubescentes, deinde glabrescentes, ad nodos tamen continenter ciliati. Folia in petiolum usque ad 12 mm longum contracta; lamina lanceolata, usque ad 5.5 cm longa et 2.3 cm lata, apice caudato-acuminata, acute exeuns, margine crenata, utrimque sparse hirsuta, subtus insuper dense sed breviter strigosa, utrimque cystolithis gracilibus sparsa, nervis utroque latere costae 5—6. Spicae breviter pedunculatae, rhachide usque ad 5 cm longa. Bractee 13 mm; bracteolae 9 mm longae. Calycis lobi 10—12.5 mm longi. Corolla 2 cm longa, tubo 5 mm, faucibus 12 mm, lobis 3 mm longis. Stamina longiora filamentis 7 mm, breviora filamentis 2.5 mm longis; antherae 2.8 mm longae, mucronulatae. Granula pollinis 50  $\mu$  longa et 27  $\mu$  diam., virgis 12 septatis ornata. Capsula 12 mm longa et 3 mm diam. Semina 2 mm diam.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.: Selassi near Tjandjur, BLUME 1298 L, typus, U, dupl. typi.

2. *Adenostachya parvifolia* Brem. n. spec.; typus: KIEVITS 3330 PAS.

Herba ramosior. Caulis ramique graciles, internodiis bisulcatis, sulcis primum hirsuti, deinde glabrescentes, ad nodos primum ciliati. Folia sessilia; lamina lanceolata, usque ad 3.5 cm longa et 1.5 cm lata, apice vix acuminata, subacute exeuns, margine crenata, supra sparse hirsuta, subtus costa nervisque densius hirsuta, inter nervos pilis aliquibus sparsa, margine ciliata, utrimque sed praesertim supra cystolithis parvis dense lineolata, nervis utroque latere costae plerumque 4—5. Spicae sessiles, rhachide usque ad 5 cm longa. Bractee



11 mm; bracteolae 11—12 mm longae. Calycis lobi 9—10 mm longi. Corolla 1.7 cm longa, tubo 4.5 mm, faucibus 9 mm, lobis 3.5 mm longis. Stamina longiora filamentis 3.5 mm, breviora filamentis 1.5 mm longis; antherae 2 mm longae, apice obtusae. Granula pollinis 44  $\mu$  longa et 28  $\mu$  diam., virgis plus quam 12, secundum marginem carunculatis ornata. Capsula 9 mm longa et 2 mm diam. Semina 1.7 mm diam.

Habitat Javam Centralem.

Central Java. Banjumas Res.: s.l., KIEVITS 3330 PAS, typus.

### GROUP P.

The genera brought together in group P comprise a large number of anisophyllous species provided with a resupinate corolla, pollen grains which are ornamented with septate bands, 4-seeded fusiform capsules, and seeds that are entirely or almost entirely covered with stiff or fairly stiff hairs. Their area extends from the slopes of the Himalayan mountains through the whole of Indo-China to the Malay Archipelago. The affinity with the preceding groups is but remote, but with several of the following ones, especially with the groups Q—W, there are unmistakable connections. All these groups consist of anisophyllous plants whose pollen grains are almost always provided with septate bands or with bands which, by the suppression of the transverse ridges have been reduced to the elevated rim, though in some cases the pollen may be echinulate: the differences between these groups reveal themselves perhaps most strikingly in the position of the corolla, in the shape of the capsule and in the structure of the testa (Tab. V C, D, E, F). Very striking is the similarity with the groups Q, R and S. The monotypic group Q (*Psacadopaepale*) differs from P mainly in the carunculate pollen, and might perhaps have been included in this one: it was provisionally kept apart, because it is still imperfectly known. The monotypic group L (*Pachystrobilus*) differs from P mainly in the structure of the hairs covering the seedcoat, and M (*Goldfussia* and its nearest allies) moreover in the peculiar form of the androecium.

Within the group itself rather important differences were found in the structure of the seedcoat. In *Perilepta* Brem. and *Adenacanthus* Nees the subepidermal layer consists of cells with conspicuously thickened walls, and the hairs covering the seedcoat are less rigid than in the other genera of which seeds were available: in the latter the central layer was always found to be thin-walled. The testa of the genera *Pteracanthus* (Nees) Brem., *Triaenacanthus* Nees and *Buteraea* Nees, however, could not yet be studied. In other respects the agreement between the various genera is more marked. This reveals itself already in the circumstance that they follow each other in the artificial key to the genera in an unbroken sequence: if they had been less similar, some of them would probably have found a place near genera with which they would have shown a more striking though less fundamental resemblance. The characters by the aid of which they are best distinguished, are found in the shape of the calyx, in the nature of the indumentum, in the form of the spikes, which may be lax or abbreviated, and provided with large or small, persistent or deciduous bracts, and in the presence or absence of a mucro or awn at the top of the anthers.

26. *Perilepta* Brem. n. gen.; typus: *P. auriculata* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

Plantae plietesiae, anisophyllae. Folia sessilia, basin versus angustata et ad insertionem plus minusve auriculata. Inflorescentiae terminales et axillares, vix pedunculatae, spiciformes et satis longae, haud raro foliis magnitudine redactis praecessae, pubescentes vel tomentosae. Bractee obovatae vel obcu-

neatae, apice haud raro recurvato-cuspidatae, plerumque ciliatae, e basi plurinerviae, calyci subaequilongae, persistentes. Flores in axillis bractearum solitarii. Bracteolae parvae vel nullae. Calyx bipartitus, i.e. segmenta duo antica in labium inferius, tria postica in labium superius connata, labiis tamen profundius fissis, segmentis linearibus, acutis vel obtusis, 1-nerviis, mediano majore, lateralibus quam aliis paulo brevioribus. Corolla coerulea vel violacea, resupinata, tubo tereti torso in fauces campanulatas tubo multo longiores ampliata, faucibus basi recurvatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus orbicularibus. Stamina 4, didynamia, omnia inclusa vel longiora subexserta; filamenta staminum longiorum basin versus hirtella, erecta; filamenta staminum breviorum tota hirtella, inclinata; antherae erectae, apice obtusae vel mucronulatae, a latere complanatae. Staminodium interdum conspicuum. Granula pollinis elliptica, virgata, virgis septatis. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, glabra, 4-seminalis, retinaculis acute exeuntibus. Semina (Tab. V C) parvo-areolata, extra areolam pilis annulatis rigidulis vestita; cellulae strati subepidermalis parietibus incrassatis instructae.

Distributum a provinciis Indiae centralibus et septemtrionalibus usque ad Chinam et Indo-Chinam. Species 8.

Species typica: *P. auriculata* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

The name *Perilepta* was chosen on account of the stem-clasping leaf-bases, by which this genus is easily recognizable from its allies.

The majority of the species belonging to this genus are so closely related that they have of late been considered mere varieties of the type, which, if this delimitation was accepted, would cover a much larger area than any other species belonging to the *Strobilanthinae*. As the differences, however, are by no means insignificant, it seems to me that the species created by NEES and CLARKE are to be restored. The other varieties mentioned by CLARKE (in HOOK. F., Fl. Brit. Ind. IV, p. 674, 1884) and BENOIST (in Lecomte, Fl. Gén. de l'Indo-China IV, p. 674, 1935) may also prove to be specifically distinct, but as I have seen no material of them, I am unable to express a more definite opinion.

#### Index Specierum.

- amplectens* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Birmania —
- *auriculata* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — India Centrali et Septemtrionali —
- dyeriana* (Mast.) Brem. n. comb. (*Strobilanthes* Mast.) — Birmania —
- edgeworthiana* (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes auriculata* Nees. var. *edgeworthiana* (Nees) Clarke — India Septemtrionali —
- Maclellandii* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Birmania —
- plumulosa* (Nees) Brem. n. comb. (*Strobilanthes* Nees); syn.: *Strobilanthes auriculata* Nees var. *plumulosa* (Nees) Clarke — Birmania —
- siamensis* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke); syn.: *Strobilanthes auriculata* Nees var. *siamensis* (Clarke) R. Ben. — Siamia —
- venusta* (Craib) Brem. n. comb. (*Strobilanthes* Craib) — Siamia —

#### Index Iconum.

- auriculata* (Nees) Brem. in Wall., Pl. As. Rar. III, Tab. 295, 1832 et in Bedd., Ic. Pl. Ind. Or. I, Tab. 210, 1874 (sub nomine *Strobilanthes auriculata* Nees)
- dyeriana* (Mast.) Brem. in Rev. Hort. Belge XX, p. 133, 1894 et in Bot. Mag. CXXIV, Tab. 7574, 1898 (sub nomine *Strobilanthes dyeriana* Mast.).

*Perileptae species sub nomine generico Strobilanthe nuncupatae.*

- amplectens* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = *Perilepta amplectens* (Nees) Brem. n. comb.
- auriculata* Nees in Wall., Pl. As. Rar. III, p. 69, Tab. 295, 1832 = *Perilepta auriculata* (Nees) Brem. n. comb.
- auriculata* Nees var. *acuta* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 674, 1935 — Cambodia, Laos — n.v.
- auriculata* Nees var. *bracteolata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 453, 1884 — Khasia — n.v.
- auriculata* Nees var. *edgeworthiana* (Nees) Clarke l.c. (*Str. edgeworthiana* Nees) = *Perilepta edgeworthiana* (Nees) Brem.
- auriculata* Nees var. *plumulosa* (Nees) Clarke l.c. (*Str. plumulosa* Nees) = *Perilepta plumulosa* (Nees) Brem.
- auriculata* Nees var. *siamensis* (Clarke) R. Ben. l.c. (*Str. siamensis* Clarke) = *Perilepta siamensis* (Clarke) Brem.
- dyeriana* Mast. in Gard. Chron. 1893 I, p. 442 et in Rev. Hort. LXV, p. 201, 1893 = *Perilepta dyeriana* (Mast.) Brem. n. comb.
- edgeworthiana* Nees in DC., Prodr. XI, p. 190, 1847 = *Perilepta edgeworthiana* (Nees) Brem. n. comb.
- Maccllellandii* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 453, 1884 = *Perilepta Maccllellandii* (Clarke) Brem. n. comb.
- plumulosa* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = *Perilepta plumulosa* (Nees) Brem. n. comb.
- siamensis* Clarke in Bull. Herb. Boiss. 2e Sér. V, p. 716, 1905 = *Perilepta siamensis* (Clarke) Brem. n. comb.
- venusta* Craib in Kew Bull. 1914, p. 131 = *Perilepta venusta* (Craib) Brem. n. comb.

27. *Adenacanthus* Nees in Wall., Pl. As. Rar. III, p. 75 et 84, 1832; id. in DC., Prodr. XI, p. 101 et 196, 1847; — *Lepidagathis* Willd. § *Apolepsis* Bl., Bijdr. Fl. Ned. Ind. p. 802, 1826; *Apolepsis* Hassk., Cat. Hort. Bogor. ed. 2, p. 150, 1844, spec. nova excl.; Nees in DC., Prodr. XI, p. 260, 1847, *A. dispar* excl.; — *Strobilanthes* species auctorum aliorum.

Plantae plietesiae, anisophyllae. Folia petiolata, subtus vel interdum utrimque glandulis sessilibus luteo- vel rubro-brunneis punctata. Inflorescentiae terminales et haud raro ex axillis foliorum supremorum laterales, nunc in triades, nunc racemose vel paniculatim dispositae, pedunculatae, spiciformes, breves vel satis longae. Bracteae oblongae vel anguste obovatae, virides vel centro albiae, marginem versus rubro-brunneae, subimbricatae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae anguste oblongae vel lineares, persistentes. Calyx tripartitus, i.e. segmentis duobus anticis subliferis, tribus posticis in labium superius trifidum connatis, lobis obtusis vel emarginatis, intus glaber. Corolla alba, resupinata, tubo tereti torso in fauces campanulatas ampliato, faucibus basi recurvatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus orbicularibus. Stamina 4, didynamia, omnia erecta et inclusa; filamenta staminum longiorum basin versus hirtella, staminum breviorum tota glabra; antherae erectae, apice obtusae, a latere complanatae. Staminodium parvum vel inconspicuum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium pilis partim capitatis comosum, utroque loculo ovulis 2. Stylus parce hirtellus. Capsula fusiformis, plerumque 4-seminalis, retinaculis in aciculum rectam exeuntibus. Semina parvo-areolata, extra areolam pilis annulatis rigidulis vestita; cellulae strati subepidermalis parietibus incrassatis instructae.

Distributum a Birmania usque ad Javam Occidentalem. Species adhuc notae 4. Species typica: *A. acuminatus* Nees.

Material of the type species was not available to me, but the fairly detailed description given by NEES shows that it must be very similar to the two species described below, especially to the first of them, *A. repandus* (Bl.) Brem. n. comb. (*Lepidagathis* Bl.). NEES describes the opposite leaves of his species as very unequal, one being about twice as long as the other, and as they are in the two Malesian species but slightly unequal, the type species ought to be easily distinguishable.

According to CLARKE (in HOOK. F., Fl. Brit. Ind. IV, p. 430, 1884) the plant described by KURZ under the name *Strobilanthes subflaccida* should be conspecific with *A. acuminatus*, but the number of the specimen upon which KURZ had based his species, is the same as that of the plant which served as type for CLARKE's own *Strobilanthes longipes*. It is possible, of course, that the specimens on which these two species were founded, although they were distributed under the same number (Kew Distrib. n. 6114), were not identical, but it is also possible, as CLARKE suggests, that part of the description of KURZ's species is wrong: it may be that KURZ had completed his description with some details taken from that of *Adenacanthus acuminatus*, the species to which this number had previously been referred by ANDERSON. This question, however, can not be settled without a reëxamination of the actual type of KURZ's species, but so long as it is unsettled, it is of course not allowed to quote *Strobilanthes subflaccida* as a synonym of *Adenacanthus acuminatus*.

Whether the plants from Laos, Cochin-China and Cambodja quoted by BENOIST (in LECOMTE, Fl. Gén. de l'Indo-Chine IV, p. 665, 1935) under the names *Strobilanthes subflaccida* Kurz and *Str. subflaccida* Kurz var. *longispicata* R. Ben., are conspecific with *Adenacanthus acuminatus*, is difficult to decide. The latter is quoted as a synonym, and it must be conceded that the description fits that species fairly well; it is however not sufficiently precise to dispel all doubts.

#### Key to the Species of the Malay Archipelago.

1. Leaves all contracted at the base and petiolate. Bracts 9—10 mm long and 4—5 mm wide. — West Java . . . . . 1. *A. repandus* (Bl.) Brem. n. comb.
- : Upper leaves cordate and sessile. Bracts 4—5 mm long and 1.5 mm wide. — Sumatra and West Java . . . . . 2. *A. glandulosus* (Bl.) Brem. n. comb.

1. *Adenacanthus repandus* (Bl.) Brem. n. comb.; *Lepidagathis* (§ *Apolepsis*) *repanda* Bl., Bijdr. Fl. Ned. Ind. p. 802, 1826; Miq., Fl. Ind. Bat. II, p. 817, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 660, 1899, syn. Decne et Lam. excl.; Koorders, Exkursionsfl. v. Java III, p. 221, 1912; *Apolepsis repanda* (Bl.) Nees in DC., Prodr. XI, p. 260, 1847.

Planta robustior, paulum anisophylla. Caulis ramique internodiis haud profunde bisulcatis, primum puberuli et in sulcis sparse pubescentes, mox glabrescentes. Folia in petiolum glabrum vel puberulum, usque ad 3 cm longum contracta; lamina ovato-lanceolata, usque ad 18 cm longa et 6.5 cm lata, apicem versus sensim attenuata, basi contracta, margine repanda, utraque facie sed praesertim subtus glandulis sessilibus luteis punctata, supra cystolithis dense lineolata, nervis utroque latere costae 5—6. Spicae longius pedunculatae, laxiores, solitariae vel in triades dispositae, casu quo laterales plerumque uno jugo foliorum praecessae; rhachis pilis capitatis pubescens et glandulis sessilibus sicc. rubro-brunneis punctata. Bractee oblongae vel obovatae, 9—10 mm longae et 4—5 mm latae, obtusae, parte centrali albidae, marginem versus rubro-brunneae, pilis capitatis ciliatae, penninerviae. Bracteolae lineari-oblongae, 7 mm longae et 2.5 mm latae, obtusae, ad apicem pilis capitatis ciliatae, uninerviae.

Calycis lobi antichi 10.5 mm longi et 2.5 mm lati; labium superius 8 mm longum, lobis 1.5 mm latis; lobi omnes obtusi vel submarginati, margine pilis partim capitatis sparse ciliolati, apice callosi. Corolla 21.5 mm longa, extus nervis pilis capitatis parce pubescens, tubo 9 mm longo, faucibus tubo aequilongis, lobis 3.5 mm longis. Stamina longiora filamentis 4.5 mm, breviora filamentis 2 mm longis; antherae 1.8 mm longae. Staminodium 0.4 mm longum, obtusum. Granula pollinis 60  $\mu$  longa et 35  $\mu$  diam., virgis 15 ornata. Capsula 8—9 mm longa et 1.8—2.2 mm lata, valvis dorso pilis capitatis brevibus parce pubescentibus, ceterum glabris.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.: G. Parang, BLUME 1246 L, typus; ibidem, REINWARDT s.n. L; BAKHUIZEN v. D. BRINK 768 L.

2. *Adenacanthus glandulosus* (Bl.) Brem. n. comb.; *Strobilanthes glandulosa* Bl., Bijdr. Fl. Ned. Ind. p. 800, 1826; Nees in DC., Prodr. XI, p. 194, 1847; Miq., Fl. Ind. Bat. II, p. 804, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; non Koorders, Exkursionsfl. v. Java III, p. 217, 1912 in adnotatione ad *Str. filiformem*, nam specimina monstrosa ab eo visa ad *Lissospermum pedunculatum* (Miq.) Brem. pertinent; non *Strobilanthes glandulosa* (T. And.) Kurz in Journ. As. Soc. Beng. XLIII, p. 92, 1873, comb. illeg.; Clarke in Hook. f., Fl. Brit. Ind. IV, p. 467, 1884, quae est species incertae sedis; — *Str. cordiformis* Lindau in Fedde, Repert. XIII, p. 552, 1915.

Planta sparse ramosa, paulum anisophylla. Caulis ramique graciles, 1.5 mm diam., internodiis bisulcatis, ad marginem sulcorum puberuli, ceterum subglabri. Folia inferiora longius vel breviter petiolata, ovato-cordata vel ovato-lanceolata, si longius petiolata ad basin interdum subcontracta, semper majora quam folia superiora et utroque latere costae nervis 5—6 munita; folia superiora sessilia et cordata, 2.5—4 cm longa et 2.5—3 cm lata, nervis utroque latere costae 3—4; omnia margine repanda, utraque facie vel subtus solum glandulis sessilibus rubro-brunneis punctata, supra cystolithis dense lineolata, tota glabra vel costa supra puberula et subtus sparse pubescente. Spicae longe pedunculatae, racemose vel paniculatim dispositae; rhachis circ. 1 cm longa, post anthesin usque ad 2 cm accrescens, glandulis sessilibus luteis densius punctata. Bracteae circ. 8-parae, oblongae, 4—5 mm longae et 1.5 mm latae, ad basin concavae, conspicue carinatae, apice obtusae, extus glandulis sessilibus et margine etiam glandulis breviter stipitatis punctatae. Bracteolae lineares, bracteis aequilongae sed 1.2 mm latae, eodem modo ut bracteae glandulosae. Calycis lobi antichi 4.5—6 mm longi et 0.8—1.2 mm lati; labium superius 3.7—5.5 mm longum, lobis 0.7—0.9 mm latis; lobi omnes obtusi et subcarinati, dorso glandulis sessilibus luteis punctati, intus glabri. Corolla 18.5 mm longa, tubo 7.5 mm longo, faucibus tubo aequilongis, lobis 3.5 mm longis. Stamina longiora filamentis 2.5 mm, breviora filamentis 2 mm longis; antherae 1.6 mm longae. Staminodium vix conspicuum. Granula pollinis 72—75  $\mu$  longa et 36—37  $\mu$  diam., virgis 15 munita. Capsula 9 mm longa et 4 mm diam.

Habitat Sumatram et Javam Occidentales.

West Sumatra. West Coast Res.: G. Melintang, KORTHALS s.n. L.

West Java. Buitenzorg Res.: G. Gedeh, REINWARDT s.n. L, typus; Priangan Res.: Pengalengan, WARBURG 3029 BD (type of *Strobilanthes cordiformis* Lindau); Passir Kaimis Karat, JAGOR s.n. BD; G. Kendeng, alt. 800 m, BAKHUIZEN v. D. BRINK JR. 2830 U; s.l. NAGLER 213 BD.

KOORDERS's remarks l.c. show that he was unacquainted with this species. As the type specimen in the Leiden herbarium by some clerical mistake had been inserted under the name *Ruellia glandulosa*, the cover bearing the name *Strobilanthes glandulosa* contained only a teratological specimen of *Lissosper-*

*mum pedunculosum* (Miq.) Brem., which he mistook for *Difflugossa filiformis* (Bl.) Brem.

The height at which these two species occur is unknown. Pengalengan lies at an altitude of 1400 m.

KUNTZE (Rev. Gen. Pl. II, p. 498, 1891) mentions the occurrence of *A. acuminatus* Nees in Java, but I suppose that his specimen will have belonged to one of the two species described above, probably to the second.

### Index Specierum.

- **acuminatus** Nees in Wall., Pl. As. Rar. III, p. 84, 1832; syn.: *Strobilanthes acuminata* (Nees) T. And.; anne *Str. subflaccida* Kurz incertum — Birmania —
- glandulosus** (Bl.) Brem. n. comb. (*Strobilanthes* Bl.) — Sumatra et Java —
- latifolius** Nees in DC., Prodr. XI, p. 197, 1847 — patria ignota — n. v.
- repandus** (Bl.) Brem. n. comb. (*Lepidagathis* Bl.) — Java —
- rubroglandulosus** (Craib) Brem. n. comb. (*Strobilanthes* Craib) — Siamia —

### Species in genere *Apolepsi* nuncupatae.

- dispar* Hassk., Cat. Hort. Bogor. ed. 2, p. 150, 1844 = *Strobilanthes dispar* (Hassk.) Hassk.
- *repanda* (Bl.) Nees in DC., Prodr. XI, p. 260, 1847 (*Lepidagathis* Bl.) = *Adenacanthus repandus* (Bl.) Brem.

### *Adenacanthi* species sub nomine generico *Strobilanthe* nuncupatae.

- acuminata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 473, 1867 = *Adenacanthus acuminatus* Nees
- cordiformis* Lindau in Fedde, Repert. XIII, p. 552, 1915 = *Adenacanthus glandulosus* (Bl.) Brem.
- glandulosa* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826 = *Adenacanthus glandulosus* (Bl.) Brem. n. comb.
- glandulosa* Bl. in errore apud Koorders, Exkursionsfl. v. Java III, p. 217, 1912 in adnot. ad *Str. filiformen* = *Lissospermum pedunculosum* (Miq.) Brem.
- glandulosa* (T. And.) Kurz in Journ. As. Soc. Beng. XLIII, p. 92, 1874 (*Hemigraphis* T. And.) comb. illeg. = species incertae sedis
- rubroglandulosa* Craib in Kew Bull. 1912, p. 268 = *Adenacanthus rubroglandulosus* (Craib) Brem. n. comb.

28. **Pteracanthus** (Nees) Brem. n. gen.; *Strobilanthes* Bl. subg. *Pteracanthus* Nees in Wall., Pl. As. Rar. III, p. 86, 1832; *Strobilanthes* Bl. ser. D. *Pteracanthi* Nees in DC., Prodr. XI, p. 192, 1847, speciebus 59 et 60 certe excl.

Plantae plietesiae, erectae et valde ramosae, basi lignescentes, paulum anisophyllae. Folia plerumque basin versus in pseudopetiolum alatum mutata. Inflorescentiae terminales et axillares, spiciformes et laxae. Bracteae calyce breviores, deciduae. Flores in axillis bractearum solitarii. Bracteolae minutae. Calyx 5-partitus, lobis linearibus obtusis, lobo mediano quam aliis interdum majore, extus pilis capitatis sparsus. Corolla violacea, resupinata, tubo tereti torso in fauces campanulatas facie antica valde inflatas ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus orbicularibus. Stamina 4, didynamia, inclusa et erecta; filamenta omnia glabra in plicas ciliatas decurrentia; antherae oblongae, apice obtusae, erectae. Staminodium nullum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium pilis capitatis breviter comosum, utroque loculo ovulis 2. Stylus pilis capitatis vel ecapitatis parce

hirtellus. Capsula fusiformis, 4-seminalis. Semina parvo-areolata et pubescentia vel villosa dicta.

Distributum in clivis Himalayae et montibus Khasiae. Species circ. 20.

Species typica: *Pt. alata* (Wall. ex Nees) Brem. n. comb. (*Ruellia* Wall. ex Nees).

The species of this genus show some resemblance to those of group S (*Goldfussia* and its nearest allies), but are easily distinguishable by the curved and inflated corolla, by the structure of the androecium and by the seeds: the androecium does not show the "*Goldfussia*-position" and the seeds have been described as pubescent or villous: although it is not quite clear what this means, they are obviously distinct from the "silky" seeds of group S. In fact, there can be no doubt that *Pteracanthus* does not find its nearest allies in the *Goldfussia* group but belongs to group P. In habit the plants are more or less like *Semnostachya*, but the presence of a small areola points in the direction of *Perilepta* and *Adenacanthus*. The deciduous bracts are a character by which it differs from all the other genera of the group. Habitually the plants are remarkable, because the anisophylly is but weakly developed and because the leaves are serrate and often contracted into a long alate pseudo-petiole. The genus, however, is as yet but imperfectly known, and it is not impossible that further study will show that it is to be split into two or three smaller ones.

#### Index Specierum.

- agrestis (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Himalaya —
- \* alatus (Wall. ex Nees) Brem. n. comb. (*Ruellia* Wall. ex Nees); syn.: *Strobilanthes Wallichii* Nees — Himalaya —
- angustifrons (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Himalaya —
- attenuatus (Wall. ex Nees) Brem. n. comb. (*Ruellia* Wall. ex Nees) — Himalaya —
- boerhaavioides (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Himalaya —
- calycinus (Nees) Brem. n. comb. (*Asystasia* Nees); syn.: *Echinacanthus calycinus* (Nees) Nees; *Strobilanthes helictus* T. And. n. nom. — Himalaya —
- extensus (Nees) Brem. n. comb. (*Goldfussia* Nees); syn.: *Strobilanthes extensa* (Nees) Nees — Assamia —
- inflatus (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Himalaya —
- lachenensis (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Himalaya —
- nobilis (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Assamia —
- Parryorum (Fischer) Brem. n. comb. (*Strobilanthes* Fischer) — Assamia —
- phyllocaulos (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Assamia —
- ? reflexus (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Himalaya —
- rotundifolius (D. Don) Brem. n. comb. (*Ruellia* D. Don); syn.: *Goldfussia lamifolia* Nees; *Strobilanthes lamifolia* (Nees) T. And. — Himalaya —
- rubescens (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Assamia —
- ? subnudatus (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Himalaya —
- urophyllus (Nees) Brem. n. comb. (*Dipteracanthus* et *Strobilanthes* Nees) — Assamia —
- urticifolius (O. Ktze) Brem. n. comb. (*Strobilanthes urticifolia* O. Ktze n. nom); syn.: *Str. alata* Nees non Bl. — Himalaya —
- ? violifolius (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Himalaya —

#### Index Iconum.

- alatus (Wall. ex Nees) Brem. in Wall., Pl. As. Rar. I, Tab. 31, 1830 (sub nomine *Ruellia alata* Wall. ex Nees)

**attenuatus** (Nees) Brem. in Gartenfl. XXXVI, Tab. 1243, 1887 (sub nomine *Strobilanthes attenuata* Nees).

*Pteracanthi species sub nomine generico Strobilanthe nuncupatae.*

- agrestis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 466, 1884 = **Pteracanthus agrestis** (Clarke) Brem. n. comb.
- alata* Nees in DC., Prodr. XI, p. 194, 1847 (non Bl., Bijdr. Fl. Ned. Ind., p. 798, 1826) = **Pteracanthus urticifolius** (O. Ktze) Brem.
- angustifrons* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 466, 1884 = **Pteracanthus angustifrons** (Clarke) Brem. n. comb.
- attenuata* (Wall. ex Nees) Nees in DC., Prodr. XI, p. 193, 1847 (*Ruellia* Wall. ex Nees) = **Pteracanthus attenuatus** (Wall. ex Nees) Brem.
- boerhaavioides* T. And. in Journ. Linn. Soc. IX, p. 479, 1867 = **Pteracanthus boerhaavioides** (T. And.) Brem. n. comb.
- extensa* (Nees) Nees in DC., Prodr. XI, p. 195, 1847 (*Goldfussia* Nees) = **Pteracanthus extensus** (Nees) Brem.
- helictus* T. And. in Journ. Linn. Soc. IX, p. 479, 1867, n. nom. (*Asystasia calycina* Nees) = **Pteracanthus calycinus** (Nees) Brem.
- inflata* T. And. in Journ. Linn. Soc. IX, p. 476, 1867 = **Pteracanthus inflatus** (T. And.) Brem. n. comb.
- lachenensis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 465, 1884 = **Pteracanthus lachenensis** (Clarke) Brem. n. comb.
- lamiifolia* (Nees) T. And. in Journ. Linn. Soc. IX, p. 476, 1867 (*Goldfussia* Nees) = ? **Pteracanthus rotundifolius** (D. Don) Brem.
- nobilis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 471, 1884 = **Pteracanthus nobilis** (Clarke) Brem. n. comb.
- Parryorum* Fischer in Kew Bull. 1928, p. 142 = **Pteracanthus Parryorum** (Fischer) Brem. n. comb.
- phyllocaule* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 464, 1884 = **Pteracanthus phyllocaulos** (Clarke) Brem. n. comb.
- reflexa* Nees in DC., Prodr. XI, p. 194, 1847 = **Pteracanthus reflexus** (Nees) Brem. n. comb.
- rubescens* T. And. in Journ. Linn. Soc. IX, p. 479, 1867 = **Pteracanthus rubescens** (T. And.) Brem. n. comb.
- rubescens* T. And. var. ? *microsperma* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 469, 1884 n.v.
- subnudata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 472, 1884 = **Pteracanthus subnudatus** (Clarke) Brem. n. comb.
- urophylla* (Nees) Nees in DC., Prodr. XI, p. 192, 1847 (*Dipteracanthus* Nees) = ? **Pteracanthus urophyllus** (Nees) Brem.
- urticifolia* O. Ktze, Rev. Gen. Pl. II, p. 499, 1891, n. nom. (*Str. alata* Nees non Bl.) = **Pteracanthus urticifolius** (O. Ktze) Brem. n. comb.
- violifolia* T. And. in Journ. Linn. Soc. IX, p. 485, 1867 = ? **Pteracanthus violifolius** (T. And.) Brem. n. comb.

*Pteracanthi species sub nominibus genericis aliis nuncupatae.*

- Asystasia calycina* Nees in Wall., Pl. As. Rar. III, p. 90, 1832 = **Pteracanthus calycinus** (Nees) Brem. n. comb.
- Dipteracanthus urophyllus* Nees in Wall., Pl. As. Rar. III, p. 82, 1832 = ? **Pteracanthus urophyllus** (Nees) Brem. n. comb.
- Echinacanthus calycinus* (Nees) Nees in DC., Prodr. XI, p. 168, 1847 (*Asystasia* Nees) = **Pteracanthus calycinus** (Nees) Brem.
- Goldfussia extensa* Nees in Wall., Pl. As. Rar. III, p. 88, 1832 = **Pteracanthus extensus** (Nees) Brem. n. comb.



- Goldfussia lamiiifolia* Nees in Wall., Pl. As. Rar. III, p. 88, 1832 = ? *Pteracanthus rotundifolius* (D. Don) Brem. n. comb.  
*Ruellia alata* Wall. ex Nees in Wall., Pl. As. Rar. I, p. 26, Tab. 31, 1830 = *Pteracanthus alatus* (Wall. ex Nees) Brem. n. comb.  
*Ruellia attenuata* Wall. ex Nees in Wall., Pl. As. Rar. III, p. 83, 1832 = *Pteracanthus attenuatus* (Wall. ex Nees) Brem. n. comb.  
*Ruellia rotundifolia* D. Don, Prodr. Fl. Nep., p. 120, 1825 = ? *Pteracanthus rotundifolius* (D. Don) Brem. n. comb.

29. *Triaenacanthus* Nees in DC., Prodr. XI, p. 100 et 169 (ubi nomen sphalmate *Triaenanthus* scriptum), 1847; *Strobilanthes* species T. Anderson et auctorum recentiorum.

Planta plietesia, anisophylla. Folia petiolata, Inflorescentiae terminales et axillares, breviter pedunculatae, spiciformes, valde elongatae et flexuosissimae, bracteis bracteolisque persistentibus, floribus quoque nodo solitariis. Bracteae anguste triangulares, obtusae, penninerviae, costa basin versus conspicue dilatata, calyce longiores. Bracteolae calyce paulo breviores. Calyx 3-partitus, i.e. segmentis anticis subliberis, posticis in labium superius 3-fidum connatis. Corolla matura a me non visa, fide CLARKE lutea et subrecta, tubo brevi, faucibus campanulatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus ovatis. Stamina 4, didynamia, erecta; filamenta omnia hirtella; antherae erectae, apice obtusae. Staminodium minutum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium glabrum, ovulis utroque loculo 2. Stylus pilis capitatis breviter hirtellus. Capsula fide NEES in medio 4-seminalis. Semina fide CLARKE parvo-areolata, ceterum pilis fulvis vestita.

Distributum in montibus Khasiae.

Species unica: *Tr. griffithianus* Nees.

*Triaenacanthus* is a very imperfectly known genus. The description given by NEES is in several respects ("Stigma truncatum"; "Spicae axillares"; "bracteolis nullis") inaccurate, and that given by CLARKE (in Hook.f., Fl. Brit. Ind. IV, p. 470, 1884) is hardly better. CLARKE l.c. states: "NEES erected this plant into a genus on the ground that the calyx was 2-lipped with one lip trifid but halfway down; an error of fact", but I have convinced myself that in this respect at least NEES was perfectly right. It is therefore not impossible that CLARKE's description may have been based partly on specimens belonging to another genus, but better material will have to be awaited before a final conclusion can be reached.

1. *Triaenacanthus griffithianus* Nees in DC., Prodr. XI, p. 169, 1847; *Strobilanthes griffithiana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867; Clarke in Hook.f., Fl. Brit. Ind. IV, p. 470, 1884.

Habitat montes Khasiae.

30. *Semnostachya* Brem. n. gen.; typus: *S. nigrescens* Brem.; *Strobilanthes* species auctorum aliorum.

Plantae plerumque plietesiae, anisophyllae. Folia petiolata, cystolithis omnibus aequalibus dense lineolata, margine plerumque calloso-dentata. Inflorescentiae terminales et axillares, breviter pedunculatae, spici- vel raro anguste racemiformes, interdum paniculatae. Bracteae bracteolaeque angustae, calyci aequilongae vel eo paulo breviores, persistentes; bracteae plerumque 3-nerviae, rarius 5- vel 1-nerviae. Flores in axillis bractearum solitarii, bracteolati, quoque nodo plerumque duo. Bracteolae plerumque ad calycem adnatae et eo aequilongae. Calyx inaequaliter 5-partitus, segmentis posticis altius connatis quam anticis; lobi lineares aestivatione valvata, cystolithis densissime lineolati, fructu

accrescentes. Corolla alba, resupinata, tubo tereti torso in fauces campanulatas tubo multo longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus emarginatis. Stamina 4, didynamia, erecta et inclusa; filamenta staminum longiorum tota vel partim hirtella; staminum breviorum glabra vel basi hirtella; antherae erectae, apice plerumque mucronulatae, a latere complanatae, thecis interdum paulum inaequalibus. Stamino-dium parvum vel nullum. Granula pollinis ellipsoidea, virgata, virgis 15—18 septatis. Ovarium comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, acuta, valvis dorso incrassatis, 4-seminalis, retinaculis ad semina totis appressis. Semina (Tab. V E) tota pilis rigidis acutis vestita.

Distributum in Sumatra, terra Borneënsi, insulis Philippinis. Species adhuc notae 9.

Species typica: *S. nigrescens* Brem. n. spec. v. infra.

The species belonging to this genus are in general aspect not unlike those of *Pteracanthus*, but the bracts and bracteoles are larger and persistent, the filaments of the longer stamens are hirtellous, the seeds are entirely covered with rigid hairs, and the leaves are not contracted in a winged pseudo-petiole and their margin is not serrate. The areas occupied by the two genera are apparently not contiguous: *Pteracanthus* is confined to the mountainous regions in the north; *Semnostachya* to those of the Malay Archipelago.

In habit both *Semnostachya* and *Pteracanthus* show some resemblance to the genera of the *Goldfussia* group, especially to *Difflugossa*, from which they are however easily distinguishable by the structure of the androecium and the testa.

#### Key to the Species. <sup>29)</sup>

1. Petiole densely strigose; the groove on the upper side fringed with long cilia. Blade ovate; margin crenato-dentate and ciliate. Anthers obtuse. — North Borneo 6. *S. galeopsis* (Stapf) Brem. n. comb.
  - : Petiole glabrous, puberulous or puberulo-pubescent; the groove on the upper side not or sparsely and fugaciously ciliate. Blade elliptic-oblong, oblong or lanceolate; margin remotely dentate or denticulate, never ciliate. Anthers mucronulate . . . . . 2
2. Inflorescences covered with capitate hairs. Bracts spatulate, 1-nerved. Flowers shortly pedicellate. — Sumatra . . . . .
  - . . . . . 1. *S. deliensis* Brem. n. spec.
  - : Inflorescences not covered with capitate hairs. Bracts not spatulate, 3- or 5-nerved. Flowers sessile . . . . . 3
3. Bracts linear, towards the top gradually narrowed. Bracts, bracteoles and calyx lobes not dotted with glands. — Sumatra . . . . .
  - . . . . . 2. *S. benculensis* Brem. n. spec.
  - : Bracts either oblong and caudate or ovate-lanceolate. Bracts, bracteoles and calyx lobes minutely gland-dotted . . . . . 4
4. Bracts oblong and caudate, 5-nerved and like the bracteoles and calyx lobes shortly pubescent. Peduncle and axis of the inflorescence shortly but densely pubescent. — Sumatra . . . . .
  - . . . . . 3. *S. nigrescens* Brem. n. spec.
  - : Bracts ovate-lanceolate, 3-nerved and like the bracteoles and calyx

<sup>29)</sup> The key is intended for the identification of the Sumatran and Bornean species. The Philippine *S. Antonii* (Elm.) Brem. has been included because it shows a very striking resemblance to the Bornean *S. kinabaluensis* Brem.; for the same reason a detailed description of this species is given below. The other Philippine species could not be included, because the material at my disposition was unsatisfactory.

- lobes glabrous. Peduncle and axis of the inflorescence glabrous or sparsely puberulous . . . . . 5
5. Internodes smooth. Margin of the older leaves recurvate. Peduncle and axis of the inflorescence smooth. — North Borneo . . . . .  
 . . . . . 4. *S. kinabaluensis* Brem. n. spec.
- : Internodes towards the upper end verruculose. Leaf margin never recurvate. Peduncle and axis of the inflorescence verruculose. — Mindanao . . . . . 5. *S. Antonii* (Elm.) Brem. n. spec.

1. *Semnostachya deliensis* Brem. n. spec.; typus: LOERZING 5541 U, dupl. L.

Planta valde ramosa. Caulis ramisque puberuli, internodiis ad apicem 2-sulcatis, basin versus 4-sulcatis. Folia opposita valde inaequalia, in petiolum satis longum contracta; petiolus indistincte canaliculatus, usque ad 3 cm longus, puberulus; lamina elliptico-lanceolata, usque ad 14 cm longa et 6.5 cm lata, apicem obtusum versus contracta, basi contracta vel cuneata, sicc. supra olivacea vel olivaceo-brunnea, subtus dilute viridi-brunnea vel viridis, utrimque minutissime papillosa et inde opaca, costa utrimque et nervis subtus puberula, cystolithis supra solum conspicuis, margine remote callosodenticulata et anguste recurvata, nervis utroque latere costae 4—8. Inflorescentiae anguste racemiformes, ad apicem ramulorum paniculatae, foliis magnitudine valde redactis suffultae, 3—8 cm longae, pilis capitatis hirtellae; pedunculus internodio praecedenti similior. Bracteae spatulatae, 8 mm longae et 1.7 mm latae, apice callosae, margine utroque latere denticulis 2 instructae, utraque facie pilis capitatis dense hirtellae, 1-nerviae. Pedicelli 0.5 mm longi, pilis capitatis hirtelli. Bracteolae ad calycem adnatae, lineares, 7.5 mm longae et 1 mm latae, apice obtusae, margine integrae, ceterum ut bracteae. Calyx extus pilis capitatis dense hirtellus, ad anthesin 1 cm longus, postea usque ad 1.2 cm accrescens, tubo facie postica 4.5 mm, facie antica 2 mm longo, lobis linearibus, apicem versus sensim attenuatis, 1.7—2 mm latis, intus ad apicem puberulis, penninerviis. Corolla extus primum pubescens et nervis pilis capitatis oblecta, deinde puberula, 1.8 cm longa, tubo 5 mm, faucibus 10 mm, lobis 3 mm longis. Filamenta staminum longiorum dimidio inferiore hirtella, 3.5—4 mm longa, staminum breviorum glabra, 1.2 mm longa; antherae 2.2 mm longae, mucronulatae. Staminodium nullum. Membrana connectiva inter stamina longiora et breviora in lobulos incurvatos producta. Granula pollinis 54  $\mu$  longa et 36  $\mu$  diam., virgis 15 instructa. Ovarium dimidio superiore pilis ecapitatis cum brevioribus capitatis mixtis comosum. Stylus eodem modo hirtellus, basin versus tamen glabrescens. Capsula 1 cm longa et 3.5 mm diam., glanduloso-puberula, valvulis haud striatis. Semina 3 mm longa et 2 mm lata.

Habitat Sumatram Septemtrionalem.

S u m a t r a. East Coast Govt.: Sibolangit, alt. 400 m, in the grounds of the botanic garden, LOERZING 5541 U, typus; L, dupl. typi; Simeloongoon, Tinggi Radja, alt.  $\pm$  400 m. YATES 2149 L.

It is not impossible that the plant collected by MOHAMED NUR at Sibolangit (n. 7356) and mentioned by RIDLEY as probably belonging to his *Strobilanthes hirticalyx* (cf. RIDLEY in Journ., As. Soc. Mal. Br. I, p. 82, 1923) will prove to be conspecific with *S. deliensis*. IMLAY (Kew Bull. 1939, p. 118) refers it to his *Str. albo-viridis*, but this is probably a mistake. Neither of *Str. hirticalyx* Ridl. nor of *Str. albo-viridis* Imlay I have seen material, and the position of both remains dubious.

*S. deliensis* is easily distinguishable from its allies by the paniculate, glandular-hirtellous inflorescences, the spatulate bracts and shortly pedicellate flowers.

2. *Semnostachya benculensis* Brem. n. spec.; typus: AJOOB (Exped. JACOBSON) 349 L.

Planta ramosa. Caulis ramisque primum plus minusve puberuli, mox prorsum glabrescentes, internodiis angustissime et haud profunde quadrisulcatis. Folia quoque pari paulum inaequalia, in petiolum satis longum contracta; petiolus canaliculatus, primum marginibus sparse ciliatus, mox glabrescens, usque ad 4 cm longus; lamina lanceolato-oblonga, usque ad 21 cm longa et 7 cm lata, apice caudata, basi acuta vel contracta, sicc. olivacea, primum subtus costa nervisque puberula, mox prorsum glabrescens, cystolithis utrimque distinguendis, margine conspicue calloso-dentata, nervis utroque latere costae 6—11. Inflorescentiae spiciformes, 8—25 cm longae, solitariae; pedunculus internodiis rhachidis similior, glaber vel ad apicem puberulus. Bracteae lineares sed apicem versus sensim attenuatae, 13—19 mm longae et 2 mm latae, subcoriaceae, concavae et carinatae, extus pubescentes, margine ciliatae, intus glabrae, e basi 3-nerviae, calyci aequilongae vel eo longiores. Bracteolae ad calycis tubum adnatae, calyce paulo longiores, lineares, 15 mm longae et 1.2 mm latae, extus apicem versus breviter pubescentes, margine ciliatae, cystolithis dense lineolatae, quam calycis lobi firmiores, 3-nerviae, acutae. Calyx ad anthesin 12 mm longus, postea usque ad 20 mm accrescens, tubo facie postica 2.5 mm, facie antica 1.5 mm longo, lobis anguste linearibus, apicem versus sensim contractis, 1.2 mm latis, 3-nerviis, extus ad apicem breviter pubescentibus, margine apicem versus ciliatis, haud glandulose punctatis. Corolla extus glabra, 4 cm longa, tubo 12 mm, faucibus 22 mm, lobis 6 mm longis, intus pilis stylum retinentibus exceptis glabra. Filamenta staminum longiorum tota hirtella, 4.5 mm longa, staminum breviorum glabra, 1.5 mm longa; antherae 2.5 mm longae, thecis paulum inaequalibus. Staminodium papilliforme, 0.3 mm longum. Granula pollinis 64  $\mu$  longa et 43  $\mu$  diam., virgis 15 instructa. Ovarium pilis ecapitatis comosum. Stylus hirtellus. Capsula 2 cm longa et 4 mm diam., apiculata, parce comosa, valvulis striatis. Semina 4 mm longa et 3 mm lata, pilis intus annulis vel spirali instructis obtecta.

Habitat Sumatram Occidentalem.

S u m a t r a. Bencoolen Res.: Subah Ajam, alt. 1200 m, AJOOB (Exped. JACOBSON) 349 L, typus; base of G. Seminoong, south of Lake Ranau, alt. 650 m, v. STEENIS 3952 L; Kaba, alt. 1000 m, DE VOOGD 1329 L.

Apart from the characters given in the key, this species differs rather conspicuously from the other ones by the presence of 15 instead of 18 bands in the pollen grains and by the nature of the hairs covering the testa. The latter are shorter than in the other species and provided either with rings or with one or two spiral threads; as their walls are fairly thick, they do not show the characteristic shrinking movements found in the genera belonging to the preceding groups.

3. *Semnostachya nigrescens* Brem. n. spec.; typus: BÜNNEMEYER 4260 L.

Planta valde ramosa. Caulis ramisque robustiores, primum puberulo-pubescentes, deinde glabrescentes, internodiis haud profunde quadrisulcatis. Folia opposita inaequalia, in petiolum satis longum contracta; petiolus subtus dense puberulo-pubescentis, usque ad 2.5 cm longus; lamina elliptico-oblonga, usque ad 18 cm longa et 7 cm lata, apice caudato-acuminata, basi contracta, sicc. supra nigrescens, subtus fuscescens, supra glabra, subtus costa nervisque dense appresse pubescens, venulis principalibus sparse pubescens, ceterum glabra, cystolithis utrimque distinguendis, margine remote et vix conspicue callosodenticulata, foliorum veteriorum recurvata, nervis utroque latere costae in foliis majoribus usque ad 12, in foliis oppositis minoribus 4—5. Inflorescentiae

spiciformes, 3—7 cm longae, interdum in triades dispositae; pedunculus internodiis rhachidis aequilongus, dense puberulo-pubescentis; rhachis sparse puberulo-pubescentis vel subglabra. Bracteae e basi oblonga caudatae, 12.5—14 mm longae et 4 mm latae, coriaceae, extus puberulo-pubescentes, margine pauci-dentatae et ciliolatae, intus glabrae, e basi 5-nerviae, dorso minutissime glanduloso-punctatae, nervis prominulis, calyce paulo breviores. Bracteolae ad calycis tubum adnatae, calyci aequilongae et lobis similiores, crassiores tamen, lineares, 12 mm longae, postea usque ad 16.5 mm accrescentes, 2.5 mm latae, apicem subobtusum versus attenuatae, extus puberulo-pubescentes et minutissime glanduloso-punctatae, margine ciliolatae, intus glabrae, 3-nerviae. Calyx ad anthesin 10 mm longus, postea usque ad 16.5 mm accrescens, tubo facie postica 5 mm, facie antica 2 mm longo, lobis linearibus apicem versus sensim contractis, 2 mm latis, extus puberulo-pubescentibus et vix conspicue glanduloso-punctatis, margine apicem versus ciliatis. Corolla extus glabra, 3 cm longa, tubo 5 mm, faucibus 20 mm, lobis 5 mm longis, intus pilis paucis stylum retinentibus exceptis glabra. Filamenta staminum longiorum tota hirtella, 5 mm longa, staminum breviorum basi hirtella, 2.5 mm longa; antherae 2.7 mm longae. Staminodium nullum. Granula pollinis 68  $\mu$  longa et 39  $\mu$  diam., virgis 18 instructa. Ovarium apice pilis ecapitatis comosum. Stylus eodem modo hirtellus. Capsula 1.9 cm longa et 4.5 mm diam., glabra, valvulis striatis. Semina (Tab. V E) 3.5 mm longa et 2.5 mm lata.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: G. Sago, alt. 1200 m, BÜNNEMEYER 4260 L, typus; Padang, Ajer Mantjur, alt. 360 m, BECCARI 533 L; G. Singalang, KORTHALS s.n. L.

A coloured drawing representing the specimen collected by KORTHALS on the Singalang and inscribed *Strobilanthes nigrescens* Korthals, is preserved in the Leiden herbarium. A description, however, has never been published.

*S. nigrescens* is easily distinguishable from the two preceding species, but shows a strong resemblance to the two following ones, from which it differs however in the longer and narrower 5-nerved bracts and in the longer bracteoles and calyx lobes.

4. *Semnostachya kinabaluensis* Brem. n. spec.; typus: J. et M. S. CLEMENS 28464 L.

Planta valde ramosa, 3—4 m alta. Caulis ramique robustiores, primum puberulo-pubescentes, mox glabrescentes, internodiis vix sulcatis. Folia opposita subaequalia, in petiolum canaliculatum, subtus primum puberulum, deinde totum glabrescentem, usque ad 1.5 cm longum contracta; lamina elliptico-oblonga, usque ad 15 cm longa et 6 cm lata, apice caudato-acuminata vel caudata, basi acuta vel subcontracta, sicc. olivaceo-brunnea, subtus costa nervisque primum puberula, mox tota glabrescens, cystolithis utrimque distinguendis, margine primum remote et vix conspicue callosio-denticulata, postea recurvata et tanquam integra, nervis utroque latere costae 4—7. Inflorescentiae spiciformes, 2.5—10 cm longae, solitariae; pedunculus rhachidis internodiis subaequilongus vel eis brevior, puberulus vel subglaber; rhachis etiam puberula vel subglabra. Bracteae ovato-lanceolatae, apice subito in appendicem obtusam contractae, 8.5 mm longae et 4 mm latae, subcoriaceae, extus intusque glabrae, margine integrae et ciliolatae, e basi 3-nerviae, dorso minutissime glanduloso-punctatae, nervis prominulis, calyci ad anthesin aequilongae, haud accrescentes. Bracteolae ad calycis tubum adnatae, calyci subaequilongae et lobis similiores, crassiores tamen, lineari-lanceolatae, 8 mm longae et 2 mm latae, post anthesin usque ad 10 mm accrescentes, extus dense

sed minutissime glanduloso-punctatae, margine apicem versus vix conspicue ciliolatae, intus glabrae, 3-nerviae, apice callosae. Calyx ad anthesin 8 mm longus, postea usque ad 18 mm accrescens, tubo facie postica 2 mm, facie antica 1.2 mm longo, lobis lineari-lanceolatis, 1.5 mm latis, extus glabris et minutissime glanduloso-punctatis, margine apicem versus ciliolatis. Corolla extus glabra, 2.5 cm longa, tubo 5 mm, faucibus 15 mm, lobis 4.5 mm longis, intus pilis paucis stylum retinentibus exceptis glabra. Filamenta staminum longiorum tota hirtella, 3 mm longa, staminum breviorum basi solum hirtella, 1.5 mm longa; antherae 2.3 mm longae. Staminodium nullum. Granula pollinis 57  $\mu$  longa et 36  $\mu$  diam., virgis 18 instructa. Ovarium apice pilis ecapitatis comosum. Stylus eodem modo hirtellus. Capsula 2 cm longa et 4 mm diam., subobtusata, glabra, valvulis striatis. Semina 4 mm longa et 3 mm lata.

Habitat partem terrae Borneënsis septemtrionalem.

British North Borneo. Mt Kinabalu, Tenompok, alt. 1500 m, J. et M. S. CLEMENS 28464 L, typus; Penibukan near Pinokok Falls, alt. 1650 m, id. 50020 L; Penibukan, Jungle Hill, alt. 1200—1500 m, id. 30567 L.

As stated above, this species comes very near to the preceding *S. nigrescens* and the following *S. Antonii*. From the first it differs in the shape and size of the 3-, not 5-nerved bracts, the shorter bracteoles and calyx lobes and the slightly smaller size of the pollen grains; and from *S. Antonii*, with which the resemblance is still more striking, in the absence of the small warts on the upper part of the internodes and on the peduncle and axis of the inflorescence, the somewhat wider, less conspicuously dentate or denticulate leaves, the inside nearly totally glabrous corolla, the slightly smaller size of the pollen grains and the larger capsules and seeds.

5. *Semnostachya Antonii* (Elm.) Brem. n. comb.; *Strobilanthes Antonii* Elm., Leafl. Philipp. Bot. VII, p. 2550, 1915; Merr., Enum. Philipp. Fl. Pl. III, p. 475, 1923.

Planta pluricaulis, caulibus robustioribus, a medio ramosis, ramis patentissimis, ramulis subpendulis. Caules ramique subglabri, internodiis haud profunde quadrisulcatis, ad apicem verruculosi. Folia opposita inaequalia, in petiolum glabrum, usque ad 2.5 cm longum contracta; lamina lanceolata, usque ad 20 cm longa et 6.5 cm lata, apice caudato-acuminata, basi contracta, sicc. pulla vel olivaceo-fusca, utrimque glabra, cystolithis utrimque sed praesertim supra dense lineolata, margine remote calloso-denticulata vel dentata, nervis utroque latere costae 3—9. Inflorescentiae spiciformes, 4—8 cm longae, solitariae; pedunculus internodiis rhachidis plerumque subaequilongus, verruculosus; rhachidis internodia apicem versus complanata et dilatata, bisulcata, sulcis puberulo-pubescentia, parce verruculosa. Bracteae anguste ovatae, obtuse exeuntes, 9 mm longae et 3.5 mm latae, coriaceae, costa et margine ciliatae, ceterum glabrae et intus nitidae, concavae, 3-nerviae, dorso minutissime glanduloso-punctatae, nervis dorso prominentibus, calyci subaequilongae. Bracteolae ad calycis tubum adnatae, calyci subaequilongae, lobis similiores sed crassiores, lineares, 8 mm longae et 1.2 mm latae, subobtusae, extus vix conspicue glanduloso-punctatae, costa et margine apicem versus ciliatae, ceterum glabrae. Calyx ad anthesin 9 mm longus, postea usque ad 17 mm accrescens, tubo facie postica altiore quam facie antica, segmentis tamen faciliter discindentibus, lobis linearibus, apicem versus attenuatis, subacutis, ad anthesin 1.2 mm, postea usque ad 2.4 mm latis, utrimque vix conspicue glanduloso-punctatis, extus costa apicem versus ciliatis, margine ubique ciliatis, ceterum glabris, 3-nerviis. Corolla extus glabra, 2.6 cm longa, tubo 6 mm, faucibus 14 mm, lobis submarginatis 6 mm longis, tubo intus pubescente, faucibus parce pilosis. Filamenta staminum longiorum tota hirtella, 3.5 mm longa, staminum breviorum

glabra, 1.5 mm longa; antherae 2.7 mm longae, thecis basi paulum inaequalibus. Staminodium parvum. Granula pollinis  $63 \mu$  longa et  $43 \mu$  diam., virgis 18 instructa. Ovarium pilis ecapitatis comosum. Stylus eodem modo hirtellus. Capsula 1.6 cm longa et 3.5 mm lata, obtusa, comosa, valvulis striatis. Semina 3 mm longa et 2.2 mm lata.

Habitat insulam Philippinam Mindanao dictam.

Philippine s. Mindanao: Agusan, Cabadbaran, Mt Urdaneta, alt. 1000 m, ELMER 13610 L, exemplum typi; Bukidnon, RAMOS et EDAÑO B. Sc. 38782 L et U.

ELMER l.c. compared this species with a Luzon plant which he found in the herbarium at Manilla under the name *Strobilanthes pachys* Clarke; it was described a few years later by MERRILL. I have seen no material of this species, but I presume that it may safely be transferred to *Semnostachya*. The same applies to *Strobilanthes Merrillii* Clarke, another species found in Luzon, and to *Str. halconensis* Merr., which was collected in Mindoro. *Str. cincinnalis* Clarke differs from all these species in the shape of the bracts: if it was to be included in this genus, the generic diagnosis ought to be changed, but so long as the seeds are unknown, it seems better to leave it apart.

6. *Semnostachya galeopsis* (Stapf) Brem. n. comb.; *Strobilanthes galeopsis* Stapf in Transact. Linn. Soc., Ser. 2 IV, p. 215, 1894; Sp. le Moore in Journ. Linn. Soc. XLII, p. 210, 1914.

