NOTES ON SOME ACANTHACEOUS GENERA AND SPECIES OF CONTROVERSIAL POSITION

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(received October 12th, 1955)

I. THE POSITION OF THE GENUS *Stenandriopsis* S. MOORE

The genus *Stenandriopsis* was created by S. MOORE in Journ. of Bot. **44**: 153. 1906 for a plant collected first by Vaughan Thompson and afterwards by Baron in an unspecified part of Madagascar. As the plate by which the description is accompanied depicts the specimen collected by Baron (n. 6708), the latter is to be regarded as the type.

Stenandriopsis was referred by its author to the *Justicieae*, but this tribe is apparently accepted by him in the delimitation it received in BENTHAM and HOOKER's "Genera Plantarum", and as it is in this sense a most heterogeneous mixture, this does not greatly enlighten us. Of more importance is that Moore compares it with *Crossandra* Salisb. and *Stenandrium* Nees, i.e. with genera belonging to my subfamily *Acanthoideae* and referred by me respectively to the *Acantheae* and the *Aphelandreae*. However, in my paper on "The *Acantheae* of the Malesian Area. I. General Considerations" in Proc. Kon. Ned. Akad. v. Wetensch., Ser. c. **58**: 166. 1955, I pointed out that it can not belong to the *Acantheae* as the corolla throat lacks the incision in the adaxial side which is characteristic for that tribe. It can not belong to the *Aphelandreae* either as the corolla limb is subactinomorphous instead of distinctly bilabiate. As I had to rely at that time entirely on Moore's description and on the plate by which the latter is accompanied, I was unable to arrive at a conclusion, but I suggested that the genus might represent a new tribe of my *Acanthoideae*. Since then I have had the opportunity to inspect in the herbarium of the British Museum of Natural History the material on which the genus was based, for which I tender my best thanks to the Keeper, and now I am able to express a more definite opinion.

As it appeared that the stem was not provided with articulations, that all parts were free from cystoliths, and that the pollen grains were not monocolpate, as described by Moore, but tricolpate, there can be no doubt that the genus belongs to the *Acanthoideae* sensu meo. That the pollen grains were regarded by Moore as monocolpate, is

doubtless due to the circumstance that he made his observations on immature ones. Such grains shrink, as a rule, considerably when the flowers are dried, and in shrinking the wall is at one side drawn in; this dent was apparently mistaken by Moore for a normal feature of the pollen grain, whereas the presence of the three true colpae was overlooked.

As the absence of an incision in the adaxial side of the corolla throat and the subactinomorphous nature of the corolla limb were confirmed, my conclusion that the genus can not belong either to the *Acantheae* or to the *Aphelandreae* is to be accepted. The structure of the flower proved to be very similar to that of the flower of *Haselhoffia* Lindau, a genus differing from *Stenandriopsis* in the presence of four instead of two ovules in each of the ovary cells and in the ellipsoidal 12-colpate instead of globose and 3-colpate pollen grains. It apparently represents a distinct tribe which may be characterized as follows:

Stenandriopsideae, nova tribus *Acanthoidearum* corolla limbo subactinomorpho instructa ad tribum *Haselhoffiearum* accedens, ovario utroque loculo ovulis duobus munito, granulis pollinis globosis et 3-colpatis ab ea diversa, ovarii structura cum tribu *Acanthearum* et cum tribu *Aphelandrearum* quadrans, a tribu *Acanthearum* corollae fauce facie adaxiali integra, a tribu *Aphelandrearum* corollae limbo subactinomorpho distincta.

Habitat insulam Madagascar dictam.

Genus typicum: *Stenandriopsis* S. MOORE in Journ. of Bot. **44**: 153, tab. 478 B. 1906.

