

NEW BORNEAN ACANTHACEAE

by

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(Issued March 15, 1960)

Last year the Director of the Government Herbarium, Leiden, asked me to identify for his Institute a set of Bornean Acanthaceae. The latter were part of a collection of plants that had been brought together by Miss W. M. A. Brooke in various parts of Sarawak. The set consisted of 63 sheets, 7 of which proved to belong to *Staurogyne* Wall., a genus that in my opinion does not belong to this family but to the Scrophulariaceae. Of the 56 remaining sheets no less than 42 contained specimens which could not be identified with any of the species that had been described so far, and among these 42 specimens 3 undescribed genera and 25 undescribed species were represented. Of one new genus and of 8 species the material was insufficient for a description, but 2 of the new genera and 17 of the species could be described. Miss Brooke is certainly to be complimented with the result of her efforts. As in this region a considerable amount of herbarium material had already been brought together by well-known collectors, among whom I only need to mention Haviland and Hose, such a large number of novelties was hardly to be expected. It is true that some of the new species were already represented among the unnamed material in the Kew Herbarium, in the Herbarium of the British Museum and in that of the Botanical Garden at Bogor, Java, but they form but a small percentage of the whole number.

Of the two new genera the first, *Borneacanthus*, is represented in Miss Brooke's collection by three new species, but as I found among the unnamed material of the Herbarium Bogoriense two more species belonging to this genus, it seemed desirable to include the descriptions of the latter too in this paper. The genus seems to be confined to Borneo, though not to Sarawak. Its taxonomic position is rather isolated, and it had therefore to be referred to a new tribe. The other new genus, *Cosmianthemum*, is a near ally of *Pseuderanthemum* Radlk. It is represented by 8 species, and is known so far from Sarawak only. Of both genera keys to the species are given.

These remarks will suffice as an introduction to the now following descriptions.

Hemigraphis sarawacensis Brem. n. spec. ad seriem *Pubicrurium* pertinens, granulis pollinis virgis 18 distincte carunculatis instructis, foliis

lanceolatis basi acutis, ovario utroque loculo ovlis 4 instructo, inflorescentia brevius pedunculata, caule petiolisque sparse pubescentibus ad *H. natunensis* Brem. et *H. sciophila* Brem. accedens, sed caule primum pilis acroscopis sparsa, foliis a nervis paucioribus percursis ab ambabus distinguenda, a priori insuper bracteis et lanceolatis et brevioribus, a *H. sciophila* calycis lobis longe ciliatis diversa.

Herba e basi repente ascendens, ramosior. *Caulis* gracilis, apicem versus pilis acroscopis, basin versus insuper pilis basiscopis sparse hirtellus. *Folia* petiolo densius pubescente 5—8 mm longo munita; lamina linearilanceolata, lanceolata vel rhomboidea, 2.5—7.0 cm longa et 1.1—2.2 cm lata, apicem versus sensim attenuata, basi acuta, apice ipso obtusa tamen, margine subintegra recurvata, discolor, supra primum setulis aliquibus sparsa, deinde glabrescens et laevis, ad marginem seabridula tamen et costa breviter strigosa, subtus costa nervisque densius strigosa, inter nervos scabrida, supra cystolithis sicc. nigrescentibus sparsa, nervis utroque latere costae plerumque 4 vel 5. *Spicae* usque ad 3 cm longae, densiores; pedunculus internodio precedente brevior, 1—2 cm longus. Bracteae lanceolatae, 10—13 mm longae et 3.5 mm latae, acutae, margine ciliatae, ceterum glabrae. *Calyx* 8—9 mm longus, lobis longe sed sparsissime ciliatis, ceterum glabris, lobo mediano aliis paulo longiore. *Corolla* alba, 16 mm longa. *Stamina* antheris apice obtusis, thecis basi acutis instructa. Granula pollinis virgis 18 carunculatis ornata, 54 μ longa et 34 μ diam. *Ovarium* non comosum, utroque loculo ovlis 4. *Stylus* hirtellus. *Capsula* glabra, 8-seminalis.

Sarawak: Lawas, Miss W. M. A. Brooke 10043, 8th June 1955, L type, BM dupl., "beside a path through secondary growth; 1—2 feet high; flowers white".

Another specimen collected by Miss Brooke (10664, 24th October 1955, L) at Lubok Antu on the river Lupar, "on the bank just above the river", has a densely ferruginous-pubescent shoot and slightly narrower leaves with a repand margin, and its calyx is glabrous. It may represent a variety of the species described above, but as no flowers have been preserved, this point can not be settled. A third specimen, also collected by Miss Brooke (10460 BM, 17th August 1955), this time at Bakalalas, alt. 900 m, is even more similar to the type of *H. sarawacensis*, but has longer internodes, larger leaves and shorter spikes; in this specimen too no flowers are present.

H. sarawacensis is, like *H. natunensis* Brem. and *H. sciophila* Brem., very similar in habit to *H. sumatrensis* (Heyne ex Roth) Boerl. ex Brem., but it has larger, on the upper side glabrescent leaves, less hairy bracts and calyx lobes, and four instead of six ovules in each of the ovary cells. From *H. natunensis* and *H. sciophila* it differs in the presence of acroscopic hairs on the shoots, and in the smaller number of nerves in the leaves, from the first moreover in the shorter bracts, and from the second in the long hairs along the margin of the calyx lobes.

Lepidagathis marginata Brem. n. spec. inter congeneras quae inflorescentiis terminalibus, bracteis in series duas flores suffulcantes et series duas viduas evolutis, calycis lobis anticis non totis connatis instructae sunt bracteis bracteolisque neenon calycis lobis postico et anticis anguste sed distincte marginatis cognoscenda.

Herba erecta et parce ramosa, circ. 45 cm alta. *Caulis* puberulus, primum quadrangularis et quadricostulatus, deinde subteres, ad apicem circ. 2 mm, parte basali usque ad 5 mm diam., internodiis bisulcatis 3—11 cm longis. *Folia* opposita in caule subaequalia, in ramulis interdum distincte inaequalia, sed omnia in petiolum puberulum 5—15 mm longum contracta; lamina ovata, foliorum e caule orientium 5.5—9 cm longa et 3.5—4.5 cm lata, apice acuminata, basi ad petiolum contracta, margine nunc repanda vel plus minusve dentata, nunc subintegra, herbacea, discolor, sicc. supra saturate brunnea, subtus dilute brunnea, supra setulis paucis sparsa et cystolithis densius lineolata, costa tamen basis versus puberula, subtus costa nervis venuisque puberula, inter venulos subglabra, costa subtus prominula, nervis utroque latere costae plerumque 6 vel 7 prominulis, reticulatione laxa subtus colore saturatiore et pubescens distinguenda; folia ramulorum minora. *Spicae* ad apicem caulis et ramulorum paniculatim dispositae, i. e. spicarum terminalium trias vel pemptas a triadibus spicarum ex axillis foliorum supremorum et interdum etiam ex axillis foliorum folia suprema precedentium orientibus comitata. Spicae laterales triadum nunc bracteis foliaceis, i. e. penninerviis, usque ad 3 cm longis, plerumque tamen multo brevioribus, nunc bracteis trinerviis circ. 8 mm longis, apice acutissime exeuntibus sed neque spinoscentibus neque distincte marginatis suffultae. Bracteae fertiles et steriles subaequilongae, 1-nerviae, anguste hyalino-marginatae, dorso puberulae, margine pilis partim capitatis ciliatae, circ. 6 mm longae; bracteae fertiles 2.3 mm latae, in spinam contractae; steriles 1.7 mm latae, sensim in spinulam vix distinctamexeuntes. Bracteoles bracteis paulo longiores, bracteis sterilibus similiores, 1.5 mm latae. *Calycis* lobus posticus bracteae fertili similius, 2.5 mm latus; lobi antici per duas partes connati, 1.2 mm lati, marginati; lobi laterales 5 mm longi et 1.2 mm lati, non marginati. *Corolla* alba, extus glabra, 6.5 mm longa, tubo tereti 2.5 mm longo et 1.8 mm diam., apice contracto, intus ad constrictiorem barbato, fauce 1.5 mm longo, campanulato, labio supero vix notabile emarginato 2.2 mm longo et 1.8 mm lato, labio infero 3-fido. *Stamina* exteriora filamentis glabris 1 mm longis, interiora filamentis 0.4 mm longis instructa; antherae circ. 1 mm longae, thecis paulum inaequaliter insertis 0.8 mm longis, parallelis, apice basique obtusis. Granula pollinis ellipsoidea, 3-colporata, 32 μ longa et 22 μ diam., minute reticulata, colpis brevibus et latis. Discus vix conspicuus. *Ovarium* 1.6 mm altum, puberulum. Stylus hirtellus 2.5 mm longus. *Capsula* puberula 5 mm longa, 4-seminalis; semina pilis brevibus obtecta.

Sarawak: Maputi (Paputi), on the Lawas River, *Miss W. M. A. Brooke* 10094, 21th June 1955, L type, BM dupl.

South-west Borneo: S. Sibau, *Hallier* 1209 BG.

L. marginata is easily distinguishable from its nearest allies by the hyaline margin of the bracts and bracteoles and of the anticus and posticus calyx lobes.

A nearly related species was collected at Kapit on the Upper Rejang River (*J. and M. S. Clemens* 21223 BG) and also at a not-specified place in North Borneo (*Amdjah* 635 BG), but the material is rather poor.

The now following group of species belong to the new genus *Borne-*

acanthus. At first I was inclined to include them in *Phialacanthus* Benth., which was based on a species collected in Assam, but to which afterwards some species of the Malay Peninsula were added. The genus is still imperfectly known, and it is not impossible that a more detailed investigation will show that the Malayan species are sufficiently distinct from the Assam one to be removed to a new genus. At any rate, the Bornean species which I refer to my new genus *Borneacanthus*, can not be regarded as near allies, for they differ from them in several important points; the calyx is divided nearly to the base, the corolla, it is true, is two-lipped, but the lateral lobes of the lower lip cover the central one in the bud, and the latter is much wider and more or less distinctly auriculate at the base, and the pollen grains, though ellipsoidal and 3-colporate, differ from those of *Phialacanthus* by the absence of the fissures which in the pollen grains of that genus divide the space between the colpae in a central shield and two marginal bands, and the testa, though glabrous, is smooth instead of wrinkled and consists of rather thin-walled cells. In fact, like the nearly related *Filetia* Miq., *Phialacanthus* belongs to the Justicieae, at least if the latter are accepted in the delimitation I have given them in my "Notes on the Acanthaceae of Java" (in Verh. Kon. Ned. Akad. v. Wetensch., Afd. Natuurk. 2nd Sect. 45, no 2: 4. 1948), where it will probably have to find a place in the vicinity of *Asystasia* Bl., whereas *Borneacanthus*, on account of the aestivation of the corolla lobes, the broad, more or less distinctly auriculate central lobe of the lower lip, and the structure of the pollen grains, is to be regarded as an ally, though not a very near one, of the Lepidagathideae. The affinity with the latter is more pronounced than that with the Andrographideae, which agree with the Lepidagathideae in the structure of the pollen and of the testa, but differ from the latter in the aestivation of the corolla lobes and the presence of more than two ovules in each of the ovary cells, two characters in which they differ also from *Borneacanthus*.