Herba ramosa, e basi decumbente et radicante ascendens, in speciminibus examinatis 20—30 cm alta, fide GIBBS apud SP. LE M. MOORE l.c. circ. 1.40 m alta. Caulis ramique primum pilis basiscopis dense appresse tomentelli et interdum setulis paucis hirti, postea interdum glabrescentes, internodiis primum parte apicali bi-, parte basali quadri-sulcatis, deinde subteretes. Folia paulum inaequalia, in petiolum canaliculatum, pilis basiscopis dense appresse pubescentem et secundum margines sulci setulis longis conspicue ciliatum, usque ad 2.5 cm longum contracta; lamina ovata, usque ad 7 cm longa et 3.5 cm lata, caudato-acuminata, basi rotundata, prope petiolum tamen subito contracta, sicc. supra fuscens vel saturate olivacea, subtus griseo-viridis, supra praesertim costa nervisque appresse setulosa et scabridula, subtus praesertim costa nervisque molliter pubescens, inter nervos interdum scabridula, cystolithis gracilibus utrimque dense lineolata, cystolithis supra circum setulos radiatim dispositis, margine dentato-crenata et setuloso-ciliata, nervis utroque latere costae 4—5. Inflorescentiae spiciformes, solitariae; flores inferiores interdum foliis plus minusve redactis, alii bracteis lanceolatis vel anguste rhomboideis, 12 mm longis et 3—4 mm latis, apice interdum recurvatis, extus dense et longius pubescentibus, apicem versus tamen glabrescentibus, intus dimidio inferiore ut extus dense et longe pubescentibus, apicem versus interdum scabridis, alioquin glabrescentibus, margine setuloso-ciliatis, e basi 3-nerviis, ceterum penninerviis suffulti. Bracteolae lineares, ad calycem vix adnatae, 9 mm longae et 0.9 mm latae, subobtusae, extus pubescentes, margine breviter setuloso-ciliatae, intus ad basin glabrae, apicem versus sparse et breviter pubescentes, 1-nerviae. Calyx extus pubescens, eglandulosus, tubo facie postica 1.5 mm, facie antica 1 mm longo, lobis e basi lineari longe attenuatis, lateralibus 8 mm, aliis 9 mm longis, omnibus 1.4 mm latis, obtusis. Corolla interdum dilute violacea, extus pilis capitatis puberula, 3 cm longa, tubo 9.5 mm, faucibus 15 mm, lobis 4 mm longis, intus pilis stylum retinentibus exceptis subglabra. Filamenta staminum longiorum tota hirtella, 4.5 mm longa, staminum breviorum glabra, 2 mm longa; antherae 3 mm longae, apice obtusae. Ovarium longius et dense comosum. Stylus parce hirtellus. Capsula 7 mm longa et 3 mm lata,

elliptica, apice obtusa, breviter comosa, valvulis levibus. Semina 2 mm longa et 1.6 mm lata.

Habitat partem terrae Borneënsis septemtrionalem.

British North Borneo. Mt Kinabalu: Dallas, alt. 900 m. J. et M. S. CLEMENS 26083 L et 26290 L; Tenompok, alt. 1500 m, id. 30253 L; Penibukan, alt. 1200—1500 m, id. 30711 L; Penataran Basin, alt. 1200 m, id. 34212 L; Colombon River, alt. 1300 m, id. 32446 L.

I have not been able to compare the specimens collected by J. et M. S. CLEMENS with the type (HAVILAND 1159), but apart from the fact that the leaves are not provided with 7—8, but merely with 4—5 pairs of nerves, they answer the description quite well.

*S. galeopsis* differs in its habit rather conspicuously from the other species of this genus, which are all strongly branched plants reaching a height of up to 4 m. Other differences are found in the crenato-dentate leaves with their fringe of cilia, in the structure of the inflorescence, the lower flowers being subtended by ordinary leaves, in the free bracteoles, in the difference in size between the calyx lobes, in the obtuse anthers and in the small size of the capsules and seeds. It occupies therefore a very isolated position in the genus.

As the genus *Semnostachya* is represented in Sumatra, North Borneo and the Philippines, it would not be surprising if it should be found also in the Malay Peninsula and in other parts of Indo-China. Of the *Strobilanthes* species described from the Malay Peninsula *Str. collina* Nees is apparently the only one which might belong here, but as its flowers are described as violet, the bracts as deciduous and the bracteoles as minute or absent, it is more probable that it belongs to *Difflugossa*. So long as the structure of the androecium and of the testa remain unknown, its position can not be determined. Among the species enumerated in the "Flore Générale de l'Indo-Chine" *Str. cystolithigera* Lindau and *Str. polystachya* R. Ben. might prove to belong to our genus, but as their seeds have not been described, the position of these species too remains dubious. The same applies to the more recently described *Str. albo-viridis* Imlay. On account of the obtuse calyx lobes and the great difference in length between the outer and inner filaments, I am inclined to regard it as generically distinct. IMLAY himself compares it with *Str. kinabaluensis* Stapf and *Str. Kerrii* Craib, two species belonging to the genus *Goldfussia*, but as the anthers of IMLAY's species are described as oblong and apiculate, and the seeds as "hirsute", the affinity between these species is probably but remote.

#### Index Specierum.

5. **Antonii** (Elm.) Brem. n. comb. (*Strobilanthes* Elm.) — Mindanao —
2. **benculensis** Brem. n. spec. — Sumatra —
1. **deliensis** Brem. n. spec. — Sumatra —
6. **galeopsis** (Stapf) Brem. n. comb. (*Strobilanthes* Stapf) — Borneo —
- halconensis** (Merr.) Brem. n. comb. (*Strobilanthes* Merr.) — Mindoro —
4. **kinabaluensis** Brem. n. spec. — Borneo —
- Merrillii** (Clarke) Brem. n. comb. — Luzon —
3. **nigrescens** Brem. n. spec. — Sumatra —
- pachys** (Clarke ex Merr.) Brem. n. comb. (*Strobilanthes* Clarke ex Merr.) — Luzon —

*Semnostachya* species sub nomine generico *Strobilanthe* nuncupatae.

*Antonii* Elm., Leaflet Philipp. Bot. VII, p. 2550, 1915 = *Semnostachya Antonii* (Elm.) Brem. n. comb.



- galeopsis* Stapf in Trans. Linn. Soc., Ser. 2, IV, p. 215, 1894 = *Semnostachya galeopsis* (Stapf) Brem. n. comb.  
*halconensis* Merr. in Philipp. Journ. of Sc. II, p. 322, 1909 = *Semnostachya halconensis* (Merr.) Brem. n. comb.  
*Merrillii* Clarke in Philipp. Gov. Lab. Bur. Bull. XXXV, p. 92, 1906 = *Semnostachya Merrillii* (Clarke) Brem. n. comb.  
*pachys* Clarke ex Merr. in Philipp. Journ. of Sc. XX, p. 456, 1922 = *Semnostachya pachys* (Clarke ex Merr.) Brem. n. comb.

31. *Pyrrothrix* Brem. n. gen.; typus: *P. deliensis* Brem. n. spec.

Plantae fere totae rufo-hirsutae, paulum anisophyllae. Folia in petiolum contracta. Inflorescentiae terminales et axillares, pedunculatae, spiciformes, breves vel satis longae. Bracteae lineari-oblongae vel spatulatae, ciliatae, penninerviae, calyci subaequilongae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, subobtusae, ciliatae, calyce paulo breviores, persistentes. Calyx subaequaliter 5-partitus, lobis linearibus. Corolla colore ignoto, resupinata, tubo tereti in fauces campanulatas ampliata, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia, inclusa, omnia erecta; filamenta omnia hirtella; antherae erectae, apice obtusae, a latere complanatae. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium parce comosum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, mucronata, vix conspicue comosa, 4-seminalis, retinaculis in aciculam exeuntibus. Semina exareolata, fere tota pilis rigidis vestita.

Distributum a Khasiae montibus usque ad Sumatram. Species circ. 10.

Species typica: *Pyrrothrix deliensis* Brem. n. spec. v. infra.

This is still an imperfectly known genus, for the only species which I could investigate, are the type and *P. vulpina* (Ridl.) Brem. n. comb. (*Strobilanthes* Ridl.). It is apparently well represented in the Malay Peninsula, but in Sumatra so far only one species has been found. Its occurrence further north is not well known, but it seems to me that *Strobilanthes polythrix* T. And., a species found in Khasia, may safely be referred to it. Up to now no species are known from other parts of Indo-China. It is possible, however, that *Pyrrothrix* may prove identical with *Buteraea* Nees, which it resembles in the rufous indumentum, but from which it is separated here on account of the subequally 5-partite, not 2-lipped, calyx and because the seeds of *Buteraea* are, according to CLARKE, "elastically white-hairy", whereas the rigid hairs on the testa of the *Pyrrothrix* species are but slightly hygrometric. If a reëxamination however would show that these plants differ merely in the structure of the calyx, it would doubtless be better to unite them, and then the area would be continuous, for the *Buteraea* species have been collected in various parts of Burma.

In the structure of the testa *Pyrrothrix* resembles *Semnostachya*, *Paragoldfussia*, *Tetragompha* and *Tetraglochidium*. The wall of the hairs is however much thicker than in any of these genera, from which it differs moreover in the peculiar rufous indumentum and in the penninerved bracts.

1. *Pyrrothrix deliensis* Brem. n. spec.; typus: LOERZING 5421 L.

Habitus mihi nondum notus. Rami graciles, 1—2 mm diam., densius pilis rufis subpatentibus vestiti, internodiis quadrisulcatis. Folia opposita paulum inaequalia, in petiolum pilis rufis subpatentibus dense vestitum, 1.5—2 cm longum contracta; lamina lanceolato-elliptica, 7—11 cm longa et 3—4.7 cm lata, apice subcaudata, basi contracta, margine repando-crenata, utrimque sparse pilosa, costa nervisque insuper subtus dense rufo-pilosa, cystolithis subtus solum distinguendis, nervis utroque latere costae 5—7. Spicae breves,

1.8 cm longae et 1.6 cm diam., bractearum paribus 4—5 instructae. Pedunculus 1—4.5 cm longus, pilis rufis subpatentibus dense vestitus; internodia rhachidis circ. 3 mm longa. Flores oppositi, infimi interdum foliis parvis, 1.5 cm longis, alii bracteis suffulti. Bracteae spatulatae, 8—10 mm longae, parte dilatata 3—4 mm lata, apice rotundata, supra pilis longioribus ciliata. Bracteolae 5—6 mm longae et 0.7 mm latae, 1-nerviae, apice recurvatae, parte recurvata vix distincte dilatata, parte basali albida, margine et subtus costa longe ciliatae. Calyx tubo subnullo; lobi bracteolis similiores sed angustiores et paulo longiores, solum apicem versus ciliati, fructu circ. 10 mm longi, parte basali albidi. Corolla matura nondum visa; ante anthesin extus minute glandulosa, intus pilis stylum retinentibus exceptis glabra. Granula pollinis 57  $\mu$  longa et 38  $\mu$  diam., virgis 18 ornata. Ovarium apice parce comosum. Stylus glaber. Capsula 5.5 mm longa et 2.5 mm lata. Semina 2.3 mm longa et 1.6 mm lata.

Habitat Sumatram Septemtrionalem.

S u m a t r a. East Coast Govt: Sibolangit, alt. 350 m, LOERZING 5421 L, typus.

This species comes apparently very near to *P. rufo-paupera* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke), but differs in the larger size of the leaves and the coarseness of the hairs with which they are sprinkled, the larger number of flowers per spike and the shorter bracts. *P. rufo-paupera* has been recorded from the same region by MERRILL (in Contr. Arnold Arbor. VIII, p. 154, 1934), but I suppose that this specimen too will prove to belong to the species described above.

#### Index Specierum.

1. \* *deliensis* Brem. n. spec. — Sumatra —  
*polythrix* (T. And.) Brem. n. comb. (*Strobilanthes* T. And.) — Khasia —  
*ruficapillis* (Ridl.) Brem. n. comb. (*Strobilanthes* Ridl.) — Peninsula Malayana —  
*ruficaulis* (Ridl.) Brem. n. comb. (*Strobilanthes* Ridl.) — Peninsula Malayana —  
*rufo-capitata* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —  
*rufo-paupera* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —  
*rufo-sepala* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —  
*rufo-strobilata* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —  
*vulpina* (Ridl.) Brem. n. comb. (*Strobilanthes* Ridl.) — Peninsula Malayana —
- Pyrrotrichos* species sub nomine generico *Strobilanthe* nuncupatae.
- polythrix* T. And. in Journ. Linn. Soc. IX, p. 470, 1867 = *Pyrrothrix polythrix* (T. And.) Brem. n. comb.  
*ruficapillis* Ridl., Fl. Mal. Pen. II, p. 326, 1925 = *Pyrrothrix ruficapillis* (Ridl.) Brem. n. comb.  
*ruficaulis* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 53, 1909 = *Pyrrothrix ruficaulis* (Ridl.) Brem. n. comb.  
*rufo-capitata* Clarke in Journ. As. Soc. Beng. LXXIV, p. 657, 1908 = *Pyrrothrix rufo-capitata* (Clarke) Brem. n. comb.  
*rufo-paupera* Clarke l.c. = *Pyrrothrix rufo-paupera* (Clarke) Brem. n. comb.  
*rufo-sepala* Clarke op. cit. p. 656 = *Pyrrothrix rufo-sepala* (Clarke) Brem. n. comb.  
*rufo-strobilata* Clarke op. cit. p. 657 = *Pyrrothrix rufo-strobilata* (Clarke) Brem. n. comb.  
*vulpina* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 53, 1909 = *Pyrrothrix vulpina* (Ridl.) Brem. n. comb.

32. *Buteraea* Nees in Wall., Pl. As. Rar. II, p. 75 et 83, 1832; id. in DC., Prodr. XI, p. 101 et 196, 1847; *Strobilanthes* sensu Anderson subgenus *Buteraea* Clarke in Hook.f., Fl. Brit. Ind. IV, p. 430, 1884, *Str. acuminata* excl.

As I had no material of this genus, I am unable to give a detailed description. The diagnosis given in the "Conspectus Generum" has been based partly on the original description and partly on that of the various species quoted by CLARKE under *Strobilanthes* subgenus *Buteraea*. As the structure of the testa is imperfectly known and that of the pollen entirely unknown, the position of the genus and its delimitation remain uncertain.

*Ruellia comosa* Roxb., which both NEES and CLARKE consider conspecific with the type species of this genus, was based on a plant grown in the Calcutta Botanical Garden. It was believed to be of Moluccan origin, but this must be a mistake, for the only representatives of the *Strobilanthinae* in the Moluccas are *Hemigraphis* species. It is however not the only plant in ROXBURGH'S "Hortus Bengalensis" and "Flora Indica" of which falsely a Moluccan origin has been indicated: see e.g. my remarks on *Ixora fulgens* Roxb., *I. congesta* Roxb. and *I. tenuiflora* Roxb. in Bull. Jard. Bot. de Buitenzorg, Sér. 3, XIV, p. 215, 1937.

#### Index Specierum.

- ?*foetidissima* (Kurz) Brem. n. comb. (*Strobilanthes* Kurz) — Birmania —  
*Parishii* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Birmania —  
*rhamnifolia* Nees in DC., Prodr. XI, p. 725, 1847 = *Pseudostenosiphonium rhamnifolium* (Nees) Lindau  
*rufescens* (Roth) Dietr., Syn. Pl. III, p. 589, 1843 (*Ruellia* Roth); syn. *Strobilanthes rufescens* (Roth) T. And.; *Buteraea ulmifolia* Nees; *Ruellia comosa* Roxb. non Vell.; *R. eucoma* Steud. n. nom. — Birmania —  
 \* *ulmifolia* Nees in Wall., Pl. As. Rar. III, p. 84, 1832 = *rufescens*.

#### *Buteraeae* species sub nominibus genericis aliis nuncupatae.

- Ruellia comosa* Roxb., Fl. Ind. III, p. 43, 1832 (non Vell., Fl. Flum. VI, Tab. 91, 1827) = *Buteraea rufescens* (Roth) Dietr.  
*Ruellia eucoma* Steud., Nom. ed. 2, II, p. 480, 1841 (*comosa* Roxb. 1832, non Vell. 1827) = *Buteraea rufescens* (Roth) Dietr.  
*Ruellia rufescens* Roth, Nov. Pl. Sp., p. 304, 1821 = *Buteraea rufescens* (Roth) Dietr.  
*Strobilanthes foetidissima* Kurz in Journ. As. Soc. Beng. XLIII, p. 93, 1873 = ? *Buteraea foetidissima* (Kurz) Brem. n. comb.  
*Strobilanthes Parishii* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 431, 1884 = *Buteraea Parishii* (Clarke) Brem. n. comb.  
*Strobilanthes rufescens* (Roth) T. And. in Journ. Linn. Soc. IX, p. 472, 1867 (*Ruellia* Roth) = *Buteraea rufescens* (Roth) Dietr.  
*Strobilanthes rufescens* (Roth) T. And. var. *rubiginosa* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 430, 1884, n.v.

33. *Paragoldfussia* Brem. n. gen.; typus: *P. barisanensis* Brem. n. spec.

Plantae plietesiaie, anisophyllae. Folia subsessilia vel breviter petiolata, subtus sub lente glanduloso-punctata, utrimque cystolithis parvis dense lineolata. Inflorescentiae terminales et interdum insuper axillares, solitariae vel in triades dispositae, subsessiles, basi foliis duobus parvis suffultae, spiciformes, abbreviatae. Bracteae ovatae vel lanceolatae, margine integrae, e basi plurinerviae, calyce multo longiores, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineari-lanceolatae vel lineares, calyce paulo longiores. Calyx aequaliter 5-fidus. Corolla probabiliter violacea, resupinata, tubo tereti torso in fauces campanulatas tubo longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus orbicularibus. Stamina 4, didyna-

mia, erecta et inclusa; filamenta omnia hirtella; antherae oblongae, apice obtusae. Stamina parva. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium glabrum vel comosum, utroque loculo ovulis 2. Capsula fusiformis, 4-seminalis, retinaculis in aciculam rectam exeuntibus. Semina parvo-areolata, fere tota pilis plus minusve annulatis vestita.

Distributum in Sumatra. Species adhuc notae 2.

Species typica: *P. barisanensis* Brem. n. spec. v. infra.

The resemblance between the species belonging to this new genus and those belonging to *Goldfussia* is but superficial: in the really important characters of the androecium and of the testa they are quite distinct. The affinity with *Tetragompha* and *Tetraglochidium* is doubtless much closer: from these genera *Paragoldfussia* is however easily distinguishable by the entire bracts and the obtuse anthers.

### Key to the Species.

1. Bracts lanceolate, 7-nerved. Bracteoles 3-nerved. Hairs on the style all ecapitate. — West Sumatra . . . 1. *P. barisanensis* Brem. n. spec.
- : Bracts ovate, 9-nerved. Bracteoles 1-nerved. Hairs at the base of the style capitate. — North Sumatra . . . 2. *P. caroënsis* Brem. n. spec.

1. ***Paragoldfussia barisanensis*** Brem. n. spec.; typus: BÜNNEMEYER 3860 L.

Planta valde ramosa. Rami graciles, primum sparsissime pubescentes, mox glabrescentes, cystolithis conspicue lineolati, internodiis profunde bisulcatis. Folia plerumque subsessilia, majora tamen interdum in petiolum usque ad 5 mm longum contracta; lamina ovata vel elliptico-lanceolata, foliorum majorum 5.5—13 cm longa et 2.4—5.8 cm lata, minorum 2—5.5 cm longa et 0.6—2.0 cm lata, omnia apicem versus longe attenuata, basin versus contracta et a petiolo brevissimo haud distincte sejuncta, margine subintegra, costa basin versus canaliculata et sulco sparse hirtella, ceterum utraque facie glabra, nervis in foliis majoribus utroque latere costae 4—11, in foliis minoribus 3—4. Folia spicam abbreviatam suffulcencia basi rotundata, utroque latere costae nervis 4—5 munita, bracteis subaequilonga, mox decidua et inde raro preservata. Bracteae 4- vel 5-parae, lanceolatae, 21 mm longae et 8 mm latae, acutae, duplicatae et carinatae, extus puberulae, intus glabrae, e basi 7-nerviae. Bracteolae lineari-lanceolatae, 18 mm longae et 5 mm latae, acutae, conduplicatae, extus puberulae, e basi 3-nerviae. Calyx 16.5 mm longus, extus puberulus, lobis linearibus, acutis, 3 mm latis, 3-nerviis. Corolla probabiliter violacea, 3.5 cm longa, extus glabra, tubo 12 mm, faucibus intus sparse villosis 18 mm, lobis 5 mm longis. Filamenta staminum longiorum 6.5 mm, staminum breviorum 2.5 mm longa; antherae 2.7 mm longae. Granula pollinis 65  $\mu$  longa et 48  $\mu$  diam., virgis 18 instructa. Ovarium apicem versus dense comosum. Stylus hirtellus. Capsula ad apicem sparse hirtella, 16 mm longa et 5 mm lata. Semina 4 mm longa et 2.5 mm lata, pilis annulatis tenuibus vestita.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: G. Malintang, alt. 1250 m, BÜNNEMEYER 3860 L, typus; ibidem, alt. 1100 m, id. 3534 L; G. Sago, id. 4374 L.

2. ***Paragoldfussia caroënsis*** Brem. n. spec.; typus: LOERZING 5961 L.

Planta valde ramosa. Rami graciles, primum sparse pubescentes, deinde glabrescentes, vix conspicue lineolati, internodiis bisulcatis. Folia in petiolum canaliculatum, breviter pubescentem, usque ad 7 mm longum contracta; lamina elliptico-lanceolata vel lanceolata, foliorum majorum 5.5—10.5 cm longa et 2.5—4 cm lata, minorum dimidio minor, omnium apicem versus sensim attenuata, basin versus contracta et sensim in petiolum transeuns, margine repando-dentata vel subintegra, cystolithis plerumque vix distinguendis, costae basin versus

canaliculatae sulco hirtella, nervis utraque facie pilis paucis sparsa, ceterum glabra, nervis in foliis majoribus utroque latere costae 6—7, in foliis minoribus 3—4. Folia spicam abbreviatam suffulciantia basi rotundata, apicem versus denticulata, utroque latere costae nervis 3—4 munita, bracteis subaequilonga. Bracteeae 4-parae, ovatae, 25—18 mm longae et 15—10 mm latae, acutae, concavae et vix carinatae, extus puberulae vel subglabrae, intus glabrae, e basi 9-nerviae. Bracteolae lineares, 15 mm longae et 3.5 mm latae, subobtusae, extus glabrae, a calycis lobis vix distinguendae. Calyx 14 mm longus, extus glaber, lobis linearibus obtusis 3—3.5 mm latis, 1-nerviis. Corolla matura nondum visa. Antherae 3.2 mm longae. Granula pollinis 70  $\mu$  longa et 45  $\mu$  diam., virgis 15 instructa. Ovarium subglabrum. Stylus ad basin dense pilis capitatis, ceterum pilis ecapitatis hirtellus. Capsula glabra, 17 mm longa et 5 mm lata. Semina 5 mm longa et 3 mm lata, pilis annulatis rigidulis vestita.

Habitat Sumatram Septemtrionalem.

S u m a t r a. East Coast Govt: North of Berastagi on the Karo Tableland, alt. 1450 m, LOERZING 5961 L, typus; ibidem, alt. 1600 m, BEUMÉE 821 L; Atjeh Govt: Boor ni Lintang, alt. 1800 m, v. STEENIS 6329 L.

It is not impossible that the "*Strobilanthes Maingayi* Clarke" found by RIDLEY at Berastagi (cf. Journ. Roy. As Soc. Mal. Br. I, p. 81, 1923), which is said to be "not exactly like the type form from Penang", represents the species described above. *Str. Maingayi* itself belongs probably to *Tetraglochidium*.

The two species described above, are doubtless nearly related, but apart from the differences given in the key, there are some other ones which are not so easily seen but which are probably of more fundamental importance: the latter are found in the number of bands with which the pollen grains are provided and in the structure of the hairs covering the testa.

#### 34. *Tetragompha* Brem. n. gen.: typus: *T. Korthalsii* Brem. n. spec.

Plantae plietesiae, paulum anisophyllae. Folia petiolata. Inflorescentiae terminales et axillares, spiciformes, abbreviatae. Bracteeae foliaceae, paucidentatae, ad basin 3-nerviae, ceterum penninerviae, apicem versus gradatim longitudine decrescentes, calyce semper multo longiores tamen, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, utroque latere denticulis 1 vel 2 vix conspicuis instructae, calyce longiores, persistentes. Calyx 3-partitus, i.e. segmenta postica in labium superius 3-fidum connata, antica sublibera; lobi lineares, acuti, ciliati. Corolla colore ignoto, resupinata, tubo tereti torso in fauces campanulatas tubo plus quam bis longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus orbicularibus. Stamina 4, didynamia, omnia erecta et inclusa; filamenta glabra; antherae erectae, connectivo in aristam satis longam, apice incurvatam producto. Staminodium inconspicuum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium comosum utroque loculo ovulis 2. Stylus ad basin pilis capitatis vestitus, ceterum pilis ecapitatis hirtellus. Capsula fusiformis, acuta, 4-seminalis, retinaculis ad semina fere totis appressis. Semina (Tab. V F) exareolata, fere tota pilis rigidulis, basi annulatis vestita.

Distributum in Sumatra Occidentali. Species una vel duae.

Species typica: *T. Korthalsii* Brem. n. spec., v. infra.

This genus comes very near to *Paragoldfussia* and *Tetraglochidium*, but is easily distinguishable from both by the tripartite calyx and by the awned anthers, from *Paragoldfussia* moreover by the dentate bracts and denticulate bracteoles, and from *Tetraglochidium* by the subequal and subentire leaves.

1. **Tetragompha Korthalsii** Brem. n. spec.; typus: KORTHALS s. n. L.

Habitus imperfecte notus. Rami subglabri, 2.5 mm diam., internodiis quadrisulcatis. Folia in petiolum 0.7—2.5 cm longum, subglabrum contracta; lamina lanceolato-elliptica, plerumque 10—15 cm longa et 4—5.7 cm lata, subcaudata, margine obscure repanda vel subintegra, herbacea, utrimque glabra, cystolithis utrimque sed praesertim supra distinguendis, nervis utroque latere costae 7—10. Spicae abbreviatae pedunculo 3—5 mm longo, bifariam pubescente instructae; rhachis dense pubescens. Bracteae plerumque 5-parae, infimae rhomboideae, 2 cm longae et 1 cm latae, margine utroque latere dentibus 3 parvis instructae et sparse ciliolatae, steriles; aliae sensim minores et praesertim angustiores, fertiles; supremae oblongae, 10 mm longae et 3 mm latae, forma et magnitudine exceptis aliis similiores. Bracteolae lineares, 10 mm longae et 1.7 mm latae, sparse ciliolatae. Calyx 6.5 mm longus, segmentis ad medium 0.9 mm latis, partibus liberis sparse ciliatis. Corolla colore ignoto, 12 mm longa, tubo 3 mm, faucibus 6.5 mm, lobis 2.5 mm longis. Antherae arista 0.6 mm longa instructae, thecis 1.3 mm longis, glaucis. Granula pollinis 67  $\mu$  longa et 43  $\mu$  diam., virgis probabiliter 18 instructa. Capsula glabra, 10 mm longa et 3.5 mm lata. Semina (Tab. V F) 5 mm longa et 3.5 mm lata.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: s.l., KORTHALS s.n. H. L. B. 897.280.261, typus.

The corolla of this species is remarkably small: in fact, flowers of this size are in the *Strobilanthinae* outside the groups A and B undoubtedly very rare, if not entirely wanting.

The plant described by MIQUEL (Fl. Ind. Bat. II, p. 800, 1858) under the name *Strobilanthes crassifolia*, resembles the species described above in the form and structure of the abbreviated spikes and especially of the bracts. As the type specimen possesses neither flowers nor fruits, and as other specimens which might have been referred to this species, could not be detected, its position remains somewhat uncertain. From *T. Korthalsii* it is easily distinguishable by its coriaceous leaves.

2. ?**Tetragompha crassifolia** (Miq.) Brem. n. comb.; *Strobilanthes crassifolia* Miq., Fl. Ind. Bat. II, p. 800, 1858; Suppl. p. 241, 1861; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: Lubu Aloong, TEYSMANN 1184 U, typus, L, dupl. typi.

35. **Tetraglochidium** Brem. n. gen.; typus: *T. thunbergii*florum (S. Moore) Brem. n. comb. (*Strobilanthes* S. Moore); *Strobilanthes* species Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 et auctorum aliorum; *Goldfussia* species Nees in DC., Prodr. XI, p. 174, 1847.

Plantae plietesiae, marginophyllae. Folia sessilia vel petiolata, supra cystolithis parvis dense lineolata, margine dentata et ciliata. Inflorescentiae terminales, uno jugo foliorum parvorum, sessilium, aequalium vel inaequalium, patentium vel suberectorum suffultae, breviter pedunculatae, spiciformes, abbreviatae, totae vel fere totae bracteis infimis inclusae, plerumque complanatae. Bracteae ovatae, ovato-oblongae vel oblongae, e basi 3- vel plurinerviae, ceterum penninerviae, margine ciliatae, externae fere totae foliaceae et dentatae, alias omnino celantes, steriles; aliae ad apicem solum foliaceae et dentatae, gradatim longitudine decrecentes, fertiles, omnes persistentes. Flores in axillis bractearum solitarii. Bracteolae lineares vel setaceae, nunc calyci subaequilongae, nunc multo breviores vel ad nihilum redactae. Calyx glaber, subaequaliter vel inaequaliter 5-lobatus vel 5-fidus, ultimo interdum bilabiatis partitus, lobis valvatis. Corolla

violacea vel alba, raro luteola, resupinata, tubo tereti torso in fauces anguste campanulatas tubo multo longiores ampliatis, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus, orbicularibus. Stamina 4, didynamia, erecta et inclusa; filamenta nunc omnia hirtella, nunc longiora solum hirtella, nunc omnia glabra; antherae erectae, connectivo in apiculam producto, thecis paulum inaequalibus, subpatentibus. Staminodium parvum vel inconspicuum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium glabrum, utroque loculo ovulis 2. Stylus ad basin pilis capitatis, ceterum pilis ecapitatis hirtellus. Capsula fusiformis, glabra, 4-seminalis, retinaculis totis appressis, apice interdum bi- vel tridenticulatis. Semina brunnea, parvo-areolata, fere tota pilis rigidulis longis, tenuiter exeuntibus vestita.

Distributum in Peninsula Malayana, Sumatra, Java et terra Borneënsi. Species minimum 8.

Species typica: *T. thunbergiiflorum* (S. Moore) Brem. n. comb. (*Strobilanthes* S. Moore).

The genus *Tetraglochidium* resembles the two preceding ones in the nature of the spikes, which in all three are strongly abbreviated, but differs from both in the larger size of the lowest pair of bracts, which envelop the remaining ones, from *Paragoldfussia* moreover by the dentate margin of the bracts and by the apiculate anthers, and from *Tetragompha* by the apiculate, not awned anthers and by the subequally or inequally 5-lobed or 5-fid, finally sometimes 2-partite, but never tripartite calyx.

Three of the species of the Malay Peninsula enumerated by CLARKE and RIDLEY under *Strobilanthes* probably belong to *Tetraglochidium*, to wit *Str. Maingayi* Clarke, of which RIDLEY gives a rather inaccurate figure (Fl. Mal. Pen. II, p. 572, fig. 127, 1923), *Str. hirtisepala* Clarke and the species recorded by both under the name *Str. bibracteata* Bl. The latter may prove identical with one of my new Sumatran species, but the nature of the indumentum and the hirtellous filaments prove that it can not be conspecific with the plant described by BLUME: the true *Str. bibracteata* appears to be confined to West Java.

#### Key to the Species of the Malay Archipelago.

1. Bracteoles either setaceous and much shorter than the calyx or absent. Filaments all glabrous. — West Java . . . . . 1. *T. bibracteatum* (Bl.) Brem. n. comb.
- : Bracteoles linear or linear-lanceolate, about as long as the calyx. At least the filaments of the longer stamens hirtellous . . . . . 2
2. Bracteoles on both sides glabrous or subglabrous . . . . . 3
- : Bracteoles on the outside, at least towards the top, hirsute . . . . . 5
3. Spikes with 3 pairs of outside glabrous bracts. Leaves repando-dentate. — Borneo . . . . . 6. *T. Hallierii* Brem. n. spec.
- : Spikes with 4—7 pairs of outside more or less hirsute bracts. Leaves serrato- or crenato-dentate . . . . . 4
4. Leaves petiolate, on the upper side glabrous. Filaments of the longer stamens densely hirtellous. — West Sumatra . . . . . 2. *T. menangkabwense* Brem. n. spec.
- : Leaves sessile or subsessile, on the upper side sparsely hirsute. Filaments of the longer stamens with a few hairs at the base. — North Sumatra . . . . . 3. *T. deliense* Brem. n. spec.
5. Spikes with 4 or 5 pairs of bracts. Bracteoles on the outside in the lower half glabrous. — South Sumatra . . . . . 4. *T. thunbergiiflorum* (S. Moore) Brem. n. comb.

- : Spikes with 3 pairs of bracts. Bracteoles on the outside entirely hirsute.  
 — Bencoolen . . . . 5. *T. benculense* Brem. n. spec.

1. *Tetraglochidium bibracteatum* (Bl.) Brem. n. comb.; *Strobilanthes bibracteata* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826; Miq., Fl. Ind. Bat. II, p. 801, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 217, 1912; Koorders-Schuhmacher, Syst. Verz. I, p. 43, 1912; S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925, quoad specimina javanica; *Goldfussia bibracteata* (Bl.) Nees in DC., Prodr. XI, p. 174, 1847; — non *Strobilanthes bibracteata* Bl. apud Clarke in Journ. As. Soc. Beng. LXXIV, p. 652, 1908, nec apud Ridl., Fl. Mal. Pen. II, p. 326, 1925, v. supra; nec apud S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925, quoad specimen sumatranum, cf. *T. thunbergiiflorum*.

Caulis usque ad 1 m longus. Rami graciles, primum subcomplanati et sulcati, sulcis dense hirsuti, deinde subquadrangulares et glabrescentes. Folia in petiolum hirsutum contracta; petiolus foliorum majorum 5—15 mm, minorum 0.5—5 mm longus; lamina lanceolata, foliorum majorum 7—10 cm longa et 2.2—2.8 cm lata, minorum magnitudine dimidio vel plus redacta, omnium apice caudata, basi contracta, margine serrato-dentata, supra costa appresse et breviter pubescens, subtus costa et nervis densius hirsuta, ceterum utrimque glabra vel sparsissime hirsuta, cystolithis supra valde conspicuis, nervis utroque latere costae in foliis majoribus 7—8, in foliis minoribus plerumque 6. Folia bina spicam suffulciantia sessilia, lineari-lanceolata, 1.2—2 cm longa, ad basin areola oblonga alba et concava instructa, patentia. Spicae fortiter complanatae, ambitu ovato-lanceolatae, 2.5—3 cm longae et 1.1—1.4 cm latae, bractearum paribus 3 instructae. Pedunculus 1.5—2 mm longus, dense pubescens. Bracteae extus intusque glabrae; infimae ovato-lanceolatae, acuminatae, vix concavae, margine ciliatae, dimidio superiore serratae, parte centrali albida, peripheriam versus virescentes vel violascentes; bracteae paris secundi anguste oblongae, 17 mm longae et 5 mm latae, acutissimae, conduplicatae, ad apicem denticulis paucis vix conspicuis instructae, albidae; bracteae paris tertii lineares, 8 mm longae et 1.4 mm latae, acutissimae, planae. Bracteolae setaceae vel nullae. Calyx 11 mm longus, extus glaber, segmentis 1.7 mm latis, usque ad medium fere connatis, 1-nerviis, ad anthesin bilabiatis partitus, labio antico quam postico paulo longiore. Corolla alba vel pallide olivacea, 4.5 cm longa, tubo 10 mm, faucibus 30 mm, lobis 5 mm longis. Filamenta glabra, staminum longiorum 10 mm, breviorum 3 mm longa. Staminodium minutum. Granula pollinis saturate coerulea, 70  $\mu$  longa et 46  $\mu$  diam., virgis 15 instructa. Capsula 14 mm longa et 4 mm diam.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.: G. Salak, BLUME 1802 L, typus; ibidem, alt. 1700 m, RAAP 209 L; G. Malang, Forest Reserve Takoka, KOORDERS 39522 L; G. Beser near Tjidadap (Tjibeber), WINCKEL 678 L; Priangan Res.: G. Patuha, COERT 1749 PAS; ibidem, KORTHALS s.n. L; G. Wajang, alt. 1800 m, FORBES 848 L; G. Paseh near Bandoong, alt. 1400 m, DOCTERS v. LEEUWEN 2326 L; Tangkuban Prah, WICHURA 2160 BD.

*T. bibracteatum* is easily distinguishable from the other species belonging to this genus by the small size or total suppression of the bracteoles and by the glabrous filaments. In the presence of three pairs of bracts it resembles *T. benculense* and *T. Hallierii*, whereas the glabrousness of the bracts is a feature which recurs in the latter only.

2. *Tetraglochidium menangkabwense* Brem. n. spec.; typus: BÜNNEMEYER 1034 L.



Rami graciles, alternantes, primum quadrangulares quadrisulcati hirsuti, deinde subteretes glabrescentes. Folia in petiolum dense hirsutum contracta; petiolus foliorum majorum 5—12 mm longus, minorum 1—2 mm longus; lamina lanceolata, foliorum majorum 5—8 cm longa et 1.8—3 cm lata, minorum usque ad 3 cm longa et 1.2 cm lata, omnium apice caudata, basi contracta, margine serrato-dentata, supra costa appresse et breviter pubescens, subtus costa nervisque densius et inter nervos sparse hirsuta, cystolithis utrimque sed praesertim supra conspicuis, nervis utroque latere costae in foliis majoribus 6—8, in foliis minoribus plerumque 4. Folia bina spicam suffulcentia aequalia, sessilia, ovata, 1.5 cm longa, erecta. Spicae paulum complanatae, ambitu ovato-lanceolatae, 2.5 cm longae et 1.2 cm latae, bractearum paribus 4—7 instructae. Pedunculus glaber 1—2 mm longus; rhachis acute quadrangularis, glabra. Bractee intus glabrae; infimae ovato-oblongae, concavae, extus hirsutae, dimidio superiore dentatae, ciliatae, probabiliter totae virides; bractee paris secundi anguste oblongae, 2.5 cm longae et 0.8 cm latae, basi conduplicatae, dimidio superiore planae, hic dentatae et ciliatae, extus costa densius, ceterum apicem versus sparse hirsutae; bractee tertii paris anguste oblongae, 2.3 cm longae et 5—7 mm latae, concavae, ad apicem pauci-dentatae, extus ad apicem sparse hirsutae; bractee aliae breviores et angustiores, ad apicem semper pauci-dentatae, dentibus parvis et approximatis, plerumque utroque latere 2, costa extus semper hirsutae. Bracteolae lineares, 12 mm longae et 0.6 mm latae, acutae, 1-nerviae, glabrae. Calyx 12 mm longus, glaber, segmentis 1-nerviis 2 mm latis, anticis quarta parte, posticis sexta parte liberis, ad anthesin bilabiatis partitus. Corolla 4.8 cm longa, tubo 15 mm, faucibus 26 mm, lobis 7 mm longis. Filamenta staminum longiorum dense hirtella, 9 mm longa, staminum breviorum sparse hirtella, 4 mm longa; antherae 2 mm longae. Staminodium minutum vel nullum. Granula pollinis 78  $\mu$  longa et 47  $\mu$  diam., virgis 15 instructa. Torus multi-sulcatus. Capsula nondum nota.

Habitat Sumatram Occidentalem.

West Sumatra. West Coast Res.: Barisan Range, Tanang Talu, alt. 1020 m, BÜNNEMFYER 1034 L, typus; Distr. Agam, Brani, alt. 850 m, id. 3190 L; ibidem, alt. 980 m, id. 3155 L; ibidem, alt. 950 m, id. 3107 L.

The specimens collected by ROBINSON and KLOSS at Barong Baru and Siolak Daras, which RIDLEY (in Journ. Fed. Mal. States Mus. VIII, p. 71, 1917) refers to *Strobilanthes bibracteata* Bl., may belong to the species described above. BLUME's species is apparently confined to West Java.

A specimen collected by KORTHALS in the same residency, probably on the Singalang, comes very near to *T. menangkabwense*, and may perhaps be regarded as a variety; however, as it has neither flowers nor fruits, its exact position remains uncertain.

Very probably conspecific with KORTHALS's specimen is the plant on which MIQUEL founded his *Dicliptera? crenata* (cf. Fl. Ind. Bat. II, p. 844, 1858). This specimen was collected by HORSFIELD in Bencoolen, and is very incomplete: only one spike has been preserved, of which the first pair of bracts are wanting, and there are moreover neither flowers nor fruits.

The four Sumatran species are all very similar, but by the aid of the characters given in the key they are nevertheless easily distinguishable.

### 3. *Tetraglochidium deliense* Brem. n. spec.; typus: LOERZING 5330 L.

Rami graciles, primum quadrangulares, quadrisulcati, dense hirsuti, deinde glabrescentes. Folia sessilia vel indistincte petiolata; lamina lanceolata, foliorum majorum 7—12 cm longa et 2.5—4.0 cm lata, minorum usque ad 4 cm longa et 1.5 cm lata, omnium caudato-acuminata, basi longe attenuata, margine crenato-dentata, supra costa basin versus breviter et dense pubescens, ceterum

sparse hirsuta, subtus costa nervisque densius, inter nervos sparse pubescens, cystolithis supra conspicuis, nervis utroque latere costae in foliis majoribus 7—10, in minoribus plerumque 5. Folia bina spicam suffulcentia inaequalia, lanceolata, patentia, majus usque ad 4 cm longum. Spicae paulum complanatae, ovato-lanceolatae, 3 cm longae et 1.5—2 cm latae, bractearum paribus 5 instructae. Pedunculus 2—4 mm longus, sparse hirsutus; rhachis acute quadrangularis, subglabra. Bracteae intus glabrae; infimae ovatae, ad medium excavatae, dimidio superiore indistincte dentatae, sparsissime ciliatae, extus sparse hirsutae, probabiliter totae virides; bracteae paris secundi oblongae, 2.7 cm longae et 8 mm latae, basi conduplicatae, apicem versus planae, dimidio superiore dentatae, haud ciliatae, extus apicem versus et ad costam hirsutae; bracteae paris tertii anguste oblongae, 2 cm longae et 4 mm latae, concavae, ad apicem pauci-dentatae, extus ad costam sparse hirsutae; aliae breviores et angustiores, ad apicem pauci-denticulatae. Bracteae lineares, 11 mm longae et 0.8 mm latae, acutae, conduplicatae, 1-nerviae, glabrae. Calyx 14 mm longus, glaber, segmentis 1.8 mm latis, 1-nerviis, lobis tubo brevioribus vel ei subaequilongis. Corolla 6 cm longa, tubo 15 mm, faucibus 35 mm, lobis 10 mm longis. Filamenta staminum longiorum ad basin sparse hirtella, 10 mm longa; staminum breviorum glabra, 5 mm longa; antherae 2.5 mm longae. Stamodium parvum. Granula pollinis 93  $\mu$  longa et 56  $\mu$  diam., virgis probabiliter 15 instructa. Capsula nondum nota.

Habitat Sumatram Septemtrionalem.

S u m a t r a. East Coast Govt: Sibolangit, alt. 1000 m, LOERZING 5330 L, typus, U dupl. typi; North-western part of Karo-land, GALONGI 501 L.

This species comes very near to the preceding one, but differs in the sessile or subsessile leaves with their sparsely hirsute upper side and crenato-dentate, not serrato-dentate margin, the unequal and patent leaves at the base of the spikes, the larger size of the bracts and flowers, the less densely hirtellous filaments of the longer stamens and the much larger pollen grains. From *T. thunbergiiiflorum* it is easily distinguishable by the similarity in shape of the opposite leaves and by the more numerous teeth along their margin, and also by the larger size of the bracts and flowers, the less densely hirtellous filaments of the longer stamens and the larger size of the pollen grains. By the aid of the same characters it can be distinguished from *T. benculense*, from which it differs moreover in the larger number of bracts.

4. *Tetraglochidium thunbergiiiflorum* (S. Moore) Brem. n. comb.; *Strobilanthes thunbergiiiflora* S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925.

Rami graciles, primum profunde quadrisulcati et hirsuti, deinde sublevés et glabrescentes. Folia in petiolum dense hirsutum contracta; petiolum foliorum majorum 5—12 mm, minorum 1—2 mm longus; lamina foliorum majorum lanceolata, 4.5—9.5 cm longa et 1.8—3.3 cm lata, minorum ovata, usque ad 2 cm longa et 1.2 cm lata, omnium apice caudato-acuminata, basi in foliis majoribus contracta, in minoribus subobtusa, margine repando-dentata, costa utrimque dense hirsuta, ceterum utrimque sparse hirsuta, cystolithis supra valde conspicuis, nervis utroque latere costae in foliis majoribus 7—9, in minoribus plerumque 4. Folia bina spicam suffulcentia aequalia, subsessilia, ovato-lanceolata, 1.5 cm longa, patentia. Spicae complanatae, ovatae, 2 cm longae et 1.4 cm latae, bractearum paribus plerumque 4—5 instructae. Pedunculus 3—4 mm longus, glaber vel sparse hirtellus; rhachis acute quadrangularis, glabra. Bracteae extus sparse hirsutae, intus glabrae; infimae ovatae, vix concavae, margine fere toto dentatae, ciliatae, probabiliter totae virides; bracteae paris secundi oblongae, 2.0 cm longae et 0.9 cm latae, valde concavae, margine dimidio superiore dentatae; bracteae paris tertii lanceolato-oblongae, 1.7 cm

longae et 0.6 cm latae, planae, dimidio superiore dentatae; bracteae aliae breviores et angustiores. Bracteolae lineares, 11 mm longae et 1.2 mm latae, acutae, 1-nerviae, extus dimidio superiore hirsutae, Calyx 13 mm longus, glaber, segmentis 1.5 mm latis, 1-nerviis, lobis tubo paulo brevioribus. Corolla alba vel luteola, 4.3 cm longa, tubo 14 mm, faucibus 24 mm, lobis 5 mm longis. Filamenta staminum longiorum dense hirtella, 9 mm longa, staminum breviorum glabra, 4 mm longa; antherae 2 mm longae. Staminodium inconspicuum. Granula pollinis 75  $\mu$  longa et 45  $\mu$  diam, virgis 15 ornata. Capsula 12 mm longa et 2.4 mm diam. Semina 3.2 mm longa et 2.7 mm lata.

Habitat Sumatram Australem.

South Sumatra. Lampongs Res.: Krohe near Hoodjoong, alt. 1000 m, FORBES 1904 L.

I have not seen the type of this species, FORBES 2514, collected in the Res. Palembang, but the specimen described above, although identified by SP. LE M. MOORE as *Strobilanthes bibracteata* Bl., fits the description of *Str. thunbergii* quite well. It might be that the numbers of these specimens have been mixed up, and that FORBES 1904 of the Leiden Herbarium belongs to the same collection as FORBES 2514 of the British Museum, and that the number 1904 of the British Museum is in reality a Javanese plant, but as I have not been able to compare these specimens, this is, of course, mere hypothesis.

*T. thunbergii* and the next species differ from the other ones by the repando-dentate leaves and by the ovate shape of the smaller ones. From *T. benculense* it differs in the larger number of bracts, in the glabrescent base of the bracteoles and in the pollen grains, which are slightly smaller and provided with the ordinary 15 bands.

##### 5. *Tetraglochidium benculense* Brem. n. spec.; typus: DE VOOGD 1083 L.

Rami graciles, primum profunde quadrisulcati et hirsuti, deinde leves et glabrescentes. Folia in petiolum dense hirsutum contracta; petiolus foliorum majorum 2—6 mm, minorum 0.5—2 mm longus; lamina foliorum majorum lanceolata, 4—9 cm longa et 1.7—3.2 cm lata, minorum ovato-lanceolata, usque ad 3 cm longa et 1.2 cm lata, omnium apice caudata vel subcaudata, basi in foliis majoribus contracta, in minoribus subobtusata, margine repando-dentata, costa utrimque dense, ceterum utrimque sparse hirsuta, sicc. supra fusca vel subnigra, subtus olivaceo-brunnea, cystolithis supra valde conspicuis, nervis utroque latere costae in foliis majoribus 6—7, in foliis minoribus 3—4. Folia bina spicam suffulcientia inaequalia, subsessilia, lanceolata vel ovato-lanceolata, 3 vel 1.7 cm longa et 1.2 vel 0.8 cm lata, patentia. Spicae vix complanatae, ovatae, 2.7 cm longae et 1.7 cm latae, bractearum paribus 3 instructae. Pedunculus 2—3 mm longus, hirsutus; rhachis acute quadrangularis, brevissima, glabra. Bracteae extus hirsutissimae, intus glabrae; infimae late ovatae, vix concavae, margine tota dentatae et ciliatae, probabiliter totae virides; bracteae paris secundi anguste ovatae, 2.2 cm longae et 1.1 cm latae, vix concavae, margine tota dentatae et ciliatae; bracteae paris tertiæ lanceolatae, 12 mm longae et 5 mm latae, dimidio superiore dentatae, totae ciliatae. Bracteolae linearilanceolatae, 11 mm longae et 2 mm latae, conduplicatae, apice subobtusatae, extus ubique sed praesertim ad apicem et ad costam pilis longis et fortibus hirsutae, 1-nerviae. Calyx 13 mm longus, subglaber, segmentis 1-nerviis, anticis interdum ad costam parcissime hirsutis, omnibus 2.2 mm latis, quarta parte liberis. Corolla 3.5 cm longa, tubo 10 mm, faucibus 18 mm, lobis 7 mm longis. Filamenta staminum longiorum dense hirtella, 7 mm longa; breviorum glabra, 4 mm longa; antherae 3 mm longae. Staminodium inconspicuum. Granula pollinis 80  $\mu$  longa et 50  $\mu$  diam., virgis 12 munita. Capsula nondum nota.

Habitat Sumatram Occidentalem.

Sumatra. Bencoolen Res.: Kota Donak (Lebong), alt. 1000 m, DE VOOGD 1083 L, typus.

This species comes nearest to *T. thunbergiiflorum*, from which it differs i.a. in the larger size of the spikes, which moreover consist of only three pairs of bracts; the one on the outside from top to base hirsute bracteoles, and the structure of the somewhat larger pollen grains: the latter are provided with 12 bands, whereas those of *T. thunbergiiflorum*, like those of the other species described in this work, possess 15 bands.

6. **Tetraglochidium Hallierii** Brem. n. spec.; typus: HALLIER 611 L.

Rami primum quadrisulcati et dense pubescentes, deinde leves et glabrescentes. Folia in petiolum breviter pubescentem contracta; petiolus in foliis majoribus usque ad 1.5 cm, in minoribus vix 5 mm longus; lamina foliorum majorum lanceolata, circ. 12 cm longa et 4.5 cm lata, minorum elliptica, circ. 5.5 cm longa et 3.7 cm lata, omnium apice caudato-acuminata, basi sensim in petiolum contracta, margine repando-dentata, costa subtus basin versus densius pubescens, ceterum utraque facie glabra, cystolithis utrimque distinguendis, nervis utroque latere costae in foliis majoribus plerumque 7, in foliis minoribus 5. Folia bina spicam suffulcientia parva, subaequalia, sessilia. Spicae ovatae, 3 cm longae et 1.8 cm latae, complanatae, bractearum paribus 3 instructae. Pedunculus dense pubescens, 2—3 mm longus. Bractee extus intusque glabrae; infimae ovatae, planae, margine fere tota dentatae et ciliatae; bractee paris secundi lanceolatae, basi conduplicatae, 2.5 cm longae et 0.9 cm latae, margine dimidio superiore dentatae, totae ciliatae; bractee paris tertii lineari-oblongae, 13.5 mm longae et 3 mm latae. Bracteolae lineares, 14.5 mm longae et 1.5 mm latae, acutae, glabrae, costa tamen parce hirsutae, basi conduplicatae. Calyx 15 mm longus, glaber, segmentis 2.7 mm latis, supra medium connatis sed faciliter discissis, bracteolis similioribus, apice tamen mucronatis et incurvatis. Corolla 4 cm longa, probabiliter violacea, tubo 10 mm, faucibus 25 mm, lobis 5 mm longis. Filamenta staminum longiorum hirtella, 10 mm longa; breviorum glabra, 5 mm longa; antherae 2.5 mm longae. Granula pollinis 78  $\mu$  longa et 48  $\mu$  diam., virgis 15 ornata. Capsula 16 mm longa et 4.5 mm diam. Semina 4.5 mm longa et 2.5 mm lata.

Habitat partem terrae Borneënsis austro-occidentalem.

Borneo. Western Division: G. Damoos, HALLIER 611 L, typus.

This species shows a strong resemblance to *T. bibracteatum*, but differs by the presence of well developed bracteoles and by the hirtellous filaments of the longer stamens, characters in which it resembles the Sumatran species, and further in the larger leaves with their repando-dentate, not serrato-dentate margin, the broader spikes and larger calyces. Among the Sumatran species *T. benculense* is the only one whose spikes are like those of *T. Hallierii* provided with three pairs of bracts, and in this species the leaves are smaller, the smaller ones subobtuse at the base, the bracts strongly hirsute, and the pollen grains provided with 12 instead of 15 bands.

#### Index Specierum.

5. *benculense* Brem. n. spec. — Sumatra —
1. *bibracteatum* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.); syn.: *Goldfussia bibracteata* (Bl.) Nees — Java —
3. *deliense* Brem. n. spec. — Sumatra —
6. *Hallierii* Brem. n. spec. — Borneo —
- ? *hirtisepalum* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —

- ? **Maingayi** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Peninsula Malayana —  
 2. **menangkabwense** Brem. n. spec. — Sumatra —  
 4. \* **thunbergiiflorum** (S. Moore) Brem. n. comb. (*Strobilanthes* S. Moore) — Sumatra —

*Tetraglochidii* species sub nomine generico *Strobilanthe* nuncupatae.

- bibracteata* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 = *Tetraglochidium bibracteatum* (Bl.) Brem. n. comb.  
*hirtisepala* Clarke in Journ. As. Soc. Beng. LXXIV, p. 655, 1908 = ? *Tetraglochidium hirtisepalum* (Clarke) Brem. n. comb.  
*Maingayi* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 448, 1884 = ? *Tetraglochidium Maingayi* (Clarke) Brem. n. comb.  
*thunbergiiflora* S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925 = *Tetraglochidium thunbergiiflorum* (S. Moore) Brem. n. comb.

#### GROUP Q.

Group Q comprises but a single genus, *Psacadopaepale* Brem., which is apparently nearly related to the genera forming group P. It differs from them in the carunculate pollen (Tab. I. J), the exserted outer stamens and the gregarious growth. Whether the gregarious growth of *Psacadopaepale* is accompanied by simultaneous flowering, is unknown, and it is therefore difficult to estimate the value of this character, for gregarious growth without simultaneous flowering might occur also in some of the genera of group P: on this point we are insufficiently informed. The other characters are in themselves not so important that they would justify the creation of a new group, and it is mainly for convenience' sake that *Psacadopaepale* is kept apart.

In the form of the bracts *Psacadopaepale* reminds one of *Lamiacanthus*, but this is to be regarded as a mere analogy, for in other respects, e.g. in the resupinate corolla with its fairly long throat and in the structure of the testa (Tab. V D), it differs so widely from the group to which that genus belongs, that a near affinity seems excluded.

36. **Psacadopaepale** Brem. n. gen.; typus: *Ps. assimulata* (S. Moore) Brem. n. comb. (*Strobilanthes* S. Moore).

Plantae plietesiae, vix anisophyllae, gregariae dictae. Folia inferiora in petiolum satis longum contracta, superiora subsessilia, omnia supra cystolithis lineolata. Inflorescentiae spiciformes, abbreviatae, ramos ramulosque terminantes, foliis subsessilibus suffultae. Bracteae rhomboideae, omnes vel infimae solae in appendicem foliaceam productae, basi in petiolum brevem sed latum, concavum et marginibus florem pro parte amplectentem contractae, e basi plurinerviae, margine et facie superiore costae ciliatae, serie pilorum in costa inductorum basin versus bifurcata et ultimo cum ciliis marginalibus confluyente, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae anguste lanceolatae, basi in petiolum contractae, 1-nerviae. Calyx aequaliter 5-partitus, lobis linearibus acutis, apicem versus ciliatis. Corolla colore ignoto, resupinata, tubo tereti torso in fauces campanulatas ei subaequilongas ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia, longiora exserta, breviora inclusa, omnia erecta; filamenta omnia glabra; antherae erectae, apice obtusae. Staminodium nullum. Granula pollinis (Tab. I. J) breviter ellipsoidea, virgis uniseriatim carunculatis ornata. Ovarium comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, 4-seminalis, retinaculis in aciculum rectam exeuntibus. Semina (Tab. V D) luteo-brunnea, parvo-areolata, extra areolam pilis annulatis rigidulis vestita.

Distributum in Sumatra. Species certe 2.

Species typica: *Ps. assimulata* (S. Moore) Brem. n. comb. (*Strobilanthes* S. Moore).

1. *Psacadopaepale assimulata* (S. Moore) Brem. n. comb.; *Strobilanthes assimulata* S. Moore in Journ. of Bot. LXIII, Suppl., p. 77, 1925.

Caulis ramique obtuse quadrangulares et quadrisulcati, primum ad margines sulcorum pubescentes, mox glabrescentes, sicc. nigricantes. Folia inferiora in petiolum canaliculatum, ad margines hirtellum, usque ad 4 cm longum contracta; superiora sessilia; lamina lanceolata, circ. 12 cm longa et 4.7 cm lata, utroque extremo attenuata, margine grandi-dentata, herbacea, costa utrimque et nervis subtus parce hirtella sed ceterum subglabra, nervis utroque latere costae 4—9 utrimque prominulis, venulis paucis ad nervos perpendicularibus. Folia bina spicam suffulcientia sessilia usque ad 7 cm longa et 3 cm lata. Pedunculus vix 2 mm longus; rhachis acute quadrangularis, glabra. Bracteae infimae e parte basali rhomboidea in appendicem foliaceam, basi conduplicatam, supra basin recurvatam exeuntes; aliae appendice foliacea carentes, 13—15 mm longae et 8—9 mm latae, margine ciliatae, dorso hirtae, supra glabrae, 5-nerviae. Bracteolae 12 mm longae, lamina lineari-lanceolata 7.5 mm longa et 1.7 mm lata, acuta, basi in petiolum circ. 4.5 mm longum contracta, dorso praesertim costa et margine hirsutae. Calyx 14.5 mm longus, tubo usque ad 3 mm longo, lobis 11.5 mm longis et 1.5 mm latis, apicem versus costa et margine ciliatis. Corolla 2.9 cm longa, tubo 11 mm, faucibus 12 mm, lobis 6 mm longis. Stamina longiora filamentis 10 mm, breviora filamentis 6 mm longis; antherae 2.2 mm longae. Granula pollinis (Tab. I. J) virgis 18 munita, 58  $\mu$  longa et 42  $\mu$  diam. Capsula 12 mm longa et 4 mm lata, comosa, dorso apicem versus breviter hirtella. Semina (Tab. VD) 3 mm longa et 2 mm lata.