The type species of the genus *Stenandriopsis* is *St. Thompsoni* S. Moore and this is the only species of which specimens were available to me. The three Madagascar species which were described by BENOIST in Not. Syst. **8**: 151. 1939, are provided with pseudo-verticillate leaves. Leaves arranged in this way are a characteristic feature of the genera *Crossandra* Salisb. and *Blepharis* Juss., and as the corolla limb of *Crossandra* is like that of *Stenandriopsis* subactinomorphous, these three species might perhaps belong either to *Crossandra* or to a new genus in the latter's vicinity. The adaxial side of the corolla throat, however, shows in *Crossandra* a deep incision, and if my supposition with regard to the position of these species is right, such an incision or at least an indication of the latter should be present here too.

II. THE POSITION OF THE GENUS *Rhombochlamys* LINDAU

The position of the genus *Rhombochlamys* Lindau, of which so far two species were found in South America, was also discussed by me in my paper on "The *Acantheae* of the Malesian Area. I. General Considerations" in Proc. Kon. Ned. Akad. v. Wetensch., Ser. C, 58: 164–165. 1955, in connection with the delimitation of my subfamily *Acanthoideae*. I came to the conclusion that the tribe *Rhombochlamydeae*, which was created by Lindau for the reception of this genus, can not belong in the vicinity of the *Andrographideae*, as Lindau thought, but that there is good reason to insert it in the vicinity of the *Aphelan-*

dreae. Lindau paid too much attention to the pollen characters, which, moreover, he seems to have observed in this case inaccurately, and neglected the apparently very striking resemblance with the *Aphelandreae*, which nevertheless had not escaped his attention, for he duly remarks "Aeusserlich hat die Gattung mit *Aphelandra* Aehnlichkeit". However, here too a definite conclusion could not be reached because no information was available with regard to three of the four main characters in which the subfamily *Acanthoideae* differs from the subfamily *Ruellioideae*, viz. the absence or presence of articulations in the stem, the absence or presence of cystoliths, and the absence or presence of pores in the pollen grains. When Lindau had been right in placing this tribe in the vicinity of the *Andrographideae*, it would have fallen in my subfamily *Ruellioideae*, and the stem ought to show articulations, cystoliths ought to be present, and the pollen grains ought to be provided with pores.

The types of the two species pertaining to the genus *Rhombochlamys* unfortunately are no longer available; they were lost in the fire by which the Berlin-Dahlem Herbarium was devastated. However, I could study in the Kew Herbarium an *Acanthacea* collected in Columbia, i.e. in the country in which the types of the two species were found, and identified by Standley as belonging to one of them. The rather poor condition of this specimen did not allow a full verification of the identification, but in so far as its characters could be compared with the description they proved to agree with it, so that there is no reason to doubt the correctness of the identification, which probably will have been based on a more complete specimen. At any rate the condition of the specimen was sufficient to allow a choice in two of the three pairs of alternatives mentioned above. The stem proved to be without articulations, and cystoliths were absent; the pollen structure unfortunately could not be studied. The absence of articulations and of cystoliths in conjunction with the presence, mentioned in the description, of four monothecous anthers, however, indubitably prove that Lindau erred when he assigned to this genus a place in the vicinity of the *Andrographideae*, and that it certainly is to be referred to the *Acanthoideae*, where it will have to be placed near or perhaps even in the *Aphelandreae*. If it should appear that the pollen grains do not possess germ pores, they would hardly differ from the 3-colpate type that is met with in the great majority of the *Acanthoideae*, the *Aphelandreae* included, and then the only point in which the *Rhombochlamydeae* would differ from the latter, would be the presence of four instead of two ovules in each of the ovary cells, and this would hardly be sufficient to maintain them as a separate tribe.

III. The position of the African "*Hemigraphis*" species

In my "Materials for a Monograph of the *Strobilanthinae* (*Acanthaceae*)" in Verh. Ned. Akad. v. Wetensch., Afd. Natuurk., 2nd Sect. **41**, no 1, 1944, I rejected the former tribe *Strobilantheae* as an artificial group, and referred *Strobilanthes* Bl. and its nearest allies, among