Borneacanthus differs from the Andrographideae as well as from the Lepidagathideae in the absence of hairs on the testa, and from the latter moreover in the small size of the bracts and bracteoles and in the narrow and but slightly unequal calyx lobes. It is perhaps not superfluous to make some comments on the Lepidagathideae, as this group of genera is not yet generally recognized as a distinct tribe.

The tribus Lepidagathideae was proposed by me in Verh. Ned. Akad. v. Wetensch., Afd. Natuurk., 2nd Sect. 41, no 1: 12. 1944, and it was mentioned also in my "Notes on the Acanthaceae of Java", but so far no description has been given.

The group comprises besides *Lepidagathis* Willd. the genera *Telostachya* Nees, *Barleriola* Oerst., *Neuracanthus* Nees, *Calacanthus* T. And. and perhaps some other ones, i. e. a number of genera that on account of the structure of the calyx and the aestivation of the corolla lobes were so far included in the Barlerieae, although the concrecence of the anticus calyx lobes is in these genera not so complete as it is in *Barleria*, L. This character is, moreover, of comparatively little taxonomic importance, as it returns in several other genera that are distributed more or less at random

throughout the whole family; it is found as a general character in the Acanthaceae, and further in the genera *Asteracantha* Nees, *Petalidium* Nees, *Duvernia* E. Mey. and *Chaetothyrlax* Nees. The resemblance in the aestivation of the corolla lobes, although at first view of greater importance, might also be a mere analogy.

Lindau (in Engler & Prantl, *Naturl. Pflanzenfam.* IV, 3b: 312. 1895) thought that *Lepidagathis* and its allies resembled *Barleria* also in the structure of the pollen grains, but this is certainly a mistake. The pollen grains of *Barleria* are always large and globose (sometimes more or less distinctly 3-lobed, but this is a deviation of minor importance), 3-porous and very distinctly reticulate, the meshes being of considerable depth; that of *Lepidagathis* and its allies, on the other hand, is rather small, ellipsoidal, 3-colporate, and if reticulate, then only very superficially so.

In my "Notes on the Acanthaceae of Surinam" (in *Rec. d. trav. bot. Néerl.* 35: 150. 1938) the difference between this kind of reticulation and that of the pollen grains of *Barleria* was already emphasized, and at that time I already proposed to remove this group of genera from the *Barlerieae*. I thought that they might be referred to a subtribe *Blechinae* of the *Ruellieae*, but this is not the right place for them. The genus *Blechum* Juss. has ovary cells with more than two ovules, a 5-partite calyx, an actinomorphous corolla with in the bud contorted lobes, globose pollen grains with very long and narrow colpae, and can therefore not be regarded as a near ally; the subtribe *Blechinae* will have to be restricted to the genus *Blechum*.

Provisionally the Lepidagathideae may be defined in the following way:

Lepidagathideae, tribus nova subfamiliae *Ruellioidearum* Brem. (cf. Bremekamp in *Proc. Kon. Ned. Akad. v. Wetensch.*, Ser. C. 58: 163. 1955) calycis lobis inaequalibus, anticis pro parte connatis, corolla bilabiata, labio supero plus minusve emarginato, labio infero 3-fido, lobo mediano latiore et haud raro basi auriculato, in alabastro a lobis lateralibus obteeto, staminibus quattuor, granulis pollinis ellipsoideis, parvis, 3-colporatis, laevibus vel leviter reticulatis, colpis brevibus et latis, ovario utroque loculo ovulis duobus instructo, stigmate parvo, capsula non stipitata, testa dense pilosa, cellulis testae pariete tenui circumdatis noscenda.

Habitat regiones tropicales totius orbis.

Genera: *Lepidagathis* Willd., *Teliostachya* Nees, *Barleriola* Oerst., *Neuracanthus* Nees, *Calacanthus* T. And.

The new tribe Borneacantheae may then be characterized as follows:

Borneacantheae, tribus nova subfamiliae *Ruellioidearum* calyce in lobos aequales vel inaequilongos angustos partito, corolla bilabiata, labio supero emarginato, labio infero 3-fido, lobo mediano latiore et basi auriculato, in alabastro a lobis lateralibus obteeto, staminibus quattuor, granulis pollinis ellipsoideis, 3-colporatis, leviter reticulatis, colpis brevibus et latis, ovario utroque loculo ovulis duobus instructo, stigmate parvo, capsula ad basin solida et breviter stipitata, testa glabra et laevi, cellulis testae pariete tenui circumdatis noscenda.

Habitat partem orientalem Asiae Tropicalis.

Genus adhuc singulum *Borneacanthus* Brem. v. infra.

It is not quite impossible that the genus *Hulemacanthus* S. Moore, which

is known from New Guinea only (see my remarks on this genus in Nova Guinea, new ser., 8: 153. 1957), will prove to belong to this tribe, as it has exactly the same kind of pollen, four stamens, although only two are provided with bitheous anthers, and two ovules in each of the ovary cells. The median lobe of the lower lip of the bilabiate corolla has been described by S. Moore as on the outside in the bud, but an investigation of material belonging to the type species has shown that this is a mistake. Just as in *Borneacanthus* the median lobe is in the bud covered by the two lateral ones. The fruit of *Hulemacanthus* is still unknown, but if the seeds should prove to be glabrous and smooth, there would be good reason to include the genus in the Borneacantheae, although the delimitation of the latter should be slightly amplified in that case, as its calyx lobes are rather wide and imbricate, and as the upper lip of the corolla is entire.

The genus *Borneacanthus* may be characterized in this way:

***Borneacanthus* Brem. gen. nov.**

Herbae silvicolae. *Caulis* sympodialis. *Folia* opposita, aequalia, petiolata, lamina margine integra, cystolithis parvis plerumque geminis dense lineolata. *Inflorescentiae* terminales et interdum etiam axillares, paniculiformes, thyrsiformes vel racemiformes, pedunculatae. Flores ebracteolati vel bracteolis parvis, plerumque filiformibus instructi. *Calyx* 5-partitus, lobis linearibus vel filiformibus, haud raro inaequilongis, saepe ad marginem vel ad apicem solum pilis capitatis instructis. *Corolla* bilabiata, tubo tereti in faucem infundibuliformem ampliato, labio supero emarginato, labio infero 3-fido, lobo mediano latiore et basi auriculato, in alabastro a lobis lateralibus obtecto. *Stamina* 4, omnia antheris bitheca instructa; antica infra postica inserta, postica plica transversa connexa; filamenta glabra vel hirtella, aequilonga vel paulo inaequalia; antherae dorsifixae, apice obtusae, thecis parallelis, basi obtusis vel vix notabilis mucronulatis. Staminodium nullum. Granula pollinis ellipsoidea, 3-colporata, leviter reticulata, colpis brevibus et latis. Discus annularis, glaber. *Ovarium* utroque loculo ovulis 2 instructum. Stylus nunc glaber vel ad basin solum hirtellus vel pilis capitatis vestitus, nunc totus hirtellus; stigma capitatum. *Capsula* breviter stipitata, 4-seminalis. Semina glabra et laevia, opaca; cellulae testae pariete tenui instructae.

Habitat speciebus adhuc notis 6 insulam Borneo dictam.

Typus generis *Borneacanthus grandifolius* Brem. v. infra.

Key to the species

1. Stem erect and rather robust, 2.5—4.0 mm in diam. Leaves at least 10 cm long, with 7—13 nerves on each side of the midrib.
 2. Inflorescence paniculiform; rachis with 2—5 pairs of branchlets.
 3. Leaves elliptic. Calyx lobes subequal. Style at the base with a few very small capitate hairs 1. ***B. grandifolius***
 3. Leaves lanceolate. Calyx lobes distinctly unequal in length. Style either entirely or at least at the base hirtellous.
 4. Petiole not winged. Blade 18—28 cm long. Inflorescence puberulous with but very few capitate hairs. Bracteoles filiform. Posticus calyx lobe 4.5 mm long. Style entirely hirtellous 2. ***B. angustifolius***
 4. Petiole with undulate wings. Blade 11—17 cm long. Inflorescence puberulo-pubescent with a large number of capitate hairs. Bracteoles absent. Posticus calyx lobe 7 mm long. Style hirtellous at the base only
 3. ***B. paniculatus***

2. Inflorescence interruptedly thyrsiform; rachis with 5 or 6 pairs of cymes
 4. *B. stenothrysus*
1. Stem ascending or creeping, 1.0—2.5 mm in diam. Leaves at the most 10 cm long, with 5—7 nerves on each side of the midrib.
 5. Inflorescence racemiform, with but a small number of flowers. Peduncle glabrous
 5. *B. parvus*
 5. Inflorescence paniculiform with 4 or 5 pairs of branchlets. Peduncle puberulous
 6. *B. mesargyreus*

1. *Borneacanthus grandifolius* Brem. n. spec. inter congregeras inflorescentia paniculiformi instructas foliis ellipticis magnis et stylo ad basin pilis capitatis obtecto cognoscenda.

Herba robustior, simplex vel parce ramosa, usque ad 1.5 m alta. *Caulis* primum sparse pubescens, sicc. nigrescens, circ. 3.5 mm diam., mox cortice griseo, dense tuberculato vestitus; internodia bisuleata 4—9 cm longa. *Folia* in petiolum canaliculatum 1.5—2.5 cm longum subglabrum contracta; lamina elliptica, 20—28 cm longa et 9—10.5 cm lata, apice caudato-acuminata, basi contracta, subcoriacea, paulum discolor, sicc. haud conspicue decolorata vel subtus praesertim in nervis brunnescens, utrimque glabra et cystolithis parvis geminis dense lineolata, costa subtus prominula, nervis utroque latere costae plerumque 10, marginem versus arcte confluentibus, reticulatione laxa subtus conspicua. *Inflorescentiae* terminales et interdum etiam axillares, paniculiformes. Pedunculus 1.0—3.5 cm longus, puberulus; rhachis 1.5—4.0 cm longa; ramulorum paria 2—4. Bracteae ramulos suffulcantes lanceolatae, usque ad 10 mm longae; bracteae ramulorum superiorum in ramulos excurrentes. Bracteae flores suffulcantes linear-lanceolatae, 4—5 mm longae. Pedicelli vix 1 mm longi. Bracteolae nullae. *Calycis* tubus vix 1 mm longus; lobi lineares paulum inaequales, 4.5—5.0 mm longi et 0.5—0.7 mm lati, subobtusi, subcarinati, apice haud raro 1 vel 2 pilis capitatis instructi. *Corolla* 15 mm longa, lutea vel brunneola et rubro vel brunneo striata, tubo 5 mm longo, fauce 3 mm longo, labio supero 7 mm longo et 8 mm lato, labio infero 9 mm longo et 7 mm lato. *Stamina* filamentis circ. 3 mm longis instructa; antherae 2 mm longae, thecis basi obtusis. Granula pollinis 43 μ longa et 27 μ diam. *Ovarium* 1 mm altum, apice pilis capitatis puberulum. Stylus 7.5 mm longus, basi pilis capitatis per-brevibus instructus. *Capsula* obscure rubra 2 cm longa, glabra et opaca. Semina 3.5 mm diam.