Habitat Sumatram Australem.

S u m a t r a. Bencoolen Res.: G. Dempo, alt. 1200 m, FORBES 2594 L, exemplum typi, "in extensive patches".

The "*Acanthopale*" found by VAN STEENIS at an altitude of 500—1000 m in the Ranau Region (Bull. Jard. Bot. de Buitenzorg, Sér. 3, XIII, p. 14, 1933) may have been this species, but as no details are given, and as the specimen itself (v. STEENIS 3422) was not available, this is of course mere hypothesis. It is also possible that this plant may have been *Pteroptychia Ridleyi* (Merr.) Brem. or even the in habit rather similar *Semnostachya nigrescens* Brem., which have both been distributed by the Buitenzorg Herbarium as "*Acanthopale* spec.", or a related species. On p. 16 of the same paper v. STEENIS mentions a "dense monotonous undergrowth of *Strobilanthes* sp." at an altitude of 1300—1500 m. As FORBES states that he found the species described above "in extensive patches", and as so far no other gregarious *Strobilanthinae* are known from this region, these plants too might have been identical with the species described above. However, as two species belonging to the genus *Strobilanthes* itself, in which this mode of development is probably general, are known already from Sumatra, the possibility that the gregarious plants observed by v. STEENIS belonged to this genus, is not excluded.

A second species belonging to the genus *Psacadopaepale* is represented by a plant collected by the Central Sumatra Expedition 1877—78 on G. Korinchi between Lubook Gadang and the Expedition's first camp. It is mentioned by v. HASSELT and BOERLAGE in VETH's report on the results of the expedition under the name *Strobilanthes parabolica* Nees. The specimen is preserved in the Leiden herbarium. The nature of the bracts and of the pollen grains prove that it is a *Psacadopaepale* differing from the species described above i.a. in

the presence of a foliaceous appendix to each of the bracts and by the smaller size of the corolla. The material, however, is too incomplete for a description. Whether the *Strobilanthes parabolica* Nees mentioned by RIDLEY (in Journ. Fed. Mal. St. Mus. VIII, p. 72, 1917) as collected at Sungei Kumbang on Mt Korinchi (alt. 1750 m) is the same species, is difficult to say. It may have been *Parastrobilanthes pycnocephala* Brem.

### GROUP R.

The position of the genus *Pachystrobilus* is difficult to determine. In the structure of the testa it resembles the following group, from which it differs however in the structure of the androecium. The affinity with the genera belonging to the two preceding groups is probably closer. However, the large, non-resupinate corolla and the subglobose pollen grains are, in combination with the structure of the testa, characters of sufficient importance to justify the creation of a new group.

37. *Pachystrobilus* Brem. n. gen.; typus: *P. involucratus* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.).

Plantae plietesiaie paulum anisophyllae. Folia petiolata, cystolithis parvis lineolata. Inflorescentiae terminales, spiciformes, abbreviatae et crassae, basi foliis binis parvis sessilibus vel subsessilibus suffultae. Bracteae apicem versus dentatae, e basi plurinerviae, persistentes; exteriores ovatae vel cordatae, calyce multo longiores. Flores in axillis bractearum solitarii, bracteolati. Bracteolae lineares, ad apicem pauci-dentatae, calyce paulo longiores. Calyx ad anthesin aequaliter 5-fidus, postea 5-partitus, lobis linearibus, ad apicem pauci-dentatis. Corolla alba vel viridula, recta et non resupinata, tubo tereti in fauces campanulatas tubo fere bis longiores ampliato, lobis subaequalibus rotundatis. Stamina 4, didynamia vel subaequalia, inclusa et erecta; filamenta omnia glabra vel exteriora basi parce hirtella; antherae erectae, apice obtusae, basi vix emarginatae, a latere complanatae. Staminodium triangulare. Granula pollinis subglobose, nunc virgis septatis in polis haud cohaerentibus (Tab. II D), nunc virgis uniseriatim carunculatis (Tab. II E) instructa. Ovarium glabrum vel comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, glabra vel comosa, 4-seminalis, retinaculis acutis. Semina brunnea, fere tota pilis undulatis longis vestita.

Distributum in Java. Species 2.

Species typica: *P. involucratus* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.).

The two species brought together in this new genus, differ considerably in the relief of the pollen grains (Tab. II D, E), and for this reason I have long hesitated before I decided to accept them as congeneric. However, as they resemble each other in the structure of the spikes, the non-resupinate corolla and the exareolate seeds covered with long undulating hairs, it seemed to me that the difference in the pollen structure was outweighed by the rather striking similarity in other respects. Moreover, since a similar difference in the pollen structure had been found in the genus *Adenostachya*, whose two species resemble each other even more closely than the two *Pachystrobilus* species, the way for this decision had already been cleared.

The resemblance of the pollen grains of *Pachystrobilus hirsutus* Brem. with those of *Psacadopaepale* is, notwithstanding the circumstance that the latter are distinctly ellipsoidal and the first subglobose, very great, but the resemblance with those of *Adenostachya parvifolia* Brem. is more superficial, for in the latter the excrescences mark the spots where the transverse ridges join the margin, whereas in *Pachystrobilus hirsutus* and in *Psacadopaepale* the

bands are not septate but solid, and the excrescences are arranged in a single row in their middle.

### Key to the Species.

1. Leaves and bracts glabrous or sparsely hispidulous. Spikes pedunculate. Outer bracts cordate. Stamens didynamous. Pollen grains provided with septate bands. — Java . . . . . 1. *P. involucratus* (Bl.) Brem. n. comb.
  - a. Leaves with sparsely pubescent midrib and nerves but otherwise glabrous. Bracts glabrous. — Java . . . . . var. *glaber* Brem. n. nom.
  - : Leaves on the upper side and along the margin hispidulous. Bracts hispidulous. — West Java . . . . . var. *tjibodensis* (Hochr.) Brem. n. comb.
- : Leaves and bracts hirsute. Spikes sessile or subsessile. Outer bracts ovate. Stamens subequal. Pollen grains provided with carunculate bands. — West Java . . . . . 2. *P. hirsutus* Brem. n. spec.

1. *Pachystrobilus involucratus* (Bl.) Brem. n. comb.; *Strobilanthes involu-crata* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826; Nees in Wall., Pl. As. Rar. III, p. 85, 1832; id. in DC., Prodr. XI, p. 184, 1847; Miq., Fl. Ind. Bat. II, p. 798, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 217, 1912; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 44, 1912; Koorders, Fl. v. Tjibodas III (1), p. 130, 1918; Hochr. in Candollea V, p. 227, 1934.

Habitat Javam.

Species huius varietates duae distinctae sunt:

*P. involucratus* (Bl.) Brem. var. *glaber* Brem. n. nom.; *Strobilanthes invo-lu-crata* Bl. var. *genuina* Hochr. in Candollea V, p. 227, 1934.

Planta parce ramosa, 0.5—1.5 m alta. Caulis ramique glabri, primum plus minusve sulcati. Folia in petiolum glabrum, 0.5—3.5 cm longum contracta; lamina elliptica, 6—15 cm longa et 3—7 cm lata, utroque extremo contracta, margine remote et obtusius denticulata, herbacea, costa nervisque utrimque sparse pubescens, ceterum glabra, utrimque cystolithis parvis dense lineolata, nervis utroque latere costae 6—7. Folia bina spicam suffulcencia sessilia et basi obtusa. Spicae pedunculatae. Pedunculus glaber, 1—2.5 cm longus. Spica ipsa 4—5 cm longa, ad anthesin 2.2 cm, postea usque ad 5 cm diam., bracte-arum paribus 5 instructae. Bracteae glabrae, apicem versus vix distincte denti-culatae, margine haud recurvatae basi cordatae; bracteae infimae et pari secundi steriles; aliae fertiles; infimae 3.5 cm longae et latae; paris secundi 3.5 cm longae et 2.5 cm latae, carinatae; paris tertii 4 cm longae et 1—2 cm latae; aliae angustiores. Bracteolae lineares, ad anthesin 22 mm longae et 4.5 mm latae, postea usque ad 35 mm longae et 5 mm latae, apice obliquae et obtusae, basin versus carinatae, apicem versus planae, apice denticibus 3 vel 4 instructae. Calyx ad anthesin 1.7 cm longus, postea usque ad 3 cm accrescens, glaber, segmentis subaequalibus linearibus, ad anthesin 2—2.5 mm, postea usque ad 6 mm latis, carinatis, apice obtusis et pauci-dentatis. Corolla alba vel viridula, 5 cm longa, extus glabra, tubo 15 mm, faucibus 32 mm, lobis 7 mm longis, tubo faucibusque intus breviter pubescentibus. Filamenta glabra, staminum longiorum 11 mm longa, breviorum 5.5 mm; antherae 4 mm longae. Granula pollinis (Tab. II D) subglobosa, 60  $\mu$  longa et 58  $\mu$  diam., virgis 15 septatis, polis non cohaerentibus instructa. Capsula 2 cm longa, glabra. Semina 6.5 mm longa et 6 mm lata.

Habitat Javam.

West Java. Buitenzorg Res.: Salak, alt. 1300 m, RAAP 197 L; ibidem, Sukamantri, alt. 1000 m, HOCHREUTINER 200 G n.v.; ibidem, Pasiran Tengah,



id. 1720 G n.v.; G. Gedeh, Tjibodas, PLOEM 403 BD; ibidem, BURRET 152 BD; G. Seribu, BLUME s.n. L, typus; Priangan Res.: Malabar, alt. 1500 m, PULLE s.n. U; Pengalengan, WICHURA 2154 BD; Papandajan, v. HARREVELD s.n. PAS. East Java. Besuki Res.: G. Idjen, Pantjur, KOORDERS 20806 L.

**P. involucratus** (Bl.) Brem. var. **tjibodensis** (Hochr.) Brem. n. comb.; *Strobilanthes involucrata* Bl. var. *tjibodensis* Hochr. in Candollea V, p. 227, 1934; — *Str. involucrata* Bl. var.  $\beta$  Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826; Nees in DC., Prodr. XI, p. 184, 1847, syn. *Ruellia lupulina* h. Wight excl. quae fide Clarke in Hook.f., Fl. Brit. Ind. IV, p. 444, 1884 est *Nilgirianthus campanulatus*; eodem modo Miq., Fl. Ind. Bat. II, p. 798, 1858; — *Str. erosa* Nees in DC., Prodr. XI, p. 180, 1847; Miq., Fl. Ind. Bat. II, p. 797, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 219, 1912; S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925.

Varietas a typo recedens foliis supra et secundum marginem hispidulis, bracteis hispidulis.

Habitat Javam.

West Java. Bantam Res.: G. Kentjana, coll. indig. s.n. L; Buitenzorg Res.: Tjibodas, VALETON s.n. L; ibidem, HOCHREUTINER 37 G, typus var.; Priangan Res.: Pengalengan, FORBES 609 L; G. Patuha, REINWARDT s.n. L.

The two varieties occur apparently side by side, and the difference is so slight that one wonders why the earlier authors, by whom differences of much greater importance were often neglected, paid so much attention to it.

2. **Pachystrobilus hirsutus** Brem. n. spec.; typus: coll. ign. s. n. L.; co-typus: WARBURG 3030 BD.

Planta valde ramosa. Caulis ramique primum hirsuti, deinde plus minusve glabrescentes, internodiis bisulcatis. Folia in petiolum dense hirsutum, 1—2 cm longum contracta; lamina ovata vel elliptica, 7—15 cm longa et 2.8—6 cm lata, apice caudata, basi sensim contracta, margine densius dentata, herbacea, costa utrimque densissime, nervis sparsius hirsutis, ceterum utrimque parce hirsuta, pilis facie superiore insertis basi incrassatis, mox deciduis: utrimque cystolithis parvis dense lineolata, nervis utroque latere costae 6—10. Folia bina spicam suffulciantia breviter petiolata. Spicae sessiles vel subsessiles, 4 cm longae et ad anthesin 2 cm diam., postea usque ad 6 cm diam., complanatae, bractearum paribus 5 instructae. Bractee infimae ovatae, apicem versus breviter et remotius dentatae, ad anthesin 3 cm longae et 1.5 cm latae, postea usque ad 4 cm accrescentes, basi obtusae, extus hirsutae, intus glabrae, parte basali erecta, conduplicata et carinata, parte superiore recurvata, steriles; bractee paris secundi oblongo-obovatae, ad anthesin 2.5 cm longae et 1 cm latae, postea usque ad 3 cm accrescentes, planae, dimidio superiore crenatodentatae, apicem versus foliaceae, e basi plurinerviae, extus hirsutae, intus glabrae, steriles; bractee paris tertii lanceolatae, ad anthesin 2.5 cm longae et 0.8 cm latae, postea usque ad 4 cm accrescentes, concavae, e basi plurinerviae, extus hirsutae, parte apicali recurvata, dentata, interdum steriles; bractee paris quarti planae, extus apicem versus hirsutae, ceterum maxime ut bractee tertii paris, semper fertiles; bractee quinti paris aliis multo angustiores, probabiliter semper steriles. Bracteolae lineares, ad anthesin 2 cm longae et 4.5 mm latae, postea usque ad 3 cm accrescentes, acutae, apice pauci-denticulatae, extus apicem versus hirsutae. Calyx 1.5 cm longus, post anthesin usque ad 2.5 cm accrescens, segmentis linearibus, acutis, apice pauci-denticulatis et pubescentibus, ceterum glaberrimis. Corolla 4.5 cm longa, tubo 10 mm, faucibus 23 mm, lobis 12 mm longis, extus glabra. Filamenta omnia circ. 8 mm longa, staminum exteriorum basin versus parce hirtella; antherae 2.2 mm

longae. Granula pollinis (Tab. II E) 55  $\mu$  longa et 52  $\mu$  diam., virgis 15 carunculatis munita. Capsula 2 cm longa, apice parce hirsuta. Semina 6 mm longa et 5 mm lata.

Habitat Javam Occidentalem.

West Java. Priangan Res.: G. Patuha, road to Telaga Patengan, WARBURG 3030 BD, co-typus florifer; s.l., coll. ign. s.n. L, typus fructifer.

### GROUP S.

The four genera brought together in group S resemble each other in the structure of the androecium and in that of the testa (Tab. V H). The androecium shows the "*Goldfussia*-arrangement", i.e. the two longer stamens are unequal so that one anther stands just above the other, and the two shorter stamens are very short and strongly incurved; the anthers moreover are all short and horizontal, the two lower ones facing each other. In *Difflugossa glandulosa* Brem. the inner stamens are completely suppressed.

The seeds (Tab. V H) are completely or nearly completely exareolate and covered with long and thin, strongly hygrometric, undulating hairs. In this respect they resemble the preceding group.

The corolla with its long campanulate throat resembles that of group P.

The four genera are easily distinguishable. *Goldfussia* and *Dossifluga* (this name is an anagram of *Goldfussia*) are provided with shortened, more or less capituliform spikes, the two other genera with lax ones. *Dossifluga* differs from *Goldfussia* in habit, in the small, sessile, ovate-orbicular leaves and in the shortness of the bracts, whereas *Semnostachya* differs from *Difflugossa* (this name too is an anagram of *Goldfussia*) by the persistent bracts, resupinate corolla and the presence of a small areola in the seed.

38. *Goldfussia* Nees in Wall., Pl. As. Rar. III, p. 75 et 87, 1832, p.p.; id. in DC., Prodr. XI, p. 101 et 171, 1847, p.p.; *Strobilanthes* species Blume, T. Anderson et auctorum aliorum.

Plantae plietesiae, anisophyllae. Folia sessilia vel petiolata, interdum asymmetrica. Inflorescentiae terminales et axillares, spiciformes, abbreviatae. Bracteae calyce longiores, e basi 3- vel 5-nerviae, plerumque persistentes. Flores in axillis bractearum solitarii. Bracteolae bracteis minores et praesertim angustiores, interdum suppressae. Calyx subaequaliter 5-partitus, lobis linearibus acutis, mediano interdum majore, aestivatione valvata. Corolla violacea vel alba, resupinata, tubo tereti torso in fauces campanulatas tubo longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia, inclusa; filamenta staminum longiorum inaequalia, erecta; breviorum aequalia, incurvata; omnia glabra vel longiora hirtella; antherae suborbiculares vel ellipsoideae, apice obtusae, basi vix emarginatae, thecis patentibus, horizontales. Staminodium minutum vel nullum. Granula pollinis (Tab. II A) ellipsoidea, virgata, virgis septatis. Ovarium pilis capitatis breviter comosum, utroque loculo ovulis 2. Stylus glaber vel subglaber. Capsula fusiformis, 4-seminalis, retinaculis acutis. Semina (Tab. V H) luteo-brunnea vel brunnea, fere tota pilis longis meandrinis, madefactis elastice erigentibus vestita.

Distributum a clivis Himalayae usque ad Javam et Insulas Philippinas. Species plus quam 30.

Species typica (lectotypus meus): *G. capitata* Nees.

The genus *Goldfussia* is but poorly represented in the Malay Archipelago. It is of course not impossible that Sumatra and Borneo will prove to possess more species than the three described below, but the main area of distribution

certainly does not lie here, but further to the north, namely in the mountainous regions separating Indo-China from China.

In the Malay Archipelago the genus occurs in Sumatra, Java and Borneo, and further in Palawan and in the Philippines. In Palawan it is represented by *G. palawanensis* (Elm.) Brem. n. comb. (*Strobilanthes* Elm.), and in the Philippines by *G. pluriformis* (Clarke) Brem. n. comb. (*Strobilanthes* Clarke), *G. Mearnsii* (Merr.) Brem. n. comb. (*Strobilanthes* Merr.) and *G. apoënsis* (Elm) Brem. n. comb. (*Hypoëstes* Elm., by Merrill transferred to *Strobilanthes*).

#### Key to the Species of Sumatra, Java and Borneo.

1. Leaves either symmetric or but slightly asymmetric, and both halves at the base acute . . . . . 2
  - : Leaves strongly asymmetric, the large half as a rule rounded at the base . . . . . 3
2. Bracteoles present. Calyx lobes ciliate along the margin and on the keel, subequal. Style glabrous. — Sumatra and Java . . . . . 1. *G. speciosa* (Bl.) Brem. n. comb.
  - : Bracteoles absent. Calyx covered on the outside with capitate hairs; the median lobe longer than the others. Style glandular-hirtellous. — Sumatra . . . . . 2. *G. talangensis* Brem. n. spec.
3. Bracts entire, outside pubescent, deciduous. Shoots, petioles and nerves puberulo-pubescent. — North Borneo . . . . . 3. *G. kinabaluensis* (Stapf) Brem. n. comb.
  - : Bracts dentate, outside hirsute, persistent. Shoots, petioles and nerves hirsute. — A native of Khasia, in West Java escaped from cultivation . . . . . 4. *G. glomerata* Nees.

1. *Goldfussia speciosa* (Bl.) Brem. n. comb.; *Strobilanthes speciosa* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826; Nees in DC., Prodr. XI, p. 195, 1847; Miq., Fl. Ind. Bat. II, p. 804, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 219, 1912; — *Str. apoënsis* Hochr. in Candollea V, p. 228, 1934.

Planta 0.5 m alta, ramosior. Caulis ramique graciles, subteretes, densissime puberuli, internodiis indistincte bisulcatis. Folia subsessilia, majora tamen petiolo densissime pubescente, usque ad 8 mm longo instructa, minora contra saepe sessilia; lamina leviter asymmetrica, foliorum majorum lanceolata vel elliptica, 4—13 cm longa et 1.5—6.2 cm lata, minorum lanceolata, plus quam dimidio brevior, omnium caudata, basi acuta, margine acute-dentata, supra costa densius, ceterum sparse hirsuta, subtus costa nervisque densius, inter nervos sparse pubescens, supra cystolithis dense, subtus sparsius lineolata, nervis utroque latere costae in foliis majoribus 5—6, in foliis minoribus 3—5. Spicae longius pedunculatae, 1.5—1.7 cm longae et 7—8 mm diam., bractearum paribus 3 vel 4 instructae. Pedunculus 1—4 cm longus, dense puberulus, haud raro uno vel duobus paribus foliorum parvorum, plerumque mox deciduorum munitus et ex axillis foliorum illorum interdum ramificatus. Bracteae lineares, 14—17 mm longae et 3.5 mm latae, concavae, 3-nerviae, margine et nervis pilis apicem versus longitudine augescentibus ciliatae; infimae steriles et mox deciduae. Bracteolae lineari-lanceolatae, 12 mm longae et 2 mm latae, acutae, 1-nerviae, margine et costa ciliatae, nervis brevius pubescentes. Calyx 12 mm longus, lobis 1.5 mm latis, margine et carina ciliatis. Corolla alba, 3—4 cm longa, extus glabra, tubo 12—14 mm, faucibus 15—20 mm, lobis subacuminatis 3—6 mm longis. Filamenta staminum longiorum 5—7 mm longa, breviorum

1—1.5 mm; antherae 2.2 mm longae. Granula pollinis 65  $\mu$  longa et 42  $\mu$  diam., virgis 24 ornata. Stylus glaber. Capsula 15 mm longa et 3 mm diam. Semina 3 mm longa et 2.5 mm lata.

Habitat Sumatram et Javam.

Sumatra. West Coast Res.: G. Singalang, KORTHALS s.n. L; Palembang Res.: near Muara Mengkulem, FORBES 3122 L.

West Java. Buitenzorg Res.: G. Salak, above Sukamantri, alt. 700 m, HOCHREUTINER 101 G, type of *Strobilanthes apoensis* Hochr.; G. Gedeh-Megamendoong, BLUME s.n. L, type; Priangan Res.: s.l.; WARBURG 3028 BD (quoted by LINDAU under *Str. exsucca* Lindau, which is *G. glomerata* Nees); Lembang, KORTHALS s.n. L; Tjinjiruan, SMITH and RANT 220 L.

East Java. Malang Res.: Poospo, alt. 600 m, BACKER 36862 PAS; Sukapura, alt. 1000 m, id. 37572 PAS; Besuki Res.: G. Hiang, alt. 1400 m, KOORDERS 43625 L.

A remarkable feature of this species are the 24 bands of the pollen grains. From the next species, which it resembles in the subsymmetric leaves, it differs moreover in the slender subterete shoots, the smaller number of nerves in the leaves, the large size of the bracts, the presence of bracteoles, the equally 5-partite, nearly glabrous and much longer calyx and the glabrous style.

The "*Strobilanthes speciosa* Bl" mentioned by JUNGHUHN (in Java, 1st ed. III, p. 546, 1853, 2nd ed. II, p. 575) in the description of his ascent of G. Tjikoraj, is apparently a true *Strobilanthes*, perhaps *Str. Boerlagei* Brem., for it is said to grow gregariously, to be 1.5—2 m high and to possess white capitula.

## 2. *Goldfussia talangensis* Brem. n. spec.; typus: BÜNNEMEYER 5126 L.

Planta ramosior. Caulis ramique robustiores, acute quadrangulares vel quadricostati, apicem versus interdum anguste quadri-alati. Folia basin versus valde contracta et fere ad costam redacta, haud distincte petiolata tamen; lamina lanceolata, foliorum majorum usque ad 18 cm longa et 6.4 cm lata, minorum multo brevior et angustior, omnium apice caudata, basin versus in pseudopetiolum longum contracta, margine calloso-dentata, basin versus integra, costa supra versus basin pubescens, ceterum utrimque glabra, subtus tamen glandulis sessilibus minimis dense punctata, cystolithis utrimque conspicuis, nervis utroque latere costae in foliis majoribus usque ad 15, in minoribus 5—6. Spicae in triades terminales et axillares dispositae, interdum subpaniculatae. Pedunculus communis triadis usque ad 5 cm longus; pedunculi spicarum 1—2 cm longi, anguste quadri-alati et bifariam pubescentes; spicae laterales bracteis linearibus circ. 1 cm longis, mox deciduis suffultae. Bractee florales 7- vel 8-parae, mox deciduae; infimae anguste triangulares, 12 mm longae et 3 mm latae, conduplicatae et carinatae, e basi indistincte 5-nerviae, ceterum penninerviae, utrimque glabrae, margine integrae, steriles; bractee paris secundi ovatae, 10 mm longae et 6 mm latae, plerumque flores rudimentarios suffulcientes; bractee aliae gradatim magnitudine decrescentes, superiores interdum margine et carina pilis capitatis longis ciliatae, omnes mox deciduae. Bracteolae nullae. Calyx extus pilis capitatis hirsutus, intus glaber, tubo 1.3 mm longo, lobis inaequalibus, mediano ad anthesin 9.5 mm longo et 1.7 mm lato, aliis 6 mm longis et 1.3 mm latis. Corolla 3 cm longa, extus subglabra, tubo 5 mm, faucibus 20 mm, lobis ovatis rotundatis 5 mm longis. Filamenta staminum longiorum 6 et 8 mm longa, breviorum 1 mm longa; antherae staminum longiorum 1.3 mm, breviorum 1.1 mm longae. Granula pollinis 58  $\mu$  longa et 36  $\mu$  diam., virgis 15 ornata. Stylus pilis capitatis hirtellus. Capsula ignota.

Habitat Sumatram.

Sumatra. West Coast Res.: G. Talang, Laras Talang, alt. 1500 m, BÜNNEMEYER 5126 L, typus.

*G. talangensis* differs from the other species belonging to this genus by the conspicuous difference in size between the calyx lobes, the median one being about  $1\frac{1}{2}$  times as long as the others. In the shape of the leaves it shows a superficial resemblance to the species of the genus *Pteracanthus*, from which it differs fundamentally in the structure of the androecium and by the very marked anisophylly.

3. *Goldfussia kinabaluensis* (Stapf) Brem. n. comb.; *Strobilanthes kinabaluensis* Stapf in Trans. Linn. Soc., Ser. 2, IV, p. 214, 1894; S. Moore in Journ. Linn. Soc. XLII, p. 120, 1914.

Planta 2 m alta, ramosior. Caulis ramique robustiores, obtuse quadrangulares, fulvo-puberuli vel tomentelli. Folia longe petiolata; petiolus fulvo-puberulus vel tomentellus usque ad 3.5 cm longus; lamina valde asymmetrica, dimidio angustiore semi-lanceolato, basi acuto, dimidio latiore semi-ovato-lanceolato, basi plerumque rotundato, ad petiolum tamen subito contracto et paulum decurrente, nervis plerumque quam dimidio altero uno plus instructo, foliorum majorum usque ad 20 cm longa et 10 cm lata, minorum plus quam dimidio brevior et angustior, omnium apice caudato-acuminata, margine inaequaliter crenata vel repando-denticulata, supra ubique sed praesertim costa nervisque hirtella, subtus ubique sed praesertim costa nervisque molliter fulvo-pubescentis, utrimque cystolithis gracillimis sparsa, sicc. supra saturate olivacea, subtus dilute olivacea, nervis utroque latere costae 4—11. Spicae plus minusve paniculatae, 1.5—1.8 cm longae et 1.0—1.2 cm latae, bractearum paribus 6—8 instructae. Pedunculus dense fulvo-tomentellus, 8—20 mm longus. Bractee e basi anguste lanceolata in caudam longam obtusam attenuatae, usque ad 2 cm longae et 3 mm latae, 3-nerviae, margine integrae, extus praesertim costa et margine, intus apicem versus pubescentes; infimae interdum steriles; pares sequentes 3—4 fertiles; superiores denuo steriles; omnes mox deciduae. Bracteolae lineares, 13 mm longae et 2.5 mm latae, subacutae, extus pubescentes, intus maximam partem glabrae, ad apicem tamen pubescentes, 1-nerviae. Calyx 15 mm longus, lobis subaequalibus 13 mm longis et 1.2 mm latis, acutis, extus maximam partem pubescentibus, ad basin glabrescentibus, intus ad apicem solum pubescentibus. Corolla alba, matura non visa, fide STAPF l.c. 2—2.5 cm longa. Granula pollinis immatura 67  $\mu$  longa et 34  $\mu$  diam., probabiliter virgis 15 ornata. Stylus glaber. Capsula 12 mm longa et 3 mm diam., glabra. Semina suborbicularia, 2.5 mm diam.

Habitat partem terrae Borneënsis septemtrionalem.

British North Borneo. Mt Kinabalu, Tenompho, alt. 1500 m, J. et M. S. CLEMENS 30235 L.

The type of this species, HAVILAND 1362 K, was collected near the Kada-maian River at a much lower altitude (600 m). The specimen quoted by S. Moore l.c. (GIBBS 3952) was found between Bundu Tuhan and Kiau at a similar altitude (600—900 m) as the type. I have not seen these specimens, but judging from STAPF's description I consider them conspecific with the specimen described above. STAPF compared this species with *Strobilanthes paniculata* (Nees) Miq., i.e. *Microstrobilus paniculatus* (Nees) Brem., from which it differs conspicuously by the exareolate seeds with their mantle of thin undulating hairs. Its nearest allies are to be sought among the Indian and Indo-Chinese species resembling *G. penstemonoides* Nees and among the Philippine species.

4. *Goldfussia glomerata* Nees in Wall., Pl. As. Rar. III, p. 88, 1832; id. in DC., Prodr. XI, p. 173, 1847; Bot. Mag. LXVIII, Tab. 3881, 1841 et LXXX, Tab. 4767, 1854 (sub nomine *glomerata* Nees var. *speciosa* Hook.); *Strobilanthes glomerata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867; Clarke in Hook.f., Fl. Brit. Ind. IV, p. 448, 1884; — *Str. exsucca* Lindau in Fedde's Repert. XIII, p. 551, 1915, quoad typum, quoad specimen alterum cf. *Goldfussia speciosa*.

Planta 0.5—2 m alta, ramosior. Caulis ramique robustiores, subteretes, hirsutissimi. Folia petiolata; petiolus foliorum majorum 7—15 mm, minorum 2—3 mm longus, hirsutissimus; lamina valde asymmetrica, dimidio angustiore semi-lanceolato, basi acuto, nervis circ. 5 instructo, dimidio latiore semi-ovato, basi obtuso, rotundato vel subcordato, nervis plerumque 8 instructo, costa dimidium angustius versus concava, foliorum majorum 7—13 cm longa et 4—6 cm lata, minorum plus quam dimidio brevior et angustior, omnium caudata et acute exeuns, margine dentata, supra sparse hirsuta, setis tamen cum pilis mollibus mixtis, subtus costa hirsuta, ceterum molliter pubescens, supra cystolithis lineolata. Spicae basi foliis binis parvis, subaequalibus et subsymmetricis suffultae, 2.5 cm longae et 1 cm diam., bractearum paribus 5 munitae. Bractee infimae 2 cm longae et 5 mm latae, dentatae, extus totae et intus apicem versus hirsutae, fere a basi 5-nerviae, flores rudimentarios subtendentes; bractee paris secundi paulo longiores sed haud latiores, dimidio superiore solum dentatae, dentibus insuper minoribus, hirsutae; bractee paris tertii ut praecedentes virides, bracteis paris secundi aequilongae sed angustiores, margine parce et remote dentatae, hirsutae sed setis apicem versus cum pilis capitatis mixtis; bractee paris quarti albidi, 2 cm longae et ut paris tertii 3 mm latae, obscure dentatae, hirsutae sed setis apicem versus cum pilis capitatis mixtis; bractee supremae lineares, 15 mm longae et 2 mm latae, ceterum ut praecedentes. Bracteolae lineares, 10 mm longae et 2.2 mm latae, acutae, membranaceae, dorso praesertim ad costam et ad marginem hirsutissimae. Calyx 15 mm longus, membranaceus, lobis 2.7 mm latis, acutis, extus hirsutis, basin versus tamen sensim glabrescentibus. Corolla violacea, 5 cm longa, extus pilis capitatis puberula, tubo 1.7 cm, faucibus 2.6 cm, lobis rotundatis 7 mm longis, faucibus ad orem 13 mm latis, intus sparse ciliatis. Filamenta staminum longiorum 7 et 8 mm, breviorum 1.5 mm longa; antherae 2.2 mm longae. Granula pollinis (Tab. II A) 67  $\mu$  longa et 45  $\mu$  diam., virgis 15 ornata. Stylus glaber. Capsula 1.4 cm longa et 5 mm diam., glabra. Semina suborbicularia, 3 mm diam.

Habitat Khasiae et Birmaniae montes. In Java Occidentali introducta et e cultura evasa.

West Java. Buitenzorg Res.; G. Gedeh, near Tjibodas, alt. 1450 m, v. STEENIS 11164 L.

The type of *Strobilanthes exsucca* Lindau (WARBURG 1658) was collected on the grounds of the "Botanical Garden", probably that at Tjibodas, in the neighbourhood of which the specimen quoted above, was found. By the courtesy of the director of the Botanical Museum, Berlin-Dahlem, I received enough material to verify the conclusion which I had drawn from LINDAU's description, namely that this species is identical with *Goldfussia glomerata* Nees. The plant is easily recognizable by its reddish pubescence, strongly asymmetric leaves and dentate, persistent bracts.

#### Index Specierum.

**anfractuosa** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke); syn.: *Strobilanthes penstemonoides* (Nees) T. And. var. *anfractuosa* (Clarke) R. Ben. — Siamia —

- anisophylla** (Wall. ex Lodd.) Nees in Wall., Pl. As. Rar. III, p. 88, 1832 (*Ruellia* Wall. ex Lodd.); syn.: *Strobilanthes anisophylla* (Wall. ex Lodd.) T. And. — Khasia —
- apoënsis** (Elm.) Brem. n. comb. (*Hypoëstes* Elm.); syn.: *Strobilanthes apoënsis* (Elm.) Merr. — Mindanao —
- articulata** (Imlay) Brem. n. comb. (*Strobilanthes* Imlay) — Siamia —
- ? **Austinii** (Clarke ex W. W. Smith) Brem. n. comb. (*Strobilanthes* Clarke ex W. W. Smith) — China —
- bibracteata** (Bl.) Nees in DC., Prodr. XI, p. 174, 1847 (*Strobilanthes* Bl.) = *Tetraglochidium bibracteatum* (Bl.) Brem.
- biceps** Nees in Wall., Pl. As. Rar. III, p. 88, 1832; syn.: *Strobilanthes biceps* (Nees) Miq. — Birmania —
- bracteata** Nees l.c.; syn.: *Strobilanthes quadrangularis* Clarke n. nom. illeg. — Himalaya —
- \* **capitata** Nees l.c.; syn.: *Ruellia capitata* D. Don p.p.; *Strobilanthes capitata* (Nees) T. And. — Himalaya —
- colorata** Nees op. cit. p. 89 = *Difflugossa colorata* (Nees) Brem. n. comb.
- colorata** (Bl.) Zoll. et Mor., Syst. Verz. p. 47, 1846 (*Ruellia* Bl.) comb. illeg. = *Hemigraphis alternata* (Burm. f.) T. And.
- crinita** Nees in DC., Prodr. XI, p. 176, 1847 = *Difflugossa crinita* (Nees) Brem. n. comb.
- cusia** Nees in Wall., Pl. As. Rar. III, p. 88, 1832 = *Baphicacanthus cusia* (Nees) Brem. n. comb.
- dalhousiana** Nees in DC., Prodr. XI, p. 174, 1847; syn.: *Strobilanthes dalhousiana* (Nees) Clarke — Himalaya —
- dasysperma** (Kurz) Brem. n. comb. (*Strobilanthes* Kurz) — Birmania —
- decurrens** (Nees) Wight, Ic. Pl. Ind. Or. IV, Tab. 1522, 1849 (*Strobilanthes* (Nees) = *Nilgirianthus decurrens* (Nees) Brem.
- dimorphotricha** (Hance) Brem. n. comb. (*Strobilanthes* Hance) — China —
- discolor** Nees in DC., Prodr. XI, p. 172, 1847; syn.: *Strobilanthes discolor* (Nees) T. And. — Himalaya —
- divaricata** Nees in Wall., Pl. As. Rar. III, p. 89, 1832 = *Difflugossa divaricata* (Nees) Brem. n. comb.
- edgeworthiana** Nees in DC., Prodr. XI, p. 173, 1847 = species incertae sedis, fide CLARKE forsitan *Pteracanthus angustifrons*
- extensa** Nees in Wall., Pl. As. Rar. III, p. 88, 1832 = *Pteracanthus extensus* (Nees) Brem. n. comb.
- filiformis** (Bl.) Nees in DC., Prodr. XI, p. 176, 1847 (*Strobilanthes* Bl.) = *Difflugossa filiformis* (Bl.) Brem. n. comb.
- flexuosa** Nees in Wall., Pl. As. Rar. III, p. 88, 1832, species non bene nota, origine incerta
- geniculata** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke); syn.: *Strobilanthes gracilis* T. And. 1867, non Bedd. 1864 — Birmania —
4. **glomerata** Nees in Wall., Pl. As. Rar. III, p. 88, 1832; syn.: *Strobilanthes glomerata* (Nees) T. And.; *Str. exsucca* Lindau — Assamia, Birmania — *glomerata* Nees var. *speciosa* Hook. in Bot. Mag. LXXX, Tab. 4767, 1854 = prec.
- ? **Hancockii** (Clarke ex W. W. Smith) Brem. n. comb. (*Strobilanthes* Clarke ex W. W. Smith) — China —
- hupehensis** (W. W. Smith) Brem. n. comb. (*Strobilanthes* W. W. Smith) — China —
- isophylla** Nees in Wall., Pl. As. Rar. III, p. 88, 1832; syn.: *Strobilanthes isophylla* (Nees) T. And.; *Str. goldfussia* Dalz. et Gibs. — patria ignota, prob. Assamia —
- Kerrii** (Craib) Brem. n. comb. (*Strobilanthes* Craib) — Siamia —

3. **kinabaluensis** (Stapf) Brem. n. comb. (*Strobilanthes* Stapf) — Borneo —  
*lamiifolia* Nees in Wall., Pl. As. Rar. III, p. 88, 1832 = ? *Pteracanthus rotun-*  
*difolius* (D. Don.) Brem.  
*leschenaultiana* Nees in DC., Prodr. XI, p. 172, 1847 = *Xenacanthus lesche-*  
*naultianus* (Nees) Brem. n. comb.  
**Mearnsii** (Merr.) Brem. n. comb. (*Strobilanthes* Merr.) — Luzon —  
**multidens** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Himalaya —  
*myrtinia* Nees in DC., Prodr. XI, p. 174, 1847 = ? *Didyplosandra lanceolata*  
(Hook. ex Nees) Brem.  
*nutans* Nees in Wall., Pl. As. Rar. III, p. 88, 1832; syn.: *Strobilanthes nutans*  
(Nees) T. And. — Himalaya —  
**oligocephala** (T. And. ex Clarke) Brem. n. comb. (*Strobilanthes* T. And. ex  
Clarke) — Himalaya —  
**palawanensis** (Elm.) Brem. n. comb. (*Strobilanthes* Elm.) — Palawan —  
*paniculata* Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = *Microstrobilus*  
**paniculatus** (Nees) Brem. n. comb.  
*paniculata* Nees var. *alata* (Bl.) Nees in DC., Prodr. XI, p. 175, 1847 (*Strobilanthes alata* Bl.)  
= *Microstrobilus alatus* (Bl.) Brem.  
**penstemonoides** Nees in Wall., Pl. As. Rar. III, p. 88, 1832; syn.: *Strobilanthes*  
*penstemonoides* (Nees) T. And. — Himalaya —  
**pluriformis** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke) — Ins. Philipp. —  
**psilostachys** (Clarke ex W. W. Smith) Brem. n. comb. (*Strobilanthes* Clarke  
ex W. W. Smith) — China —  
**rex** (Clarke) Brem. n. comb. (*Strobilanthes* Clarke); syn.: *Strobilanthes penste-*  
*monoides* (Nees) T. And. var. *rex* (Clarke) R. Ben. — Siamia —  
**scoriarum** (W. W. Smith) Brem. n. comb. (*Strobilanthes* W. W. Smith) —  
China —  
**sessilis** Nees in DC., Prodr. XI, p. 172, 1847; syn. *Strobilanthes rhombifolia*  
Clarke n. nom. — Assamia —  
1. **speciosa** (Bl.) Brem. n. comb. (*Strobilanthes* Bl.); syn.: *Strobilanthes apoensis*  
Hochr. — Sumatra, Java —  
2. **talangensis** Brem. n. spec. — Sumatra —  
**Thomsoni** Hook. in Bot. Mag. LXXXV, Tab. 5119, 1859 (non *Strobilanthes*  
*Thomsoni* T. And.) — Himalaya —  
**tristis** Wight, Ic. Pl. Ind. Or. IV, Tab. 1508, 1850; syn. *Strobilanthes tristis*  
(Wight) T. And. = species incertae sedis, Peninsulae Indicae incola,  
n. v.  
**zenkeriana** Nees in DC., Prodr. XI, p. 172, 1847 = *Xenacanthus zenkerianus*  
(Nees) Brem. n. comb.

#### Index Iconum.

- anisophylla** (Wall. ex Lodd.) Nees in Bot. Mag. LXII, Tab. 3404, 1835; in  
Nouv. Mém. Acad. Sc. Brux. XII, Tab. 1 et 2, 1839 (fl.); in Strong,  
Amer. Fl. IV, p. 7, 1850; in Gartenfl. XXVIII, p. 312, 1879; — sub  
nomine *Ruellia anisophylla* Wall. ex Lodd. in Bot. Cab. XI, Tab. 1070,  
1825; in Hook., Exot. Fl. III, Tab. 191, 1827; in Mém. Acad. Sc. Péters-  
bourg, Div. Sav. III, Tab. V fig. 8, 1807 (fl.); — sub nomine *Stro-*  
*bilanthes anisophylla* (Wall. ex Lodd.) T. And. in Engl. u. Prantl. Nat.  
Pflanzenfam. IV, 3 b, p. 304, 1895; in Rev. Hort. Belg. XXIX, p. 36,  
1903; — sub nomine *Ruellia persicifolia* Lindl. in Bot. Reg. XI, Tab.  
955, 1826  
**dalhousiana** Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1509, 1849; — sub  
nomine *Strobilanthes dalhousiana* (Nees) Clarke in Vollett, Fl. Simla,  
p. 373, 1902; in Ill. Handb. Laubholzk. II, p. 1054, 1912



- decurrens* (Nees) Wight, Ic. Pl. Ind. Or. IV, Tab. 1522, 1849 = *Nilgirianthus decurrens* (Nees) Brem.
- glomerata* Nees in Maund, Botanist IV, Tab. 155, 1840; in Paxt. Mag. VIII, p. 121, 1841; in Bot. Mag. LXVIII, Tab. 3881; in Journ. Jard. 1843, p. 185; in Sitzungsber. Akad. Wiss. Wien CXXV, I, p. 437, 1916 (veg.); in Troll, Vergl. Morph. d. höh. Pfl. I, p. 399, 1937 (veg.); — sub nomine: *glomerata* Nees var. *speciosa* Hook. in Bot. Mag., Tab. 4767, 1854; in Cottage Gard. XI, p. 493, 1854
- isophylla* Nees in Maund, Botanist IV, Tab. 244, 1841; in Burnett, Pl. Util. II, Tab. 13 a, 1845; in Bot. Mag. LXXIV, Tab. 4363, 1848; in Ann. Gard IV, Tab. 200, 1848; in Journ. Hort. Soc. London VIII, p. 321, 1853; in Cottage Gard. XVIII, p. 89, 1857
- penstemonoides* Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1510, 1849 = species *penstemonoidae* affinis
- Thomsoni* Hook. in Journ. Hort. Prat. Belg., n. sér. III, Tab. 16, 1859; in Bot. Mag. LXXXV, Tab. 5119, 1859
- tristis* Wight in Ic. Pl. Ind. Or. IV, Tab. 1508, 1849 et in Spicil. Neilgherr. II, Tab. 175, 1851 = species incertae sedis
- zenkeriana* Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1517, 1849, in textu, sub icone: *Strobilanthes ciliata* Nees = *Xenacanthus zenkerianus* (Nees) Brem.

*Goldfussiae* species sub nomine generico *Strobilanthe* nuncupatae.

- anfractuosa* Clarke in Engl. Bot. Jahrb. XLI, p. 66, 1907 = *Goldfussia anfractuosa* (Clarke) Brem. n. comb.
- anisophylla* (Wall. ex Lodd.) T. And. in Cat. Pl. Hort. Calc. p. 43, 1865 (*Ruellia* Wall. ex Lodd.) = *Goldfussia anisophylla* (Wall. ex Lodd.) Nees
- apoënsis* (Elm.) Merr., Enum. Philipp. Fl. Pl. III, p. 475, 1923 (*Hypoëstes* Elm.) = *Goldfussia apoënsis* (Elm.) Brem. n. comb.
- apoesensis* Hochr. in Candollea V, p. 228, 1934 = *Goldfussia speciosa* (Bl.) Brem.
- articulata* Imlay in Kew Bull. 1939, p. 121 = *Goldfussia articulata* (Imlay) Brem. n. comb.
- Austinii* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 208, 1918 = ? *Goldfussia Austinii* (Clarke ex W. W. Smith) Brem. n. comb.
- biceps* (Nees) Miq., Fl. Ind. Bat. II, p. 804, 1858 = *Goldfussia biceps* Nees
- biceps* (Nees) T. And. in Journ. Linn. Soc. IX, p. 476, 1867 = prec.
- capitata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = *Goldfussia capitata* Nees
- dalhousiana* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884 = *Goldfussia dalhousiana* Nees
- dasysperma* Kurz in Journ. As. Soc. Beng. XLII, p. 94, 1873 = *Goldfussia dasysperma* (Kurz) Brem. n. comb.
- dimorphotricha* Hance in Journ. of Bot. XXI, p. 355, 1883 = *Goldfussia dimorphotricha* (Hance) Brem. n. comb.
- discolor* (Nees) T. And. in Journ. Linn. Soc. IX, p. 477, 1867 = *Goldfussia discolor* Nees
- discolor* (Nees) T. And. var. *nudicalyx* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 462, 1884, n. v.
- exsucca* Lindau in Fedde, Repert. XIII, p. 551, 1915 = *Goldfussia glomerata* Nees
- geniculata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 459, 1884 n. nom. (*gracilis* T. And. 1867, non Bedd. 1864) = *Goldfussia geniculata* (Clarke) Brem. n. comb.

- glomerata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = **Goldfussia glomerata** Nees
- goldfussia* Dalz. et Gibs., Bomb. Fl., Suppl., p. 71, 1861 = **Goldfussia isophylla** Nees
- gracilis* T. And. in Journ. Linn. Soc. IX, p. 474, 1867, nom. illeg. (non Bedd. in Madras Journ. of Sc., ser. 3, I, p. 55, 1864) = **Goldfussia geniculata** (Clarke) Brem.
- Hancockii* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 193, 1918 = ? **Goldfussia Hancockii** (Clarke ex W. W. Smith) Brem. n. comb.
- hupehensis* W. W. Smith in Notes Bot. Gard. Edin. X, p. 193, 1918 = **Goldfussia hupehensis** (W. W. Smith) Brem. n. comb.
- isophylla* (Nees) T. And. in Cat. Pl. Hort. Bot. Calc. p. 43, 1865 = **Goldfussia isophylla** Nees
- Kerrii* Craib in Kew Bull. 1912, p. 267 = **Goldfussia Kerrii** (Craib) Brem. n. comb.
- kinabaluensis* Stapf in Trans. Linn. Soc., Ser. 2, IV, p. 214, 1894 = **Goldfussia kinabaluensis** (Stapf) Brem. n. comb.
- Mearnsii* Merr. in Philipp. Journ. of Sc. IV, p. 322, 1909 = **Goldfussia Mearnsii** (Merr.) Brem. n. comb.
- multidens* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884 = **Goldfussia multidens** (Clarke) Brem. n. comb.
- nutans* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = **Goldfussia nutans** Nees
- oligocephala* T. And. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884 = **Goldfussia oligocephala** (T. And. ex Clarke) Brem. n. comb.
- palawanensis* Elm., Leafl. Philipp. Bot. V, p. 1686, 1913 = **Goldfussia palawanensis** (Elm.) Brem. n. comb.
- penstemonoides* (Nees) T. And. in Journ. Linn. Soc. IX, p. 477, 1867 = **Goldfussia penstemonoides** Nees
- penstemonoides* (Nees) T. And. var. *anfractuosa* (Clarke) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 667, 1935 (*Strobilanthes anfractuosa* Clarke) = **Goldfussia anfractuosa** (Clarke) Brem.
- penstemonoides* (Nees) T. And. var. *flexuosa* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884 = **Goldfussia flexuosa** Nees, species non bene nota
- penstemonoides* (Nees) T. And. var. *rex* (Clarke) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 667, 1935 (*Strobilanthes rex* Clarke) = **Goldfussia rex** (Clarke) Brem.
- pluriformis* Clarke in Philipp. Gov. Lab. Bur. Bull. XXXV, p. 93, 1906 = **Goldfussia pluriformis** (Clarke) Brem. n. comb.
- psilostachys* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 198, 1918 = **Goldfussia psilostachys** (Clarke ex W. W. Smith) Brem. n. comb.
- quadrangularis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884, n. nom. illeg. = **Goldfussia bracteata** Nees
- rex* Clarke in Engl., Bot. Jahrb. XLI, p. 68, 1907 = **Goldfussia rex** (Clarke) Brem. n. comb.
- rhombifolia* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884, n. nom. = **Goldfussia sessilis** Nees
- scoriarum* W. W. Smith in Notes Bot. Gard. Edin. X, p. 199, 1918 = **Goldfussia scoriarum** (W. W. Smith) Brem. n. comb.
- speciosa* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 = **Goldfussia speciosa** (Bl.) Brem. n. comb.

39. **Dossifluga** Brem. n. gen.; typus: *D. suborbicularis* (Imlay) Brem. n. comb. (*Strobilanthes* Imlay).

Herba perennis, isophylla. Folia sessilia vel subsessilia, ovata vel suborbicularia, parva. Inflorescentiae terminales et axillares, spiciformes, abbreviatae. Bractee ovatae vel obovatae, calyce breviores, persistentes. Flores in axillis

bractearum solitarii. Bracteolae bracteis aequilongae vel eis paulo longiores, calyce breviores. Calyx subaequaliter 5-partitus, lobis linearibus acutis. Corolla resupinata, tubo tereti in fauces campanulatas tubo multo longiores ampliata, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus emarginatis. Stamina 4, didynamia, inclusa; filamenta staminum longiorum inaequalia, erecta; breviorum aequalia, incurvata; longiora basi hirtella; antherae ovoideae, apice obtusae, basi vix emarginatae, thecis patentibus, horizontales. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, 4-seminalis. Semina fere tota pilis longis meandrinis, madefactis elastice erigentibus vestita.

Distributum in Siamia. Species 1.

Species unica: *D. suborbicularis* (Imlay) Brem. n. comb. (*Strobilanthes* Imlay).

This species was separated from *Goldfussia* on account of its peculiar habit: it is apparently a perennial herb provided with isophyllous shoots and very small, sessile or subsessile leaves. An other remarkable feature are the small bracts.

1. *Dossifluga suborbicularis* (Imlay) Brem. n. comb.; *Strobilanthes suborbicularis* Imlay in Kew Bull. 1939, p. 118.

Habitat Siamiam.

40. *Diflugossa* Brem. n. gen.; typus: *D. colorata* (Nees) Brem. n. comb. (*Goldfussia* Nees); *Strobilanthes* species Blume et Anderson; *Goldfussia* species Nees.

Plantae plietesiae, anisophyllae. Folia petiolata vel subsessilia, semper symmetrica, cystolithis majoribus plerumque cum minoribus mixtis lineolata. Inflorescentiae spici- vel anguste racemiformes, plerumque in paniculam unitae, floribus inferioribus interdum foliis suffultis. Bracteae bracteolaeque parvae, calyce multo breviores, 1-nerviae, plerumque mox deciduae. Flores in axillis bractearum plerumque solitarii, raro in triades dispositi. Calyx subaequaliter 5-partitus, lobis plerumque imbricatis, apice callosis, mediano interdum quam aliis paulo longiore. Corolla alba vel violacea, vix curvata et non resupinata, tubo tereti in fauces campanulatas tubo multo longiores ampliata, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis vel obcordatis. Stamina plerumque 4, didynamia, inclusa; filamenta staminum longiorum inaequalia, erecta; breviorum aequalia, incurvata; antherae suborbiculares vel ellipsoideae, apice subobtusae, basi vix emarginatae, thecis patentibus, horizontales; raro stamina interiora suppressa. Staminodium parvum vel nullum. Granula pollinis ellipsoidea, virgata, virgis septatis. Ovarium glabrum vel pilis capitatis comosum, utroque loculo ovulis 2. Stylus glaber vel pilis capitatis interdum cum pilis ecapitatis mixtis hirtellus. Capsula fusiformis, 4-seminalis, retinaculis acutis. Semina brunnea, fere tota pilis longis meandrinis, madefactis elastice erigentibus vestita.

Distributum a clivis Himalayae usque ad Javam et terram Celebicam. Species minimum 16.

Species typica: *D. colorata* (Nees) Brem. n. comb. (*Goldfussia* Nees).

The genus *Diflugossa* is nearly related to *Goldfussia*, from which it is however easily distinguishable by the lax inflorescences, the small size of the bracts and bracteoles and the non-resupinate corolla.

In one of the species, the Sumatran *D. glandulosa* Brem., the inner stamens are completely suppressed. Nevertheless, there is little doubt that it belongs to this genus: the bracts and bracteoles are small and deciduous, the anthers short and horizontal and the seeds covered with thin undulating hairs.

In another Sumatran species, *D. ovatifolia* Brem., the flowers in the axils

of the bracts are arranged in triads. Spiciform inflorescences of this kind are found also in a single species of *Sericocalyx* and are a general feature of the genus *Stenosiphonium*, but in both these genera the lateral flowers are subsessile, whereas they are here distinctly pedicellate.

In the Javanese *D. filiformis* (Bl.) Brem. and in the two species from Celebes the bands of the pollen grains are not so clearly septate as in the other species; especially in *D. filiformis* the septa are often difficult to detect. This is probably due to the circumstance that fully mature pollen of these species is difficult to obtain: in most other species mature pollen may be obtained from the larger buds, but here it ripens apparently tardily, while in fully expanded flowers it is nevertheless usually shed.

The pollen grains of the species occurring in the northern part of the area are apparently always provided with 15 bands, whereas those of the Malesian species show 18 or, more often, 21 bands.

#### Key to the Species of the Malay Archipelago.

1. Calyx glabrous; lobes linear to ovate-oblong, imbricate . . . . . 2
  - : Calyx glandular hairy; lobes all or with the exception of the median one narrowly triangular, not overlapping . . . . . 7
2. Flowers in triads in the axils of the bracts; the lateral ones pedicellate. — North Sumatra . . . . . 6. *D. ovatifolia* Brem. n. spec.
  - : Flowers solitary in the axils of the bracts . . . . . 3
3. Leaves all ovate or ovate-elliptic. Shoots and petioles densely, leaves sparsely ferruginous-pubescent. — South-east Sumatra . . . . .
  - . . . . . 5. *D. pubescens* Brem. n. spec.
  - : Leaves lanceolate or oblong-lanceolate; the smaller and upper ones sometimes ovate. Shoots and petioles glabrous or sparsely pubescent; leaves either entirely glabrous or the midrib on the underside pubescent . . . . . 4
4. Smaller leaves ovate. Bracts about 4 mm long, slightly shorter than the bracteoles. Corolla more than 3 cm long. — A Himalayan species naturalized in West Java . . . . .
  - . . . . . 1. *D. colorata* (Nees) Brem. n. comb.
  - : Leaves all lanceolate to oblanceolate. Bracts up to 2 mm long, slightly longer than the bracteoles. Corolla less than 2 cm long . . . . . 5
5. Calyx lobes ending in a usually recurved apiculus. Peduncles 2—11 cm long. South-east Sumatra . . . . .
  - . . . . . 2. *D. capillipes* (Clarke ex Ridl.) Brem. n. comb.
  - : Calyx lobes obtuse or emarginate. Peduncles not more than 3 cm long . . . . . 6
6. Leaves callosely dentate. Inflorescence provided with a 3—15 mm long peduncle. Calyx lobes oblong to oblanceolate. — West Sumatra . . . . .
  - . . . . . 3. *D. polybotrya* (Miq.) Brem. n. comb.
  - : Leaves serrato-dentate. Inflorescence provided with a 12—30 mm long peduncle. Calyx lobes linear. — North Sumatra . . . . .
    - . . . . . 4. *D. multiflora* (Ridl.) Brem. n. comb.
7. Stamens 2. Calyx lobes subequal. The larger leaves usually with 16 nerve pairs. — West Sumatra . . . . .
  - . . . . . 7. *D. glandulosa* Brem. n. spec.
  - : Stamens 4. Median calyx lobe distinctly longer than the other ones. The larger leaves with 4—5 nerve pairs . . . . . 8
8. All flowers subtended by, as a rule, early deciduous bracts. — Java . . . . .
  - . . . . . 8. *D. filiformis* (Bl.) Brem. n. comb.
  - : The lower flowers subtended by ordinary leaves; bracts of the others persistent . . . . . 9

9. Shoots and petioles subglabrous. Leaves narrowly lanceolate, glabrous. Bracteoles early deciduous. — West Celebes . . . . . 9. *D. celebica* Brem. n. spec.  
: Shoots and petioles pubescent. Leaves lanceolate to narrowly elliptic, above sparsely hirsute, beneath on the nerves appressed pubescent. Bracteoles more or less persistent. — South-west and South Celebes . . . . . 10. *D. parva* Brem. n. spec.

1. *Difflugossa colorata* (Nees) Brem. n. comb.: *Goldfussia colorata* Nees in Wall, Pl. As. Rar. III, p. 89, 1832; id. in DC., Prodr. XI, p. 176, 1847; *Strobilanthes colorata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867, comb. illeg. (non *Strobilanthes colorata* Nees in DC., Prodr. XI, p. 186, 1847); Clarke in Hook.f., Fl. Brit. Ind. IV, p. 473, 1884; Hook.f. in Bot. Mag. CXIII, Tab. 6922, 1887; *Ruellia hamiltoniana* Steud., Nom. ed. 2, II, p. 481, 1841, n. nom.; Hassk., Cat. Hort. Bogor. ed. 2, p. 148, 1844; — *Str. laevigata* Clarke in Hook.f., Fl. Brit. Ind. IV, p. 467, 1884.