which *Hemigraphis* Nees occupies a prominent position, as a subtribe *Strobilanthinae* to a widened tribe *Ruellieae*. The subtribe *Strobilanthinae* proved easily recognizable 1° by the presence of two rows or, more rarely, bundles of hairs by which the upper part of the style is retained against the adaxial side of the corolla, and 2° by the laterally flattened abaxial stigma lobe. I stated l.c. that this subtribe is confined to Asia and the adjoining part of Oceania, where it is represented by a few *Hemigraphis* species. The position of Bentham's African *Strobilanthes* species, for which CLARKE in Thiselton-Dyer's "Flora of Tropical Africa" (**5**: 162. 1899) had created a new genus *Acanthopale*, I had discussed a year before in my paper "Ueber *Dischistocalyx* T. And. ex Bth. und *Acanthopale* C. B. Clarke (*Acanthaceae*)" in Bot. Jahrb. **73**: 126–150. 1943, where I came to the conclusion that *Acanthopale* is no near ally of *Strobilanthes*, as Clarke had assumed, but that it should be placed near *Dischistocalyx*, as Lindau had done, and that these two genera belong to a group centered round *Ruellia* L. Of the *Strobilanthes* species that had been described from Madagascar I stated in my "Materials for a Monograph of the *Strobilanthinae*" (p. 29) that they had wrongly been referred to this genus, and that they do not even belong to the *Strobilanthinae*. This apparently applies also to the Madagascar species that since then have been described. The descriptions of these plants, however, are in most cases not sufficiently detailed to allow a determination of the genus to which they really belong.

Of the three African species that CLARKE in Flora of Tropical Africa **5**: 58. 1899 had referred to *Hemigraphis* Nees, viz. *H. abyssinica* (Nees) C. B. Clarke, *H. tenera* (Lindau) C. B. Clarke and *H. Schweinfurthii* C. B. Clarke, and of the two African species that since then had been added to this group, viz. *H. origanoides* Lindau and *H. prunelloides* S. Moore, I said l.c. that they coud not belong to this genus because their flowers are arranged in small axillary clusters, their calyx segments are nearly free, their stamens about equal in length, and their pollen grains globose. I suggested that they might belong to *Synnema* Bth., i.e. to the subtribe *Hygrophilinae*.

At the time I worked on my "Materials for a Monograph of the *Strobilanthinae*" I had to rely solely on the descriptions of these species given in the literature, but recently I found the opportunity to study specimens in the Herbarium of the Royal Botanic Gardens, Kew, for which opportunity I wish to thank the Director. This study confirmed my supposition that these plants do not belong to the *Strobilanthinae*, for the hairs on the adaxial side of the corolla by which in this group the style is retained in its place, proved to be absent, and the abaxial stigma lobe is not laterally flattened but filiform. That they really belong to the *Hygrophilinae* is proved by the shape and structure of the pollen grains, which are in all these species not only globose, what in itself is of no great importance, but also ornamented with a fairly large number of bands, all of them of the same width and separated from each other by narrow furrows, and provided with four equatorial germ pores situated in the furrows. They are therefore of the type that is characteristic for this subtribe.

In referring these species to the *Hygrophilinae* I returned to the standpoint that the earlier authors had taken in. The longest-known species of this group, *Hemigraphis abyssinica*, was originally described by NEES in DC, Prodr. **11**: 83. 1847 as *Polyechma abyssinicum*, and the genus *Polyechma* Hochst. was placed by him in his "*Hygrophileae*", where it is preceded by the genera *Hemiadelphis* Nees and *Physichilus* Nees, and followed by *Glossochilus* Nees, *Nomaphila* Bl. and *Hygrophila* R.Br., which means that it is included in a group of genera which, with the exception of the imperfectly known *Glossochilus*, are all part of my subtribe *Hygrophilinae*. ANDERSON (in Journ. Linn. Soc. **7**: 22. 1864) was so fully convinced of the near affinity between the *Polyechma* species listed by NEES and the species which the latter had referred to *Hygrophila*, that he sank the whole group in *Hygrophila*. S. Moore too had originally assumed a similar attitude, viz. when he described a plant that Clarke afterwards referred to *Hemigraphis abyssinica*, as *Cardanthera justicioides*, and some nearly related ones as *C. africana* (T. And.) S. Moore var. *Schweinfurthii*; on the latter Clarke afterwards based his *Hemigraphis Schweinfurthii*. That the genus *Cardanthera* Buch-Ham., which is identical with *Synnema* Bth., belongs to the *Hygrophilinae* can not be doubted.

