orsale lanceolatum, acutum, concaviusculum, 5 mm. longum. etala linearia, acuta, trinervia, 6 mm. longa, circiter .5 mm. lata. abellum 7 mm. longum brevi-unguiculatum, deinde cunea-um, trilobum, lobi laterales rotundati, circiter 2 mm. lati, leviter enulati; lobus medius triangularis, 2.5 mm. longus, 2.5 mm. tus, subacutus. Mentum 3–4 mm. longum. In disco labelli linea evata, sulcata, a basi ipsa medium labelli usque decurrens ibi-ue in processus setiformes mutans.

Dendrobium leytense in general habit resembles *D. piesto-ulon* Schltr., from which it differs in its broader leaves and more rongly complanate stems. The labellum is not at all fleshy, or ickened at the tip, in dried specimens. Besides the type I have xamined many specimens collected by Wenzel (0415) in Leyte, hich bear flowers 1 cm. long with lips 9 mm. long. From the aterial at hand the sepals and petals appear to have been yel-wish, the labellum tinged with pale purple.

LEYTE, Dagami, *C. A. Wenzel 082*, January 15, 1913. On trees at great height. Altitude 60 meters above sea level. Flowers greenish-yellow and pink.

37. Dendrobium longicolle *Lindl.* in Bot. Reg. (1840) Misc. 74. his species has been ascribed to the Philippines, but not with rety. Cf. *D. Clemensiæ*.

38. Dendrobium lunatum *Lindl.* in Journ. Linn. Soc. 3 : 4.

PALAWAN.

39. Dendrobium luzonense *Lindl.* in Bot. Reg. (1844) Misc. 54. . alagense *Ames* in Phil. Journ. Sci. 2 : 328.

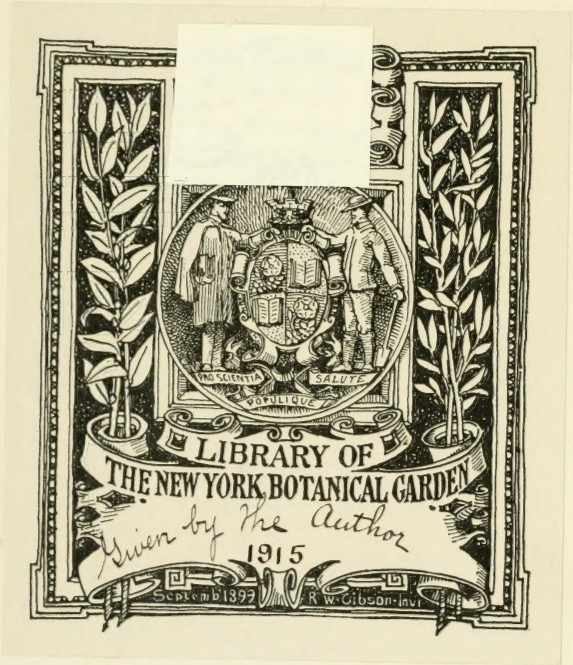
MINDANAO, MINDORO, LEYTE, LUZON.

40. Dendrobium Lyonii *Ames* ORCHIDACEÆ 2:177.

LUZON.

STUDIES IN THE FAMILY ORCHIDACEÆ

OAKES AMES A. M.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ORCHIDACEÆ

V

ORCHIDACEÆ

ILLUSTRATIONS AND STUDIES OF
THE FAMILY ORCHIDACEÆ

ISSUED FROM THE AMES BOTANICAL LABORATORY
NORTH EASTON, MASSACHUSETTS

* * *

THE GENERA AND SPECIES OF PHILIPPINE ORCHIDS

BY

OAKES AMES

DIRECTOR OF THE BOTANIC GARDEN OF HARVARD UNIVERSITY

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TO

BLANCHE AMES AMES

MY WIFE COLLEAGUE AND

PLAYFELLOW

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PREFACE

AMONG the plant families that constitute the vegetation of the Philippine Islands the Orchidaceæ is the richest in representatives. It exceeds the Rubiaceæ, the next largest family, by several hundred species. Although, in addition to the regular explorations carried on by the botanical department of the Bureau of Science at Manila, several collectors have given special attention to the search for orchids, there are still large areas, botanically unknown, from which it is highly probable that rich accessions to our orchid herbaria will be made.

In the list that follows it has been necessary to exclude many species referred by authors to the Philippines on questionable evidence or on unreliable data. At the same time several species have been included which, though inadequately known because of the absence of types, were originally described from material supposedly of Philippine origin. Furthermore, for purposes of discussion, a very few species have been admitted to the list which have not yet been found in the islands, although ascribed to them by monographers.

The genera Arundina and Bromheadia have been reported from the Philippines on the evidence of Cuming's 2058 and 2054. Vidal, in a footnote on page 88 of Phanerogamæ Cumingianæ Philippinarum, excluded 2053 to 2058 inclusive from the Philippines, and states that they belong to specimens gathered at Singapore. Naves ascribes *Arundina pentandra* Reichb. f. and *A. Wallichii* Reichb. f. to Luzon, but on evidence which we may safely disregard.

Dendrobium lamellatum Lindl. is given an extension of range by Fritz Kränzlin in his recent monograph, that includes the Philippines. The basis of this extension is Cuming's 2074. Unfor-

tunately I have not seen the material collected by Cuming and distributed under this number, but I suspect that it may prove conspecific with *D. platycaulon* Rolfe, which is a near ally of *D. lamellatum*. I have not seen any specimens of *D. lamellatum* among the collections from the Philippines that I have examined, although several specimens referable to the endemic *D. platycaulon* have been received from the Bureau of Science.

In the early days of Philippine botany new acquisitions were described in numerous journals, for the most part in brief terms, consequently it is a difficult task to make a comprehensive enumeration of the different kinds, to clear away the obscurity that surrounds some of them, or to identify, in the absence of type specimens, those that were published as new by the pioneer students of the Philippine flora. Taken as a whole, however, the doubtful species are comparatively few if those that authors have ascribed to the Philippines conjecturally are removed from consideration. That this should be so is all the more surprising when it is realized that the types on which Blanco's first and second editions of the Flora de Filipinas were based have not been preserved.

When the third edition of Blanco's Flora was made ready for publication at Manila under the auspices of the Order of Augustinians, Andreas Naves, who wrote the part of the Novissima Appendix devoted to the orchids and other monocotyledonous groups, included a number of names on the authority of a list transmitted to him by Sebastian Vidal, the author of Phanerogamæ Cumingianæ Philippinarum. This list is cited by Naves as the Boxall Manuscript. It was prepared by Boxall, not from collections he personally had made in the Philippines, but from horticultural and other sources consulted prior to his departure from England. In other words, the Boxall Manuscript

was just such a guide as a horticultural explorer might take to a new country. It was not a list of actual discoveries made by its author, nor a record of plants of indisputable Philippine origin, but a compilation that was to prove useful for reference. In my enumeration of genera and species in the following pages I have regarded Boxall's manuscript as useless for purposes of citation unless subsequent collections have verified its contents.

The unrestrained adoption of Boxall's manuscript list does not complete the shortcomings of the Novissima Appendix, because the determination of its authors to reduce Blanco's species to older ones, on the assumption that few of them were new, and their efforts to identify with the plants of India and the Malayan region the components of the Philippine flora resulted in numerous errors in judgment. A single example will suffice to make clear what I mean. *Cypripedium Fairrieanum* was included by Naves as a native of the Philippines, although its habitat at the time was extremely doubtful. The native country was not definitely known until 1905, twenty-two years after the publication of Naves' work, when specimens were found in the valley of the Torsa or Amuchu River (Machoo of some authors), in the Chumbi district of Western Bhotan, in India.

It has been estimated that of the one thousand one hundred and twenty-seven species and varieties of plants described by Blanco five only were deemed valid by the authors of the Novissima Appendix. In other words, one thousand one hundred and twenty-two of them were reduced to synonymy without discussion. Merrill sums up the revision of Naves and his colleague, Fernandez-Villar, as follows: "It is evident that these authors accomplished their work in the library rather than in the field and in the herbarium, and that they reduced Blanco's species to

those of other authors not so much by a study of botanical material as by an examination and comparison of descriptions."

The orchid flora of the Philippine Archipelago is closely allied to that of Celebes, Java, and the Malay Peninsula. There are no endemic genera. The number of endemic species, on the contrary, is very large, at least six-sevenths of the known ones having been found nowhere else. It is safe to say that approximately ninety per cent of the orchid flora is endemic.

In the following enumeration seven hundred and twenty-three species distributed among one hundred and one genera are admitted. Of this number one hundred and nineteen species and one variety are herein proposed as new. The species of the Apostasiinæ have been dropped, as this group should, in my opinion, be excluded from the Orchidaceæ. The sequence of the genera conforms closely to that adopted by Pfitzer in Engler and Prantl's Die natürlichen Pflanzenfamilien, but several points of dissimilarity that distinguish my arrangement from Pfitzer's should be noted, as they seem to establish a more natural grouping. In my treatment of the Sarcanthinæ I have attempted to bring the genera into accord with modern botanical thought, and to recognize those deviations from Pfitzer's interpretation of affinities that recent studies have proved to be desirable. The genera of the Sarcanthinæ, however, are by no means, even now, thoroughly understood, although late investigations have done much to bring us nearer to a rational solution of those problems that have perplexed botanists for many years, have given rise to discussion, and have produced a copious synonymy.

In my remarks about several of the species enumerated in the following pages I have had occasion to refer to the plants collected by Camelli. Georg Joseph Camelli (Camell or Kamel), in

whose honor Linnæus named the genus Camellia, was a missionary who passed a number of years in the Philippines, where he devoted part of his leisure to the collection and study of botanical specimens. In 1704, in an appendix to the third volume of Ray's Historia Plantarum, descriptions of Camelli's plants were published. This appendix is of importance, as it constitutes one of the earliest records of Philippine botany. Camelli prepared drawings to illustrate his specimens, but no attempt was made to reproduce them until Jacob Petiver published a plate of the orchids in his Gazophylacium. Petiver's plate represents modifications of the originals, much reduced, that make possible approximate identifications. The original drawings are still extant, and are preserved in the Sloane collections at the British Museum.*

In the citations of collectors' numbers the abbreviations Bur. Sci. and For. Bur. refer to the Bureau of Science and the Forestry Bureau at Manila. C. A. Wenzel's field numbers, cited in the references to distribution, are preceded by a cipher, to distinguish his orchids collected especially for me from the specimens of his general collections distributed to the subscribers to his sets of plants from Leyte. As Wenzel unfortunately numbered both his orchids and general collections alike, confusion would be inevitable were not some means of distinction adopted.

A complete bibliography has not been included in this work, as most of the species have been amply treated in the preceding volumes of Orchidaceæ or in my contributions published in the Philippine Journal of Science. Furthermore, with very few

* Photographic copies of the orchid drawings, for which I am indebted to Dr. A. B. Rendle, are in my herbarium.

exceptions, a detailed account of geographical distribution has been confined to the new species.

As it is yet too early to offer an orchid flora of the Philippines, the following pages should be regarded simply as a contribution toward such a flora.

OAKES AMES

July 10, 1915

ORCHIDACEÆ

SYNOPSIS OF THE GENERA

I. Diandræ. The lateral anthers of the outer series fertile.

CYPRIPEDILINÆ

1. Paphiopedilum *Pfitzer* Morph. Stud. über d. Orchideenb. 11.

II. Monandræ. The unpaired anther of the outer series fertile.

A. BASITONÆ. Anther adherent by a broad base; caudiculæ developed at the base of the anther. (Cf. Ames ORCHIDACEÆ 2 : 35-38, figs.)

HABENARINÆ

2. Herminium *R. Br.* in Ait. Hort. Kew. ed. 2, 5 : 191.
3. Habenaria *Willd.* Sp. Pl. 4 : 44.

DISPERIDINÆ

4. Disperis *Sw.* in K. Vet. Acad. Stockh. Nya. Handl. 21 : 218.

AA. ACROTONÆ. Anther attached to the column by a filament; caudiculæ when present developed at the tip of the anther.

B. *Polychondreæ.* Pollinia granular, mealy or powdery.

THELYMITRINÆ

5. Thelymitra *Forst.* Char. Gen. Pl. 97, t. 49.

PRASOPHYLLINÆ

6. Microtis *R. Br.* Prodr. 320.

ACIANTHINÆ

7. Corybas *Salisb.* Parad. Lond. t. 83. Syn. Corysanthes *R. Br.*

CRYPTOSTYLIDINÆ

8. Cryptostylis *R. Br.* Prodr. 317.

VANILLINÆ

9. Galeola *Lour.* Fl. Cochinch. 520.
10. Vanilla *Sw.* in Nov. Act. Ups. 6 : 66, t. 5.
11. Lecanorchis *Bl.* Mus. Bot. Lugd. Bat. 2 : 188.
12. Aphyllorchis *Bl.* Bijdr. t. 77. Orch. Arch. Ind. 51, t. 13, 17.

GASTRODINÆ

13. Epipogum *Gmel.* Fl. Sib. 1 : 11.
14. Nervilia *Comm. ex Gaudich.* in Freyc. Voy. Bot. 422, t. 35.
15. Stereosandra *Bl.* Mus. Bot. Lugd. Bat. 2 : 176.
16. Didymoplexis *Griff.* in Calc. Journ. 4 : 383, t. 17.
17. Gastrodia *R. Br.* Prodr. 330.

SPIRANTHINÆ

18. Spiranthes *L. C. Rich.* in Mém. Mus. Par. 4 : 50.

PHYSURINÆ

19. Goodyera *R. Br.* in Ait. Hort. Kew. ed. 2, 5 : 197.
20. Lepidogyne *Bl.* Fl. Jav. nov. ser. 1 : 78, t. 25.
21. Dicerostylis *Bl.* Fl. Jav. nov. ser. 1 : 98, t. 38.
22. Erythrodes *Bl.* Bijdr. 410, t. 72.
23. Kuhlhasseltia *J. J. Smith* Ic. Bogor. 4 : 1, t. 301.
24. Cystorchis *Bl.* Fl. Jav. nov. ser. 1 : 73.
25. Cystopus *Bl.* Fl. Jav. nov. ser. 1 : 69.
26. Anœctochilus *Bl.* Bijdr. 411.
27. Macodes *Lindl.* Gen. & Sp. Orch. 496.
28. Cheirostylis *Bl.* Bijdr. 413, t. 16.
29. Adenostylis *Bl.* Bijdr. 414.
30. Myrmechis *Bl.* Fl. Jav. nov. ser. 1 : 64.
31. Vrydagzynea *Bl.* Fl. Jav. nov. ser. 1 : 59.
32. Hetæria *Bl.* Bijdr. 409, t. 14.

TROPIDIINÆ

33. Tropidia *Lindl.* Bot. Reg. sub t. 1618.
34. Corymborchis *Thou.* Orch. Iles Afr. t. 37.

BB. *Kerosphæreæ.* Pollinia of waxy consistency.

COLLABIINÆ

35. Chrysoglossum *Bl.* Bijdr. 337, t. 7.
36. Nephelaphyllum *Bl.* Bijdr. 372, t. 22.
37. Diglyphosa *Bl.* Bijdr. 336, t. 60.

CŒLOGYNINÆ

38. Cœlogyne *Lindl.* Collect. Bot. sub t. 33.
39. Dendrochilum *Bl.* Bijdr. 398, t. 52.
40. Pholidota *Lindl.* in Hook. Exot. Fl. 2, t. 138.
41. Crinonia *Bl.* Bijdr. 338.

LIPARIDINÆ

42. Malaxis *Sw.* in K. Vet. Acad. Stockh. Nya Handl. 21 : 233.
43. Oberonia *Lindl.* Gen. & Sp. Orch. 15.
44. Hippeophyllum *Schltr.* in Schum. & Lauterb. Nachtr. Fl. Deutsch. Schutzg. 107.
45. Liparis *L. C. Rich.* in Mém. Mus. Par. 4 : 52, t. 5, fig. 10. Syn. Cestichis *Pfitz.*

THUNIINÆ

46. Dilochia *Lindl.* Gen. & Sp. Orch. 38.

GLOMERINÆ

47. Ceratostylis *Bl.* Bijdr. 304, t. 56.
48. Agrostophyllum *Bl.* Bijdr. 368, t. 53.
49. Glomera *Bl.* Bijdr. 372, t. 68.

PODOCHILINÆ

50. Podochilus *Bl.* Bijdr. 295, t. 12.
51. Chilopogon *Schltr.* in Fedde Rep. Beihefte 1: 332.
52. Appendicula *Bl.* Bijdr. 297, t. 40.

POLYSTACHYINÆ

53. Polystachya *Hook.* Exot. Fl. 2, t. 103.

PHAJINÆ

54. Acanthophippium *Bl.* Bijdr. 353, t. 47.
55. Phajus *Lour.* Fl. Cochinch. 529.
56. Calanthe *R. Br.* in Bot. Reg. sub t. 573.
57. Ascotainia *Ridl.* Mat. Fl. Mal. Pen. part 1, 115.
58. Spathoglottis *Bl.* Bijdr. 400.
59. Plocoglottis *Bl.* Bijdr. 380.
60. Pachystoma *Bl.* Bijdr. 376.

CYRTOPODIINÆ

61. Eulophia *R. Br.* in Bot. Reg. t. 686.
62. Geodorum *Jackson* in Andr. Bot. Repos. 10, t. 626.

DENDROBIINÆ

63. Dendrobium *Sw.* Nov. Act. Ups. 6: 82.
64. Eria *Lindl.* in Bot. Reg. t. 904.

BULBOPHYLLINÆ

65. Bulbophyllum *Thou.* Orch. Iles Afr. t. esp. 3, & fig. t. 93-97 & 99-110.

THELASINÆ

66. Octarrhena *Thw.* Enum. Pl. Zeyl. 305.
67. Thelasis *Bl.* Bijdr. 385, t. 75.
68. Phreatia *Lindl.* Gen. & Sp. Orch. 63.

THECOSTELINÆ

69. Acriopsis *Reinw.* in Syll. Pl. Ratisb. 2: 4.
70. Thecostele *Reichb. f.* in Bonpl. (1857) 37.

CYMBIDIINÆ

71. Grammatophyllum *Bl.* Bijdr. 377, t. 20.
72. Dipodium *R. Br.* Prodr. 330.
73. Cymbidium *Sw.* Nov. Act. Ups. 6 : 70.

SARCANTHINÆ

74. Chamæanthus *Schltr. ex J. J. Smith* Orch. Jav. 552.
75. Thrixspermum *Lour.* Fl. Cochinch. 519.
76. Sarcochilus *R. Br.* Prodr. 332.
77. Doritis *Lindl.* Gen. & Sp. Orch. 178.
78. Phalænopsis *Bl.* Bijdr. 294.
79. Aërides *Lour.* Fl. Cochinch. 525.
80. Rhynchostylis *Bl.* Bijdr. 285, t. 49.
81. Luisia *Gaudich.* in Freyc. Voy. Bot. 426, t. 37.
82. Arachnis *Bl.* Bijdr. 365, t. 26.
83. Esmeralda *Reichb. f.* Xen. Orch. 2 : 38.
84. Vandopsis *Pfitz.* in Engler & Prantl, Die nat. Pflanzenf. II, 6 Abteil. p. 210, f. 229.
85. Stauropsis *Reichb. f.* in Hamb. Gartenzeit. 16 : 117.
86. Renanthera *Lour.* Fl. Cochinch. 521.
87. Vanda *Jones* in As. Res. 4 : 302.
88. Angræcum *Bory* Voy. 1: 359, t. 19.
89. Saccolabium *Bl.* Bijdr. 292.
90. Gastrochilus *Don* Prodr. 32.
91. Omœa *Bl.* Bijdr. 359.
92. Ascocentrum *Schltr.* in Fedde Rep. Beihefte 1 : 975.
93. Malleola *J. J. Smith & Schltr.* in Fedde Rep. Beihefte 1 : 979.
94. Robiquetia *Gaudich.* in Freyc. Voy. Bot. 426, t. 34.
95. Schœnorchis *Bl.* Bijdr. 361.
96. Camarotis *Lindl.* Gen. & Sp. Orch. 219.
97. Sarcanthus *Lindl.* Collect. Bot. t. 39 (B).
98. Pomatocalpa *Breda* Orch. Kuhlh. & v. Hass. t. 15.
99. Trichoglottis *Bl.* Bijdr. 359.
100. Microsaccus *Bl.* Bijdr. 367.
101. Tæniophyllum *Bl.* Bijdr. 355, t. 70.

Arundina and Bromheadia have been reported from the Philippines. I have not seen any material among the collections I have examined that is referable to either genus.

ORCHIDACEÆ

GENERA AND SPECIES OF
PHILIPPINE ORCHIDS

I. DIANDRÆ–CYPRIPEDILINÆ

FOUR genera are recognized. Cypripedium *L.* has representatives in both hemispheres. Selenipedium *Reichb. f.* is a small genus of tropical American species. Phragmopedium *Rolfe*, a genus of horticultural value, is chiefly South American. Paphiopedilum *Pfitzer* is confined to the tropical regions of Asia and the East Indies. Five species, all of which are cultivated for the beauty of their flowers, are natives of the Philippines.

1. PAPHIOPEDILUM *Pfitz.*

In the Orchid Review of January, 1912, R. A. Rolfe discussed the nomenclature of the Cypripedilinæ, and in a footnote referred all the species which are representatives of Paphiopedilum to Cordula *Rafinesque.*

Rafinesque, in Flora Telluriana, part 4 (1836), page 46, proposed four new genera, Sacodon, Stimegas, Cordula, and Nemophora, to include species of Cypripedium. The first of these is represented by the group of which *Cypripedium macranthum* Sw. is an example. Stimegas and Cordula, as understood by Rafinesque, include species which Pfitzer referred to Paphiopedilum. Under Stimegas Rafinesque included *Paphiopedilum venustum* and under Cordula *P. insigne.* The fourth genus, Nemophora, from the description of the type species, is congeneric with Paphiopedilum.

These Rafinesquean genera were not unknown to Pfitzer when his Orchidaceæ-Pleonandræ for Engler's Das Pflanzenreich was prepared, but with the exception of Sacodon, Pfitzer wrongly referred them all to the synonymy of Paphiopedilum. On the

basis of priority Mr. Rolfe is justified in taking up Cordula, but surely we may hope that Paphiopedilum will be added to the list of genera which one must retain regardless of priority. Cordula, if adopted, will be most inharmonious in a group which has been distinguished by uniformity in the termination of its generic names.

Two of Pfitzer's subgenera of Paphiopedilum are represented in the Philippines.

I. Subgen. ANATOPEDILUM.

1. Paphiopedilum Haynaldianum (*Reichb. f.*) *Stein* Orchideenb. 470.

Luzon.

2. Paphiopedilum philippinense (*Reichb. f.*) *Stein* Orchideenb. 480. Cypripedium philippinense *Reichb. f.* in Bonpl. 10 : 335. Cf. Botanical Magazine, t. 5508. "Associated especially with *Cymbidium Finlaysonianum* on open cliffs and boulders, above reach of waves in time of storm, exposed to full sunlight. Upper sepal nearly white with prominent longitudinal, dark purple stripes; lower sepal nearly white, tip yellow. Petals elongated, purple, except near the base where they are yellow, with three lines of large purple dots. Labellum white on the back, apex and margin yellow (lemon yellow)." Collector's Note.

Palawan, Taytay Bay, Apulit Island, *E. D. Merrill 9423*, May 31, 1913. On limestone cliffs and boulders near the seashore, 2–4 meters above sea level.

II. Subgen. OTOPEDILUM.

3. Paphiopedilum Argus (*Reichb. f.*) *Stein* Orchideenb. 453.

Luzon (Bohol, according to Rolfe).

4. Paphiopedilum barbatum (*Lindl.*) *Pfitz.* in Pringsh. Jahrb. 19 : 159.

PALAWAN, BOHOL, *Cuming 2060*. As Cuming also collected in Malacca, and as *P. barbatum* is a native of Mount Ophir, his *2060* may have come from there.

5. Paphiopedilum ciliolare (*Reichb. f.*) *Stein* Orchideenb. 462.

MINDANAO, DINAGAT.