SARAWAK: Gilam Pasang on the Belanga River, Miss W. M. A. Brooke 9057, 22nd August 1954, L type, BM dupl.; Belanga, ead. 9110, 27th August 1954, L, "fruits and upper pedicels dull red"; Berumput (Poi Range), alt. 1500 m, ead. 8673, 11th May 1954, L; Kapit on the Upper Rejang River, J. and M. S. Clemens 21225 K, BG, "flowers yellow and red"; ibid., Haviland and Hose 567 K et 9057 K; Gat on the Upper Rejang River, J. and M. S. Clemens 21556 K, BG; near Long Kapa, Mt Dulit (Ulu Tinjar), below 300 m, Richards 1036, 1283 et 1568 K; Baram District, Entoyut River, Hose 404 K, BM; Niat, Haviland and Hose 3515 K; Bau, Jebong, C. J. Brooks 1045 BM; Lundu, J. and M. S. Clemens 22232 K.

NORTH BORNEO: Tenampak, Amdjah 605, Sept. 1912, BG; Mt. Kinabalu, alt. 900 m, J. and M. S. Clemens 51328 K.

EAST BORNEO: West Kutai, Temalein, alt. 200 m, Endert 2915 BG.

CENTRAL BORNEO: s.l., Amdjah (Exped. Nieuwenhuis 1898/99) 297 BG; S. Utung, id. 351 BG; Bt Kasian, Jaheri (Exped. Nieuwenhuis 1896/97) 1039 et 1040 BG.

On the labels this species has sometimes been described as a shrub, but one of the specimens is complete with root, and this is doubtless no more than a robust herb.

B. grandifolius is easily recognizable by the very large, elliptic leaves, but it is doubtless a near ally of the two following species.

Another related species with lanceolate, caudate leaves and with calyx lobes which after flowering reach a length of 2 cm, is represented at Kew by a specimen collected at Gat (*J. and M. S. Clemens 21557*). The material was not sufficiently complete for a description.

2. *Borneacanthus angustifolius* Brem. n. spec. inter congeneras inflorescentia paniculiformi instructas maxime ut *B. grandifolius* Brem., sed foliis et bracteis angustioribus, calycis lobis et corolla brevioribus, stylo dense hirtello ab ea distinguenda, a *B. paniculato* Brem. petiolis non alatis et lamina majore diversa.

Herba robustior. *Caulis* primum vix notabile puberulus, sicc. nigrescens, circ. 3.5 mm diam.; internodia bisulcata 4.5—6 cm longa. *Folia* in petiolum canaliculatum 1.5—2.0 cm longum subglabrum contracta; lamina lanceolata, 18—28 cm longa et 5—6.5 cm, rarius usque ad 10 cm lata, apice acuminata vel sensim contracta, basi cuneata, subcoriacea, paulum discolor, sicc. olivacea, utrimque glabra et cystolithis parvis geminis dense lineolata, costa subtus prominente, nervis utroque latere costae 10—12, marginem versus arete confluentibus, reticulatione laxa subtus conspicua. *Inflorescentiae* terminales et interdum etiam axillares, paniculiformes. Pedunculus circ. 1.5 cm longus, puberulus; rachis 1.5—4 cm longa; ramulorum paria 2—5. Bracteae ramulos suffulientes linearis-lanceolatae, usque ad 8 mm longae, haud raro in ramulis excurrentes. Bracteae flores suffulientes vix 2 mm longae. Pedicelli circ. 1 mm longi, puberuli. Bracteolae filiformes, 0.5 mm longae. *Calycis* tubus vix 1 mm longus; lobi linearis-subulati inaequales; posticus 4.5 mm longus et 0.8 mm latus, alii 3 mm longi et 0.5 mm lati, omnes acuti, puberuli et insuper pilis aliquibus capitatis sparsi. *Corolla* 12.5 mm longa, colore ignoto, extus praesertim limbo puberula, intus ad insertionem staminum dense barbata, tubo 3 mm, fauce 4 mm longo, labio supero 5.5 mm longo et 6 mm lato, labio infero 6.5 mm longo et 5 mm lato. *Stamina* filamentis circ. 5.5 mm longis, vix notabile hirtellis instructa; antherae 1.8 mm longae. Granula pollinis 40 μ longa et 23 μ diam. *Ovarium* parce comosum. Stylus 9 mm longus, dense hirtellus. *Capsula* nondum visa.

SOUTHWEST BORNEO: Bt Liang Karing, Jaheri (*Exped. Nieuwenhuis 1896/97*) 1209 BG, type.

B. angustifolius differs from *B. grandifolius* in the narrower leaves, the smaller size if the floral bracts, the presence of small bracteoles, the distinctly unequal calyx lobes and the hirtellous style; occasionally, however, one of the leaves may reach a width which does not differ much from that of the leaves of the other species. From the next species, *B. paniculatus*, it is easily distinguishable by the absence of the undulate wings along the petiole, by the somewhat larger size of the lamina, by the less distinctly glandular-puberulous inflorescence and by the somewhat smaller size of the pollen grains.

3. *Borneacanthus paniculatus* Brem. n. spec. inter congeneras inflorescentia paniculiformi instructas ad *B. grandifolium* Brem. et *B. angustifolium* Brem. accedens, sed ab ambabus foliis minoribus petiolo undulato-

alato instructis, inflorescentia laxiore et distincte glanduloso-puberula diversa, a *B. grandifolio* insuper foliis lanceolatis et calycis lobis longioribus, a *B. angustifolio* granulis pollinis majoribus et stylo ad basin solum hirtello recedens.

Herba robustior. *Caulis* ab initio glaber, sicc. nigrescens, circ. 3.0 mm diam.; internodia 5—15 cm longa. *Folia* in petiolum undulato-alatum 1—2 cm longum glabrum contracta; lamina lanceolata, 11—17 cm longa et 3.0—5.2 cm lata, apice caudato-acuminata, basi contracta, margine interdum subundulata, subcordacea, discolor, sicc. supra brunnescens, subtus griseo-viridis, utrimque glabra et cystolithis geminis parvis dense lineolata, costa utrimque prominula, nervis utroque latere costae plerumque 10, marginem versus arete confluentibus, cum nervis uno vel duobus brevioribus alternantibus, reticulatione vix conspicua. *Inflorescentiae* probabiliter terminales et axillares, sed in specimine solo examinato inflorescentiae axillares solum preservatae, hae laxe paniculiformes. Pedunculus 3 cm longus; rachis 4 cm longa; ramulorum paria 3 vel 4; ubique pilis partim capitatis puberulo-pubescentes. Bracteae ramulos suffulcantes linear-lanceolatae vel lineares; infimae in petiolum contractae et usque ad 12 mm longae. Bracteae flores suffulcantes filiformes, 4—5 mm longae. Pedicelli 1—2 mm longi, sed bracteae ultimae saepe sine floribus, easu quo pedicelli quasi usque ad 5 m longi et circ. 1 mm infra apicem quasi bracteolati. Flores breviter pedicellati semper ebracteolati. *Calycis* tubus circ. 1 mm longus; lobi lineares 6 mm longi et 0.5 mm lati; lobus posticus tamen 7 mm longus et 1.0 mm latus; omnes acuti et carinati, pilis capitatis puberuli. *Corolla* 12 mm longa, colore ignoto, tubo 4 mm longo, fauce 3 mm longo, labio supero 5 mm longo et 6 mm lato, labio infero 6 mm longo et 7 mm lato. *Stamina* filamentis circ. 5 mm longis, glabris instructa; antherae 2.0 mm longae. Granula pollinis 50 μ longa et 28 μ diam. Ovarium parce comosum. Stylus 8 mm longus, ad basin hirtellus. *Capsula* nondum visa.

SARAWAK: Wong Pelagus on the Rejang River, Miss W. M. A. Brooke 8993, 12th August 1954, L type, "on a steep slope in the forest".

The points in which *B. paniculatus* differs from its nearest allies, *B. grandifolius* and *B. angustifolius*, have already been mentioned in the notes attached to the descriptions of these two species. Its most conspicuous feature is doubtless the winged petiole.

4. *Borneacanthus stenothrysus* Brem. n. spec. a congeneris omnibus hactenus notis inflorescentia ad thyrum interruptum redacta distinguenda.

Herba erecta. *Caulis* primum puberulus, sicc. nigrescens, circ. 2.5 mm diam.; internodia bisulcata 3—5 cm longa. *Folia* in petiolum canaliculatum 1—2 cm longum subglabrum contracta; lamina lanceolata, 12—14 cm longa et 4.0—4.8 cm lata, apicem versus contracta, basi cuneata, herbacea, paulum discolor, sicc. supra saturate olivaceo-brunnea, subtus griseo-viridis, utrimque glabra et opaca, utrimque cystolithis geminis dense lineolata, costa supra basin versus impressa, subtus prominente, nervis utroque latere costae circ. 8, subtus prominulis, reticulatione satis densa subtus colore saturatiore conspicua. *Inflorescentia* ad thyrum interruptum, e cymarum paribus 5 vel 6 compositum redacta. Pedunculus puberulus circ. 5 cm longus; rachis

8—9 cm longa; cymae triflorae vel partim ad florem singulum redactae. Bracteae lineares 3 mm longae, mox deciduae. Pedicelli 1—2 mm longi. Bracteolae 1.0—1.5 mm longae, etiam mox deciduae. *Calyx* fere ad basin partitus; lobi lineares circ. 5 mm longi, extus papilloso, post anthesin paulo elongati. *Corolla* 10.5 mm longa, colore ignoto, extus subglabra, tubo 3 mm, fauce 2 mm longo, labiis 5.5 mm longis et 5 mm latis. *Stamina* filamentis glabris 4 et 5 mm longis instructa; antherae 1.5 et 1.7 mm longae. Granula pollinis 48 μ longa et 27 μ diam. Ovarium glabrum. Stylus glaber 7.5 mm longus. *Capsula* 1.6 cm longa, glabra et opaca. Semina non visa.

CENTRAL BORNEO: S. Salut, Bt Kapur, *Jaheri* (Exped. Nieuwenhuis 1896/97) 1557 BG, type.

B. stenothyrsus is very easily recognizable by its thyrsoid inflorescence. Other noteworthy characters are the small size and deciduousness of the bracts, the fact that the calyx is divided nearly to the base, and that the upper and lower lip of the corolla are not only of the same length, a character that is also met with in the two following species, but also of the same width.

5. *Borneacanthus parvus* Brem. n. spec. inter congeneras hactenus notas statura parva cum *B. mesargyreo* (Hall. f.) Brem. v. infra solum comparanda sed ab ea inflorescentia racemiformi et pauciflora faciliter distinguenda.