In order to understand why Clarke in opposition to the three authors quoted above referred these plants to *Hemigraphis*, we should realize that Clarke did not place this genus in the neighbourhood of *Strobilanthes*, as BENTHAM and HOOKER had done in their "Genera Plantarum" (**2**: 1065. 1876) and as LINDAU did in Nat. Pflanzenfam. IV, 3 b: 300. 1895, but in that of *Ruellia*; his tribe *Strobilantheae* was restricted to those genera of my *Ruellieae* in which the ovary cells contain but one or two ovules, whereas his *Euruellieae* differed from his *Hygrophilinae* in the actinomorphous or subactinomorphous instead of distinctly bilabiate corolla. As the Asiatic species for which the genus *Hemigraphis* was created, as well as the African species with which we are here concerned, are provided with actinomorphous or subactinomorphous corollas, and as they possess more than two ovules in each of the ovary cells, it is clear that they had to be referred in this classification to the *Euruellieae*, and a certain similarity in habit, caused by the comparatively small stature of these plants and by the small size and white colour of the flowers, will have led him to consider them congeneric. His mistake therefore was due to the circumstance that he was not acquainted with the really important features of the *Strobilanthinae*, and that he overrated the importance of the differences in the degree of symmetry of the corolla (actinomorphous or nearly so versus zygomorphous). In the genera that so far have been referred to the *Hygrophilinae* we find all transitions between the distinctly bilabiate corolla of *Brillantaisia* Pal. Beauv. and corollas that are no more distinctly zygomorphous than some of those that are found in the other subtribes of the *Ruellieae*. Moreover, we should not forget that when we speak in the *Acanthaceae* of an actinomorphous corolla we mean a corolla with an actinomorphous limb; the corolla considered as a whole is always zygomorphous, the androecium being

adnate to its adaxial side; it is not be expected that the limb of such a corolla will ever be fully actinomorphous; there is only a more or less close approximation to this state.

Apart from the but slightly zygomorphous corolla (it is cautiously described by him as "not 2-lipped") there is in the description of the genus *Hemigraphis* given by CLARKE in the "Flora of Tropical Africa" but one point which, if it could be confirmed, would exclude the possibility that the African "*Hemigraphis*" species might belong to the *Hygrophilinae*, viz. the subtrigonous shape of the pollen grains. This however, proved to be a mistake; in reality the pollen grains are globose and provided with four equatorial germ pores, which, as stated above, irrefutably proves that the plants belong to this subtribe. At any rate, this character can not have influenced Clarke's decision, because at that time it was not yet known that the presence of four equatorial germ pores is a character that is confined to this subtribe. It was even generally believed that the pollen grains of the *Hygrophilinae* were provided with three pores; so indeed they had been described by LINDAU in Naturl. Pflanzenfam. IV, 3 b: 295. 1895. The presence of four pores was for the first time used as a diagnostic character of the *Hygrophilinae* in my "Key to the Surinam Genera and Species based on Pollen Characters", which is to be found in my "Notes on the *Acanthaceae* of Surinam" in Rec. d. trav. bot. Néerl. **35**: 136. 1938 (see also the "Key to the subtribes of the *Ruellieae*" in BREMEKAMP and NANNENGA–BREMEKAMP, "A preliminary survey of the *Ruelliinae* (*Acanthaceae*) of the Malay Archipelago and New Guinea" in Verh. Kon. Ned. Akad. v. Wetensch., Afd. Natuurk. 2nd Sect. **45**, no. 1, p. 4. 1948).