Two other species of Anatopedilum have been reported from the Philippines, but on evidence that is not quite satisfactory. *P. Lowii* (Lindl.) Stein is a Bornean species which, it is believed, has been discovered in the Sulu Archipelago. (Cf. Orchid Review 3 : 129, 193.) *P. Rothschildianum* (Reichb. f.) Stein is another Bornean species which has been given an extension of range that includes the Philippine Islands.

In 1899 I obtained at the nurseries of Messrs. Hugh Low & Co., England, a specimen of a supposed natural hybrid which had been imported from Palawan. At least the records at hand indicated that the plant had come from a collector who had passed part of his time on that island. This hybrid proved to be the same as *P.* × *Kimballianum*, a natural hybrid produced by a cross between *P. Rothschildianum* and *P. Dayanum*, both natives of Borneo. *P.* × *Kimballianum* may be a native of Palawan, but, aside from the garden name *Cypripedium* × *palawanense*, there is no evidence at hand to prove that it is. *P.* × *Kimballianum* was originally imported from Borneo.

Although for many years I have had under observation almost every known species of Paphiopedilum, including many varieties and several hundred hybrids, I find it very difficult to identify with surety dried specimens. I have at least two species from the Philippines that I have been unable to identify. These are representatives of the subgenus Otopedilum.

2. HERMINIUM *R. Br.*

One species is known to be a native of the Philippines. About twenty species have been described.

1. Herminium angustifolium (*Lindl.*) *Benth.* MS. *ex Hook. f.* Fl. Brit. Ind. 6 : 129. Aceras angustifolia *Lindl.* Wall. Cat. no. 7061.

H. angustifolium is a native of Formosa, Japan, Timor, Java, Manchuria, Hupeh, Khasia Hills, Tenasserim, Sikkim, and the northwestern Himalayas.

LUZON, common in Benguet.

3. HABENARIA *Willd.*

Platanthera and Peristylus are here included. In the third volume of ORCHIDACEÆ I gave my reasons for keeping Habenaria intact. In Die Orchidaceen von Deutsch-Neu-Guinea, Dr. R. Schlechter refers Peristylus to Habenaria as a section and keeps Platanthera as a distinct genus.

1. Habenaria alagensis *Ames* in Phil. Journ. Sci. 2 : 312. H. luzonensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1550.

LUZON, LEYTE, MINDANAO, MINDORO.

2. *Habenaria Amesiana* (Schltr.) *comb. nov.* Platanthera Amesiana *Schltr.* in Fedde Rep. 9 : 212. Habenaria angustata *Ames* ORCHIDACEÆ 2 : 26 not *Kuntze.* Aside from details in form which help to distinguish *H. Amesiana* from *H. angustata*, there is a conspicuous difference in the size of the flowers. Specimens from the Philippines and specimens from Java, the latter determined by J. J. Smith, are before me, which show a difference of 7 mm. in the length of the spur; that of *H. angustata* measuring 14 mm., that of *H. Amesiana* 7 mm.

LUZON.

3. Habenaria aristulifera *Reichb. f.* in Bonpl. 3:213.

Luzon, Mindanao.

4. Habenaria bisæta *Ames* Orchidaceæ 2:30.

Luzon.

5. Habenaria congesta *Ames* Orchidaceæ 2:38. H. Rumphii *Lindl.* is a closely allied species.

Guimaras, Mindanao, Panay.

6. Habenaria Copelandii *Ames* Orchidaceæ 2:29.

Luzon.

7. Habenaria Cumingii *Kränzl.* Gen. & Sp. Orch. 1:262. This species is unknown to me. The original description was taken from Cuming's 2091. From this same number Reichenbach f. described *H. aristulifera.* Kränzlin describes the petals as bipartite. The only species with bipartite petals from the Philippines are *H. Leibergii, H. aristulifera, H. Curranii,* and *H. linguloso. H. Cumingii,* from the description, is unlike any of these. *H. dichopetala* Thw. and *H. lancifolia* A. Rich. are cited as near allies.

No habitat other than the Philippines is given by Kränzlin in the original diagnosis.

8. Habenaria Curranii *Ames* in Phil. Journ. Sci. 7:1.

Luzon.

9. Habenaria Delessertiana *Kränzl.* Gen. & Sp. Orch. 1:233. Cf. Phil. Journ. Sci. 7:2.

Luzon, Mindanao.

10. Habenaria diphylla *Dalzell* in Hook. Kew Journ. Bot. 2:262. There are slight differences between the Indian and Philippine specimens I have examined, but I doubt if they would prove constant through a large series of plants.

Luzon.

11. Habenaria Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1550. The inflated spur of this species is a conspicuous differentiating character between it and *H. Amesiana.*

MINDANAO, NEGROS.

12. Habenaria falcigera *Reichb. f.* in Linnæa 41 : 100. I have not seen any specimens that Reichenbach f. determined, but I believe Curran's 4884 represents this species. Kränzlin does not cite any specimens in his monograph.

LUZON.

13. Habenaria Goodyeroides *Don* Prodr. 25.

LUZON, MINDANAO.

Also from New Guinea, Java, Formosa, Yunnan, Assam, Burma, Andaman Islands, Nepal, India.

14. Habenaria halconensis *Ames* in Phil. Journ. Sci. 2 : 312. Platanthera halconensis *Schltr.* in Fedde Rep. 9 : 212.

MINDORO.

15. Habenaria hystrix *Ames* ORCHIDACEÆ 2 : 35. Dissorhynchium muricatum *Schauer* Nov. Act. Nat. Cur. 19, suppl. I, 434, t. 13 (A). H. muricata *Vidal* Phan. Cum. Phil. 80, not H. muricata *Barb. Rodriguez.*

DUMARAN, LUZON, MINDANAO, SIGUIJOR.

16. Habenaria lacertifera (*Lindl.*) *Benth.* Fl. Hongkong 362. Chœradoplectron Spiranthes *Schauer* Nov. Act. Nat. Cur. 19, suppl. I, 436, t. 13 (C).

LUZON.

Also from China, Formosa, India, Java, and the Malay Peninsula.

17. Habenaria Leibergii *Ames* ORCHIDACEÆ 2 : 34.

LUZON.

18. Habenaria lingulosa *Ames* ORCHIDACEÆ 2 : 33.

LUZON.

19. Habenaria Mearnsii *Ames* in Phil. Journ. Sci. 7 : 3.

Luzon, Province of Benguet.

20. Habenaria militaris *var.* philippinensis *Ames* Orchidaceæ 2 : 40.

Mindanao.

21. Habenaria pelorioides *Par. & Reichb. f.* Trans. Linn. Soc. 30 : 135. The underground parts of the plant are said to be edible.

Luzon.
Also from lower Burma and the Malay Peninsula.

22. Habenaria ponerostachys *Reichb. f.* in Bonpl. 3 : 213.

Mindanao, Negros.

23. Habenaria Robinsonii *Ames* in Phil. Journ. Sci. 7 : 3.

Luzon.

24. Habenaria rosulata *Ames* in Phil. Journ. Sci. 7 : 5.

Luzon.

25. Habenaria tipulifera *Par. & Reichb. f.* Trans. Linn. Soc. 30 : 139. This species has been reported from the Philippines (Cuming 2095). *H. bisæta* may have been confused with it.

26. *Habenaria Vanoverberghii sp. nov.* Bulbi circiter 6 mm. in diametro, sphæroides vel leviter elongati. Radices fibratæ. Folia 2–4, rosulata, ad basim pedunculi conferta, lanceolata, acuta, variabilia, usque ad 4 cm. longa, circiter 11 mm. lata, sessilia, in sicco chartacea. Pedunculus 1–3 dm. longus, pergracilis, 2–4 bracteatus, bracteis arcte adpressis, acuminatis, acutis, ad basim tubularibus, circiter 1 cm. longis. Racemi laxiflori, 4–7 cm. longi. Pedicellus cum ovario circiter 1.3 cm. longus, glaber. Bracteæ flores subtendentes quam pedicellus cum ovario breviores, anguste lanceolatæ, longe acuminatæ, valde acutæ, 5–10 mm. longæ. Flores 3–9, virides. Sepala lateralia anguste lanceolata, acuta, 6 mm. longa, circiter 2 mm. lata. Sepalum dorsale concaviuscu-

lum, erectum, acutum, late lanceolatum, circiter 5 mm. longum. Petala simplicia, lineari-triangula, subfalcata, leviter recurva, uninervia, acuta, circiter 5 mm. longa, prope medium 1 mm. lata. Labellum tripartitum, divisiones laterales quam divisio media longiores, lineares, patentes, usque ad 13 mm. longæ, .5 mm. latæ; divisio media linearis, leviter incrassata, vix 6 mm. longa, circiter .75 mm. lata. Calcar 10–11 mm. longum, obtusum, leviter inflatum. Processus stigmatis hippocrepiformes.

From *H. rosulata* Ames, *H. Vanoverberghii* is in part distinguished by its broader leaves, green flowers, more slender spur, and narrower sepals.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 3687*, August 8, 1913. In wet soil, 1300 meters above sea level.

27. Habenaria Warburgeana *Kränzl.* Gen. & Sp. Orch. 1: 467.

Luzon.

28. *Habenaria Zephyrica sp. nov.* Herba terrestris valdissime gracilis, circiter 25 cm. alta. Folia 4, prope medium caulem conferta, lineari-lanceolata, apiculata, membranacea, utrinque attenuata, 4–7 mm. longa, 9–12 mm. lata, 5–15 mm. distantia, ad basim breviter vaginata. Bracteæ infra racemum lineares, acutæ. Bracteæ flores subtendentes flavidæ, ovatæ, acutæ, circiter 2 mm. longæ. Sepala lateralia oblongi-lanceolata, subacuta, subtus prope apicem apiculata, 2.25 mm. longa. Sepalum dorsale concavum, obtusum, vix 2.5 mm. longum. Petala oblongi-elliptica, ±2 mm. longa, circiter 1 mm. lata, simplicia. Labellum tripartitum, carnosum, divisionibus lateralibus quam divisio intermedia multo longioribus. Totum labellum 4.5 mm. longum, lobus medius oblongus, obtusus, usque ad apicem attenuatus, 1.5 mm. longus, .75 mm. latus, lobi laterales vel divisiones laterales lineares (cir-

cinati?), 4 mm. longi. Calcar dependens, 5 mm. longum ad apicem subulatum, supra apicem clavatum. Gynostemium?

The type consists of a single specimen. In habit it suggests a depauperate *H. aristulifera*, and in fact has aristulate tips to the leaves. The lateral sepals are dependent; near the apex, on the dorsal side, the thickened mid-nerve protrudes to form a subulate tip (as in *H. repens*). The underground part of the plant in the type specimen is apparently incomplete. From the parts remaining it would seem to have had two cylindrical, fleshy, tuberoid roots 2 cm. beneath the surface of the ground. The flowers of the type are in a poor state of preservation, consequently it is impossible to describe the details of the gynostemium.

MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.* November, 1906.

4. DISPERIS *Sw.*

Only one species of Disperis has been reported from the Philippines. Schlechter ascribes fifty species to the genus, of which more than forty are natives of Africa. *D. rhodoneura* Schltr. comes from New Guinea, and *D. philippinensis* Schltr. from the Province of Papanga, Luzon. The type of the latter was collected in September, 1905, at an altitude between three hundred and seven hundred meters, by Elmer D. Merrill (4215). It is a small terrestrial species, hardly 8 cm. tall, with sessile, ovate, acute leaves ± 1 cm. long. The flowers are purplish and odorless. In habit it resembles *D. Bolusiana* Schltr. and *D. villosa* Lindl.

1. Disperis philippinensis *Schltr.* in Fedde Rep. 9 : 436. The flowers are said to be similar to those of *D. zeylanica* Trim.

5. THELYMITRA *Forst.*

The genus Thelymitra is essentially Australian. More than half of the forty-four species now known come from that country. About twelve are natives of New Zealand. Only one species is known to be a native of the Philippines. *Thelymitra malintana* Blanco Fl. Fil. ed. 1, 642 is unknown to me. Naves referred it to *Habenaria trinervis* Wight, a species that has never been authentically reported from the Philippines.

1. Thelymitra javanica *Bl.* Bijdr. 419.

LUZON.
Also from Java.

6. MICROTIS *R. Br.*

A small genus of about twelve species, with the centres of distribution in Australia and New Zealand.

1. Microtis unifolia *Reichb. f.* Beitr. Syst. Pl. 62. Ophrys unifolia *Forst.* Prodr. Fl. Ins. Aust. 59 (1786). *M. unifolia*, as at present understood, is a native of southern China, Japan, Formosa, Liukiu Islands, Java, New Caledonia, Australia, and New Zealand. Undoubtedly studies of specimens from the wide range indicated will result in the recognition of several species that are now confused with *M. unifolia.*

LUZON.

7. CORYBAS *Salisb.*

There appears to be no valid reason for upholding the generic name Corysanthes *R. Br.* It is antedated by Corybas, and, in accordance with the rules of nomenclature adopted by the Vienna Botanical Congress, is not available. The description of *Corybas aconitiflorus* in Salisbury's Paradisus Londinensis is accompanied by a plate that leaves no room for doubt as to the generic char-

acters of Corybas. In his Prodromus Floræ Novæ Hollandiæ Robert Brown gave his reasons for excluding this genus, reasons which it is difficult to consider seriously to-day.

The genus includes about thirty-eight species, sixteen of which are natives of New Guinea. Nine or ten species have been reported from New Zealand, and about four from Australia. *Corybas Merrillii* marks the northern limit of distribution for the genus.

1. Corybas Merrillii *Ames* Orchidaceæ 2 : 42.

Luzon.

8. CRYPTOSTYLIS *R. Br.*

There are about fourteen species of Cryptostylis reported to be natives of New Guinea, Australia, Samoa, New Caledonia, Java, Borneo, Ceylon, Malay Peninsula, and the Fiji Islands.

1. Cryptostylis arachnites (*Bl.*) *Hasskarl* Cat. Bogor. 48.

Luzon, Polillo, Negros, Leyte, Mindanao.

Also reported from Borneo, Java, Malay Peninsula, Ceylon, and southern India.

9. GALEOLA *Lour.*

About fourteen species have been described. C. A. Wenzel, who has collected *Galeola pterosperma* in Leyte, reports that a superstition prevails among the natives that if this plant grow near a human habitation, the occupants will die.

1. Galeola pterosperma (*Lindl.*) *Schltr.* in Engler's Bot. Jahrb. 45: 386. G. Hydra *Reichb. f.* Xen. Orch. 2 : 77.

Babuyanes, Leyte, Luzon, Mindoro.

Also reported from Java, Formosa, Sumatra, Malacca, Tenasserim, Sikkim.

10. VANILLA *Sw.*

More than fifty species of Vanilla have been described. These are

conveniently divided into two large sections, one characterized by leafy, the other by leafless stems. Both sections are represented in the Philippines, each by a single species.

Vanilla is of special interest, as it contains the only orchids that are economically important.

Vanilla majaijensis Blanco is a doubtful species which authors have referred to *V. planifolia* Andrews, the vanilla of commerce. If this treatment is correct, then Blanco's specimens, as Mr. R. A. Rolfe suggested in his monograph of the genus Vanilla, may have been introduced from Mexico by the Spaniards.

V. ovalis Blanco, which Naves considered identical with *V. aromatica*, is probably conspecific with *V. majaijensis*. In my herbarium there is a specimen from Laguna Province, Luzon, the type locality of *V. ovalis*, which Mr. Merrill has referred to *V. ovalis* Blanco. If Mr. Merrill's suppositions, published in his review of the identifications of the species described in Blanco's Flora de Filipinas, are correct, *V. ovalis* and *V. majaijensis* are conspecific, in which case *V. ovalis* Blanco would by priority become the name of the species. Unfortunately Blanco's types are no longer in existence, so that no clear understanding of his species can be reached.

The next step is to examine *V. philippinensis* Rolfe. The specimen from Laguna Province, referred to above, which Merrill identified as *V. ovalis*, appears to be conspecific with *V. philippinensis*, and is a native of the region from which Blanco's material was received. It is impossible to arrive at a definite conclusion, but conjecture surely favors the supposition that *V. ovalis*, *V. majaijensis*, and *V. philippinensis* are one and the same; a conjecture strengthened by the evidence which has gradually accumulated to show that *V. philippinensis* is not uncommon in the Philippines, while no other species comparable to *V. ovalis* or

V. majaijensis has been detected, not even in Laguna Province, the type locality of Blanco's species.

In Petiver's Gazophylacium (pl. 103, f. 4) a species of Vanilla is figured which represents one of Camelli's Luzon plants published in Ray's Historia Plantarum.

1. Vanilla calopogon *Reichb. f.* Otia bot. Hamb. 40. To this species I have referred a specimen preserved in the United States National Herbarium (351735).

Luzon, *A. Loher, 630*, June 29, 1890.

2. Vanilla ovalis *Blanco* Fl. Fil. ed. 2, 448. V. majaijensis *Blanco* Fl. Fil. ed. 2, 593. V. philippinensis *Rolfe* in Journ. Linn. Soc. 32 : 459.

Luzon, Mindanao.

11. LECANORCHIS *Bl.*

The peculiar cup-like collar at the summit of the ovary beneath the perianth is a remarkable character which is diagnostic for the genus. About seven species are known. *Lecanorchis japonica* Bl., however, is probably only a variety of *L. javanica* Bl.

The range of the genus includes the Malay Peninsula, Perak, Singapore, Siam, Japan, Java, New Guinea, and Borneo.

1. Lecanorchis triloba *J. J. Smith* in Bull. Dép. Agric. Ind. Neérl. no. 19, p. 26. This is the only representative of the genus at present known to be a native of the Philippines. Although Smith has recently referred *L. triloba* to *L. javanica* Bl., because of the likelihood of an incorrect diagnosis of the latter by Blume, I have retained it here as the three-lobed labellum appears to be a strong specific character and as my specimens agree with *L. triloba* as described and figured by Smith. They do not agree with the characters assigned to *L. javanica* by Blume.

LEYTE, Jaro, *C. A. Wenzel 0282*, February 23, 1914. Terrestrial in forest. "Petals greenish, sepals white, labellum white. Leaf none."

12. APHYLLORCHIS *Bl.*

Two species are natives of the Philippines. The genus contains less than twenty valid species which are essentially East Indian and Malayan.

1. Aphyllorchis benguetensis *Ames* ORCHIDACEÆ 2 : 49.

LUZON, MINDANAO.

2. Aphyllorchis pallida *Bl.* Bijdr. 77.

MINDORO.
Also Java, Perak, Pahang, and Singapore.

13. EPIPOGUM *Gmel.*

The genus is a small one, numbering about five valid species.

1. Epipogum roseum (*Don*) *Lindl.* in Journ. Linn. Soc. 1 : 177. E. nutans *Reichb. f.* in Bonpl. 5 : 36. This species has been found in Java, Ceylon, New Guinea, tropical India, and Australia.

LUZON, LEYTE, MINDANAO, NEGROS.

14. NERVILIA *Comm. ex Gaudich.*

Four species have been collected in the Philippines. These are referable to § Linervia, § Vinerlia, and § Eu-Nervilia. (Cf. Schlechter in Engler's Bot. Jahrb. 45: 399-405.)

I. Flower shoot always one-flowered, lengthening after anthesis, as in Corybas. A. § Linervia.

II. Flower shoot more than one-flowered, not lengthening after anthesis.
a. Flowers usually in pairs. Rhachis abbreviated. B. § Vinerlia.
b. Flowers usually three or more. Rhachis elongated. C. § Eu-Nervilia.

A. § Linervia.
Labellum fringed on the margin. N. crispata *Schltr.*
Labellum three-lobed, entire on the margin. N. dilatata *Schltr.*

B. § Vinerlia.
Labellum not conspicuously three-lobed, lobes rounded. N. discolor *Schltr.*

C. § Eu-Nervilia.
Labellum conspicuously three-lobed, disc hairy. N. Aragoana *Gaudich.*

1. Nervilia crispata *Schltr.* in Schum. & Lauterb. Nachtr. Fl. Deutsch. Schutzg. 82 (*in adnot.*), in Engler's Bot. Jahrb. 45 : 402. Pogonia crispata *Bl.* Mus. Bot. Lugd. Bat. 1 : 32. Fl. Jav. Orch. 151, t. 52. Cœlogyne javanica *Lindl.* Fol. Orch. 17.

Palawan, Taytay, *E. D. Merrill 9288*, May 8, 1913. In forests on dry slopes under Ficus. Sepals pale green, labellum white, stems leafless at anthesis, pale green, sheaths pale green. Seen only in three places, few plants in each place. After pollination flower nodding. Leaf green, round cordate, nine-lobed, appearing after flower stalk has withered.

Also from India and New Guinea.

2. Nervilia dilatata *Schltr.* in Engler's Bot. Jahrb. 45 : 402. Pogonia dilatata *Bl.* Fl. Jav. Orch. 127, t. 10, fig. 4. *Ames* Orchidaceæ 1 : 66.

Luzon, Province of Benguet, Sablan, *A. D. E. Elmer 6259*, April 18, 1914.

Also reported from Borneo.

3. Nervilia discolor *Schltr.* in Engler's Bot. Jahrb. 45 : 403. Pogonia discolor *Bl.* Mus. Bot. Lugd. Bat. 1 : 32. P. pudica *Ames* Orchidaceæ 2 : 44.

Mindanao, District of Davao, *E. B. Copeland 427*, March 10, 1904 (type of *P. pudica*). Luzon, Laguna Province, *A. D. E. Elmer s.n.* April, 1906; Los Baños, *Elmer 8180*, April, 1906; Mount Maquiling, *W. H. Brown Bur. Sci. 17917*, May 10, 1913; Province of Batangas, *F. Tamesis For. Bur. 21501*, May 6, 1910, on hillsides, 350 meters altitude; Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 459*, May 1, 1910, *Vanoverbergh 1460*, June 24, 1912. *Vanoverbergh 1201*, May 5, 1911, on grassy slopes.

Also reported from Java.

4. Nervilia Arogoana *Gaudich.* in Freyc. Voy. Bot. 422, t. 35. Pogonia flabelliformis *Lindl.* in Wall Cat. no. 7400. P. Nervilia *Bl.* Mus. Bot. Lugd. Bat. 1 : 32. P. gracilis *Bl.* Fl. Orch. Jav. 129, t. 57.

Luzon, Zambales Province, *Henry Sandkuhl s.n.* 1910; Laguna Province, Mount Maquiling, *W. H. Brown Bur. Sci. 17915*, May 10, 1913,

50 meters altitude. MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens 546*, May, 1906.

Also reported from India-Samoa.

15. STEREOSANDRA *Bl.*

A small genus containing two described species. *Stereosandra pendula* Kränzl. in Schmidt Fl. Koh Chang is a native of Klong Son. The following is the only representative of the genus in the Philippines.

1. Stereosandra javanica *Bl.* Mus. Bot. Lugd. Bat. 2 : 176. This species has also been reported from Java and Singapore. It is very rare, and difficult to find.

MINDANAO, LUZON.

16. DIDYMOPLEXIS *Griff.*

This is a small genus of about eleven species, natives of Java, New Guinea, Borneo, Formosa, New Caledonia, the Himalayas, Malay Peninsula, Christmas Island, and Samoa.

1. Didymoplexis pallens *Griff.* Calcutt. Journ. Nat. Hist. 4: 383, t. 17. This species has been found in Formosa, Java, Perak, Calcutta, and Sikkim.

LUZON, under bamboos.

2. *Didymoplexis philippinensis sp. nov.* Herba terrestris, gracilis, usque ad 7 dm. alta, aphylla. Racemus multiflorus, 5–8 cm. longus. Bracteæ inflorescentiæ squamiformes. Pedicellus gracilis, cum ovario usque ad 1.5 cm. longus. Flores circiter 5 mm. longi. Sepalum intermedium oblongum, obtusum, cum petalis connatum. Sepala lateralia in labium semi-2-fidum plus minus connata. Labellum trilobatum, ad basim cuneatum, lobi laterales quam lobus medius multo majores, vix 3 mm. longi, ad apicem circiter 2 mm. lati, obtusi. Lobus medius triangulus, obtusus, 1 mm. longus; per medium labellum carina longitudinalis orta; prope

basim callus bilobus stat. Columna crassa, basi in pedum brevem producta.