Planta erecta, valde ramosa. Caulis ramique obtuse quadrangulares, glabri, internodiis sulcatis. Folia majora petiolo glabro, usque ad 3.5 cm longo munita; minora breviter petiolata vel subsessilia; lamina foliorum majorum lanceolata, usque ad 13 cm longa et 5 cm lata, apice caudato-acuminata, basi acuta, foliorum minorum interdum ovata, omnium margine serrata, vivo supra viridis, subtus purpurea sed nervis viridibus venosa, utrimque glabra et cystolithis dense lineolata, nervis utroque latere costae 6. Spicae in paniculas laxas unitae, floribus ad nodos solitariis, bracteis bracteolisque mox deciduis. Paniculae pedunculus et rhachis obtuse quadrangulares. Bractee ellipticae vel oblongae, 4 mm longae et 3.5 mm latae, apice truncatae, glaberrimae, 1-nerviae. Bracteolae oblongae, 4.5 mm longae et 2 mm latae, apice truncatae vel emarginatae, 1-nerviae, glaberrimae. Calyx aequaliter 5-partitus, 6 mm longus, lobis 2.5 mm latis, apice emarginatis, glaberrimis, imbricatis. Corolla violacea, 3.5 cm longa, tubo 1.5 cm, faucibus tubo subaequilongis, lobis orbicularibus 4.5 mm longis, extus glabra. Filamenta glabra; longiora 5 et 6 mm longa; breviora 1.5 mm; antherae orbiculares 1.5 mm diam. Granula pollinis 71  $\mu$  longa et 43  $\mu$  diam., virgis 15 ornata. Ovarium glabrum. Stylus basin versus parce hirtellus. Capsula 8—12 mm longa.

Habitat clivos Himalayae Orientalis et montes Khasiae; in insula Java culta et assuefacta.

West Java: Res. Buitenzorg: Bantar Pete, Tjipanas, BOERLAGE s.n. L; Tjisarua, alt. 1000 m, v. STEENIS 5143 L et U; Priangan Res.: Tjidadap near Tjibeber, alt. 1000 m, BAKHUIZEN v. D. BRINK 2175 L.

This species differs from those that are indigenous in the Malay Archipelago by the number of bands with which the pollen grains are decorated: here as in the other species of the Himalayas, Assam and Burma investigated by me, the number is 15, whereas it is 18 or more often 21 in the Malesian species.

The descriptions of the two following new species, both natives of Upper Burma, may serve to facilitate a comparison between the northern species and those which are indigenous in the Malay Archipelago.

*Difflugossa nagaënsis* Brem. n. spec.; typus: MEEBOLD 7381 BD.

Planta erecta, ramosa, 1.5—1.8 m alta. Caulis ramique glabri; rami tenuiores quadricostati; crassiores obtuse quadrangulares vel subteretes. Folia (superiora sola nota) in petiolum glabrum, supra planum, marginibus costatum, usque ad 2.5 cm longum contracta; lamina ovato-elliptica, usque ad 11 cm longa et 6 cm lata, apice caudato-acuminata, basi attenuata, margine dense serrata, discolor,

utrimque glabra et cystolithis dense lineolata, nervis utroque latere costae 6—8. Spicae paniculatae; paniculae rhachis flexuosa, quadricostata, internodiis circ. 5 cm longis; ramuli quadricostati, foliis vel probabilis bracteis deciduis et a me nondum visis suffulti, internodiis plerumque 1 cm haud superantibus, ultimis brevissimis. Bractee bracteolaeque deciduae, nondum visae, sed e cicatricibus aestimatae sine dubio parvae. Calyx 4—4.5 mm longus, lobo mediano aliis paulo longiore, omnibus linearibus obtusis, ad apicem vix conspicue puberulis, ceterum glabris, 1-nerviis. Corolla violacea, 2.9 cm longa, extus glabra, tubo 8 mm, faucibus 18 mm, lobis rotundatis 3 mm longis. Filamenta staminum longiorum parce hirtella, 7 et 7.5 mm longa; breviorum glabra, 1.5 mm longa; antherae 1.2 mm longae. Granula pollinis 66  $\mu$  longa et 38  $\mu$  diam., virgis 15 ornata. Ovarium pilis brevissimis vix conspicue comosum. Stylus parce et breviter hirtellus. Capsula nondum nota.

Habitat Birmaniam Superiorem.

Upper Burma. Narum Naga Mts, alt. 1500 m, MEEBOLD 7381 BD, typus.

*D. nagaënsis* differs from *D. colorata* in the greater width of the leaves, the four-ribbed axis of the panicle, the fugacious bracts and bracteoles, the shorter calyx with its somewhat lengthened median lobe and the slightly smaller pollen grains. On the whole these differences, though conspicuous enough, are taxonomically of little importance. Even the difference in length between the calyx lobes does not carry much weight, for this difference returns in the species of the Malay Archipelago.

*Difflugossa shanensis* Brem. n. spec.; typus: MEEBOLD 8025 BD.

Planta erecta ramosa, 1.2—1.8 m alta. Caulis ramique glabri; rami tenuiores acute quadrangulares et quadrisulcati; crassiores obtuse quadrangulares vel subteretes. Folia (superiora sola nota) quoque pari paulum inaequalia, in petiolum glabrum, supra planum, marginibus costatis, usque ad 1.5 cm longum contracta; lamina lanceolata, usque ad 14 cm longa et 4.3 cm lata, apice caudato-acuminata, basi contracta, margine apicem versus dense, basin versus sparse dentata, discolor, utrimque glabra et cystolithis dense lineolata, nervis utroque latere costae 11—12. Spicae breves, in racemas parvas terminales et axillares dispositae, foliis ordinariis suffultae. Pedunculus quadricostatus glaber, 1—1.3 cm longus; ramuli quadricostati puberulo-pubescentes, internodiis 3—7 mm longis, floribus ad apicem ramulorum congestis. Bractee bracteolaeque mox deciduae nondum visae, sed sine dubio parvae. Calyx 8—9 mm longus, lobo mediano aliis paulo longiore, tubo pubescente, lobis linearibus ciliolatis et ad apicem puberulis. Corolla dilute violacea, 2 cm longa, extus glabra, tubo 4 mm, faucibus 12.5 mm, lobis emarginatis 3.5 mm longis. Filamenta staminum longiorum densius hirtella, 3.5 et 4 mm longa; breviorum glabra, 0.6 mm longa; antherae 1 mm longae. Granula pollinis 48  $\mu$  longa et 28  $\mu$  diam., virgis 15 ornata. Ovarium subglabrum. Stylus pilis partim capitatis hirtellus. Capsula nondum nota.

Habitat Birmaniam Superiorem.

Upper Burma. Gokteik Shan Mts, alt. 600 m, MEEBOLD 8025 BD, typus.

The pollen grains of *D. shanensis* are for a species belonging to the genus *Difflugossa* uncommonly small. In other respects, for instance in the four-ribbed axis of the panicle and in the difference in length between the median calyx lobe and the other lobes, it resembles *D. nagaënsis*, from which it differs however conspicuously in the greater number of nerves in the leaves, the longer calyx, smaller corolla and rather densely hirtellous filaments.

Apart from the violet colour of the corolla and the 15 bands of the pollen grains, I am unable to find any well marked differences between these species from the northern part of the area and those of the Malay Archipelago.

2. *Diflugossa capillipes* (Clarke ex Ridl.) Brem. n. comb.; *Strobilanthes capillipes* Clarke ex Ridl. in Journ. Fed. Mal. States Mus. VIII, p. 71, 1917; S. Moore in Journ. of Bot. LXIII, Suppl., p. 79, 1925.

Planta probabiliter erecta, valde ramosa. Caulis ramique glabri, internodiis primum complanatis et bisulcatis, deinde obtuse quadrangulares vel subteretes. Folia quoque pari inaequalia vel subaequalia; majora petiolo usque ad 3.5 cm longo, glabro munita; minora petiolo 0.5—1.5 cm longo; lamina lanceolata, foliorum majorum usque ad 17 cm longa et 7 cm lata; omnium longe caudata, basi acuta, margine serrato-dentata, utrimque glabra, cystolithis majoribus cum minoribus mixtis utrimque dense lineolata, nervis utroque latere costae in foliis majoribus plerumque 7—8, in foliis minoribus plerumque 4—5. Inflorescentiae anguste racemiformes in paniculam terminalem compositae, glabrae, gracillimae, foliis parvis, mox deciduis suffultae. Pedunculus 2—11 cm longus; paniculae rhachis 4—25 cm longa, internodiis 1.5—7 cm longis composita; racemorum internodia 1.3—2.4 cm longa. Bractee florales lineares, 2 mm longae, mox deciduae. Pedicelli glabri usque ad 1 mm longi. Bracteolae basi pedicelli insertae, lineares, 1.5 mm longae, mox deciduae. Calyx 5 mm longus, post anthesin usque ad 7.5 mm accrescens, glaber; lobi lanceolati, subaequales, 1.2 mm lati, in apiculam haud raro recurvatam exeuntes, utroque latere costae cystolithis lineolati et sicc. nigricantes, imbricati. Corolla alba, 17 mm longa, extus glabra, tubo 4 mm, faucibus 9 mm, lobis ovatis 4 mm longis. Filamenta omnia glabra; staminum longiorum 3.5 et 4 mm, breviorum 0.7 mm longa; antherae 1.2 mm longae. Ovarium glabrum. Stylus glaber vel pilis capitatis vix conspicue hirtellus. Capsula 15 mm longa et 3.5 mm diam., glabra. Semina 3 mm longa et 2 mm lata.

Habitat Sumatram Australem.

S u m a t r a. Lampongs Res.: Mt Tengamoos, alt. 900 m, FORBES 1867 L (the locality is quoted by RIDLEY l.c. as "Kaiser's Peak"); ibidem, alt. 1200 m, DE VOOGD 162 L; Bencoolen Res.: foot of Mt Dempo, alt. 1100 m, FORBES 2166 L, exemplum typi (the locality is quoted by S. Moore l.c. as "Tadjan Hills near Pauh, alt. 1200 m", but the label in the Leiden herbarium gives the foot of Mt Dempo as locality; Rimbo Pengadang (near G. Daun) JACOBSON 113 L.

RIDLEY l.c. describes this plant as a decumbent herb of about 40 cm height, but this is apparently a mistake. According to him it has also been collected by ROBINSON and KLOSS in the vicinity of G. Talang (West Coast Residency) at Barong Baru (alt. 1200 m) and at Siolak Daras (alt. 900 m), but these specimens may have belonged to *D. polybotrya*.

*D. capillipes* resembles *D. polybotrya* and *D. multiflora*, two more Sumatran species, but is easily distinguishable by the apiculate calyx lobes and the slender peduncles. RIDLEY l.c. compares it with "*Strobilanthes glandulosa* Bl.", but the plant to which he applied this name, was doubtless an entirely different species: it may have been *D. filiformis* (Bl.) Brem., of which some examples have been distributed under the name "*Strobilanthes glandulosa* Bl." (see my remarks on this confusion under *Lissospermum pedunculosum* (Miq.) Brem.).

3. *Diflugossa polybotrya* (Miq.) Brem. n. comb.; *Strobilanthes polybotrya* Miq., Fl. Ind. Bat. II, p. 803, 1858; id., Suppl., p. 241, 1860; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899.

Planta erecta, ramosa. Caulis ramique obtuse quadrangulares, glabri, internodiis ad apicem bi-, basin versus quadrisulcatis. Folia quoque pari valde inaequalia; petiolus glaber, usque ad 2.5 cm longus; lamina lanceolata vel oblanceolata, usque ad 17 cm longa et 7 cm lata, apice caudata, basi cuneata, margine calloso-dentata, basin versus tamen integra, utrimque glabra et cysto-

lithis dense lineolata, nervis utroque latere costae in foliis majoribus usque ad 8, in foliis minoribus plerumque 4—5. Inflorescentiae anguste racemiformes, solitariae vel paniculatim dispositae, glabrae. Pedunculus 3—15 mm longus; rhachis 3—6 cm longa; bracteae florales 1.5 mm longae; bracteolae 1.2 mm longae. Calyx glaber, 5.5 mm longus, post anthesin usque ad 9 mm accrescens; lobi oblongi vel oblanceolati, apice obtusi vel paulum emarginati, subaequales, 4.3 mm longi et 1.8 mm lati, toti cystolithis lineolati, imbricati. Corolla matura in speciminibus examinatis non preservata, fide MIQUEL l.c. circ. 1.5 cm longa, tubo brevi instructa. Stamina 4. Granula pollinis virgis septatis ornata, sed matura non visa. Stylus pilis capitatis breviter et sparse hirtellus. Capsula 17 mm longa et 4 mm lata. Semina 3 mm longa et 2.5 mm lata.

Habitat Sumatram Occidentalem.

Sumatra. Tapanuli Res.: Batang Baroos, Ladok-ladok Rimbu, TEYSMANN H.B. 1188 U, typus, dupl. typi L; West Coast Res.: G. Talamau (Ophir), western slope at an alt. of 600 m, BÜNNEMEYER 370 L.

The specimens collected by ROBINSON and KLOSS in the vicinity of G. Talang and quoted by RIDLEY under the name *Strobilanthes capillipes*, may belong to this species, which was apparently unknown to RIDLEY.

This species has been confused with *D. colorata*, from which it differs conspicuously in the smaller size of the bracts, bracteoles and flowers. The colour of the corolla is still unknown, but I have little doubt that it will prove to be white. The number of bands decorating the pollen grains could not be determined, but in view of the close affinity between this species, *D. capillipes* and *D. multiflora*, it will probably be 21.

4. *Difflugossa multiflora* (Ridl.) Brem. n. comb.; *Strobilanthes multiflora* Ridl. in Journ. As. Soc., Mal. Branch I, p. 82, 1923.

Caulis ramique glabri vel primum sparse et vix conspicue hirtelli, obtuse quadrangulares, internodiis primum quadrisulcatis, sicc. interdum nigrescentes. Folia quoque pari paulum inaequalia; petiolus glaber vel sparse hirtellus, 5—10 mm longus; lamina lanceolata, 4—11 cm longa et 0.9—3 cm lata, longe caudata, basi cuneata, margine serrato-dentata, basin versus tamen integra, supra interdum nigrescens, utrimque glabra vel costa subtus sparse pubescens, cystolithis supra plerumque valde conspicuis, in foliis nigrescentibus tamen difficiliter distinguendis, nervis utroque latere costae 6—8. Inflorescentiae anguste racemiformes, in paniculas axillares et terminales dispositae, graciles, glabrae vel vix conspicue hirtellae. Pedunculus 1.2—3 cm longus; rhachis 1.5—6 cm longa, internodiis 3—8 mm longis. Bracteae 1.5 mm; bracteolae 1 mm longae. Pedicelli brevissimi. Calyx glaber, 5—6 mm longus, post anthesin usque ad 8 mm accrescens; lobi lineares, apice obtusi vel subemarginati, medianus quam aliis paulo longior, omnes 1.3 mm lati, imbricati. Corolla fide RIDLEY l.c. alba, 1.8 cm longa, tubo 5 mm, faucibus 10 mm, lobis emarginatis 3 mm longis. Filamenta staminum longiorum hirtella, 3.5 et 4.5 mm longa; breviorum glabra, 1.5 mm longa; antherae 1.6 mm longae. Granula pollinis 66  $\mu$  longa et 37  $\mu$  diam., virgis 21 ornata. Ovarium glabrum. Stylus pilis partim capitatis hirtellus. Capsula nondum nota.

Habitat Sumatram Septemtrionalem.

Sumatra. East Coast Govt: above Bandar Baru, alt. 1000 m, LOERZING 5201 L; Sibolangit, east of Bandar Baru, alt. 900 m, id. 5792 L.

LOERZING 5201 has slightly hirtellous shoots, petioles and inflorescences and has turned black in drying: it represents perhaps a variety.

The type of this species was unavailable to me; it was collected by RIDLEY at Berastagi, i.e. in the same district as the specimens quoted above.



*D. multiflora* differs but slightly from *D. polybotrya*. Apart from the characters mentioned in the key, they differ in the degree of anisophylly, *D. polybotrya* being strongly anisophyllous and *D. multiflora* but slightly, and further in the structure of the calyx, the median lobe being of the same length as the others in *D. polybotrya* and slightly longer than the others in *D. multiflora*.

5. *Difflugossa pubescens* Brem. n. spec.; typus: DE VOOGD 1437 L.

Caulis ramique quadrangulares et quadrisulcati, primum dense, deinde sparse ferrugineo-hirsuti. Folia quoque pari distincte inaequalia; petiolus dense hirsutus, usque ad 2.5 cm longus; lamina foliorum majorum ovato-elliptica, usque ad 14 cm longa et 7.5 cm lata; foliorum minorum ovata, usque ad 7.5 cm longa et 5 cm lata; omnium caudata, basi contracta, margine crenato-dentata, utrimque sparse hirsuta, cystolithis numerosis sed difficiliter distinguendis lineolata, nervis utroque latere costae in foliis majoribus circ. 10, in foliis minoribus circ. 7. Inflorescentiae anguste racemiformes, in paniculas terminales et axillares dispositae; paniculae axillares foliis magnitudine multo redactis suffultae; omnes hirtellae. Pedunculus 3—8 cm longus; rhachis 4—12 cm longa. Bracteae florales 2 mm longae. Pedicelli hirtelli vel glabri, 0.5—1 mm longi. Bracteolae basi pedicelli insertae, 1.5 mm longae. Calyx 6 mm longus, glaber; lobi ovati-oblongi, subaequales, 2.2 mm lati, apice obtusi vel subemarginati, intus glandulis sessilibus minute punctati, imbricati. Corolla matura nondum nota, immatura 15 mm longa, lobis emarginatis. Filamenta omnia glabra; longiora 3.5—4 mm longa; breviora 1.5 mm longa; antherae 1.7 mm longae. Granula pollinis 62  $\mu$  longa et 40  $\mu$  diam., virgis 21 ornata. Ovarium glabrum. Stylus pilis capitatis brevibus densissime hirtellus. Capsula nondum nota.

Habitat Sumatram Occidentalem.

S u m a t r a. Bencoolen Res.: Bt Daun, alt. 1600 m, DE VOOGD 1437 L, typus.

This species is easily recognizable by its ferruginous pubescence. From the preceding species it differs moreover in the greater width of the leaves and from *D. ovatifolia* in the structure of the inflorescence, the flowers standing singly in the axils of the bracts, from *D. glandulosa* by the presence of 4 stamens and by the greater width of the calyx lobes, and from the species occurring in Java and in Celebes by the glabrous calyx and its broader, subequal lobes.

6. *Difflugossa ovatifolia* Brem. n. spec.; typus: PRINGO ATMODJO 22 L.

Caulis ramique glabri vel primum sparse pubescentes, primum obtuse quadrangulares, internodiis ad apicem bi-, basin versus quadrisulcatis, postea subteretes. Folia quoque pari valde inaequalia; inferiora longius petiolata, superiora subsessilia; petiolus sparse pubescens, usque ad 4 cm longus; lamina foliorum majorum ovata, usque ad 18 cm longa et 10 cm lata, apice caudata, basi rotundata; foliorum minorum ovato-cordata; omnium margine dentata vel crenata, supra glabra, subtus costa basin versus pubescens, utrimque cystolithis dense lineolata, nervis utroque latere costae in foliis majoribus usque ad 11, in foliis minoribus plerumque 5. Inflorescentiae spiciformes bracteis flores tamen non singulos sed in triades dispositos suffulcientibus, in paniculam terminalem confluentes. Pedunculus paniculae 2—3 cm longus; rhachis paniculae 8—12 cm longa; bracteae spicas subtendentes foliaceae, usque ad 1.5 cm longae, deciduae; spicarum rhachides ex internodiis 9—20 mm longis, gracilibus, apice plerumque incrassatis compositae, plerumque glabrae, interdum tamen pilis capitatis sparse hirtellae; bracteae florales circ. 2 mm longae, glabrae; flos centralis triadis subsessilis, ebracteolatus; pedicelli florum lateralem internodiis rhachidis subaequilongi, i.e. 9—20 mm longi; flores laterales basi bracteolati; bracteolae 1.5 mm longae. Calyx 7.5—8 mm longus, post anthesin usque ad 12 mm

accrescens, glaber; lobi lineari-oblongi, mediano aliis paulo longiore, omnes apice emarginati, imbricati. Corolla 4 cm longa, tubo 10 mm, faucibus 23 mm, lobis 7 mm longis. Filamenta staminum longiorum hirtella, 6 et 7 mm longa; breviora glabra, 1.5 mm longa; antherae 1.5 mm longae. Granula pollinis 61  $\mu$  longa et 36  $\mu$  diam., virgis 21 ornata. Ovarium glabrum. Stylus glaber. Capsula 21 mm longa et 5 mm diam. Semina 4.5 mm longa et 3 mm lata.

Habitat Sumatram Septemtrionalem.

S u m a t r a. Atjeh and Dependencies: Gajo-land, Gajo Luas, Boor ni Paja, PRINGO ATMODOJO 22 L, typus; Boor ni Bias, alt. 1300 m, v. STEENIS 6176 L.

The type specimen consists of two sheets: in one of them the branches of the inflorescences are sparsely strewn with long capitate hairs. A similar abnormality is shown by a specimen of *Lissospermum pedunculatum* (Miq.) Brem. (v. infra).

A specimen with very immature flower buds collected by LOERZING (n. 6793 L) north of Berastagi (East Coast Govt) may be conspecific, but the material is too imperfect to allow a definite conclusion.

Apart from the flower triads, this species is easily recognizable by the shape of the leaves and the large size of the corolla.

Flowers arranged in triads are very rare in the *Strobilanthinae*, for apart from the species described above, they are found only in the genus *Stenosiphonium*, where they are a general feature, and in a single species of *Sericocalyx*. Those of *D. ovatifolia* are moreover remarkable by the comparatively slender pedicels of the lateral flowers. In other respects, e.g. in the structure of the androecium and in that of the testa it agrees so well with the other species of *Difugossa*, that I feel justified in considering them congeneric.

#### 7. *Difugossa glandulosa* Brem. n. spec.; typus: BÜNNEMEYER 10256 L.

Planta probabiliter erecta, ramosa. Caulis ramique quadrangulares, primum puberulo-pubescentes, deinde glabrescentes, internodiis quadrisulcatis. Folia quoque pari inaequalia, in petiolum brevem contracta; petiolus primum puberulo-pubescentis, deinde glabrescens, foliorum majorum 1.5 cm longus; lamina foliorum majorum ovato-elliptica vel oblonga, basi contracta, usque ad 14 cm longa et 6.2 cm lata; foliorum minorum ovata, basi rotundata; omnium apice caudata, margine callosa-dentata, supra costa primum puberulo-pubescentis, deinde tota glabrescens, subtus costa nervisque puberulo-pubescentis, utrimque sed praesertim supra cystolithis valde numerosis, majoribus cum minoribus mixtis, lineolata, nervis utroque latere costae in foliis majoribus plerumque 16, in foliis minoribus 7—12. Inflorescentiae anguste racemiformes in paniculas terminales et axillares dispositae. Pedunculus paniculae 2—7 cm longus, dense puberulo-pubescentis; rhachis 4—12 cm longa, pilis partim capitatis dense puberulo-pubescentis. Rhachides racemorum dense pilis capitatis vestitae. Bracteae florales lineares 2 mm longae, pilis capitatis vestitae, mox deciduae; bracteolae bracteis similiores sed 1.5 mm longae. Pedicelli pilis capitatis vestiti, 0.7 mm longi. Calyx 6—6.5 mm longus, extus pilis partim capitatis puberulus, lobis anguste triangularibus, ad basin 0.7 mm latis, apice callosis et subrecurvatis, haud imbricatis. Corolla alba, 15—20 mm longa, extus sparse puberula, tubo 5—8 mm, faucibus 6—8 mm, lobis rotundatis 4 mm longis. Stamina exteriora filamentis parce hirtellis 2 mm longis; interiora omnino suppressa; staminodium impar triangulare; antherae 1.5 mm longae. Granula pollinis 56  $\mu$  longa et 34  $\mu$  diam., virgis 21 ornata. Ovarium glabrum. Stylus pilis capitatis brevissimis et pilis ecapitatis paulo longioribus sparse hirtellus. Capsula glabra, 15 mm longa et 4.5 mm diam. Semina 4 mm longa et 3 mm lata.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.; G. Korinchi, alt. 2200 m, BÜNNEMEYER 10256 L,

typus; G. Singalang, alt. 1400 m, SCHIFFNER 2611 L, co-typus fructifer, "a solitary specimen".

Another specimen collected on Mt Singalang (BECCARI 128 L) has much larger leaves, but agrees otherwise very well with the plant described above; its flowers, however, are too young to allow a reliable identification. Another specimen collected on Korinchi Peak (BÜNNEMEYER 9447 L) is also rather similar, but lacks the characteristic glandular indumentum of the type: it might represent a variety, but here also the flowers are too immature for a good identification.

*D. glandulosa* is easily distinguishable from its allies by the complete suppression of the two inner stamens, but as it agrees in other respects, e.g. in the nature of the cystoliths very well with the other species, I have little doubt that it may be referred to this genus.

The position of the Sumatran *Strobilanthes hirticalyx* Ridl., a species which according to RIDLEY has also but two stamens, is uncertain. Although the flora of the region in which this plant was collected, is well represented in our herbaria, I have not been able to find a specimen answering RIDLEY's description. It may have been either a *Goldfussia* or a *Tetraglochidium*.

8. *Difflugossa filiformis* (Bl.) Brem. n. comb.; *Strobilanthes filiformis* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826; Miq., Fl. Ind. Bat. II, p. 804, 1858; Hall. f., in Nov. Act. Acad. Nat. Cur. LXX, p. 196, 1897; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 217, 1912, syn. *Str. glandulosa* Bl. excl.; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 44, 1912; Hall. f. in Mededeel. Rijksherb. n. 26, p. 5, 1915, syn. *Str. sumatrana* Miq. excl.; Koorders, Fl. v. Tjobodas III § 1, p. 129, 1918; *Goldfussia filiformis* (Bl.) Nees in DC., Prodr. XI, p. 176, 1847; — *Ruellia junghuhniana* Miq., Fl. Ind. Bat. II, p. 790, 1858; ? *Hemigraphis junghuhniana* (Miq.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899; — *Strobilanthes urticifolia* O. Ktze var. *multilobulata* O. Ktze, Rev. Gen. Pl. II, p. 499, 1892; — anne *Str. axilliflora* Clarke ex. S. Moore in Journ. of Bot. LXIII, p. 166, 1925, adhuc incertum sed haud improbabile.

Planta erecta, usque ad 1.5 m alta, ramosior. Caulis ramique ad basin subteretes, apicem versus, ubi graciliores, acute quadrangulares vel anguste quadricostati, subglabri. Folia quoque pari inaequalia, sessilia vel subsessilia, plerumque lanceolata vel rhomboidea, majora usque ad 8.5 cm longa et 2.8 cm lata, omnia in caudam longam et angustam, obtuse exeuntem attenuata, basin versus longe attenuata, margine serrata vel dentata, utrimque glabra et cystolithis lineolata, nervis utroque latere costae in foliis majoribus plerumque 5, in foliis minoribus paucioribus. Inflorescentiae spiciformes plerumque in paniculam amplam dispositae. Spicae rhachis pilis capitatis sparsa. Bractee bracteolaeque parvae et deciduae, plerumque e cicatricibus solum cognoscendae. Calyx 6.2—7.5 mm longus, post anthesin paulum accrescens, extus et ad apicem loborum utrimque pilis capitatis vestitus, lobo mediano quam aliis 1.5 mm longiore, apicem versus haud sicut aliis angustato. Corolla alba, 2 cm longa, extus glabra, tubo 4.5 mm, faucibus 13 mm, lobis emarginatis 3.5 mm longis. Filamenta staminum longiorum hirtella, 4 et 4.5 mm longa; staminum breviorum 0.7 mm longa; antherae 1.3 mm longae. Granula pollinis 58—66  $\mu$  longa et 34—37  $\mu$  diam., virgis 18 ornata. Ovarium pilis capitatis comosum. Stylus glaber. Capsula 11 mm longa et 3 mm lata, nunc tota glabrescens, nunc pilis capitatis comosa. Semina brunnea, 3.5 mm longa et 3 mm lata.

Habitat Javam.

West Java. Buitenzorg Res.: Salak, alt. 2215 m, KOORDERS 36659 n.v.; Gedeh, Tjipanas, KUHL et v. HASSELT s.n. L; Tjibodas, alt. 1500 m, BOERLAGE

s.n. L, DE MONCHY s.n. L, SCHEFFER s.n. L; Tjibeureum, alt. 1700 m, JESWIET 1358 Vad, PULLE 4059 U; Gedeh, s.l., BLUME 1393 L, typus; REINWARDT s.n. L; Priangan Res.: Tangkuban Prah, alt. 1600 m, JUNGHUHN s.n. (type of *Ruellia junghuhniana* Miq.); Papandajan, KORTHALS s.n. L; Tji Matjal, WENT s.n. L; Tji Koppo, BOERLAGE s.n. L.

Central Java. Semarang Res.: G. Oongaran, Medinie, alt. 1200 m, JUNGHUHN s.n. L; G. Telemojo, alt. 1700 m, KOORDERS 35939 L; Banjumas Res.: Dieng, Telaga Dringu, alt. 2000 m, v. STEENIS 4587 L; ibidem, north of Semboongan, alt. 2100 m, BRINKMAN 881 et 882 PAS.

East Java. Madioon Res.: G. Lawu, above Sarangan, alt. 1700 m, DORGELO 70 et 382 PAS; G. Blentjong, alt. 1600 m, LOERZING 326 BD; Malang Res.: G. Butak, above Tjoban Rondo, v. OOSTEN 9 PAS; G. Ardjuno, above Tretes, alt. 1500 m, BACKER 36446 PAS, KOORDERS 43703 L; Djurungkali, alt. 1800 m, FOR. INST. s.n. Vad; Malang, dessa Ngabad, GROENHART 165 U; G. Tenger, Nongkodjadar, alt. 1200 m, DORGELO 42 PAS; Tosari, alt. 1800 m, KOBUS 17 PAS; G. Dorowati, alt. 1550 m, POSTHUMUS 1860 PAS; Besuki Res.: Kalibendo, alt. 1000 m, KOORDERS 43238 L; G. Raung, JESWIET 1130 Vad.

*Strobilanthes axilliflora* Clarke ex S. Moore is known to me only from the rather unsatisfactory description. If it really belongs to the *Strobilanthinae*, it will probably prove identical with the species described above. The possibility that it might be conspecific with my *Echinopaepale javanica* is discussed in a note at the end of the description of that species.

The material of *D. filiformis* is rather variable. The specimens collected on the Dieng Tableland are provided with somewhat more coriaceous leaves than the others, and their pollen grains are larger than those of the specimens collected elsewhere. The plants collected in East Java have a less distinctly glandular calyx and capsule and their upper leaves are rounded at the base.

*D. filiformis* and the two following species differ from the preceding ones in the small size of the leaves, in the large size of the median calyx lobes, and in the presence of capitate hairs on the top of the ovary. From the two Celeban species *D. filiformis* differs by its larger size, its paniculate spikes and deciduous bracts.

9. *Diflugossa celebica* Brem. n. spec.; typus: BÜNNEMEYER 11819 L.

Planta gracilis, ramosa, subglabra. Caulis ramique basin versus subteretes, apicem versus acute quadrangulares vel anguste quadricostati. Folia sessilia vel in petiolum usque ad 3 mm longum contracta, anguste lanceolata, usque ad 8.5 cm longa et 2.4 cm lata, in caudam longam et angustam, obtuse exeuntem attenuata, margine subintegra vel repanda, utrimque cystolithis lineolata, nervis utroque latere costae in foliis majoribus 4, in foliis minoribus 3 vel 2. Inflorescentiae spiciformes, floribus inferioribus foliis magnitudine vix redactis suffultis. Bractee florum aliorum foliaceae, ovatae, 3—5 mm longae et 1.5—3 mm latae, glabrae, penninerviae, persistentes. Bracteolae lineares, 2.5 mm longae et 0.4 mm latae, 1-nerviae, basi carinatae, extus et margine pilis capitatis vestitae, mox deciduae et plerumque cicatricibus solum cognoscendae. Calyx extus et ad apicem loborum utrimque pilis capitatis vestitus, 8 mm longus, lobo mediano quam aliis 1.5 mm longiore, omnibus 0.6 mm latis, 3-nerviis, ad basin carinatis. Corolla alba, 2.2 cm longa, extus glabra, tubo 4.5 mm, faucibus 13 mm, lobis 4.5 mm longis, profunde emarginatis. Filamenta staminum longiorum hirtella, 3.5 et 4 mm longa; staminum breviorum 1.5 mm longa; antherae 1.5 mm longae. Granula pollinis 58  $\mu$  longa et 34  $\mu$  diam., virgis 21 ornata. Ovarium pilis capitatis comosum. Stylus glaber. Capsula nondum nota.

Habitat terram Celebicam.

West Celebes: Lombasang (G. Bonthain) alt. 1100 m, BÜNNEMEYER 11819 L, typus.

This species shows a rather striking resemblance to *D. filiformis*, from which it is however readily distinguishable by the inflorescences, the lower flowers being subtended by ordinary leaves and the others by somewhat larger and more or less persistent bracts. The pollen grains are of the same size, but show a difference in the structure of the bands: the marginal rim is not straight but wavy and the transverse septa are but feebly developed. The seeds of this species and the following one are unfortunately still unknown.

10. *Difflugossa Everetti* (Rolfe) Brem. n. comb.; *Strobilanthes Everetti* Rolfe in Kew Bull. 1896, p. 39.

Planta parva, simplex vel ramosa, 15—30 cm alta. Caulis ramique primum dense, deinde sparse pubescentes, graciles, quadrangulares et interdum quadricostati, internodiis haud profunde quadrisulcatis. Folia quoque pari inaequalia, in petiolum pubescentem, usque ad 7 mm longum contracta; lamina lanceolata vel elliptico-lanceolata, usque ad 5.5 cm longa et 2 cm lata, longitudine interdum circ. bis majore quam latitudine, acuminata vel caudato-acuminata, basi contracta, margine dentata vel repando-dentata, supra sparse hirsuta, subtus costa et interdum nervis appresse pubescens, ceterum glabra, cystolithis utrimque lineolata, nervis utroque lateris costae in foliis majoribus plerumque 5, in foliis minoribus plerumque 3. Flores inferiores foliis magnitudine vix redactis, sequentes foliis sensim decrescentibus et ultimo in bracteas transeuntibus suffulti. Bracteolae lineari-oblongae, 2.5 mm longae et 0.7 mm latae, extus pubescentes, subpersistentes. Calyx 9—9.5 mm longus, extus et ad apicem loborum pilis partim capitatis pubescens, utrimque insuper glandulis subsessilibus minutis punctatus, lobo mediano quam aliis 1 mm longiore, omnibus 0.8 mm latis, 3-nerviis, ad basin carinatis. Corolla 21.5 mm longa, alba, extus pilis capitatis vestita, tubo 5 mm, faucibus 13 mm, lobis profunde emarginatis 3.5 mm longis. Stamina longiora filamentis hirtellis, 4.5 et 5 mm longis; breviora filamentis 0.5 mm longis; antherae 1.3 mm longae. Granula pollinis 60  $\mu$  longa et 36  $\mu$  diam., virgis 21 ornata. Ovarium pilis capitatis comosum. Stylus glaber. Capsula nondum nota.

Habitat terram Celebicum.

South-west Celebes: G. Bonthain, alt. 2200 m, BÜNNEMEYER 11842 L, typus; ibid. alt. 2000 m, Monod de Froideville 220 et 221 L.

South Celebes: W. Kraeng, "im Bergwald", WARBURG 16840 BD.

At first sight this plant does not look much like a *Difflugossa* species: it is of rather small size, and its inflorescences, which develop gradually out of a shoot provided with axillary flowers, are so unlike those found in the other species that one would hardly consider them comparable. An intermediary state, however, was observed in the inflorescences of *D. celebica*, and the latter shows such a striking resemblance with *D. filiformis* that its near affinity to that species need scarcely be doubted. However, if the structure of the seeds, which is at present unknown, should prove to be different from those of the other species, the question of the taxonomic position of these two Celeban species would have to be re-examined.

The type specimen of *Difflugossa Everetti* (EVERETT 28 K) was collected on G. Bonthain at an altitude of 1750 m. Although it was unavailable, I have little doubt that it is conspecific with the plants quoted above; the dimensions of the leaves given by ROLFE, however, are somewhat larger than those given above.

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- crinita* (Nees) Brem. n. comb. (*Goldfussia* Nees); syn.: *Strobilanthes crinita* (Nees) T. And.; *Str. colorata* (Nees) T. And. var. *crinita* (Nees) Clarke — Himalaya —
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## Icon.

*colorata* (Nees) Brem. in Bot. Mag. CXIII, Tab. 6922, 1887 (sub nomine: *Strobilanthes colorata* (T. And.)

*Diflugossae species sub nomine generico Strobilanthe nuncupatae.*

- axilliflora* Clarke ex S. Moore in Journ. of Bot. LXIII, Suppl., p. 77, 1925, probabiliter = *Diflugossa filiformis* (Bl.) Brem.
- capillipes* Clarke ex Ridl. in Journ. Fed. Mal. States Mus. VIII, p. 71, 1917 = *Diflugossa capillipes* (Clarke ex Ridl.) Brem. n. comb.
- colorata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867 (*Goldfussia* Nees) comb. illig., (non *colorata* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836) = *Diflugossa colorata* (Nees) Brem. n. comb.
- colorata* (Nees) T. And. var. *crinita* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 473, 1884 (*Goldfussia crinita* Nees) = *Diflugossa crinita* (Nees) Brem.
- crinita* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867 (*Goldfussia* Nees) = *Diflugossa crinita* (Nees) Brem.
- divaricata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 478, 1867 (*Goldfussia* Nees) = *Diflugossa divaricata* (Nees) Brem.
- Everettii* Rolfe in Kew Bull. 1896, p. 39 = *Diflugossa Everettii* (Rolfe) Brem. n. comb.
- filiformis* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826 = *Diflugossa filiformis* (Bl.) Brem. n. comb.
- laevigata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 467, 1884 = *Diflugossa colorata* (Nees) Brem.
- multiflora* Ridl. in Journ. As. Soc. Mal. Br. I, p. 82, 1923 = *Diflugossa multiflora* (Ridl.) Brem. n. comb.
- paupera* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 463, 1884 = *Diflugossa paupera* (Clarke) Brem. n. comb.
- polybotrya* Miq., Fl. Ind. Bat. II, p. 803, 1858 = *Diflugossa polybotrya* (Miq.) Brem. n. comb.

- subnudata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 472, 1884 = *Difflugossa subnudata* (Clarke) Brem. n. comb.  
*urticifolia* O. Ktze var. *multilobulata* O. Ktze, Rev. Gen. Pl. II, p. 499, 1891 = *Difflugossa filiformis* (Bl.) Brem.

*Difflugossae species sub nominibus genericis aliis nuncupatae.* —

- Goldfussia colorata* Nees in Wall., Pl. As. Rar. III, p. 89, 1832 = *Difflugossa colorata* (Nees) Brem. n. comb.  
*Goldfussia crinita* Nees in DC., Prodr. XI, p. 176, 1847 = *Difflugossa crinita* (Nees) Brem. n. comb.  
*Goldfussia divaricata* Nees in Wall., Pl. As. Rar. III, p. 89, 1832 = *Difflugossa divaricata* (Nees) Brem. n. comb.  
*Goldfussia filiformis* (Bl.) Nees in DC., Prodr. XI, p. 176, 1847 (*Strobilanthes* Bl.) = *Difflugossa filiformis* (Bl.) Brem.  
 ? *Hemigraphis junghuhniana* (Miq.) Boerl., Handl. Fl. Ned. Ind. II, p. 658, 1899 (*Ruellia* Miq.) = *Difflugossa filiformis* (Bl.) Brem.  
*Ruellia junghuhniana* Miq., Fl. Ind. Bat. II, p. 790, 1858 = *Difflugossa filiformis* (Bl.) Brem.

41. *Semnothyrsus* Brem. n. gen.; typus: *S. sumatranus* (Miq.) Brem. n. comb. (*Strobilanthes* Miq.).

Planta plietesia, anisophylla. Folia breviter petiolata, symmetrica, utrimque cystolithis similaribus lineolata. Inflorescentiae anguste racemiformes, longius pedunculatae, terminales et axillares. Bracteae ovato-lanceolatae, e basi 5-nerviae, calyce paulo longiores, persistentes. Flores in axillis bractearum solitarii. Bracteolae parvae vel minimae, basi pedicelli insertae. Calyx 5-partitus, tubo facie postica paulo longiore quam facie antica, lobis linearibus obtusis, mediano aliis paulo longiore. Corolla colore ignoto, resupinata, tubo tereti torso in fauces campanulatas ampliata, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus, paulum emarginatis. Stamina 4, didynamia, inclusa; filamenta staminum longiorum paulum inaequalia, erecta; staminum breviorum incurvata, omnia glabra; antherae orbiculares, apice obtusae, basi breviter bilobatae, horizontales, staminum breviorum paulo minores quam staminum longiorum. Staminodium satis conspicuum, incurvatum; stamina cum lobulis interstaminilibus staminodio similioribus alternantia. Granula pollinis ellipsoidea, virgis septatis ornata. Ovarium pilis capitatis comosum, utroque loculo ovulis 2. Stylus pilis capitatis hirtellus. Capsula fusiformis, 4-seminalis, retinaculis brevibus et crassis. Semina luteo-brunnea, parvo-areolata, ceterum pilis longis tenuibus vestita.

Distributum in Sumatra. Genus adhuc monotypicum.

Species unica: *S. sumatranus* (Miq.) Brem. n. comb. (*Strobilanthes* Miq.).

In general aspect the type species of this genus resembles the species of *Semnostachya*, but the structure of the androecium and of the testa show that it belongs in the *Goldfussia* group. From *Goldfussia* itself and from *Dossifluga* it differs in the rather long, narrowly racemiform inflorescences, and from *Difflugossa* in the rather large, persistent bracts and in the resupinate corolla.

1. *Semnothyrsus sumatranus* (Miq.) Brem. n. comb.; *Strobilanthes sumatrana* Miq., Fl. Ind. Bat. II, p. 802, 1858; id., Suppl., p. 241, 1860; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899.

Rami graciles, internodiis ad apicem bi-, basin versus quadrisulcatis, sulcis primum puberulo-pubescentibus, mox toti glabrescentes, sicc. nigrescentes. Folia in petiolum canaliculatum brevem contracta; lamina lanceolata, foliorum majorum fide MIQUEL l.c. 6—10 cm longa, foliorum a me inspectorum 3.5—7 cm longa et 1.4—2.2 cm lata, apice caudata, basi acuta, margine remote calloso-denticu-

lata, sicc. supra fusca, subtus olivacea, utrimque glabra, nervis utroque latere costae 4—5. Racemi terminales fide MIQUEL l.c. in triades dispositi, alii solitarii. Pedunculus glaber, usque ad 8 cm longus, plerumque tamen brevior; rhachis ex internodiis apicem versus longitudine decrescentibus, bisulcatis et sulcis puberulo-pubescentibus composita. Bractee ovato-lanceolatae, 11 mm longae et 7 mm latae, concavae et fortiter carinatae, e basi 5-nerviae, costa utroque latere nervis 2 instructa, acutae et apice breviter recurvatae, margine subintegrae, glaberrimae. Pedicelli erecti, 1.5 mm longi, pilis partim capitatis dense hirtelli. Bracteolae oblongae, glabrae, usque ad 0.6 mm longae, sed interdum vix conspicuae. Calyx 9—10 mm longus, post anthesin usque ad 17 mm accrescens, extus pilis partim capitatis hirtellus, lobis ad apicem utrimque hirtellis, mediano quam aliis 1 mm longiore, omnibus 1 mm latis. Corolla 2.8 cm longa, extus primum pilis capitatis vestita, tubo 9 mm, faucibus 15 mm, lobis 4.5 mm longis. Filamenta staminum longiorum 5 et 5.5 mm longa; breviorum 1.5 mm longa; antherae staminum longiorum 1.5 mm, staminum breviorum 1.1 mm longae. Granula pollinis 62  $\mu$  longa et 36  $\mu$  diam., virgis 21 ornata. Capsula 15 mm longa et 4 mm diam., breviter pubescens. Semina 2.7 mm longa et 2.2 mm lata.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: Alahan Pandjang, alt. 1500—2000 m, TEYSMANN H. B. 1191 U, typus, L. dupl. typi.

RIDLEY (in Journ. Fed. Mal. States Mus. VIII, p. 72, 1917) refers to this species a specimen collected by ROBINSON and KLOSS at Barong Baru (G. Talang) at an altitude of 1200 m, but as RIDLEY (in Journ. As. Soc. Mal. Br. I, p. 82, 1923) compared this plant subsequently with the totally different *Difflugossa capillipes* and *D. multiflora*, this identification is almost certainly wrong.

## GROUP T.

As the seeds of the only genus belonging to this group are not yet known, its position remains uncertain. The structure of the androecium with the slightly unequal longer and the strongly incurved shorter stamens, suggests affinity with the preceding group, but the pollen grains (Tab. III F) are globose and provided with pectinate bands, whereas those of the *Goldfussia* group are ellipsoidal and provided with septate bands.

42. *Ctenopaepale* Brem. n. gen.; typus: *Ct. Winckelii* Brem. n. spec.

Planta plietesia, paulum anisophylla. Folia in petiolum satis longum contracta, supra cystolithis lineolata. Inflorescentiae terminales et axillares, spiciformes et abbreviatae, sessiles. Bractee bracteolaeque similiores, lineari-spathulatae, obtusae, 1-nerviae, calyce plus quam dimidio breviores, persistentes. Flores in axillis bractearum solitarii. Calyx 5-partitus, lobo mediano aliis majore. Corolla alba, resupinata, tubo tereti torto, apice recurvato et in fauces campanulatas eo plus quam bis longiores ampliato, lobis subaequalibus rotundatis. Stamina 4, didynamia, inclusa; filamenta omnia glabra, staminum exteriorum paulum inaequalia, erecta, quam interiorum multo longiora; staminum interiorum incurvata; antherae horizontales, ovoideae, quoque extremo obtusae, staminorum longiorum paulo majores quam breviorum. Staminodium nullum et membrana connectiva inter stamina breviora emarginata. Granula pollinis (Tab. III F) globosa, virgis crassis, dense sed breviter pectinatis ornata. Ovarium pilis capitatis vix conspicue comosum, utroque loculo ovulis 2. Stylus ad basin hirtellus, ceterum glaber. Capsula nondum nota.

Distributum in Java Occidentali. Genus adhuc monotypicum.

Species unica: *Ct. Winckelii* Brem. n. spec.



1. *Ctenopaepale Winckelii* Brem, n. spec.; typus: WINCKEL 5/VI/17 L.

Caulis ramique graciles, subteretes, glabri. Folia in petiolum glabrum, usque ad 2 cm longum contracta; lamina elliptico-lanceolata, 4.5—7.5 cm longa et 2.2—3.5 cm lata, utroque extremo contracta, margine remote sinuoso-dentata, herbacea, supra saturate, subtus dilute viridis, utrimque glabra, nervis utroque latere costae 3—4, tenuissimis. Spicae bractearum paribus plerumque 3 instructae. Bracteae bracteolaeque lineari-spathulatae, 4—4.5 mm longae et 1 mm latae, obtusae, glabrae, subcarinatae. Calyx glaber, tubo 1.5 mm longo, lobis 1-nerviis, basin versus carinatis, mediano 11 mm longo et 2.7 mm lato, obtuso, aliis 9.5 mm longis et 1.8 mm latis, subacutis. Corolla 24 mm longa, extus glabra, tubo 5 mm, faucibus 13 mm, lobis orbicularibus 6 mm longis. Stamina exteriora filamentis 5 et 4.5 mm longis; interiora filamentis 1.5 mm longis; antherae staminum longiorum 1.4 mm, staminum breviorum 1.2 mm longae. Granula pollinis (Tab. III F) 44  $\mu$  diam. Capsula nondum nota.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.: Tjadas Malang, alt. 1200 m, WINCKEL 5/VI/17 L, typus.

## GROUP II.

The only genus belonging to this group comprises a small number of species found in Sumatra and Java. It comes probably nearest to the following group, which it resembles in the comparatively large areola (Tab. VI C), in the shape of the non-resupinate corolla and in the hairs by which the style is retained against the wall of the corolla forming bundles instead of rows. It differs however in the nature of the hairs covering the testa and in the ellipsoidal pollen grains (Tab. II B, C).

43. *Microstrobilus* Brem, n. gen.; typus: *M. paniculatus* (Nees) Brem, n. comb. (*Goldfussia* Nees).

Plantae plietesiae, anisophyllae, probabiliter gregariae et multis interjectis annis uno tempore florentes. Folia sessilia vel petiolata, basin versus valde contracta, symmetrica. Inflorescentiae capituliformes, longius et graciliter pedunculatae, in paniculis terminales et axillares dispositae. Bracteae infimae foliaceae, aliae oblanceolatae vel obovatae, obtusae, dense ciliolatae, penninerviae, superiores interdum indistincte 3- vel pluri-nerviae, persistentes vel deciduae. Flores in axillis bractearum solitarii, bracteolati. Bracteolae bracteis angustiores, obtusae, dense ciliolatae, bracteis et calycis lobis subaequilongae. Calyx 5-partitus, segmentis posticis quam anticis interdum tamen paulo altius connatis, lobis omnibus lanceolatis vel oblongis, dense ciliolatis, imbricatis. Corolla violacea vel alba, non resupinata, tubo tereti in fauces breviter campanulatas tubo paulo longiores ampliato, pilis stylum retinentibus in fasciculos binos dispositis, lobis rotundatis subaequalibus. Stamina 4, didynamia, longiora exserta; filamenta omnia erecta et glabra vel staminum longiorum basi hirtella, staminum exteriorum quam interiorum bis longiora; antherae erectae, apice obtusae. Staminodium minutum. Granula pollinis ellipsoidea vel subglobosa, virgis septatis ornata. Ovarium pilis capitatis breviter et parce comosum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, glabra, 4-seminalis, retinaculis in aciculam satis longam exeuntibus. Semina (Tab. VI C) luteo-brunnea, magno-areolata, extra areolam pilis valde applanatis, pariete tenui, non annulata munitis vestita.

Distributum in Sumatra et in Java. Species adhuc notae 3.

Species typica: *M. paniculatus* (Nees) Brem, n. comb. (*Goldfussia* Nees).

## Key to the Species.

1. Plants strongly anisophyllous; the smaller leaves often early deciduous. Calyx as long as the bracts and bracteoles. Pollen grains (Tab. II B) distinctly ellipsoidal. — Java and South Sumatra . . . . . 1. *M. paniculatus* (Nees) Brem. n. comb.
- : Plants but slightly anisophyllous; the smaller leaves not shed before the larger ones. Calyx of the middle and upper flowers longer than the bracts and of all flowers longer than the bracteoles. Pollen subglobose (Tab. II C) . . . . . 2
2. Shoots towards the top narrowly 4-winged. Leaves sessile; the upper ones ovate. Calyx lobes oblong. — West Java . . . . . 2. *M. alatus* (Bl.) Brem. n. comb.
- : Shoots obtusely to subacutely quadrangular. Leaves distinctly petiolate and all lanceolate. Calyx lobes linear. — West Sumatra . . . . . 3. *M. orthostachyus* Brem. n. spec.

1. *Microstrobilus paniculatus* (Nees) Brem. n. comb.; *Goldfussia paniculata* Nees in DC., Prodr. XI, p. 175, 1847, var. *alata* (Bl.) Nees excl.; *Strobilanthes paniculata* (Nees) Miq., Fl. Ind. Bat. II, p. 802, 1858, var. *alata* (Bl.) Miq. excl.; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899, var. *alata* (Bl.) Miq. excl.; Hall. f. in Meded. Rijksherb. n. 26, p. 4, 1915; (non T. And. in Journ. Linn. Soc. IX, p. 483, 1867, nom. illeg., nec Clarke in Hook.f., Fl. Brit. Ind. IV, p. 475, 1884, nec Trimen, Handb. Fl. Ceylon III, p. 314, 1895, quae est *Leptacanthus paniculatus* Brem, n. nom.) — *Strobilanthes* spec. B, Koorders-Schuhmacher, Syst. Verz. I § 1, p. 45, 1912; — *Str. deminuta* S. Moore in Journ. of Bot. LXIII, Suppl. p. 78, 1925.

Planta ramosissima, 3—4.5 m alta. Rami graciles, obtuse vel acutius quadrangulares, haud profunde sulcati, subglabri. Folia valde inaequalia; minora plerumque mox decidua; omnia sessilia sed basin versus valde contracta, elliptico-lanceolata, majora 8—17 cm longa et 2.5—6 cm lata, longe caudata, obscure sinuoso-dentata, tota glabra vel subtus nervis breviter pubescentia, cystolithis supra dense, subtus ad nervos venulosque solum lineolata, nervis utroque latere costae plerumque 9. Spicae capituliformes longius et graciliter pedunculatae; aliquae tamen quae ex axillis bractearum infimiarum normaliter sterilius interdum oriuntur breviter pedunculatae; omnes bractearum paribus 4 vel 5 instructae, 7—9 mm longae et 6—7 mm diam. Bracteae infimae foliaceae, 11 mm longae et 6 mm latae, nervis utroque latere costae 3, steriles, mox deciduae et inde in speciminibus siccatis raro preservatae; bracteae aliae oblanceolatae, fertiles; paris secundi 8 mm longae et 3 mm latae, nervis utroque latere costae 2, plerumque mox deciduae; sequentes 5 mm longae et 2 mm latae, obtusae, dense ciliolatae sed ceterum glabrae, cystolithis dense lineolatae, obscure 3-nerviae, subpersistentes. Bracteolae membranaceae, lineari-lanceolatae, 5.5 mm longae et 1.5 mm latae, obtusae, dense ciliolatae sed ceterum glabrae, cystolithis dense lineolatae. Calyx membranaceus, ad anthesin 5.5 mm longus, postea usque ad 6.5 mm accrescens, tubo facie postica 2 mm longo, facie antica brevior, lobis lanceolatis, ad anthesin 1.7 mm, postea 2.2 mm latis, obtusis vel acutis, dense ciliolatis, cystolithis dense lineolatis. Corolla violacea vel alba, 1.7 cm longa, extus puberula, tubo 6 mm, faucibus 7 mm, lobis 4 mm longis. Filamenta omnia glabra, staminum longiorum 9 mm, breviorum 4 mm longa; antherae 2 mm longae. Granula pollinis (Tab. II B) ellipsoidea, 66  $\mu$  longa et 44  $\mu$  diam., virgis 15 instructa. Capsula 7 mm longa et 5 mm diam., subobtusa. Semina (Tab. VI C) 2 mm longa et 1.5 mm lata.

Habitat partem Sumatrae australem et partes occidentalem et centralem Javae.

Sumatra. Lampons Res.: Kroë, north of Hoodjoong, alt. 1000 m, FORBES 1929 L et BD (numerus typi *Strobilanthes deminuta* S. Moore).

West Java. Buitenzorg Res.: Pangerango, alt. 1500 m, JUNGHUHN s.n. L et U, exempla typi; Gedohan Ravine, KUHL et v. HASSELT s.n. L.

Central Java. Madioon Res.: Ngebél, alt. 1350 m, KOORDERS 22705, 23338 et 29244 L.

According to KOORDERS-SCHUHMACHER, Syst. Verz., this species has also been collected by KOORDERS at Pringombo in the Banjumas Residency.

*M. paniculatus* is easily distinguishable from the two other species by the strongly pronounced anisophylly, the smaller leaves moreover lasting but a short time.

2. *Microstrobilus alatus* (Bl.) Brem. n. comb. *Strobilanthes alata* Bl., Bijdr. Fl. Ned. Ind., p. 798, 1826, ubi species haec cautius ad genus *Strobilanthes* relata est; Kuntze, Rev. Gen. Pl. II, p. 498, 1891; Koorders in Junghuhngedenkboek p. 189, 1910; id. Exkursionsfl. v. Java III, p. 218, 1912, syn. *Str. paniculatus* (Nees) Miq. excl.; Hall, f. in Meded. Rijksherb. n. 26, p. 4, 1915; S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925 (non *Str. alata* Nees in DC., Prodr. XI, p. 194, 1847, nom. illeg., nec T. And. in Journ. Linn. Soc. IX, p. 476, 1867, nec Clarke in Hook.f., Fl. Brit. Ind. IV, p. 464, 1884, quae est *Pteracanthus urticifolius* (O. Ktze) Brem); *Goldfussia paniculata* Nees var. *alata* (Bl.) Nees in DC., Prodr. XI, p. 175, 1847; *Strobilanthes paniculata* (Nees) Miq. var. *alata* (Bl.) Miq., Fl. Ind. Bat. II, p. 802, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; — *Str. dictypteroides* Miq., Fl. Ind. Bat. II, p. 802, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 219, 1912; Backer in Trop. Natuur VII, p. 24, 1918.

Planta valde ramosa, circ. 1 m alta, gregaria et multis interjectis annis uno tempore florens dicta. Ramuli in axillis foliorum haud raro bini superpositi, quadrangulares et apicem versus anguste quadri-alati, subglabri. Folia quoque pari inaequalia; omnia sessilia; inferiora tamen dimidio basali valde contracta et inde quasi petiolata, lanceolato-elliptica, circ. 13 cm longa et 5 cm lata, apice caudata, margine dentata, nervis utroque latere costae 9—10; superiora ovato-lanceolata vel ovata, 2—4.5 cm longa et 1—3 cm lata, acuta vel subacuminata vel subobtusata, irregulariter et inconspicue dentata vel sinuosa, nervis utroque latere costae 4—5; omnia subglabra, cystolithis utrimque sed praesertim supra conspicue lineolata. Spicae capituliformes longius pedunculatae; pedunculi interdum ex internodiis duobus compositi; bractearum pares 6. Bractee infimae foliaceae orbiculares vel reniformes, subintegrae, nervis utroque latere costae 3—4, semper steriles; bractee aliae obovatae, 5—6 mm longae et 4—4.5 mm latae, apice late-truncatae vel subemarginatae, ciliolatae, ceterum glabrae; pares 3 centrales solum fertiles. Bracteolae bracteis similiores, angustiores tamen, 3.5 mm latae. Calyx 7—9 mm longus, tubo 1.5—2 mm longo, lobis oblongis 5.5—7 mm longis et 3—3.5 mm latis, apice rotundatis, ciliolatis. Corolla violacea, 2.5—2.8 cm longa, extus glabra, tubo 7—8 mm, faucibus 12—14 mm, lobis 5—6 mm. Filamenta omnia glabra, staminum longiorum 10 mm, breviorum 5 mm longa; antherae 2.5 mm longae. Granula pollinis (Tab. II C) subglobosa, 53  $\mu$  longa et 49  $\mu$  diam., virgis 15 ornata. Capsula 7 mm longa, glabra et obtusa. Semina 3 mm longa et 2.5 mm lata.