Clarke's above mentioned description of *Hemigraphis* contains, on the other hand, one character that is never met with in this genus nor, in fact, in any other genus belonging to the *Strobilanthinae*. This is the arrangement of the "flowers in small axillary clusters". Although Clarke was not acquainted with the two main diagnostic characters of the *Strobilanthinae* to which I have already referred, and although he lacked therefore a reliable guide, it is nevertheless strange that he accepted the arrangement of the flowers in small axillary clusters as admissible in the genus *Hemigraphis*, for this kind of arrangement of the flowers had doubtless been one of the principal reasons why his predecessors had referred plants of this group either to *Hygrophila* or to genera in the latter's vicinity.

The question to what genus the five African "Hemigraphis" species are to be transferred is difficult to decide, at least when we do not accept *Hygrophila* R.Br. in the wide sense in which it was understood by Anderson and by Clarke, for in that case they are doubtless to be included in that genus. This delimitation, however, is in my opinion too wide, and I advocate the restoration of the genera *Hemiadelphis* Nees, *Physichilus* Nees and *Nomaphila* Bl. and, if necessary, the creation of one or more new ones.

In my "Materials for a Monograph of the *Strobilanthinae*" I referred these African "*Hemigraphis*" species in the "Index Specierum" (l.c.

p. 136–142) to *Synnema* Bth. At that time this seemed to me the most plausible solution, because the type species of *Polyechma*, the genus to which one of the species had been referred by Nees reminded me of this genus, and also because S. Moore had referred two of these species to *Cardanthera*, which, as stated above, is synonymous with *Synnema*. This decision, however, is to be rescinded. *Synnema* Bth. is well characterized by the very large number of ovules and by the small size of the retinacula, and these characters are not met with in the African "*Hemigraphis*" species.

Nees, as we have seen, had referred one of the species to *Polyechma* Hochst., and it might therefore be possible that this genus would prove to be the most suitable place for them. This, however, has also proved an illusion. *P. coeruleum* Hochst., the type species of the genus, appears to be provided with numerous ovules and with weakly developed retinacula, and in these undoubtedly very important points it agrees therefore with *Synnema*, and might be identical with the latter. At any rate, whether the two are identical, in which case *Polyechma* would be the correct name for the genus, or distinct though nearly related, so much is certain that *Hemigraphis abyssinica* can not be returned to this genus, as its retinacula are well developed, and its ovules not very numerous. A more suitable place can perhaps be found in the genus *Physichilus* Nees, in which a similar arrangement of the flowers is met with, but where the corolla is more distinctly zygomorphous.

However, whether we refer the African "*Hemigraphis*" species to *Hygrophila* R.Br. sensu T.And., to *Physichilus* Nees or to a new genus in the vicinity of the latter, is for the moment of secundary importance only, the main point is that they do not belong to *Hemigraphis* nor to any other genus of the *Strobilanthinae* but to the *Hygrophilinae*.

IV. The position of the genus *Stenothyrsus* G. B. Clarke

The monotypic genus *Stenothyrsus* was based by Clarke in Journ. As. Soc. Beng. 74: 650. 1908 on a plant collected by Curtis in Perak, Malay Peninsula. It is said to be related to *Hemigraphis* Nees, from which it would differ mainly by the nature of its inflorescence, which is described as a spike consisting of opposite short cymes made up of 6 or 7 flowers. However, as inflorescences of this kind are entirely unknown in the *Strobilanthinae*, the supposition that this genus would be related to *Hemigraphis* seemed to me unfounded, but as the description gave me no clue to its real position, and as I had no material of this species at hand when I was working on my "Materials for a Monograph of the *Strobilanthinae*" I left it out of consideration. Since then I have found occasion to inspect in the Kew Herbarium the specimen on which the genus was based. As it appeared that there were no rows or bundles of hairs on the adaxial side of the corolla for retaining the upper part of the style in its place, and that the abaxial stigma lobe, though rather long, was not laterally flattened, my conclusion that the genus can not belong to the *Strobilanthinae* was fully confirmed. A study of the globose pollen grains revealed the

presence of four equatorial germ pores situated in groves and of 24 or 28 meridional bands, all of the same size and shape and separated from each other by narrow groves, four of which contained the germ pores. There can therefore be no doubt that the genus has to be transferred to the *Hygrophilinae*. The abaxial side of the corolla throat is provided with a very distinct palate, but the corolla limb is, as in the African "*Hemigraphis*" species dealt with above, subactinomorphous, and this will doubtless have induced Clarke to regard it as related to *Hemigraphis*; the presence of a distinct palate, however, is another feature pointing in the direction of the *Hygrophilinae*. On account of the terminal long-pedunculate and narrowly paniculiform inflorescence it occupies a rather isolated position in this subtribe, but the cymous partial inflorescences are in structure fully comparable to the axillary inflorescences found in the other genera. Noteworthy diagnostic characters are the two spinules at the base of each theca and the strongly pilose dorsal side of the connective.