The free portion of the upper sepal and petals is about 3 mm. long. The obtuse petals are 3.5 mm. wide. From base of column to the tip of the middle lobe, the labellum is about 4.5 mm. long. The keel, which extends from the tip of the middle lobe to about the middle of the disc, is only slightly elevated. The callus near the base of the labellum is fleshy and distinctly two-lobed.

Didymoplexis philippinensis is very distinct from *D. pallens*, the only other Philippine species, in having a three-lobed labellum.

The three-lobed labellum of *D. philippinensis* is an interesting development. Dr. Schlechter has described two species from New Guinea which also have the labellum three-lobed.

Luzon, Camarines Province, Mount Isarog, *M. Ramos Bur. Sci. 22083*, December 7, 1913. Altitude 54 meters. Leyte, Jaro, *C. A. Wenzel 0362*, March 17, 1904. Sepals brown, petals brown and white, labellum white and yellow. Mr. Wenzel's specimen is more slender than the type and about 3 dm. tall.

17. GASTRODIA *R. Br.*

About fifteen species have been described. The genus is represented in Formosa, Ceylon, Java, Australia, New Guinea, Sumatra, Japan, China, Tibet, New Zealand, and the Himalayas. (Cf. Engler's Bot. Jahrb. 45 : 409.)

1. Gastrodia javanica *Lindl.* Gen. & Sp. Orch. 384. Epiphanes javanica *Bl.* Bijdr. 421.

Leyte, Palawan.
Also from Java.

18. SPIRANTHES *L. C. Rich.*

Spiranthes is represented in both hemispheres. Probably one

hundred and eighty species are valid. *Spiranthes sinensis* as at present understood is a polymorphic species which has been reported from Japan, China, Siberia, Afghanistan, India, Sunda Islands, New Guinea, Australia, Tasmania, and New Zealand. A critical study of specimens throughout the range may reëstablish a few of the segregates which have been described. It must not be overlooked, however, that several species of the genus, which have been critically examined, not only extend over a vast territory, but appear to adapt themselves to a wide range of climatic and soil conditions.

1. Spiranthes sinensis *Ames* ORCHIDACEÆ 2 : 53. Neottia sinensis *Persoon* Syn. 2 : 511. For a more detailed synonymy Ames ORCHIDACEÆ (2 : 53) should be consulted.

LUZON, MINDANAO.

19. GOODYERA *R. Br.*

About sixty species have been described. For a discussion of nomenclatorial details reference should be made to the Philippine Journal of Science (VIII, no. 6, Sec. C, 409). Six species have been reported from the Philippines.

1. Goodyera clausa *Schltr.* in Engler's Bot. Jahrb. 45 : 392. Epipactis clausa *Eaton ex Ames* ORCHIDACEÆ 3 : 41, t. 38.

LUZON, NEGROS.

2. *Goodyera luzonensis sp. nov.* Herba epiphytica, 12 cm. alta, foliosa, succulenta. Folia ovato-lanceolata, ad apicem attenuata, ad basim rotundata, in petiolum abrupte contracta, lamina ± 3 cm. longa, usque ad 1.5 cm. lata, valde acuta, in sicco membranacea; petiolus infra laminam linearis, prope basim dilatatus, caulem cingens, usque ad 2 cm. longus. Bracteæ inflorescentiæ lineari-triangulares, acutæ, usque ad 1 cm. longæ, flores excedentes, ad margines pubescentes. Racemus 5 cm. longus. Flores subcer-

nui, albidi, circiter 3 mm. longi, subglobosi, pubescentes. Sepala lateralia ovata, acuta, distincte uninervia, 2.5 mm. longa, prope basim 1.5 mm. lata. Sepalum dorsale cum petalis supra gynostemium fornicato-conglutinatum, 2 mm. longum. Petala inæqualiter oblanceolata, 2.5 mm. longa, supra medium .5 mm. lata. Labellum sessile, rotundato-ovatum, ventricosum, intus pubescens, ad apicem acuminato-acutum, 2.5 mm. longum. Gynostemium breve; rostellum bifidum.

Goodyera luzonensis is related to *G. reticulata* Bl. and *G. pusilla* Bl., from both of which it is clearly distinct. *G. amœna* Schltr. from Celebes is a very near ally. I have only seen two specimens among the collections which I have examined.

Luzon, Laguna Province, Mount Banajao, *E. D. Merrill 7488*, February 19, 1911. On prostrate log in forest, ± 6000 feet above sea level. Whole plant somewhat flesh colored, very little green in some leaves. Only one plant seen; *F. W. Foxworthy Bur. Sci. 2465*, March 24, 1914. On bark of trees, 1450 meters altitude.

3. Goodyera philippinensis *Schltr.* in Engler's Bot. Jahrb. 45: 392. Epipactis philippinensis *Ames* Orchidaceæ 2 : 60.

Luzon.

4. Goodyera Ramosii *Ames* in Phil. Journ. Sci. 8 : 409.

Mindanao.

5. Goodyera rubicunda *Lindl.* Bot. Reg. (1839) Misc. p. 61; Gen. & Sp. Orch. 493; Journ. Linn. Soc. 1 : 184, excl. syn.

Mindanao, Negros.
Also from Celebes, Java, and Perak.

6. Goodyera viridiflora *Bl.* Fl. Jav. Orch. 34, t. 9 (C), fig. 2.

Mindanao, Negros.
Also from Java.

20. LEPIDOGYNE *Bl.*

Probably not more than three species have been recognized. Of these only one is a native of the Philippines.

1. Lepidogyne longifolia *Bl.* Fl. Jav. Orch. 94, t. 25. Neottia longifolia *Bl.* Bijdr. 406. *L. sceptrum* Schltr. and *L. minor* Schltr. are natives of New Guinea.

LEYTE, NEGROS.
Also from Java.

21. DICEROSTYLIS *Bl.*

If Dr. R. Schlechter's views are adopted, the species which I have referred to Hylophila *Lindl.* should be placed in Dicerostylis. Dicerostylis and Hylophila have been differently treated by different authors.

1. Dicerostylis rubra *Schltr.* in Engler's Bot. Jahrb. 45 : 392. Hylophila rubra *Ames* ORCHIDACEÆ 2 : 65.

MINDORO, SIBUYAN.

2. Dicerostylis lanceolata *Bl.* Fl. Jav. Orch. 98, t. 38. A single specimen deposited in the herbarium of the Bureau of Science at Manila is the only material from the Philippines which I have seen that is referable to *D. lanceolata.* This is a more robust species than *D. rubra*, with a spicate raceme 13 cm. long; flowers whitish.

BATANES ISLANDS, Santo Domingo de Basco, *Eugenio Fenix Bur. Sci. 3781*, June 8, 1907. In mossy forest near Mount Traya. Flowers white and yellow.

22. ERYTHRODES *Bl.*[1]

Erythrodes until recently has been included in Physurus *L. C.*

[1] The following changes in the nomenclature of several American species becomes necessary: 1. Physurus polygonatus *Ames* ORCH. 2 : 259 = *Erythrodes polygonata comb. nov.* 2. Physurus purpureus *Ames* ORCH. 2 : 259 = *Erythrodes purpurea comb. nov.* 3. Physurus secundus *Ames* ORCH. 2 : 260 = *Erythrodes secunda comb. nov.* 4. Physurus venustulus *Ames* ORCH. 2 : 260 = *Erythrodes venustula comb. nov.* The following according to specimens in my herbarium should be referred to Erythrodes : 5. Physurus longicornu *Cogn.* Bull. Soc. Roy. Belg. 43 : 298 = *Erythrodes longicornu comb. nov.* 6. Physurus pictus *Lindl.* Gen. & Sp. Orch.

Rich. According to geographical distribution the species of Erythrodes as understood by Dr. R. Schlechter are confined to the eastern hemisphere and are in part distinguished by the bilobed sac or spur of the labellum. Physurus *L. C. Rich.* in Mém. Mus. Par. 4 : 55 (1815) is a *nomen nudum*, consequently the name Erythrodes must be adopted for the genus. If Schlechter's views are upheld and we regard a bilobed spur in connection with geographical distribution sufficient characterization for a genus, then it becomes necessary to make nomenclatorial changes. But it seems best to assign to Erythrodes all the species that have been valid under Physurus, and to disregard the segregation proposed by Schlechter.

1. Erythrodes Merrillii *Ames* ORCHIDACEÆ 3 : 79, t. 54. Herpysma Merrillii *Ames* in Phil. Journ. Sci. 2 : 313.

MINDORO.

2. *Erythrodes vrydagzynoides sp. nov.* Herba terrestris 20 cm. alta, rhizomate decumbente. Folia succulenta, alterna, superne infra inflorescentiam conferta, lanceolata, acuta, usque ad 4.5 cm. longa, ± 1 cm. lata, erecto-patentia, petiolata. Petioli basi brevi vaginante caulem cingentes, ± 1 cm. longi. Flores albi in racemo denso dispositi. Caulis sub racemum pubescens. Racemus 2–4 cm. longus, circiter 1 cm. in diametro, bracteatus, bracteis lanceolatis, usque ad 5 mm. longis. Sepala lateralia lanceolata, carinata, præsertim ad apicem, 3 mm. longa, circiter 1.5 mm. lata, ad apicem cucullata. Sepalum dorsale petalis adhærens, lineari-oblongum, obtusum, uninervium, 3 mm. longum, circiter 1 mm. latum. Petala inæqualiter spathulata, obtusa, uninervia, 3 mm. longa, circiter 1 mm. lata. Labellum in calcar

504 = *Erythrodes picta comb. nov.* 7. Physurus querceticola Lindl. Gen. & Sp. Orch. 505 = *Erythrodes querceticola comb. nov.* 8. Physurus Sagreanus *A. Rich.* in Sagra Fl. Cub. 11 : 253, t. 88 = *Erythrodes Sagreana comb. nov.* 9. Physurus vaginatus *Hook. f.* Icones, t. 449 = *Erythrodes vaginata comb. nov.*

leviter retusum productum; lamina margine involuta, oblique ascendens, semi-elliptica, ad apicem rotundata, ad medium 1 mm. lata, disco glabro, vix 2 mm. longa, cum margine involuto. Calcar circiter 2 mm. longum, ad apicem vix retusum, postice subtiliter apiculatum, intus glabrum. Gynostemium vix 2 mm. longum.

In general habit dried specimens of *Erythrodes vrydagzynoides* resemble *Vrydagzynea albida* Bl. The spur is scarcely bifid at the tip as in typical specimens of the genus as represented in the tropics of the Old World. There are no warts or callosities within the spur and no excrescences on the disc. The margin of the limb is strongly inrolled. In dried specimens the leaves appear to have been marked with a white median band.

Leyte, Dagami, *C. A. Wenzel 0150*, June 18, 1913. *Wenzel 0225*, September 29, 1913. In forest. Sixty meters altitude.

3. *Erythrodes Weberi sp. nov.* Herba terrestris, gracilis, circiter 1.5 dm. alta, pars foliosa caulis circiter 6 cm. longa, succulenta. Folia 6–7, inæqualiter ovato-lanceolata, acuta, in sicco chartacea, in petiolum contracta, lamina usque ad 5 cm. longa, circiter 2.5 cm. lata; petioli basi brevi vaginante, caulem cingentes, ± 2 cm. longi. Scapus erectus, gracilis, pubescens, bracteatus, 12 cm. longus, bracteis subarcte adpressis, acutis. Flores in racemo sublaxo dispositi. Racemus 6 cm. longus, pubescens. Pedicellus cum ovario pubescens, circiter 9 mm. longus. Bracteæ flores subtendentes lanceolatæ, acutæ, pubescentes, circiter 8 mm. longæ. Sepala lateralia lanceolata, acuta, trinervia, 4.5 mm. longa, 1.75 mm. lata, extus pubescentia. Sepalum dorsale concavum, 4.5 mm. longum, petalis adhærens, lanceolatum, extus pubescens. Petala ad apicem cohærentia, oblanceolata, 4 mm. longa, vix 1 mm. lata, uninervia. Labellum breviter subpanduriforme

in saccum bilobum productum; pars labelli subpanduriformis 2.5 mm. longa, 2 mm. lata. Saccum vix 4 mm. longum. Gynostemium 3 mm. longum; rostellum bifidum.

Erythrodes Weberi is a near ally of *E. Wenzelii*, from which it differs chiefly in the smaller flowers. The sac is not so deeply bilobed as in *E. Wenzelii*, but too much reliance cannot be placed on this character, as flowers from the same raceme are likely to show wide differences in the apex of the sac.

MINDANAO, Province of Agusan, *C. M. Weber 156 A*, July 14, 1911. Terrestrial in shady forest. Flowers brownish green, labellum white. Altitude 10 meters. Lake Lanao, *Mary Strong Clemens s. n.*

4. *Erythrodes Wenzelii sp. nov.* Herba terrestris, 3.4 dm. alta. Rhizoma repens. Pars foliosa caulis circiter 8 cm. longa, succulenta. Folia circiter 7, inæqualiter ovato-lanceolata, acuta, in sicco chartacea, in petiolum contracta; lamina usque ad 6 cm. longa, 2.5 cm. lata; petioli basi brevi vaginante, caulem cingentes, ± 2 cm. longi, in sicco totum folium flavidum. Scapus vel pars aphylla caulis erectus, pubescens, bracteatus, circiter 1.5 dm. longus, bracteis subarcte adpressis, acutis, 1.5–2.5 cm. longis, scariosis. Flores in racemo sublaxo dispositi. Racemus plus 5.5 cm. longus, pubescens. Pedicellus cum ovario glandulosi-pubescens, circiter 9 mm. longus. Bracteæ flores subtendentes lanceolatæ, acuminatæ, acutæ, pubescentes, vix 1 cm. longi. Sepala lateralia lanceolata, acuta, pubescentia, 5 mm. longa, circiter 2 mm. lata. Sepalum dorsale lanceolatum, pubescens, ad basim concaviusculum, petalis adhærens, circiter 5 mm. longum, vix 2 mm. latum. Petala ad apicem cohærentia, circiter 4 mm. longa, inæqualiter spathulata, uninervia, obtusa, glabra. Labellum saccatum, limbus panduratus, 4.5 mm. longus, circiter 3 mm. latus, ad constrictionem vix 2 mm. latus. Saccus curvatus, ad apicem

profunde bilobulatus, 4.5 mm. longus. Gynostemium 4 mm. longum; rostellum bifidum.

This is a smaller species than *Erythrodes Merrillii*, well characterized by its very different labellum. I have seen two specimens from Palawan (Merrill 7218), which appear to be representatives of this species.

LEYTE, *C. A. Wenzel s. n.* 1913.

23. KUHLHASSELTIA *J. J. Smith.*

Sepals and petals free, connivent, upper sepal conglutinated with the petals. Lateral sepals completely hiding the sac or spur. Labellum at the base saccate or calcarate, unguiculate, the sac containing two entire gland-like papillæ; unguis fleshy, entire, with the margin incurved; lamina dilated, subconcave. Gynostemium on the under side elamellate; clinandrium large, concave, margin in front on each side produced into a lobe parallel with the rostellum. Anther narrowly oblong. Pollinia 2. Low plants, terrestrial, stems foliose near the incumbent and rooting base. Leaves ovate, petiolate. Inflorescence erect, lax, pubescent.

Nearly allied with Cystopus, from which it is distinguished by the entire margin of the claw of the labellum and the complete absence of a lamella on the under surface of the gynostemium.

1. *Kuhlhasseltia Whiteheadi* (Rendle) *comb. nov.* Zeuxine Whiteheadi *Rendle* in Journ. Bot. 34 : 358. Kuhlhasseltia Merrillii *Schltr.* in Fedde Rep. 9 : 437. Hæmaria Merrillii *Ames* in Phil. Journ. Sci. 2 : 315; ORCHIDACEÆ 3 : 21, t. 30. From a sketch of the type of *Zeuxine Whiteheadi* in my herbarium, kindly presented to me by Dr. A. B. Rendle, there is no doubt in my mind but that the synonymy given above represents the correct status of this species. K. javanica *J. J. Smith* is a closely allied species.

MINDORO, LUZON.

24. CYSTORCHIS *Bl.*

Until recently the genus Cystorchis was known only through two valid species. At present nine species are recognized, three of which are natives of the Philippines.

1. Cystorchis aphylla *Ridl.* in Journ. Linn. Soc. 32 : 400.

LUZON.
Also Java and Malacca.

2. Cystorchis javanica *Bl.* Fl. Jav. Orch. 87. C. variegata *var.* purpurea *Ridl.* in Journ. Linn. Soc. 32 : 399. Etæria javanica *Bl.* Bijdr. 410; *Lindl.* Gen. & Sp. Orch. 491.

MINDANAO, District of Davao, Magaum — Compostela Trail, *C. M. Weber 286*. In dense forest, 45 meters above sea level. Flower red and green; fruit light green tinged with red, upper surface of the leaves greenish purple, lower surface red purple, lamina about 4 cm. long.

3. *Cystorchis luzonensis sp. nov.* Herba terrestris, gracilis, aff. C. javanicæ *Bl.* sed minor. Rhizoma repens, elongatus. Caules erecti vel ascendentes. Tota planta usque ad 2.5 dm. alta. Folia 4–10, ovato-lanceolata, petiolata, chartacea, in sicco margine minute crenulata, lamina ad basim rotundata, abrupte in petiolum contracta, ad apicem breviter acuminata, valde acuta, 1.5–2.5 cm. longa, 8–15 mm. lata. Petiolus usque ad 7 mm. longus, vaginans, superne sulcatus. Internodia usque ad 1 cm. longa. Pedunculus vel pars aphylla circiter 1.5 dm. longus, pilosus, pilis albidis. Bracteæ infra racemum 2–3, ad basim vaginatæ, subpatentes, circiter 1 cm. longæ, acutæ. Flores in racemo subdenso dispositi. Pedicellus cum ovario circiter 5 mm. longus. Bracteæ inflorescentiæ usque ad 5 mm. longæ, acutæ. Sepala lateralia oblonga, obtusa, sparsim hirsuta, uninervia, 7 mm. longa, usque ad 2.5 mm. lata. Sepalum dorsale lanceolatum, fastigatum, subacutum, 6 mm. longum, ad basim vix 2 mm. latum, petalis adhærens, sparsim hirsutum. Petala linearia, obtusa, circiter 1 mm. lata. Labellum

erectum, ad basim utrinque in cavitatem vesiculorem inflatum, intra has expansiones vesicæformes subtus in calcar breve conico-obtusum extra sepalorum lateralium basim prominens productum, limbus lineari-angustatus, marginibus involutis, superne incrassatis, ad apicem leviter dilatatus, obtusus. Totum labellum 7 mm. longum, calcar circiter 1 mm. longum, utroque appendix carnosa. Gynostemium 2 mm. longum.

Cystorchis luzonensis is similar to *C. javanica* Bl., but smaller. From the dried specimens the leaves appear to have been tinged with madder purple. The middle of the limb of the labellum in dried specimens is brownish. The bladder-like vesicles, one on each side of the short conical spur, are concealed by the lateral sepals. Each bladder contains a round wart-like excrescence. The spur itself protrudes between the lateral sepals.

C. celebica Schlechter is a closely related species, with the tip of the labellum dilated into a semiorbicular-reniform, obtuse lobe. My specimens of *C. celebica* are from 10.5 to 14 cm. high, the aphyllous part of the plant not exceeding 6 cm. in length.

Luzon, Province of Laguna, Mount Maquiling, *W. H. Brown Bur. Sci. 17910*, March, 1913.

25. CYSTOPUS *Bl.*

A small genus which has been more or less confused with Odontochilus, with representatives in Java, Borneo, New Guinea, Amboina, and New Hebrides.

1. *Cystopus mindanaensis sp. nov.* Aff. *C. pubescenti* Bl. Herba epiphytica foliosa ± 1 dm. alta. Rhizoma repens. Folia ovato-lanceolata, acuta, crenata; lamina usque ad 3 cm. longa, 1–1.5 cm. lata. Petioli caulem cingentes, circiter 1 cm. longi, prope basim laminæ constricti. Flores ± 4, albidi, circiter 1 cm. longi, approximati. Bracteæ inflorescentiæ pubescentes, quam pedicellus cum

ovario breviores, circiter 1 cm. longæ. Sepala lateralia oblongi-ligulata, obtusa, extus pubescentia, inferne circum basim labelli scrotiformem saccato-connata, superne patentia, circiter 1 cm. longa, 4 mm. lata. Sepalum dorsale cum petalis supra gynostemium fornicato-conglutinatum. Petala anguste lanceolata, obtusa, circiter 8 mm. longa, uninervia. Labellum 1 cm. longum, medio angustatum ad margines inæqualiter dentatum, apice in limbum 5 mm. latum, 2.5 mm. longum, semiorbicularem dilatatum. Calli duo prope basim sacci. Gynostemium breve, apice in rostellum acuminatum, bidentatum, desinens, antice sub stigmate appendicibus binis.

The teeth of the claw of the labellum are mere crenatures, with obtuse tips. The dilated apical part is obscurely apiculate.

Mindanao, Province of Camaguin, *M. Ramos Bur. Sci. 14422*, April 22, 1912. On tree-top.

2. *Cystopus philippinensis sp. nov.* Herba terrestris usque ad 1 dm. alta. Caules succulenti, rhizomate decumbente. Folia alterna, ovato-cordata, acuta, apiculata, lamina usque ad 2.5 cm. longa, 1.4 cm. lata, folia infima quam folia suprema minora, circiter 1 cm. longa; caulis supra folia pubescens. Flores 1–2, permagni, ± 2 cm. longi, albidi, erecti, membranacei. Sepala lateralia oblonga, obtusa, 2 cm. longa, circiter 7 mm. lata. Sepalum dorsale petalis adhærens, pubescens, anguste lanceolatum, obtusum, quam sepala lateralia angustius, 1.5 cm. longum, circiter 4 mm. latum. Petala dimidiato-rhombea, acuminata, acuta, utpote valde inæquilatera ad latus labello adversum magis producta, 1.5 cm. longa, 4 mm. lata, supra medium circiter 1 mm. lata. Labellum unguiculatum, patulum, in basi scrotiformi-saccatum, callos binos adnatos, carnosos occultans, in parte unguiculata canaliculatum, ad margines utrinque breviter tridentatum, apice dilatatum et

in lobos binos divaricatos subovatos divisum. Totum labellum circiter 2.5 cm. longum, lobi ± 7 mm. longi, circiter 6 mm. lati, leviter crenulati. Dentes labelli circiter 1 mm. longi. Saccus sepalis lateralibus occultus. Gynostemium 8 mm. longum, sub stigmate lamellis binis in saccum labelli dependentibus.

Cystopus philippinensis is closely related to *C. occultus* Bl.

Luzon, Province of Tayabas, Infanta, *C. B. Robinson Bur. Sci. 9446*, August 28, 1909. Altitude 1000 meters above sea level.

26. ANŒCTOCHILUS *Bl.*

Wenzel 0286 from Leyte is the only material referable to this genus that I have seen among the Philippine orchids I have examined. It is a low plant with three capsules and the withered remains of the flowers. From dried specimens the leaves appear to have been reddish beneath, very dark green above veined with red. From the withered remains of the flowers the generic characteristics of Anœctochilus are discoverable. The closest affinities appear to be *A. setaceus* Bl. and *A. Roxburghii* Lindl.

27. MACODES *Lindl.*

A genus of about eight species with one representative in the Philippine Islands.

1. Macodes Petola *Lindl.* Gen. & Sp. Orch. 497; *Reichb. f.* Xenia Orch. 1 : 227, t. 96, figs. 1-5; *Blume* Fl. Jav. Orch. 100, t. 31, fig. 2, t. 36 (D).

Several species of Macodes have been reported from the Philippines, but *M. Petola* is the only one that I have seen. *M. Petola* is an addition to my previously published lists.

Luzon, Province of Tayabas, Mount Binnang, *C. B. Robinson Bur. Sci. 9464*, August 29, 1909. Altitude 300 meters. Flower brown-purple, yellow-tipped; Laguna Province, Mount Maquiling, *M. Ramos Bur. Sci. 13705*, September 13, 1911.

Also found in Java, Singapore, and Malacca.