Habitat Javam Occidentalem.

West Java. Bantam Res.: s.l., BLUME s.n. L, typus; Priangan Res.: G. Malabar, coll. indig. s.n. L; ibid., alt. 1000 m, H. WINKLER 1909 BD; G.

Wajang, alt. 1650 m, FORBES 719 L, BD; *ibid.* near Pengalengan, alt. 1500—1800 m, JUNGHUHN s.n. L et U (types of *Strobilanthes diclipteroides* Miq.); G. Papandajan, alt. 2000 m, v. STEENIS 6771 L; Taloon, coll. indig. s.n. L.

*M. alatus* is easily distinguishable from the two other species by its narrowly four-winged shoots and by its more voluminous capitula.

3. *Microstrobilus orthostachyus* Brem. n. spec.; typus: KORTHALS 625 c L.

Planta ramosa. Rami graciles, subteretes, internodiis haud profunde quadrisulcatis, primum sparse pubescentes, deinde nodis densius pubescentibus exceptis glabrescentes. Folia quoque pari paulum inaequalia, in petiolum usque ad 1.5 cm longum contracta; lamina lanceolata, 7.5—17 cm longa et 2.7—6.5 cm lata, utroque extremo contracta, apice acutissime exeuns, margine irregulariter repando-dentata, subtus costa nervis venulisque dense pubescens, ceterum glabra, supra cystolithis parvis lineolata, nervis utroque latere costae in foliis majoribus 6—7. Spicae capituliformes gracillime pedunculatae; pedunculi foliis parvis, mox deciduis instructi, paniculatum dispositi; bractearum pares plerumque 7. Bracteae infimae foliaceae, mox deciduae, internodio puberulo 1—6 mm longo ab aliis remotae, steriles; aliae ovato-orbiculares, 6 mm longae et 5 mm latae, nervis pluribus flabellatim dispositis instructae, extus puberulae, margine vix conspicue ciliolatae, intus glabrae, concavae; pares centrales solum fertiles. Bracteolae cuneatae, 6 mm longae et 2.4 mm latae, apice truncatae, extus vix conspicue puberulae, margine vix conspicue ciliolatae, intus glabrae, 3-nerviae. Calyx 7 mm longus, tubo subnullo, lobis bracteolis similioribus sed 2 mm latis et apice subtruncatis. Corolla 10.5 mm longa, extus puberula, tubo 3.5 mm, faucibus 5 mm, lobis 2 mm longis. Filamenta staminum longiorum 4 mm longa, basi hirtella, staminum breviorum 2 mm longa; antherae 1.6 mm longae. Granula pollinis subglobosa, 48  $\mu$  longa et 43  $\mu$  diam., virgis probabiliter 12 ornata. Capsula nondum nota.

Habitat Sumatram Occidentalem.

S u m a t r a. West Coast Res.: probably on Mt Singalang, KORTHALS 625 c L, typus.

The label of the type specimen does not specify the locality, but the number makes it probable that it was collected on Mt Singalang.

In the but slightly anisophyllous shoots and in the shape of the pollen grains *M. orthostachyus* resembles *M. alatus*, from which it is however easily distinguishable by the thin subterete shoots and peduncles.

#### Index Specierum.

2. *alatus* (Bl.) Brem. n. comb. (*Strobilanthes* Bl.); syn.: *Goldfussia paniculata* Nees var. *alata* (Bl.) Nees; *Strobilanthes paniculata* (Nees) Miq. var. *alata* (Bl.) Miq.; *Str. diclipteroides* — Java —
3. *orthostachyus* Brem. n. spec. — Sumatra —
1. \* *paniculatus* (Nees) Brem. n. comb. (*Goldfussia* Nees); syn.: *Strobilanthes paniculata* Miq. 1858, non T. And. 1867; *Str. diminuta* S. Moore — Sumatra, Java —

*Microstrobili* species sub nominibus genericis aliis nuncupatae.

*Goldfussia paniculata* Nees in DC., Prodr. XI, p. 175, 1847 = *Microstrobilus paniculatus* (Nees) Brem. n. comb.

*Goldfussia paniculata* Nees var. *alata* (Bl.) Nees l.c. (*Strobilanthes alata* Bl.) = *Microstrobilus alatus* (Bl.) Brem.

*Strobilanthes alata* Bl., Bijdr. Fl. Ned. Ind., p. 798, 1826 = *Microstrobilus alatus* (Bl.) Brem. n. comb.

- Strobilanthes deminuta* S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925  
= *Microstrobilus paniculatus* (Nees) Brem.
- Strobilanthes diclipteroides* Miq., Fl. Ind. Bat. II, p. 802, 1858 = *Microstrobilus alatus* (Bl.) Brem.
- Strobilanthes paniculata* (Nees) Miq., Fl. Ind. Bat. II, p. 802, 1858 = *Microstrobilus paniculatus* (Nees) Brem.
- Strobilanthes paniculata* (Nees) Miq. var. *alata* (Bl.) Miq. l.c. = *Microstrobilus alatus* (Bl.) Brem.

### GROUP V.

The main characters of group V are the rather small, areolate seeds and the globose pollen grains (Tab. II F, G; Tab. III C). Other important features are the anisophylly, the non-resupinate corolla and the exerted stamens.

The structure of the pollen grains is rather variable. In shape and size, it is true, they are all similar, but the relief varies. As a rule, they are banded (Tab. II F, G), but the nature of the bands is not everywhere the same: in *Listrobanthes* and *Strobilanthes* they are septate (Tab. II F), but in *Sympagis*, *Parasympagis* and *Parastrobilanthes* the transverse septa are suppressed, and the bands therefore reduced to the elevated and sometimes more or less wavy rim (Tab. II G). The pollen grains of *Lamiacanthus* are not banded but echinulate (Tab. III C).

The seeds (Tab. VI D, E, F) too, although always areolate, differ considerably. In *Listrobanthes*, *Sympagis* and *Parasympagis* they are outside the areola covered with rather long, gradually tapering hairs; in *Strobilanthes* too the extra-areolar part is covered with annulate hairs, but the latter are much shorter, everywhere of the same width, and at the top obtuse; and the seeds of *Parastrobilanthes* and *Lamiacanthus* are completely glabrous.

The shape of the inflorescence too varies. *Listrobanthes* and *Sympagis* are provided with fairly long spikes; in *Parasympagis* they are much shorter and in the other genera they are capituliform. In *Listrobanthes* the bracts moreover are partly penninerved and partly 1-nerved, whereas in all the other genera they are pluri-nervous. The genus *Listrobanthes*, which differs also from the other ones by the reduction of the inner stamens to staminodia, is doubtless the most aberrant member of the group.

The affinity between group V and the preceding one has already been discussed; the relations with the other groups are not clear and at any rate more remote.

44. *Listrobanthes* Brem. n. gen.; typus: *L. khasyana* (Nees) Brem. n. comb. (*Endopogon* Nees); *Strobilanthes* species T. Anderson et auctorum aliorum.

Planta plietesia, anisophylla. Inflorescentiae spiciformes, elongatae, terminales et axillares, hirsutae. Bracteae inferiores ellipticae, calyce multo longiores, penninerviae; aliae angustiores et calyci subaequilongae, 1-nerviae; omnes persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae angustae, calyce dimidio breviores. Calyx subaequaliter 5-partitus, lobis linearibus, apicem versus sensim attenuatis, apice callosis. Corolla alba, non resupinata, tubo in fauces infundibuliformes eo breviores ampliato, pilis stylium retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina exteriora exserta, interiora ad staminodia capitata eis dimidio breviora redacta; filamenta omnia basi hirtella; antherae ovoideae, apice obtusae, erectae, thecis patentibus. Staminodium impar nullum; membrana connectiva inter staminodia contra profunde emarginata. Granula pollinis globosa, virgibus septatis, polis cohaerentibus ornata. Ovarium comosum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, parce comosa, 4-seminalis, retinaculis in aciculam rectam

exeuntibus. Semina albida, areolata, extra areolam pilis annulatis, sensim attenuatis vestita.

Distributum in Himalaya Orientali et in montibus Khasiae. Genus adhuc monotypicum.

Species unica: *L. khasyana* (Nees) Brem. n. comb. (*Endopogon* Nees).

1. *Listrobanthes khasyana* (Nees) Brem. n. comb.; *Endopogon khasyanus* Nees in DC., Prodr. XI, p. 104, 1847; *Strobilanthes khasyana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 471, 1867; Clarke in Hook.f., Fl. Brit. Ind. IV, p. 436, 1884.

Habitat Himalayam Orientalem et Khasiae montes.

The name *Listrobanthes* is an anagram of *Strobilanthes*, which, as stated above, it resembles in the structure of the pollen grains.

*Strobilanthes hypomalla* R. Ben. in Bull. Mus. Paris, 1921, p. 543, a plant collected in Annam, resembles the species described above in the presence of but two fertile stamens and in the globose, banded pollen grains. However, as it has an entirely different kind of inflorescence, it can not be included in the same genus.

45. *Sympagis* (Nees) Brem. n. gen.; *Strobilanthes* Bl. subgen. *Sympagis* Nees in Wall., Pl. As. Rar. III, p. 87, 1832.

Plantae plietesiae, isophyllae vel paulum anisophyllae. Folia petiolata. Inflorescentiae spiciformes, elongatae, terminales et axillares, bracteis decussatis, sed floribus ad nodos solitariis. Bracteae oblongae, obtusae, calyce paulo breviores, e basi 3- vel 5-nerviae, persistentes. Bracteolae lineari-oblongae, bracteis paulo breviores, 1-nerviae, persistentes. Calyx subaequaliter 5-partitus, lobis linearibus subobtusis, mediano interdum quam aliis paulo angustiore. Corolla lavandula vel alba, non resupinata, tubo in fauces late campanulatas ei subaequilongas ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia; omnia exserta; filamenta glabra, staminum exteriorum quam interiorum fere bis longiora; antherae erectae, apice obtusae, thecis patentibus; membrana connectiva inter stamina exteriora et interiora in lobulos incurvatos producta. Staminodium late triangulare, parvum. Granula pollinis globosa, virgis ad marginem redactis ornata. Ovarium comosum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, 2-, 3- vel 4-seminalis, retinaculis recte exeuntibus. Semina (Tab. VI D) albida, areolata, extra areolam pilis annulatis sensim attenuatis vestita.

Distributum in Himalaya Orientali et in montibus Khasiae. Species 5.

Species typica: *S. brunoniana* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

The genus *Sympagis* resembles *Listrobanthes* in the shape of the inflorescence and in the structure of the testa, but differs in the presence of four fertile stamens and in the relief of the pollen grains, the bands not being septate but reduced to the elevated and somewhat wavy rim. Pollen grains ornamented with this kind of bands occur also in *Parasympagis* and *Parastrobilanthes*, and of these two genera *Parasympagis* is doubtless nearly related to *Sympagis*, which it resembles i.a. in the structure of the testa.

#### Index Specierum.

- \* *brunoniana* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Assamia —  
*maculata* (Wall. ex Nees) Brem. n. comb. (*Ruellia* Wall. ex Nees); syn.:  
*Strobilanthes maculata* (Wall. ex Nees) Nees — Assamia —  
*monadelpha* (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Assamia —

**nivea** (Craib) Brem. n. comb. (*Strobilanthes* Craib) — Siamia —  
**petiolaris** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Himalaya —

#### Index Iconum.

**brunoniana** (Nees) Brem. in Engl., Bot. Jahrb. XVIII, Tab. I fig. 19, 1893,  
 pollen (sub nomine *Strobilanthes brunoniana* Nees)

**maculata** (Wall. ex Nees) Brem. in Wall., Pl. As. Rar. III, Tab. 250, 1832  
 (sub nomine *Ruellia maculata* Wall. ex Nees).

*Sympagis* species sub nomine generico *Strobilanthe nuncupatae*.

**brunoniana** Nees in Wall., Pl. As. Rar. III, p. 87, 1832 = **Sympagis brunoniana**  
 (Nees) Brem. n. comb.

**maculata** (Wall. ex Nees) Nees in DC., Prodr. XI, p. 190, 1847 (*Ruellia*  
 Wall. ex Nees) = **Sympagis maculata** (Wall. ex Nees) Brem.

**monadelpha** Nees in Wall., Pl. As. Rar. III, p. 87, 1832 = **Sympagis mona-**  
**delpha** (Nees) Brem. n. comb.

**nivea** Craib in Kew Bull. 1914, p. 131 = **Sympagis nivea** (Craib) Brem. n.  
 comb.

**petiolaris** Nees in DC., Prodr. XI, p. 189, 1847 = **Sympagis petiolaris** (Nees)  
 Brem. n. comb.

**petiolaris** Nees var. **tubiflos** Clarke in Hook. f., Fl. Brit. Ind. IV, p. 458, 1884, n. v., prob.  
 = *Sympagis* sp. nov.

46. **Parasympagis** Brem. n. gen.; typus: *P. Kerrii* Brem. n. spec.

Plantae plietesiaceae, anisophyllae. Folia petiolata. Inflorescentiae spiciformes breves, terminales et axillares vel in paniculas terminales et axillares dispositae, floribus oppositis. Bracteae oblongae, concavae, margine ciliatae, dorso pubescentes et apicem versus pilis capitatis vestitae, 3- vel 5-nerviae; inferiores saltem apice lamina rudimentaria instructae, intus ad basin laminae rudimentariae conspicue ciliatae; omnes persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calycis lobis similiores, paulo latiores tamen, 1-nerviae, persistentes. Calyx aequaliter 5-partitus, lobis linearibus, apice ciliatis. Corolla alba, non resupinata, extus pilis capitatis vestita, tubo tereti in fauces campanulatas eo paulo breviores ampliatio, pilis stylum retinentibus in series duas brevissimas dispositis, lobis subaequalibus obreniformibus. Stamina 4, didynamia, exserta; filamenta staminum exteriorum quam interiorum paulo longiora, basi hirtella; membrana connectiva barbata; antherae erectae, obtusae, thecis patentibus. Staminodium nullum. Granula pollinis globosa, virgis ad marginem redactis ornata. Ovarium comosum, utroque loculo ovulis 2. Stylus glaber. Capsula fusiformis, 4-seminalis, comosa, retinaculis crassis, apice paulum recurvatis. Semina albida, areolata, extra areolam pilis annulatis sensim attenuatis vestita.

Distributum in Birmania et Siamia. Species adhuc notae 2.

Species typica *P. Kerrii* Brem. n. spec. v. infra.

In the structure of the testa *Parasympagis* resembles *Sympagis* and *Listrob-anthes*, in that of the pollen grains *Sympagis* and *Parastrobilanthes*, whereas in its inflorescences it approaches the three following genera, and recedes from *Sympagis* and *Listrob-anthes*. The rows of hairs by which the style is attached to the wall of the corolla are extremely short, and in this too the genus occupies a more or less intermediate position between the two preceding and the three following genera. The affinity between one of the species here referred to *Parasympagis* and the *Sympagis* species was noted already by NEES (cf. Nees in Wall., Pl. As. Rar. III, p. 86, 1832).

**Parasympagis Kerrii** Brem. n. spec.; *Strobilanthes imbricata* Nees in errore

apud R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 668, 1935, syn. *Str. pterocaulis* Kurz excl.; typus: KERR 884 L.

Planta ramosa, 1.5 m alta. Caulis ramique quadrangulares et quadrisulcati, primum pubescentes, deinde glabrescentes. Folia quoque pari valde inaequalia, basi contracta et sensim in petiolum vergentia; lamina elliptico-lanceolata, apice caudato-acuminata, margine crenato-dentata, herbacea, supra viridis, sparse hirtella et cystolithis parvis et gracilibus lineolata, subtus violacea, costa nervis venulis pubescens et cystolithis parvis vix conspicue lineolata, nervis utroque latere costae 7—11. Spicae breves solitariae vel in triades dispositae, 1.5—2 cm longae et 7—9 mm diam. Bractee 7.5—8.5 mm longae et 3 mm latae. Bracteolae bracteis aequilongae, 0.7 mm latae, ad apicem virides, ceterum hyalinae. Calyx bracteis bracteolisque aequilongus, lobis 0.6 mm latis, ad apicem viridibus, ceterum hyalinis. Corolla alba, 12 mm longa, tubo 5 mm, faucibus 4 mm, lobis 3 mm longis. Granula pollinis 52  $\mu$  diam., virgis 12 ornata. Capsula 6.5 mm longa.

Habitat Siamiam.

Siam. Chiangmai: Doi Sootep, alt. 1500 m, KERR 884 L, typus.

This species differs from the plant collected in Upper Burma which NEES had described under the name *Strobilanthes imbricata*, in the smooth shoots and the but sparsely hirtellous upper side of the leaves. The plant described by CLARKE in HOOK. F., Fl. Brit. Ind. IV, p. 455, 1884, under the name *Str. imbricata*, was collected in Lower Burma and has much larger leaves and longer spikes: it is apparently "*Strobilanthes*" *pterocaulis* Kurz.

The name *Strobilanthes imbricata* Nees does not belong to the plant collected in Upper Burma, but to a specimen collected in Java and described by BLUME under the name *Str. hirta* Bl. var.  $\beta$ . As this name is quoted by NEES as a synonym of *Str. imbricata*, it is clear that the latter must be considered a new name for BLUME's plant. As the Upper-Burma species had up to now no legitimate name, I will call it *Parasympagis Wallichii* Brem.

**Parasympagis Wallichii** Brem. n. nom.; *Strobilanthes imbricata* Nees in Wall., Pl. As. Rar. III, p. 86, 1832, quoad specimina in Birmania lecta, haud quoad typum; id. in DC., Prodr. XI, p. 186, 1847; non Clarke in Hook. f., Fl. Brit. Ind. IV, p. 455, 1884, quae prob. est "*Strobilanthes*" *pterocaulis* Kurz.

Habitat Birmaniam Superiorem.

47. **Strobilanthes** Bl., Bijdr. Fl. Ned. Ind., p. 781 et 797, 126, p. p.; Nees in Wall., Pl. As. Rar. III, p. 75 et 84, 1832, pp.; id. in DC., Prodr. XI, p. 101 et 177, 1847, p. p.; Miq., Fl. Ind. Bat. II, p. 794, 1858, p. p.; Suppl., p. 241, 1860, p. p.; Boerl., Handl. Fl. Ned. Ind. II, p. 632 et 659, 1890, p. p.; Koorders, Exkursionsfl. v. Java III, p. 216, 1912, p. p.; Lemée, Dict. Pl. Phan. VI, p. 349, 1935, p. p., syn. excl.; non apud auctores qui de flora indica, chinensi, indo-chinensi et philippinensi tractaverunt.

Plantae plietesiae, valde ramosae, gregariae et pluribus interjectis annis uno tempore florentes. Folia in petiolum satis longum contracta, cystolithis parvis vel parvis cum majoribus mixtis lineolata. Inflorescentiae spiciformes valde abbreviatae, partim solitariae vel omnes in paniculas vel racemulas terminales et axillares dispositae. Bractee ovatae vel orbiculares, e basi plurinerviae, totae vel fere totae albae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calycis lobis similiore, persistentes. Calyx subaequaliter 5-partitus, lobis linearibus vel anguste triangularibus, apice viridibus, ceterum albis. Corolla alba, non resupinata, tubo tereti in fauces infundibuliformes eo breviores ampliato, pilis stylum retinentibus in fasciculos binos dispositis, lobis subaequalibus orbicularibus vel ovatis. Stamina 4,



didynamia, exserta; filamenta tota glabra vel basi hirtella, exteriora quam interiora paulo longiora; antherae erectae vel versatiles, apice obtusae, thecis patentibus. Staminodium parvum vel inconspicuum. Tubus staminalis apice barbatus. Granula pollinis (Tab. II F) globosa, circ.  $50\ \mu$  diam., virgis 18 septatis, polis cohaerentibus ornata. Ovarium glabrum vel comosum, utroque loculo ovulis 2 quorum inferius semper rudimentarium. Stylus glaber. Capsula ambitu elliptica, complanata, 2-seminalis, tegmentis lateralibus in dehiscentia a dorso discidentibus. Semina (Tab. VI E) luteo-brunnea, areolata, cellulis extra-areolaribus annulatis et in papillos vel pilos breves annulatos, obtusos exeuntibus.

Distributum in Sumatra et in Java. Species adhuc notae 11.

Species typica: *Str. cernua* Bl.

The delimitation of this genus has already been discussed in the introduction to this work. In its present shape it is a quite natural one, nearly related to the other genera belonging to group V and especially to *Parasympagis*, *Parastrobilanthes* and *Lamiacanthus*, but easily distinguishable from them by the structure of the pollen grains and by that of the testa. The ellipsoidal spikes with their almost entirely or even entirely white bracts are probably also a characteristic feature, but it must be admitted that the colour of the bracts in the other genera is but imperfectly known.

#### Key to the Species.

1. Calyx lobes either entirely or at least at the top fringed with cilia . . . 2
  - : Calyx entirely glabrous . . . . . 6
2. Spikes with four pairs of glabrous, eglandular bracts. — West Java . . . . . 1. *Str. prianganensis* Brem. n. spec.
  - : Spikes with a larger number of bracts; the latter, with the exception of the lowest pair, covered either with capitate hairs or with larger, sessile or stipitate glands or with capitate hairs and glands . . . . . 3
3. Bracts covered with capitate hairs but without larger sessile or stipitate glands; at the top with a small green patch. — West Java . . . . . 2. *Str. Blumei* Brem. n. nom.
  - a. Shoots, petioles and underside of the leaves densely puberulo-pubescent. — West Java . . . . . var. *puberula* Brem. n. nom.
    - : Shoots, petioles and underside of the leaves hirtellous. — West Java . . . . . var. *tomentella* Brem. n. var.
  - : Bracts provided with sessile or stipitate glands and sometimes also with capitate hairs; margin at least in the upper half green . . . . . 4
4. First pair of bracts entirely glabrous; the others with stipitate glands, 5-nerved. — East Java . . . . . 3. *Str. lawangensis* Brem. n. spec.
  - : First pair of bracts ciliate; the others with subsessile glands, 3-nerved . . . . . 5
5. Shoots and petioles subglabrous; nerves on the underside of the leaves densely puberulo-pubescent. Rhachis of the inflorescence subglabrous. — Central Java . . . . . 4. *Str. Rantii* Brem. n. spec.
  - : Shoots and petioles hirsute; nerves on the underside of the leaves sparsely hirsute. — West Java . . . . . 5. *Str. imbricata* Nees
    - a. Bracts covered with ecapitate bristles. — West Java . . . . . var. *Blumei* Brem. n. nom.
      - : Bracts covered with capitate bristles. — West Java . . . . . var. *glandulosa* Brem. n. var.
6. Bracts provided with a recurved green margin; in the upper half glandular . . . . . 7

- : Bracts entirely white or with a small green patch at the top, rarely with a narrow green margin, but the margin never recurved; entirely eglandular . . . . . 8
7. Shoots and petioles hirsute; leaves serrate and rather densely hirsute; the larger ones provided with 9—10 pairs of nerves. Ovary comose. — West Java . . . . . 6. *Str. Boerlagii* Brem. n. spec.
- a. Petioles densely hirsute. — West Java . . . . .  
     var. *densipila* Brem. n. nom.
- : Petioles sparsely hirsute. — West Java . . . . .  
     var. *sparsipila* Brem. n. var.
- : Shoots and petioles glabrous; leaves shortly and callosely dentate, subglabrous; the larger ones provided with 11—13 pairs of nerves. Ovary entirely glabrous. — West Java and perhaps Sumatra . . . . .  
     . . . . . 7. *Str. cernua* Bl.
- a. Glands on the outside of the bracts shortly stipitate. — West Java and perhaps Sumatra . . . . .  
     var. *brevistipitata* Brem. n. nom.
- : Glands on the outside of the bracts rather long stipitate. — West Java . . . . .  
     var. *laxiflora* Bl.
8. Petioles densely covered with patent capitate or ecapitate hairs . . . . . 9
- : Petioles glabrous or subglabrous . . . . . 10
9. Petioles covered with ecapitate hairs. Bracts broadly ovate, 7.5 mm long and 7 mm wide. — Central Java . . . . .  
     . . . . . 8. *Str. slamatensis* Brem. n. spec.
- : Petioles covered with capitate hairs. Bracts broadly orbicular, 12 mm long and 13 mm wide. — Central Java . . . . .  
     . . . . . 9. *Str. prahuensis* Clarke ex S. Moore
10. Leaf margin curled. Bracts 7.5 mm long and 7 mm wide, with a green patch at the top. — Sumatra and perhaps West Java . . . . .  
     . . . . . 10. *Str. Teysmannii* Miq.
- : Leaf margin flat. Bracts 10 mm long and 8 mm wide, with a narrow green margin. — Sumatra . . . . .  
     . . . . . 11. *Str. ancolana* Miq.

As most of the species belonging to this genus are confined to a small area, and as the herbaria in this country possess no specimens from several mountains in Central and East Java and, apart from the old ones on which MIQUEL based his *Str. ancolana* and *Str. Teysmannii*, nothing at all from Sumatra, it is to be expected that their number will undergo a considerable increase when the material of the Buitenzorg herbarium becomes available.

1. *Strobilanthes prianganensis* Brem. n. spec.; typus: BOERLAGE s. n. L.  
 Caulis ramique primum setulis incurvatis brevibus asperi, postea asperuli, primum acutius quadrangulares et conspicue quadrisulcati, postea obtuse quadrangulares vel subteretes. Folia in petiolum glabrum, usque ad 3 cm longum contracta; lamina lanceolato-elliptica, usque ad 14 cm longa et 6.7 cm lata, utroque extremo contracta, margine crenata, utrimque sed praesertim supra cystolithis parvis lineolata, utrimque setulis incurvatis brevibus aspera; nervis utroque latere costae 10—13. Spicae in racemulas vel paniculas terminales et axillares dispositae. Paniculae pedunculus et rhachis acute quadrangulares, glabri, bracteis deciduis muniti. Spicae post anthesin usque ad 9 mm longae et 13 mm diam., bractearum paribus 4 instructae. Bracteae omnes glaberrimae et eglandulosae, apice areola viridi parva munitae, ceterum glabrae; infimae reniformes, 4 mm longae et 5.5 mm latae, 5-nerviae, steriles; aliae obovatae, 6 mm longae et 5 mm latae, 3-nerviae. Bracteolae ad calycem adnatae, lineari-lanceolatae, 4 mm longae et 1.1 mm latae, obtusae, apice virides, ceterum

albae, margine sparse et longe ciliatae, 1-nerviae. Calyx (post anthesin solum visus) bracteolis paulo longior, 5 mm longus, lobis anguste triangularibus 3.5 mm longis et 0.7 mm latis, apice subcallosis, viridibus, ciliatis, ceterum albis et glabris. Corolla ignota. Capsula 6 mm longa et 3.5 mm diam., tota glabra vel pilis paucis breviter comosa.

Habitat Javam Occidentalem.

West Java. Priangan Res.: Papandajan, BOERLAGE s.n. L, typus.

A rather isolated species, easily recognizable by the small number of bracts. By the total absence of glands it reminds one of the species 8—11, from which it differs however conspicuously by the presence of cilia at the top of the calyx lobes and by the small size of the bracts.

2. *Strobilanthes Blumei* Brem. n. nom.; *Str. hirta* (Vahl) Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826, quoad descriptionem et specimina javanica, haud quoad typum Vahlia qui est *Hemigraphis hirta* (Vahl) T. And., var. *crenulata* Bl. excl. (cf. *Str. imbricata* Nees); eodem modo Nees in DC., Prodr. XI, p. 183, 1847; non Koorders, Exkursionsfl. v. Java III, p. 218, 1912, nam specimina eius ad *Str. imbricatam* Nees et ad *Parastrobilanthem parabolicam* (Nees) Brem. pertinent; nec Koorders-Schuhmacher, Syst. Verz. I § 1, p. 44, 1912, nam specimen citatum est *Parastrobilanthes Koordersii* Clarke ex Kds; Hall. f. in Meded. Rijksherb. n. 26, p. 5, 1915; Koorders, Fl. v. Tjibodas III § 1, p. 131, 1918; non S. Moore in Journ. of Bot. LXII, Suppl., p. 79, 1925, quae est *Str. Boerlagei* Brem. var. *sparsipila* Brem.; — *Str. longifolia* Miq., Fl. Ind. Bat. II, p. 797, 1858, nom. conf. et illeg. nam includens *Str. cernuam* Bl., p.p.

Habitat regiones montanas Javae Occidentalis.

Species haec solvenda est in varietates duas. Forma typica a me vocatur: *Str. Blumei* Brem. var. *puberula* Brem.

Circ. 1.5 m alta. Caulis ramique obtuse quadrangulares, profunde quadrisulcati, dense puberuli. Folia sensim in petiolum contracta; petiolus dense puberulus, foliorum majorum usque ad 2.5 cm longus, foliorum minorum usque ad 1 cm longus; lamina lanceolato-elliptica, foliorum majorum 7—8 cm longa et 3 cm lata, minorum dimidio fere brevior et angustior, omnium utroque extremo contracta, margine serrata, supra costa nervisque dense appresse pubescens, inter nervos pilis basi incrassatis et supra basin deciduis sparse scabridula, subtus costa nervisque dense et inter nervos sparse pubescens, supra cystolithis parvis dense lineolata, nervis utroque latere costae in foliis majoribus 7—9, in foliis minoribus 5—7. Spicae apice ramorum et in axillis foliorum superiorum solitariae vel 3—5 racemose dispositae. Pedunculi et rhachides racemorum subglabri, bracteis deciduis vel interdum uno jugo foliorum parvorum aequalium munitae. Spicae ellipsoideae, 1.2 cm longae et 0.7 cm diam., post anthesin 1.5—3 cm longae, ad anthesin cernuae, postea erectae, bractearum paribus circ. 9 instructae. Bractee infimae plerumque totae glabrae, acutae, steriles; aliae obtusae et fertiles; omnes obovatae, 6 mm longae et 4 mm latae, albae, apice areola viridi instructae, extus dimidio superiore setis capitatis sparsae, ceterum glabrae, 3-nerviae. Bracteolae lineares, 4 mm longae et 0.6 mm latae, apice virides, ceterum albae, dimidio superiore setis longis ciliatae, 1-nerviae. Calyx 4.5—5.5 mm longus, lobis linearibus 3.5—4 mm longis et 0.4 mm latis, apice viridibus, ceterum albis, dimidio superiore setis longis ciliatis. Corolla extus glabra, 14 mm longa, tubo 9 mm, faucibus 2.5 mm, lobis rotundatis 2.5 mm longis. Stamina filamentis basi hirtellis; longiora 5 mm, breviora 3 mm longa; antherae erectae 1.8 mm longae. Ovarium comosum. Capsula 6 mm longa et 3.8 mm lata, apice parce pilosa.

Habitat regiones montanas Javae Occidentalis.

West Java. Buitenzorg Res.: G. Salak, BLUME s.n. L, typus; at the base of G. Pangerango, REINWARDT s.n. L; G. Malang, south of Tji Reungkas, WINCKEL s.n. L; Tjidadap, south of Tjibeber, alt. 1000 m, WINCKEL 50  $\beta$  L.

*Str. Blumei* Brem. var. *tomentella* Brem. n. var.; typus varietatis: BACKER s.n. L.

Varietas ramis, petiolis, foliorum facie inferiore pilis et patentibus et longioribus vestitis a typo recedens.

Habitat regiones montanas Javae Occidentalis.

West Java. Buitenzorg Res.: G. Malang, south of Tji Reungkas, BACKER s.n. 16/III/09 L, typus var.; Priangan Res.: Lembang, KORTHALS s.n. L; Taloon, REINWARDT 1266 L.

In the ciliate bracteoles and calyx lobes *Str. Blumei* resembles *Str. prianganensis*, *Str. lawangensis*, *Str. Rantii* and *Str. imbricata*, but from all four it is easily distinguishable, from the first, because the bracts are more numerous and glandular pubescent, and from the three latter, because they lack the shortly stipitate glands. The difference between the two varieties, although conspicuous enough, is taxonomically of little importance. It would not surprise me if they were found to grow side by side and to interbreed freely: on the not very extensive G. Malang, south of Tji Reungkas, both forms have been collected.

### 3. *Strobilanthes lawangensis* Brem. n. spec.; typus: JESWIET 991 L.

Caulis ramique primum acutius, deinde obtuse quadrangulares, primum profunde, deinde superficialiter quadrisulcati, glabri. Folia sensim in petiolum contracta; petiolus primum sparse pubescens, mox glabrescens, in foliis preservatis (superioribus solum) usque ad 1.7 cm longus; lamina elliptico-lanceolata, in foliis preservatis usque ad 12 cm longa et 5 cm lata, caudato-acuminata, basi contracta, margine dentata, supra sparse scabrido-hirtella, subtus nervis venulisque pubescens, supra cystolithis parvis dense lineolata, nervis utroque latere costae in foliis majoribus usque ad 10, in foliis minoribus interdum ad 4 redactis. Spicae in paniculas terminales et axillares dispositae; pedunculus et rhachis paniculae glabri et acute quadrangulares; ramuli foliis redactis, usque ad 4 cm longis, mox deciduis suffulti. Spicae 0.6—1 cm longae et latae, probabiliter cernuae, bractearum paribus 7 instructae. Bractee infimae totae glabrae, steriles; aliae dorso ad marginem glandulis stipitatis sparsae, ceterum glabrae; omnes late obovatae, 6—8.5 mm longae et 5—6 mm latae, obtusae, interdum sub apice contractae, apice late recurvatae, probabiliter albae et viridi-marginatae, valde concavae, 5-nerviae. Bracteolae lineares, ad calycem adnatae, 4 mm longae et 0.7 mm latae, obtusae, 1-nerviae, dimidio superiore margine longe ciliatae, albae sed apice calloso viridi. Calyx albus, 4.5 mm longus, post anthesin usque ad 5.5 mm accrescens, lobis anguste triangularibus 3 mm longis et basi 0.4 mm latis, apice callosis viridibus, obtusis, ad apicem pilis paucis longe-ciliatis. Corolla tubo 5 mm, faucibus extus puberulo-pubescentibus 3 mm, lobis ovato-orbicularibus, extus hirtellis 2.5 mm longis. Stamina filamentis glabris 3 et 2.5 mm longis; antherae versatiles 1.5 mm longae. Ovarium comosum. Capsula 4.5 mm longa et 3.5 mm lata, apice breviter comosa.

Habitat Javam Orientalem.

East Java. Malang Res.: District Lawang, dessa Wiju, between Ardjuno and Imogiri, JESWIET 991 L, typus.

*Str. lawangensis* comes nearest to *Str. Rantii* and *Str. imbricata*, which it resembles in the ciliate bracteoles and calyx lobes and in the presence of large glands on the bracts. It differs from these two species in the 5- instead of 3-nerved bracts with their stipitate instead of sessile glands. Five-nerved

bracts occur also in *Str. Boerlagei* and in *Str. cernua*, but in these species the bracteoles and calyx lobes are eciliate, and the glands on the bracts sessile.

The description given by HASSKARL (Pl. Jav. Rar., p. 505, 1848) of his *Strobilanthes dispar* (*Apolepsis dispar* Hassk., Cat. Hort. Bogor. ed. 2, p. 150, 1844) suggests a plant nearly related to *Str. lawangensis*. The type of HASSKARL's species is unknown to me, but material received under the name *Str. dispar* from the Buitenzorg herbarium, where it was probably compared with the type, proved conspecific with *Str. cernua*. The type, however, can not have belonged to this species, for its leaves are described as "supra punctato-aspera", whereas they are glabrous and smooth in *Str. cernua*, and the spikes are described as erect instead of cernuous. Its identity, however, can not be established so long as no authentic material is available.

4. *Strobilanthes Rantii* Brem. n. spec.; typus: RANT s. n. L.

Usque ad 1.5 m alta. Caulis ramique obtuse quadrangulares, profunde quadrisulcati, glabri. Folia sensim in petiolum subglabrum, in foliis majoribus usque ad 5 cm longum contracta; lamina nunc elliptica et circ. 10 cm longa et 5 cm lata (foliorum majorum usque ad 18 cm longa et 9 cm lata), nunc lanceolata et circ. 9 cm longa et 2.2 cm lata, foliorum omnium utroque extremo contracta, margine sinuoso-crenata vel obtuse dentata, supra sparse hirsuta, subtus costa nervisque densius puberula, ceterum glabra, supra cystolithis parvis haud conspicue sed nihilo minus dense lineolata, nervis utroque latere costae in foliis majoribus usque ad 10, in foliis minoribus interdum ad 5 reductis. Spicae 3—5 in racemos abbreviatos terminales et axillares dispositae; pedunculus et rhachis racemorum glabri; spicae bracteis mox deciduis suffultae. Spicae globosae, 10 mm diam., bractearum paribus plerumque 6 instructae. Bracteae obovatae, 5.5 mm longae et 5 mm latae, albae et viridi-marginatae, apice subobtusae, margine recurvatae, intus ad marginem recurvatum dense ciliatae; superiores insuper extus ad marginem apicalem glandulis subsessilibus sparsae; omnes 3-nerviae. Bracteolae anguste lineares, 4.5 mm longae, albae, ad apicem obtusum virides, dimidio superiore ciliatae, indistincte 1-nerviae. Calyx 5 mm longus, lobis linearibus albis, apice viridibus, ciliatis, enerviis. Corolla 11 mm longa, apicem versus extus hirtella, ceterum glabra, tubo 6 mm, faucibus 2.5 mm, lobis rotundatis 2.5 mm longis. Stamina filamentis glabris. Ovarium totum glabrum vel pilis perpauca comosum. Capsula comosa, 4.3 mm longa et 3 mm lata.

Habitat Javam Centralem.

Central Java. Madioon Res.: G. Wilis, Ngebel, alt. 833 mm, RANT s. n. L, typus.

KOORDERS 23897, collected at an altitude of 500 m in the residency Malang in East Java, and mentioned in KOORDERS-SCHUHMACHER, Syst. Verz. I § 1, p. 46, 1912, as *Strobilanthes* spec. L, may belong to the species described above: it is said to resemble *Str. cernua*, but to differ from that species in the bracts, which are described as villously ciliated ("zottig-gewimpert"). As such bracts occur also in the next species, its identity remains for the present dubious.

In the 3-nerved bracts *Str. Rantii* resembles *Str. imbricata* and *Str. Blumei*; from *Str. Blumei* it differs in the other characters of the bracts: the recurved green margin, the presence of sessile glands on the outside and of a zone of cilia near the recurved margin on the inside; and from *Str. imbricata* in the nature of the indumentum, the shoots, petioles and axial parts of the inflorescence being subglabrous, and also in the smaller size of the spikes.

5. *Strobilanthes imbricata* Nees in Wall., Pl. As. Rar. III, p. 86, 1832, quoad synonymum *Str. hirtam* Bl. var. *crenulatam* Bl. et specimen in Java

lectum, haud quoad specimina ultra Javam lecta; non Nees in DC., Prodr. XI, p. 186, 1847; nec T. And. in Journ. Linn. Soc. IX, p. 473, 1867; nec Clarke in Hook. f., Fl. Brit. Ind. IV, p. 455, 1884; nec R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 668, 1935, quae omnes ad *Parasympagin Wallichii* Brem. et species ei affines ducendae sunt; *Strobilanthes hirta* (Vahl) Bl. var. *crenulata* Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826; Nees in Prodr. XI, p. 183, 1847; *Str. crenulata* (Bl.) Hassk., Cat. Hort. Bogor. ed. 2, p. 148, 1844; *Str. longifolia* Miq. var. *crenulata* (Bl.) Miq., Fl. Ind. Bat. II, p. 798, 1858, *Str. cernua* Bl. var. *crenulata* (Bl.) Hochr. in Candollea V, p. 226, 1934; — *Str. elata* Jungh. in Nat. en Geneesk. Arch. II, p. 53, 1845; Koorders, Exkursionsfl. v. Java III, p. 219, 1912; Hall. f. in Meded. Rijksherb. n. 26, p. 5, 1914; Koorders, Fl. v. Tjibodas III § 1, p. 132, 1918; — *Str. hirta* Bl. in errore apud Koorders, Exkursionsfl. v. Java III, p. 218, 1912, quoad specimen a Pulle lectum; — *Str. cernua* Bl. in errore apud S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925, quoad specimen citatum.

Habitat Javam Occidentalem.

Species haec solvenda est in varietates duas. Forma typica a me vocatur: **Str. imbricata** Nees var. **Blumei** Brem.

Usque ad 4 m alta. Caulis ramique obtuse quadrangulares, profunde quadrisulcati, primum hirsuti, postea glabrescentes sed numquam toti glabri. Folia sensim in petiolum primum dense, deinde sparse hirsutum, in foliis majoribus usque ad 5 cm, in foliis minoribus usque ad 2 cm longum contracta; lamina elliptica, foliorum majorum 17—20 cm longa et 7—10.5 cm lata, minorum plerumque 9—12 cm longa et 4.5—5.5 cm lata, ad apicem ramorum tamen multo minor, omnium utroque extremo contracta, margine sinuoso-crenata vel obtuse dentata, utraque facie pilis paucis et cystolithis haud numerosis sparsa, nervis utroque latere costae in foliis majoribus 10—11, in foliis minoribus 7—8. Spicae partim solitariae, partim 3—5, raro usque ad 9 in racemos vel paniculas parvas dispositae; pedunculus et rhachis racemorum vel panicularum hirsuti; rhachis bracteis parvis, mox deciduis instructa. Spicae 12 mm longae et 10 mm diam., bractearum paribus 7—8 instructae. Bracteae infimae plerumque steriles; aliae fertiles; omnes obovatae, 5 mm longae et 4 mm latae, albae et viridi-marginatae, apice obtusae; inferiores margine et dorso nervorum longe ciliatae; superiores margine sparse ciliatae et dorso dimidio superiore glandulis breviter stipitatis dense vestitae; omnes 3-nerviae. Bracteolae lineares, 4.5 mm longae et 0.7 mm latae, albae, apice obtuso virides, longe ciliatae, indistincte 1-nerviae. Calyx 5 mm longus, lobis linearibus 0.5—0.6 mm latis, obtusis, apice viridi excepto albis, longe ciliatis, enerviis. Corolla 15.5 mm longa, extus apicem versus hirtella, faucibus citrina, tubo 9 mm, faucibus 3.5 mm, lobis rotundatis 3 mm longis. Stamina filamentis glabris. Ovarium comosum. Capsula 5 mm longa et 4 mm lata, comosa.

Habitat Javam Occidentalem.

West Java. Priangan Res.: G. Patuha, Pondok Tengah, REINWARDT s.n. L, typus; Burangrang, G. Soonda, Pasir Lembang, alt. 1700 m, BAKHUIZEN v. D. BRINK 4527 L, p.p.; G. Malabar, alt. 1500 m, PULLE 3200 U; ibidem, WARBURG 11430 BD; G. Wajang, FORBES 843 BD.

**Str. imbricata** Nees var. **glandulosa** Brem. n. var.; typus var.: BAKHUIZEN v. D. BRINK 4527 L, p.p.

Varietas pilis dorso bractearum insitis capitatis a typo recedens.

Habitat Javam Occidentalem, typum comitans.

West Java. Priangan Res.: Burangrang, G. Soonda, Pasir Lembang, alt. 1700 m, BAKHUIZEN v. D. BRINK 4527 L, p.p., typus var.

The relations between *St. imbricata* and the other species belonging to this

genus have been discussed already: it comes nearest to *Str. Rantii*, from which it differs mainly in the indumentum and in the size of the spikes.

The two varieties are doubtless nearly related. They were found in each other's company.

The plants which NEES originally referred to *Strobilanthes imbricata* belong partly to the Javanese species described above and partly to an entirely different one occurring in Burma. The name is in this work reserved for the Javanese plant: for the Burmese species, which was transferred to the genus *Parasympagis*, a new specific epithet (*Wallichii*) was chosen. As in NEES's monograph the two species had already been separated and the specific epithet reserved for the Burmese plant, this may seem irregular, but the change is nevertheless fully justified, for NEES's choice was, according to our present standard, the International Rules of Nomenclature, illegitimate. At that time the decision in matters of this kind was entirely in the hands of the individual author, and NEES will probably have argued: I have a suitable name for the Javanese plant, one that is even older than mine, and I am therefore free to use mine for the Burmese plant. This, in fact, was the same attitude as that taken up by LINNÉ in similar circumstances, e.g. when he bestowed the name *Aesculus* to the horse-chestnut: LINNÉ, of course, knew quite well that it was a name for the oak, but as he had chosen for the latter the name *Quercus*, the princeps botanicorum conferred the other one with a most princely gesture to an entirely different plant. Now, however, we are bound by art. 52 of the International Rules (3rd ed.), which prescribes that when a species is split, the name should be retained for the segregate which includes the type specimen. In this instance the Javanese plant must be regarded as the type, for the name under which the latter was described by BLUME, is quoted by NEES, and as no other synonyms are given, the name introduced by NEES must be regarded as a new one for BLUME's plant: the latter is therefore to be accepted as the type. I might put it also in this way: In 1832 NEES recognized that the Javanese plant described by BLUME as var. *crenulata* of his *Strobilanthes hirta*, deserved specific rank, and he described it therefore as a new species for which he introduced the name *Str. imbricata*. At the same time, however, he erroneously referred to this new species a plant collected in Burma. Subsequently he came to the conclusion that the latter was not identical with the Javanese one, and in 1847 he therefore removed the latter to its original position, retaining the new name for the Burmese plant, which according to art. 52 is illegal. For the Burmese plant, therefore, a new name had to be coined. I might, of course, have used the epithet *imbricata*, for in the genus *Parasympagis* this name would have been perfectly legitimate, but in that case it would nomenclaturally have dated from the publication of this paper, and when the genera *Parasympagis* and *Strobilanthes* were to be reunited, the plant would have to be renamed, for in *Strobilanthes* the name belongs to the Javanese species. It appeared therefore more advisable to select an entirely new epithet.

6. *Strobilanthes Boerlagei* Brem. n. spec.; typus: BOERLAGE s. n. L; — *Str. spec. C*, Koorders-Schuhmacher, Syst. Verz. I § 1, p. 45, 1912; — *Str. hirta* Bl. in errore apud S. Moore in Journ. of Bot. LXIII, Suppl., p. 79, 1925.

Habitat Javam Occidentalem.

Species haec solvenda est in varietates duas. Forma typica a me vocatur: **Str. Boerlagei** Brem. var. **densipila** Brem.

Caulis ramique primum acutius, deinde obtuse quadrangulares, profunde quadrisulcati, internodiis ad basin primum satis hirsutis, apicem versus glabrescentibus. Folia sensim in petiolum densissime hirsutum, in foliis majoribus

usque ad 3 cm, in minoribus usque ad 1 cm longum contracta; lamina elliptica vel ovato-elliptica, usque ad 10 cm longa et 5 cm lata, utroque extremo valde contracta, margine serrata, utrimque primum densissime, postea minus dense hirsuta, supra cystolithis parvis dense lineolata, nervis utroque latere costae in foliis majoribus 9—10, in foliis minoribus 5—6. Spicae in paniculas terminales et racemos axillares dispositae; pedunculus et rhachis panicularum et racemorum glabri; rhachis et ramuli bracteis parvis deciduis instructi. Spicae depresso-globosae, 6—8 mm longae et 12—15 mm diam., post anthesin paulum excrescentes, bractearum paribus 6—7 instructae. Bractee reniformes vel late rhomboideae, albae et viridi-marginatae, 5-nerviae; infimae 9 mm longae et 10 mm latae, acutiores; aliae 8 mm longae et latae; superiores dorso ad marginem glandulis brevissime stipitatis vestitae, ceterum omnino glabrae. Bracteolae lineares, 6 mm longae et 1.2 mm latae, apice viridi excepto albae, obtusae et glabrae. Calyx 5 mm longus, lobis linearibus apice viridi excepto albis, 0.5 mm latis. Corolla 13 mm longa, extus glabra, tubo 6 mm, faucibus 3.5 mm, lobis 3.5 mm longis. Stamina filamentis ad basin hirtellis, longioribus 5 mm, brevioribus 3 mm longis; antherae 1.7 mm longae. Ovarium comosum. Capsula 5 mm longa et 3 mm lata, parce comosa.

Habitat Javam Occidentalem.

West Java. Priangan Res.: G. Telaga Bodas, BOERLAGE s.n. L, typus; ibidem, alt. 1600 m, KOORDERS 26490 L; G. Galoonggoong, Pangentjangan, alt. 1600 m, KOORDERS 42416 et 42834 L; G. Malabar, coll. indig. s.n. L.

**Str. Boerlagei** Brem. var. *sparsipila* Brem. n. var.; typus var.: DOCTERS v. LEEUWEN 8361 U.

Varietas petiolis minus dense hirsutis, corolla extus apicem versus sparse pubescente, paulo minore a typo recedens.

Habitat Javam Occidentalem.

West Java. Priangan Res.: G. Tjikoraj, alt. 1800 m, DOCTERS v. LEEUWEN 8361 U, typus var.; Papandajan, v. HARREVELD s.n. PAS; ibidem, alt. 2000 m, DOCTERS v. LEEUWEN s.n. in herb. priv.; G. Waringin, alt. 1750 m?, FORBES 733 L.

The "*Str. speciosa* Bl." mentioned by JUNGHUHN in Java, ed. 1, III, p. 546, as growing in large quantities on the G. Tjikoraj, may have been the species described above. *Goldfussia speciosa* (Bl.) Brem. does not grow gregariously.

*Str. Boerlagei* resembles in the nature of the indumentum *St. imbricata*, but is easily distinguishable by the eciliate bracteoles and calyx.

The two varieties have not yet been collected in the same locality, but if more material becomes available, I have little doubt that they will prove to grow side by side.

7. **Strobilanthes cernua** Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826; Nees in DC., Prodr. XI, p. 182, 1847, var. *multiflora* Nees excl.; Koorders, Exkursionsfl. v. Java III, p. 218, 1912; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 43, 1912; Hall. f., in Meded. Rijksherb. n. 26, p. 5, 1914, var. *macrostachya* Hall. f. et syn. *Str. Teysmannii* Miq. excl.; Koorders, Fl. v. Tjobodas III § 1, p. 130, 1918; Backer in Trop. Natuur VII, p. 21 et Fig. 1 et 2, 1918; an S. Moore in Journ. of Bot. LXII, Suppl., p. 78, 1925, incertum; — *Str. longifolia* Miq. var.  $\gamma$  Miq., Fl. Ind. Bat. II, p. 798, 1858; — *Str. polycephala* Miq. l.c.; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; — *Str. picta* Kds, Fl. v. Tjibodas III § 1, p. 132, 1918.

Habitat Javam Occidentalem et forsitan Sumatram.

Species haec solvenda est in varietates duas. Forma typica a me vocatur:

**Str. cernua** Bl. var. *brevistipitata* Brem.

Usque ad 4 m alta. Caulis ramique glabri, obtuse vel acutius quadrangula-



res, profunde quadrisulcati. Folia sensim in petiolum glabrum, in foliis majoribus usque ad 5 cm, in foliis minoribus usque ad 2.5 cm longum contracta; lamina elliptica, usque ad 22 cm longa et 10.5 cm lata, apice caudata, basi contracta, margine callosodentata, costa nervisque subtus interdum sparse et breviter pubescens, ceterum glabra, supra cystolithis parvis dense lineolata, subtus ad nervos solum cystolithis instructa, nervis utroque latere costae in foliis majoribus 11—13, in foliis minoribus interdum ad 4 redactis. Spicae solitariae vel 3—5 in racemulos terminales et axillares dispositae; racemuli interdum in paniculam confluentes. Pedunculus et rhachis racemulorum glabri; rhachis bracteis parvis, mox deciduis instructa. Spicae globosae, 8 mm diam., cernuae, bractearum paribus 6—7 instructae. Bracteae obovatae; infimae acutae, steriles; aliae obtusae, fertiles; mediae alii majores, 6—7 mm longae et 5—6 mm latae, omnes 5-nerviae, albae, viridi-marginatae, glabrae; superiores ad apicem glandulis breviter stipitatis vestitae. Bracteolae lineares, 5 mm longae et 1 mm latae, obtusae, apice viridi excepto albae, glabrae, 1-nerviae. Calyx glaber, 4.5 mm longus, lobis apice viridi excepto albis, anguste triangularibus, basi 0.7 mm latis, 1-nerviis. Corolla 10.5 mm longa, extus glabra, tubo 6 mm, faucibus 2.3 mm, lobis 2.2 mm longis. Stamina filamentis glabris, 5 et 2.5 mm longis; antherae 1.5 mm longae. Ovarium totum glabrum. Capsula 5.5 mm longa et 3.5 mm lata, glabra.

Habitat Javam Occidentalem et forsitan Sumatram.

West Java. Buitenzorg Res.: Salak, BLUME s.n. L, typus; G. Perbakti, BAKHUIZEN v. D. BRINK JR 1743 U; G. Gadjak, alt. 750 m, BAKHUIZEN v. D. BRINK 4000 L et U; G. Gedeh, Geger Bintang, REINWARDT s.n. L; Pangerango, alt. 900—1500 m et 1500—2100 m, JUNGHUHN L et U; ibidem, KUHL et v. HASSELT s.n. L; Poontjak, alt. 1300 m, KOORDERS 8919 L; Tjibodas, BOERLAGE s.n. L, KOORDERS 39353 L, RAAP 781 L, LA RIVIÈRE s.n. L, BURRET 176 BD, VOLKENS 173 BD.

Sumatra. West Coast Res.: G. Singalang, KORTHALS 625 L?

*Str. cernua* Bl. var. *laxiflora* Bl. l. c.; Hall. f. l. c.; Hochreutiner in Candollea V, p. 226, 1934.

Varietas glandulis dorso bractearum insertis longius stipitatis a typo recedens; an spicae laxiores incertum, nam specimina preservata omnia frutescentia et spicae typi post anthesin etiam elongatae.

Habitat Javam Occidentalem.

West Java. Buitenzorg Res.: Salak, Falls of Tji Apoos, BLUME s.n. L, typus var.; G. Gedeh, Tjibodas, VALETON s.n. L.

The var. *laxiflora* was originally separated from the type on account of the laxer spikes, but as the specimen on which it was based, was a fruiting one, and as since then no flowering plants have been collected, it still remains uncertain whether it was sufficiently founded: that the strobili in the fruiting stage become more or less distended, is apparently a common phenomenon in this genus. I would not have kept up this variety, if I had not found another slight difference in the length of the glands by which the bracts are covered.

The identity of NEES's var. *multiflora* could not yet be established, as the type specimen, ZOLLINGER 2023, was not available. As the leaves are said to be hirsute, it probably belongs to another species.

HALLIER's var. *macrostachya* is conspecific with *Str. Teysmannii* Miq. As the description of the latter will show, it differs in so many respects from *Str. cernua* that it must be considered a distinct species.

The occurrence of *Str. cernua* in Sumatra is somewhat dubious. There can be little doubt that the specimen quoted above belongs to this species, but the fact that it has never again been found in this region, although the moun-

tains of the West Coast Residency are comparatively well explored, suggests that the specimen may be wrongly labelled. The important collections of KORTHALS in the Leiden herbarium have at one time been treated with criminal carelessness, so that at present a large part of his specimens have lost their labels or are provided with new and unreliable ones.

The nearest ally of this species is doubtless *Str. Boerlagei*, which it resembles in the characters of the bracts with their recurved green margin and subsessile glands and in the eciliate bracteoles and calyx lobes, but from which it is easily distinguishable by its nearly complete glabrousness, its larger leaves and smaller spikes and the completely glabrous ovary. In its glabrousness it resembles *Str. prianganensis*, *Str. Rantii*, *Str. Teysmannii* and *Str. ancolana*. From the first two species it differs in the eciliate bracteoles and calyx lobes, and from the two others by the glandular bracts with their green recurved margin.

8. *Strobilanthes slamatensis* Brem. n. spec.; typus: JESWIET 219 L.

Caulis ramique obtuse quadrangulares et quadrisulcati, primum densius hirsuti, postea glabrescentes. Folia in petiolum dense hirsutum, usque ad 3 cm longum contracta; lamina elliptica, usque ad 20 cm longa et 10 cm lata, apice caudato-acuminata, basi contracta, margine serrata, basin versus tamen integra, utrimque sparse hirsuta, supra cystolithis gracilibus densius lineolata, nervis utroque latere costae in foliis majoribus usque ad 12, in foliis minoribus interdum usque ad 4 redactis. Spicae in paniculas terminales et axillares dispositae; pedunculus et rhachis paniculae acutius quadrangulares, sparse hirsuti; rhachis foliis multo redactis, longitudine 1 cm haud superantibus et mox deciduis instructa. Spicae globosae vel ellipsoideae, 1—1.5 cm longae et 1 cm diam., probabiliter cernuae, bractearum paribus 7 instructae. Bracteae infimae totae glabrae et steriles, aliis paulo minores; aliae dorso ad marginem glandulis stipitatis sparsae, fertiles; omnes late obovatae, plerumque 7.5 mm longae et 7 mm latae, obtusae, truncatae vel emarginatae, areola apicali viridi excepta albae, valde concavae, margine haud recurvatae, 5-nerviae. Bracteolae ad calycem adnatae, lineares, 5 mm longae et 0.6 mm latae, probabiliter albae, apice calloso viridi tamen, apice pilis paucis longe ciliatae. Calyx totus glaber, 5 mm longus, lobis anguste linearibus, 3.3 mm longis et 0.4 mm latis, apice viridi excepto albis. Corolla 12.5 mm longa, extus parce hirtella, tubo 5 mm, faucibus 4 mm, lobis ovato-orbicularibus 3.5 mm longis. Stamina filamentis basi hirtellis, 4.5 et 4 mm longis; antherae versatiles 2 mm longae. Ovarium comosum. Capsula nondum nota.

Habitat Javam Centralem.

Central Java. Pekalongan Res.: G. Slamati, JESWIET 219 L, typus.