Herba e basi repente ascendens, 7—12 cm alta. *Caulis* subteres, glaber, circ. 1.2 mm diam., foliorum paribus 3—5 instructus; internodia bisulcata 0.6—2.6 cm longa. *Folia* petiolo canaliculato glabro 3—9 mm longo instructa; lamina oblongo-lanceolata, 2.8—6.5 cm longa et 1.0—2.0 cm lata, utroque extremo acuta, herbacea, paulum discolor, sicc. supra saturate olivacea, subtus griseo-viridis, utrimque glabra et cystolithis geminis dense lineolata, costa utrimque prominula, nervis utroque latere costae 6—7, marginem versus arcte confluentibus, cum nervis brevioribus alternantibus, reticulatione satis densa subtus distinguenda. *Inflorescentia* racemiformis, pauciflora; pedunculus glaber 3—4 mm longus; rachis pedunculo subaequilonga. Bracteae lineares, pilis septatis sparsae, infimae penninerviae et circ. 6 mm longae, aliae 1-nerviae et circ. 5 mm longae. Pedicelli usque ad 2 mm longi. Bracteolae filiformes 5 mm longae. *Calyx* fere ad basin partitus; lobi filiformes margine primum pilis capitatis parce ciliati, deinde plus minusve glabrescentes, ad anthesin 8 mm longi, post anthesin usque ad 13 mm elongati. *Corolla* alba dicta 11 mm longa, extus ad apicem primum pilis capitatis sparsa, tubo tereti 3.5 mm, fauce 2.5 mm longo, labiis 5 mm longis, supero 4 mm lato, infero 5.5 mm lato. *Stamina* filamentis glabris 4 et 3 mm longis instructa; antherae 1.3 mm longae, thecis basi vix notabile mucronulatis. Granula pollinis 62 μ longa et 26 μ diam. *Ovarium* glabrum. Stylus glaber 8 mm longus. *Capsula* 1.2 cm longa, glabra et opaca. Semina 2.5 mm diam.

SARAWAK: Bakelalan (near Kelabit Plateau), alt. 1100 m, Miss W. M. A. Brooke 10489, 23rd August 1955, L type, BM dupl.; a half day from Maputi (or Paputi) on the Lawas River, alt. 600 m, ead. 10206, 5th July 1955, L.

NORTH BORNEO: Elphinstone Prov., Tawao, Elmer 20526 U (distributed as *Staugyne* spec.).

In habit *B. parvus* differs conspicuously from the four species described above. *B. mesargyreus* (Hall. f.) Brem. v. *infra*, however, is also a small plant, though not so small as *B. parvus*. The latter differs from all the species that so far have become known by its short recemiform inflorescence.

6. *Borneacanthus mesargyreus* (Hall. f.) Brem. n. comb. — *Strobilanthes mesargyrea* Hall. f., Nov. Act. Acad. Cur. 70: 195. 1897. — *Filetia mesargyrea* (Hall. f.) Brem., Verh. Ned. Akad. v. Wetensch., Afd. Natuurk. 2nd Sect. 41, no. 1: 280. 1944, inter congeneras hactenus notas statura parva cum *B. parvo* Brem. solum comparanda, inflorescentia paniculiformi et e floribus numerosioribus composita ab ea faciliter distinguenda.

Herba e basi repente ascendens, 10—25 cm alta. *Caulis* primum puberulo-pubescentes, subteres, 2.0—2.5 mm diam.; internodia bisulcata 2—10 cm longa, marginibus sulcorum subglabris. *Folia* in petiolum gracilem puberulo-pubescentem 0.6—3.0 cm longum contracta; lamina elliptica, 3.5—10.0 cm longa et 3.1—4.4 cm lata, apice acuminata, basi acuta vel raro subrotundata, margine interdum subundulata, herbacea, utrimque opaca, paulum discolor, sicc. supra olivacea vel olivaceo-brunnea, ad costam haud raro late albo-variegata, subtus viridi-brunnea, utrimque glabra, cystolithis quorum plures non gemini dense lineolata, costa subtus prominula, nervis utroque latere costae 5 vel 6, subtus ut reticulatio laxa colore saturatiore conspicuis. *Inflorescentia* anguste paniculiformis; pedunculus gracilis puberulus, 3.5—4.5 cm longus; rachis puberula 4.5—7.5 cm longa; ramulorum paria 4 vel 5. Bracteae ramulos suffulcantes foliaceae, puberulæ, infimæ circ. 10 mm longæ, aliae apicem versus usque ad 5 mm decrescentes, omnes mox deciduae. Bracteae flores suffulcantes lineares, usque ad 6 mm longæ, plerumque tamen breviores. Pedicelli puberuli 1—2 mm longi, sed bracteae ultimæ interdum sine floribus, casu quo pedicelli quasi usque ad 6 mm longi et 1—2 mm infra apicem quasi bracteolati. *Flores* breviter pedicellati semper ebracteolati. *Calycis* tubus vix 1 mm longus; lobi lineares, paulum inaequales, posticus et antici 6.5 mm longi et 1.5 mm lati, laterales 6 mm longi et 1.0 mm lati, omnes pilis pro parte capitatis puberulo-pubescentes. *Corolla* colore ignoto circ. 13 mm longa, extus apicem versus pubescens, intus glabra, tubo 4 mm, fauce 2.2 mm longo, labiis 6 mm longis. *Stamina* filamentis glabris 5 et 4 mm longis instructa; antheræ 1.5 mm longæ, thecis staminum posticorum interdum paulo inaequalibus, omnibus basi obtusis. *Granula pollinis* 48—52 μ longa et 26—30 μ diam. *Ovarium* glabrum. *Stylus* glaber, 7.5 mm longus. *Capsula* nondum visa.

CENTRAL BORNEO: Bt Kasiran, *Amdjah* (*Exped. Nieuwenhuis 1898/99*) 110 BG; Bt Tjihan, *id. 312* BG; S. Utung, *id. 354* BG; S. Bulit, *Jaheri* (*Exped. Nieuwenhuis 1898/99*) 267 BG; S. Salut, Bt Kapur, *id. 1551* BG; s.l., cult. in Hort. Bog. (*Exped. Nieuwenhuis 1896/97* 2108) BG.

SOUTH-EAST BORNEO: between Lumo Sibak and Bt Menangin, *Hub. Winkler* 3223 BG.

I have not seen the type specimen, which was collected at the base of the Amai Ambit and from there transferred to the Botanical Garden at Bogor, but the specimen from that garden which I have quoted above, agrees so completely with Hallier's figure that there can be no doubt as to their conspecificity; it may even be a descendant of the type specimen.

The other specimen mentioned by Hallier was not seen by me either; it was collected at the base of the Liang Gagang, and was like the type without flowers and fruits.

The broad, irregularly outlined band of white tissue along the midrib that was described and figured by Hallier, is present also in the cultivated specimen cited above, and further in Amdjah 312 and 354, but not in the other specimens, which therefore might be referred to a var. *viridis*. In *Hub. Winkler* 3223 the leaves are somewhat thicker, but there seem to be no other differences.

In habit *B. mesargyreus* shows some resemblance with *B. parvus* Brem., from which it is easily distinguishable by the larger, paniculiform inflorescence. In the form of the latter it approaches to the other species. In the peculiar development of the pedicels of some of the ultimate flowers, which seem to be much longer than the other ones and bibracteolate, because the upper bracts are empty, it resembles *B. paniculatus* Brem. In the nearly complete absence of paired cystoliths it differs from all the other species that are known so far.

The following two species are provisionally referred to the genus *Filetia* Miq. The latter is, like the related genus *Phialacanthus* Benth., but imperfectly known. Miquel's genus was based on a Sumatran plant of which unfortunately but little material is available for study, and the species of the Malay Peninsula which afterwards were referred to this genus, do not seem to be very near to the species of Miquel. The two species described below show on the whole a greater resemblance to some of the Malayan species than to *F. costulata* Miq. It is noteworthy, however, that the leaves of *F. costulata* are covered with patelliform glands, and that such glands are present also in part of the Malayan species, viz. in *F. glabra* Ridl., *F. scortechini* C. B. Clarke, *F. hirta* Ridl. and *F. ridleyi* C. B. Clarke, but not in *F. paniculata* C. B. Clarke and in *F. bracteosa* C. B. Clarke; in the two Bornean species described below they are well-developed. A very peculiar feature of the two Bornean species is that their leaves are rich in inulin, a substance that has not been found so far in the Acanthaceae. It was not found in the leaves of *F. costulata* nor in those of *F. bracteosa*, but other species could not be investigated.

1. *Filetia brookeae* Brem. n. spec. inflorescentia racemiformi et bracteis angustis cum *F. scortechini* C. B. Clarke, *F. ridleyi* C. B. Clarke et *F. lanceolata* Brem. v. infra congruens, sed ab eis foliis longioribus, a *F. scortechini* insuper foliis angustioribus distincta.

Herba probabiliter decumbens. *Caulis* sympodialis, primum pilis septatis dense pubescens, circ. 1.7 mm diam., deinde cortice griseo opaco vestitus; internodia 3—6 cm longa. *Folia* petiolo canaliculato densius pubescente 5—12 mm longo instructa; lamina lanceolata, 9—19 cm longa et 2.7—6.9 cm lata, apice longius acuminata, basin versus contracta, sed prope petiolum rotundata et plus minusve auriculata, margine integra, herbacea, paulum discolor, sicc. haud conspicue decolorata vel leviter brunnescens, utrimque opaca et glandulis patelliformibus vix notabile

punctata, praesertim supra cystolithis densius lineolata, subtus insuper primum sparse puberulo-pubescentia, costa supra basin versus impressa, subtus prominula, nervis utroque latere costae plerumque 7, subtus sicc. colore saturatiore conspicuis, reticulatione laxa vix conspicua. *Inflorescentia* terminalis et interdum etiam axillaris, racemiformis; pedunculus sparse pubescens 1.5—2.0 cm longus; rachis 3.5—4.5 cm longa, sparse puberulo-pubescentia vel subglabra, floribus 4 vel 5 munita. Bracteae 4—5 mm longae, acutae, margine ciliatae. Pedicelli 1—2 mm longi. Bracteolae bracteis similiores sed paulo breviores. *Calycis* tubus 1 mm longus; lobi bracteis bracteolisque similiores, 4.0—4.5 mm longi et ad medium 0.8—1.0 mm lati. *Corolla* alba, labio infero luteo, extus glabra, intus ad insertionem staminum et in lobo mediano labii inferi pilosa, circ. 13 mm longa, tubo 2.5 mm, fauce 5 mm longo, labio supero subintegro 4.5 mm longo, labio infero tripartito 5.5 mm longo. *Stamina* filamentis subaequilongis basin versus hirtellis, circ. 6 mm longis instructa; antherae thecis oblongis 1.4 mm longis, utroque extremo obtusis instructae, theca altera 0.4 mm supra alteram inserta. Granula pollinis ellipsoidea, 3-colporata, colpis fissuris 2 comitatis, 50 μ longa et 30 μ diam. Discus annularis glaber. *Ovarium* glabrum 1.6 mm altum. Stylus glaber 9 mm longus; stigmata subaequalia 0.3 mm longa, patentia. *Capsula* nondum nota.