V. The position of the genus *Oreothyrsus* Lindau

Among a batch of *Acanthaceae* received for identification from the Director of the Philippine National Herbarium, Manila, I noticed a plant with opposite long-pedunculate, once or more often twice pseudo-dichotomously ramified inflorescences and with globose, sparsi-porous pollen grains. The combination of these characters was observed so far only in two New-Guinean species that Lindau in Schumann and Lauterbach, Nachträge zur Flora der deutschen Schutzgebiete in der Südsee, 308–309, 1905, had referred to a new genus *Oreothyrsus*, and it seemed therefore indicated to put the Philippine plant at least provisionally in this genus. It is true that the pollen structure of the latter does not agree in every respect with that of the two New-Guinean species, but for the moment it seems allowed to regard the differences as of secundary importance only. Further on we will return to this question, and then we will discuss it in some detail. A final decision, however, will have to be postponed until the New-Guinean species can be studied on actual specimens. At present this is impossible, as Lindau's specimens, as the Director of the Botanical Museum and Herbarium, Berlin-Dahlem kindly informed me, are no longer extant, and as no new collections are available. For a critical examination of the position to which the genus has been referred, we will have to rely on the description given by Lindau and on the data which the study of the Philippine species has brought to light. Before entering into details it seems therefore desirable to give a description of the latter. Here it is.

Oreothyrsus samarensis Brem n. spec. a congeneribus hactenus notis foliis basi rotundatis, floribus majoribus, calyce 5-partito, corollae labio superiore integro, granulis pollinis nec alveolatis nec scrobiculatis, capsulis majoribus distinguenda.

Herba e basi decumbente erecta, 20–30 cm alta. Caulis simplex, primum tomentellus, deinde puberulo-pubescens, 0.9–1.6 mm diam.,

internodiis 2–6 cm longis. Folia petiolo primum tomentello, deinde dense puberulo-pubescente 1.0–2.5 cm longo instructa; lamina oblonga, lanceolato-oblonga vel ovato-lanceolata, plerumque 3.5–7.5 cm longa et 1.5–3.5 cm lata, interdum tamen usque ad 10 cm longa et 3 cm lata, apicem obtusum versus plerumque paulum contracta, basi rotundata et ibi interdum paulum asymmetra, margine integra, paulum discolor, sicc. supra saturate et subtus dilute olivacea, supra glabra et cystolithis parvis dense lineolata, subtus costa nervisque primum tomentella, deinde puberulo-pubescens, inter nervos glabra, nervis utroque latere costae 4-7, venulis inconspicuis. Inflorescentiae oppositae, pedunculo puberulo-pubescente 2–4 cm longo elatae, semel vel saepius bis dichasiales, abortu florum terminalium tamen semel vel bis pseudo-dichotomae, ramulis ultimis monochasialibus. Bracteae subulatae, infimae usque ad 3 mm longae, superiores usque ad 1.5 mm decrescentes. Bracteolae nullae. Pedicelli 1.5–3.0 mm longi. Calyx aequaliter 5-partitus; lobi 7 mm longi et basi 0.6 mm lati, post anthesin usque ad 9 mm accrescentes, acuti, subglabri. Corolla 6 mm longa, extus subglabra, tubo 3 mm longo apice parce barbato, fauce 1.5 mm, labiis etiam 1.5 mm longis; labium superius integrum, sine rugula; labium inferius 3-partitum, lobo mediano 1.0 mm lato, lobis lateralibus 0.3 mm latis. Stamina 2 filamentis glabris 2.2 mm longis instructa; antherae dorsifixae 1.2 mm altae, apice basique obtusae, paulum asymmetrae. Granula pollinis (cf. fig.) globosa, sparsipora, poris 6–8 virgis circumdatis, virgis a