*Str. slamatensis* is the only species with eciliate calyx lobes in which the bracteoles are ciliate. Bracts which, apart from a small green patch at the top, are entirely white, are found also in *Str. prianganensis*, *Str. Blumei*, *Str. Teysmannii* and, perhaps, in *Str. prahuensis*. From the first two *Str. slamatensis* differs in the presence of stipitate glands on the bracts and in the entirely glabrous calyx, from *Str. Teysmannii* in the nature of the indumentum and the comose ovary, and from the very imperfectly known *Str. prahuensis* in the smaller size of the spikes and the hirsute, not glandular-hirsute petioles.

9. *Strobilanthes prahuensis* Clarke ex S. Moore in Journ. of Bot. LXIII, p. 166, 1925.

Caulis ramique ad nodos pilis capitatis hirsuti, mox glabrescentes, conspicue sulcati. Folia in petiolum pilis capitatis dense hirsutum, 4.5 cm longum contracta; lamina late ovata, usque ad 20 cm longa et 13.5 cm lata, apicem versus

contracta, apice ipso obtuso, margine crenata, supra sparse appresse pubescens, subtus praesertim nervis etiam appresse pubescens, nervis utroque latere costae circ. 12. Spicae in racemulos vel paniculas terminales et axillares dispositae; pedunculus paniculae vel racemuli sparse pubescens vel glaber. Spicae 1.5 cm longae et latae. Bracteae late orbiculares, 12 mm longae et 13 mm latae, probabiliter albae, glabrae. Bracteolae oblongae, 4.5—5 mm longae, truncatae, apice subcalloso et decolorato (?). Calyx (immaturus?) 4 mm longus, lobis linearibus ad apicem paulo dilatatis et decoloratis (?). Corolla "valde cruda" 4 mm longa. Capsula 3.5 mm longa et 2.5 mm lata, comosa. Semina glabra (?).

Habitat Javam Centralem.

C e n t r a l J a v a. Pekalongan Res.: G. Prahū, HORSFIELD 56 BM, typus, n.v.

The description given above has been adapted from the original one. It leaves several questions undecided. The glabrous seeds are doubtless a mistake, and the discoloured tips of the bracteoles and calyx lobes were very probably green. On the whole *Str. prahuensis* is apparently not unlike *Str. slamatensis*. It should be easily distinguishable from the other species discussed in this work, by the large size of the bracts.

10. *Strobilanthes Teysmannii* Miq., Fl. Ind. Bat. II, p. 799, 1858; id., Suppl., p. 241, 1860; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; *Str. cernua* Bl. var. *macrostachya* Hall.f. in Meded. Rijksherb. n. 26, p. 4, 1915; — anne *Str. Micholitzii* Ridl. in Gard. Chron. XLI, p. 246, 1907, adhuc incertum.

Caulis ramique obtuse quadrangulares et quadrisulcati, vix conspicue puberuli. Folia in petiolum subglabrum contracta; lamina elliptico-lanceolata in foliis paucis preservatis circ. 11 cm longa et 4.5 cm lata, apice caudata, basi contracta, margine calloso-denticulata et crispata, supra glabra, subtus costa nervisque vix conspicue puberulo-pubescens, margine setulis vix conspicuis parce ciliata, supra cystolithis majoribus cum minoribus mixtis dense lineolata, subtus ad venulos solum cystolithis instructa, nervis utroque latere costae 11—12. Spicae in racemulos terminales et axillares dispositae; pedunculus et rhachis racemuli glabri; rhachis bracteis mox deciduis instructa. Spicae ovoideae, 10—15 mm longae et 9—12 mm latae, bractearum paribus 10—12 instructae. Bracteae obovatae, 7.5 mm longae et 7 mm latae, concavae, apice calloso virides, ceterum albae, truncatae vel emarginatae; superiores dorso apicem versus glandulis breviter stipitatis vestitae, ceterum glabrae, margine ad anthesin haud recurvata, 5-nerviae. Bracteolae lineari-oblongae, 4.5 mm longae et 1.2 mm latae, apice calloso virides, ceterum albae, totae glabrae, 1-nerviae. Calyx totus glaber, 5 mm longus, lobis linearibus apice calloso viridibus, ceterum albis, 0.4 mm latis. Corolla extus glabra, 13.5 mm longa, tubo 6.5 mm, faucibus 3.5 mm, lobis rotundatis 3.5 mm longis. Stamina filamentis glabris, 4 et 2.5 mm longis. Ovarium glabrum. Capsula nondum nota.

Habitat Sumatram.

S u m a t r a. Tapianuli Res.: Batang Baroos, TEYSMANN H.B. 1187 U, p.p., typus; dupl. typi L.

The sheet in the Utrecht herbarium contains besides flowering shoots of the plant described above, fruiting ones from another species. The latter are provided with up to 3 cm long spikes and with bracts showing a recurved margin. MIQUEL's description has been based partly on the shoots of the flowering plant and partly on those of the fruiting one, and the name might be regarded therefore as a "nomen confusum". I propose to use it in future for the species to which the flowering shoots belong. As the fruits ripen in this genus slowly, fruits and flowers are but rarely found on the same sheet.

*Str. Teysmannii* and *Str. ancolana* differ from all the other species known so far, by the presence of two kinds of cystoliths, smaller and larger ones,

and by the larger number of bracts, namely 10 to 12 instead of 4 to 9 pairs. *Str. Teysmannii* and *Str. ancolana* differ from each other in the size of the bracts, in the extent of the green part at the top, and in the either curled or flat margin of the leaves. These differences are however of little importance and it is not impossible that they may fall within the limits of ordinary intraspecific variability. More material however will have to be studied before a definite conclusion can be drawn. *Str. Micholitzii* Ridl. in Gard. Chron. XLI, p. 246, 1907, is also nearly related and may be conspecific, but I have seen no material of this species.

The supposition that this species might occur in West Java rests on the presence of some old specimens in the Leiden herbarium which, according to the label, have been collected in Java, but of which neither the collector nor the exact locality are known. They are probably wrongly labelled, for they look very much like the plants collected by TEYSMANN and may be duplicates of the latter.

11. *Strobilanthes ancolana* Miq., Fl. Ind. Bat. II, p. 799, 1858; id., Suppl., p. 241, 1860; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899.

Caulis ramique obtuse quadrangulares, internodiis haud profunde bisulcatis, glabri. Folia in petiolum glabrum, in foliis majoribus usque ad 5 cm longum contracta; lamina elliptica, foliorum majorum usque ad 22 cm longa et 11 cm lata, apice caudata, basi contracta, margine calloso-dentata, utrimque glabra, margine tamen setulis vix conspicue ciliolata, supra cystolithis majoribus cum minoribus mixtis densissime lineolata, subtus ad nervos venulosque solum cystolithis instructa, nervis utroque latere costae in foliis majoribus 12—13. Spicae in racemulos terminales et axillares dispositae; pedunculus et rhachis racemuli glabri; rhachis bracteis deciduis instructa. Spicae ovoideae. 1.5 cm longae et 1.3 cm diam., bractearum paribus 10—12 instructae. Bracteae obovato-orbitales, 10 mm longae et 8 mm latae, apice rotundatae, apice costae calloso, anguste viridi-marginatae, ceterum albae, margine haud recurvatae, totae glabrae et eglandulosae, 5-nerviae; pares 2 infimi steriles; aliae fertiles. Bracteolae lineari-oblongae, 5 mm longae et 1.4 mm latae, obtusae, apice viridi excepto albae, glabrae, 1-nerviae. Calyx glaber, lobis apice calloso viridi excepto albis. Corolla extus glabra (matura non visa). Ovarium totum glabrum. Capsula ignota.

Habitat Sumatram.

Sumatra. Tapianuli Res.: Upper Angkola, alt. 300—1000 m, JUNGHUHN s.n. L et U, typi.

The material is rather poor, and, as stated above, it is not impossible that it will prove to be conspecific with the preceding species. The differences given in the original descriptions rest almost entirely on the inclusion of details derived from the fruiting branches accompanying the type specimen of *Str. Teysmannii*, which belong to another species.

#### Index Specierum.

- aborensis* Dunn in Kew Bull. 1920, p. 208 — Himalaya Orientali — genus adhuc incertum  
*acrocephala* T. And. in Journ. Linn. Soc. IX, p. 473, 1867 = *Tarphochlamys affinis* (Griff.) Brem.  
*acrocephala* T. And. var. *glabrior* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 668, 1935 — Tonkin — genus adhuc incertum  
*acuminata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 473, 1867 = *Adenacanthus acuminatus* Nees

- adenophora* Nees in DC., Prodr. XI, p. 182, 1847 = ? *Didyplosandra lanceolata* (Hook. ex Nees) Brem.
- adenophora* Nees in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 53, Tab. 225, 1874 = *Nilgiri-anthus Beddomei* Brem. n. nom.
- adnata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 436, 1884, n. nom. (*Endopogon decurrens* Nees) = *Hymenochlaena decurrens* (Nees) Brem.
- aenobarba* W. W. Smith in Notes Bot. Gard. Edin. XIII, p. 185, 1921 — Tibet — genus adhuc incertum
- agrestis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 466, 1884 = *Pteracanthus agrestis* (Clarke) Brem. n. comb.
- agrestis* Clarke var. *hemiotis* Clarke l.c. n. v.
- alata* Bl., Bijdr. Fl. Ned. Ind., p. 798, 1826 = *Microstrobilus alatus* (Bl.) Brem. n. comb.
- alata* (Wall. ex Nees) Nees in DC., Prodr. XI, p. 194, 1847, n. comb. illeg. (*Ruellia* Wall. ex Nees) = *Pteracanthus alatus* (Wall. ex Nees) Brem.
- albo-striata* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 54, 1909 — Peninsula Malayana — genus adhuc incertum
- albo-viridis* Imlay in Kew Bull. 1939, p. 117 — Siamia — genus adhuc incertum
- amabilis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 476, 1884 = *Leptacanthus amabilis* (Clarke) Brem. n. comb.
- amplectens* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = *Perilepta amplectens* (Nees) Brem. n. comb.
- anamitica* O. Ktze, Rev. Gen. Pl. II, p. 498, 1891 — Annamia — genus adhuc incertum
- anceps* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 — Ceylania — genus adhuc incertum
- anceps* Nees var. *microstachya* (Benth.) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 442, 1884 (*Strobilanthes microstachya* Benth.) = *Nilgiri-anthus punctatus* (Nees) Brem.
- anceps* Nees var. ? *punctata* (Nees) T. And. in Thwaites, Enum. p. 229, 1860 (*Strobilanthes punctata* Nees) — Ceylania — genus adhuc incertum
- anceps* Ridl. in Journ. As. Soc. Straits Br. n<sup>o</sup> 1, p. 82, 1923, nom. illeg. = *Pteroptychia Ridleyi* (Merr.) Brem.
11. *ancolana* Miq., Fl. Ind. Bat. II, p. 799, 1858 = Sumatra —
- Andersonii* Bedd. in Madras Journ. of Sc., Ser. 3, I, p. 55, 1864 = *Didyplosandra Andersonii* (Bedd.) Brem. n. comb.
- anfractuosa* Clarke in Engl., Bot. Jahrb. XLI, p. 66, 1907 = *Goldfussia anfractuosa* (Clarke) Brem. n. comb.
- angustifrons* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 466, 1884 = *Pteracanthus angustifrons* (Clarke) Brem. n. comb.
- anisandra* R. Ben. in Bull. Mus. Hist. Nat. Paris XXVII, p. 190, 1922 = *Gutzlaffia anisandra* (R. Ben.) Brem. n. comb.
- anisophylla* (Wall. ex Lodd.) T. And. in Cat. Pl. Hort. Bot. Calc., p. 43, 1865 (*Ruellia* Wall. ex Lodd.) = *Goldfussia anisophylla* (Wall. ex Lodd.) Nees
- Antonii* Elm., Leafl. Philipp. Bot. VII, p. 2550, 1915 = *Semnostachya Antonii* (Elm.) Brem. n. comb.
- apoënsis* (Elm.) Merr., Enum. Philipp. Fl. Pl. III, p. 475, 1923 (*Hypoëstes* Elm.) = *Goldfussia apoënsis* (Elm.) Brem. n. comb.
- apoënsis* Hochr. in Candollea V, p. 228, 1934 = *Goldfussia speciosa* (Bl.) Brem.
- aprica* (Hance) T. And. ex Benth., Fl. Hongk., p. 262, 1861 = *Gutzlaffia aprica* Hance
- aprica* (Hance) T. And. var. *glabra* Imlay in Kew Bull. 1939, p. 116 — Siamia — prob. spec. distincta

- aprica* (Hance) T. And. var. *pedunculata* (Craib) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 666, 1935 = *Gutzlaffia pedunculata* Craib
- ? *arborea* Span. in Linnaea XV, p. 328, 1841 = *Xanthostachya arborea* (Span.) Brem. n. comb.
- arenicola* W. W. Smith in Notes Bot. Gard. Edin. X, p. 190, 1918 — Birmania — genus adhuc incertum
- argentea* Imlay in Kew Bull. 1939, p. 121 — Siamia — genus adhuc incertum
- arguta* Nees in DC., Prodr. XI, p. 188, 1847 = *Mackenzia arguta* (Nees) Brem. n. comb.
- arnottiana* Nees in Hook., Comp. Bot. Mag. II, p. 132, 1836 — Ceylania — genus adhuc incertum
- articulata* Imlay in Kew Bull. 1939, p. 121 = *Goldfussia articulata* (Imlay) Brem. n. comb.
- aspera* Decne in Nouv. Ann. Mus. Par. III, p. 385, 1834 = *Xanthostachya aspera* (Decne) Brem. n. comb.
- aspera* Wight, Ic. Pl. Ind. Or. IV, Tab. 1518, 1849, nom. illeg. — Peninsula Indica — forsitan = *Nilgirianthus warreënsis* (Dalz.) Brem.
- asperrima* Nees in DC., Prodr. XI, p. 183, 1847 — Ceylania — genus adhuc incertum
- assimulata* S. Moore in Journ. of Bot. LXIII, Suppl., p. 77, 1925 = *Psacado-paepale assimulata* (S. Moore) Brem. n. comb.
- atropurpurea* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 — Himalaya — genus adhuc incertum
- attenuata* (Nees) Nees in DC., Prodr. XI, p. 193, 1847 (*Ruellia* Nees) = *Pteracanthus attenuatus* (Nees) Brem.
- auriculata* Nees in Wall., Pl. As. Rar. III, p. 69, Tab. 295, 1832 = *Perilepta auriculata* (Nees) Brem. n. comb.
- auriculata* Nees var. *acuta* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 674, 1935 — Cambodia, Laos — n. v.
- auriculata* Nees var. *bracteolata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 453, 1884 — Khasia — n. v.
- auriculata* Nees var. *edgeworthiana* (Nees) Clarke l. c. (*Strobilanthes edgeworthians* Nees) = *Perilepta edgeworthiana* (Nees) Brem.
- auriculata* Nees var. *plumulosa* (Nees) Clarke l. c. (*Strobilanthes plumulosa* Nees) = *Perilepta plumulosa* (Nees) Brem.
- auriculata* Nees var. *rubrifolia* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 674, 1935 — Cambodia — n. v.
- auriculata* Nees var. *siamensis* (Clarke) R. Ben. l. c. (*Strobilanthes siamensis* Clarke) = *Perilepta siamensis* (Clarke) Brem.
- Austinii* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 208, 1918 = ? *Goldfussia Austinii* (Clarke ex W. W. Smith) Brem. n. comb.
- axilliflora* Clarke ex S. Moore in Journ. of Bot. LXIII, Suppl., p. 77, 1925, probabiliter = *Diflugossa filiformis* (Bl.) Brem.
- Balansae* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 652, 1897 = *Baphicacanthus cusia* (Nees) Brem.
- bantonensis* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 650, 1897 — Tonkin — genus adhuc incertum
- barbata* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgirianthus barbatus* (Nees) Brem. n. comb.
- Beddomei* T. And. in Journ. Linn. Soc. IX, p. 482, 1867, n. nom. illeg. (*Strobilanthes gracilis* Bedd.) = *Mackenzia gracilis* (Bedd.) Brem.
- bibracteata* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 = *Tetraglochidium bibracteatum* (Bl.) Brem. n. comb.
- bibracteata* Bl. in errore apud Clarke in Journ. As. Soc. Beng. LXXIV, p. 655, 1908 et apud Ridl., Fl. Mal. Pen. II, p. 572, 1922 = species alia
- biceps* (Nees) Miq., Fl. Ind. Bat. II, p. 804, 1858 = *Goldfussia biceps* Nees
- biceps* (Nees) T. And. in Journ. Linn. Soc. IX, p. 476, 1867 = prec.

- Biroi* Lindau et K. Sch. in K. Sch. et Lauterb., Nachtr. Fl. Deutsch. Schutzgeb. Südsee, p. 387, 1905 = **Jadunia Biroi** (Lindau et K. Sch.) Lindau in Engl., Bot. Jahrb. L, p. 169, 1913
- Blinii* Leveillé in Fedde, Repert. XII, p. 19, 1913 — China — genus adhuc incertum
2. **Blumei** Brem. n. nom. (*hirta* Bl. quoad descr. et specim. javan. haud quoad typum) — Java —
- Blumei* Brem. var. *puberula* Brem. n. nom. = forma typica  
*Blumei* Brem. var. *tomentella* Brem. n. var. — Java —
- Bodinieri* Leveillé in Fedde, Repert. XII, p. 19, 1913 — China — genus adhuc incertum
- boerhaavioides* T. And. in Journ. Linn. Soc. IX, p. 479, 1867 = **Pteracanthus boerhaavioides** (T. And.) Brem. n. comb.
6. **Boerlagii** Brem. n. spec. — Java —
- Boerlagii* Brem. var. *densipila* Brem. n. nom. = forma typica  
*Boerlagii* Brem. var. *sparsipila* Brem. n. var. — Java —
- bogoriensis* Lindau in Fedde, Repert. XIII, p. 531, 1915 = **Hemigraphis buruensis** Hall. f.
- boholensis* Merr. in Philipp. Journ. Sc. XXIX, p. 487, 1926 — Ins. Philipp. — genus adhuc incertum
- bolumpattiana* Bedd., Ic. Pl. Ind. Or. I, p. 46, Tab. 200, 1874 = **Didyplosandra bolumpattiana** (Bedd.) Brem. n. comb.
- bombycina* Imlay in Kew Bull. 1939, p. 124 — Siamia — genus adhuc incertum
- bonatiana* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- Brandisii* T. And. in Journ. Linn. Soc. IX, p. 475, 1867 — Birmania — genus adhuc incertum
- brunnescens* R. Ben. in Bull. Mus. Par. XXVII, p. 544, 1921 — Tonkinia — genus adhuc incertum
- brunoniana* Nees in Wall., Pl. As. Rar. III, p. 87, 1832 = **Sympagis brunoniana** (Nees) Brem. n. comb.
- bulusanensis* Elm., Leaf. Philipp. Bot. X, p. 2678, 1939 = **Hemigraphis cumingiana** (Nees) F. Vill.
- Burkillii* Dunn in Kew Bull. 1920, p. 208 — Himalaya Orientali — genus adhuc incertum
- burmanica* Kurz in Journ. As. Soc. Beng. XLIII, p. 92, 1873 = **Hemigraphis crossandra** (Steud.) Brem.
- callosa* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = **Carvia callosa** (Nees) Brem. n. comb.
- callosa* Nees var. *hispida* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 451, 1884 = **Carvia callosa** (Nees) Brem. var. *hispida* (Clarke) Brem. n. comb.
- calycina* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 — Ceylania — genus adhuc incertum
- calycina* Nees var. ? *parvifolia* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 450, 1884, n. v.
- campanulata* Wight, Ic. Pl. Ind. Or. IV, Tab. 1562, 1849 = **Nilgirianthus campanulatus** (Wight) Brem. n. comb.
- canarica* Bedd., Ic. Pl. Ind. Or. I, p. 50, Tab. 215, 1874 = **Phlebophyllum canaricum** (Bedd.) Brem. n. comb.
- capillipes* Clarke ex Ridl. in Journ. Fed. Mal. States Mus. VIII, p. 71, 1917 = **Difflugossa capillipes** (Clarke ex Ridl.) Brem. n. comb.
- capitata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = **Goldfussia capitata** Nees
- capitata* (Nees) T. And. var. *nitida* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 459, 1884, n. v.

- caudata* T. And. in Thwaites, Enum. Pl. Zeyl., p. 228, 1860 — Ceylania — genus adhuc incertum
- caudata* T. And. var. *laniceps* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 441, 1884, n. v.
- Cavallieri* Leveillé in Fedde, Repert. XII, p. 18, 1913, fide R. Benoist in Lecomte, Fl. Gén. de l'Indo-China IV, p. 666 = *Gutzlaffia aprica* Hance
- Cavallieri* Leveillé var. *angustifolia* Leveillé l. c. — China — n. v.
- cerinthoides* Nees in DC., Prodr. XI, p. 724, 1847 = *Mackenzia sessilis* Nees
7. \* *cernua* Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826 — Java —
- cernua* Bl. var. *brevistipitata* Brem. n. nom. = forma typica
- cernua* Bl. var. *crenulata* (Bl.) Hochr. in Candollea V, p. 226, 1934 (*hirta* Bl. var. *crenulata* Bl.) = *imbricata*
- cernua* Bl. var. *laxiflora* Bl., l. c. — Java —
- cernua* Bl. var. *macrostachya* Hall. f. in Meded. Rijksherb. n. 26, p. 5, 1914 = *Teysmannii*
- cernua* Bl. var. *multiflora* Nees in DC., Prodr. XI, p. 182, 1847, n. v.
- ceylanica* T. And. cf. *zeylanica*
- Chaffanjeni* Leveillé in Fedde's Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- Championi* T. And. ex Benth., Fl. Hongk., p. 261, 1861 = *Baphicacanthus cusia* (Nees) Brem.
- ciliata* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgirianthus ciliatus* (Nees) Brem. n. comb.
- cinnamalis* Clarke in Philipp. Journ. of Sc. I, Suppl., p. 249, 1906 — Ins. Philipp. — genus adhuc incertum
- circarensis* Gamble in Kew Bull. 1923, p. 373 = *Nilgirianthus circarensis* (Gamble) Brem. n. comb.
- claviculata* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 191, 1918 — China — genus adhuc incertum
- cognata* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 189, 1922 — China — genus adhuc incertum
- collina* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 — Peninsula Malayana — genus adhuc incertum
- colorata* Nees in Hook., Comp. Bot. Mag. II, p. 312 — Ceylania — genus adhuc incertum (fide Clarke in Hook. f., Fl. Brit. Ind. IV, p. 443 = *trifida*)
- colorata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867 (*Goldfussia* Nees), n. comb. illeg. = *Diflugossa colorata* (Nees) Brem.
- colorata* (Nees) T. And. var. *crinita* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 473, 1884 (*Goldfussia crinita* Nees) = *Diflugossa crinita* (Nees) Brem.
- comosa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 546, 1921 — China — genus adhuc incertum
- connata* Collett et Hemsl. in Journ. Linn. Soc. XXVIII, p. 104, Tab. XVI, 1890 — Birmania — genus adhuc incertum
- consanguinea* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 (*Endopogon* Nees) = *Phlebophyllum spicatum* (Roth) Brem.
- consanguinea* (Nees) T. And. var. *amomum* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 435, 1884 (*Endopogon amomum* Nees) = *Phlebophyllum spicatum* (Roth) Brem. var. *amomum* (Nees) Brem. n. comb.
- consanguinea* (Nees) T. And. var. *hypoleuca* (Nees) Clarke op. cit. p. 436 (*Endopogon hypoleucus* Nees) = *Phlebophyllum spicatum* (Roth) Brem. var. *hypoleucum* (Nees) Brem. n. comb.
- consors* Clarke in Engl., Bot. Jahrb. XLI, p. 66, 1906 — Siamia — genus adhuc incertum
- corcana* Leveillé in Fedde's Repert. XII, p. 19, 1913 — China — genus adhuc incertum



- cordiformis* Lindau in Fedde, Repert. XIII, p. 552, 1915 = **Adenacanthus glandulosus** (Bl.) Brem.
- corrugata* Imlay in Kew Bull. 1939, p. 123 — Siamia — genus adhuc incertum
- crassifolia* Miq., Fl. Ind. Bat. II, p. 800, 1858 = ? **Tetragompha crassifolia** (Miq.) Brem. n. comb.
- crataegifolia* T. And. in Journ. Linn. Soc. IX, p. 477, 1867 — Birmania — genus adhuc incertum
- crenulata* (Bl.) Hassk. Cat. Hort. Bogor. ed. 2, p. 148, 1844 (*hirta* Bl. var. *crenulata* Bl.) = **imbricata**
- crinita* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867 (*Goldfussia* Nees) = **Diflugossa crinita** (Nees) Brem.
- crispa* (L.) Bl., Bijdr. Fl. Ned. Ind., p. 798, 1826 (*Ruellia* L.) = **Sericocalyx crispus** (L.) Brem.
- crispa* (L.) Bl. in errore apud T. And. in Journ. Linn. Soc. IX, p. 467, 1867 = **Sericocalyx phyllostachyus** (Kurz) Brem.
- crispa* (L.) Bl. var. *citrina* O. Ktze, Rev. Gen. Pl. II, p. 499, 1892 = forma typica
- cusia* (Nees) O. Ktze, Rev. Gen. Pl. II, p. 499, 1892 (*Goldfussia* Nees) = **Baphiacanthus cusia** (Nees) Brem.
- cusia* (Nees) Imlay in Kew Bull. 1939, p. 115 = prec.
- cuspidata* (Benth.) T. And. in Journ. Linn. Soc. IX, p. 465, 1867 (*Endopogon* Benth.) = **Plebophyllum versicolor** (Wight) Brem.
- cycla* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 192, 1918 — China — genus adhuc incertum
- cyphanta* Diels in Notes Bot. Gard. Edin. V, p. 162, 1912 — China — genus adhuc incertum
- cystolithigera* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 651, 1897 — Tonkinia — genus adhuc incertum
- dalhousiana* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884 = **Goldfussia dalhousiana** Nees
- Dalzielii* (W. W. Smith) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 679, 1935 (*Acanthopale* W. W. Smith) = ? **Championella Dalzielii** (W. W. Smith) Brem. n. comb.
- Dalzielii* (W. W. Smith) R. Ben. var. *inaequalis* R. Ben. l.c. = **Pteroptychia inaequalis** (R. Ben.) Brem. n. comb.
- Darrisii* Leveillé in Fedde, Repert. XII, p. 18, 1913 — China — genus adhuc incertum
- dasysperma* Kurz in Journ. As. Soc. Beng. XLII, p. 94, 1873 = **Goldfussia dasysperma** (Kurz) Brem. n. comb.
- debilis* Hemsl. in Journ. Linn. Soc. XXVI, p. 239, 1890 = **Championella debilis** (Hemsl.) Brem. n. comb.
- decurrens* Nees in DC., Prodr. XI, p. 189, 1847 = **Nilgirianthus decurrens** (Nees) Brem. n. comb.
- decurrens* (Nees) T. And. in Journ. Linn. Soc. IX, p. 470, 1867 (*Endopogon* Nees) comb. illeg. = **Hymenochlaena decurrens** (Nees) Brem.
- deflexa* T. And. in Thwaites, Enum. Pl. Zeyl., p. 227, 1860 — Ceylania — genus adhuc incertum
- deminuta* S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925 = **Microstrobilus paniculatus** (Nees) Brem.
- densa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 188, 1922 — China — genus adhuc incertum
- denticulata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 483, 1867 (*Asystasia* Nees) — Khasia — genus adhuc incertum
- deutzifolia* Leveillé in Fedde, Repert. XII, p. 21, 1913 (sphalm. *Strobilanthopsis*, cf. id., Fl. Kouy — Tchéou, p. 60, 1913) — China — genus adhuc incertum

- diandra* (Nees) Alston in Trimen, Handb. Fl. Ceyl. VI, p. 227, 1931 (*Stenosiphonium* Nees) = *Pseudostenosiphonium diandrum* (Nees) Brem.
- diclipterooides* Miq., Fl. Ind. Bat. II, p. 802, 1858 = *Microstrobilus alatus* (Bl.) Brem.
- dielsiana* W. W. Smith in Notes Bot. Gard. Edin. VIII, p. 207, 1914 = *Gutzlaffia dielsiana* (W. W. Smith) S. Moore.
- dimorphotricha* Hance in Journ. of Bot. XXI, p. 355, 1883 = *Goldfussia dimorphotricha* (Hance) Brem. n. comb.
- discolor* (Nees) T. And. in Journ. Linn. Soc. IX, p. 477, 1867 = *Goldfussia discolor* Nees
- discolor* (Nees) T. And. var. *nudicalyx* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 462, 1884, n. v.
- dispar* (Hassk.) Hassk., Pl. Jav. Rar., p. 505, 1848 (*Apolepsis* Hassk.) — Java —
- divaricata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 478, 1867 (*Goldfussia* Nees) = *Difflugossa divaricata* (Nees) Brem.
- dolichophylla* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 546, 1921 = *Sericocalyx Schomburgkii* (Craib) Brem.
- dryadum* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 94, 1922 — China — genus adhuc incertum
- Duclouxii* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 96, 1922 — China — genus adhuc incertum
- Dupeni* Bedd. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 453, 1884 — Peninsula Indica — genus adhuc incertum
- dyeriana* Mast. in Gard. Chron. 1893, I, p. 442 = *Perilepta dyeriana* (Mast.) Brem. n. comb.
- echinata* Wall. ex Nees<sup>30</sup>) in Wall., Pl. As. Rar. III, p. 85, 1832 — Himalaya et Khasia — genus adhuc incertum
- echinata* Wall. ex Nees var. *acuminata* Imlay in Kew Bull. 1939, p. 119 — Siamia — n. v.
- echinata* Wall. ex Nees var. *Daltoni* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 447 — Himalaya — n. v.
- echinata* Wall. ex Nees var. *glandulosa* Imlay l.c. — Siamia — n. v.
- echinata* Wall. ex Nees var. *punctata* Imlay l.c. — Siamia — n. v.
- edgeworthiana* Nees in DC., Prodr. XI, p. 190, 1847 = *Perilepta edgeworthiana* (Nees) Brem. n. comb.
- elata* Jungh. in Nat. en Geneesk. Arch. Ned. Indië II, p. 53, 1845 = *imbricata*
- elongata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 470, 1884 — Assamia — genus adhuc incertum
- elongata* (Bl.) O. Ktze, sphalm. apud Ridl., Fl. Mal. Pen. II, p. 574, 1923 = *Staurogynne elongata* (Bl.) Ktze
- ? *equitans* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- erecta* Clarke in Engl., Bot. Jahrb. XLI, p. 67, 1907 — Siamia — genus adhuc incertum
- eriocephala* Benth. sphalm. apud T. And. in Journ. Linn. Soc. IX, p. 466, 1867 (recte: *ixiocephala*) = *Thelepaepale ixiocephala* (Benth.) Brem.
- erosa* Nees in DC., Prodr. XI, p. 180, 1847 = *Pachystrobilus involucratus* (Bl.) Brem. var. *tjibodensis* (Hochr.) Brem.
- Esquirollii* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum

<sup>30</sup>) According to T. ANDERSON (in Journ. Linn. Soc. IX, p. 474, 1867) WALLICH called this plant *Ruellia pectinata*: the name *echinata* would owe its origin to a misreading of WALLICH's label. However, as NEES quotes in his monograph both *Ruellia echinata* from WALLICH's catalogue and *Ruellia pectinata* Wall. from the Berlin herbarium, he evidently judged the epithet *echinata* appropriate, and it will therefore have to stand.

- Everettii* Rolfe in Kew Bull. 1896, p. 39 = *Difflugossa Everettii* (Rolfe) Brem. n. comb.
- Evrardi* R. Ben. in Bull. Soc. Bot. de France LXXX, p. 731, 1934 — Annamia — genus adhuc incertum
- Evrardi* R. Ben. var. *parviflora* Imlay in Kew Bull. 1939, p. 119 — Siamia — n. v.
- exareolata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884, n. nom. illeg. (*Stenosiphonium diandrum* Nees) = *Pseudostenosiphonium diandrum* (Nees) Brem.
- exareolata* Clarke var. *densa* Clarke l.c. = *Pseudostenosiphonium diandrum* (Nees) Brem. var. *densum* (Clarke) Brem. n. comb.
- exserta* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 445, 1884, n. nom. (*Stenosiphonium zeylanicum* T. And.) — Ceylania — genus adhuc incertum
- exserta* Clarke var. *integra* (T. And.) Clarke l.c. (*Stenosiphonium zeylanicum* T. And. var. *integrum* T. And.) — Ceylania — n. v.
- exsucca* Lindau in Fedde, Repert. XIII, p. 551, 1915 = *Goldfussia glomerata* Nees
- extensa* (Nees) Nees in DC., Prodr. XI, p. 195, 1847 (*Goldfussia* Nees) = *Pteracanthus extensus* (Nees) Brem.
- extensa* (Nees) Nees in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 47, Tab. 252, 1874 = *Mackenzia Newii* (Bedd. ex Clarke) Brem.
- Falconeri* T. And. in Journ. Linn. Soc. IX, p. 484, 1867 — Birmania — genus adhuc incertum
- farinosa* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 470, 1884 — Birmania — genus adhuc incertum
- Fauriei* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 187, 1922 — Formosa — genus adhuc incertum
- Feddei* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum.
- filiformis* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826 = *Difflugossa filiformis* (Bl.) Brem. n. comb.
- fimbriata* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 — Khasia — genus adhuc incertum
- fimbriata* Nees var. *majuscula* W. W. Smith in Notes Bot. Gard. Edin. X, p. 192, 1918 — Birmania — n. v.
- flaccidifolia* Nees in DC., Prodr. XI, p. 194, 1847 = *Baphicacanthus cusia* (Nees) Brem.
- flava* Kurz in Journ. As. Soc. Beng. XXXIX, p. 78, 1870 (*Ruellia flava* Roxb. non Pers.) = *Sericocalyx flavus* (Kurz) Brem. n. comb.
- flexa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 186, 1922 — China — genus adhuc incertum
- flexicaulis* Hayata, Ic. Pl. Formos. V, p. 135, 1915 — Formosa — genus adhuc incertum
- foetidissima* Kurz in Journ. As. Soc. Beng. XLIII, p. 93, 1873 = ? *Buteraea foetidissima* (Kurz) Brem. n. comb.
- foliosa* (Wight) T. And. in Journ. Linn. Soc. IX, p. 467, 1867 (*Endopogon* Wight) = *Nilgirianthus foliosus* (Wight) Brem.
- formosana* S. Moore in Journ. of Bot. XV, p. 294, 1877 — Formosa — genus adhuc incertum
- Forrestii* Diels in Notes Bot. Gard. Edin. V, p. 162, 1912 — China — genus adhuc incertum
- furcata* Biswar in Assam Forest Rep., Bot. I, p. 23, 1934 — Assamia — genus adhuc incertum
- galeopsis* Stapf in Trans. Linn. Soc., Ser. 2 IV, p. 215, 1894 = *Semnostachya galeopsis* (Stapf) Brem. n. comb.

- gardneriana* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860  
(*Endopogon* Nees) — Ceylania — genus adhuc incertum
- geniculata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 459, 1884, n. nom. (*gracilis*  
T. And. 1867, non Bedd. 1864) = **Goldfussia geniculata** (Clarke)  
Brem. n. comb.
- gentilliana* Leveillé in Bull. Soc. Agr. Sc. Sarthe XLIV, p. 449, 1914 — China —  
genus adhuc incertum
- gigantodes* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 649, 1897 — Tonkinia —  
genus adhuc incertum
- glabrata* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = Assamia — genus  
adhuc incertum
- glandulosa* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826 = **Adenacanthus glandulosus**  
(Bl.) Brem. n. comb.
- glandulosa* Bl. in errore apud Koorders, Exkursionsfl. v. Java III, p. 217, 1912, in adnot. ad  
*Str. filiformem* = **Lissospermum pedunculatum** (Miq.) Brem.
- glandulosa* (T. And.) Kurz in Journ. As. Soc. Beng. XLIII, p. 92, 1873 (*Hemi-*  
*graphis* T. And.), comb. illeg. — Ins. Andaman. — genus adhuc incer-  
tum, forsitan *Sericocalyx*
- glaucescens* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = **Sericocalyx glau-**  
**cescens** (Nees) Brem. n. comb.
- glomerata* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = **Goldfussia**  
**glomerata** Nees
- glutinosa* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = **Pseudaechmanthera**  
**glutinosa** (Nees) Brem. n. comb.
- goldfussia* Dalz. et Gibs., Bomb. Fl., Suppl., p. 71, 1861, n. nom. illeg. =  
**Goldfussia isophylla** Nees
- gossypina* T. And. in Journ. Linn. Soc. IX, p. 466, 1867 = **Phlebophyllum**  
**lanatum** (Nees) Brem.
- gracilicaulis* R. Ben. in Not. Syst. VIII, p. 145, 1939 — Madagascar — genus  
adhuc incertum, forsitan *Dyschoriste*
- gracilis* Bedd. in Madras Journ. of Sc., Ser. 3 I, p. 55, 1864 = **Mackenzia**  
**gracilis** (Bedd.) Brem. n. comb.
- gracilis* T. And. in Journ. Linn. Soc. IX, p. 474, 1867, nom. illeg. = **Goldfussia**  
**geniculata** (Clarke) Brem.
- grahamiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1520, 1849 = **Carvia callosa**  
(Nees) Brem.
- graminea* Imlay in Kew Bull. 1939, p. 116 = **Gutzlaffia graminea** (Imlay)  
Brem. n. comb.
- gregalis* Collett et Hemsl. in Journ. Linn. Soc. XXVII, p. 104, 1890 = Birmania  
— genus adhuc incertum
- griffithiana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 481, 1867 = **Triaena-**  
**canthus griffithianus** Nees
- halconensis* Merr. in Philipp. Journ. of Sc. II, p. 322, 1909 = **Semnostachya**  
**halconensis** (Merr.) Brem. n. comb.
- Hallbergii* Blatten in Journ. et Proc. As. Soc. Beng. 1930, n. s. XXVI, p. 345,  
1931 — India — genus adhuc incertum.
- Hancockii* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 193, 1918  
= ? **Goldfussia Hancockii** (Clarke ex W. W. Smith) Brem. n. comb.
- haplanthoides* T. And. in Journ. Linn. Soc. IX, p. 471, 1867 — Birmania —  
genus adhuc incertum
- Helperi* T. And. in Journ. Linn. Soc. IX, p. 472, 1867 — Birmania — genus  
adhuc incertum
- helicoides* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860 =  
**Leptacanthus helicoides** Nees

- helictus* T. And. in Journ. Linn. Soc. IX, p. 479, 1867, n. nom. (*Asystasia calycina* Nees) = **Pteracanthus calycinus** (Nees) Brem.
- Henryi* Hemsl. in Journ. Linn. Soc. XXVI, p. 240, 1890 = **Gutzlaffia Henryi** (Hemsl.) Clarke
- heteromalla* T. And. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 437, 1884 = **Xenacanthus heteromallus** (T. And. ex Clarke) Brem. n. comb.
- heyneana* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = **Nilgirianthus heyneanus** (Nees) Brem. n. comb.
- heyneana* Nees var. *campanulata* (Wight) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 444, 1884 (*Strobilanthes campanulata* Wight) = **Nilgirianthus campanulatus** (Wight) Brem.
- heyneana* Nees var. *fusca* Clarke l.c. = **Nilgirianthus heyneanus** (Nees) Brem. var. *fuscus* (Clarke) Brem. n. comb.
- heyneana* Nees var. *viridis* Clarke l.c. = **Nilgirianthus heyneanus** (Nees) Brem. var. *viridis* (Clarke) Brem. n. comb.
- hirsuta* Decne in Nouv. Ann. Mus. Par. III, p. 386, 1834 = **Hemigraphis decaisneana** (Nees) T. And.
- hirsutissima* Nees in Hook., Comp. Bot. Mag. II, p. 313, 1836 = **Mackenzia hirsutissima** (Nees) Brem. n. comb.
- hirta* (Vahl) Bl., Bijdr. Fl. Ned. Ind., p. 797, 1826 (*Ruellia* Vahl), quoad typum = **Hemigraphis hirta** (Vahl) T. And.; quoad descr. et specim. javan. = **Strobilanthes Blumei** Brem. n. nom.
- hirta* (Vahl) Bl. var. *crenulata* Bl. l.c. = *imbricata*
- hirticalyx* Ridl. in Journ. As. Soc. Mal. Br. n<sup>o</sup> 1, p. 82, 1923 — Sumatra — genus adhuc incertum
- hirtisepala* Clarke in Journ. As. Soc. Beng. LXXIV, p. 655, 1908 = ? **Tetraglochidium hirtisepalum** (Clarke) Brem. n. comb.
- hispidula* Baker in Journ. Linn. Soc. XXII, p. 509, 1887 = **Dyschoriste hispidula** (Baker) R. Ben.
- homotropa* Nees in DC., Prodr. XI, p. 187, 1847 = **Mackenzia homotropa** (Nees) Brem. n. comb.
- Hookeri* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 = ? **Didyplosandra Hookeri** (Nees) Brem. n. comb.
- Hossei* Clarke in Engl., Bot. Jahrb. XLI, p. 67, 1907 — Siamia — genus adhuc incertum
- humilis* Gamble, Fl. Madras II, p. 1026 et 1035, 1927, n. comb. (*Endopogon viscosus* Nees var. *humilis* Nees) = **Phlebophyllum humile** (Gamble) Brem. n. comb.
- hupehensis* W. W. Smith in Notes Bot. Gard. Edin. X, p. 193, 1918 = **Goldfussia hupehensis** (W. W. Smith) Brem. n. comb.
- hygrophiloides* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 194, 1918 — China — genus adhuc incertum
- hygrophiloides* Clarke ex W. W. Smith var. *subnuda* R. Ben. in Bull. Mus. Hist. Nat. XXVIII, p. 189, 1922 — China — n. v.
- hypericifolia* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- hypoleuca* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 (*Endopogon* Nees), quoad typum = **Phlebophyllum spicatum** (Roth) Brem. var. *hypoleucum* (Nees) Brem.; quoad specim. cit. = **Pseudostenosiphonium rhytispermum** (Clarke) Brem.
- hypomalla* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 543, 1921 — Annamia — genus adhuc incertum
5. *imbricata* Nees in Wall., Pl. As. Rar. III, p. 86, 1832, n. nom. (*Strobilanthes hirta* Bl. var. *crenulata* Bl.), quoad typum — Java —
- imbricata* Nees l.c., quoad specim. birman. = **Parasympagis Wallichii** Brem. n. nom.
- imbricata* Nees in errore apud R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 668, 1935 = **Parasympagis Kerrii** Brem. n. spec.

- imbricata* Nees var. *Blumei* Brem. n. nom. = forma typica  
*imbricata* Nees var. *glandulosa* Brem. n. var. — Java —
- incisa* Imlay in Kew Bull. 1939, p. 120 — Siamia — genus adhuc incertum
- inflata* T. And. in Journ. Linn. Soc. IX, p. 476, 1867 = *Pteracanthus inflatus* (T. And.) Brem. n. comb.
- integrifolia* (Dalz.) O. Ktze, Rev. Gen. Pl. II, p. 499, 1892 (*Endopogon* Dalz.) = *Mackenzia integrifolia* (Dalz.) Brem.
- interrupta* Benth. in Pl. Hohenacker., nomen = *Mackenzia homotropa* (Nees) Brem.
- involutrata* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 = *Pachystrobilus involutratus* (Bl.) Brem. n. comb.
- involutrata* Bl. in errore apud Span. in Hook., Comp. Bot. Mag. I, p. 349, 1835 = *Hemigraphis decaisneana* (Nees) T. And.
- involutrata* Bl. var. *tjibodensis* Hochr. in Candollea V, p. 227, 1934 = *Pachystrobilus involutratus* (Bl.) Brem. var. *tjibodensis* (Hochr.) Brem. n. comb.
- isoglossoides* Lindau in Engl., Bot. Jahrb. XXIV, p. 315, 1897 = *Mimulopsis isoglossoides* (Lindau) Brem.
- isophylla* (Nees) T. And. in Cat. Pl. Hort. Bot. Calc., p. 43, 1865 = *Goldfussia isophylla* Nees
- ixiocephala* Benth. in Flora XXXII, p. 557, 1849 = *Thelepaepale ixiocephala* (Benth.) Brem. n. comb.
- japonica* (Thunb.) Miq. in Ann. Mus. Bot. Lugd.-Bat. II, p. 124, 1866 (*Ruellia* Thunb.) = *Championella japonica* (Thunb.) Brem.
- jeyporensis* Bedd., Ic. Pl. Ind. Or. I, p. 50, Tab. 214, 1874 = *Phlebophyllum jeyporensis* (Bedd.) Brem. n. comb.
- jugorum* R. Ben. in Bull. Soc. Bot. de France LXXXI, p. 601, 1934 = *Tonkinia* — genus adhuc incertum
- karensium* Kurz in Journ. As. Soc. Beng. XLII, p. 94, 1873 — Birmania — genus adhuc incertum
- Kerrii* Craib in Kew Bull. 1912, p. 267 = *Goldfussia Kerrii* (Craib) Brem. n. comb.
- khasyana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 471, 1867 (*Endopogon* Nees) = *Listrobantes khasyana* (Nees) Brem.
- kinabaluensis* Stapf in Trans. Linn. Soc., Ser. 2 IV, p. 214, 1894 = *Goldfussia kinabaluensis* (Stapf) Brem. n. comb.
- Koordersii* Clarke ex Kds, Exkursionsfl. v. Java III, p. 218, 1912 = *Parastrobilanthes Koordersii* (Clarke ex Kds) Brem. n. comb.
- kunthiana* (Nees) T. And. ex Benth., Fl. Hongk., p. 262 in nota, 1861 = *Phlebophyllum kunthianum* Nees
- Labordei* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- lachenensis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 465, 1884 = *Pteracanthus lachenensis* (Clarke) Brem. n. comb.
- lactata* Hook. in Bot. Mag. LXXIV, Tab. 4366, 1848, non pertinet ad *Strobilanthes* sed ad *Ruellianas*
- lactucifolia* Leveillé in Fedde, Repert. XII, p. 20, 1913 — China — genus adhuc incertum
- laevigata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 467, 1884 = *Diflugossa colorata* (Nees) Brem.
- lamiifolia* (Nees) T. And. in Journ. Linn. Soc. IX, p. 476, 1867 (*Goldfussia* Nees) = ? *Pteracanthus rotundifolius* (D. Don) Brem.
- lamioides* T. And. in Journ. Linn. Soc. IX, p. 485, 1867 — Birmania — genus adhuc incertum
- lamium* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 195, 1918 — China — genus adhuc incertum

- ? *lanata* Nees in DC., Prodr. XI, p. 191, 1847 = *Phlebophyllum lanatum* (Nees) Brem. n. comb.
- lanceifolia* T. And. in Journ. Linn. Soc. IX, p. 480, 1867 — Birmania — genus adhuc incertum
- lanceolata* Hook. ex Nees in DC., Prodr. XI, p. 181, 1847 = ? *Didyplosandra lanceolata* (Hook. ex Nees) Brem. n. comb.
- lasiocalyx* Hayata, Ic. Pl. Formos. IX, p. 82, 1920 — Formosa — genus adhuc incertum
- latebrosa* Ridl., Journ. As. Soc. Straits Br. n<sup>o</sup> 86, p. 304, 1922 — Peninsula Malayana — genus adhuc incertum
- latibracteata* Imlay in Kew Bull. 1939, p. 122 — Siamia — genus adhuc incertum
- latisejala* Hemsl. in Journ. Linn. Soc. XXVI, p. 241, 1890 — China — genus adhuc incertum
3. *lawangensis* Brem. n. spec. — Java —
- Lawsonii* Gamble in Kew Bull. 1923, p. 374 = *Phlebophyllum Lawsonii* (Gamble) Brem. n. comb.
- laxa* T. And. in Thwaites, Enum. Pl. Zeyl., p. 228, 1860 = ? *Didyplosandra laxa* (T. And.) Brem. n. comb.
- leucocephala* Craib in Kew Bull. 1914, p. 130 — Siamia — genus adhuc incertum
- leucopogon* Ridl., Journ. As. Soc. Straits Br. n<sup>o</sup> 86, p. 304, 1922 — Peninsula Malayana — genus adhuc incertum
- leucotricha* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 96, 1922 — China — genus adhuc incertum
- lilacina* Clarke in Engl., Bot. Jahrb. XLI, p. 67, 1907 — Siamia — genus adhuc incertum
- Limprichtii* Diels in Fedde, Beihefte zum Repert. XII, p. 488, 1922 — China — genus adhuc incertum
- lofouensis* Leveillé in Fedde, Repert. XII, p. 99, 1913 — China — genus adhuc incertum
- longespicata* Hayata, Ic. Pl. Formos. IX, p. 83, 1920 — Formosa — genus adhuc incertum
- longiflora* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 94, 1922 — China — genus adhuc incertum
- longifolia* Miq., Fl. Ind. Bat. II, p. 797, 1858 (*Ruellia longifolia* Thunb. ex Nees in DC., Prodr. XI, p. 182, 1847, in syn. *Str. cernua* Bl., nomen, non *R. longifolia* Rich. in Act. Soc. Hist. Nat. Par. I, p. 110, 1792) nom. illeg. et conf., p. p. = *Blumei*, p. p. = *cernua*
- longifolia* Miq. var. *crenulata* (Bl.) Miq. l.c. (*hirta* Bl. var. *crenulata* Bl.) = *imbricata*
- longifolia* Miq. var.  $\gamma$  Miq., l.c. = *cernua*
- longipes* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 455, 1884 — Birmania — genus adhuc incertum
- lupulina* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = *Nilgirianthus lupulinus* (Nees) Brem. n. comb.
- lurida* Wight, Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1849 = *Didyplosandra lurida* (Wight) Brem. n. comb.
- Maclellandii* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 453, 1884 = *Perilepta Maclellandii* (Clarke) Brem. n. comb.
- Maclurei* Merr. in Philipp. Journ. of Sc. XXI, p. 354, 1922 — China — genus adhuc incertum
- macrostegia* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 456, 1884 (*Endopogon* Nees) — Assamia et Birmania — genus adhuc incertum
- maculata* (Wall. ex Nees) Nees in DC., Prodr. XI, p. 190, 1847 (*Ruellia* Wall. ex Nees) = *Sympagis maculata* (Wall. ex Nees) Brem.
- madagascariensis* Baker in Journ. Linn. Soc. XX, p. 220, 1883 = *Acanthopale madagascariensis* (Baker) Brem.

- mahongensis* Leveillé, Cat. Fl. Yunnan, p. 6, 1915 — China — genus adhuc incertum
- Maingayi* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 448, 1884 = ? *Tetraglochidium Maingayi* (Clarke) Brem. n. comb.
- Maingayi* Clarke var. *glabra* Imlay in Kew Bull. 1939, p. 119 — Siamia — n. v.
- Mairei* Leveillé, Cat. Fl. Yunnan, p. 6, 1915 — China — genus adhuc incertum
- Marchandii* Leveillé in Fedde, Repert. XII, p. 99, 1913 — China — genus adhuc incertum
- Martinii* Leveillé in Fedde, Repert. XII, p. 99, 1915 — China — genus adhuc incertum
- Mastersii* T. And. in Journ. Linn. Soc. IX, p. 481, 1867 — Assamia — genus adhuc incertum
- Mearnsii* Merr. in Philipp. Journ. of Sc. IV, p. 322, 1909 = *Goldfussia Mearnsii* (Merr.) Brem. n. comb.
- Meeboldii* Craib in Kew Bull. 1910, p. 278 = *Nilgirianthus Meeboldii* (Craib) Brem. n. comb.
- mekongensis* W. W. Smith in Notes Bot. Gard. Edin. X, p. 195, 1918 — China — genus adhuc incertum
- membranacea* Talb., Trees and Shrubs Bombay, ed. 2, p. 261, 1902 = *Nilgirianthus membranaceus* (Talb.) Brem. n. comb.
- Merrillii* Clarke in Philipp. Gov. Lab. Bur. Bull. XXXV, p. 92, 1906 = *Semnostachya Merrillii* (Clarke) Brem. n. comb.
- mesargyrea* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, p. 195, 1897 = *Filetia mesargyrea* (Hall. f.) Brem. n. comb.
- Micholitzii* Ridl. in Gard. Chron. XLI, p. 246, 1907, probabiliter = *Teysmannii micrantha* Wight, Ic. Pl. Ind. Or. IV, Tab. 1519, 1849 = *Taeniandra micrantha* (Wight) Brem. n. comb.
- microcarpa* T. And. in Journ. Linn. Soc. IX, p. 482, 1867 — patria incerta — genus adhuc incertum
- microcephala* R. Ben. in Bull. Soc. Bot. de France LXXX, p. 730, 1933 — Laos — genus adhuc incertum
- microstachya* Benth. in Flora XXXII, p. 557, 1849 = *Nilgirianthus punctatus* (Nees) Brem.
- minor* Talb., Trees and Shrubs, Bombay, ed. 2, p. 262, 1902 — Peninsula Indica — genus adhuc incertum
- mogokensis* Lace in Kew Bull. 1915, p. 406 — Birmania — genus adhuc incertum
- monadelpha* Nees in Wall., Pl. As. Rar. III, p. 87, 1832 = *Sympagis monadelpha* (Nees) Brem. n. comb.
- moschifera* Bl., Bijdr. Fl. Ned. Ind., p. 800, 1826 = *Adenostachya moschifera* (Bl.) Brem. n. comb.
- mucronato-producta* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 650, 1897 — Tonkinia — genus adhuc incertum
- mucronato-producta* Lindau var. *glabrescens* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 676, 1935, n. v.
- multangula* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 669, 1935 — Tonkinia — probabiliter ad subtribum aliam pertinens
- multidens* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884 = *Goldfussia multidens* (Clarke) Brem. n. comb.
- multiflora* Ridl. in Journ. As. Soc. Mal. Br. I, p. 82, 1923 = *Difflugossa multiflora* (Ridl.) Brem. n. comb.
- mysurensis* (Roth) Nees in Wall., Pl. As. Rar. III, p. 86, 1832 (*Ruellia* Roth) = *Asystasia mysurensis* (Roth) T. And.