SARAWAK: Matang, Miss W. M. A. Brooke 9389, 6th November 1954, L type; ibidem, alt. 300 m, ead. 9742, 24th March 1955, L, "forest"; Mt Santubong, Hewitt 16 K.

The pollen grains of this species are of the same type as those of *F. costulata* Miq., which, however, are somewhat shorter (34 μ \times 28 μ) and which show a slight torsion of the colpae and fissures. This type occurs also in the other species of *Filetia* which I could investigate, and in the related genus *Phialacanthus* too; Lindau called it "Spangenpollen" (clasp pollen).

In its racemiform inflorescence and small bracts *F. brookeae* resembles *F. scortechini* C. B. Clarke and *F. ridleyi* C. B. Clarke and also the second Bornean species, which is described below. Its leaves, however, are much longer.

2. *Filetia lanceolata* Brem. n. spec. inflorescentia racemiformi et bracteis angustis cum *F. scortechini* C. B. Clarke, *F. ridleyi* C. B. Clarke, *F. brookeae* Brem. congruens, foliis lanceolatis parvis insuper *F. ridleyi* similior, sed caule decumbente, primum sparse pubescente, foliis apice longius acuminatis et numero minore nervorum percursis, sepalis acutis ab ea certe diversa.

Herba decumbens. *Caulis* sympodialis teres, primum pilis septatis sparse pubescens, circ. 1.7 mm diam., deinde cortice griseo opaco vestitus; internodia 3.5—7 cm longa. *Folia* petiolo canaliculato, sparse pubescente, 3—7 mm longo instructa; lamina lanceolata, 3.5—11 cm longa et 1.3—3.0 cm lata, apice longius acuminata, basi cuneata, margine integra, subcoriacea, paulum discolor, sicc. supra olivaceo-brunnea, subtus griseo-brunnea, supra cystolithis dense lineolata, utrimque opaca et glandulis patelliformibus dense punctata, subtus costa nervisque sparse pubescentia, costa supra basin versus impressa, subtus prominula, nervis utroque latere costae 3 vel 4, subtus colore saturatiore conspicuis, reticulatione inconspicua.

Inflorescentia terminalis, racemiformis; pedunculus 1.3 cm longus, sparse pubescens; rachis 4 cm longa, subglabra, florum paribus 5 instructa. Bracteae lanceolatae, circ. 5 mm longae, glabrae. Pedicelli usque ad 4 mm longi, glabri. Bracteolae lineares 5 mm longae, glabrae. *Calycis* tubus 1 mm longus; lobi lineares 6 mm longi et 1.2 mm lati, acuti, glabri. *Corolla* nondum visa. *Capsula* etiam ignota.

SARAWAK: Pensiong Berumput (Poi Range), alt. 600 m, Miss W. M. A. Brooke 8493, 10th May 1954, L type.

This species is doubtless more nearly related to *F. brookeae* Brem. than to *F. ridleyi* C. B. Clarke, which it resembles in the size of the leaves, but from which it differs in habit and in the acute sepals. From *F. brookeae* it differs in the size of the leaves and in the number of their nerves, and also in a more scanty pubescence and a somewhat greater length of the calyx lobes.

Hallieracantha peranthera Brem. n. spec. inter congeneras anisophyllas inflorescentiis graciliter pedunculatis instructas maxime ut *H. laxa* Stapf, *H. dulcamaroides* Stapf, *H. creaghii* Stapf et *H. gibbsiae* (S. Moore) S. Moore, sed a prioribus antheris thecis inaequalibus instructis, foliis basi subobtusis vel obtusis, longius petiolatis, a *H. gibbsiae* caule sulcis solum pubescente, foliis basi symmetris et numquam cordatis, pedunculis paulo longioribus distinguenda.

Herba anisophylla. *Caulis* subteres; internodia bisulcata, sulcis breviter pubescentia, circ. 5 cm longa, sicc. nigrescentia. *Folia* normalia petiolo canaliculato 4—5 mm longo, marginibus puberulo instructa; lamina lanceolato-elliptica, 9—13.5 cm longa et 3.0—4.8 cm lata, apice caudato-acuminata, basin versus cuneata, sed prope petiolum subrotundata, symmetra, subconcolor, margine vix ciliolata, ceterum glabra, utrimque cystolithis dense lineolata, costa supra prominula, subtus prominente, nervis utroque latere costae plerumque 8 utrimque prominulis, reticulatione laxa utrimque distinguenda. *Folia* rudimentaria subulata, 4—5 mm longa, mox decidua. *Inflorescentiae* quoque nodo singulae vel binae, graciliter pedunculatae, e floribus 3 vel 4 monochasialiter dispositis constantes. Pedunculus pilis capitatis vix notabile puberulus, 1—3 cm longus; internodia rachidis usque ad 4 mm longa, apicem versus longitudine gradatim decrescentibus. Bracteae inferiores subulatae, 1.5 mm longae; superiores ovatae, circ. 1 mm longae. Pedicelli pilis capitatis puberuli, 4 mm longi. *Calyx* fere ad basin partitus, 5 mm longus; lobi filiformes, pilis capitatis puberuli. *Corolla* viridula, 23 mm longa, extus intusque glabra, tubo 7 mm longo et 2 mm diam., fauce 7.5 mm longo, labio supero bilobato 6 mm longo, sine rugula, lobis rotundatis 1.5 mm longis, labio infero supero aequilongo, 3-fido, lobis 3 mm longis, mediano palatifero, palato ad medium longitudinaliter canaliculato. *Stamina* 2 filamentis glabris 7.5 mm longis instructa; antherae 1.5 mm longae connectivo obliquo instructae, thecis inaequalibus, altera recta 1.5 mm, altera subpatente 1 mm longa, ambabus apice basique obtusis. Granula pollinis 3-colporata, 53 μ longa et 26 μ diam., laevia; colpae non fissuris comitatae. Staminodia nulla. Discus annularis 0.8 mm altus. *Ovarium* glabrum 1 mm altum. Stylus glaber 15 mm longus; stigma vix distingu-

dum. *Capsula* parce puberula stipite 7 mm longo inclusa 15 mm longa. Semina verruculosa 2.2 mm diam.

SARAWAK: Lawas, Miss W. M. A. Brooke 9944, 22nd May 1955, L type; a half day from Maputi (or Paputi) on the Lawas River, alt. 350 m, ead. 10181, 5th July 1955, L.

Apart from the anisophylly, a peculiarity found in the greater part of the species, and apart from the slender peduncle, a character of much rarer occurrence, the description mentions two features that deserve special attention, viz. the asymmetrical anthers with the subpatent smaller theca, to which the specific epithet refers, and the absence of additional fissures in the pollen grains. The latter are therefore not of the type which Lindau called "Spangenpollen" (clasp pollen), and which has been found in most of the anisophyllous *Hallieracantha* species that so far have been studied. Pollen grains similar to those of *H. peranthera* have been found in *H. anisophylla* (Hall. f.) Stapf, *H. dispar* (Hall. f.) Stapf, *H. laxa* Stapf and *H. gibbsiae* (S. Moore) S. Moore. This difference in pollen structure probably means that the genus can not be regarded as an entirely natural unit. In the structure of the anthers *H. peranthera* agrees with *H. gibbsiae*, but not with *H. laxa*, *H. dulcamaroides* Stapf and *H. creaghii* Stapf, the species with which it agrees in the comparatively long peduncle. Other points of difference with the latter are given in the latin diagnosis¹⁾.

Peristrophe monosemaeophora Brem. n. spec. inter congeneras quarum bracteae involucrales calycibus distinete latiores et longiores et etiam bracteis pedunculos capitulorum suffulcentibus dissimiles sunt, rachide inflorescentiae basi folio singulo magnitudine normali et bractea parva instructa et insuper bracteis involucralibus aequalibus, ovatis et minoribus distinguenda.

Herba erecta, ramosior, circ. 1 m alta. *Caulis* ramulique obtuse quadrangulares, graciles, 1—3 mm diam., primum sparse puberulo-pubescentes, deinde glabrescentes; internodia 4-sulcata, 4.5—11 cm longa. *Folia* petiolo gracili, primum densius puberulo-pubescent 1—2.5 cm longo instructa; lamina lanceolata vel elliptico-lanceolata, 7.5—12.5 cm longa et 2.4—5.0 cm lata, apicem versus contracta et acute exeuns, basi acuta, margine integra, herbacea, paulum discolor, sicc supra saturate et subtus dilute olivacea, supra glabra et costa nervisque cystolithis dense lineolata, subtus costa nervisque sparse puberula, inter nervos cystolithis majoribus densius lineolata, costa subtus prominula, nervis utroque latere costae plerumque 5, venulis paucis subtus difficiliter distinguendis. *Capitula* in inflorescentias paniculiformes disposita. Pedunculus communis internodio precedente similior. Rachis basi folio singulo forma et magnitudine normali vel magnitudine paulo redacto et etiam bractea setacea circ. 2 mm longa, dense puberula instructa, ramulis sequentibus a bracteis deltoideis circ. 1 mm longis suffultis. Capitula a pedunculis circ. 5 mm longis elata. Bracteae involucrales ovatae, 9 mm longae et 4 mm latae, costa et margine pilis brevibus sparsae. Flores quoque capitulo plerumque 3. Bracteae florum

¹⁾ The genus *Hallieracantha* appears to be represented in Siam too, for *Justicia graphocaula* Imlay is to be transferred to it; the name of the latter becomes therefore *Hallieracantha graphocaula* (Imlay) Brem., n. comb.

lateralium et bracteolae ovatae, circ. 1.2—1.7 mm longae et 0.5 mm latae, ciliolatae. *Calyx* 5 mm longus, fissio-partitus; lobi lineares acutissime ex-euntes, margine pilis capitatis et ecapitatis ciliolati, ad basin 0.5 mm lati. *Corolla* alba (*Rutten* 625), 2.2 cm longa, extus puberula, tubo 10 mm longo et 1 mm diam., labiis 12 mm longis, supero 6 mm lato, apice vix notabile emarginato, infero 4 mm lato, 3-lobato, lobis 1 mm longis, rotundatis. *Stamina* filamentis hirtellis, apicem versus glabrescentibus, 8.5 mm longis instructa; antherae 3.5 mm longae, thecis 1.8 mm longis. *Granula* pollinis 3-colporata, 49 μ longa et 43 μ diam. *Discus* urceolatus 0.8 mm altus, glaber. *Ovarium* 1.8 mm altum, puberulum. *Stylus* 18.5 mm longus, glaber; stigmata 2 filiformia 0.7 mm longa. *Capsula* 1.9 cm longa, puberula.

SARAWAK: Bah on the upper Rejang River, *Miss W. M. A. Brooke* 9043, 17th August 1954, L type, BM dupl.

NORTH-EAST BORNEO: Bulongan, River Sadjan, *Rutten* 625, 25th October 1912, U.

This new *Peristrophe* species is easily recognizable by the peculiar aspect of the inflorescence in which the capitula are combined. Of the lowermost pair of branchlets one is subtended by a very small bract, the other one by a leaf of more or less normal dimensions; the specific epithet refers to this leaf.