28. CHEIROSTYLIS *Bl.*

Cheirostylis is not a large genus. About twenty-three species are known from Formosa, New Guinea, Burma, Ceylon, Java, Siam, Tenasserim, and Celebes.

1. Cheirostylis octodactyla *Ames* in Phil. Journ. Sci. 2 : 314.

Cheirostylis octodactyla was found in dense mossy thickets on Mount Halcon, Mindoro, 8200 feet above sea level. I have seen specimens in fruit from Luzon.

MINDORO.

2. Cheirostylis philippinensis *Ames* ORCHIDACEÆ 2 : 59.

LUZON.

29. ADENOSTYLIS *Bl.*

Adenostylis strateumatica is the only Philippine species with an extra-limital range. Specimens have been collected in Formosa, China, Assam, Ceylon, India, Java, and Amboina. This is the species on which Blume founded the genus Adenostylis.

Adenostylis by priority, if we follow the rules of nomenclature adopted at the Vienna Botanical Congress, is the name of the genus commonly called Zeuxine.

Adenostyles *Cass* (Bull. Soc. Philom. 1816) is a genus of the Compositæ, but has no power to eliminate Adenostylis, as the last clause of Article 57 of the *Vienna Code* provides for the retention of generic names when the difference in spelling lies in the termination, even though the termination differs by one letter only. The examples given are Rubia and Rubus, Monochæte and Monochætum, Peponia and Peponium, Iria and Iris. In Recommendation xxx under Article 57, cases are cited where names differ in spelling by one letter in or near the middle, and in such cases it is recommended that the older name should be kept. Pluripetalum and Pluropetalum is one of the examples given. Here might

be added Coryanthes and Corysanthes, genera of the Orchidaceæ which are retained notwithstanding a perplexing similarity in their spelling. According to this recommendation it might be supposed that the point could be stretched so that Adenostylis (1825) should yield to Adenostyles (1816), and that Zeuxine, a generic name now preferred by authors for the species of Adenostylis, should be kept in force, but in view of the very clear and precise wording of Article 57 of the *Vienna Code* and the examples given, it would seem that personal preference has no weight in choosing the best course to follow, and that Adenostylis, which differs from Adenostyles in its termination only, must stand. Article 57 is here given in full:

Art. 57. The original spelling of a name must be retained except in case of a typographic or orthographic error. When the difference between two names, *especially two generic names, lies in the termination, these are to be regarded as distinct even though differing by one letter only.*[1]

Examples: *Rubia* and *Rubus*, *Monochæte* and *Monochætum*, *Peponia* and *Peponium*, *Iria* and *Iris*.

Recommendations.

xxx. The liberty of making orthographic corrections must be used with reserve, especially if the change affects the first syllable, and above all the first letter of a name.

xxxi. Many names differ by a single letter without risk of confusion (ex. Durvillea and Urvillea). In cases where a close approach to identity is a source of error (Astrostemma and Asterostemma in one and the same family, Asclepiadaceæ, Pleuripetalum and Pleuropetalum in Orchidaceæ), only one, the older, of the names should be kept, in accordance with Article 51, 4°.

[1] Italics are mine.

1. Adenostylis benguetensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1551.

LUZON.

2. Adenostylis Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1552.

LUZON, PALAWAN.

3. *Adenostylis leytensis sp. nov.* Herba terrestris, gracilis, ± 1 dm. alta, succulenta. Folia lanceolata, acuta; lamina usque ad 2 cm. longa, circiter 5 mm. lata, in petiolum contracta. Petiolus ad basim vaginans, circiter 1 cm. longus. Bracteæ infra racemum scariosæ, valde acutæ. Caulis sparse pubescens. Racemus usque ad 5 cm. longus, subdensus. Bracteæ inflorescentiæ lanceolatæ, acuminatæ, acutæ, flores æquantes, ad margines fimbriato-pubescentes. Flores parvuli, globosi, circiter 3 mm. longi. Sepala lateralia 3 mm. longa, 1.75 mm. lata, ovato-lanceolata, acuta. Sepalum dorsale cum petalis supra gynostemium fornicato-conglutinatum. Petala inæqualiter lanceolata, uninervia, circiter 3 mm. longa. Labellum ad basim saccatum, 2.5 mm. longum, saccus subglobosus, 1 mm. altus, intus processu subulato utroque, apex labelli in laminam orbiculari-triangularem circiter 1 mm. latam, dilatatus. Gynostemium circiter 2 mm. longum.

The labellum is not unlike that of *Adenostylis strateumatica* Ames. *A. leytensis* is a slender species which is readily distinguishable from *A. strateumatica* by the form of the leaves.

LEYTE, Jaro, *C. A. Wenzel 0349*, March 12, 1904. Terrestrial in forest. Sepals green, petals white, lip white. Altitude 500 meters.

4. Adenostylis luzonensis *Ames* ORCHIDACEÆ 2 : 57.

LUZON, MINDORO.

5. Adenostylis marivelensis *Ames* ORCHIDACEÆ 2 : 58.

LUZON, NEGROS.

6. Adenostylis strateumatica *Ames* Orchidaceæ 2 : 59. Orchis strateumatica *L.* Fl. Zeyl. 150. Zeuxine integerrima *Lindl.* Gen. & Sp. Orch. 486.

Mindanao.
Also Formosa, China, Assam, Ceylon, India, Java, and Amboina.

7. Adenostylis Vanoverberghii *Ames* in Phil. Journ. Sci. 8 : 408.

Luzon.

8. *Adenostylis Weberi sp. nov.* Rhizoma succulentum, ad nodos radicans. Caules ± 3 dm. alti, succulenti, supra pubescentes. Folia prope medium caulem conferta. Bases foliorum vaginatæ, scariosæ, amplæ. Lamina inæqualiter, ovato-lanceolata, acuta, subtus purpurascens, 4–8 cm. longa, usque ad 4.5 cm. lata, in sicco valde membranacea. Racemus usque ad 7 cm. longus, laxiflorus pubescens. Bracteæ inflorescentiæ purpurascentes, lanceolatæ, acutæ, circiter 8 mm. longæ. Flores ± 15, extus virescenti-purpurei, intus albidi. Pedicelli, ut videtur, nulli. Ovarium 5 mm. longum, glabrum. Sepala lateralia, ovata, acuta, uninervia, 4 mm. longa, vix 3 mm. lata. Sepalum dorsale simile. Petala dimidiato-obovata, obtusa, uninervia, 4 mm. longa, prope apicem 2.75 mm. lata. Labellum vix 5 mm. longum, crassum, concavum, trilobatum, lobi laterales rotundati, lobus medius 1.5 mm. longus, 1.5 mm. latus, quadratus, ad apicem rotundatus, non bilobus, in disco callus prope medium labelli stat; basis labelli saccum non altum formans, intus utroque processu cuneiformi.

Adenostylis Weberi in general habit resembles *A. Vanoverberghii* Ames, but the details of the labellum are characteristic. The processes or calli near the base of the labellum are cuneiform, flattened, and at the broadened end several, and finely, lobed.

MINDANAO, District of Davao, Mount Binatun, *C. M. Weber 280*, November 2, 1911. Terrestrial among damp leaves in bamboo forest, altitude above sea level 1750 feet.

9. *Adenostylis Wenzelii sp. nov.* Herba terrestris, usque ad 6.6 dm. alta, rhizomate ascendente, cauliforme, radicibus flexuosis, villosis; caule infra medium foliato, tereti, glabro, supra vaginulis paucis, distantibus, bracteiformibus obsesso, glanduloso-puberulo. Folia erecto-patentia, oblique lanceolata, acuminata, utrinque attenuata, membranacea, petiolata, petiolo basi dilatata vaginante, lamina usque ad 1.5 dm. longa, 1.5–3.5 cm. lata. Petiolus circiter 3 cm. longus. Racemus circiter 2 dm. longus, multiflorus, glanduloso-puberulus. Bracteæ inflorescentiæ lanceolatæ ± 2 cm. longæ, acutæ, patentes. Flores albidi. Ovarium glanduloso-pubescens. Sepala lateralia lanceolata, acuta, extus glanduloso-pubescentia, intus glabra, 1.5–1.8 cm. longa, 5 mm. lata. Sepalum dorsale lanceolatum, concavum, cum petalis galeam formans. Petala oblongi-lanceolata, membranacea, glabra, obtusa, circiter 1.5 cm. longa, supra medium 3.5 mm. lata. Labellum 1.4 cm. longum, saccatum, lamina usque ad medium oblonga, circiter 5 mm. lata, antice breviter pectinata vel dentata, in disco bilamellata, supra medium in unguem 3 mm. longum, 1.5 mm. latum contracta, ad apicem in lobum triangulum dilatata. Saccus scrotiformis, circiter 4 mm. longus, intus, utrinque, aliquot squamis ornatus. Gynostemium elongatum, 1.3 cm. longum.

The labellum is saccate, with about twelve flattened scales or hairs on either side within. The lamina of the labellum is broad where it joins the sac, somewhat oblong in outline, and above the middle suddenly contracted into a narrow claw which terminates in a subtriangular blade; the lamina just in front of the claw is pectinate fringed on the margin.

Dr. R. Schlechter, who has kindly examined a specimen, re-

gards *A. Wenzelii* as a near relative of *Zeuxine elatior* Schltr. and *Z. argentea* Schltr., natives of New Guinea. From both of these species *Adenostylis Wenzelii* is distinct in its much larger flowers and in the processes on each side of the sac of the labellum.

LEYTE, Dagami, *C. A. Wenzel 0210*, July 21, 1913. Terrestrial in forest, 60 meters above sea level. Flowers white; Ormoc, *Wenzel 0119*, April 28, 1913. Terrestrial in forested foothills, 200 meters above sea level. Flowers white.

30. MYRMECHIS *Bl.*

1. Myrmechis gracilis *Bl.* Fl. Jav. Orch. 64, t. 21, fig. 2.

MINDORO, MINDANAO, LUZON.

2. Myrmechis philippinensis *Ames* ORCHIDACEÆ 2 : 64. Aspect of *M. japonica.*

LUZON.
Also a native of Java and Japan.

31. VRYDAGZYNEA *Bl.*

Twenty or more species are recognized. Of this number about twelve are natives of New Guinea.

1. Vrydagzynea albida *Bl.* Fl. Jav. Orch. 62, t. 19, fig. 2.

LUZON, MINDANAO, LEYTE, MINDORO, NEGROS.
Also from German New Guinea, Java, Perak, Sumatra, and Singapore.

2. *Vrydagzynea Weberi sp. nov.* Herba terrestris 1.5 dm. alta, gracilis. Rhizoma succulentum ad nodos radicans. Caules erecti, foliosi, supra folia pubescentes. Folia ovato-lanceolata, acuta, ad basim rotundata, supra vix decrescentia, 1.5–4 cm. longa, usque ad 1.5 cm. lata, in sicco membranacea, glabra. Petioli graciles, vaginati, ad basim ampli, circiter 1 cm. longi, sulcati. Bracteæ infra racemum vaginatæ, 1–2. Racemum densiflores, sæpe laxiflorus usque ad 3 cm. longus. Bracteæ flores subtendentes ovato-lanceolatæ, acutæ, pubescentes, circiter 6 mm. longæ. Sepala lateralia oblonga, obtusa, uninervia, 4.5 mm. longa, circiter 2 mm. lata.

Sepalum dorsale lanceolatum cum petala galeam formans, 4 mm. longum, uninervium. Petala oblongi-lanceolata, obtusa, uninervia, 4 mm. longa, circiter 1 mm. lata. Labellum sessile, subtus obtuse calcaratum, in calcar inflato semipellucido binis glandulis breviter pedicellatis ellipsoideis dependentibus; limbus oblongus, obtusus, margine involutus, in disco papilloso-puberulus. Calcar 3.5 mm. longum. Limbus labelli 4 mm. longus. Gynostemium circiter 3 mm. longum.

The flowers are not unlike *Vrydagzynea albida*, but the habit of the plant is distinctive, the leaves and stems suggesting *Cystorchis javanica* Bl.

MINDANAO, *C. M. Weber 333.*

32. HETÆRIA *Bl.*

About twenty-five species have been recorded, distributed over a wide range which includes Java, Perak, Upper Assam, Borneo, Malacca, Ceylon, New Guinea, Tenasserim, Singapore, Burma, Himalaya, Samoa, Tahiti, Penang, etc.

1. *Hetæria Blackii sp. nov.* Rhizoma longe repens, circiter 2 mm. in diametro. Caulis ascendens, gracilis. Tota planta circiter 18 cm. alta. Folia petiolata infra medium caulem disposita, inæqualiter lanceolata, acuminata, acuta, lamina 5–7 cm. longa, usque ad 2.5 cm. lata, infra medium, ad basim, rotundata. Petiolus gracilis ad basim vaginatus, 2–3 cm. longus. Bracteæ infra racemum 4, lanceolatæ, acutæ, 8–10 mm. longæ. Racemus laxiflorus, 5.5 cm. longus, circiter 1 cm. in diametro, pubescens. Bracteæ inflorescentiæ, flores subtendentes, lanceolatæ, acutæ, pubescentes, ± 5 mm. longæ, concavæ, infra medium racemi flores excedentes, pedicellus subnullus, cum ovario circiter 5 mm. longus. Sepala lateralia ovato-lanceolata, uninervia, membranacea, acuta, concaviuscula, subpatentia, deflexa, 4 mm. longa, circiter 2.5 mm.

lata, extus sparse pubescentia. Sepalum dorsale erectum, concavum, cum petalis galeam formans, ovatum acutum, margine leviter involuta, uninervium vix 3 mm. latum, vix 4 mm. longum, extus sparse pubescens. Petala membranacea, inæqualiter ovato-elliptica, uninervia, 3.5 mm. longa, 2 mm. lata, glabra. Labellum breviter saccatum, 3.5 mm. longum, trilobatum, supra medium, lobi laterales membranacei, rotundati, vix 1 mm. longi, 1 mm. lati (erecti?). Lobus medius quadratus, valde obtusus, 1 mm. longus, 1 mm. latus. In disco callus inconspicuus, ad basim utroque callus cuneatus complanatus, carnosus, .5 mm. longus, ad apicem .75 mm. latus. Gynostemium generis.

This species is represented by a single specimen in the herbarium of the Bureau of Science at Manila. The leaves appear to have been dark green above, and dull red beneath. No notes about the color of the flowers were made by the collector. From the dried specimens the sepals appear to have been purplish, the petals and lobes of the labellum whitish.

Mindanao, District of Davao, *Rev. R. F. Black s. n.* 1912.

2. *Hetæria lancifolium sp. nov.* Herba terrestris, usque ad 3.5 dm. alta. Rhizoma succulentum ad nodos radicans. Caules ascendentes, graciles, sparsim pilosi, usque ad medium foliosi, supra folios pauci-bracteati, bracteis tubularibus, acutis. Folia ± 6, petiolata, anguste lanciformia, acuta, apiculata, subtus purpurascens, lamina usque ad 6.5 cm. longa, usque ad 1.4 cm. lata, membranacea. Petiolus ad basim vaginans, prope laminam folii gracilis, circiter 1.5 cm. longus. Flores albidi et purpureo-viridi ± 5 in racemo laxo dispositi. Racemus 3.5 cm. longus. Bracteæ flores subtendentes lanceolatæ, acuminatæ, acutæ, sparsim pilosi, ± 6 mm. longæ, erectæ. Sepala lateralia glabra, oblonga, obtusa, 5 mm. longa, vix 2 mm. lata. Sepalum dorsale cum petalis supra gynostemium for-

nicato-conglutinatum ad basim valde concavum. Petala semi-ovata, acuminata, circiter 4.5 mm. longa. Labellum ad basim saccatum, 5 mm. longum, apex labelli in laminam 4 mm. latam, vix 2 mm. longam, transverse oblongam dilatatus. Saccus semi-globosus, intus processu 2, subulato, utroque. Gynostemium generis.

MINDANAO, Apayo Subprovince, *C. M. Weber 327*, January 25, 1912. Terrestrial in forest. Altitude 76.2 meters.

3. *Hetœria mindanaensis sp. nov.* Rhizoma succulentum ad nodos radicans. Caules cum racemo circiter 2.3 dm. alti, pubescentes. Folia conferta, inæqualiter lanceolata supra decrescentia, in sicco membranacea, acuta. Bases foliorum vaginatæ, amplæ. Petioli graciles; lamina foliorum 3–7 cm. longa, usque ad 2 cm. lata. Racemus laxiflorus, elongatus, ± 1 dm. longus. Flores virescenti-purpurei, 14–30, inter minores generis, circiter 3–4 mm. longi, glabri, pedicellus ut videtur nullus, cum ovario ± 6 mm. longus, pubescens. Bracteæ flores subtendentes triangulari-lanceolatæ, longe acuminatæ, valde acutæ, pubescentes, ad basim concavum, ± 5 mm. longum. Bracteæ infra racemum simile usque ad 1 cm. longæ. Sepala lateralia oblongi-lanceolata, subacuta, circiter 4 mm. longa, vix 2 mm. lata, concaviuscula, uninervia. Sepalum dorsale angustius, cum petala galeam formans. Petala dimidiato ovata, acuminata, acuta, uninervia, 3.5 mm. longa, circiter 2 mm. lata. Labellum vix 4 mm. longum, valde concavum, ad apicem, in lobum reniforme dilatatum, circiter 2 mm. latum, intus utroque processibus duobus unciformis.

The labellum suggests *Adenostylis strateumatica* (L.) Ames, but otherwise there is no close relationship between the two species.

MINDANAO, Province of Agusan, Sangaan, Cabadbaran Trail, *C. M. Weber 317*, December 11, 1911. Terrestrial in shady forest, 22 meters above sea level.

4. Hetæria oblongifolia *Bl.* Fl. Jav. Orch. 85, t. 32, fig. 3 (cf. Orchidaceæ 2 : 62, 63).

Luzon, Negros, Palawan, Balabac, Mindanao.
Also Java, Moluccas, German New Guinea.

5. *Hetæria Wenzelii sp. nov.* Herba terrestris, usque ad 35 cm. alta, usque ad medium foliata. Folia anguste lanceolata, paulatim acuminata, valde acuta, in sicco membranacea, 2.5–6 cm. longa, circiter 1.5 cm. lata, petiolata; petiolus usque ad 13 mm. longus, ad basim vaginans, infundibuliformis, inter laminam foliorum et vaginam contractus. Pars aphylla caulium circiter 2 dm. longa, sparsim villosa, bracteis 3. Bracteæ infimæ tubulares, vel oblique infundibuliformes, in apicem valde acutum productæ. Flores ±12 in racemo laxo dispositi. Bracteæ inflorescentiæ lanceolatæ, ad basim concavæ, infimæ pedunculum cum ovario excedentes vel æquantes, circiter 8 mm. longæ, sparsim villosæ. Sepala lateralia ovato-lanceolata, acuta minute puberula, 6 mm. longa, 2.5 mm. lata. Sepalum dorsale ovato-lanceolatum paulatim acuminatum, acutum, ad basim concaviusculum, extus minute puberulum, vix 7 mm. longum, petalis adhærens. Petala 7 mm. longa, supra medium linearia, 1 mm. longa, infra medium semiorbicularia. Labellum saccatum; limbus, marginibus involutis, superne incrassatis, in lobos triangulos expansus, apiculatus. Totum labellum 6 mm. longum; lobi 4 mm. longi, ad basim 2 mm. lati, paulatim acuminati. Saccus scrotiformis, intus utrinque callus tridigitatus. Gynostemium 3 mm. longum. Ovarium sparsim hirsutum.

Hetæria Wenzelii is related rather closely to *H. lamellata* Bl., from which it differs in habit and in having within the sac of the labellum only one series of calli on each side. The three divisions of the calli are slenderly conical. The apical lobes of the

labellum form a transverse plate 8 mm. long from tip to tip and are very slightly reflexed. In front the labellum is furnished with a triangular apiculate point.

LEYTE, Dagami, *C. A. Wenzel 0227*, July 10, 1913. In forest, 60 meters above sea level. Flowers white and pink.

33. TROPIDIA *Lindl.*

Among the collections made for the Bureau of Science at Manila there are several specimens of this genus in fruit or incomplete that may represent additions to the Philippine flora. *Tropidia septemnervis* Reichb. f. (*Ptychochilus septemnervis* Schauer) is known to me only from the plate in Meyen's Beitrage. Here *T. minor* may belong. *T. curculigoides* Lindl. is cited by Naves. This species is a native of Java, Borneo, and Malacca. It is not improbable that Naves referred specimens, represented by one of the four species in the following list, wrongly, to Lindley's species.

1. Tropidia calcarata *Ames* in Phil. Journ. Sci. 7 : 7.

   LUZON.

2. Tropidia mindanaensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1553.

   MINDANAO.

3. Tropidia mindorensis *Ames* in Phil. Journ. Sci. 2 : 315.

   MINDORO.

4. Tropidia minor *Ames* ORCHIDACEÆ 2 : 65.

   LUZON.

34. CORYMBORCHIS *Thou.*

About twelve species are known. *Corymborchis flava* is a native of Mexico and the West Indies. Corymborchis is the generic name adopted by Thouars. Corymbis is a uninomial formed from the generic and specific names. According to the rules of nomenclature, Corymbis is not available.

1. *Corymborchis confusa comb. nov.* Corymbis disticha *Naves* Nov. App. 248 non *Lindl.*

MINDANAO, LEYTE.

35. CHRYSOGLOSSUM *Bl.*

About fourteen species constitute the genus. These have been reported from Assam, New Guinea, Formosa, Japan, Java, Sikkim, New Caledonia, Fiji, and Perak.

1. Chrysoglossum villosum *Bl.* Bijdr. 338, fig. 7.

MINDORO.

36. NEPHELAPHYLLUM *Bl.*

A small genus represented by about nine species in Borneo, China, Khasia, Hongkong, Java, Singapore, Sikkim, Malacca, and Perak.

1. Nephelaphyllum mindorense *Ames* in Phil. Journ. Sci. 2:316.

MINDORO, NEGROS? MINDANAO?

37. DIGLYPHOSA *Bl.*

Diglyphosa Elmeri Ames is the only species known to be a native of the Philippines. The genus contains one other species, *D. latifolia* Bl. from Java. *D. latifolia* var. *celebica* Schltr. is a native of Celebes. *D. Elmeri* is known only from the type that was collected on Mount Apo in Mindanao.

1. Diglyphosa Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5:1555.

MINDANAO.

38. CŒLOGYNE *Lindl.*

Pfitzer admitted one hundred and three species to the genus in Engler's Das Pflanzenreich. To this number must be added from New Guinea, Sumatra, the Philippines, etc., not less than thirty-four species which have been described since the monograph in Das Pflanzenreich was published.

It is by no means a simple task to ascertain with surety just how many species of Cœlogyne are natives of the Philippines, as several have been reported from there on very unreliable data. In the following list I have relied on the Bureau of Science collections and on information which I have every reason to believe is trustworthy. Those species marked with an asterisk I have studied from herbarium material of Philippine origin.

* 1. Cœlogyne asperata *Lindl.* in Journ. Hort. Soc. 4 : 221.

MINDANAO, NEGROS, BASILAN.
Also found in New Guinea, Borneo, Sumatra, and Perak.

*2. Cœlogyne bilamellata *Lindl.* Fol. Orch. Cœlogyne, p. 14.

LEYTE, LUZON, MINDANAO.
Reported from Borneo.

* 3. Cœlogyne chloroptera *Reichb. f.* in Gard. Chron. (1883) 53: 466.

LUZON.