- myura* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 95, 1932 — China — genus adhuc incertum
- Naumannii* Engl. in Engl., Bot. Jahrb. VII, p. 474, 1886 et in Forschungsreise Gazelle, p. 44, 1886 = *Hemigraphis Naumannii* (Engl.) Brem. n. comb.
- neesiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1523, 1849 = *Thelepaepale ixiocephala* (Benth.) Brem.
- Neesii* Kurz in Journ. As. Soc. Beng. XLII, p. 93, 1873 — Birmania — genus adhuc incertum
- neilgherrensis* Bedd., Ic. Pl. Ind. Or. I, p. 45, Tab. 196, 1874 = *Nilgirianthus neilgherrensis* (Bedd.) Brem. n. comb.
- nemorosa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 97, 1922 — China — genus adhuc incertum
- Newii* Bedd. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 471, 1884 = *Mackenzia Newii* (Bedd. ex Clarke) Brem. n. comb.
- nigrescens* T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 = *Pseudostenosiphonium nigrescens* (T. And.) Lindau
- nivea* Craib in Kew Bull. 1914, p. 131 = *Sympagis nivea* (Craib) Brem. n. comb.
- nobilis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 471, 1884 = *Pteracanthus nobilis* (Clarke) Brem. n. comb.
- Nockii* Trimen, Handb. Fl. Ceyl. III, p. 301, Tab. 70, 1895 = *Pseudostenosiphonium Nockii* (Trimen) Brem. n. comb.
- novomegapolitana* Lindau in Engl., Bot. Jahrb. L, p. 166, 1913 = *Hemigraphis novomegapolitana* (Lindau) Brem. n. comb.
- nutans* (Nees) T. And. in Journ. Linn. Soc. IX, p. 475, 1867 = *Goldfussia nutans* Nees
- obesa* R. Ben. in Bull. Soc. bot. de France LXXXI, p. 601, 1934 — Tonkinia — genus adhuc incertum
- oligantha* Miq. in Ann. Mus. Bot. Lugd.-Bat. II, p. 124, 1866 = *Championella oligantha* (Miq.) Brem. n. comb.
- oligocephala* T. And. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884 = *Goldfussia oligocephala* (T. And. ex Clarke) Brem. n. comb.
- oresbia* W. W. Smith in Notes Bot. Gard. Edin. X, p. 196, 1918 = Birmania — genus adhuc incertum
- pachyphylla* Clarke in Journ. As. Soc. Beng. LXXIV, p. 658, 1908 — Peninsula Malayana — genus adhuc incertum
- pachys* Clarke ex Merr. in Philipp. Journ. Sc. XX, p. 456, 1922 = *Semnostachya pachys* (Clarke ex Merr.) Brem. n. comb.
- palawanensis* Elm., Leaflet Philipp. Bot. V, p. 1686, 1913 = *Goldfussia palawanensis* (Elm.) Brem. n. comb.
- pallida* T. And. in Journ. Linn. Soc. IX, p. 470, 1867 = *Nilgirianthus decurrens* (Nees) Brem.
- panichanga* (Nees) T. And. in Journ. Linn. Soc. IX, p. 478, 1867 (*Asystasia* Nees) — Himalaya — genus adhuc incertum
- paniculata* (Nees) Miq., Fl. Ind. Bat. II, p. 802, 1858 (*Goldfussia* Nees) = *Microstrobilus paniculatus* (Nees) Brem.
- paniculata* (Nees) Miq. var. *alata* (Bl.) Miq. l.c. (*Goldfussia paniculata* Nees var. *alata* Nees; *Strobilanthes alata* Bl.) = *Microstrobilus alatus* (Bl.) Brem.
- paniculata* T. And. in Journ. Linn. Soc. IX, p. 483, 1867, nom. illeg. = *Leptacanthus paniculatus* Brem. n. nom.
- paniculata* T. And. in errore apud Bedd., Ic. Pl. Ind. Or. I, p. 46, Tab. 199, 1874 = *Leptacanthus rubicundus* Nees
- panpienkaiensis* Leveillé, Cat. Pl. Yunnan, p. 6, 1915 — China — genus adhuc incertum

- papillosa* T. And. in Journ. Linn. Soc. IX, p. 468, 1867 = *Nilgirianthus papillosus* (T. And.) Brem. n. comb.
- parabolica* Nees in DC., Prodr. XI, p. 180, 1847 = *Parastrobilanthes parabolica* (Nees) Brem. n. comb.
- Parishii* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 431, 1884 = *Buteraea Parishii* (Clarke) Brem. n. comb.
- Parryorum* Fischer in Kew Bull. 1928, p. 142 = *Pteracanthus Parryorum* (Fischer) Brem. n. comb.
- parvibracteata* Clarke in Bot. Tidskr. XXIV, p. 349, 1902 — Siamia — genus adhuc incertum
- parviflora* Bedd., Ic. Pl. Ind. Or. I, p. 45, Tab. 197, 1874 = *Nilgirianthus warreënsis* (Dalz.) Brem.
- pateriformis* Lindau in Bull. Herb. Boiss., 2e Sér. V, 653, 1897 = *Pteroptychia pateriformis* (Lindau) Brem. n. comb.
- patula* R. Ben. in Bull. Soc. bot. de France LXXXI, p. 601, 1934 = *Pteroptychia patula* (R. Ben.) Brem. n. comb.
- paupera* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 463, 1884 = *Difflugossa paupera* (Clarke) Brem. n. comb.
- pectinata* T. And. in Journ. Linn. Soc. IX, p. 474, 1867, cf. *echinata* Nees
- pedicellata* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 54, 1909 — Peninsula Malayana — genus adhuc incertum
- pedunculosa* Miq., Fl. Ind. Bat. II, p. 803, 1858 = *Lissospermum pedunculatum* (Miq.) Brem. n. comb.
- penstemonoides* (Nees) T. And. in Journ. Linn. Soc. IX, p. 477, 1867 = *Goldfussia penstemonoides* Nees
- penstemonoides* (Nees) T. And. var. *anfractuosa* (Clarke) R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 667, 1935 (*Strobilanthes anfractuosa* Clarke) = *Goldfussia anfractuosa* (Clarke) Brem.
- penstemonoides* (Nees) T. And. var. *flexuosa* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884 = *Goldfussia flexuosa* Nees
- penstemonoides* (Nees) T. And. var. *rex* (Clarke) R. Ben. l.c. (*Strobilanthes rex* Clarke) = *Goldfussia rex* (Clarke) Brem.
- perfoliata* T. And. in Journ. Linn. Soc. IX, p. 471, 1867 = *Mackenzia integrifolia* (Dalz.) Brem.
- Perrieri* R. Ben. in Not. Syst. VIII, p. 145, 1939 — Madagascar — ad subtribum aliam pertinens
- perrottetiana* Nees in DC., Prodr. XI, p. 179, 1847 = *Nilgirianthus perrottetianus* (Nees) Brem. n. comb.
- Petelotii* R. Ben. in Bull. Soc. bot. de France LXXX, p. 731, 1933 — Tonkinia — genus adhuc incertum
- petiolaris* Nees in DC., Prodr. XI, p. 189, 1847 = *Sympagis petiolaris* (Nees) Brem. n. comb.
- petiolaris* Nees var. *tubiflos* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 458, 1884, n. v.
- phoenicea* Ridl., Fl. Mal. Pen. II, p. 575, 1923, n. nom. (*violacea* Ridl. 1911, non Bedd. 1874) — Peninsula Malayana — genus adhuc incertum
- phyllocaule* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 464, 1884 = *Pteracanthus phyllocaulos* (Clarke) Brem. n. comb.
- phyllostachya* Kurz in Journ. As. Soc. Beng. XL, p. 75, 1871 = *Sericocalyx phyllostachyus* (Kurz) Brem. n. comb.
- phyllostachya* Kurz var. *dura* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 446, 1884 = *Sericocalyx durus* Brem. n. spec.
- picta* Kds, Fl. v. Tjibodas III § 1, p. 132, 1918 = *cernua*
- Pierrei* R. Ben. in Bull. Soc. bot. de France LXXX, p. 730, 1933 — Siamia — genus adhuc incertum

- pinetorum* W. W. Smith in Notes Bot. Gard. Edin. X, p. 197, 1918 — China — genus adhuc incertum
- plumulosa* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = *Perilepta plumulosa* (Nees) Brem. n. comb.
- pluriformis* Clarke in Philipp. Gov. Lab. Bur. Bull. XXXV, p. 93, 1906 = **Goldfussia pluriformis** (Clarke) Brem. n. comb.
- Poilanei* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 545, 1921 — Cambodia et Annamia — genus adhuc incertum
- polybotrya* Miq., Fl. Ind. Bat. II, p. 803, 1858 = *Difflugossa polybotrya* (Miq.) Brem. n. comb.
- polycephala* Miq., Fl. Ind. Bat. II, p. 803, 1858 = *cernua*
- polyneura* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 198, 1918 — China — genus adhuc incertum
- polystachya* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 545, 1921 — Laos — genus adhuc incertum
- polythrix* T. And. in Journ. Linn. Soc. IX, p. 470, 1867 = **Pyrrothrix polythrix** (T. And.) Brem. n. comb.
9. *prahuensis* Clarke ex S. Moore in Journ. of Bot. LXIII, p. 166, 1925 — Java —
1. *prianganensis* Brem. n. spec. — Java —
- prioniphylla* Hayata, Ic. Pl. Formos. IX, p. 84, 1920 — Formosa — genus adhuc incertum
- psilostachys* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 198, 1918 = **Goldfussia psilostachys** (Clarke ex W. W. Smith) Brem. n. comb.
- pteroaulis* Kurz in Journ. As. Soc. Beng. XLII, p. 93, 1873 — Birmania — genus adhuc incertum
- pteroclada* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 187, 1922 — China — genus adhuc incertum
- pterygorrhachis* Clarke in Journ. Linn. Soc. XXV, p. 54, Tab. 25, 1889 — Kohima — genus adhuc incertum
- pulcherrima* T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860, n. nom. = **Leptacanthus Walkeri** Nees
- pulneyensis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 438, 1884 = **Xenacanthus pulneyensis** (Clarke) Brem. n. comb.
- punctata* Nees in DC., Prodr. XI, p. 183, 1847 — Ceylania — genus adhuc incertum
- quadrangularis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 460, 1884, n. nom. illeg. = **Goldfussia bracteata** Nees
- radicans* T. And. ex Benth., Fl. Hongk., p. 262, 1861 = **Championella tetrasperma** (Champ. ex Benth.) Brem.
- rankanensis* Hayata, Ic. Pl. Formos. IX, p. 84, 1920 = **Parachampionella rankanensis** (Hayata) Brem. n. comb.
4. **Rantii** Brem. n. spec. — Java —
- recurva* Clarke in Journ. Linn. Soc. XXV, p. 53, Tab. 24, 1889 — Kohima — genus adhuc incertum
- reflexa* Nees in DC., Prodr. XI, p. 194, 1847 = **Pteracanthus reflexus** (Nees) Brem. n. comb.
- remota* T. And. in Journ. Linn. Soc. IX, p. 471, 1867 — Birmania — genus adhuc incertum
- reticulata* Stapf in Kew Bull. 1894, p. 347 = **Nilgirianthus reticulatus** (Stapf) Brem. n. comb.
- rex* Clarke in Engl., Bot. Jahrb. XLI, p. 68, 1907 = **Goldfussia rex** (Clarke) Brem. n. comb.
- rhamnifolia* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 (*Buteraea* Nees) = **Pseudostenosiphonium rhamnifolium** (Nees) Lindau

- rhombifolia* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 461, 1884, n. nom. = **Goldfussia sessilis** Nees
- rhytisperma* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884 = **Pseudostenosiphonium rhytispermum** (Clarke) Brem. n. comb.
- Ridleyi* Merr. in Contr. Arn. Arbor. VIII, p. 155, 1934, n. nom. (*anceps* Ridl. 1923, non Nees 1836) = **Pteroptychia Ridleyi** (Merr.) Brem. n. comb.
- rosea* Nees in Wall., Pl. As. Rar. III, p. 84, 1832 — Birmania — genus adhuc incertum
- rotundifolia* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 97, 1922 — China — genus adhuc incertum
- rubescens* T. And. in Journ. Linn. Soc. IX, p. 479, 1867 = **Pteracanthus rubescens** (T. And.) Brem. n. comb.
- rubescens* T. And. var. ? *microsperma* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 469, 1884, n. v.
- rubicunda* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 229, 1860 = **Leptacanthus rubicundus** Nees
- rubroglandulosa* Craib in Kew Bull. 1912, p. 268 = **Adenacanthus rubroglandulosus** (Craib) Brem. n. comb.
- rufescens* (Roth) T. And. in Journ. Linn. Soc. IX, p. 472, 1867 (*Ruellia* Roth) = **Buteraea rufescens** (Roth) Dietr.
- rufescens* (Roth) T. And. var. *rubiginosa* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 430, 1884, n. v.
- ruficapillis* Ridl., Fl. Mal. Pen. II, p. 326, 1925 = **Pyrrothrix ruficapillis** (Ridl.) Brem. n. comb.
- ruficaulis* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 53, 1909 = **Pyrrothrix ruficaulis** (Ridl.) Brem. n. comb.
- rufo-capitata* Clarke in Journ. As. Soc. Beng. LXXIV, p. 657, 1908 = **Pyrrothrix rufo-capitata** (Clarke) Brem. n. comb.
- rufo-hirta* Clarke ex W. W. Smith in Notes Bot. Gard. Edin. X, p. 199, 1918 — China — genus adhuc incertum
- rufo-paupera* Clarke in Journ. As. Soc. Beng. LXXIV, p. 657, 1908 = **Pyrrothrix rufo-paupera** (Clarke) Brem. n. comb.
- rufo-sepala* Clarke in Journ. As. Soc. Beng. LXXIV, p. 656, 1908 = **Pyrrothrix rufo-sepala** (Clarke) Brem. n. comb.
- rufo-strobilata* Clarke in Journ. As. Soc. Beng. LXXIV, p. 657, 1908 = **Pyrrothrix rufo-strobilata** (Clarke) Brem. n. comb.
- rugosa* Wight, Ic. Pl. Ind. Or. IV, Tab. 1619, 1849 = **Nilgirianthus heyneanus** (Nees) Brem.
- sabiniana* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 — Himalaya et Assamia — genus adhuc incertum
- salicifolia* T. And. in Journ. Linn. Soc. IX, p. 484, 1867 — patria ignota — genus adhuc incertum
- saltiensis* S. Moore in Journ. Nat. Hist. Soc. Siam IV, p. 152, 1921 — Annamia — genus adhuc incertum
- sarmentosa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 547, 1921 = **Pteroptychia sarmentosa** (R. Ben.) Brem. n. comb.
- scabra* Nees in Wall., Pl. As. Rar. III, p. 84, 1832 = **Sericocalyx scaber** (Nees) Brem. n. comb.
- scabra* Nees var.  $\gamma$  Nees l.c. et var.  $\beta$  Nees in DC., Prodr. XI, p. 178, 1847 = **Xenacanthus heteromallus** (T. And. ex Clarke) Brem.
- scabrida* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 54, 1909 — Peninsula Malayana — genus adhuc incertum
- scoriarum* W. W. Smith in Notes Bot. Gard. Edin. X, p. 199, 1918 = **Goldfussia scoriarum** (W. W. Smith) Brem. n. comb.
- scrobiculata* Dalz. ex Clarke in Hook. f., Fl. Brit. Ind. IV, p. 445, 1884 — Peninsula Indica — genus adhuc incertum

- secunda* T. And. in Journ. Linn. Soc. IX, p. 484, 1867 = **Ditrichospermum secundum** (T. And.) Brem. n. comb.
- Sequini* Leveillé in Fedde, Repert. XII, p. 19, 1913 — China — genus adhuc incertum
- serrata* Imlay in Kew Bull. 1939, p. 117, 1939 — Siamia — genus adhuc incertum
- sessilis* Nees in Wall., Pl. As. Rar. III, p. 85, 1832 = **Pleocaulus sessilis** (Nees) Brem. n. comb.
- sessilis* Nees var. *Ritchei* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 452, 1884 = **Pleocaulus Ritchei** Brem. n. spec.
- sessilis* Nees var. *sessiloides* (Wight) Clarke l.c. (*Strobilanthes sessiloides* Wight) = **Pleocaulus sessiloides** (Wight) Brem.
- sessiloides* Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 = **Pleocaulus sessiloides** (Wight) Brem. n. comb.
- sexennis* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 = **Mackenzia sexennis** (Nees) Brem. n. comb.
- sexennis* Nees var. *arguta* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 474, 1884 (*Strobilanthes arguta* Nees) = **Mackenzia arguta** (Nees) Brem.
- sexennis* Nees var. *cerinthoides* (Nees) Clarke l.c. (*Strobilanthes cerinthoides* Nees) = **Mackenzia sessilis** Nees
- sexennis* Nees var. *hirsutissima* (Nees) Clarke l.c. (*Strobilanthes hirsutissima* Nees) = **Mackenzia hirsutissima** (Nees) Brem.
- shweliensis* W. W. Smith in Notes Bot. Gard. Edin. XII, p. 224, 1920 — China — genus adhuc incertum
- siamensis* Clarke in Bull. Herb. Boiss., 2e Sér. V, p. 716, 1905 = **Perilepta siamensis** (Clarke) Brem. n. comb.
- sibulanensis* Merr. in Philipp. Journ. of Sc. XXIX, p. 488, 1926, in obs.: *Hypoestes sibulanensis* — Ins. Philipp. — genus adhuc incertum
- silvestris* cf. *sylvestris*
- Simonsii* T. And. in Journ. Linn. Soc. IX, p. 472, 1867 — Assamia — genus adhuc incertum
8. *slamatensis* Brem. n. spec. — Java —
- spathulata* R. N. Parker in Fedde, Repert. XXIX, p. 105, 1931 — Himalaya — genus adhuc incertum
- speciosa* Bl., Bijdr. Fl. Ned. Ind., p. 799, 1826 = **Goldfussia speciosa** (Bl.) Brem. n. comb.
- spicata* T. And. in Journ. Linn. Soc. IX, p. 484, 1867 — Khasia — genus adhuc incertum
- squalens* S. Moore in Journ. Nat. Hist. Soc. Siam IV, p. 151, 1921 — Annamia — genus adhuc incertum
- stenodon* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884 — Ceylania — genus adhuc incertum
- stolonifera* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 98, 1922 — China — genus adhuc incertum
- straminea* W. W. Smith in Notes Bot. Gard. Edin. X, p. 200, 1918 — China — genus adhuc incertum
- strobilata* Imlay in Kew Bull. 1939, p. 116, n. nom. (*Endopogon Ridleyi* Clarke) = **Hymenochlaena Ridleyi** (Clarke) Brem.
- subcapitata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 455, 1884 — Birmania — genus adhuc incertum
- subflaccida* Kurz in Journ. As. Soc. Beng. XLII, p. 91, 1873, forsitan = **Adenacanthus acuminatus** Nees
- subflaccida* Kurz var. *longispicata* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 666, 1935 — Cambodia — n. v.
- subnudata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 472, 1884 = **Pteracanthus subnudatus** (Clarke) Brem. n. comb.

- suborbicularis* Imlay in Kew Bull. 1939, p. 118 = *Dossifluga suborbicularis* (Imlay) Brem. n. comb.
- sulfurea* R. Ben. in Bull. Soc. bot. de France LXXX, p. 732, 1933 — Annamia — genus adhuc incertum
- sumatrana* Miq., Fl. Ind. Bat. II, p. 802, 1858 = *Semnothyrsus sumatranus* (Miq.) Brem. n. comb.
- sylvestris* Ridl. in Journ. As. Soc. Straits Br. n<sup>o</sup> 57, p. 80, 1921 — Peninsula Malayana — genus adhuc incertum
- tamburensis* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 454, 1884 — Himalaya — genus adhuc incertum
- Tashiroi* Hayata, Ic. Pl. Formos. IX, p. 85, 1920 = *Parachampionella Tashiroi* (Hayata) Brem. n. comb.
- Tatei* F. Müll. in Trans. Roy. Soc. S. Austr. V, p. 81, 1882 — Australia Septemtrionali — genus adhuc incertum
- tenax* Dunn in Kew Bull. 1920, p. 209 — Himalaya Orientali — genus adhuc incertum
- tenera* Nees in DC., Prodr. XI, p. 184, 1847, fide Clarke in Hook. f., Fl. Brit. Ind. IV, p. 443, 1884 = *trifida*
- tetraptera* Dalz. in Hook., Kew Journ. II, p. 342, 1850 = *Nilgirianthus barbatus* (Nees) Brem.
- tetrasperma* (Champ. ex Benth.) Druce in Rep. Bot. Exch. Club Brit. Isles 1916, p. 649, 1917 (*Ruellia* Champ. ex Benth.) = *Championella tetrasperma* (Champ. ex Benth.) Brem.
10. *Teysmannii* Miq., Fl. Ind. Bat. II, p. 797, 1858 — Sumatra —
- Thirionii* Leveillé in Fedde, Repert. XII, p. 18, 1931 — China — genus adhuc incertum
- Thomsonii* T. And. in Journ. Linn. Soc. IX, p. 478, 1867 — Himalaya — genus adhuc incertum
- thunbergiiflora* S. Moore in Journ. of Bot. LXIII, Suppl., p. 78, 1925 = *Tetraglochidium thunbergiiflorum* (S. Moore) Brem. n. comb.
- Thwaitesii* T. And. in Thwaites, Enum. Pl. Zeyl., p. 227, 1860 — Ceylania — genus adhuc incertum
- timorensis* Nees in DC., Prodr. XI, p. 178, 1847 = *Sericocalyx timorensis* (Nees) Brem. n. comb.
- tonkinensis* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 651, 1897 — Tonkin — genus adhuc incertum
- tonkinensis* Lindau var. *sarmentosa* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 677, 1935 n. v.
- torrentium* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVIII, p. 188, 1922 — China — genus adhuc incertum
- trichophora* Fischer in Kew Bull. 1932, p. 202 — Assamia — genus adhuc incertum
- trifida* Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 — Ceylania — genus adhuc incertum
- tristis* (Wight) T. And. in Journ. Linn. Soc. IX, p. 470, 1867 (*Goldfussia* Wight) — Peninsula Indica — genus adhuc incertum
- turginodis* Imlay in Kew Bull. 1939, p. 120 — Siamia — genus adhuc incertum
- urceolaris* Gamble in Kew Bull. 1923, p. 374 = *Nilgirianthus urceolaris* (Gamble) Brem. n. comb.
- urophylla* (Nees) Nees in DC., Prodr. XI, p. 192, 1847 (*Dipteracanthus* Nees) = ? *Pteracanthus urophyllus* (Nees) Brem. n. comb.
- urticifolia* O. Ktze, Rev. Gen. Pl. II, p. 499, 1892, n. nom. (*alata* Nees 1847, non Bl. 1826) = *Pteracanthus urticifolius* (O. Ktze) Brem. n. comb.
- urticifolia* O. Ktze var. *multilobulata* O. Ktze l.c. = *Difflugossa filiformis* (Bl.) Brem.

- venusta* Craib in Kew Bull. 1914, p. 131 = **Perilepta venusta** (Craib) Brem. n. comb.
- verruculosa* Nees in DC., Prodr. XI, p. 181, 1847 — India — species incertae sedis
- versicolor* Diels in Notes Bot. Gard. Edin. V, p. 163, 1912 — China — genus adhuc incertum
- vestita* Nees in DC., Prodr. XI, p. 180, 1847 = ? **Didyplosandra vestita** (Nees) Brem. n. comb.
- violacea* Bedd., Ic. Pl. Ind. Or. I, p. 48, Tab. 205, 1874 = **Mackenzia violacea** (Bedd.) Brem. n. comb.
- violacea* Ridl. in Journ. As. Soc. Straits Br. n<sup>o</sup> 57, p. 80, 1911, nom. illeg. cf. *phoenicea*
- violascens* Ridl. in Journ. Fed. States Mus. X, p. 106, 1920 — Peninsula Malayana — genus adhuc incertum
- violifolia* T. And. in Journ. Linn. Soc. IX, p. 485, 1867 = ? **Pteracanthus violifolius** (T. And.) Brem. n. comb.
- virgata* Bl. ex Zipp. in Flora XII, p. 284, 1829, nomen tantum, n. v.
- viscida* Imlay in Kew Bull. 1939, p. 123 — Siamia — genus adhuc incertum
- viscosa* (Nees) T. And. in Thwaites, Enum. Pl. Zeyl., p. 226, 1860 (*Endopogon* Nees) = **Pseudostenosiphonium viscosum** (Nees) Lindau
- viscosa* (Nees) T. And. var. *arguta* (Nees) Clarke in Hook. f., Fl. Brit. Ind. IV, p. 432, 1884 (*Endopogon argutus* Nees) = **Pseudostenosiphonium argutum** (Nees) Brem.
- viscosa* (Nees) T. And. var. *digitalis* (Nees) Clarke l.c. (*Endopogon digitalis* Nees) = **Pseudostenosiphonium digitale** (Nees) Brem.
- viscosa* (Nees) T. And. var. *microphylla* (Nees) Clarke l.c. (*Endopogon viscosus* Nees var. *microphyllus* Nees) — Ceylania — n. v.
- vulpina* Ridl. in Journ. Fed. Mal. States Mus. IV, p. 53, 1909 = **Pyrrothrix vulpina** (Ridl.) Brem. n. comb.
- Walkeri* Arn. ex Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836 — Ceylania — genus adhuc incertum
- Walkeri* Arn. ex Nees var. ? *stenocarpa* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 441, 1884, n. v.
- Wallichii* Nees in Wall., Pl. As. Rar. III, p. 87, 1832, n. nom. (*Ruellia alata* Wall. ex Nees) = **Pteracanthus alatus** (Wall. ex Nees) Brem.
- Wallichii* Nees var. *microphylla* Nees in DC., Prodr. XI, p. 193, 1847, n. v.
- Wardii* W. W. Smith in Notes Bot. Gard. Edin. X, p. 202, 1918 — Birmania — genus adhuc incertum
- warreënsis* Dalz. in Hook., Kew Journ. II, p. 345, 1850 = **Nilgirianthus warreënsis** (Dalz.) Brem. n. comb.
- wightiana* Nees in Wall., Pl. As. Rar. III, p. 86, 1832 = **Nilgirianthus wightianus** (Nees) Brem. n. comb.
- xanthantha* Diels in Notes Bot. Gard. Edin. V, p. 163, 1912 — China — genus adhuc incertum
- xanthosticta* Clarke in Engl., Bot. Jahrb. XLI, p. 68, 1907 — Siamia — genus adhuc incertum
- yangtsekiangensis* Leveillé, Cat. Pl. Yunnan, p. 7, 1915 — China — genus adhuc incertum
- yunnanensis* Diels in Notes Bot. Gard. Edin. V, p. 164, 1912 — China — genus adhuc incertum
- zenkeriana* (Nees) T. And. in Journ. Linn. Soc. IX, p. 467, 1867 (*Goldfussia* Nees) = **Xenacanthus zenkerianus** (Nees) Brem.
- zeylanica* T. And. in Thwaites, Enum. Pl. Zeyl., p. 227, 1860 — Ceylania — genus adhuc incertum

## Index Iconum.

- adenophora* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 225, 1874 = **Nilgirianthus Beddomei** Brem.

- anceps* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 204, 1874, adhuc incerti generis  
*Andersonii* Bedd., Ic. Pl. Ind. Or. I, Tab. 208, 1874 = *Didyplosandra Andersonii* (Bedd.) Brem.
- anisophylla* (Nees) T. And. in Engl. u. Prantl, Nat. Pflanzenfam. IV 3 b, p. 304, 1895 et in Rev. Hort. Belge XXIX, p. 36, 1903 = *Goldfussia anisophylla* Nees
- arnottiana* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 261, 1874, adhuc incerti generis
- aspera* Wight, Ic. Pl. Ind. Or. IV, Tab. 1518, 1849, adhuc incerti generis, cf. index specierum
- attenuata* Nees in Gartenfl. XXXVI, Tab. 1243, 1887 = ? *Pteracanthus attenuatus* (Nees) Brem.
- auriculata* Nees in Wall., Pl. As. Rar. III, Tab. 295, 1832 et in Bedd., Ic. Pl. Ind. Or. I, Tab. 210, 1874 = *Perilepta auriculata* (Nees) Brem.
- barbata* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 212, 1874 = *Nilgirianthus barbatus* (Nees) Brem.
- bolumpattiana* Bedd., Ic. Pl. Ind. Or. I, Tab. 200, 1874 = *Didyplosandra bolumpattiana* (Bedd.) Brem.
- callosa* Nees in Bot. Mag. CXXIII, Tab. 7538, 1897 et in Talbot, For. Fl. Bombay II, p. 336, 1911 = *Carvia callosa* (Nees) Brem.
- calycina* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 209, 1874, adhuc incerti generis
- campanulata* Wight, Ic. Pl. Ind. Or. IV, Tab. 1562, 1849 = *Nilgirianthus campanulatus* (Wight) Brem.
- canarica* Bedd., Ic. Pl. Ind. Or. I, Tab. 215, 1874 = *Phlebophyllum canaricum* (Bedd.) Brem.
- caudata* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 213, 1874, adhuc incerti generis
- cernua* Bl. in Trop. Natuur VII, p. 21 fig. 1 et 2, 1918
- ceylanica* T. And. cf. *zeylanica*
- ciliata* Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1517, 1849 = *Xenacanthus zenkerianus* (Nees) Brem.
- ciliata* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 211, 1874 = *Nilgirianthus ciliatus* (Nees) Brem.
- colorata* (Nees) T. And. in Bot. Mag. CXIII, Tab. 6922, 1887 = *Diflugossa colorata* (Nees) Brem.
- connata* Coll. et Hemsl. in Journ. Linn. Soc. XXVIII, Tab. 16, 1890, adhuc incerti generis
- consanguinea* (Nees) T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 216, 1874 = *Phlebophyllum spicatum* (Roth) Brem.
- cuspidata* (Benth.) T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 221, 1874 et in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 207, 1915 = *Phlebophyllum versicolor* (Wight) Brem.
- dalhousiana* (Nees) Clarke in Collett, Fl. Siml., p. 373, 1902 et in Ill. Handb. Laubh. II, p. 1054, 1912 = *Goldfussia dalhousiana* Nees
- deflexa* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 218, 1874, adhuc incerti generis
- dyeriana* Mast. in Rev. Hort. Belge XX, p. 133, 1894 et in Bot. Mag. CXIII, Tab. 7574, 1898 = *Perilepta dyeriana* (Mast.) Brem.
- extensa* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 202, 1874 = *Mackenzia Newii* (Bedd. ex Clarke) Brem.
- flaccidifolia* Nees in Bot. Mag. CXXIV, Tab. 6947, 1887 = *Baphicacanthus cusia* (Nees) Brem.
- flexicaulis* Hayata, Ic. Pl. Formos. V, p. 136, 1915, adhuc incerti generis
- foliosa* (Wight) T. And. in Fyson, Fl. Nilgiri and Pulney Hill-tops III, p. 451, 1920 = *Nilgirianthus foliosus* (Wight) Brem.



- gardneriana* (Nees) T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 259, 1874, adhuc incerti generis
- gossypina* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 198, 1874 et in Bot. Mag. CXXVII, Tab. 7790, 1903 = *Phlebophyllum lanatum* (Nees) Brem.
- gracilis* Bedd., Ic. Pl. Ind. Or. I, Tab. 207, 1874 = *Mackenzia gracilis* (Bedd.) Brem.
- grahamiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1520, 1849 = *Carvia callosa* (Nees) Brem.
- helicoides* (Nees) T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 220, 1874 = *Leptacanthus helicoides* Nees
- Hookeri* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 262, 1874 = ? *Didyplosandra Hookeri* (Nees) Brem.
- ixiocephala* Benth. in Bedd., Ic. Pl. Ind. Or. I, Tab. 203, 1874 = *Thelepaepale ixiocephala* (Benth.) Brem.
- japonica* (Thunb.) Miq. in Yatabe, Ic. Fl. Jap. I, Tab. 14, 1891 et in Somoku Dzusetsu, ed. Makino XI, Tab. 64, 1912 = *Championella japonica* (Thunb.) Brem.
- jeyporensis* Bedd., Ic. Pl. Ind. Or. I, Tab. 214, 1874 = *Phlebophyllum jeyporensis* (Bedd.) Brem.
- kunthiana* (Nees) T. And. in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 206, 1915
- lactata* Hook. in Bot. Mag. LXXIV, Tab. 4366, 1848 et in Fl. des Serres I, (IV), Tab. 346, 1848 = species ad subtribum *Ruellinarum* pertinens
- laxa* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 223, 1874 = ? *Didyplosandra laxa* (T. And.) Brem.
- lurida* Wight, Ic. Pl. Ind. Or. IV, Tab. 1515/6, 1849; in Wight, Spicil. Neilgherr. II, Tab. 178/9, 1851 et in Fyson, Fl. Nilgiri and Pulney Hilltops III, p. 453, 1920 = *Didyplosandra lurida* (Wight) Brem.
- membranacea* Talb., For. Fl. Bombay II, p. 327, 1911 = *Nilgirianthus membranaceus* (Talb.) Brem.
- mesargyrea* Hall. f. in Nov. Act. Acad. Nat. Cur. LXX, Tab. 14, 1897 = *Filetia mesargyrea* (Hall. f.) Brem.
- micrantha* Wight, Ic. Pl. Ind. Or. IV, Tab. 1519, 1849 = *Taeniandra micrantha* (Wight) Brem.
- neesiana* Wight, Ic. Pl. Ind. Or. IV, Tab. 1523, 1849 = *Thelepaepale ixiocephala* (Wight) Brem.
- neilgherrensensis* Bedd., Ic. Pl. Ind. Or. I, Tab. 196, 1874 = *Nilgirianthus neilgherrensensis* (Bedd.) Brem.
- nigrescens* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 217, 1874 = *Pseudostenosiphonium nigrescens* (T. And.) Lindau
- Nockii* Trimen, Handb. Fl. Ceylon, Atlas III, Tab. 70, 1895 = *Pseudostenosiphonium Nockii* (Trimen) Brem.
- oligantha* Miq. in Somoku Dzusetsu ed. Makino XI, Tab. 63, 1912 = *Championella oligantha* (Miq.) Brem.
- paniculata* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 199, 1874 = *Leptacanthus rubicundus* Nees
- papillosa* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 201, 1874 = *Nilgirianthus papillosus* (T. And.) Brem.
- parviflora* Bedd., Ic. Pl. Ind. Or. I, Tab. 197, 1874 = *Nilgirianthus warreënsis* (Dalz.) Brem.
- perrottetiana* Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1513, 1849 et in Wight, Spicil. Neilgherr. II, Tab. 177, 1851 = *Nilgirianthus perrottetianus* (Nees) Brem.

- pterygorrhachis* Clarke in Journ. Linn. Soc. XXV, Tab. 25, 1889, adhuc incerti generis
- pulneyensis* Clarke in Fyson, Fl. Nilgiri and Pulney Hill-tops III, p. 452, 1920 = *Xenacanthus pulneyensis* (Clarke) Brem.
- recurva* Clarke in Journ. Linn. Soc. XXV, Tab. 24, 1889, adhuc incerti generis
- reticulata* Stapf in Talbot, For. Fl. Bombay II, p. 324, 1911 = *Nilgirianthus reticulatus* (Stapf) Brem.
- rugosa* Wight, Ic. Pl. Ind. Or. IV, Tab. 1619, 1849 = *Nilgirianthus heyneanus* (Nees) Brem.
- sabiniana* Nees in Bot. Mag. LXIII, Tab. 3517, 1836, adhuc incerti generis
- scabra* Nees in Bot. Reg. XXVII, Tab. 32, 1841 = *Sericocalyx scaber* (Nees) Brem.
- sessilis* Nees in Bot. Mag. LXVIII, Tab. 3902, 1841; in Wight, Ic. Pl. Ind. Or. IV, Tab. 1511, 1849; in Wight, Spicil. Neilgherr. Tab. 176, 1851 et in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 209, 1915 = *Pleocaulus sessilis* (Nees) Brem.
- sessiloides* Wight, Ic. Pl. Ind. Or. IV, Tab. 1512, 1849 = *Pleocaulus sessiloides* (Wight) Brem.
- sexennis* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 206, 1874 = *Mackenzia sexennis* (Nees) Brem.
- Thwaitesii* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 219, 1874, adhuc incerti generis
- vestita* Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 260, 1874 = ? *Didyplosandra vestita* (Nees) Brem.
- violacea* Bedd., Ic. Pl. Ind. Or. I, Tab. 205, 1874 = *Mackenzia violacea* (Bedd.) Brem.
- Walkeri* Arn. ex Nees in Bedd., Ic. Pl. Ind. Or. I, Tab. 222, 1874, adhuc incerti generis
- wightiana* Nees in Wight, Ic. Pl. Ind. Or. IV, Tab. 1514, 1849 et in Fyson, Fl. Nilgiri and Pulney Hill-tops II, p. 208, 1915 = *Nilgirianthus wightianus* (Nees) Brem.
- zeylanicum* T. And. in Bedd., Ic. Pl. Ind. Or. I, Tab. 207, 1874, adhuc incerti generis

48. *Parastrobilanthes* Brem. n. gen.; *Strobilanthes* species Neesii et auctorum aliorum; typus: *P. parabolica* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

Plantae plietesiae, valde ramosae, anisophyllae. Folia in petiolum satis longum contracta, supra cystolithis parvis lineolata. Inflorescentiae spiciformes, valde abbreviatae, terminales et axillares vel in capitula, racemosos vel paniculas terminales et axillares dispositae, erectae. Bracteae e basi 3- vel 5-nerviae, ad apicem glandulis subsessilibus vel stipitatis instructae, persistentes. Flores in axillis bractearum solitarii. Bracteolae lanceolatae vel lineares, calycis lobis subaequilongae, 1-nerviae, persistentes. Calyx subaequaliter 5-partitus, lobis anguste lanceolatis vel linearibus. Corolla alba vel rosea, non resupinata, tubo in fauces late infundibuliformes ei subaequilongas vel eo breviores ampliato, pilis stylum retinentibus in fasciculos binos dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia, exserta; filamenta basi hirtella; antherae versatiles, apice obtusae vel mucronulatae, thecis subpatentibus. Staminodium parvum. Granula pollinis (Tab. II G) globosa, virgis ad marginem redactis ornata. Ovarium comosum, utroque loculo ovulis 2 subaequalibus vel inferiore rudimentario. Stylus glaber. Capsula breviter fusiformis, 2-, 3- vel 4-seminalis. Semina luteo-brunnea, areolata, cellulis extra-areolaribus annulatis sed ex-appendiculatis.

Distributum in Sumatra et Java. Species adhuc notae 4.

Species typica: *P. parabolica* (Nees) Brem. n. comb. (*Strobilanthes* Nees).

*Parastrobilanthes* was separated from *Strobilanthes*, with which it is doubtless closely related, on account of the structure of the pollen grains and of the testa. The pollen grains (Tab. II G) are of the same kind as those of *Sympagis* and *Parasympagis*, i.e. they are in shape and size very similar to those of *Strobilanthes*, but the bands consist merely of the marginal rim, the transverse ridges being entirely suppressed. The testa differs from that of *Strobilanthes* in the complete absence of hairs: the latter, however, are in *Strobilanthes* sometimes reduced to papillae and are at the most of medium length only. Whether the *Parastrobilanthes* species are like those of *Strobilanthes* gregariously growing plants, flowering in the same locality simultaneously, is as yet unknown.

#### Key to the Species.

1. Spikes almost all solitary, 12—16 mm long and 14—17 mm in diam.; the lowest pair of bracts crenate. — Java . . . . . 1. *P. parabolica* (Nees) Brem. n. comb.
- : Spikes for the greater part arranged in capitula, racemuli or small panicles, at the most 10 mm long and 13 mm in diam.; bracts never crenate . . . . . 2
2. Spikes congested in small capitula. — Sumatra . . . . . 2. *P. pycnocephala* Brem. n. spec.
- : Spikes arranged in racemuli or small panicles . . . . . 3
3. Shoots and petioles hirsute; underside of the leaves grey-tomentose. Rhachis of the panicles glabrous. Spikes 8—10 mm  $\times$  11—13 mm; bracts apart from the stipitate glands glabrous. — East Java . . . . . 3. *P. Koordersii* (Clarke ex Kds) Brem. n. comb.
- : Shoots and petioles densely puberulo-pubescent; underside of the leaves apart from the nerves subglabrous. Rhachis of the panicles densely appressed pubescent. Spikes circa 4.5 mm  $\times$  3 mm; bracts softly pubescent. — Java . . . . . 4. *P. Backeri* Brem. n. spec.

1. *Parastrobilanthes parabolica* (Nees) Brem. n. comb.; *Strobilanthes parabolica* Nees in DC., Prodr. XI, p. 180, 1847; Miq., Fl. Ind. Bat. II, p. 797, 1858; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; non v. Hasselt et Boerl. in Veth, Midden Sumatra Expeditie 1877—1878 IV (2), p. 25, 1884, quae est *Psacadopaepale* spec., nec Ridl. in Journ. Fed. Mal. States Mus. VIII, p. 72, 1917; — *Str. hirta* (Vahl) Bl. in errore apud Koorders, Exkursionsfl. v. Java III, p. 218, 1912, quoad specimen a Junghuhn lectum.

Caulis ramique primum griseo-hirsuti, postea plus minusve glabrescentes, primum obtuse quadrangulares et quadrisulcati, postea subteretes. Folia petiolo griseo-hirsuto, usque ad 4 cm longo munita; lamina ovato-elliptica, circ. 12 cm longa et 6 cm lata, apice acuminata, basi contracta, margine crenato-dentata, herbacea, sicc. supra saturate brunnea, subtus griseo-brunnea, supra costa basin versus densius, ceterum sparse hirsuta, subtus sparse et molliter pubescens, nervis utroque latere costae 5—13. Spicae terminales et axillares, plerumque solitariae. Pedunculus plerumque brevis, hirsutissimus. Spica 12—16 mm longa et 14—17 mm diam., bractearum paribus 5 instructa. Bracteae infimae foliaceae, ovatae, acutae, margine crenatae, costa subtus ut margine longe ciliatae, eglandulosae; bracteae aliae rhomboideae, 12 mm longae et 7 mm latae, apice in caudam brevem et obtusam contractae et fortiter recurvatae, costa subtus et margine longe ciliatae, apicem versus glandulis longe stipitatis sparsae,

3-nerviae. Bracteolae ad calycem adnatae, lanceolatae, 7 mm longae et 1.7 mm latae, totae albae, acutae, dimidio superiore margine et facie inferiore costae longe ciliatae, eglandulosae. Calyx 9 mm longus, albus, lobis linearibus, 7.5 mm longis et 0.9 mm latis, acutis, margine dimidio superiore ciliatis. Corolla 16.5 mm longa, extus glabra, tubo 7 mm, faucibus 4.5 mm, lobis orbicularibus 5 mm longis. Filamenta staminum exteriorum 5 mm, interiorum 2.5 mm longa. Granula pollinis 50  $\mu$  diam. Ovarium utroque loculo ovulis 2 subaequalibus. Capsula fusiformis, 8 mm longa et 4 mm lata, obtusiuscula, comosa, plerumque 3-, rarius 4-seminalis.

Habitat regionem Javae Occidentalis montanam.

West Java. Buitenzorg Res.: G. Gedeh, v. HASSELT s.n. L, WISSE s.n. PAS, alt. 1800—2100 m, JUNGHUHN s.n. L, exemplum typi; Priangan Res.: G. Tjikuraj, alt. 2700 m, DOCTERS v. LEEUWEN 8328 herb. priv. D. v. L.

Another specimen in the Leiden herbarium was collected by REINWARDT at "Pondok Tengah", but as there are several localities bearing this name, which means "half-way house", it is impossible to say where it was found.

*P. parabolica* differs from the other species of this genus <sup>1</sup>° in the larger size of the spikes, which are found moreover for the greater part solitary at the end of the branches and in the axils of the upper leaves, and <sup>2</sup>° in the leaf-like lower bracts with their crenate margin. In the general aspect of the spikes it resembles the *Strobilanthes* species, from which it differs however, apart from the pollen and testa characters, in the entirely white bracteoles and calyx lobes and in the ovate-elliptic leaves.

2. *Parastrobilanthes pycnocephala* Brem. n. spec.; typus: BÜNNEMEYER 9103 U.

Caulis ramique primum pilis aureo-brunneis hirsuti, mox glabrescentes, primum obtuse quadrangulares et quadrisulcati, deinde subteretes. Folia petiolo pilis aureo-brunneis primum dense, deinde sparsius hirsuto, usque ad 6 cm longo munita; lamina elliptica, usque ad 18 cm longa et 8.5 cm lata, apice acuminata, basi contracta, margine crenato-dentata, herbacea, sicc. supra saturate, subtus dilute brunnea, utrimque sparse hirsuta, nervis utroque latere costae 6—12. Spicae in capitula congestae; capitula pedunculo 1—2 cm longo, subglabro munita et in triades vel pemptades terminales et axillares disposita, interdum aliqua solitaria. Bractee capitulorum ellipticae, 10 mm longae et 5.5 mm latae, apice acuminatae et recurvatae, basi acutae, 3-nerviae, subtus et apice utrimque hirsutae, margine integro longe ciliatae. Capituli spica centralis bractearum paribus 3—5, spicae laterales bractearum paribus 2—3 instructae. Bractee florales ellipticae vel obovatae, 7 mm longae et 3.5 mm latae, apice acuminatae et plerumque paulum recurvatae, 3- vel indistincte 5-nerviae, utrimque glabrae vel dorso parce hirsutae, margine longe ciliatae et a basibus pilorum incrassatis subdenticulatae, dorso glandulis stipitatis sparsae. Bracteolae ad calycem adnatae, lineares, 5 mm longae et 0.4 mm latae, obtusiusculae, margine dimidio superiore longe ciliatae et ut bractee a basis pilorum incrassatis subdenticulatae, eglandulosae. Calyx 5 mm longus, fere usque ad basin partitus, lobis bracteolis similioribus sed paulo angustioribus et quarta parte solum ciliatis. Corolla 13 mm longa, extus tubo excepto hirtella, tubo 5 mm, faucibus 5 mm, lobis reflexis 3 mm longis. Filamenta staminum exteriorum 5 mm, interiorum 4 mm longa; antherae 2 mm longae, connectivo in apiculam producto. Granula pollinis 52  $\mu$  diam. Ovarium utroque loculo ovulis 2 instructum quorum inferius paulo minus. Capsula nondum visa.

Habitat Sumatram Occidentalem.

Sumatra. West Coast Res.: G. Korinchi, alt. 1900 m, BÜNNEMEYER 9103 U, typus; L, dupl. typi; ibidem, alt. 2000 m, id. 9159 L.

*P. pycnocephala* is easily distinguishable from the other species by its capitate spikes. It resembles *P. parabolica* in the size of the pollen grains, which are larger than those of the two other species, and in the nature of the bracts with their recurved tips and long cilia.

3. *Parastrobilanthes Koordersii* (Clarke ex Kds) Brem. n. comb.; *Strobilanthes Koordersii* Clarke ex Kds, Exkursionsfl. v. Java III, p. 218, 1912; — *Str. hirta* (Vahl) Bl.? in errore apud Koorders-Schumacher, Syst. Verz. I § 1, p. 44, 1912.

Planta 1.5—3 m alta. Caulis ramique quadrangulares, primum praesertim ad angulos densius hirsuti, postea glabrescentes. Folia petiolo dense hirsuto, usque ad 5 cm longo munita; lamina ovato-elliptica, usque ad 20 cm longa et 9 cm lata, apice acuminata, basi valde contracta, margine sinuoso-crenata, vivo subtus rubro-violacea, supra primum densius, postea sparse hirsuta, costa basin versus tamen persistenter densissime hirsuta, subtus densius griseo-tomentosa, nervis utroque latere costae in foliis majoribus 10—12, in foliis minoribus interdum usque ad 4 redactis. Spicae in paniculas vel racemulos terminales et axillares dispositae; paniculae et racemuli rhachide glabra et bracteis mox deciduis instructi. Spicae 8—10 mm longae et 11—13 mm diam.; pedunculus 2—12 mm longus; bractearum pares 3, omnes fertiles. Bractee obovatae vel late obcuneatae, 9—11 mm longae et 5 mm latae, obtusissimae sed margine utroque latere apicis reflexo fecte subacutae, 3-nerviae, ad apicem glandulis breviter stipitatis dense vestitae, ceterum glabrae. Bracteolae anguste lanceolatae, 9.2 mm longae et 3 mm latae, apice obtusiusculae et hic glandulis stipitatis paucis instructae. Calyx 9.5 mm longus, glaber, fere usque ad basin partitus, lobis anguste lanceolatis, imbricatis. Corolla 15 mm longa, extus parce pubescens, tubo 6 mm, faucibus 6 mm, lobis 3 mm longis. Filamenta staminum exteriorum 5 mm, interiorum 4 mm longa; antherae apice obtusae. Granula pollinis (Tab. II G) 43  $\mu$  diam. Ovarium utroque loculo ovulis 2, quorum inferius minus. Capsula elliptico-lanceolata, 8 mm longa et 4 mm lata, acuta, comosa, 2-seminalis.

Habitat Javam Orientalem.

East Java. Malang Res.: G. Ardjuno, G. Kembar, alt. 2500 m, BACKER 36383 PAS; G. Tenger, Ngadiwono, alt. 2000 m, MOUSSET 369 BD; Ngadisari, alt. 2000 m, KOORDERS 37310 L, exemplum typi?; southern rim of the Sandsea, alt. 2200 m, KOBUS s.n. PAS; G. Semeru, at the base of the Adjakadjak, alt. 2400 m, JESWIET 108, 1274 et 1277 Vad.

This species and the next differ rather conspicuously from the two preceding ones by the smaller pollen grains and by the obtuse bracts and glandular bracteoles. *P. Koordersii* differs from *P. Backeri* in the larger size of the spikes, the absence of a green patch at the end of the bracteoles and calyx lobes and by the nature of the indumentum.

4. *Parastrobilanthes Backeri* Brem. n. spec.; typus: BACKER 37473 L.

Caulis ramique obtuse vel interdum acutius quadrangulares, primum breviter sed densissime pubescentes, haud profunde sulcati. Folia petiolo breviter sed dense pubescente, usque ad 4.5 cm longo munita; lamina elliptico-lanceolata, usque ad 15 cm longa et 8 cm lata, utroque extremo contracta, margine leviter crenato-dentata et apice basique integra, primum utrimque densissime sed breviter pubescens, deinde facie superiore costa nervisque strigosis exceptis glabrescens, subtus costa nervis venulis strigosa et inter nervos sparse pubescens, nervis utroque latere costae in foliis majoribus 7—9, in foliis minoribus interdum usque ad 5 redactis. Spicae in paniculas vel racemulos terminales

et axillares dispositae; paniculae et racemuli rhachide densius sed breviter appresse pubescentes et bracteis mox deciduis instructi. Spicae circ. 4.5 mm longae et 3 mm diam.; pedunculus 1—2 mm longus; bractearum pares 3, omnes fertiles. Bractee oblongo-ellipticae, 3.5 mm longae et 2.2 mm latae, obtusissimae, ad apicem glandulis stipitatis vel subsessilibus densissime vestitae, ceterum extus molliter pubescentes, margine interdum ciliatae, 3-nerviae; nervis carinatis. Bracteolae lineares, 3.5 mm longae et 1.2 mm latae, obtusiusculae, apice viridi excepto albae, extus parce pubescentes et ad apicem glandulis stipitatis vel subsessilibus vestitae, apicem versus ciliatae. Calyx 3.7 mm longus, fere usque ad basin partitus, extus molliter pubescens, lobis anguste lanceolatis 0.7 mm latis, apice viridi excepto albis, acutioribus, apicem versus ciliatis et glandulis paucis stipitatis vel subsessilibus instructis. Corolla 8 mm longa, extus parce pubescens, tubo 2 mm, faucibus 4 mm, lobis 2 mm longis. Filamenta staminum exteriorum 2.5 mm, interiorum 2 mm longa; antherae apice obtusae, 1.7 mm longae. Granula pollinis 45  $\mu$  diam. Ovarium utroque loculo ovulis 2 instructum quorum inferius minus. Capsula ambitu elliptico-lanceolata, 3.5 mm longa et 2.5 mm lata, comosa, 2-seminalis.

Habitat Javam.

West Java. Priangan Res.: Tjidadap near Tjibeber, alt. 750 m, BAKHUIZEN v. D. BRINK 2178 L (determinatio incerta, v. infra).

East Java. Malang Res.: G. Ardjuno, alt. 2000 m, BACKER 37473 L, typus; Besuki Res.: G. Hiang, alt. 1500 m, KOORDERS 43555 L.

In the type specimen the glands on the bracts, bracteoles and calyx lobes are subsessile; in the two other specimens they are stipitate. The plant collected in West Java is a rather poor specimen in the fruiting stage: it is not impossible that it represents another new species.

#### Index Specierum.

4. **Backeri** Brem. n. spec. — Java —
3. **Koordersii** (Clarke ex Kds) Brem. n. comb. (*Strobilanthes* Clarke ex Kds) — Java —
1. \* **parabolica** (Nees) Brem. n. comb. (*Strobilanthes* Nees) — Java —
2. **pycnocephala** Brem. n. spec. — Sumatra —

*Parastrobilanthes* species sub nomine generico *Strobilanthe* nuncupatae.

*Koordersii* Clarke ex Kds in Exkursionsfl. v. Java III, p. 218, 1912 = *Parastrobilanthes Koordersii* (Clarke ex Kds) Brem. n. comb.

*parabolica* Nees in DC., Prodr. XI, p. 180, 1847 = *Parastrobilanthes parabolica* (Nees) Brem. n. comb.

49. **Lamiacanthus** O. Ktze, Rev. Gen. Pl. II, p. 492, 1892; Lindau in Engl. u. Prantl, Nat. Pflanzenfam. IV 3 b, p. 302, 1895; Boerl., Handl. Fl. Ned. Ind. II, p. 633 et 659, 1899; Lemée, Dict. Pl. Phan. III, p. 932, 1931.

Plantae plietesiae, valde ramosae, anisophyllae. Folia in petiolum longum contracta, supra cystolithis parvis lineolata. Inflorescentiae spiciformes, abbreviatae, terminales et axillares, erectae. Bractee e basi 3- vel 5-nerviae, parte basali erecta florem amplectente, parte apicali patente, dorso apicem versus pilis capitatis vel glandulis subsessilibus instructae, persistentes. Flores in axillis bractearum solitarii, bracteolati. Bracteolae calyci subaequilongae, persistentes. Calyx subaequaliter 5-partitus vel bilabiatus, lobis linearibus obtusis. Corolla alba, non resupinata, tubo tereti in fauce infundibuliformes ei subaequilongas vel eo breviores ampliato, pilis stylum retinentibus in fasciculos binos aggregatis, lobis subaequalibus. Stamina 4, leviter didynamia,

exserta; filamenta basi hirtella vel subglabra; antherae versatiles, apice muticae, thecis subpatentibus. Staminodium parvum. Granula pollinis (Tab. III C) globosa et echinulata. Ovarium comosum, utroque loculo ovulis 1 vel 2, casu quo inferius semper rudimentarium. Stylus glaber vel parce hirtellus. Capsula obovoidea vel ambitu elliptico-lanceolata, acuta, comosa, 2-seminalis. Semina (Tab. VI F) luteo-brunnea, areolata, cellulis extra-areolaribus annulatis sed exappendiculatis.

Distributum in Java et in Insula Lombok. Species adhuc notae 2.

Species typica: *L. viscosus* O. Ktze.

The genus *Lamiacanthus* is doubtless nearly related to the two preceding ones, from which it differs in the echinulate pollen and in the shape of the bracts, which consist of an erect basal part and a spreading top. The structure of the testa is the same as in *Parastrobilanthes*. The seed figured by VALETON in Ic. Bogor. IV, Tab. 326, 1912, does not belong to *Lamiacanthus viscosus* but to an entirely different plant collected by TEYSMANN at Pangkadene in Southern Celebes nearly at sea level. VALETON l.c. called it "*Lamiacanthus celebicus*", but did not stop to describe it. A duplicate of the type in the Leiden herbarium had no flowers, so that I have not been able to study the pollen, which according to VALETON is echinulate, but the structure of the testa with its long hygrometric hairs proves that the plant is no near ally of *Lamiacanthus*; its occurrence in a place nearly at sea level points in the same direction, for the species of *Lamiacanthus* and of the nearly related genera *Parastrobilanthes* and *Strobilanthes* are all mountain plants. A plant collected by BÜNNEMEYER on the G. Bonthain at an altitude of 2200 m, on the other hand, may prove to belong to this genus; its fruits are unfortunately unknown, but its pollen is echinulate. On the whole, the material is poor, and better specimens will have to be awaited before it can be described.

#### Key to the Species.

1. Leaves ovate. Bracts and bracteoles on the back with long and soft, partly capitate hairs. Calyx subequally 5-partite. — Java . . . . . 1. *L. viscosus* O. Ktze.
- : Leaves elliptic. Bracts and bracteoles on the back with long and soft hairs and sessile glands. The three posticous calyx segments united up to the middle. — Lombok . . . . . 2. *L. Renschiae* Brem. n. spec.

1. *Lamiacanthus viscosus* O. Ktze, Rev. Gen. Pl. II, p. 492, 1892; Lindau in Engl. u. Prantl, Nat. Pflanzenfam. IV 3 b, p. 302, 1895; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Val. in Ic. Bogor. IV, p. 83, Tab. 326, 1912, figura seminis excl.; Koorders, Exkursionsfl. v. Java III, p. 216, 1912; Koorders-Schuhmacher, Syst. Verz. I § 1, p. 43, 1912; Hochreutiner in Candollea V, p. 226, 1934; Backer in Brittonia III, p. 83, 1938; — *Strobilanthes Schuhmacheræ* Kds in sched.

Planta 2—3 m alta. Caulis ramique primum acute quadrangulares, haud sulcati, pilis longis partim capitatis dense hirsuti, postea obtuse quadrangulares vel subteretes, parce et brevius pilosi. Folia petiolo pilis longis partim capitatis dense hirsuto, usque ad 3 cm longo munita; lamina ovata, usque ad 6 cm longa et 5 cm lata, apice contracta sed obtuse exeuns, basi rotundata sed prope petiolum subito contracta vel in foliis minoribus minus subito contracta, margine crenata, utrimque pilis crassiusculis densius vestita, nervis utroque latere costae 3—5. Spicae plerumque solitariae, terminales et axillares, 10 mm longae et

17 mm diam.; pedunculus pilis capitatis dense hirsutus, plerumque 1—1.5 cm longus; bractearum pares plerumque 5. Bractearum pars basalis erecta alba, intus glabra; pars apicalis patens viridis, margine crenata vel integra, supra pilis longis ecapitatis hirsuta, dorso pilis capitatis vestita, 5-nervia, nervis exterioribus tamen aliis multo tenuioribus; bractee infimae 10 mm longae et 6 mm latae, parte patente crenata et parti basali subaequilonga; pars basalis aliarum gradatim latitudine usque ad 4 mm decrescens, longitudine vix mutans, pars apicalis magnitudine gradatim decrescens, margine subintegra vel integra, in bracteis supremis ad marginem circ. 1.5 mm latam redacta. Bracteolae ad calycem adnatae et calycis lobis similiores, anguste lanceolatae, 5.5 mm longae et 1.6 mm latae, obtusae, 1-nerviae, dorso apicem versus pilis partim capitatis vestitae, intus glabrae. Calyx 8 mm longus, lobis subaequalibus linearibus, 6 mm longis et 1.3 mm latis, obtusis, extus ad apicem pilis partim capitatis vestitis, ceterum glabris. Corolla 11.5 mm longa, extus glabra, tubo 4.5 mm, faucibus 4.5 mm, lobis obreniformibus 2.5 mm longis. Stamina filamentis basi hirtellis, longioribus 3.2 mm, brevioribus 2 mm longis; antherae 1.5—1.7 mm longae. Granula pollinis (Tab. III C) 56  $\mu$  diam. Ovarium plerumque utroque loculo ovulo singulo, raro ovulis binis, casu quo inferius semper rudimentarium. Stylus parce hirtellus. Capsula obovata, 5.5 mm longa et 3.5 mm lata, acuta, comosa, 2-seminalis.

Habitat regiones Javae montanas.

Central Java. Pekalongan Res.: G. Slamet, DE MONCHY 26 BZ (fide VAL. l.c.), alt. 2500 m, DOCTERS v. LEEUWEN 2793 L, alt. 2400—2450 m, BACKER 434 L; Dieng, alt. 2300 m, KUNTZE, typus, n.v.; G. Prahū, alt. 2550 m, HOCHREUTNER 2421 G, n.v.; Kedu Res.: G. Telemojo, G. Andong, alt. 1600 m, KOORDERS 28058 L.

East Java. Madioon Res.: G. Lawu, alt. 1400 m, RANT s.n. L; Malang Res.: G. Andjasmoro, alt. 1800 m, WINCKEL 383 L; G. Ardjuno, above Tretes, alt. 1600 m, BACKER 36447 PAS.

As stated above, the seed figured and described by VALETON l.c. does not belong to this species but to a plant collected by TEYSMANN in South Celebes; the latter belongs doubtless to a totally different, as yet undescribed genus. KUNTZE's description of the seed is correct.

According to VALETON this species should occur also in West Java, but as he quotes no specimen and as I have seen no specimens collected in that part of Java myself, I regard this as insufficiently established.

## 2. *Lamiacanthus Renschiae* Brem. n. spec.; typus: Mrs I. Rensch 368 BD.

Caulis ramique obtuse quadrangulares et quadrisulcati, puberuli et primum pilis ferrugineis sparse hirsuti. Folia petiolo pilis ferrugineis, haud capitatis hirsuto, usque ad 4 cm longo munita; lamina elliptica, usque ad 18 cm longa et 8 cm lata, apice in caudam longam et angustam contracta, basin versus similiter contracta, margine prolixo serrato-dentata, supra parce hirsuta, subtus costa nervisque densius, ceterum sparse pubescens, nervis utroque latere costae 7—11. Spicae plerumque solitariae, terminales et axillares, foliis spicas laterales subtendentibus tamen magnitudine redactis et haud raro deciduis, casu quo spicae fecte subspicatae vel subpaniculatae; spicae ipsae sessiles, bractearum paribus 3—7 instructae. Bractee infimae saepe steriles, ut bractee aliae a foliis spicas subtendentibus praesentia glandulorum sessilium diversae, ad apicem tamen foliaceae, i.e. attenuatae et eglandulosae; omnes lanceolatae, 8—9 mm longae et 3 mm latae, dorso glanduliferae et praesertim basin versus dense villosae, margine longe ciliatae, 3-nerviae. Bracteolae lineares, 6.5 mm longae et 1.5 mm latae, dorso densius pilosae et ad apicem glandulis sessilibus sparsae, vix distincte 3-nerviae, costa et margine longe ciliatae. Calyx 6.5 mm



longus, post anthesin usque ad 8 mm accrescens, segmentis posticis usque ad medium connatis, anticis subliberis, lobis margine et costa longe ciliatis. Corolla 11 mm longa, tubo 5.5 mm, faucibus 3 mm, lobis ovato-oblongis 2 mm longis. Stamina filamentis subglabris, 4.5 et 3.5 mm longis; antherae 1.5 mm longae. Granula pollinis 48  $\mu$  diam. Ovarium utroque loculo ovulis 2 instructum quorum inferius rudimentarium. Stylus glaber. Capsula elliptico-lanceolata, parce comosa, 2-seminalis.