The following eight species, the last that will be dealt with in this paper, belong to a new genus that seems to be confined to Sarawak. With the exception of the first and the last, none of them was so far represented in the collections which I could study.

The genus is apparently nearly allied to *Pseuderanthemum* Radlk., with which it agrees in the extremely short corolla throat, in the structure of the androecium and in that of the pollen grains. It differs from that genus in the very small size of the flowers, in the emarginate or bilobate upper lip of the corolla, in the thinness of the wall in the pollen grains, and in the nearly smooth testa. It is true that in the genus *Pseuderanthemum* too occasionally very small flowers have been described, but there is good reason to assume that in these instances the description has been based on cleistogamic flowers, which in this genus are very common, and sometimes even so numerous that the chasmogamic flowers may be overlooked; they may have been shed in the specimens that were studied, and they may even have been entirely absent.

Cosmianthemum Brem. gen. nov. *Justicearum* sensu meo (cf. Bremekamp, Notes on the Acanthaceae of Java in Verh. Kon. Ned. Akad. v. Wetensch., Afd. Natuurk. 2nd Sect. 45, no. 2: 4. 1948) fauce brevissimo et androecio e staminibus 2 fertilibus exsertis et staminodiis 2 multo brevioribus composito, granulis pollinis globosis 3-colporatis, colpis quae in vineulis apice coherentibus et cum clupeis alternantibus inclusae sunt cum *Pseuderanthemo* Radlk. congruens, floribus parvis, corollae lobis 2 superioribus in labium bilobatum vel emarginatum connatis, testa sublaevi ab eo distinguendum.

Herbae silvicolae parvae. *Caulis* plerumque e basi decumbente ascendens, rarius erectus, sympodialis. *Folia* opposita aequalia, lamina plerumque ad petiolum subito rotunda et ibi conduplicata, rarius sensim in petiolum contracta, margine integra, supra cystolithis singulis satis magnis

densius lineolata. *Inflorescentia* terminalis, racemiformis, ad nodos inferiores tamen interdum ramulis perbrevibus instructa. *Flores* in axillis bractearum plerumque solitarii, ad nodos inferiores tamen haud raro duo vel tres superpositi, parvi. Bracteae parvae. Bracteolae ad basin pedicelli insertae, bractea minores. *Calyx* plerumque fere ad basin partitus; lobi subaequales vel paulum inaequales, casu quo posticus brevior, omnes angusti et acuti. *Corolla* ubi color notus est alba vel viridula, hypocrateriformis, intus glabra, tubo subrecto vel incurvato, casu quo facie postica paulo infra apicem bulla plus minusve distincta instructo, fauce subnullo, limbo bilabiato, labio supero emarginato vel bilobato, labio infero 3-partito. Androecium e staminibus 2 fertilibus et staminodeis 2 multo brevioribus compositum. *Stamina* fertilia filamentis applanatis satis longis et ad basin dilatatis instructa; antherae medio dorsi affixae, thecis aequalibus vel paulum inaequalibus, casu quo theca interna paulo minore; granula pollinis globosa, 3-colporata, colpis in vinculis apice coherentibus et cum clupeis rotundatis alternantibus inclusis, sculptura tamen ob tenuitatem parietis difficiliter distinguenda. Staminodia ad basin labii superi inserta et cum basibus filamentorum connexa, plerumque filiformia, recta vel incurvata. Discus annularis glaber. *Ovarium* utroque loculo ovulis 2 instratum. Stylus in stigmata 2 parva exiens et tantum quantum stamina exsertus. *Capsula* satis magna, stipite solido parti seminiferae subaequilongo instructa, 4-seminalis, inter semina inferiora et superiora plus minusve contracta, apice acuta. Semine sublaevia; testa e cellulis pariete crassiore flexuosa instructis composita.

Genus speciebus adhuc notis 8 in parte occidentali terraे borneensis distributum.

Species typica *Cosmianthemum magnifolium* Brem. v. infra.

Key to the species

1. Blade at the base suddenly rounded. Ascending or decumbent herbs.
2. Petioles tomentose.
 3. Stem tomentose. Bracts small and easily overlooked.
 4. Leaves glabrous above, never rounded at the top.
 5. Leaves lanceolate-oblong or elliptic, 11–21 cm long and 4.5–6.6 cm wide, caudate-acuminate, with 7–14 nerves on each side of the midrib, provided with a 3–5 mm long petiole. Peduncle 5.5–12 cm long; rachis 11–13 cm 1. *C. magnifolium*
 5. Leaves smaller and never caudate-acuminate, rarely with more than 8 nerves on each side of the midrib; petiole more than 5 mm long. Peduncle usually less than 5.5 cm; rachis always less than 11 cm long.
 6. Leaves elliptic or obovate, 7.5–12.5 cm long and 3.4–5.5 cm wide, acute or sub acuminate, usually with 6–8 nerves on each side of the midrib, without patelliform glands and provided with a 7–24 mm long petiole 2. *C. latifolium*
 6. Leaves linear, linear-lanceolate or oblanceolate, 4–8 cm long and 2.5–2.8 cm wide, gradually tapering towards the subobtuse top, usually with 5–7 nerves on each side of the midrib, on the lower side with small patelliform glands, and provided with a 5–15 mm long petiole 3. *C. angustifolium*
 4. Leaves on the upper side with scattered bristles, rounded at the top
 4. *C. obtusifolium*

3. Stem densely covered with basiscopic hairs. Bracts linear, the lower ones up to 9 mm long, towards the top of the raceme gradually decreasing to 2 mm 5. *C. longibracteatum*
2. Petioles puberulo-pubescent; hairs acroscopic. — Leaves linear-lanceolate or lanceolate with 5 or 6 nerves on each side of the midrib 6. *C. brookeae*
1. Blade at the base gradually merging into the petiole. Erect, nearly glabrous herbs.
7. Petioles 1—3 mm long; blade distinctly discolored, in the herbarium on the upper side dark, and on the lower side light brown; on the lower side with small patelliform glands, laxly reticulate 7. *C. punctulatum*
7. Petioles 6—10 mm long; blade not distinctly discolored, in the herbarium not markedly discolored, without patelliform glands, on the lower side rather densely reticulate 8. *C. subglabrum*

1. *Cosmianthemum magnifolium* Brem. n. spec. a congeneris foliis magnis, caudato-acuminatis, numero majore nervorum percursis et racemis longis noscenda.

Herba e basi decumbente ascendens, 25—40 cm alta. *Caulis* crassior, circ. 3.5 mm diam., pilis septatis tomentosus; internodia 2—5 cm longa. *Folia* petiolo tomentoso 3—5 mm longo instructa; lamina lanceolato-oblonga vel elliptica, 11—21 cm longa et 4.5—6.6 cm lata, apice caudato-acuminata, basi cuneata sed ad petiolum subito rotundata et ibi conduplicata, herbacea, distinete discolor, sicc. supra subnigra, subtus griseo-brunnea, utrimque opaca, supra glabra et in foliis veterioribus cystolithis parce lineolata, subtus costa tomentosa, nervis tomentellis et venulis nonnullis puberulo-pubescentibus exceptis etiam glabra, margine sparse ciliata costa supra basin versus impressa, subtus prominente, nervis utroque latere costae 7—14 subtus prominulis, reticulatione laxa subtus colore saturatiore conspicua. *Inflorescentia* racemiformis, floribus ad nodos tamen fasciculatis. Pedunculus 5.5—12 cm longus, tomentellus. Rachis 11—13 cm longa, tomentella, ex internodiis 3—10 mm longis composita. Bractae fasciculos suffulcantes lineari-subulatae; infimae circ. 6 mm longae, aliae apicem versus usque ad 3 mm decrescentes, margine hirtellae. Pedicelli hirtelli 2—5 mm longi. *Calyx* vix notabile hirtellus, fere ad basin partitus; lobi subaequales 2.5—3.0 mm longi. *Corolla* alba extus subglabra, tubo 4.5 mm longo et 1.0 mm diam., facie postica ad apicem bullata, labii 2.5 mm longis, supero breviter bilobato, infero 3-partito. *Stamina* fertilia filamentis glabris 2 mm longis et ad basin 0.4 mm latis instructa; antherae 1.2 mm longae, thecis subaequalibus, utroque extremo obtusis. *Granula pollinis* 42 μ diam. *Staminodia* filiformia 1 mm longa, recta. *Ovarium* glabrum 1.3 mm altum. *Stylus* glaber 5.7 mm longus. *Capsula* glabra, stipite 1.0 cm longo inclusa 2.1 cm longa. *Semina* 3.5 mm diam.

SARAWAK: Nanga Mujong, near Kapit, at the junction of the Mujong and Baleh River, Miss W. M. A. Brooke 8934, 4th August 1954, L type; Lawas, ead. 10011, 29th May 1955, L, "forest"; Kapit on the Upper Rejang River, J. et M. S. Clemens 21227 K; Gat on same river, id. 21558 K.

By its comparatively large size *C. magnifolium* differs conspicuously from the other species of this genus, and shows, especially in the fruiting stage, a rather strong resemblance to the *Pseuderanthema*. The other characters in which it differs from its allies, are mentioned in the key.

2. *Cosmianthemum latifolium* Brem. n. spec. a congeneris quae lamina

basi ad petiolum subito rotundata et caule petiolisque tomentosis instructae sunt foliis supra glabris ad *C. magnifolium* Brem. et *C. angustifolium* Brem. v. infra accedens, a priori foliis minoribus et numero minore nervorum percursis, longius petiolatis, a *C. angustifolia* foliis latioribus subtus sine glandulis distinguenda.

Herba e basi decumbente ascendens, 20—30 cm alta. *Caulis* 2.5—3.5 cm diam., pilis septatis tomentosus; internodia 1—5 cm longa. *Folia* petiolo tomentoso 7—24 mm longo instructa; lamina elliptica vel obovata, 7.5—12.5 cm longa et 3.4—5.5 cm lata, apice acuta vel subacuminata, basi etiam acuta sed ad petiolum subito rotundata et ibi conduplicata, subcoriacea, distincte discolor, supra sicc. subnigra, subtus griseo-brunnea, utrimque opaca, supra glabra et cystolithis satis dense lineolata, subtus costa nervisque pubescens, inter nervos pilis paucis sparsa, costa supra basin versus impressa, subtus prominula, nervis utroque latere costae plerumque 6—8 subtus prominulis, reticulatione laxa subtus colore saturatiore conspicua. *Inflorescentia* racemiformis. Pedunculus tomentellus vel densius puberulus 2.5—9 cm longus. Rachis 2—8 cm longa, puberula, ex internodiis plerumque 2—5 mm longis, infimis tamen usque ad 15 mm longis constans. Bractae anguste deltoideae, 1.5 mm longae, max deciduae. Bracteolae bracteis minoris. Pedicelli 1—1.5 mm longi, subglabri. *Calyx* vix notabile hirtellus, 1.2 mm longus, fere ad basin partitus; lobi deltoidei. *Corolla* colore ignoto extus subglabra, tubo 2.8 mm longo, facie postica indistincte bullata, labii 1.8 mm longis, supero bilobato. *Stamina* fertilia filamentis glabris 1.8 mm longis et ad basin 0.4 mm latis instructa; antherae 1.2 mm longae, thecis subaequalibus, utroque extremo obtusis. Granula pollinis 35 μ diam. Staminodia filiformia 0.6 mm longa, recta. *Ovarium* glabrum 0.9 mm altum. Stylus basi vix notabile hirtellus 3.0 mm longus. *Capsula* nondum visa.