*4. *Cœlogyne confusa sp. nov.* Aff. *S. sparsæ* Reichb. f. Radices puberulæ. Pseudobulbi anguste fusiformes, circiter 5 cm. longi, diphylli, erecti. Folia elliptico-lanceolata, subcoriacea, utrinque attenuata, acuminata, acuta, prominente nervosa, petiolata, lamina usque ad 22 cm. longa, circiter 4.5 cm. lata; petiolus 2.5 cm. longus, sulcatus, rigidus. Scapus heteranthus, 2.5 dm. longus, ad basim bracteis imbricatis. Bracteæ inflorescentiæ deciduæ. Racemus laxus, circiter 1.5 dm. longus. Flores 2–2.5 cm. distantes. Pedicellus cum ovario 2 cm. longus. Ovarium alatum. Sepala lateralia 2 cm. longa, circiter 7 mm. lata, valde carinata, lanceolata, acuta. Sepalum dorsale simile, carinatum. Petala linearia, acuta, trinervia, 1.8 cm. longa, 4 mm. lata. Labellum magnum, trilobatum, 1.8 cm. longum, 7 mm. latum. Lobi laterales semi-ovati, obtusi, e basi labelli 1 cm. longi; lobus medius semi-ellipticus, ad apicem rotundatus, vix emarginatus, circiter 1 cm. longus, 7 mm.

latus, margine leviter undulatus. Carinæ 3, non flexuosæ, a basi labelli fere ad medium lobi medii extensæ, laterales quam carina intermedia longiores. Discus minute puberulus. Columna ad apicem valde arcuata, 11 mm. longa, alata; androclinium integerrimum.

The nearest ally of this species appears to be *Cœlogyne sparsa* Reichb. f. *C. confusa* is more robust, and differs from it in the details of the flowers. The three-nerved petals constitute a differentiating character. I originally referred the type to *C. sparsa* Reichb. f.

Camiguin de Mindanao, *M. Ramos Bur. Sci. 1430*, March to April, 1912. Flowers white and yellow. Plants epiphytic.

*5. Cœlogyne Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5: 1556.

Mindanao.

*6. Cœlogyne integerrima *Ames* in Phil. Journ. Sci. 4: 665.

Luzon.

*7. Cœlogyne Loheri *Rolfe* in Kew Bull. (1908) 414.

Luzon?

8. Cœlogyne marmorata *Reichb. f.* Linnæa 41 : 116. Imperfectly known. Originally described from material collected near Manila by Wallis. From Sablan, Province of Benguet, Luzon, I have a specimen (W. Schultze s. n.) which agrees with Reichenbach's description. The sepals are ecarinate. The flowers are as large as those of *C. fuscescens*. Pseudobulbs elongated, somewhat fusiform, crowded, about 10 cm. long, in dried specimens 1 cm. thick at about the middle, with several scarious sheaths, two-leaved. Leaves oblong-lanceolate, about 40 cm. long when mature, 4 cm. wide, acute, about 15 cm. long at anthesis, the petioles concealed by closely imbricating sheaths. Scape shorter than the

leaves, slender, winged, about three-flowered. Bracts soon deciduous. Flowers white and yellow, about 3.3 cm. long. Lateral sepals with a prominent mid-vein, otherwise ecarinate, oblong-lanceolate, acute, about 3.3 cm. long, 7 mm. wide. Upper sepal 3.3 cm. long, about 1 cm. wide, oblong-lanceolate, acute. Petals linear, three-nerved to about the middle, 3 cm. long, about 2 mm. wide at base. Labellum three-lobed near the middle, 3 cm. long, 1.7 mm. wide near the base of the middle lobe. Lateral lobes semi-obcordate, rounded, 1.7 mm. long from base of labellum, about 5 mm. wide, netted veined with numerous brown dots near the veins. Middle lobe round cordate, emarginate-apiculate at the apex, margin slightly crenulate, 1.7 cm. long. Carinæ five, three extending from the base of the labellum to the base of the mid-lobe or a little farther, two about equalling the others beginning near the lateral lobes, all the carinæ strongly undulated. The middle carina not equalling the laterals. Column clavate, androclinium sub-entire. Rostellum conspicuous.

Luzon, Province of Benguet, Sablan, *W. Schultze s. n.* May, 1909.

*9. Cœlogyne Merrillii *Ames* in Phil. Journ. Sci. 6 : 40.

Negros, Luzon.

*10. *Cœlogyne palawanense sp. nov.* Radices validæ, pubescentes. Pseudobulbi approximati, conferti, elongati, in sicco valde sulcati, superne fastigati, ad basim ±1 cm. in diametro, 5–7 cm. longi, flavidi in sicco, diphylii, erecti, vaginis obtecti. Folia longe petiolata, lamina cum petiolo usque ad 26 cm. longa, anguste elliptico-lanceolata, utrinque attenuata, usque ad 2 dm. longa, usque ad 3.5 cm. lata, nerviis subtus prominentibus. Petioli graciles 5.5–8 cm. longi, in sicco nervosi. Scapus synanthus usque ad 17 cm. altus, squamis imbricatis, acutis, inclusus, quinqueflorus. Bracteæ inflorescentiæ naviculares, persistentes, ovaria pe-

dunculata superantes, usque ad 2 cm. longæ, acutæ, glumaceæ. Racemus laxiflorus, flores, 1.5–2 cm. distantes, circiter 2.5 cm. longi, albidi et flavidi. Sepala lateralia oblonga, acuta, leviter attenuata usque ad apicem, membranacea in sicco, leviter carinata, 2.7 cm. longa, 9–10 mm. lata. Sepalum dorsale simile, ecarinatum. Petala sepalis angustiora, oblonga, obtusa, leviter, attenuata prope apicem, 2.9 cm. longa, circiter 6 mm. lata. Labellum 12 mm. longum, trilobatum, lobi laterales quinta parte breviores, late semicordati, antice rotundati, lobus medius vix unguiculatus, rotundatus, denticulatus, 6 mm. longus, 9 mm. latus, carinæ 2, leviter arcuati, convergentes a basi labelli fere ad apicem lobi medii extensæ biseriatæ, ex processibus digitiformibus compositis, carinula brevi utrinque addita prope medium lobi medii. Gynostemium curvatum 1.5 cm. longum ad apicem late alatum, minute denticulatum, ovarium nigro-puberulum.

Aside from the pair of supplementary carinæ in the middle lobe the labellum is distinctly bicarinate. The median nerve is perhaps thickened, but it is free from verrucose projections. The lateral carinæ are biseriate, that is, grooved with the edges of the groove broken up rather regularly into short blunt teeth or digitate processes. *Cœlogyne palawanense* is perhaps nearer to *C. Swaniana* than to any other described species, but the form of the middle lobe and the bicarinate disc are distinguishing characteristics. In the specimens from which my description was taken the flower shoot was much shorter than the leaves.

Palawan, Mount Capoas, *E. D. Merrill 9499*, April 21, 1913, 1000 meters altitude. Flower white, lateral lobes of the labellum with yellow lines inside, middle lobe yellow within.

* 11. Cœlogyne Rochussenii *De Vriese* Illust. Orch. Ind. Or. t. 2, t. 11, fig. 6.

Mindanao.
Also Java, Sumatra, and Singapore.

* 12. Cœlogyne sparsa *Reichb. f.* in Gard. Chron. (1883) 53:306.
Mindanao, Luzon, Palawan, Panay, Negros.

13. Cœlogyne Swaniana *Rolfe* in Kew Bull. (1894) 183. This species is known to me through cultivated specimens. I have not seen any specimens from the Philippine Islands.

* 14. *Cœlogyne Vanoverberghii, sp. nov.* Aff. *C. sparsæ* Reichb. f. Radices crassæ, elongatæ, ramosæ. Pseudobulbi conferti, fusiformes, ad apicem basimque fastigati, circiter 4 cm. longi, in sicco circiter 1 cm. in diametro, monophylli. Folium late ellipticum, acuminatum, acutum ad apicem basimque fastigatum in sicco chartaceum, breviter petiolatum; lamina 9–15 cm. longa, 4.5–5.5 cm. lata. Racemus probabiliter pendulus, vel suberectus, foliis juvenilibus synanthus, usque ad 2 dm. longus cum scapo, folia adulta æquans. Bracteæ inflorescentiæ deciduæ. Flores ±6. Scapus gracilis, glaber, sub inflorescentia nudus. Sepala lateralia oblongi-lanceolata, acuta, extus valde carinata, 2 cm. longa, circiter 6 mm. lata. Sepalum dorsale ovato-lanceolatum, acutum, extus leviter carinatum, 2 cm. longum, circiter 8 mm. latum, ad basim concaviusculum. Petala lineari-triangula, acuta, trinervia, circiter 2 cm. longa, vix 4 mm. lata. Labellum trilobatum, circiter 2 cm. longum, lobi laterales manifeste prominentes, ovati, obtusi, 3 mm. longi usque ad sinum, lobus medius breviter unguiculatus, transverse ellipticus, emarginatus ad apicem, usque ad 11 mm. latus, circiter 1 cm. longus, margine integer, carinæ 2 elevatæ a basi labelli usque ad dimidium lobi medii extensæ, carina media fere evanida. Gynostemium arcuatum, androclinium irregulariter denticulatum.

The collector's notes give no clue as to the color of the flowers,

and in dried specimens the only trace of coloration retained is the characteristic brownish marking found on the labellum of *Cœlogyne sparsa* and several other species of the § Lentiginosæ. *C. Loheri* Rolfe (Kew Bull. 1908, 414) appears to be a closely related species, but the leaves are much narrower in proportion to their length and the disc of the labellum is traversed by five carinæ.

Luzon, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 2865*, April 4, 1913. Altitude above sea level 1700 meters.

39. DENDROCHILUM *Bl.*

Only two other Philippine orchid genera are richer in species: Bulbophyllum with eighty-six and Dendrobium with eighty-three. Dendrochilum has sixty-nine species.

Dendrochilum bistortum J. J. Smith from Maschate Island has been referred to the Philippines. I have not seen any Philippine specimens that match it.

Dendrochilum cucumerinum Reichb. f. I know only from cultivated specimens. I have not seen any specimens of authentic Philippine origin.

Dendrochilum grandiflorum Schltr. is known to me only by the description and a flower from the type.

Dendrochilum longifolium Reichb. f. has been referred to the Philippines by Kränzlin (Jagor 680), but I have not seen Jagor's specimens. *D. longifolium* was not originally described from Philippine material.

Dendrochilum maleolens Kränzl. I know only from the description.

Reference should be made to Orchidaceæ, volume 2, for detailed synonymy and descriptions of Philippine species of Dendrochilum, and for a key to the species described up to 1905.

At the present time not less than one hundred and forty spe-

cies of Dendrochilum are recognized. The Philippine representatives may be distributed into four well-differentiated sections, as follows:

A. Stelidia of the column obsolete.
  a. Peduncles terminal. § Acoridium, 44 species.
  b. Scape lateral. § Pseudacoridium, 1 species.
B. Stelidia of the column well developed, rarely rudimentary.
  a. Scape lateral. § Eu-Dendrochilum, 1 species.
  b. Peduncle terminal. § Platyclinis, 23 species.

Although § Acoridium is the largest section, only three species referable to it were known prior to the American occupation of the Philippines. *Dendrochilum Merrillii*, from Luzon, and several species not known to inhabit the Philippines, such as *D. Kingii* (Hook. f.) Pfitz., are characterized by the lack of stelidia on the column, and yet show closer relationship with § Platyclinis than with § Acoridium. These species constitute the § Aphanostelidion proposed by Pfitzer.

1. Dendrochilum (§ Acoridium) affine *Ames* Orchidaceæ 2:95.

Luzon.

2. Dendrochilum (§ Acoridium) anfractoides *Ames* Orchidaceæ 3 : 13, t. 28.

Luzon.

3. Dendrochilum (§ Acoridium) anfractum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 118; *Ames* Orchidaceæ 2 : 91.

Luzon.

4. Dendrochilum (§ Platyclinis) arachnites *Reichb. f.* in Gard. Chron. (1882) 51 : 256.

Mindoro, Luzon, Mindanao.

5. Dendrochilum (§ Acoridium) auriculare *Ames* in Phil. Journ. Sci. 4 : 595.

Luzon.

6. Dendrochilum (§ Platyclinis) bicallosum *Ames* ORCHIDACEÆ 2 : 117.

LUZON, MINDORO.

7. Dendrochilum (§ Platyclinis) cagayanense *Ames* in Phil. Journ. Sci. 6 : 41.

LUZON.

8. Dendrochilum (§ Acoridium) cinnabarinum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 104.

LUZON.

9. Dendrochilum (§ Platyclinis) Clemensiæ *Ames* ORCHIDACEÆ 2 : 109.

LUZON, MINDANAO.

10. Dendrochilum (§ Platyclinis) Cobbianum *Reichb. f.* in Gard. Chron. (1880) n. s. 14 : 748.

LUZON, MINDANAO.

11. Dendrochilum (§ Acoridium) confusum *Ames* in Phil. Journ. Sci. 6 : 41.

LUZON.

12. Dendrochilum (§ Platyclinis) convallariæforme *Schauer* Nov. Act. Nat. Cur. 19, Suppl. 1 : 429.

LUZON?

13. Dendrochilum (§ Platyclinis) Copelandii *Ames* ORCHIDACEÆ 2 : 115. Referred to synonymy of *D. convallariæforme* Schauer in Engler's Das Pflanzenreich Cœlog. 97.

MINDANAO.

14. Dendrochilum (§ Platyclinis) cucullatum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 98.

MINDANAO.

15. Dendrochilum (§ Platyclinis) cucumerinum *Reichb. f.* in

Gard. Chron. (1884) 56 : 649. Origin not known. Referred to Philippines.

16. Dendrochilum (§ Acoridium) Curranii *Ames* Orchidaceæ 3 : 15, t. 29.

Luzon.

17. Dendrochilum (§ Platyclinis) cymbiforme *Ames* in Phil. Journ. Sci. 6 : 41.

Luzon.

18. Dendrochilum (§ Acoridium) Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1558.

Mindanao.

19. Dendrochilum (§ Acoridium) exile *Ames* Orchidaceæ 2 : 84.

Mindoro.

20. Dendrochilum (§ Platyclinis) filiforme *Lindl.* Bot. Reg. (1840) Misc. p. 52. I have seen only cultivated specimens.

21. Dendrochilum (§ Acoridium) Foxworthyi *Ames* Orchidaceæ 3 : 8, t. 26.

Luzon.

22. Dendrochilum (§ Platyclinis) glumaceum *Lindl.* Bot. Reg. (1841) Misc. p. 23.

Luzon, Mindanao, Leyte.

23. Dendrochilum (§ Platyclinis) graciliscapum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 99.

Mindanao.

24. Dendrochilum (§ Acoridium) graminifolium *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 114.

Luzon.

25. Dendrochilum (§ Platyclinis) grandiflorum *Schltr.* in Fedde Rep. 8 : 563. Origin not surely known.

26. Dendrochilum (§ Acoridium) hastatum *Ames* Orchidaceæ 2 : 99.

Mindoro.

27. Dendrochilum (§ Acoridium) Hutchinsonianum *Ames* Orchidaceæ 2 : 96.

Mindoro.

28. *Dendrochilum* (§ *Acoridium*) *irigense sp. nov.* Aff. *D. pumilo* Reichb. f., in habitu aff. *D. Hutchinsonio.* Radices elongatæ, ramosæ. Pseudobulbi graciles, fusiformes, in sicco valde rugosi, flavidi, 15–47 mm. longi, superne fastigati, monophylli, conferti, juniores vaginis brunneis obtecti. Folium oblongi-lanceolatum, acuminatum, acutum, utrinque attenuatum, conspicue 3–5 nervosum, cum petiolo 6–15 cm. longum, usque ad 2 cm. latum, vix proteranthum. Racemus sublaxus, ±10 florus, erectus, ±5 cm. longus. Scapus gracilis, circiter 1 dm. longus. Bracteæ inflorescentiæ 5 mm. longæ, glumaceæ, rigidæ. Pedicellus cum ovario 2.5 mm. longus. Flores circiter 12 mm. in diametro. Sepala lateralia lanceolata, acuta, trinervia, 6 mm. longa, prope basim 3 mm. lata, membranacea. Sepalum dorsale oblongi-ellipticum, obtusum, 6.5–7 mm. longum. Petala ovato-elliptica, acuta, trinervia, 6 mm. longa, 3.5 mm. lata. Labellum trilobatum, lobus medius quam lobi laterales longior; lobi laterales semicrescentiformes vel falcati, obtusi, 1.5 mm. longi, .75 mm. lati; lobus medius fere 2 mm. longus, lobos laterales excedens, trilobatus, lobuli laterales rotundati, lobulus medius triangulus fere 1 mm. longus, circiter .5 mm. latus; calli 3, papilliformes, unus ad basim lobi lateralis utriusque, unus in media partis saccatæ labelli, prope basim lobi medii. Columna ut in *D. pumilo.*

The inflorescence is well developed while the leaf is expanding, and in several plants which were examined the leaf was only slightly longer than the sheaths when all but three of the flowers were fully open. From *Dendrochilum Hutchinsonianum*, *D. irigense* is in part distinguishable by the labellum, which is similar to *D. affine* in the outline of the middle lobe. From *D. pumilum* and *D. affine* it is distinguished by its larger flowers. From the rich series of specimens gathered by Santos *D. irigense* appears to be an extremely variable species in the size of the leaves and pseudobulbs. Santos describes the flowers as yellow. Ramos describes them as being white. When dry the flowers are brownish red.

LUZON, Camarines Province, Mount Iriga, *F. Santos s. n.* December, 1913. *M. Ramos Bur. Sci. 22186*, December 31, 1913. Altitude 500 meters. Both collections were made at the same time.

29. Dendrochilum (§ Platyclinis) latifolium *Lindl.* in Bot. Reg. (1843) Misc. p. 56.

LUZON, NEGROS, MINDANAO.

30. Dendrochilum (§ Acoridium) Loheri *Ames* ORCHIDACEÆ 3 : 12, t. 27.

LUZON.

31. Dendrochilum (§ Acoridium) longibulbum *Ames* in Phil. Journ. Sci. 7 : 26.

LUZON.

32. Dendrochilum (§ Platyclinis) longilabre *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 99.

MINDANAO.

33. Dendrochilum (§ Platyclinis) longispicatum *Ames* ORCHIDACEÆ 2 : 105.

LUZON, NEGROS.

34. Dendrochilum (§ Acoridium) lucbanense *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1559.

Luzon.

35. Dendrochilum (§ Acoridium) luzonense *Ames* Orchidaceæ 2 : 121.

Luzon.

36. Dendrochilum (§ Acoridium) McGregorii *Ames* in Phil. Journ. Sci. 6 : 42.

Luzon.

37. Dendrochilum (§ Platyclinis) magnum *Reichb. f.* in Walp. Ann. 6 : 240.

Mindoro.

38. Dendrochilum (§ Acoridium) maleolens *Kränzl.* Orchis 2 : 63. Said to be near *D. oliganthum.*

39. Dendrochilum (§ Platyclinis) malindangense *Ames* Orchidaceæ 2 : 114.

Mindanao.

40. Dendrochilum (§ Platyclinis) Mearnsii *Ames* Orchidaceæ 2 : 116.

Mindanao.

41. Dendrochilum (§ Acoridium) Merrillii *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 119.

Luzon.

42. Dendrochilum (§ Acoridium) microchilum *Ames* Orchidaceæ 2 : 87.

Luzon.

43. Dendrochilum (§ Acoridium) mindorense *Ames* Orchidaceæ 2 : 91.

Mindoro.

44. Dendrochilum (§ Acoridium) ocellatum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 117.

Luzon.

45. Dendrochilum (§ Acoridium) oliganthum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 117.

Luzon.

46. Dendrochilum (§ Platyclinis) palawanense *Ames* Orchidacæ 2 : 103.

Palawan.

47. Dendrochilum (§ Acoridium) parvulum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 116.

Luzon.

48. Dendrochilum (§ Acoridium) philippinense *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 118.

Luzon.

49. Dendrochilum (§ Acoridium) pulogense *Ames* in Phil. Journ. Sci. 4 : 594.

Luzon, Benguet Province.

50. Dendrochilum (§ Acoridium) pumilum *Reichb. f.* in Bonpl. 3 : 222.

Luzon.

51. *Dendrochilum* (§ *Acoridium*) *quadrilobum sp. nov.* Radices fibratæ, ramosæ. Pseudobulbi dense conferti juniores vaginis mox in fibras solutis inclusi, anguste fusiformes, monophylli, rugosi in sicco circiter 2 cm. longi, ad apicem basimque valde fastigati. Folium lineare, 3–7 cm. longum, circiter 2 mm. latum, manifeste uninervium per medium, ad basim fastigatum, vix petiolatum, ad apicem truncatum, apiculatum, pedunculo brevius. Pedunculus gracilis, filiformis, inter pseudobulbum et bracteam floris infimi

nudus, usque ad 13 cm. longus. Racemus pendulus usque ad 5 cm. longus. Flores distichi, flavidi vel albiduli. Bracteæ inflorescentiæ cuneato-ovatæ, acutæ, vix 2 mm. longæ flores æquantes. Sepala lateralia anguste lanceolata, valde acuminata, acuta, ad apicem subulata, uninervia, 2 mm. longa. Sepalum dorsale simile ad basim circiter .5 mm. latum. Petala quam sepala multo breviora linearia, valde acuta, 1.5 mm. longa, erecta. Labellum quadrilobatum, .75 mm. longum, lobi laterales minuti, ovati, obtusi; lobi terminales semiovati, obtusi, .5 mm. longi, apiculo interpositi, vel labellum trilobatum lobo medio late cuneato, valde emarginato cum apiculo ad apicem. Ad basim lobi utriusque lateralis in margine interiore callus vel papilla; papillæ minutæ. Columna sectionis.

Dendrochilum quadrilobum in general habit resembles *D. parvulum* and *D. tenue*, but the structure of the flowers indicates specific differences. The middle lobe of the labellum is larger than the lateral lobes with a cuneiform open space at the tip which gives a four-lobed appearance when taken in conjunction with the lateral lobes. In both *D. parvulum* and *D. tenue* the middle lobe hardly exceeds the lateral lobes. In *D. quadrilobum*, on the other hand, the middle lobe conspicuously exceeds the laterals, giving an aspect suggestive of the labellum of *Malaxis quadriloba* Ames.

Luzon, Subprovince Ifugao, Mount Polis, *R. C. McGregor Bur. Sci. 19894*, February 11, 1913; *McGregor Bur. Sci. 19896*.

52. Dendrochilum (§ Platyclinis) Ramosii *Ames* in Phil. Journ. Sci. 8 : 410.

Luzon.

53. Dendrochilum (§ Acoridium) recurvum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 116.

Luzon.

54. *Dendrochilum* (§ *Acoridium*) *reniforme sp. nov.* Similitudinem gerit cum *D. microchilo.* Radices fibratæ. Pseudobulbi fusiformes, leviter fastigati, in sicco rugosi, conferti, juniores vaginis mox in fibras solutis inclusi, 2.5–3 cm. longi, monophylli, oblique ascendentes. Folium petiolatum, in sicco manifeste trinervium, subchartaceum, rigidum, lineari-lanceolatum, obtusum, nervo medio leviter prædito. Totum folium usque ad 1 dm. longum. Lamina 6–9 cm. longa. Petiolus gracilis, sulcatus, circiter 1.5 cm. longus. Pedunculi graciles, foliis longiores, usque ad 12 cm. longi, inter pseudobulbos et bracteas racemi nudi. Racemus densiflorus, arcuatus, usque ad 7 cm. longus. Bracteæ inflorescentiæ distichæ, late ovatæ, 3 mm. longæ, 3 mm. latæ, margine irregulariter denticulato, hyalino. Pedicellus cum ovario bracteis multo brevior. Flores parvuli, oblique ascendentes. Sepala lateralia lanceolata, trinervia, acuminata, valde acuta, ad basim rotundata, 3.5 mm. longa, 1.25 mm. lata. Sepalum dorsale simile. Petala oblongi-lanceolata, acuta, manifeste uninervia in sicco, 3.5 mm. longa, .75 mm. lata. Labellum reniforme, integrum, leviter retusum, apiculatum, latius quam longius, semitubulatum, marginibus lateralibus erectis, .5 mm. longum, 1.5 mm. latum, tricallosum, calli minuti, papilliformes, unus in depressione disci. Gynostemium sectionis.

Remarkable among the species which it resembles closely in habit in having a reniform entire labellum. The three calli on the disc are very distinct, one being in the middle of the depression of the disc and one on each side of the depression near its margin. That *Dendrochilum reniforme* is a close ally of such species as *D. microchilum* and *D. tenue* is clearly indicated by two slight indentations on the labellum in front, which if sufficiently depressed would give the characteristic three-lobed labellum of the Acoridium section of the genus.