Habitat insulam Lombok dictam.

L o m b o k. s.l., Mrs I. Rensch 368 BD, typus.

The union of the three posticous calyx lobes into a 3-fid upper lip is uncommon in group V. It recurs however in a plant collected on the G. Bonthain in South Celebes (BÜNNEMEYER n. 11852 L), which in other respects too comes very near to the Lombok species. As its fruits however are unknown, I prefer to leave it undescribed.

*L. Renschiae* differs from *L. viscosus* in the form of the leaves, the presence of subsessile glands on the bracts and bracteoles and in the structure of the calyx. In the shape of the leaves and in the presence of the subsessile glands on the bracts and bracteoles it looks more like some of the *Strobilanthes* and *Parastrobilanthes* species than like an ally of *L. viscosus*. For this reason it might perhaps have been better to refer it to a genus of its own. However, before taking a decision, I should like to wait until more material of the G. Bonthain plant is available.

#### Index Specierum.

*celebicus* Val. in Ic. Bogor. IV, p. 85, 1912 in adnot. ad *L. viscosum* O. Ktze, nomen tantum, non huius generis

2. *Renschiae* Brem. n. spec. — Lombok —

1. \* *viscosus* O. Ktze, Rev. Gen. Pl. II, p. 492, 1892 — Java —

#### Icon.

*viscosus* O. Ktze in Ic. Bog. IV, Tab. 326, 1912, figura seminis excl.

#### GROUP W.

The position of the only genus belonging to this group is difficult to determine. Its most characteristic features are the strongly pronounced anisophylly, the presence of capitate hairs on the testa (Tab. V G), and the echinulate pollen grains. Echinulate pollen grains, however, occur in genera of very different affinities, and the presence of capitate hairs on the testa is of no avail, because they occur nowhere else in this subtribe. The strongly pronounced anisophylly points in the direction of the groups whose pollen grains are, as a rule, provided with septate bands, and the small size of the annular hairs found between the capitate ones on the extra-areolar part of the testa remind one of *Strobilanthes*, from which it differs however conspicuously in the strongly recurved and resupinate corolla. A noteworthy analogy with *Gutzlaffia* is found in the annular thickenings with which the areolar cells are provided.

50. *Echinopaepale* Brem. n. gen.; typus: *E. javanica* Brem. n. spec.

Planta plietesia, anisophylla. Folia minora fere ad nihilum redacta et mox decidua; majora sessilia vel brevissime petiolata, supra cystolithis longioribus dense lineolata. Inflorescentiae spiciformes, terminales et axillares, pauciflorae, apicis abortu plerumque in florem singulum exeuntes. Bractee bracteolaeque

parvae et mox deciduae, plerumque cicatricibus solum cognoscendae. Flores in axillis bractearum solitarii. Calyx 5-partitus, lobo mediano aliis paulo longiore. Corolla violacea vel alba, resupinata, tubo tereti torso apice recurvato in fauces campanulatas tubo longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia; longiora exserta, breviora inclusa; filamenta staminum longiorum basin versus parce hirtella, in plicas simplices dense ciliatas decurrentia, quam interiorum plus quam bis longiora; antherae erectae, apice obtusae. Staminodium late triangulare, apice ciliatum. Granula pollinis globosa echinulata. Ovarium glabrum, utroque loculo ovulis 2. Stylus glaber vel parce hirtellus. Capsula fusiformis, glabra vel pilis capitatis parce comosa, 4-seminalis; retinacula apice acuta. Semina (Tab. V G) luteo-brunnea, parvo-areolata, extra areolam pilis capitatis brevissimis cum pilis annulatis brevibus mixtis sparsa; cellulae areolares annulatae.

Distributum in Java Occidentali. Genus adhuc monotypicum.

Species unica: *E. javanica* Brem. n. spec.

1. *Echinopaepale javanica* Brem. n. spec.; typus: KÜHL et v. HASSELT H.L.B. 897.279.257.

Caulis ramique graciles, apicem versus obtuse quadrangulares, basin versus subteretes, glabri. Folia sessilia vel in petiolum glabrum usque ad 6 mm longum contracta; lamina lanceolata, foliorum majorum 8.5—11 cm longa et 3.2—4 cm lata, foliorum minorum 6—10 mm longa et 3—4 mm lata, omnium apice attenuata, basi cuneata, margine obscure repando-dentata vel subintegra, utrimque glabra, nervis in foliis majoribus utroque latere costae 5—6. Spicae breviter pedunculatae, vix 1 cm longae; rhachis glabra vel puberula, quadrangularis. Calyx glaber, tubo 2 mm longo, lobis linearibus 8—10 mm longis et 0.9—1.2 mm latis, post anthesin accrescentibus, obtusissimis. Corolla 21 mm longa, tubo 6 mm, faucibus 11 mm, lobis 4 mm longis. Stamina longiora filamentis 6 mm, breviora filamentis 2.5 mm longis; antherae 1.9 mm longae. Granula pollinis 47  $\mu$  diam. Capsula 18 mm longa et 4—4.5 mm lata. Semina 4 mm longa et 3 mm lata.

Habitat Javam Occidentalem.

West Java. s.l., KÜHL and v. HASSELT s.n. L, typus; coll. ign. s.n. L; Batavia Res.: Distr. Krawang, Wanajasa, G. Burangrang, alt. 800 m, BAKHUIZEN v. D. BRINK 4667 L; ibidem alt. 1000 m, id. 4774 L.

The rather unsatisfactory description of *Strobilanthes axilliflora* Clarke ex S. Moore (in Journ. of Bot. LXIII, p. 166, 1925) differs but in minor details (distinctly petiolate, serrate leaves; puberulous ovary) from that given above, but as no mention is made of the echinulate pollen, a character of whose importance both CLARKE and SPENCER LE M. MOORE were well aware, I do not think that it can be this species: if its pollen had been echinulate, CLARKE would have referred the plant to *Acanthopale*. For this reason I suppose that it is merely a synonym of the common but rather variable *Difflugossa filiformis* (Bl.) Brem., of which the leaves are serrate and, though not distinctly petiolate, at least contracted at the base, and in which the top of the ovary is covered with short capitate hairs. However, as the really important characters of the androecium and of the testa are not mentioned, no definite conclusion can be reached before the type material has been re-examined.

#### GROUP X.

This group too comprises but a single genus, for which I have coined the name *Tetragoga*, because the four bracts at the base of the spike point in

various directions. Its two species are in habit not unlike those belonging to the genera of group P, especially to the genus *Pyrrothrix*, and it is even possible that some of the species which have been referred to that genus, may prove to belong to this one. Of the *Pyrrothrix* species described by CLARKE the pollen grains were studied, and as CLARKE does not mention anything abnormal in them, they were apparently not of the type found in *Tetragoga*. Of two of the three species described by RIDLEY the pollen grains are still unknown, but in *Pyrrothrix vulpina* (Ridl.) Brem. I found them of the same kind as in the type species. If some of the species of the Malay Peninsula and Birma should prove to belong to *Tetragoga*, the gap between Assam and Sumatra, the areas in which the two species known at present, have been found, would be bridged. A similar discontinuity is shown by the areas occupied by the species of the genus *Hymenochlaena* (Group Y), but it is of course not impossible that in this case too further study will reveal the presence of other species in the intervening parts.

The outstanding features of the genus *Tetragoga* are the large, strongly costate pollen grains (Tab. I K) and the involucrate capituliform spikes. The seeds (Tab. VI G) are very large, but otherwise not unlike some of those found in the genera belonging to group P, e.g. in *Paragoldfussia*.

51. *Tetragoga* Brem. n. gen.; typus: *T. nagaënsis* Brem. n. spec.

Plantae plietesiae, anisophyllae, fusco- vel ferrugineo-hirsutae. Folia petiolata, supra cystolithis parvis vix conspicue lineolata. Inflorescentiae spiciformes abbreviatae, terminales et axillares, pedunculatae. Bracteae 4 inferiores e parte basali erecta et e parte apicali patente et foliacea compositae, cruciatae; ut aliae plurinerviae et persistentes. Flores in axillis bractearum solitarii. Bracteolae lineares, calyci subaequilongae vel eo longiores. Calyx aequaliter 5-partitus, lobis linearibus acutis. Corolla colore ignoto, resupinata, tubo tereti torso in fauces campanulatas eo bis longiores ampliato, pilis stylum retinentibus in series binas dispositis, lobis subaequalibus rotundatis. Stamina 4, didynamia, omnia erecta et inclusa; filamenta staminum longiorum unifariam hirtella, quam filamenta staminum breviorum fere bis longiora; filamenta breviora glabra; antherae erectae, apice obtusae, thecis a latere complanatis. Staminodium parvum. Granula pollinis (Tab. I K) ellipsoidea, 12-costata. Ovarium glabrum vel comosum, utroque loculo ovulis 2. Stylus pilis pro parte saltem capitatis hirtellus. Capsula fusiformis, glabra, 4-seminalis. Semina (Tab. VI G) brunnea, parvo-areolata, extra areolam pilis annulatis rigidulis curvis vestita.

Distributum speciebus duabus in Assamia et Sumatra.

Species typica: *Tetragoga nagaënsis* Brem. n. spec.

1. *Tetragoga nagaënsis* Brem. n. spec.; typus: MEEBOLD 4891 BD.

Planta 1—2 m alta, solitaria. Caulis ramique primum obtuse quadrangulares, profunde quadrisulcati, ferrugineo-hirsuti, postea subteretes et glabrescentes. Folia petiolo pilis partim capitatis dense hirsuto, 1—1.5 cm longo munita; lamina elliptico-lanceolata, foliorum superiorum interdum ovato-lanceolata, 5.5—10.5 cm longa et 2.5—4.5 cm lata, apice caudato-acuminata, basi acuta, margine irregulariter denticulata et sparse ciliata, sicc. supra dilute brunnea, subtus albida, tenuior, supra sparse hirsuta, costa tamen pilis partim capitatis densius hirsuta, subtus costa densius, ceterum sparse pubescens, nervis utroque latere costae 7—9. Spicae ferrugineo-hirsutae, bractearum paribus 4 instructae, paulum complanatae. Bracteae parum primi et secundi steriles; pars basalis bractearum infimarum subquadrata, 6 mm longa et 5 mm lata, 5-nervia, extus pilis capitatis dense vestita, intus glabra; pars foliacea ovata 1 cm longa et

8 mm lata, e basi 5-nervia, ceterum penninervia, utroque latere costae nervis 3 instructa, margine denticulata, utrimque pilis capitatis hirsuta; pars basalis bractearum paris secundi oblonga, 8 mm longa et 5 mm lata, valde concava, 5-nervia; pars foliacea ovato-triangularis, 4 mm longa et 5 mm lata, denticulata, e basi 5-nervia, utrimque pilis capitatis dense hirsuta; bracteae paris tertii lineares, 16 mm longae et 3 mm latae, acutae, margine integrae, extus pubescentes et apicem versus pilis capitatis hirsutae, intus glabrae, plurinerviae, nervis costa excepta tamen tenuibus; bracteae paris quarti eis paris tertii similiores, minores tamen. Bracteolae anguste lineares, usque ad 11 mm longae et vix 1 mm latae, extus pubescentes et apicem versus pilis capitatis hirsutae, intus glabrae. Calyx 11 mm longus, extus ad basin glabrescens, ceterum pubescens, lobis apicem versus pilis longioribus ciliatis et intus ad apicem sericeo-strigosis. Corolla 2.5 cm longa, extus glabra, in specimine investigato male conservata. Granula pollinis (Tab. I K) 97  $\mu$  longa et 45  $\mu$  diam. Ovarium comosum. Stylus pilis capitatis hirtellus, Capsula glabra, Semina (Tab. VI G) 4 mm longa et 3 mm lata.

Habitat Assamiam.

A s s a m. Narum Naga Hills, alt. 1500 m, MEEBOLD 4891 BD, typus.

2. *Tetragoga cruciata* Brem. n. spec.; typus: LOERZING 5668 L.

Caulis ramique primum obtuse quadrangulares, profunde quadrisulcati, fusco-hirsuti, postea subteretes et glabrescentes. Folia superiora (alia nondum nota) petiolo pilis partim capitatis dense hirsuto, 1—2 cm longo munita; lamina ovata, circ. 7 cm longa et 4 cm lata, apice acuminata, basi rotundata, margine remote denticulata et ciliata, sicc. supra saturate brunnea, subtus dilute olivacea, subcoriacea, supra costa pilis capitatis densius, ceterum sparse hirsuta, subtus ubique molliter pubescens in costa nervisque tamen densius quam inter nervos, nervis utroque latere costae 7—9. Spicae fusco-hirsutae, bractearum paribus 4 instructae, haud complanatae. Bracteae paris primi steriles; aliae fertiles; pars basalis bractearum infimarum oblonga, 12 mm longa et 6.5 mm lata, 5-nervia, extus dense pubescens, intus glabra; pars foliacea ovata, usque ad 5 cm longa et 3 cm lata, e basi 5-nervia, ceterum penninervia, utroque latere costae nervis 2—6 instructa, margine denticulata, utrimque fusco-hirsuta. Bracteae paris secundi infimis similiores, parte foliacea multo minore tamen, 12—15 mm longa et 5—9 mm lata, remote denticulata. Bracteae paris tertii lanceolatae, 20 mm longae et 5 mm latae, extus sparse pubescentes, intus glabrae, parte foliacea vix 0.5 mm longa, intus appresse pubescente et margine denticulata. Bracteae paris quarti lineares, 18 mm longae et 3 mm latae, extus ad costam praesertim apicem versus pubescentes, intus ad apicem strigosae. Bracteolae lineares, 17 mm longae et 3 mm latae, acutae, ad apicem utrimque strigosae, ceterum glabrae. Calyx 12.5 mm longus, lobis extus intusque breviter strigosis. Corolla 3.6 cm longa, extus glabra, tubo 10 mm, faucibus 22 mm, lobis 4 mm longis, faucibus sub incisuras inter lobos intrusionibus conicis munitis. Stamina longiora filamentis 4.5 mm, breviora filamentis 2 mm longis. Granula pollinis 84  $\mu$  longa et 48  $\mu$  diam. Ovarium glabrum. Stylus pilis capitatis et apicem versus pilis ecapitatis hirtellus. Capsula nondum nota.

Habitat Sumatram Orientalem.

S u m a t r a. East Coast Govt: between Bandar Baru and Dolok Baru, alt. 900 m LOERZING 5668 L, typus.

*T. cruciata* differs from *T. nagaënsis* in the colour of the indumentum, the ovate shape of the leaves, the neither complanate nor glandular spikes and the much larger size of the bracts and bracteoles. The pollen grains are somewhat shorter and thicker.

## GROUP Y.

The seeds (Tab. VI B) of *Hymenochlaena*, the only genus belonging to this group, are not unlike those (Tab. IV F) of *Nilgirianthus*, i.e. here too the extra-areolar zone is suppressed and the areola extends unto the margin, but the structure of the pollen grains proves that these plants are no near allies, for the bands with which they are decorated, are not smooth or finely punctate but septate. The androecium is very peculiar: the longer stamens are, like those of *Goldfussia* and its nearest allies, slightly unequal and provided with horizontal subglobose anthers, but the inner ones are reduced to clavate staminodia (in *Diflugossa glandulosa* Brem., where the number of fertile stamens is also reduced to two, the inner stamens are completely suppressed). Other noteworthy features of *Hymenochlaena* are the at first green, afterwards scarious oblong bracts with their decurrent base, to which the genus owes its name, and the sessile golden glands with which the leaves are dotted; the latter are of the same kind as those found in the genus *Adenacanthus*. Pollen grains decorated with septate bands, and glabrous seeds with an areola extending to the margin, are found also in *Lissospermum*, but in that genus there are four stamens provided with erect, laterally compressed anthers, the small, early deciduous bracts are not decurrent, and the leaves are not gland-dotted.

52. *Hymenochlaena* Brem. n. gen.; *Endopogon* species Nees et Clarke; *Strobilanthes* species Anderson, Clarke et Imlay; typus: *H. decurrens* (Nees) Brem. n. comb. (*Endopogon* Nees).

Plantae plietesiaie, paulum anisophyllae. Folia in petiolum longum contracta, utrimque glandulis aureis punctata. Inflorescentiae spiciformes, longe pedunculatae, terminales et axillares. Bracteae oblongae, usque ad nodum praecedentem et interdum ultra decurrentes, penninerviae, calyce multo longiores, persistentes et post anthesin scariosae. Flores in axillis bractearum solitarii. Bracteolae minutae. Calyx subaequaliter 5-fissus, lobis acutis. Corolla alba, probabiliter non resupinata, tubo perbrevis in fauces campanulatas ampliata, pilis stylum retinentibus in series binas dispositis, lobis subaequalibus ovatis acutis. Stamina exteriora subinclusa; interiora ad staminodia clavata redacta; filamenta staminum exteriorum paulum inaequalia; antherae subgloboosae, utroque extremo emarginatae, horizontales. Staminodium impar vix conspicuum. Granula pollinis ellipsoidea, virgis septatis ornata. Ovarium pilis capitatis breviter comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula fusiformis, pilis capitatis sparsa, 4-seminalis, retinaculis apice 3-denticulatis. Semina (Tab. VI B) albida, glabra et nitentia, areola usque ad marginem expansa.

Distributum in montibus Assamiae et in Peninsula Malayana. Species adhuc notae 2.

Species typica *H. decurrens* (Nees) Brem. n. comb. (*Endopogon* Nees).

1. *Hymenochlaena decurrens* (Nees) Brem. n. comb.; *Endopogon decurrens* Nees in DC., Prodr. XI, p. 104, 1847; *Strobilanthes decurrens* (Nees) T. And. in Journ. Linn. Soc. IX, p. 470, 1867, comb. illeg. (non *Str. decurrens* Nees in DC., Prodr. XI, p. 189, 1847); *Str. adnata* Clarke in Hook. f., Fl. Brit. Ind. IV, p. 136, 1884, n. nom.

Habitat Assamiae montes.

2. *Hymenochlaena Ridleyi* (Clarke) Brem. n. comb.; *Endopogon Ridleyi* Clarke in Journ. As. Soc. Beng. LXXIV, p. 654, 1908; Ridl., Fl. Mal. Pen. II, p. 324, 1925; *Strobilanthes strobilata* Imlay in Kew Bull. 1939, p. 116, n. nom.

Habitat Peninsulam Malayanam.

## GROUP Z.

The pollen grains of *Lissospermum*, the only genus belonging to this group, show a peculiarity that I have not found anywhere else in the *Strobilanthinæ*: they are provided with two instead of the ordinary three germ pores. The seeds (Tab. VI A) resemble those of *Hymenochlaena*, but they are larger, and the epidermis of the testa consists of much larger, curiously pitted cells. Other noteworthy features are the small and early deciduous bracts and bracteoles, the valvate calyx lobes and the resupinate corolla.

53. *Lissospermum* Brem. n. gen.; *Strobilanthes* species Miquel et auctorum aliorum; typus: *L. pedunculatum* (Miq.) Brem. n. comb. (*Strobilanthes* Miq.).

Planta plietesia, valde anisophylla. Folia inferiora in petiolum contracta, superiora sessilia et basi rotundata vel cordata. Inflorescentiae spiciformes, elongatae, longe pedunculatae, terminales et axillares. Bracteae bracteolaeque similiores, apice recurvatae, calyce multo breviores, mox deciduae. Flores in axillis bractearum solitarii. Calyx aequaliter 5-partitus, lobis linearibus acutis, alabastro valvatis. Corolla albida vel viridula, resupinata, tubo tereti torso in fauces campanulatas tubo fere bis longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus obcordatis. Stamina 4, didynamia, omnia erecta et inclusa; filamenta staminum exteriorum unifariam hirtella et quam interiorum fere bis longiora; antherae erectae, apice obtusae, thecis a latere complanatis. Staminodium inconspicuum. Granula pollinis ellipsoidea, poris 2 instructa et virgis septatis ornata. Ovarium glabrum, utroque loculo ovulis 2. Stylus ad basin hirtellus. Capsula fusiformis, glabra, 4-seminalis, retinaculis in aciculam patentem satis longam exeuntibus. Semina (Tab. VI A) albida, glabra et nitentia; areola usque ad marginem expansa, e cellulis magnis, 10—18  $\mu$  diam. composita.

Distributum in regionibus montanis Sumatrae et Javae. Genus adhuc monotypicum.

Species unica: *L. pedunculatum* (Miq.) Brem. n. comb. (*Strobilanthes* Miq.).

1. *Lissospermum pedunculatum* (Miq.) Brem. n. comb.; *Strobilanthes pedunculata* Miq., Fl. Ind. Bat. II, p. 803, 1858; Kuntze, Rev. Gen. Pl. II, p. 499, 1892; Boerl., Handl. Fl. Ned. Ind. II, p. 659, 1899; Koorders, Exkursionsfl. v. Java III, p. 219, 1912; Hall. f. in Meded. Rijksherb. n. 26, p. 5, 1915; S. Moore in Journ. of Bot. LXIII, Suppl., p. 79, 1925.

Planta robustior. Caulis ramique primum quadrangulares et parce pubescentes, deinde subteretes et glabri, profundius sulcati tamen. Folia inferiora in petiolum usque ad 2 cm longum contracta; superiora sessilia vel subsessilia; lamina foliorum inferiorum ovato-elliptica, usque ad 17 cm longa et 8.5 cm lata, foliorum superiorum ovata vel cordata, usque ad 8 cm longa et 5 cm lata, sed plerumque multo minor, foliorum omnium apicem versus contracta, margine acute dentata, costa et facie inferiore nervorum sparse pilosa, ceterum glabra, utrimque sed praesertim supra cystolithis lineolata, nervis utroque latere costae in foliis majoribus 7—9, in foliis minoribus plerumque 5. Bracteae 2.5 mm longae, acutae. Bracteolae calyci adnatae, 2 mm longae, obtusae. Calyx 15 mm longus, extus glandulis sessilibus minute punctatus, lobis 11.5 mm longis et 2 mm latis, carinatis et ad carinam sicc. nigrescentibus, intus ad apicem tomentellis. Corolla 3.5 cm longa, extus lobis exceptis pubescens, tubo 10 mm, faucibus 19 mm, lobis 6 mm longis. Filamenta staminum exteriorum 4.5 mm, interiorum 2 mm longa. Granula pollinis 72—75  $\mu$  longa et 46—48  $\mu$  diam., virgis 14 ornata. Capsula 2 cm longa et 5 mm lata. Semina (Tab. VI A) 6 mm longa et 4.5 mm lata.

Habitat regiones montanas Sumatrae et Javae Occidentalis.

S u m a t r a. Tapanuli Res.: Batang Baroos, TEYSMANN H. B. 1186 U; West Coast Res.: G. Singalang, KORTHALS 625 b L.

W e s t J a v a. Batavia Res.: Distr. Krawang, G. Burangrang, above Wanajasa, Falls of Tji Sasarap, BAKHUIZEN v. D. BRINK 4725 L; Buitenzorg Res.: G. Gedeh, s.l., WENT s.n. L; ibidem, near Tjibunus, alt. 600—900 m, JUNGHUHN s.n. L, typus; Pondok Tengah Gedeh, REINWARDT s.n. L; Tjidadap near Tjibeber, alt. 1000 m, BAKHUIZEN v. D. BRINK 2576 L; Priangan Res.: G. Malabar, KORTHALS s.n. L; Tjilaki, alt. 600 m, FORBES 984 L.

HALLIER l.c. mentions the occurrence of this species in East Java. This rests on the indication "East Java" on the label of the specimen collected by FORBES. This indication is found on the labels of all the specimens collected by FORBES in Java, which are preserved in the Leiden herbarium. The real localities may be found by consulting the paper on FORBES's Malesian plants in *Journal of Botany* Vol. LXIII, Suppl.

The specimens collected by REINWARDT on the G. Gedeh and by BAKHUIZEN v. D. BRINK on the G. Burangrang show a curious malformation, the inflorescences being strongly ramified and covered with long capitate hairs. REINWARDT's specimen is accompanied by a branch of *Difflugossa filiformis* (Bl.) Brem. and as the label bears the inscription "*Strobilanthes glandulosa* Bl." it was regarded by KOORDERS (*Exkursionsfl. v. Java* III, p. 217, 1912) as the type of that species. This led him to the remark: "*S. glandulosus* Bl. halte ich nur für durch Krankheit deformierte,  $\pm$  hexenbesenbildende Exemplare von *S. filiformis* Bl." The same abnormality has been observed in a specimen of *Difflugossa ovatifolia* Brem. This might be interpreted as indicating a nearer affinity between the genera *Lissospermum* and *Difflugossa*, but the structure of the androecium and that of the testa are weighty arguments against this view.

## GROUP AA.

The most striking features of *Pteroptychia*, the only genus of this group, are found in the structure of the pollen grains (Tab. III A), which are subglobose and echinulate, and in the presence of a wing on each of the spurs running down from the outer filaments along the wall of the corolla tube: to these wings the genus owes its name. In *Pt. Ridleyi* (Merr.) Brem. (*Strobilanthes* Merr.), the only species which I could examine, the pollen grains are provided with five equatorial germ pores, and the surface of the grains is distinctly banded, the spinules being arranged in a single row in the middle of each of the bands.

The seeds are unfortunately unknown, but the characters which in the absence of data with regard to the structure of the testa may be deemed to throw some light on the affinities of the genus, the anisophylly, the spiciform inflorescence with its small and usually early deciduous bracts and bracteoles, the resupinate corolla and the included stamens with their erect anthers, seem to point to a nearer affinity with group P and perhaps also with group Z.

54. *Pteroptychia* Brem. n. gen.; *Strobilanthes* species auctorum aliorum; typus: *Pt. Ridleyi* (Merr.) Brem. n. comb. (*Strobilanthes* Merr.).

Plantae plietesiae, anisophyllae. Folia petiolata vel subsessilia, supra cystolithis satis magnis dense lineolata. Inflorescentiae spiciformes, elongatae, terminales et axillares. Bractae plerumque angustae, raro foliaceae, 1-nerviae vel penninerviae, calyce breviores vel ei subaequilongae, deciduae vel subpersistentes. Flores in axillis bractearum solitarii. Bracteolae semper angustae,

calyce paulo breviores, deciduae vel subpersistentes. Calyx subaequaliter 5-partitus, lobis anguste linearibus, subobtusis vel acutis. Corolla coerulea, coerulescens vel alba, resupinata, tubo tereti torso in fauces campanulatas eo bis longiores ampliato, pilis stylum retinentibus in series duas dispositis, lobis subaequalibus late rotundatis. Stamina 4, didynamia, erecta et inclusa, in plicis duplices, marginibus ambobus vel uno solum ciliatas decurrentia; filamenta ad basin vel fere tota hirtella, staminum exteriorum quam interiorum fere bis longiora; antherae erectae, apice obtusae, thecis a latere complanatis. Staminodium parvum vel inconspicuum. Granula pollinis (Tab. III A) subglobosa, virgata et echinulata, in specie typica poris 5 instructa. Ovarium glabrum vel parce comosum, utroque loculo ovulis 2. Stylus hirtellus. Capsula nondum nota.

Distributum ab Indo-China usque ad Sumatram. Species adhuc notae 5.

Species typica: *Pteroptychia Ridleyi* (Merr.) Brem. n. comb. (*Strobilanthes* Merr.).

The distribution of the genus *Pteroptychia* is rather peculiar: four of the five species occur in Tonkin and Laos and one in Sumatra. It is possible, however, that some of the species from Siam, the Malay Peninsula and Burma which could not yet be located, may prove to belong to this genus. The Burmese *Strobilanthes pterygorrhachis* Clarke looks very much like *Pteroptychia Ridleyi*, though its bracts are leaflike and the bracteoles minute; its corolla, moreover, is said to be yellow. The structure of the pollen grains is as yet unknown.

BENOIST mentions in the "Flore générale de l'Indo-Chine among the *Strobilanthes* species provided with a "membrane staminale double" a var. *inaequalis* of *Str. Dalzielii* W. W. Smith. I have raised it to specific rank, because it seems to me that the type of this species belongs to another genus, namely to *Championella*.

1. *Pteroptychia Ridleyi* (Merr.) Brem. n. comb.; *Strobilanthes anceps* Ridl. in Journ. As. Soc. Mal. Br. n<sup>o</sup> 1, p. 82, 1923, non Nees in Hook., Comp. Bot. Mag., p. 312, 1836; *Str. Ridleyi* Merr. n. nom. in Contr. Arnold Arbor. VIII, p. 155, 1934.

Caulis ramique robustiores, basin versus obtuse quadrangulares, apicem versus fortiter complanati et utroque latere anguste bi-alati, bisulcati, glabri vel subglabri. Folia basi sensim in petiolum plerumque satis longum excurrentia; petiolus glaber vel subglaber, usque ad 3 cm longus, in foliis superioribus interdum tamen fere omnino suppressus; lamina lanceolata vel oblonga, usque ad 22 cm longa et 8.5 cm lata, plerumque pro rato angustior tamen, apice caudata, basi contracta, margine remote sed conspicue callosodentata, herbacea, costa utrimque setulis aliquibus parvis sparsa, ceterum utrimque glabra, nervis utroque latere costae 6—8. Spicae 2.5—10 cm longae, in paniculam terminalem confluentes; pedunculus internodiis axis precedentibus subaequilongus; rhachis acute quadrangularis, puberulo-pubescentis. Bractee mox deciduae vel interdum usque ad anthesin persistentes, lineari-lanceolatae, 8 mm longae et 1.5 mm latae, obtusiusculae, 1-nerviae, dorso parce puberulo-pubescentes. Bracteolae anguste lineares, 7 mm longae et 1 mm latae, ad calycem adnatae, extus parce puberulo-pubescentes, usque ad anthesin persistentes. Calyx 9 mm longus, lobis anguste linearibus, 7.5 mm longis, obtusiusculis, extus parce puberulo-pubescentibus vel glabrescentibus. Corolla alba, 3 cm longa, extus glabra, tubo 8 mm, faucibus 17 mm, lobis 5 mm longis. Stamina exteriora filamentis totis hirtellis, 5 mm longis; interiora filamentis basi solum hirtellis, 2.2 mm longis; antherae 3.5 mm longae; tubus staminalis margine ciliatus, alis eciliatis. Granula pollinis (Tab. III A) 64  $\mu$  longa et 58  $\mu$  diam., poris 5 aequatorialibus et virgis 20 uniseriatim echinulatis instructa. Ovarium glabrum vel vix conspicue comosum. Stylus vix conspicue hirtellus. Capsula nondum nota.



## Habitat Sumatram.

S u m a t r a. East Coast Govt: Sibolangit, alt. 350 m, LOERZING 5479 L; Karo Tableland, Kabon Djahe, alt. 1175 m, id. 6230 L; GALOONGI (BARTLETT et LA RUE) 71 L.

The type of this species was collected by RIDLEY at Berastagi, which lies just between Sibolangit and Kabon Djahe. RIDLEY's description differs in several points from that given above, but as there is in this part of Sumatra apparently but one species of this group which is provided with winged shoots, I have little doubt that the identification of the specimens quoted above, is right. The discrepancies in the two descriptions may partly be due to variability in the material and partly to mistakes in RIDLEY's description: to the latter belong the axillary spikes and the presence of 5 stamens. RIDLEY compared it with *Strobilanthes collinus* Nees, which is unknown to me, but whose pollen grains are, according to CLARKE, of the ordinary ellipsoidal kind, not provided with spinules; the position of this species is still uncertain.

A plant collected by KORTHALS on the G. Singalang in the East Coast Residency, is very similar to the one described above. Its leaves, however, are somewhat larger. As it has neither flowers nor fruits, its identity can not be regarded as fully established. The plant is of some importance, because VAN STEENIS (in Bull. Jard. Bot. de Buitenz., Sér. 3 XIII, p. 14, 1933) mentions the presence of an "*Acanthopale*" in the Ranau Region (South-west Sumatra), which may have been a *Pteroptychia*. See however the remarks I made on this plant under the genus *Psacadopaepale*.

The presence of five equatorial germ pores in the pollen grains has been noted so far only in the type species. Of the other species no material was available to me, and the descriptions pay no attention to this point. However, as the germ pores are not such a conspicuous feature as the spinules, the absence of information with regard to the number of pores does not preclude the possibility that they may have numbered more than three.

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- inaequalis* Brem. n. spec. (*Strobilanthes Dalzielii* R. Ben. var. *inaequalis* R. Ben.) — Tonkin et Laos —  
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*patula* (R. Ben.) Brem. n. comb. (*Strobilanthes* R. Ben.) — Tonkin —  
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*sarmentosa* (R. Ben.) Brem. n. comb. (*Strobilanthes* R. Ben.) — Tonkin —

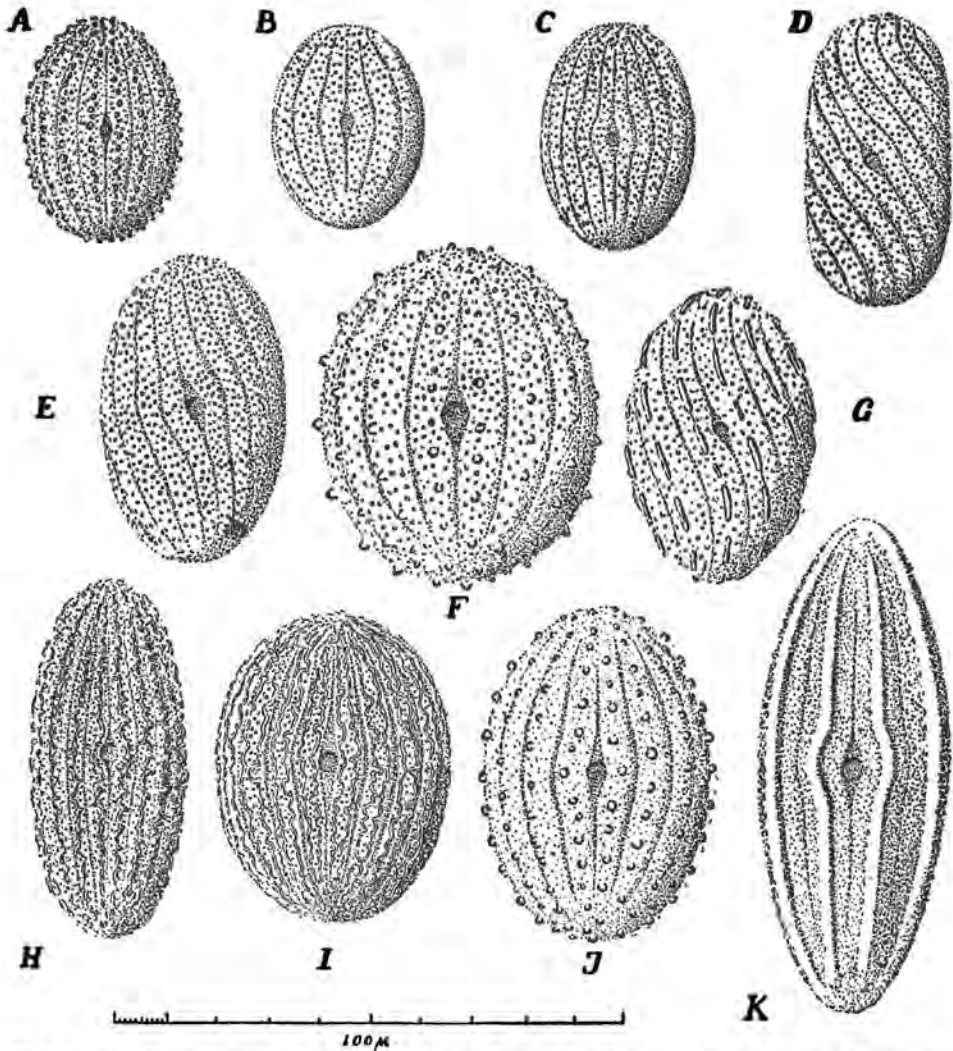
*Pteroptychiae* species sub nomine generico *Strobilanthes* nuncupatae.

- anceps* Ridl. in Journ. As. Soc. Mal. Br. I, p. 82, 1923 (non Nees in Hook., Comp. Bot. Mag. II, p. 312, 1836) = *Pteroptychia Ridleyi* (Merr.) Brem.  
*Dalzielii* (W. W. Smith) R. Ben. var. *inaequalis* R. Ben. in Lecomte, Fl. Gén. de l'Indo-Chine IV, p. 679, 1935 = *Pteroptychia inaequalis* Brem. n. spec.  
*pateriformis* Lindau in Bull. Herb. Boiss., 2e Sér. V, p. 653, 1897 = *Pteroptychia pateriformis* (Lindau) Brem. n. comb.  
*patula* R. Ben. in Bull. Soc. bot. de France LXXXI, p. 601, 1934 = *Pteroptychia patula* (R. Ben.) Brem. n. comb.  
*Ridleyi* Merr. in Contr. Arn. Arbor. VIII, p. 155, 1934, n. nom. (*anceps* Ridl. 1923, non Nees 1836) = *Pteroptychia Ridleyi* (Merr.) Brem. n. comb.  
*sarmentosa* R. Ben. in Bull. Mus. Hist. Nat. Par. XXVII, p. 547, 1921 = *Pteroptychia sarmentosa* (R. Ben.) Brem.

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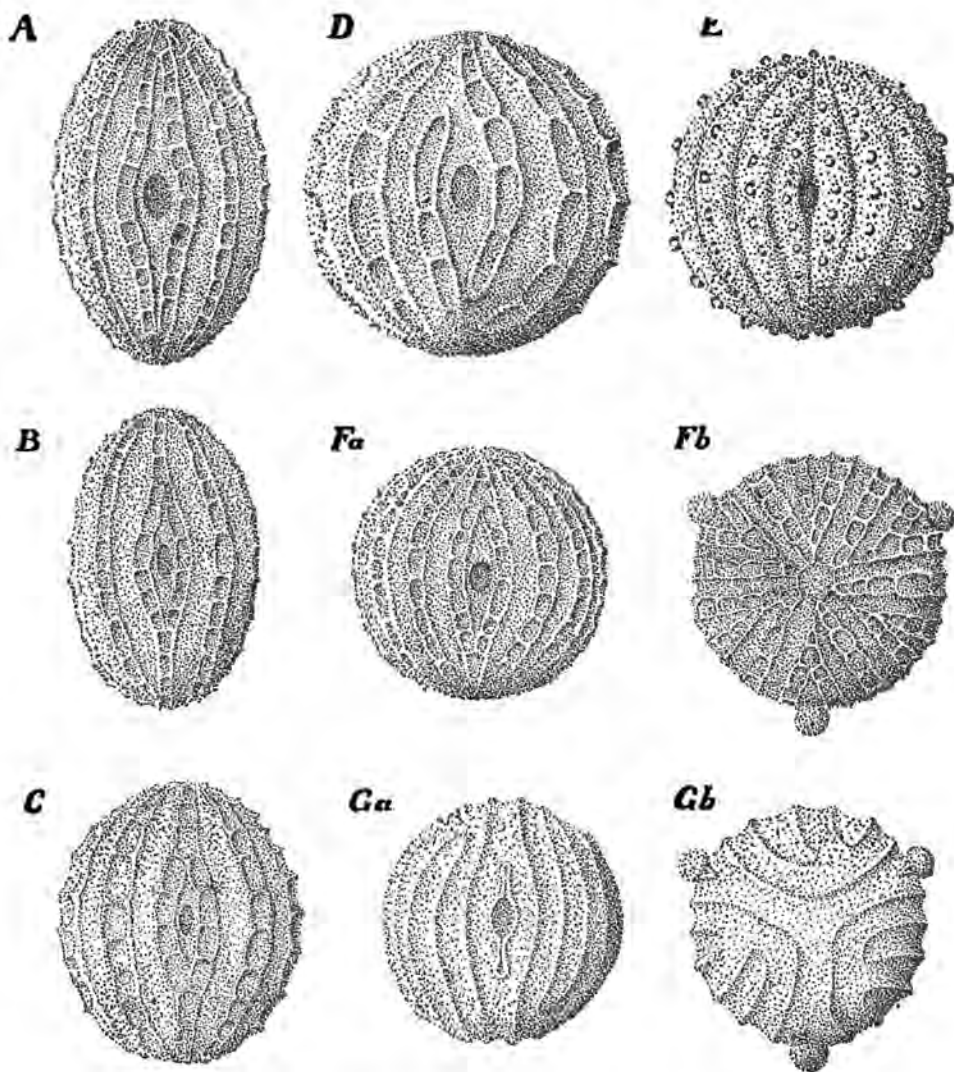
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C. E. B. BREMEKAMP: MATERIALS FOR A MONOGRAPH OF THE  
STROBILANTHINAE (ACANTHACEAE).



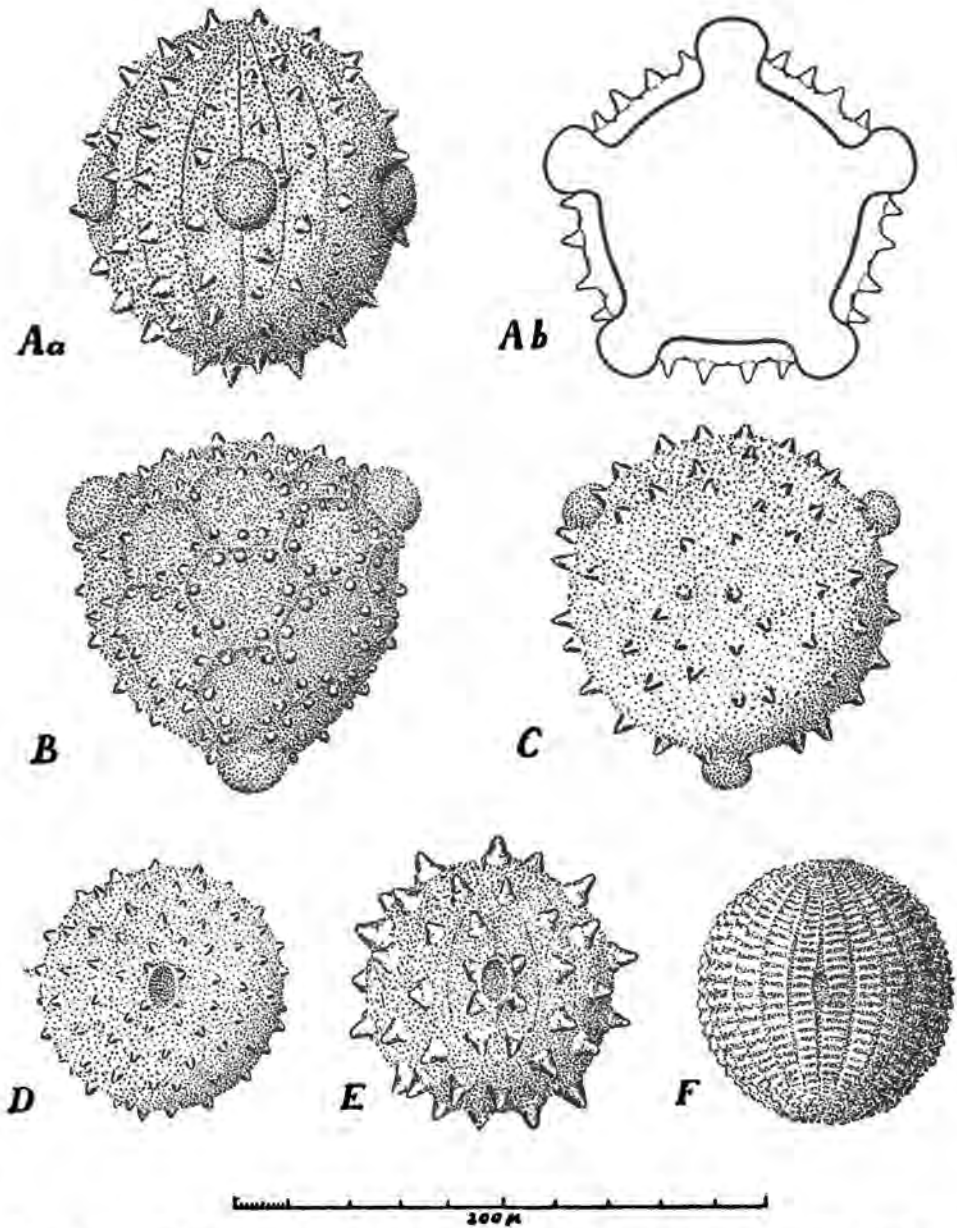
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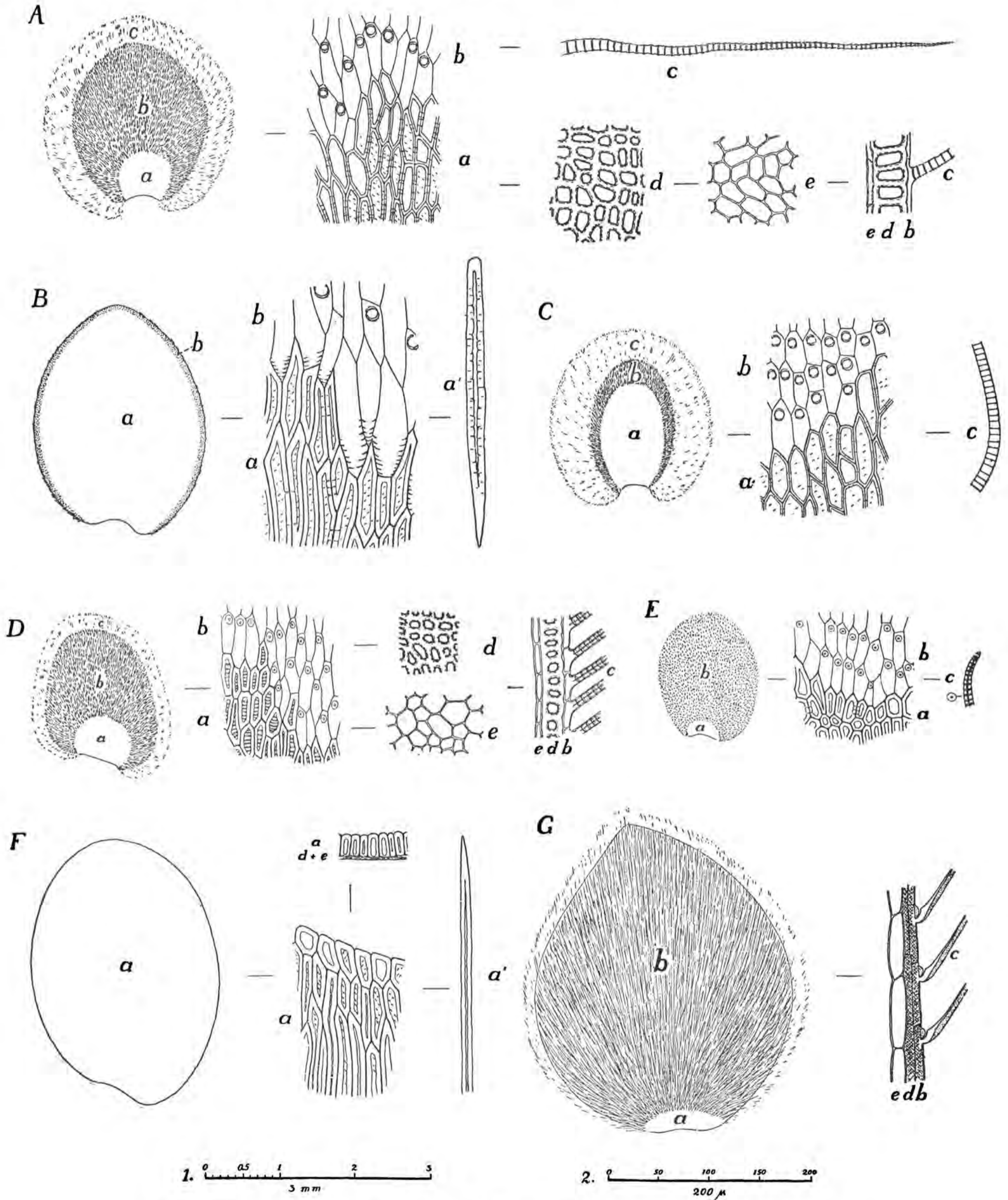


Tab. II. A. *Goldfussia glomerata* Nees; B. *Microstrobilus paniculatus* (Nees) Brem.; C. *M. alatus* (Bl.) Brem.; D. *Pachystrobilus involucratus* (Bl.) Brem.; E. *P. hirsutus* Brem.; F. *Strobilanthes cernua* Bl.; G. *Parastrobilanthes Koordersii* (Clarke ex Kds) Brem.  
a. frontal view; b. polar view.

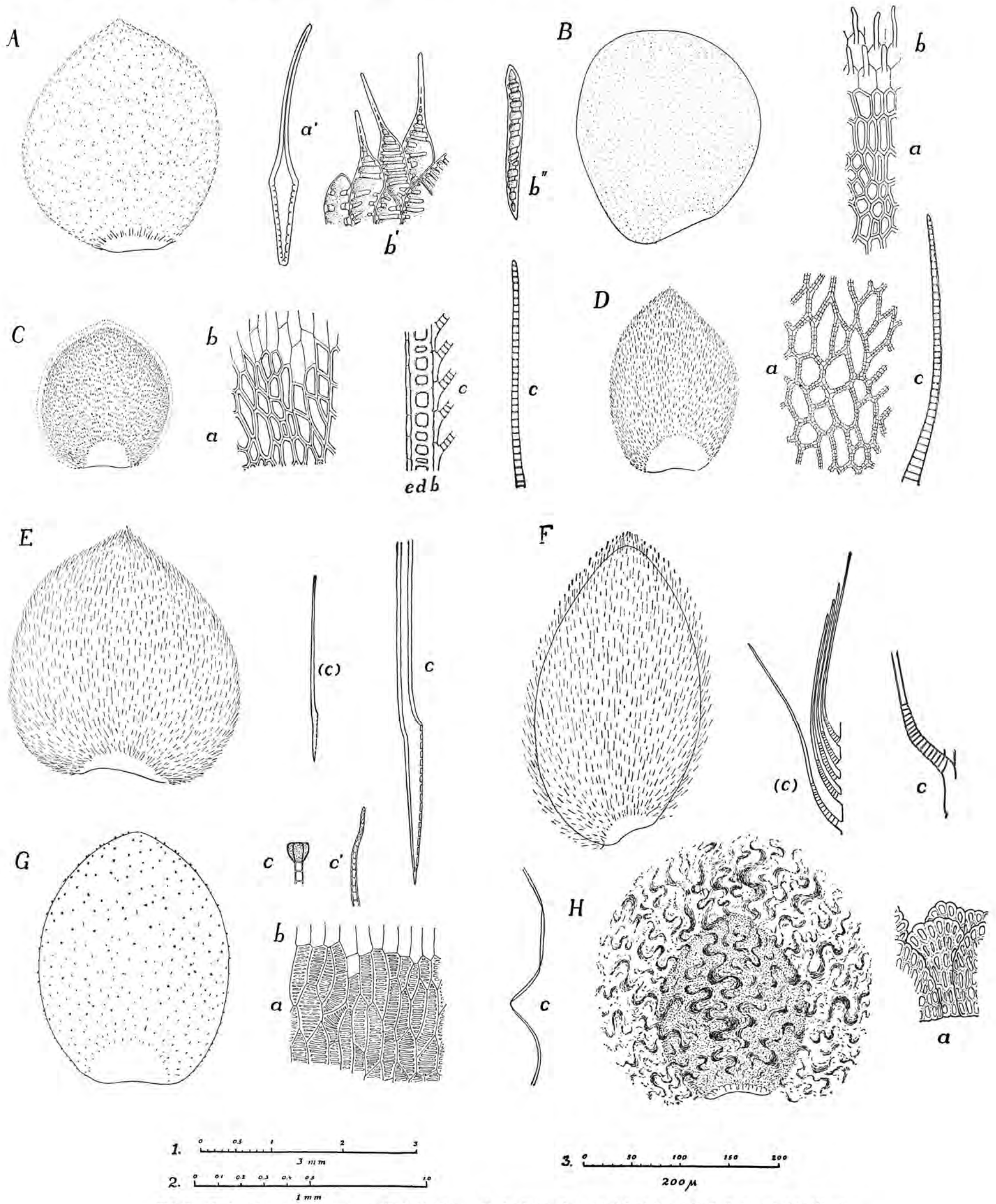
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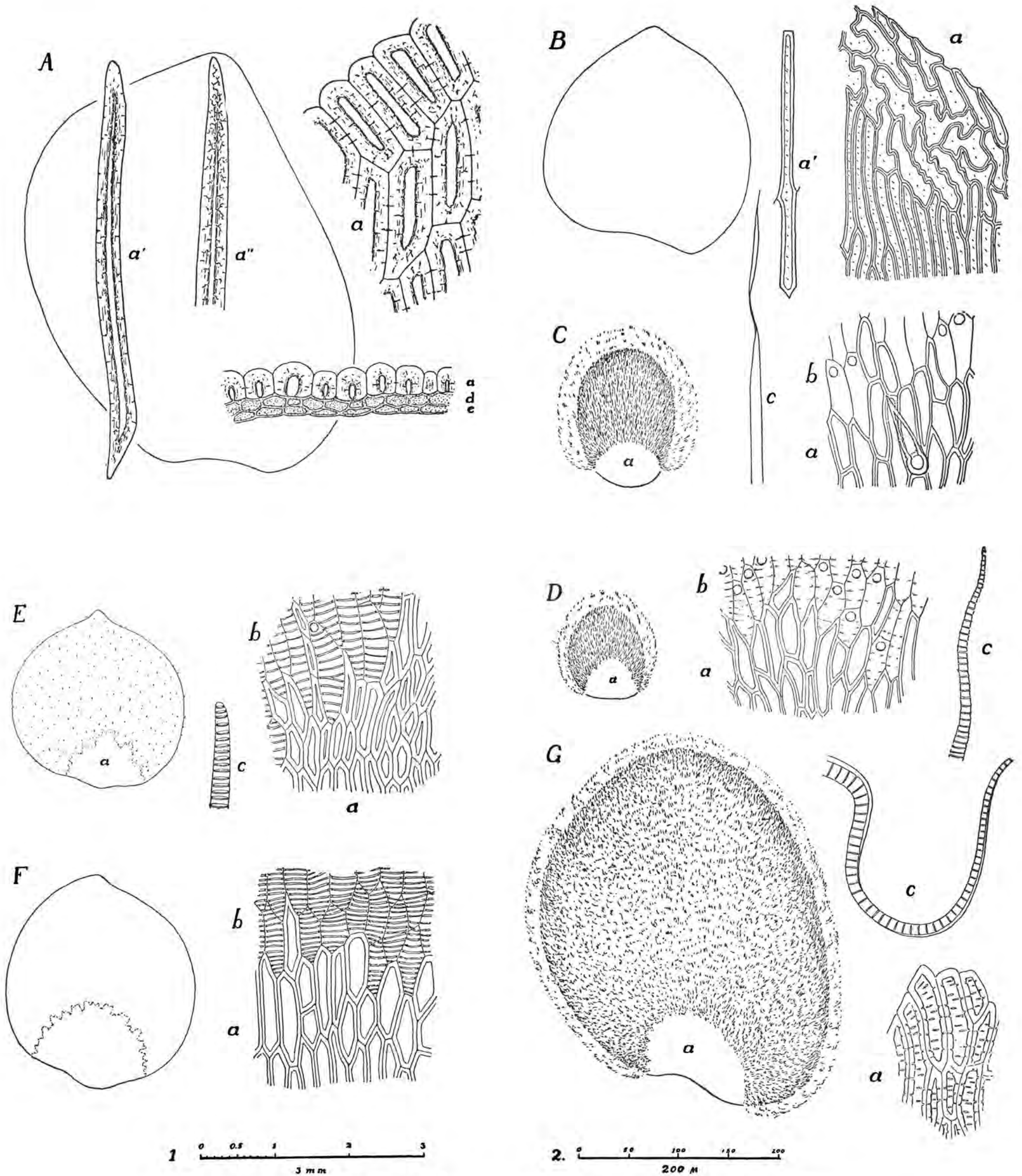
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 a. frontal view; b. optical section through the equator.



Tab. IV. A. *Hemigraphis brunelloides* (Lam.) Brem. var. *vahliana* Brem.; B. *Sericocalyx crispus* (L.) Brem.; C. *Stenosiphonium setosum* T. And.; D. *Gutzlaffia aprica* Hance; E. *Championella tetrasperma* (Champ. ex Benth.) Brem.; F. *Nilgiranthus wightianus* (Nees) Brem.; G. *Mackenzia homotropa* (Nees) Brem.  
 a. areola, respectively epidermis of its marginal part; a'. a single fiber from the central part; b. extra-areolar zone, respectively epidermis of the latter; c. hairs; d. subepidermal layer of the extra-areolar zone; e. inner layer.  
 1. scale of general survey sketches; 2. scale of histological detail drawings.



Tab. V. A. *Ditrichospermum secundum* (T. And.) Brem.; B. *Baphicacanthus cusia* (Nees) Brem.; C. *Perilepta auriculata* (Nees) Brem.; D. *Psacadopaepale assimulata* (S. Moore) Brem.; E. *Semnostachya nigrescens* Brem.; F. *Tetragompha Korthalsii* Brem.; G. *Echinopaepale javanica* Brem.; H. *Goldfussia glomerata* Nees.  
 a. areola, respectively its epidermis; a'. marginal hair of areola; b. epidermis of the extra-areolar part; b'. marginal cells of the latter; c. and c'. hairs of the extra-areolar part; d. subepidermal layer; e. inner layer.  
 1. scale of general survey sketches; 2. scale of the histological detail drawings E (c) and F (c); 3. scale of the other histological detail drawings.



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a. areola, respectively epidermis of its marginal part; a' and a'' fibers from the central part; b. epidermis of the extra-areolar zone; c. hairs; d. subepidermal layer; e. inner layer.

1. scale of general survey sketches; 2. scale of histological detail drawings.