SARAWAK: Kuching, Miss W. M. A. Brooke 9776, 28th March 1955, L type, Simanggang on the River Lutar, ead. 10889, October 1955, L; Sungai Raya, ead. 9354, 3rd November 1954, L (determinatio incerta).

The differences between this species and its allies are given in the key.

3. *Cosmianthemum angustifolium* Brem. n. spec. a congeneris omnibus hactenus notis *C. punctulato* Brem. v. infra excepto foliis subtus glandulis patelliformibus punctulatis diversa, lamina ad petiolum subito rotundata et caule petiolisque tomentosis ad *C. magnifolium* Brem. et *C. latifolium* Brem. accedens sed foliis minoribus et multo angustioribus ab eis faciliter distinguenda.

Herba decumbens, 15—20 cm alta. *Caulis* 1.5—2.0 mm diam., primum pilis septatis tomentosus; internodia 1—4 cm longa. *Folia* petiolo tomentoso 5—15 mm longo instructa; lamina linearis, lineari-lanceolata vel ob lanceolata, plerumque 4—8 cm longa et 0.9—2.1 cm lata, rarius in foliis aliquibus 7—8 cm longa et 2.5—2.8 cm lata, apicem obtusiusculum versus acutata et basi ad petiolum subito sed vix notabile rotundata, margine anguste recurvata, subcoriacea, distincte discolor, sicc. supra subnigra vel saturate olivacea, subtus griseo-brunnea, utrimque opaca, supra glabra et cystolithis densius lineolata, subtus costa nervisque densius pubescentibus, venulis pro parte sparse pubescentibus exceptis etiam glabra sed glandulis patelliformibus vix notabile punctulata, costa supra basin versus impressa, sub-

tus prominente, nervis utroque latere costae plerumque 5—7, venulis paucis subtus distinguendis. *Racemus* terminalis interdum utroque latere inflorescentia singula vel inflorescentiis duabus superpositis ex axillis foliorum supremorum orientibus comitatus. Pedunculus pilis septatis brevibus densius puberulo-pubescentes, 4—9 mm longus. Rachis 2—4 cm longa, etiam densius pubescens, internodio infimo usque ad 10 mm longo, aliis plerumque circ. 2 mm longis. Bracteae ovato-deltoidae 1—2 mm longae. Bracteolae bracteis minores. Flores in axillis bractearum inferiorum interdum duo superpositi; alii in axillis solitarii. Pedicelli vix notabile hirtelli 1—2 mm longi. *Calyx* fere ad basin partitus; lobi subaequales 1.2 mm longi, vix notabile hirtelli. *Corolla* alba vel viridula, extus glabra, tubo incurvato 4 mm longo, facie postica 1 mm infra apicem bullata, labiis 2.4 mm longis, supero breviter bilobato. *Stamina* fertilia filamentis glabris 2 mm longis et basi 0.4 mm latis instructa; antherae 1.0 mm longae, thecis subaequalibus utroque extremo obtusis. Granula pollinis 35 μ diam. Staminodia filiformia 0.4 mm longa, recta. *Ovarium* glabrum 1 mm altum. Stylus ad basin vix notabile glanduloso-puberulus 4 mm longus. *Capsula* glabra, stipite 1.0—1.3 cm longo inclusa 1.5—2.0 cm longa.

SARAWAK: Kuching, Miss W. M. A. Brooke 9422, 11th November 1954, L type, BM dupl.; ibidem, ead. 8374, 15th April 1954, L; 8212, 22nd March 1954, L; "forest", 8639, 1st June 1954, BM.

A noteworthy, although not very conspicuous, feature of this species are the patelliform glands on the lower side of the leaves. Although such glands are not very rare in the Acanthaceae, they are certainly not a general feature of the family, and in the genus *Cosmianthemum* they are confined to this species and *C. punctulatum* Brem., at least if we confine our attention to the species described in this paper, for a third species whose leaves are provided with this kind of glands was collected in North Borneo on Mt Kinabalu between Dallas and Tenompok at an altitude of 1200 m (*J. and M. S. Clemens* 27545 K, BM). It is apparently a near ally of *C. angustifolium*, but differs from the latter in the indumentum of the stem and the petioles, which are tomentellous instead of tomentose, and in the size and shape of the leaves, which are lanceolate to obovate, and measure 9—14 cm \times 3.0—4.8 cm. *C. punctulatum*, although also provided with narrow leaves, can hardly be regarded as a near ally, as it has an entirely different habit, and as its leaves are provided with a large number of nerves. The points in which *C. angustifolium* differs from the other species described in this paper, can be learned from the key.

4. *Cosmianthemum obtusifolium* Brem. n. spec. inter congeneras caule petiolisque tomentosis instructas foliis apice obtusis, supra primum setis sparsis distinguenda.

Herba e basi decumbente ascendens, 20—25 cm alta. *Caulis* 1.3—2.0 cm diam., pilis septatis tomentosus; internodia 1—6 cm longa. *Folia* petiolo tomentoso 5—17 mm longo instructa; lamina oblonga, 5—6 cm longa et 2.0—3.4 cm lata, apice obtusa, basi rotundata et ad petiolum plus minusve conduplicata, herbacea, distincte discolor, sicc. supra subnigra et subtus dilute brunnea, utrimque opaca, supra primum setis paucis sparsa en in costa dense pubescens, deinde plus minusve glabrescens, subtus costa nervis

et venulis aliquibus pubescens sed ceterum glabra, costa supra basin versus impressa, subtus prominente, nervis utroque latere costae 6—8 subtus prominulis, reticulatione laxa subtus distinguenda. *Inflorescentia* racemiformis. Pedunculus 4—6.5 cm longus, dense pubescens. Rachis 2—7 cm longa, dense puberula, ex internodiis plerumque 3—5 mm longis, infimis tamen usque ad 15 mm longis composita. Bracteae minimae et mox deciduae. Bracteolae etiam minimae. Flores in axillis bractearum infimarum interdum superpositi, alii singuli. Pedicelli 2—3 mm longi, vix notabile puberuli. *Calyx* vix notabile hirtellus 1.2 mm altus, fere ad basin partitus; lobi subaequales deltoidei. *Corolla* colore ignoto extus subglabra, tubo facie postica bullato 3.5 mm longo, labiis 2.0 mm longis, supero emarginato. *Stamina* fertilia filamentis glabris 2 mm longis et basi 0.4 mm latis instructa; antherae 1.1 mm longae, thecis subaequalibus, apice basique obtusis. Granula pollinis 34 μ diam. Staminodia filiformia 0.6 mm longa, recta. *Ovarium* glabrum 1.1 mm altum. Stylus subglaber 4 mm longus. *Capsula* glabra, stipite 1.1 cm longo inclusa 2.0 cm longa.

SARAWAK: Eerian on the Sadung, 40 miles SE of Kuching, Miss W. M. A. Brooke 9560, 16th January 1955, L type, BM dupl.

C. obtusifolium is among the species with tomentose stem and petioles easily recognizable by its rather small obtuse leaves.

5. *Cosmianthemum longibracteatum* Brem. n. spec. a congeneris omnibus haec tenus notis bracteis longioribus distinguenda, petiolis tomentosis ad species precedentes accedens, sed caule subtomentoso ab eis etiam recedens.

Herba e basi decumbente ascendens, circ. 25 cm alta. *Caulis* gracilis, 1.0—1.5 mm diam., pilis septatis plus minusve basiscopis subtomentosus; internodia 2.5—4.5 cm longa. *Folia* petiolo tomentoso 2—3 mm longo instructa; lamina angusta obovata, 4.5—8 cm longa et 1.8—3.2 cm lata, apicem obtusiusculum versus contracta, basi cuneata sed ad petiolum subito rotundata et ibi plus minusve conduplicata, herbacea, distincte discolor, supra sicc. subnigra, subtus dilute brunnea, utrimque opaca, supra glabra et cystolithis densius lineolata, subtus costa nervisque tomentella sed ceterum etiam glabra, costa supra basin versus impressa, subtus prominula, nervis utroque latere costae plerumque 5 vel 6, rarius usque ad 9, subtus prominulis, reticulatione laxa subtus interdum colore saturatiore conspicua. *Racemus* pedunculo pilis basiscopis densius puberulo-pubescente 3.5 cm longo elatus; rachis 6—7 cm longa, etiam puberulo-pubescent, ex internodiis 2—4 mm longis, infimo tamen usque ad 10 mm longo composita. Bracteae lineares, infimae usque ad 9 mm longae, aliae 3—4 mm longae, superiores interdum alternantes et ad 2 mm redactae, margine brevissime hirtello-ciliolatae. Bracteolae ad basin pedicelli insertae, vix 0.5 mm longae. Pedicelli hirtelli 3 mm longi. *Calyx* sparse et vix notabile hirtellus, tubo 0.3 mm alto, lobis subaequalibus 2.0 mm longis. *Corolla* lactea, extus subglabra, tubo 4.5 mm longo, paulum curvato et facie postica circ. 1 mm infra apicem vix notabile bullato, labiis 2.5 mm longis, supero bilobato. *Stamina* fertilia filamentis glabris 2.5 mm longis et ad basin 0.3 mm latis instructa; antherae apice emarginatae, thecis paulum inaequalibus, utroque extremo obtusis. Granula pollinis 35 μ diam. (multa sterilia). Staminodia 0.3 mm longa, latiora et obtusa. *Ovarium* glabrum 1.2 mm altum. Stylus ad basin sparse et vix

notabile hirtellus, 5 mm longus. *Capsula* glabra, stipite 0.9 mm longo inclusu 2 cm longa.

SARAWAK: Grajih Betong near Batang, *Miss W. M. A. Brooke* 8250, 28th March 1954, L type, BM dupl.; Gilam Bakun, above Belarga on the Balu River, *ead.* 9074; 23rd August 1954, L; Wong Pelagus on the Upper Rejang River, *ead.* 9302, 14th September 1954, L.

C. longibracteatum is easily recognizable by its well-developed bracts. Further it is noteworthy that this species and *C. punctulatum* Brem. are the only representatives of this genus in which the calyx is not divided nearly to the base, but only somewhat less than half-way. However, whereas the lobes in *C. punctulatum* are distinctly unequal, they are here subequal.

The considerable percentage of sterile pollen grains might suggest a hybrid origin, but the species does not seem to be intermediate between any two of the other ones that so far are known.

6. *Cosmianthemum brookeae* Brem. n. spec. a speciebus precedentibus caule petiolisque puberulo-pubescentibus, a speciebus sequentibus foliis paucinerviis distinguenda.