Pollen grain of *Oreothyrsus samarensis* Brem.

scutellis separatis, 45 μ diam. Staminodia nulla. Discus 0.5 mm altus. Ovarium glabrum 1 mm altum, utroque loculo ovulis 2. Stylus 4.0 mm longus, glaber; stigma vix distinctum. Capsula stipitata 15 mm longa et 3 mm diam., glabra, 4-sperma; retinacula acuta vel vix conspicue bidenticulata. Semina corrugata; testa e cellulis tracheidalibus composita.

Habitat insulam Filippinam Samar dictam.

Samar: Mt Sarawag, alt. 100 m, Edaño 3180 (PNH 15323), typus, fl. 8.XII. 1951; Mt Purog, alt. 150 m, id. 3444 (PNH 15433), 3477 (PNH 15424), 3489 (PNH 15402), all fr. 24.XII.1951.

As it is as yet not absolutely certain that this species really belongs to *Oreothyrsus*, I have mentioned in my description certain features that may be regarded as general characters of this genus. I have also included a number of characters that are usually omitted from species descriptions because they are typical for groups of higher rank; they have been inserted here because the group to which the genus belongs, is still unknown. However, before attempting to justify my inclusion of

the Philippine plant in this genus, and before entering into a discussion of the position of the latter, it seems desirable to review our knowledge of the two New-Guinean species and of the grounds on account of which the author of the genus referred it to a definite group.

The genus, which was referred by its author to his *Porphyrocominae*, was described by him in the following terms:

"Calyx 5-lobus. Corolla parva, bilabiata, labio supero bidentato, infero 3-lobo. Stamina 2 antheris aequialte affixis, muticis. Pollinis granula globosa, scrobiculata, poris 8 instructa. Capsula stipitata, 4-sperma.—Herbae. Inflorescentiae pedunculatae, dichotome-ramosae." ("Stamina 2 antheris aequialte affixis" should doubtless be read as "Stamina 2 thecis aequialte affixis", but this was a mere slip of the pen).

The Philippine species described above appears to differ in three points from this generic description: the calyx is 5-partite instead of 5-lobed, the upper lip of the corolla is entire instead of bidentate, and the pollen grains are ornamented with bands alternating with shields instead of scrobiculate. The two first-named points are doubtless of minor importance and may be left out of consideration, but the difference in the relief of the pollen grains is not so easily dismissed.

In the remarks added by Lindau to his generic description the pollen grains are described as sparsiporous, and their surface is said to be provided with "Gruben . . ., die durch Leisten getrennt sind, welche oft zu kurzen Spitzchen oder Höckerchen sich erheben." This might suggest a structure as is found in the pollen of the *Ruelliinae*, a group in which some of the genera are provided with sparsiporous pollen, but the distinctly bilabiate corolla makes it very improbable that the genus should belong to this group. However, our impression that the pollen of *Oreothyrsus* should be of this type, may be entirely wrong. That this is possible, will have to be admitted when we recollect that Lindau's description of the pollen structure of *Lepidagathis* Willd. suggested similarity with the pollen structure of *Barleria* L, and was indeed intended to suggest this, for Lindau referred these rather widely differing genera to the same group. Here too the similarity is very slight indeed, for the almost imperceptible sculpture of the *Lepidagathis* pollen is doubtless totally different from the coarse reticulation seen in that of *Barleria*. It is therefore by no means impossible that the reticulation of the pollen of the two New-Guinean *Oreothyrsus* species too is very faint, and that the spinules by which the grains are covered deserve more attention. This certainly was not Lindau's opinion for it was doubtless on account of the reticulation of the pollen grains that he put the genus in the vicinity of the South-American genus *Poikilacanthus*, which he had described at an earlier occasion, and which he referred to his *Porphyrocominae*. The latter, however, are a mixture of genera which do not seem to have a single character in common, and as *Poikilacanthus*, moreover, does not show a definite affinity to any of the genera included in this subtribe, it is difficult to see why it was put there. Its seeds, which I could not study myself, are figured by Lindau as smooth and distinctly marginate, and remind