Luzon, Laguna Province, back of San Antonio, *F. Calica s. n.* February to March, 1913; *M. Ramos Bur. Sci. 20440*, February 22, 1913.

55. Dendrochilum (§ Acoridium) rhombophorum *Ames* Orchidaceæ 3 : 7. The identity of this species, which Reichenbach f. published under Cœlogyne in Linnæa (41 : 116), cannot be positively known until the Reichenbachian herbarium is unsealed in 1915. From the description and from Reichenbach's observations it is a near ally of *D. pumilum.*

Luzon?

56. Dendrochilum (§ Acoridium) simulacrum *Ames* Orchidaceæ 2 : 92.

Luzon.

57. Dendrochilum (§ Acoridium) sphacelatum *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 112.

Luzon.

58. Dendrochilum (§ Acoridium) strictiforme *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 116.

Luzon.

59. Dendrochilum (§ Acoridium) tenellum *Ames* Orchidaceæ 2 : 81. D. junceum *Reichb. f.* Otia bot. Hamb. 54.

Luzon, Camiguin, Mindoro, Leyte.

60. Dendrochilum (§ Acoridium) tenue *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 116.

Mindanao, Luzon, Negros, Leyte.

61. Dendrochilum (§ Acoridium) tenuifolium *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 114.

Luzon.

62. Dendrochilum (§ Acoridium) turpe *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 118.

Luzon.

63. Dendrochilum (§ Platyclinis) uncatum *Reichb. f.* in Bonpl. 3 : 222.

Luzon.

64. Dendrochilum (§ Acoridium) Vanoverberghii *Ames* in Phil. Journ. Sci. 7 : 27.

Luzon.

65. Dendrochilum (§ Eu-Dendrochilum) Weberi *Ames* in Phil. Journ. Sci. 8 : 410.

Mindanao, Basilan.

66. *Dendrochilum* (§ *Acoridium*) *Wenzelii sp. nov.* Herba epiphytica. Radices fibratæ, ramosæ. Pseudobulbi subcylindracei, superne leviter attenuati, in sicco sulcati, ± 2.5 cm. longi, monophylli, juniores vaginis maculatis mox in fibras solutis inclusi. Folium rigidum, erectum, usque ad medium pedunculum vaginatum, lineare, acutum, ± 2 dm. longum, 4 mm. latum, infra medium involutum. Pedunculus complanatus, quam folium longior vel brevior. Racemus complanatus, ± 5 cm. longus. Flores distichi, rubri. Bracteæ inflorescentiæ glumaceæ, circiter 3 mm. longæ, flores subæquantes. Sepala lateralia ovato-lanceolata, valde acuta, trinervia, 5 mm. longa, vix 2.5 mm. lata. Sepalum dorsale multo angustius acutum, circiter 4 mm. longum. Petala oblongi-lanceolata, valde acuta, quam sepalum dorsale breviora, vix 3 mm. longa, 1 mm. lata. Labellum saccatum, trilobatum, lobo medio in dentem brevem, minutum reducto; lobi laterales, crescentiformes, callo in medio, circiter 1 mm. longi, antice leviter denticulati vel integri. Saccus 1 mm. longus, semi-rotundatus. Gynostemium sectionis.

Dendrochilum Wenzelii is a near ally of *D. graminifolium* (Ames) Pfitz., from which it differs in the much reduced, almost

obsolete middle lobe of the labellum and in the broader, more coriaceous leaves which form a sheath around the peduncle.

Luzon, Camarines Province, Sagnay, Mount Canayan, *M. Ramos Bur. Sci. 22161*, December 9, 1913. On wooded slopes, 300 meters above sea level. Leyte, Jaro, *C. A. Wenzel 0264*, February 11, 1914. Epiphyte, flower greenish yellow, altitude 750 meters.

67. Dendrochilum (§ Acoridium) Whitfordii *Ames* Orchidaceæ 2 : 100.

Luzon.

68. Dendrochilum (§ Acoridium) Williamsii *Pfitz.* in Engler's Das Pflanzenreich Cœlog. 114.

Luzon.

69. Dendrochilum (§ Pseudacoridium) Woodianum *Ames* Orchidaceæ 2 : 80.

Mindoro.

40. PHOLIDOTA *Lindl.*

A genus of about thirty-eight species, with two representatives in the Philippine Islands.

Pholidota conchoidea Lindl. Bot. Reg. (1840) Misc. p. 84. Probably only a form of *P. imbricata*. *P. Elmeri* Ames is a synonym for *Thecostele alata* Par. and Reichb. f. *P. rhombophora* Reichb. f. (*fide* Kränzlin) I have referred to Dendrochilum. *P. sesquitorta* Kränzlin is a synonym of *P. ventricosa*. *P. triotos* Reichb. f. is probably conspecific with *P. imbricata*.

1. Pholidota imbricata *Lindl.* in Hook. Exot. Fl. 2 : t. 138.

Luzon, Leyte, Polillo, Basilan, Palawan, Mindanao.

2. Pholidota ventricosa *Reichb. f.* in Bonpl. 5 : 43. Kränzlin, in his work on the Cœlogyninæ for Engler's Das Pflanzenreich, takes exception to J. J. Smith's conclusion that *Pholidota ventricosa* Reichb. f. and *P. sesquitorta* Kränzl. are identical. In the

Philippine Journal of Science (Botany) 4: 665 (1909) I discussed the distinguishing characteristics on which Kränzlin placed emphasis, and decided to refer Philippine material to *P. ventricosa* until a clearer case could be made for the retention of *P. sesquitorta* as a distinct species. In Fedde Rep. Beihefte 1 : 109 Dr. R. Schlechter has adopted Smith's conclusions after a study of the type material at the Botanic Garden in Berlin.

LUZON, MINDANAO.

Also reported from the Sunda Islands, Malay Peninsula, Burma, Andaman Islands, Ceylon, and northern India. Also from Java.

41. CRINONIA *Bl.*

This is a small genus of four species. Kränzlin, in the monograph of the Cœlogyninæ in Engler's Das Pflanzenreich, recognized Crinonia as distinct from Pholidota. I have seen one representative from the Philippines that appears to be an undescribed species. A diagnosis will appear in Elmer's Leaflets of Philippine Botany.

1. C. Elmeri *Ames.*

MINDANAO, *Elmer 13834*, September, 1912.

42. MALAXIS *Sw.*

Although the first published species of Malaxis was later referred to Microstylis as *Microstylis spicata* Lindl., the laws governing nomenclature necessitate the adoption of the name Malaxis to designate generically all those species which are allied with *M. spicata*. In Nova Guinea, VIII, Bot. 30, J. J. Smith has expressed the opinion that Microstylis should be added to the list of genera which are to be retained in spite of the laws of priority. But as the original Malaxis was a true Microstylis and antedates Microstylis, and as Microstylis was not included in the list of names to be retained, sanctioned by the Vienna Congress and emended at the Brussels Congress, Malaxis is the only name available.

Fawcett and Rendle in Flora Jamaica have adopted Malaxis as the generic name of this group.

Probably not less than two hundred species are recognized. Geographically the genus is most interesting, as its representatives are found in the tropical and temperate regions of both hemispheres. Thirty species are natives of the Philippines. Of this number three are extra-limital. *Malaxis biloba* Ames has been reported from Travancore, Himalayas, Khasia Hills, and Andaman Islands. *M. flavescens* Ames is a native of Java. *M. latifolia* Smith has been reported from Java, Sumatra, Borneo, Celebes, Singapore, Malacca, Siam, China, New Guinea, and Australia.

1. Malaxis alagensis *Ames* Orchidaceæ 2 : 122.

Mindoro.

2. Malaxis arietina *Ames* in Phil. Journ. Sci. 8 : 411. The labellum suggests *Malaxis sagittata* (*Microstylis sagitatta* J. J. Smith Ic. Bog. 2 : t. 107, c.).

Mindanao.

3. Malaxis balabacensis *Ames* in Phil. Journ. Sci. 6 : 42. This is very closely allied to *Malaxis tubulosa* (*Microstylis tubulosa* J. J. Smith in Bull. Dép. Agr. Indes neérl. no. 5, p. 1). The column has the same hooked appendage on the back, only it is larger in the Philippine species. The teeth on the labellum of *M. tubulosa* are unlike those of *M. balabacensis*, and the flowers show slight differences which indicate specific distinction. *Malaxis rhinoceros* (*Microstylis rhinoceros* J. J. Smith in Bull. Dép. Agr. Indes neérl. 22 : 21) is also closely related, but differs in part through the very dissimilar petals.

Leyte, Palawan, Mindanao, Balābac, Luzon, Sibutu.

4. Malaxis bancanoides *Ames* Orchidaceæ 2 : 129.

Sibuyan.

5. Malaxis bataanensis *Ames* in Phil. Journ. Sci. 6 : 43.

LUZON.

6. Malaxis benguetensis *Ames* in Phil. Journ. Sci. 6 : 43.

LUZON.

7. Malaxis biloba *Ames* ORCHIDACEÆ 2 : 122.

LUZON.
Also Travancore, Himalayas, Khasia Hills, and Andaman Islands.

8. Malaxis binabayensis *Ames* ORCHIDACEÆ 2 : 124. Microstylis binabayensis *Ames* in Phil. Journ. Sci. 2 : 318.

MINDORO.

9. Malaxis Copelandii *Ames* ORCHIDACEÆ 2 : 124.

MINDANAO.

10. Malaxis Curranii *Ames* in Phil. Journ. Sci. 6 : 45.

LUZON.

11. *Malaxis davaensis sp. nov.* Planta terrestris, humilis, cum racemo usque ad 12 cm. alta. Caules circiter 2 cm. longa, vaginis foliorum obtecti. Folia ± 7, lineari-lanceolata, ad apicem basimque fastigata, membranacea in sicco, 3.5–7.5 cm. longa, usque ad 6 mm. lata, pedunculo breviora. Pedunculus usque ad 1 dm. longus, uni- vel pauci-bracteatus, bracteæ scariosæ, circiter 5 mm. longæ, valde acutæ, patentes. Flores flavescentes, in racemo laxo, usque ad 5.5 cm. longo dispositi. Bracteæ inflorescentiæ lanceolatæ acutæ, quam pedicellus cum ovario breviores. Pedicellus cum ovario ± 3 mm. longus. Sepala lateralia late elliptica vel suborbicularia, valde obtusa et ad apicem rotundata, 2 mm. longa, 1.5 mm. lata. Sepalum dorsale ovato-ellipticum, 2 mm. longum, 1.5 mm. latum. Petala quam sepala angustiora, 2 mm. longa, vix 1 mm. lata. Labellum antice trilobatum, similitudinem gerit cum *M. Junghuhnio* (Smith.) sed in lobo medio leviter divisum; lobi laterales rotundati, lobus medius semiorbicularis, vix 1 mm. longus, 1 mm.

latus, ad apicem fissus; auriculæ late subfalcatæ, ad apicem rotundatæ, 1 mm. longæ, vix .75 mm. latæ, leviter incurvæ. Gynostemium brevissimum.

Malaxis davaensis, although clearly distinct from it in habit, resembles in the details of the labellum *Malaxis Junghuhnii* (*Microstylis Junghuhnii* Smith Die Orchideen von Java 253, fig. cxci). The middle lobe of the labellum of *M. davaensis* is split.

MINDANAO, District of Davao, Divide of the Apo Range, *C. M. Weber 243* (Hb. Ames 12487), August 25, 1911. Terrestrial in shade of forest.

12. Malaxis dentata *Ames* ORCHIDACEÆ 2 : 125. The details of the labellum are not unlike those of *Malaxis sordida*. (*Microstylis sordida* J. J. Smith in Bull. Dép. Agr. Indes neérl. no. 19, p. 30; Nova Guinea 8 : 34, t. xi, fig. 35.)

MINDORO, LEYTE, LUZON, POLILLO.

13. Malaxis Elmeri *Ames* ORCHIDACEÆ 2 : 126.

LUZON.

14. Malaxis flavescens *Ames* ORCHIDACEÆ 2 : 127.

LUZON.
Also Java.

15. Malaxis Hutchinsoniana *Ames* ORCHIDACEÆ 2 : 128.

MINDORO.

16. Malaxis latifolia *Smith* in Rees Cycl. 22, no. 3.

LUZON.
Also Java.

17. Malaxis longipedunculata *Ames* in Phil. Journ. Sci. 8: 411. According to Mr. Wenzel's notes no. 0237 has red flowers, no. 0132 yellow flowers, and the type, brownish yellow flowers. In nos. 0237 and 0132 the labellum differs from the type in having two teeth on either side of the labellum. In one flower of no. 0132

there was only one tooth on the left side, while on the right side there were two teeth. Although there may be differences between the type and nos. 0132 and 0237 which constitute specific differences, I have been unable to detect them. The original description of *Malaxis longipedunculata* should be amplified to include the forms characterized by three or four teeth on the labellum.

LEYTE, Dagami, *C. A. Wenzel 0237*, September 30, 1913. In forest 60 meters above sea level; Dagami, *Wenzel 0132*, May 27, 1913. Leaves bronze green above, purple beneath.

18. Malaxis McGregorii *Ames* in Phil. Journ. Sci. 6 : 45.

POLILLO, MINDANAO.

19. Malaxis Merrillii *Ames* ORCHIDACEÆ 2 : 128.

MINDORO, Mount Halcon.

20. Malaxis mindanaensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1561.

MINDANAO.

21. Malaxis mindorensis (*Rendle*) *Ames* ORCHIDACEÆ 2 : 131. I only know this from a sketch of the type, with analyses, kindly given to me by Dr. A. B. Rendle. It is a larger flowered species than *M. quadriloba* Ames from Luzon.

MINDORO.

22. Malaxis negrosiana *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 156.

NEGROS.

23. *Malaxis philippinensis comb. nov.*, Microstylis philippinensis *Kränzl.* Orchis 2 : 16. Stated by the author to be an ally of *Microstylis discolor* R. Wight. "Labellum toto ambitu orbiculare, basi profunde cordatum et gynostemium amplectens, utrinque quinquedentatum, dentibus triangulis, apex labelli profundius bidentatus, discus excavatus melle scatens."

24. Malaxis quadridentata *Ames* ORCHIDACEÆ 2 : 130.
MINDORO.

25. Malaxis quadriloba *Ames* ORCHIDACEÆ 2 : 131.
LUZON.

26. Malaxis Ramosii *Ames* in Phil. Journ. Sci. 6 : 45. A near ally of *Malaxis tubulosa* and *M. balabacensis*, but smaller in all its parts.
LUZON.

27. Malaxis rizalensis *Ames* in Phil. Journ. Sci. 6 : 46.
LUZON.

28. Malaxis uncata *Ames* in Phil. Journ. Sci. 6 : 46.
LUZON.

29. Malaxis Wenzelii *Ames* in Phil. Journ. Sci. 8 : 412.
LEYTE.

30. Malaxis Williamsii *Ames* ORCHIDACEÆ 2 : 131.
LUZON.

43. OBERONIA *Lindl.*

There are twenty representatives of this genus in the Philippine Islands. *Oberonia iridifolia* Lindl. and the Bornean *O. monstruosa* Lindl. are the only species with an extra-limital range.

1. Oberonia anceps *Lindl.* Sert. Orch. sub t. 8.
MINDANAO, LUZON, POLILLO, CULION.

2. Oberonia aporophylla *Reichb. f.* in Bonpl. 3 : 223.
LUZON, MINDANAO.

3. *Oberonia basilanensis sp. nov.* Tota planta usque ad 1.5 dm. alta, aff. *O. insectiferæ* Hook. f., specie quam habitu et structura hæc species conspicue simulat, sed inflorescentia densiore et angustiore. Folia coriacea, ensiformia, acuminata, valde acuta, ascendentia, scapo breviora, usque ad 1.4 dm. longa, usque ad 7 mm. lata, lineari-lanceolata a latere visa. Scapus 1.3–1.5 dm. longus,

gracilis, infra racemum bracteis numerosis. Racemus usque ad 12 cm. longus, gracilis, circiter 3 mm. in diametro. Flores subverticillati. Bracteæ inflorescentiæ triangulari-lanceolatæ, breviter setaceæ. Pedicellus cum ovario circiter 1 cm. longus. Sepala lateralia elliptica, reflexa, 1 mm. longa. Sepalum dorsale simile. Petala linearia, vix 1 mm. longa, integra. Labellum ad basim utrinque bilobulatum, vel lobo bifurcato (divisiones lobulorum subsetaceæ .5 mm. longæ), deinde cuneato-oblongum ad apicem bifurcatum, divisionibus triangulari-setaceis. Totum labellum 1.5 mm. longum, divisionibus terminalibus 1 mm. longis. Gynostemium .5 mm. longum.

Oberonia basilanensis is related to *O. insectifera* Hook. f. and to *O. Toppingii* Ames. The latter is a Philippine species which may be distinguished at a glance by its denticulate oblong petals.

Basilan, *J. Reillo Bur. Sci. 16247*, September 9, 1912.

4. Oberonia benguetensis *Ames* in Phil. Journ. Sci. 7:8.

Luzon.

5. Oberonia cylindrica *Lindl.* Bot. Reg. (1840) Misc. p. 20.

Luzon, Palawan, Leyte (Bohol, *Cuming*).

6. Oberonia Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5: 1564.

Luzon.

7. Oberonia hispidula *Ames* in Phil. Journ. Sci. 7:8.

Luzon, Mindanao.

8. Oberonia iridifolia *Lindl.* Wall. Cat. no. 1948. What appears to be this species is figured by Petiver on plate 103, fig. 3, from a specimen collected by Camelli in Luzon and described in Ray's Historia Plantarum.

Mindanao, Luzon, Palawan.
Also Java, Sumatra, Borneo.

9. *Oberonia luzonensis sp. nov.* Radices fibratæ. Caules elongati, graciles, usque ad 1.5 dm. longi, foliis imbricatis, ensiformibus, ascendentibus, usque ad 7 cm. longis, 3–5 mm. latis. Scapus erectus vel subpendulus, gracilis, 7–13 cm. longus. Racemus valde multiflorus, bracteis linearibus subtendentibus. Flores flavidi minimi, valde aperti, subverticillati. Bracteæ inflorescentiæ linearilanceolatæ, acuminatæ, valde acutæ, irregulariter dentatæ, pedicellis æquilongæ, circiter 2 mm. longæ, adpressæ. Sepala lateralia divaricata, oblique ovata, acuta, vix 1 mm. longa, circiter .75 mm. lata. Sepalum dorsale simile. Petala lanceolata leviter et irregulariter dentata, vix 1 mm. longa, acuta. Labellum ad basim minute auriculatum, prope medium leviter constrictum deinde cuneatum vel dilatatum, ad apicem profunde retusum, vel apice late emarginato, bilobum; margo irregulariter dentatus. Gynostemium brevissimum. Ovarium pedicellatum, tenue, glabrum, 1.5 mm. longum.

In general habit *Oberonia luzonensis* resembles *O. rosea* Hook. f. and *O. masarangica* Schltr., the latter, from Celebes, with narrower leaves and looser racemes. Among Philippine species it approaches most closely *O. hispidula* Ames, from which it is to be distinguished by its looser racemes, smooth ovaries, and more slender habit. *O. luzonensis* is a variable species in the size of the leaves and stems. The form of the labellum is not dissimilar from that of *O. aporophylla* Reichb. f.

Luzon, Province of Tayabas, Guinayangan, *L. Escritor Bur. Sci. 20809*, March 25, 1913.

10. Oberonia McGregorii *Ames* in Phil. Journ. Sci. 2 : 321.

Mindanao, Luzon, Mindoro.

11. Oberonia Merrillii *Ames* in Phil. Journ. Sci. 7 : 9.

Luzon.

12. Oberonia mindorensis *Ames* in Phil. Journ. Sci. 2 : 322.
MINDORO, MINDANAO.

13. Oberonia miniata *Lindl.* Bot. Reg. (1843) Misc. p. 6. Fol. Orch. Oberonia 6. This species has been reported from Singapore and the Philippines. I have not seen any Philippine specimens referable to it.

14. *Oberonia minima sp. nov.* Herba tenella, epiphytica, caule leviter producto. Tota planta 5 cm. alta. Caulis circiter 1 cm. longus, basibus vaginantibus foliorum obtectus. Folia disticha, ensiformia, equitantia, oblique ascendentia, sæpe falcata, circiter 3 cm. longa, linearia a latere visa, circiter 2 mm. lata, acuta, in sicco flavida. Pedunculus pergracilis, terminalis, erectus, folia excedens, 3–4 cm. longus, infra racemum sparsim bracteatus, bracteis ascendentibus, lineari-lanceolatis, acutis, integris. Flores rubri et flavidi, minuti, verticillati, in racemo laxo dispositi. Racemus circiter 2 cm. longus, ± 2 mm. in diametro. Bracteæ inflorescentiæ triangulari-lanceolatæ, integræ. Pedicellus cum ovario circiter 1 mm. longus. Sepala lateralia elliptica, valde concava, circiter .75 mm. longa. Sepalum dorsale ovatum, .75 mm. longum, .5 mm. latum. Petala oblonga, truncato-obtusa, .75 mm. longa. Labellum ad basim utrinque lobulatum vel auriculatum (lobuli obtusi .25 mm. longi) deinde oblongum, quadratum, ad apicem bifurcatum, divisiones triangulares, valde acutæ. Totum labellum 1.25 mm. longum, circiter .5 mm. latum prope medium, divisiones triangulares .5 mm. longæ. Gynostemium .25 mm. longum.

The labellum somewhat resembles in outline the labellum of *Oberonia Mannii* Hook. f., but the basal lobes are rounded, not acute, and are about as wide at the tip as at the middle. *O. minima* is hardly caulescent in the manner of *O. anceps* and *O. aporo-*

phylla, and as exemplified by the specimens examined belongs to Lindley's § Acaules.

Leyte, Dagami, *C. A. Wenzel 046*, November 22, 1912. On trees at medium height above ground. Altitude 60 meters.

15. Oberonia monstruosa *Lindl.* Gen. & Sp. Orch. 17. Malaxis monstruosa *Blume* Bijdr. 395. *O. monstruosa* is the largest of the caulescent species so far known to be natives of the Philippine Islands. The stems attain a height of 2 dm. or even more, and are completely concealed by the sheathing bases of the leaves. In the Philippine material examined each stem bears from five to seven leaves ± 5 cm. long. The labellum of this species is subcordate. *O. hastata* Schltr. from Celebes is a near ally, but in that species the labellum is subtridentate.

O. monstruosa Lindl. is a native of Java and Borneo. Heretofore unrecorded as a native of the Philippines.

Mindanao, Province of Agusan, Talacogon, Agusan River, *C. M. Weber 173*, July 20, 1911. Altitude 10 meters. Epiphyte on trees. Bunauan, *Weber 312*, November, 1911.

16. *Oberonia obesa sp. nov.* Aff. *O. Costerianæ.* Tota planta cum pedunculo 2 dm. alta, paucifoliata. Folia (3?) erecta valde carnosa, equitantia, ensiformia, acuta, usque ad 1.3 dm. longa, usque ad 1.8 cm. lata a latere visa, quam racemus breviora. Pedunculus ± 1 dm. longus, infra racemum bracteatus, bracteis arcte adpressis. Racemus cylindraceus, elongatus, sublaxiflorus, usque ad 12 cm. longus, circiter 5 mm. in diametro. Bracteæ inflorescentiæ anguste lanceolatæ, subsetaceæ. Pedicellus cum capsula vix 5 mm. longus. Sepala lateralia elliptica, concava, vix 1.5 mm. longa, circiter 1.25 mm. lata. Sepalum dorsale simile. Petala oblanceolata, valde obtusa, 1.5 mm. longa, vix 1 mm. lata. Labellum quadrilobatum, 2 mm. longum, lobi laterales flabellati, subtiliter crenellati, lobus medius bifurcatus, 1 mm. longus, divisionibus circiter .5 mm. longis,

.5 mm. latis, obtusis. Ad basim totum labellum vix 2 mm. latum. Gynostemium .5 mm. longum.