Herba suberecta, 20—25 cm alta. *Caulis* in parte superiore 1.0—1.5 mm diam., basin versus usque ad 2 mm diam., pilis basiscopis densius puberulo-pubescentis, mox cortice griseo, sicc. plicatulo vestitus; internodia 1.5—4 cm longa. *Folia* petiolo pilis acroscopis puberulo-pubescente 3—6 mm longo instructa; lamina linear-lanceolata vel lanceolata, 9.5—11 cm longa et 1.8—2.0 cm lata vel 7—13 cm longa et 2.1—3.5 cm lata, apicem versus contracta vel in foliis lanceolatis caudato-acuminata, basi cuneata sed prope petiolum rotundata et ibi conduplicata, herbacea, discolor, sicc. supra saturate olivacea, subtus griseo-viridis, utrimque opaca, supra glabra et cystolithis lineolata, subtus costa nervisque puberulo-pubescentis sed inter nervos glabra, costa nervisque insuper in foliis veterioribus cystolithis densissime lineolatis, costa subtus prominula, nervis utroque latere costae 5 vel 6, reticulatione laxa subtus ut nervi colore saturatiore conspicua. *Inflorescentia* racemiformis, floribus ad nodos inferiores tamen fasciculatis. Pedunculus puberulus 3.5—4.5 cm longus. Rachis puberula 5—6 cm longa, ex internodiis 2—10 mm longis composita. Bracteae infimae auguste deltoideae, circ. 6 mm longae; aliae ovato-deltoideae, 1—1.5 mm longae, subglabrae. Bracteolae basi pedicelli insertae bracteae forma similiores sed 0.6 mm longae. Pedicelli sparse papillosi circ. 2 mm longi. *Calyx* sparse papillosus, fere ad basin partitus; lobi subaequales 2.0—2.2 mm longi, basi 0.4 mm lati. *Corolla* alba extus glabra, tubo 3.5 mm longo, facie postica ad apicem bullato, labiis 2.2 mm longis, supero bilobato. *Stamina* fertilia filamentis glabris 1.8 mm longis et basi 0.4 mm latis instructa; antherae 1.2 mm longae, thecis subaequalibus utroque extremo obtusis. Granula pollinis 38 μ diam. Staminodia anguste deltoidea 0.4 mm longa. *Ovarium* glabrum 1.1 mm altum. Stylus glaber 4.3 mm longus. *Capsula* glabra, stipite 6 mm longo inclusu 1.5 cm longa.

SARAWAK: Lubok Antu on the river Lumar, *Miss W. M. A. Brooke* 10681, 25th October 1955; L type, BM dupl., "along river bank in forest".

In the peculiar form shown by the basal part of the leafblade, which is folded along the midrib and suddenly rounded at the place where it passes into the petiole, this species reveals its affinity to the preceding

species. Its puberulo-pubescent stem reminds one of *C. longibracteatum* Brem., but whereas the petioles of the latter are tomentose, those of *C. brookeae* are puberulo-pubescent. The fascicled flowers in the basal part of the inflorescence form a feature that is also met with in *C. magnifolium* Brem. and in the two following species.

7. *Cosmianthemum punctulatum* Brem. n. spec. a speciebus precedentibus lamina basi non rotundata sed sensim in petiolum contracta recedens et ad speciem sequentem accedens, ab ea foliis brevius petiolatis, subtus glandulis patelliformibus punctulatis diversa.

Herba erecta 30—40 cm alta. *Caulis* 1.8—2.5 mm diam., sparse et vix notabile puberulus, basin versus cortice griseo-brunneo opaco vestitus; internodia 1.5—4 cm longa. *Folia* in petiolum subglabrum 1—3 mm longum contracta; lamina lanceolata, linear-oblunga vel oblonga, 11—13.5 cm longa et 3.0—3.9 cm, rarius usque ad 5 cm lata, apice in caudam obtusiusculam contracta, basi sensim in petiolum mergens et ibi arcuato-concava, herbacea, distinete discolor, sicc. supra saturate et subtus dilute brunnea, utrimque subglabra, supra tarde et parce cystolithis lineolata, subtus glandulis patelliformibus punctulata, costa supra prominula et subtus prominente, nervis utroque latere costae 10—12, reticulatione laxa ut costa et nervi colore saturatiore conspicua. Inflorescentia racemiformis, re vera tamen panicula ramulis brevissimis instructa. Pedunculus 4—5.5 cm longus, dimidio superiore puberulo-pubescentis. Rachis 5.5—13 cm longa, ex internodiis 0.2—2.0 cm longis composita, puberulo-pubescentis. Bracteae ramulos suffulientes lineares; infimae circ. 4 mm longae, apicem versus usque ad 0.5 mm decrescentes, mox deciduae; bracteae flores suffulientes ovato-deltoidae, circ. 1 mm longae. Pedicelli 0.5—1.0 mm longi. *Calyx* puberulus tubo 0.3 mm longo instructus; lobi deltoidei inaequales, posticus 1.0 mm longus et basi 0.5 mm latus, antici 1.9 mm longi et basi 0.8 mm lati, laterales forma et magnitudine intermedii. *Corolla* colore ignoto extus puberula, tubo 8 mm longo, facie postica sine bulla, labiis 3.0 mm longis, supero apice breviter bilobato, lobo mediano labii inferi equitante. *Stamina* fertilia filamentis glabris vel vix notabile et parce hirtellis 1.6 mm longis et basi 0.4 mm latis instructa; antherae 1.3 mm longae, thecis paulo inaequalibus, majore apice basique subacuta, minore apice basique obtusa. Granula pollinis 42—45 μ diam. Staminodia filiformia 0.6 mm longa, apice paulum incurvata. *Ovarium* glabrum 1.6 mm altum. Stylus hirtellus 5 mm longus. *Capsula* glabra, stipite, 1.3 cm longo inclusa 2.8 cm longa.

SARAWAK: Berumput, Poi Range, alt 900 m, *Miss W. M. A. Brooke* 8594, 10th May 1954, L type; Serian on the Sadong, 40 miles SE of Kuching, ead. 9556, 16th January 1955, L, "in forest".

C. punctulatum agrees with *C. angustifolium* Brem. in the presence of patelliform glands on the lower side of the leaf, but it can nevertheless not be regarded as a near ally as it differs from the latter and, in fact, from all the preceding species in its erect habit, the nearly complete absence of an indumentum on the stem and petioles, the shape of the lamina which passes gradually into the petiole, the absence of the hollow swelling on the posticus side of the corolla tube, the equitant middle lobe of the lower lip, the incurvate top of the staminodes and the entirely hir-

tellous style. In all these points it agrees with the next species, from which it is easily distinguishable by the shortness of the petioles, the presence of patelliform glands on the lower side of the leaf and the lax reticulation of the latter.

8. *Cosmianthemum subglabrum* Brem. n. spec. lamina sensim in petiolum contracta, corolla facie postica non bullata, lobo mediano labii inferi equitante, staminodiis incurvatis, stylo hirtello cum *C. punctulatum* Brem. congruens, petiolis longioribus, foliis non distinete discoloribus, subtus non punctulatis, reticulatione densiore ab ea faciliter distinguenda.

Herba erecta 25—60 cm alta. *Caulis* gracilis 1.0—1.8 mm diam.; internodia 1.7—6.5 cm longa, bisulcata, sulcis interdum pilis paucis sparsis. *Folia* in petiolum gracilem 6—10 mm longum, marginibus pilis paucis sparsum contracta; lamina lanceolata vel linearis-lanceolata, 4.5—15 cm longa et 0.9—3.8 cm lata, apice in caudam obtuse exaequata, basi cuneata, herbacea, paulum discolor, sicc. haud conspicue discolorata, utrimque glabra et cystolithis satis magnis densissime lineolata, costa supra prominula, subtus prominente, nervis utroque latere costae 11—15, reticulatione satis densa utrimque distinguenda, costa nervis et venulis princeps palibus cystolithis minoribus densissime striatis. *Inflorescentia* racemiformis, ad nodos inferiores tamen ramulis perbrevibus instructa. Pedunculus 2—4 cm longus, glaber vel pilis aliquibus perbrevibus sparsus. Rachis 3.5—9.5 cm longa, subglabra, ex internodiis circ. 5 mm longis composita. Bracteae ramulos suffulcantes anguste deltoideae, vix 1 mm longae; bracteae flores suffulcantes paulo latiores sed vix 0.5 mm longae. Pedicelli 1—2 mm longi, puberuli. *Calyx* fere ad basin partitus; lobi 3 mm longi, posticus tamen paulo minor, omnes puberuli. *Corolla* viridula, extus vix notabile puberula, tubo 6.5—7.0 mm longo, facie postica sine bulla, labii 4.0 mm longis, supero breviter bilobato, lobo mediano labii inferi equitante. *Stamina* fertilia filamentis glabris 2 mm longis et ad basin 0.7 mm latis instructa; antherae 1.3 mm longae, thecis aequalibus, apice basique obtusis. Granula pollinis 35 μ diam. Staminodia 1.3 mm longa, apice incurvata. *Ovarium* apice pilis capitatis minimis sparsum 1.7 mm altum. Stylus 6.5 mm longus, hirtellus. *Capsula* glabra, stipite 1.2 cm longo inclusa 2.3 cm longa.

SARAWAK: Kuching, Miss W. M. A. Brooke 9679, 13th February 1955, L type, BM dupl.; ibidem, Haviland and Hose 3545 p.p. K, BM; Simanggang on the River Lupar, Miss W. M. A. Brooke 10818, 31st October 1955, L.

As pointed out in the note attached to the description of *C. punctulatum* Brem., *C. subglabrum* and *C. punctulatum* are to be regarded as very near allies; the points in which they differ from each other, have been given at the same place.

Summary

Descriptions are given of the tribe Lepidagathideae, that had already been proposed in an earlier paper, and of an entirely new tribe related to the latter, the Borneacantheae. The last-named tribe comprises so far

but a single genus, *Borneacanthus*, based on *B. grandifolius*; it further includes *B. angustifolius*, *B. paniculatus*, *B. stenothyrsus*, *B. parvus* and *B. mesargyreus* (Hall. f.) Brem. (*Strobilanthes mesargyreus* Hall. f. = *Filetia mesargyrea* Brem.), and is confined to Borneo. Another new genus, *Cosmianthemum*, a near ally of *Pseuderanthemum*, seems to have an even narrower geographical distribution, for it has been found so far only in the western part of Borneo. It is based on *C. magnifolium*, and comprises in addition *C. latifolium*, *C. angustifolium*, *C. obtusifolium*, *C. longibracteatum*, *C. brookeae*, *C. punctulatum* and *C. subglabrum*. To the species of these two genera keys are provided. Further are described *Hemigraphis sarawacensis*, *Lepidagathis marginata*, *Filetia brookeae*, *F. lanceolata*, *Hallieracantha peranthera* and *Peristrophe monosemaeophora*. The area of *Hallieracantha* is extended to Siam by the inclusion of *H. graphocaula* (Imlay) Brem. (*Justicia graphocaula* Imlay). On account of the presence of two different kinds of pollen in this genus, it is suggested that it may not be an altogether natural unit. The leaves of the two new species of *Filetia* proved to contain inulin, but this substance, whose occurrence in the Acanthaceae was so far unknown, is not present in all the representatives of this genus.