one of those of some of the *Ruellieae*, where the marginal thickening is due to the presence of mucous hairs. Howsoever this may be, so much is certain that seeds of this kind are not found in any of the groups with which the *Porphyrocominae* are supposed to be related. The finely reticulated pollen grains of *Poikilacanthus* are ellipsoidal and provided with 4–6 equatorial pores, and in the two last-named characters they are doubtless widely different from the globose sparsiporous ones of *Oreothyrsus*. In fact, there seems to be no reason whatever to regard these two genera as nearly related.

The armature of spinules by which the pollen grains of the two New-Guinean species are covered, is in so far of importance as it may have been responsible for the disappearance of the relief shown by the pollen grains of the Philippine species. A similar phenomenon is observed in the genus *Rhacodiscus* Lindau, where the pollen grains of some species are covered with spinules but lack the typical relief of the *Justiciinae*, the group to which this genus is to be referred, whereas the pollen of some other species shows this relief quite clearly; this pollen, however, lacks the spinules. If a similar development had taken place in the genus *Oreothyrsus*, then the structure seen in the pollen grains of the Philippine species will have to be regarded as the original one. This structure, however, is essentially the same as that shown by the globose or ellipsoidal pollen grains provided with three pores that are met with in several subtribes of the *Justicieae*, and it might be therefore that in one of the latter a place for the genus *Oreothyrsus* is to be found. To determine this place we will have to turn our attention to other taxomonically important parts. Among the latter the seedcoat occupies a very prominent place.

The seeds of the two New-Guinean species are unfortunately not known in sufficient detail so that we will have to base our conclusion on those of the Philippine one. Here the seedcoat proves to consist of cells whose walls show tracheidal thickenings. This structure has so far been observed in the *Rhytiglossinae* and in two genera of which the exact position in the tribe could not yet be determined, viz. in *Polytrema* C. B. Clarke and in *Leptostachya* Nees emend. C. B. Clarke et Stapf. On account of the totally different pollen type a very near affinity between the *Rhytiglossinae* and *Oreothyrsus* seems excluded. Still it is worth while to remember that Lindau had drawn the attention to the very striking similarity in habit between his New-Guinean species and the plant for which Nees had used the name *Raphidospora dichotoma* (Bl.) Nees, but which, as Lindau rightly remarked, can not belong to that genus; since then it was found out that it is a *Strophacanthus*, viz. *Str. membranifolius* (Miq.) Brem. *Strophacanthus*, it should be remembered, is a genus belonging to the *Rhytiglossinae*. The habitual similarity rests i.a. on the structure of the inflorescences, which in both genera are once or twice dichasially branched with suppressed terminal flowers. However, the difference between the 2-porous discoid pollen grains of the *Rhytiglossinae* with their clearly differentiated marginal zone and the globose, sparsiporous pollen grains of *Oreothyrsus* seems to be so fundamental that it would

hardly be justifiable to assume a very near affinity between this genus and the *Rhytiglossinae*.

In the genera *Polytrema* and *Leptostachya* the pollen structure comes nearer to that of *Oreothyrsus* than it does in the *Rhytiglossinae*. The pollen grains of *Polytrema* are globose and probably sparsiporous, and those of *Leptostachya* shortly ellipsoidal or subglobose and provided, with three pores situated in furrows. The inflorescence of *Leptostachya*, which is either a spike or a panicle consisting of spikes, is however so unlike the once or twice pseudo-dichotomously branched inflorescences of *Oreothyrsus*, that between these genera too the affinity can not be very near. The inflorescences of *Polytrema*, on the other hand, are cymous, and this genus, which unfortunately is still very imperfectly known, might therefore be more nearly related.

The investigations on which this paper was based, were made possible by a grant from the Netherlands Organization for Pure Research (Z.W.O.).