Oberonia obesa resembles *O. Costeriana* J. J. Smith in general habit, but is smaller, with fleshier leaves and with a slightly different labellum. In the specimens examined the leaves are erect, and incurve in such a way as to overlap one another. This peculiarity gives to the plants quite a distinct aspect. Whether or not it is found in living specimens I am unable to tell from herbarium material.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 407*, November 24, 1910.

17. Oberonia setigera *Ames* in Phil. Journ. Sci. 7:10.

Luzon.

18. Oberonia Thisbe *Reichb. f.* in Bonpl. 3 : 223.

Polillo, Luzon.

19. Oberonia Toppingii *Ames* in Phil. Journ. Sci. 8 : 413.

Luzon.

20. *Oberonia Wenzelii sp. nov.* Herba epiphytica, gracilis, usque ad 2.5 dm. alta. Caules abbreviati. Folia ensiformia, elongata, ad apicem attenuata, usque ad 22 cm. longa, 5–12 mm. lata a latere visa, ad basim equitantia, quam inflorescentia longiora. Scapus cum racemo usque ad 1.7 dm. longus, subdensiflorus. Bracteæ inflorescentiæ triangulæ, acuminatæ, acutæ. Flores verticillati, minuti. Sepala lateralia ovata, 1 mm. longa, vix 1 mm. lata, acuta. Sepalum dorsale simile. Petala linearia. Labellum 2 mm. longum, late ovatum, auriculatum, ad apicem bifidum, margo utrinque 5–7-dentatus.

Oberonia Wenzelii resembles *O. cylindrica* Lindl. in habit and has a labellum similar to that of *O. iridifolia* Lindl. The petals are entire with the exception of the tips, which are obscurely dentate.

The dentation of the labellum is irregular with the teeth reduced to triangular protuberances near the base and apex. In dried specimens the sepals and petals are whitish, the labellum yellowish.

LEYTE, Jaro, *C. A. Wenzel 0388*, April 30, 1914. Epiphyte in forest. Altitude 500 meters. Sepals and petals red, labellum yellow and red.

44. HIPPEOPHYLLUM *Schltr.*

A small genus related to Oberonia and Liparis. About four species are known.

1. Hippeophyllum Wenzelii *Ames* in Phil. Journ. Sci. 8 : 413. This species is perhaps more closely related to *H. celebicum* Schltr. than to any other known species. The form of the labellum suggests *H. micranthum* Schltr. *H. celebicum* is a more slender plant with large narrow leaves.

LEYTE.

45. LIPARIS *L. C. Rich.*

The species of this genus are found in the temperate and tropical regions of both hemispheres. Twenty-seven species have been reported from the Philippines. In previous publications I have adhered to the generic interpretations of Pfitzer in my treatment of these species. At present I am convinced that this treatment necessitates an extremely artificial disintegration of a group which is for all purposes best kept intact.

1. Liparis (§ Distichæ) Amesiana *Schltr.* in Fedde Rep. Beihefte 1 : 210. Cestichis gracilis *Ames* ORCHIDACEÆ 2 : 136.

LUZON.

2. Liparis (§ Distichæ) benguetensis (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1 : 210.

LUZON, NEGROS.

3. Liparis cæspitosa *Lindl.* Bot. Reg. sub t. 882.

MINDANAO, LUZON.

Also from Java, Sumatra, Ceylon, India, Bourbon, Mauritius, and Madagascar.

4. *Liparis Clemensiæ comb. nov.* Cestichis Clemensiæ *Ames* in Phil. Journ. Sci. (Bot.) 4 : 666.

MINDANAO.

5. Liparis (§ Distichæ) compressa *Lindl.* Gen. & Sp. Orch. 32.

LUZON.
Also Java, Sumatra, Perak.

6. Liparis confusa *J. J. Smith* Orch. Jav. 275. From the description in Icones Plantarum Formosanarum (4 : 27) *L. dolichopoda* Hayata belongs to the same section with *L. confusa*, *L. parviflora*, etc. There appear to be two species of Liparis in the Philippines referable to Ridley's § Densifloræ which I have identified indiscriminately with *Liparis vestita* Reichb. f. One of these is distinguished chiefly by elongated, slender stems, the other by contracted bulbous stems, which as a rule are elongated slightly, if at all. Both species are characterized by a retuse labellum. The one with short pseudobulbous stems I refer to *L. parviflora* Lindl. The one with elongated stems agrees in many of its details with *Liparis confusa* J. J. Smith, and is represented in the Philippines by the following:

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1536*, September to October, 1912. LEYTE, *C. A. Wenzel 022*, October, 1912. I have seen specimens from MINDANAO and BASILAN.
Also Java.

7. Liparis (§ Distichæ) Cumingii *Ridl.* in Journ. Linn. Soc. 22 : 292.

LUZON.

8. Liparis (§ Distichæ) disticha *Lindl.* Bot. Reg. sub t. 882.

PALAWAN, MINDORO, LUZON.
Also Mauritius, Bourbon, Ceylon.

9. *Liparis dumaguetensis Ames nom. nov.* L. Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1561.

Negros, Leyte, Mindanao.

10. Liparis (§ Distichæ) Elmeri (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1 : 210.

Luzon.

11. Liparis Forbesii *Ridl.* in Journ. Linn. Soc. 22 : 283.

Luzon (Mindanao?).
Also Java.

12. *Liparis* (§ *Distichæ*) *fragilis comb. nov.* Cestichis fragilis *Ames* in Phil. Journ. Sci. 8 : 412.

Mindanao.

13. *Liparis halconensis comb. nov.* Cestichis halconensis *Ames* in Phil. Journ. Sci. 2 : 321.

Mindoro.

14. Liparis latifolia *Lindl.* Gen. & Sp. Orch. 30.

Mindanao.

15. *Liparis* (§ *Distichæ*) *leytensis sp. nov.* Rhizoma longe repens, bracteis scariosis, approximatis, tubularibus instructum. Pseudobulbi inter se ± 4 cm. distantes, subpyriformes, superne contracti in collum gracilem producti, totus pseudobulbus usque ad 4 cm. longus, monophyllus. Folium articulatum, anguste oblanceolatum, acutum, usque ad basim fastigatum, 1.5–2.8 dm. longum, supra medium 1.6–2 cm. latum, in sicco subchartaceum, quam scapus longius. Scapus terminalis, bialatus, 1.3–2.5 dm. longus, infra racemum nudus. Bracteæ inflorescentiæ distichæ, confertæ, complanatæ, lanceolatæ a latere visæ, 5 mm. longæ, circiter 2 mm. latæ. Racemus usque ad 4 cm. longus, 5–7 mm. latus. Flores virides, succedanei. Pedicellus cum ovario usque ad 7 mm. longus, gracilis. Sepala lateralia oblongi-lanceolata, acuta, deflexa, 4 mm.

longa, 1.5 mm. lata. Sepalum dorsale deflexum, oblongi-lanceolatum, 4 mm. longum. Petala deflexa, lineari-spathulata, uninervia, 3.5 mm. longa, vix .5 mm. lata supra medium. Labellum circiter 3 mm. longum, oblongum, ad apicem utrinque in lobum obtusum dilatatum, apiculo inter lobos, lobi subtiliter crenulati. Ad basim labelli prope columnam callus cucullatus stat, utrinque ad basim labelli carinæ transversæ. Gynostemium gracile, 2.5 mm. longum. Anthera antice rotundata, non emarginata.

Liparis leytensis resembles *L. Merrillii* Schltr., but differs from it chiefly in the smaller flowers, linear-spathulate petals, and in the form of the anther.

LEYTE, Jaro, *C. A. Wenzel 0216*, September 26, 1913. Epiphyte in forest, 100 meters above sea level.

16. *Liparis* (§ *Distichæ*) *linearifolia comb. nov.* Cestichis linearifolia *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1552.

MINDANAO.

17. *Liparis Lyonii comb. nov.* Cestichis Lyonii *Ames* in Phil. Journ. Sci. 6 : 47.

LUZON.

18. Liparis (§ Distichæ) Merrillii (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1 : 210.

LUZON, MINDORO, MINDANAO.

19. Liparis negrosiana *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1562.

NEGROS.

20. *Liparis* (§ Distichæ) *nutans comb. nov.* Cestichis nutans *Ames* in Phil. Journ. Sci. 4 : 597.

PALAWAN, MINDANAO.

21. Liparis parviflora *Lindl.* Gen. & Sp. Orch. 31. Malaxis parvi-

flora *Bl.* Bijdr. 392. Liparis flaccida *Reichb. f.* in Linnæa 41 : 45. The Philippine plants which I believe represent *L. parviflora* resemble the specimens, preserved in the herbarium of the British Museum, which Ridley referred to *L. flaccida* (*Lobb 171*, *Horsfield*, Java). In my herbarium (12612) there is a specimen collected by Weber (290) that resembles the specimen from Java (Forbes) which Ridley in his monograph referred to *L. parviflora*. This has an elongated, drooping inflorescence nearly 8 dm. in length. *L. parviflora* is represented in the Philippines by the following:

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 1535*, September to October. Mindanao, District of Davao, *C. M. Weber 290*, November 14, 1911. I have also seen specimens from Polillo.

Also Java.

22. Liparis pectinata *Ridley* Journ. Linn. Soc. 22 : 277. The labellum of this species is cuneate-oblong, or rather indistinctly pandurate, with the truncate 3–3.5 mm. wide apex fringed or pectinate. The labellum from base to tip is about 5.5 mm. long, with a callus at the base. The type consists of a single specimen collected by Cuming in the Philippines and now preserved in the Lindley Herbarium at Kew. Aside from the type, with which, unfortunately, I have not compared the material on which my identification is based, the collections mentioned below are the only ones I have seen. Undoubtedly a very rare endemic species.

Liparis pectinifera Ridley is a closely allied species from Borneo in part distinguished by the absence of calli from the labellum. This species is figured by J. J. Smith in Die Orchideen von Java (f. cciii). *L. punctifera* Schltr., a native of Celebes, from the description is a closely allied species. *L. Nakaharai* Hayata, from Formosa (Icones Plantarum Formosanarum 4 : 29), is also a close ally.

Luzon, Laguna Province, *Juan Reillo 55* (Hb. Ames 13251), July, 1912. Basilan, *Reillo Bur. Sci. 15445*, August, 1912. Mindanao, District of Davao, Mount Binatun near Degas and Kaiangan trail, *C. M. Weber 279*, November 2, 1911. Altitude 304 meters. Terrestrial in dense forest amongst decayed leaves. Flowers light green. Leyte, Dagami, *C. A. Wenzel 0207*, July 29, 1913. Terrestrial in forest. Found 60 meters above sea level. Flowers white.

23. Liparis (§ Distichæ) philippinensis *Schltr.* in Fedde Rep. Beihefte 1: 210.

Luzon, Leyte, Mindanao, Mindoro, Negros.

24. Liparis tricallosa *Reichb. f.* in Gard. Chron. (1879) 45 : 684. Hook. f. Bot. Mag. t. 7804. I know this species only from the type in the herbarium of the British Museum of Natural History, and from a specimen given to me by Messrs. F. Sander & Co. of St. Albans, England, which Mr. Rolfe and I compared with authentic material of *L. tricallosa* at Kew. On the type sheet in the British Museum Herbarium there is a drawing of a plant in flower from Buut Island, Sulu Archipelago, which in Reichenbach's handwriting bears the name *Liparis tricallosa*. The actual type consists of two flowering racemes and one fruiting. There are no leaves or roots. Under these specimens is mounted a clipping from the Gardeners' Chronicle which bears Reichenbach's original description of the specimens "introduced by Mr. Bull from Borneo." The nearest ally of this species from the Philippines that I have studied among the specimens collected for the Bureau of Science or by independent collectors is *Liparis Elmeri* Ames, which has smaller flowers, and is more conspicuously striated on the labellum.

Buut Island (*Burbidge*).

25. Liparis trichoglottis (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1: 203.

Luzon, Mindanao.

26. Liparis triloba *Ridl.* Journ. Linn. Soc. Bot. 22: 295. Ridley described *Liparis triloba* from a Cuming specimen preserved in the Lindley Herbarium at Kew. This specimen, of Philippine origin, resembles very closely *L. confusa*, but is in part distinguished by having the apex of the labellum entire. It also resembles *L. clavigera* Ridl., the type of which is preserved in the British Museum of Natural History. On the type sheet of *L. clavigera* there is a note which reads as follows: "Liparis triloba Cuming Hb. Lindl."

L. triloba appears to be much less common in the Philippines than either *L. confusa* or *L. parviflora*. The specimens I have referred to it agree satisfactorily with the type in the Lindley Herbarium as represented by a sketch in my possession for which I am indebted to Dr. Prain, Director of the Royal Gardens, Kew. The sketch shows a monophyllous stem which Ridley was inclined to regard an exceptional condition, and which would in fact be anomalous in the group to which *L. triloba* belongs. But I have seen monophyllous forms of *L. confusa* mingled with the characteristically diphyllous form. Lindley's sketch of the flower illustrates perfectly the flowers of the specimens gathered by Whitford and Hutchinson.

The following collection appears to belong to *L. triloba:*

Mindanao, Zamboanga, *H. N. Whitford & W. I. Hutchinson For. Bur. 9218*, January, 1908. I have also seen specimens from Luzon.

27. *Liparis Wenzelii sp. nov.* Herba epiphytica. Pseudobulbi approximati, pyriformes vel cylindracei, superne fastigati, diphylli, 2.5–3.5 cm. longi, in sicco rugosi. Folia coriacea, articulata, 11–18 cm. longa, usque ad 22 mm. lata, oblongi-lanceolata, acuta, utrinque attenuata, racemo multo breviora. Pedunculus infra racemum in angulo foliorum vaginatus. Racemus cum pedunculo circiter 2.8 dm. longus, laxiflorus; flores circiter 1 cm. distantes.

Bracteæ inflorescentiæ ± 5 mm. longæ, acutæ, anguste triangulares, quam pedicellus cum ovario breviores. Pedicellus cum ovario circiter 1 cm. longus. Flores in sicco aurantiaci. Sepala lateralia reflexa, oblongi-ligulata, obtusa, 5.5 mm. longa. Sepalum dorsale simile. Petala linearia, obtusa, 6 mm. longa, reflexa. Labellum anguste panduriforme, bilobum, 7 mm. longum, lobi circiter 2.5 mm. longi, margine glabro, intus ad basim, juxta medium, lamella parvula calliformi ornatum. Columna leviter arcuata, glabra.

Liparis Wenzelii is a member of the group to which *L. latifolia* Lindl. and *L. crenulata* Lindl. belong. It is a near ally of *L. trichoglottis* Schltr. and of *L. parviflora* Lindl.

Leyte, *C. A. Wenzel 0403*, May 27, 1914. Epiphyte in forest. Altitude 500 meters. Sepals and petals brown, labellum brown and green.

46. DILOCHIA *Lindl.*

A small genus of three or four species with one representative in the Philippines.

1. Dilochia Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1554.

To this species I refer two specimens collected by Wenzel in Leyte. These specimens are not so robust as the type.

Leyte, Jaro, *C. A. Wenzel 0446*, June 11, 1914. Terrestrial in forest. Altitude 500 meters. Sepals and petals white. Labellum white and yellow. The type was collected in Mindanao.

47. CERATOSTYLIS *Bl.*

Seven species are known to be natives of the Philippines. Two additional species are recorded, but insufficiently characterized. *Ceratostylis pendula* Hook. f. (cf. Hook. Ic. Pl. 2100) is very similar to *C. philippinensis* Rolfe. Probably the Philippine specimens which have been referred to *C. pendula* are conspecific with *C. philippinensis.*

About eighty species of Ceratostylis have been described. *C. subulata* Bl. is the only representative of the genus in the Philippines which has an extra-limital range. This species has been reported from Borneo, Sumatra, Java, Malay Peninsula, Assam, Khasia, and Sikkim.

1. Ceratostylis latipetala *Ames* in Phil. Journ. Sci. 4 : 671.

Luzon, Mindanao.

2. Ceratostylis philippinensis *Rolfe ex Ames* in Ames Orchidaceæ 1 : 79.

Luzon.

3. Ceratostylis ramosa *Ames & Rolfe* in Ames Orchidaceæ 2 : 149.

Luzon, Mindanao.

4. Ceratostylis (§ Caulescentes) retisquama *Reichb. f.* in Bonpl. 5 : 53, "Vaginis valide retinerviis, folio carnosissimo lanceolato, apice inæquali bilobo, perula obtusa parva, sepalis ligulatis, tepalis linearibus acutis, labelli lamina ab ungue abrupte oblonga apice contracta, carinis semilunatis geminis, brachiis gynostemii retusis. Cuming 2152!"

The only caulescent species from the Philippines with lanceolate leaves is *Ceratostylis ramosa* Ames & Rolfe. *C. latipetala* Ames and *C. rubra* Ames have fleshy linear or narrowly oblong leaves, which in dried specimens have a semiterete aspect.

5. Ceratostylis rubra *Ames* in Phil. Journ. Sci. 4 : 670.

Luzon, Mindanao.

6. Ceratostylis senilis *Reichb. f.* in Otia bot. Hamb. 54.

Luzon.

7. Ceratostylis subulata *Bl.* Bijdr. 306.

Luzon, Mindanao, Mindoro.
Also Java, Borneo, Sumatra, Malay Peninsula, Assam, Khasia, Sikkim.

8. Ceratostylis Wenzelii *Ames* in Phil. Journ. Sci. 8 : 421.

LEYTE, BASILAN.

48. AGROSTOPHYLLUM *Bl.*

Nine species are natives of the Philippines. In my herbarium there is a fruiting specimen collected by C. M. Weber in Agusan Province, Mindanao, on the west slope of Mount Hilonghilong, at 419 meters altitude, no. 90, March 28, 1911, which is apparently an undescribed species, allied with *Agrostophyllum celebicum* Schltr. from Celebes, *A. stipulatum* Schltr. from Java, and *A. trifidum* from Sumatra. It has a very much branched habit and the leaves are quite distinct in outline from those of any of the species named. The leaves are ± 1.5 cm. long, perceptibly narrower toward the tip, about 3 mm. wide near the base, and at the apex bilobed with a well-developed apiculate point to the midrib, which exceeds the lobes. The sheaths of the leaves are bicuspidate as in *A. celebicum*, *A. stipulatum*, and *A. trifidum*. Fruit hardly 1 cm. long.

1. Agrostophyllum Hasseltii (*Schltr.*) *J. J. Smith* Ic. Bogor. 2: sub t. 90 (A). Podochilus Hasseltii *Schltr.* Mém. Herb. Boiss. 1900, no. 20, 61. Appendicula Hasseltii *Bl.* Bijdr. 304; *Lindl.* Gen. & Sp. Orch. 230; *Miquel* Fl. Ind. Bat. 3 : 704. A. graminifolia *T.* & *B.* Tijdsch. Ned. Ind. 24 : 322. A. elongata *Ridl.* Trans. Linn. Soc. (Bot). ser. II, 3: 375.

LEYTE, Jaro, *C. A. Wenzel 0263*, February 11, 1914. Epiphyte in forest, 750 meters above sea level. MINDANAO, Province of Agusan, *C. M. Weber 307*. Epiphyte on trees in lake.

2. Agrostophyllum inocephalum (*Schauer*) *Ames* ORCHIDACEÆ 2 : 148.

MINDANAO.

3. Agrostophyllum longivaginatum *Ames* in Phil. Journ. Sci. 8: 420.

LEYTE, MINDORO.

4. Agrostophyllum malindangense *Ames* in Phil. Journ. Sci. 6 : 50.

MINDANAO.

5. Agrostophyllum Mearnsii *Ames* in Phil. Journ. Sci. 8 : 420.

MINDANAO.

6. Agrostophyllum Merrillii *Ames* in Phil. Journ. Sci. 2 : 323.

MINDORO.

7. *Agrostophyllum mindanaense Ames nom. nov.* A. pelorioides *Ames* in Phil. Journ. Sci. 8 : 421, non *Schltr.*

MINDANAO.

8. Agrostophyllum philippinense *Ames* in Phil. Journ. Sci. 4: 669.

LUZON, LEYTE, CAMIGUIN, NEGROS.

9. *Agrostophyllum Wenzelii sp. nov.* Herba epiphytica. Caules cæspitosi, usque ad 3.2 dm. longi, valde complanati, plerumque 1.5 dm. longi. Folia elongata, linearia, acuminata, acuta, usque ad 5 dm. longa, 1–1.8 cm. lata, subrigida. Vaginæ foliorum perlongæ, caulem obtectæ, vaginæ foliorum inferiorum imbricatæ. Flores in capitulis sublaxis, 2.2 cm. diametientibus dispositi, albidi et flavidi. Pedunculi abbreviati, cum floribus usque ad 1.3 cm. longi, vaginulis paucis imbricantibus omnino obtecti, triflori. Bracteæ flores subtendentes glumaceæ, lanceolatæ, cymbiformes, 4.5 mm. longæ. Sepala lateralia triangulari-lanceolata, acuminata, acuta, extus in longitudinem leviter carinata, valde concava, 5 mm. longa. Sepalum dorsale simile. Petala lineari-triangula circiter 5 mm. longa, ad basim vix 1 mm. lata. Labellum ad basim leviter saccatum, saccus antice in laminam retusam productus, epichilium cordato-ovatum, 3 mm. longum, circiter 3 mm. latum, acutum, margine involutum, ad basim contractum, leviter apiculatum. Totum labellum 5 mm. longum, saccus vix 2 mm.

latus; lamina retusa, 1.5 mm. longa, 1.5 mm. lata. Gynostemium circiter 4 mm. longum, prope apicem, antice utrinque, in stelidium deflexum obtusum productum; rostellum bifidum. Pollinia 8.

In most of the specimens examined the stems were very short and greatly exceeded by the long gramineous leaves. The structure of the labellum resembles that of *Agrostophyllum glumaceum* Hook. f. The epichile where it joins the sac is contracted, with the margins inrolled to form a semitubular claw. Over this claw extends the retuse continuation of the sac. The epichile appears to arise from the base of the sac or hypochile.

Leyte, Jaro, *C. A. Wenzel 0212*, September 19, 1913. Epiphyte in forest, 60 meters above sea level.

49. GLOMERA *Bl.*

About sixty-five species have been described. New Guinea is apparently the centre of distribution. Glomera is distinguished from Agrostophyllum by its pollinia: Agrostophyllum has eight. One species has been reported from the Philippines.

1. Glomera Merrillii *Ames* in Phil. Journ. Sci. 8 : 419.

Mindanao.

50. PODOCHILUS *Bl.*

Ten species are natives of the Philippines. Podochilus has four pollinia, Appendicula six.

§ *Apista.*

1. Podochilus Cumingii *Schltr.* in Fedde Rep. 3 : 19.

Luzon.

2. Podochilus curviunguis *Schltr.* in Fedde Rep. 10 : 34.

Basilan, Mindanao, Luzon.
Also Celebes.

3. Podochilus longilabris *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1565.

Luzon.

4. Podochilus lucescens *Bl.* Bijdr. 295, fig. 12. *P. Robinsonii* Ames in Phil. Journ. Sci. 6 : 49, is so similar to *P. lucescens* that we can hardly regard it as distinct.

Luzon, Leyte, Negros.
Also Borneo.

5. Podochilus serpyllifolius *Lindl.* in Journ. Linn. Soc. 3 : 37. *P. curviunguis* Schltr. is the only Philippine species which closely approaches *P. serpyllifolius* in habit. The labellum, however, is quite distinctive.

Manila, *Meyen fide* Schlechter.
Also Java, Borneo.

6. Podochilus strictus *Ames* in Phil. Journ. Sci. 4 : 669.

Luzon, Mindanao, Basilan.

§ *Diadena.*

7. Podochilus bicaudatus *Schltr.* in Fedde Rep. 3 : 19.

Basilan, Paragua.

8. Podochilus intricatus *Ames* in Phil. Journ. Sci. 8 : 416.

Luzon, Mindanao.

9. Podochilus plumosus *Ames* in Phil. Journ. Sci. 4 : 668.

Mindanao, Luzon.

10. Podochilus Ramosii *Ames* in Phil. Journ. Sci. 8 : 417.

Mindanao.

51. CHILOPOGON *Schltr.*

The genus Chilopogon is in part distinguished from Appendicula by the barbate callus on the labellum and by the apiculate lateral sepals. Four species have been described.

1. *Chilopogon Merrillii comb. nov.* Appendicula Merrillii *Ames* in Phil. Journ. Sci. 8 : 418. *C. Merrillii* is related to *C. oxysepalum* Schltr., but is at once distinguishable by the very different habit. The bilobed, plate-like callus on the disc of the labellum is copiously barbate hairy.

Mindanao.

52. APPENDICULA *Bl.*

§ *Eu-Appendicula.*

1. Appendicula anceps *Bl.* Bijdr. 299.

Basilan, Mindanao.
Also Java, Borneo, Sumatra, Malay Peninsula.

2. Appendicula Clemensiæ *Ames* in Phil. Journ. Sci. 8 : 415.

Leyte, Luzon, Mindanao.

3. Appendicula cornuta *Bl.* Bijdr. 302.

Mindoro, Palawan, Leyte.
Also eastern India, Malay Peninsula, Singapore, Java, Borneo, China.

4. Appendicula Fenixii (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1 : 336.

Batanes Islands.

5. Appendicula malindangensis (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1 : 337.

Mindanao, Negros.

6. Appendicula micrantha *Lindl.* in Ann. Nat. Hist. 15: 386.

Leyte, Luzon, Mindanao, Mindoro, Polillo, Negros.

7. Appendicula Wenzelii *Ames* in Phil. Journ. Sci. 8 : 419.

Leyte.

§ *Chaunodesme.*

8. Appendicula alba *Bl.* Bijdr. 299, fig. 40 (A). I have seen a

single specimen, from Mindanao, District of Davao, E. B. Copeland, s. n. 1904, which appears to belong to this species.

MINDANAO.

9. Appendicula lucbanense *Ames* in Phil. Journ. Sci. 8: 415. This species is almost indistinguishable in habit from *A. celebica* Schltr. The inflorescence is slightly different. Further studies may result in a combination of these species under *A. celebica.* Both species are very similar to *A. xytriophora* Reichb. f. in habit.

NEGROS, LUZON, MINDANAO.

10. Appendicula luzonensis *Ames* in Phil. Journ. Sci. 8: 415.

LUZON.

11. Appendicula maquilingensis *Ames* in Phil. Journ. Sci. 8: 417.

LUZON.

12. Appendicula pendula *Bl.* Bijdr. 298.

LUZON, NEGROS, MINDANAO, MINDORO.
Also Sumatra.

13. Appendicula perplexa *Ames* in Phil. Journ. Sci. 8: 415.

LUZON.

14. Appendicula philippinensis (*Schltr.*) *J. J. Smith* in Bull. Jard. Buit. 2d ser. XIII, p. 38.

LUZON, MINDANAO, MINDORO.

15. Appendicula xytriophora *Reichb. f.* in Seem. Fl. Vit. 299.

LEYTE, LUZON, POLILLO, MINDANAO, MINDORO.
Also Perak.

§ *Pododesme.*

16. Appendicula Elmeri *Ames* in Phil. Journ. Sci. 8: 416.

MINDANAO.

17. Appendicula negrosiana *Ames* in Phil. Journ. Sci. 8: 418.

NEGROS.

18. Appendicula undulata *var.* calcarata *Ames.*

MINDANAO.
Also BORNEO.

19. Appendicula Weberi *Ames* in Phil. Journ. Sci. 8: 418.

MINDANAO.

§ *Oligodesme.*

20. Appendicula buxifolia *Bl.* Bijdr. 300. A. frutex *Ridl.* in Journ. Linn. Soc. 31: 302. A. fruticosa *Ames* in Phil. Journ. Sci. 8: 415.

Specimens referable to this species have been collected in LUZON and MINDANAO.
Also Java.

§ *Chromatodesme.*

21. Appendicula crotalina (*Ames*) *Schltr.* in Fedde Rep. Beihefte 1: 336.

MINDANAO.

53. POLYSTACHYA *Hook.*

1. Polystachya minuta *Britton* in Small's Fl. So. East. U. S. 328. P. luteola *Hook.* Exotic Flora 2: t. 103. This is the only representative of the genus in the Philippines. Polystachya is represented by species in both hemispheres.

LUZON.
Also tropical America.

54. ACANTHOPHIPPIUM *Bl.*

1. Acanthophippium Mantinianum *L. Linden & Cogn.* in Journ. des Orch. 7: 138. This is the only species known to be a native of the Philippines. About ten species have been recog-

nized from Ceylon, Java, New Guinea, China, Himalaya, and Celebes.

Luzon.

55. PHAJUS *Lour.*

Although only eight species have been reported from the Philippines, an increase in this number is to be expected. From dried specimens it is often impossible to make diagnoses, as the parts of the flowers become agglutinated and torn. Consequently without alcoholic material and detailed field notes it is difficult to make satisfactory determinations. About fifty species have been recognized from New Guinea, Java, Borneo, Perak, Amboina, Burma, Celebes, Sumatra, Japan, China, Formosa, Fiji, Hongkong, Australia, and Ceylon. *Phajus grandifolius* has been collected in tropical America, where it was originally introduced as a cultivated plant.

1. Phajus halconensis *Ames* in Phil. Journ. Sci. 2 : 323. Phajus calanthoides *Ames* Orchidaceæ 2 : 153.

Luzon, Negros, Mindoro.

2. Phajus flavus *Lindl.* Gen. & Sp. Orch. 128.

Luzon.
Also Java.

3. Phajus grandifolius *Lour.* Fl. Cochinch. 2 : 529.

Mindanao.

4. Phajus linearifolius *Ames* in Phil. Journ. Sci. 7 : 10.

Luzon.

5. *Phajus Lyonii sp. nov.* Rhizoma valde incrassatum. Radices validæ, elongatæ. Caules in caudice conferta, basi in pseudobulbum brevem contracti. Vaginæ elongatæ, subarcte adpressæ. Folia plicata elliptico-lanceolata utrinque acuminata, in petiolum longum contracta; lamina ± 5 dm. longa, usque ad 1 dm. lata. Petiolus

elongatus, usque ad 3 dm. longus. Scapi ± 5 dm. alti, laterales, ad basim vaginis elongatis obtecti. Racemus laxiflorus, ± 1.5 dm. longus. Flores 5–7, leviter deflexi, carnosi; sepala petalaque intus lutea, extus albida, labellum purpureo-tinctum. Pedicellus cum ovario circiter 2 cm. longus. Bracteæ inflorescentiæ mox deciduæ. Sepala lateralia 3 cm. longa, 1.4 cm. lata, ad basim cuneata, oblongi-elliptica, obscure apiculata. Sepalum dorsale simile ± 3.5 cm. longum, supra medium 1.3 cm. latum, subunguiculatum, prope basim circiter 7 mm. latum. Petala quam sepala multo angustiora usque ad 3.6 cm. longa, anguste oblanceolata vel spathulata, obtusa, circiter 9 mm. lata prope apicem, ad basim circiter 2 mm. latum. Labellum trilobatum circiter 2.5 cm. longum, ad basim cuneatum, lobi laterales vix sejuncti, rotundato-triangulares, obtusi, ad marginem plicati, minute puberuli, integerrimi. Lobus medius valde retusus in sinu leviter apiculatus, transverse oblongus, latior quam longior, circiter 12 mm. latus, circiter 5 mm. longus, integer, plicatus, puberulus. Carinæ per disco duæ, carinæ duæ abbreviatæ ad basim lobi medii. Calcar abbreviatum, conicum, 2–3 mm. longum. Gynostemium elongatum, circiter 2 cm.longum, ad apicem dilatatum, tota columna clavata, arcuata, antice puberula vel subglabra.

A near ally of *Phajus flavus* Lindl., but differing from it in the absence of hairs from the anterior surface of the column. *Phajus celebica* Schltr. is also nearly allied.

Luzon, Zambales Province, *W. S. Lyon s. n.* 1914. In partly shaded and open glades.

6. Phajus mindorensis *Ames* in Phil. Journ. Sci. 2 : 324.

Mindoro.

7. Phajus philippinensis *N. E. Brown* in Gard. Chron. (1889) 2 : 239. Vanoverbergh's 3886 from Bontoc Subprovince belongs

to this species. The labellum is entire, three-lobed. The bracts are deciduous.

LUZON.

8. *Phajus Ramosii comb. nov.* Calanthe Ramosii *Ames* in Phil. Journ. Sci. 7 : 12. I originally described this species under Calanthe, but the labellum is not joined to the column. It is a member of § Limatodes. It is closely related to *Calanthe gracilis* Lindl., but distinct in the construction of the labellum.

LUZON.

56. CALANTHE *R. Br.*

Probably between one hundred and fifty and one hundred and eighty species are recognized. The geographical range of the genus is similar to that of Phajus. *Calanthe mexicana* Reichb. f. is a native of the American tropics.

1. Calanthe angustifolia (*Bl.*) *Lindl.* Gen. & Sp. Orch. 251.

MINDORO.

Also Java, Sumatra, and Malay Peninsula.

2. Calanthe conspicua *Lindl.* Fol. Orch. Calanthe, no. 9. C. lilacina *Loher* in Gard. Chron. (1910) 47 : 66. This is a gigantic Calanthe, which in the flower before me measures exactly two and one-half inches from the base of the pedicel to the apex of the large obcordate labellum. The labellum is 4 cm. long, and across the widest part of the middle lobe it measures 2.8 cm. The spur, 3 cm. long, slender at its origin, and clavate below the middle, resembling the abdomen of an ichneumon-fly, suggests a sabre as described by Lindley. In dried specimens not unlike *Phajus flavus* in aspect.

Calanthe lilacina Loher appears to be conspecific. I have not seen the type of Loher's species, but the figure and description in the Gardeners' Chronicle are sufficiently clear to warrant the conclusion at which I have arrived.

Luzon, Albay Province, Mount Mayon, *C. B. Robinson Bur. Sci. 6459*, September 5, 1908. Altitude 435 meters. Sepals and petals purple, labellum white or yellow. Palawan? Collected on the island of Bohol *fide* Rolfe.

3. Calanthe davaensis *Ames* in Phil. Journ. Sci. 8 : 422.

Mindanao.

4. Calanthe Elmeri *Ames* Orchidaceæ 2 : 155. Cf. Orch. Rev. 9 : 142. *C. rubens* Ridl. is a closely allied species.

Luzon, Palawan.

5. Calanthe halconensis *Ames* in Phil. Journ. Sci. 2 : 324. *Calanthe halconensis* Ames is a near ally of *C. phajoides* Reichb. f. (cf. Hook. f. Ic. Pl. t. 1864), a species which has been ascribed to the Philippines. *C. phajoides* is referred to the synonymy of *C. angustifolia* Lindl. by J. J. Smith.

Calanthe maquilingensis Ames is very similar to *C. halconensis*, but has deeper labellum lobes. It resembles *C. angustifolia*.

Mindoro.

6. Calanthe Hennisii *Loher* in Gard. Chron. (1909) 46 : 34.

Luzon.

7. Calanthe lacerata *Ames* in Phil. Journ. Sci. 7 : 11.

Luzon.

8. Calanthe lyroglossa *Reichb. f.* in Otia bot. Hamb. 53 (1878).

Luzon, Palawan, Negros.

9. *Calanthe maquilingensis sp. nov.* Herba terrestris, valida. Folia usque ad 8 dm. longa, permagna, chartacea, flaccida, oblongi-lanceolata, acuminata, acuta, ad apicem basimque fastigata, circiter 11 cm. lata, longipetiolata. Scapus elongatus, tumescens, in sicco angulatus, foliis vix longior, multiflorus. Bracteæ inflorescentiæ deciduæ. Pedicellus cum ovario usque ad 2 cm. longus, gracilis (pendulus?). Flores flavidi. Sepala lateralia lanceolata, acuta, circiter 1 cm. longa, 4 mm. lata, trinervia. Sepalum dor-

sale simile. Petala oblanceolata, vel spathulata, trinervia, acuta, 1 cm. longa, 4 mm. lata prope apicem. Labellum trilobatum, e basi labelli usque ad apicem loborum lateralium 7 mm.; lobi laterales obtusi, circiter 1 mm. lati; lobus medius apiculatus, transverse oblongus, 2 mm. longus, 4 mm. latus, lobos laterales vix excedens, lineæ duæ, leviter elevatæ per discum. Calcar circiter 8 mm. longum, paulatim dilatatum, clavatum. Columna vix 4 mm. longa.

Calanthe maquilingensis in general habit is comparable to *C. pulchra* Lindl. In the form of the labellum, however, it is quite distinct from that species, resembling more closely *C. halconensis* Ames and *C. angustifolia* Lindl. The labellum is more deeply lobed than in *C. halconensis.*

From the material at hand, which represents two flowering plants, the scapes appear to be shorter than the leaves.

Luzon, Province of Laguna, Mount Maquiling, *W. H. Brown Bur. Sci. 17246*, December 7, 1912. Altitude 1000 meters.

10. Calanthe McGregorii *Ames* in Phil. Journ. Sci. 2 : 325.

Mindoro.

11. Calanthe mindorensis *Ames* in Phil. Journ. Sci. 2 : 325.

Mindoro.

12. Calanthe pulchra *Lindl.* Gen. & Sp. Orch. 250.

Mindoro.

Also Java, Sumatra, Singapore, Malay Peninsula, Malacca, and Penang.

13. Calanthe triplicata *Ames* in Phil. Journ. Sci. 2 : 326. For synonymy consult Ames Orchidaceæ 2 : 159. *Calanthe furcata* Batem. and *C. veratrifolia* R. Br. belong here.

Mindoro, Leyte, Negros, Batanes Islands, Sibutu, Luzon, Mindanao.

Also New South Wales, Queensland, New Guinea, Amboina, Sumatra, Borneo, Java, southern India, Ceylon, Cochin China, Formosa, Liukiu, Fiji Islands, Guam.

57. ASCOTAINIA *Ridl.*

The genus Ascotainia contains about three species: *Ascotainia penangiana* Ridl. from Penang Hill, *A. Hookeriana* Ridl. from Sikkim, and the following:

1. *Ascotainia Elmeri comb. nov.* Tainia Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1570.

LUZON.

58. SPATHOGLOTTIS *Bl.*

About thirty-five species from Java, Sumatra, Borneo, Malay Peninsula, New Guinea, and Celebes have been described. The distinguishing characteristics are not clearly understood, consequently it is difficult to differentiate between the species which have already been described.

1. Spathoglottis aurea *Lindl.* Journ. Hort. Soc. 5 : 34. This species has been reported from the Philippines, but I have not seen any material quite referable to it. *S. Elmeri* Ames is a near ally.

2. Spathoglottis chrysantha *Ames* ORCHIDACEÆ 2 : 161.

LUZON.

3. Spathoglottis Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1572. This species exhibits the tendency toward variation in the middle of the labellum which is characteristic of *S. aurea* Lindl. In my herbarium a specimen from the type collection has a linear middle lobe to the labellum without any indication of lobules or dilation. The basal lobes and the calli are smooth. The oblong lateral lobes serve to distinguish *S. Elmeri* from *S. Kimballiana.*

NEGROS, MINDORO?

4. *Spathoglottis Kimballiana var. angustifolia Ames var. nov.* Folia linearia, ± 40 cm. longa, 5–11 mm. lata, in sicco, valde nervosa, 3–5-nervia. Sepala lateralia 2 cm. longa. Petala 2.5 cm. longa.

Labellum circiter 2 cm. longum, lobo intermedio angustato, glabro; basim versus auriculis duobus triangularibus glabris, lobis lateralibus magnis auriculæformibus.

The only difference between this variety and *Spathoglottis Kimballiana* that I have been able to detect is in the form of the leaves. From *S. Elmeri*, *S. Kimballiana* is readily separable by the auriculate lateral lobes of the labellum.

Luzon, Province of Isabella, Palanan Bay, *L. Escritor Bur. Sci. 21149*, June 24, 1913. Flowers yellow. *S. Kimballiana* is a Bornean species.

5. Spathoglottis plicata *Bl.* Bijdr. 401. This species is widely distributed in the Philippines.

Luzon, Mindanao, Negros, Batanes Islands, Leyte.
It has been reported from the Malay Peninsula, Java, Borneo, Sumatra, Celebes, Moluccas, New Guinea, Solomon Islands, and the Fiji Islands. Flowers purplish.

6. Spathoglottis tomentosa *Lindl.* in Bot. Reg. (1845) sub. t. 19.

Luzon, Mindanao.

59. PLOCOGLOTTIS *Bl.*

Probably thirty-four species are recognized. These are natives of Java, Sumatra, Borneo, Malay Peninsula, New Guinea, and Celebes. Five Philippine species have been described.

1. Plocoglottis bicallosum *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1571.

Mindanao, Negros.

2. Plocoglottis Copelandii *Ames* in Phil. Journ. Sci. 2 : 326.

Leyte, Luzon, Mindanao, Polillo, Negros, Mindoro.

3. Plocoglottis lucbanensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1572.

Luzon.

4. Plocoglottis mindorensis *Ames* in Phil. Journ. Sci. 2 : 327.
MINDORO.

5. *Plocoglottis Wenzelii sp. nov.* Herba terrestris. Caules ad basim incrassati, fibris elongatis tecti, monophylli. Folium oblongi-lanceolatum, acuminatum, acutum, distincte trinervium, chartaceum, ad basim attenuatum, in petiolum elongatum, sulcatum, contractum; lamina folii 3–4.5 dm. longa, usque ad 3.5 cm. lata. Scapi aphylli a basi caulium laterales, foliis longiores, usque ad 7 dm. longi, pubescentes, pauci-bracteati, bracteæ tubulares, adpressæ, usque ad 2.5 cm. longæ, in sicco scariosæ, nervosæ; bracteæ inflorescentiæ lanceolatæ, acuminatæ pubescentes, circiter 5 mm. longæ, pedicellis multo breviores. Pedicellus cum ovario circiter 1.5 cm. longus, dense pubescens. Racemi elongati, laxi, rhachidi pubescente, ± 2 dm. longi. Sepala lateralia oblonga, falcata, acuta, extus pubescentia, 1 cm. longa, circiter 4 mm. lata. Sepalum dorsale oblongi-lanceolatum quam lateralia longius, concaviusculum, extus pubescens, ± 1 cm. longum, 3.5 mm. latum. Petala lineari, obtusa, 8 mm. longa, 1 mm. lata. Labellum quadrato-panduratum, apiculatum, 11.5 mm. longum, 11.5 mm. latum, intus scabridulum. Columna arcuata, pubescens, ad apicem leviter denticulata, circiter 6 mm. longa. Pollinia 4.

The foliage of *Plocoglottis Wenzelii* resembles that of *P. lucbanensis* Ames and *P. bicallosum* Ames. From the former species it is in part easily distinguished by the looser inflorescence, the flowers of *P. lucbanensis* being crowded in an abbreviated raceme. From *P. bicallosum*, *P. Wenzelii* is distinguishable by means of its smaller flowers, very different labellum, and narrower leaves. *P. mindorensis* Ames is a near ally, but differs in the foliage.

LEYTE, Ormoc, *C. A. Wenzel 067*, April 28, 1913. Altitude 200 meters above sea level in forest of the foothills. Flower white, yellow, and purple.

60. PACHYSTOMA *Bl.*

About six species are known. These are natives of New Guinea, Java, and New Caledonia.

1. Pachystoma pubescens *Bl.* Bijdr. 376.

LUZON.
Also a native of Java.

61. EULOPHIA *R. Br.*

This is a large genus of over one hundred and eighty species, of which sixty-five or more are natives of tropical Africa. In Malaya, Polynesia, Australia, and tropical America there are comparatively few species.

1. Eulophia dentata *Ames* in Phil. Journ. Sci. 6 : 51. *E. graminea* Ames *non* Lindl. ORCHIDACEÆ 2 : 166. The nearest relative of this species is *E. venosa* Reichb. f., which is in part distinguished by the two carinæ on the disc of the labellum. *E. bicarinata* Hook. f., an Indian species, which is a member of the group to which *E. dentata* belongs, is also characterized by a bicarinate labellum.

A specimen of *Eulophia dentata*, which I originally referred to *E. graminea* Lindl. in my list of Philippine orchids in ORCHIDACEÆ 2 : 166, was sent to me with a note which referred it, perhaps because of the very glutinous substance prepared from its bulbs, to *Arethusa glutinosa* Blanco. There is no doubt but that Blanco gave special attention to useful plants, and his specific name *glutinosa* may have been suggested by the use of the plant for gluing boxes, violins, etc. It may be that Blanco's species and *E. dentata* are conspecific. Naves referred *Arethusa glutinosa* to *Geodorum nutans*. Blanco's reference to the use of the glutinous substance prepared from the plant he described is a cause for the suspicion that it includes *E. dentata*.

LUZON.

2. Eulophia exaltata *Reichb. f.* in Bonpl. **5**: 38. Bletia stricta *Presl* Rel. Haenk. 1: 98. I have been unsuccessful in my efforts to ascertain just what Philippine plant Presl described under *Bletia stricta*. By elimination, on the basis that everything in my possession from the Philippines includes everything that could by any possibility have reached Presl's hands, *Eulophia exaltata* is indubitably the species in question. The long narrow leaves, "*2–3 pedes longa, ad 9 lineas lata*," are a strong characteristic of *E. exaltata*. The elongated scape, the simple lax raceme, the floral bracts, broadly lanceolate, the lowermost up to 8 lines long, the pedicels 8–10 lines long, the divisions of the perianth mucronate, 10 lines long, the three exterior ones oblong-lanceolate, the interior ones broader, the labellum erect and three-lobed, with its subascending spur or horn 3 lines long, the rounded lateral lobes and the rugose crest near the apex, are all descriptive of *E. exaltata*. The only discrepancies are the following: 1. "*Perianthium pallide roseum?*" But Presl did not know the color. A guess on his part should not be conclusive evidence that *Bletia stricta* has been recorded only once from the Philippines. 2. Middle lobe of the labellum ovate-obcordate. These words hardly describe the middle lobe of *E. exaltata*, nor do they describe the middle lobe of the labellum of any species of Eulophia yet known from the Philippines. An obcordate middle lobe immediately suggests some species of Calanthe, but it is improbable that *Bletia stricta* belongs to any genus other than Eulophia. According to my views it should receive the new combination-name *Eulophia stricta* (Presl), with *E. exaltata* Reichb. f., *E. ensiformis* Schltr., *E. Leschenaultii* Bl., and *E. Warburgiana* Kränzl. as synonyms.

Mindanao, Luzon.
Also Java.

3. Eulophia macrorhiza *Bl.* Fl. Jav. Orch. 155, t. 63.

LEYTE, Dagami, *C. A. Wenzel 0121*, May 11, 1913. Terrestrial in forest foothills, 60 meters above sea level. Flowers purple, brown, and yellowish. Also Java.

4. Eulophia macrostachya *Lindl.* Gen. & Sp. Orch. 183.

LEYTE, MINDANAO.
Also southern India, Ceylon, Sumatra, Moluccas, Java.

5. *Eulophia Merrillii sp. nov.* Rhizoma? Folia? Scapus 8.8 dm. altus, basim versus bracteis tubularibus circiter 4 cm. longis. Racemus laxiflorus, elongatus, flores ± 2 cm. distantes, infra racemum bractea caulis 2.5 cm. longa, linearia, acuta. Bracteæ racemi lineari-lanceolatæ, valde acutæ, in sicco scariosæ, ± 1.5 cm. longæ. Pedicellus gracilis cum ovario 1–1.5 cm. longus. Sepala lateralia pedi gynostemii inserta, oblongi-elliptica, acuta, 1.2–1.4 cm. longa, 4.5 mm. lata, quinquenervia, nerviis dorso prominentibus. Sepalum dorsale simile circiter 1.2 cm. longum. Petala membranacea, late spathulata, vix 8 mm. longa, 5 mm. lata, breviter apiculata, trinervia, nerviis lateralibus ramosis. Labellum 11 mm. longum, trilobatum, pedi gynostemii insertum, brevissime calcaratum, intus valde nervosum, costis duabus parallelis, glabris apice paulo altioribus, rotundato-terminantibus, lobis lateralibus bene brevioribus, seriebus tribus verrucularum a medio labelli usque ad basim lobi medii; lobi laterales erecti oblique subovato-trianguli, obtusi vix 3 mm. longi, 3 mm. lati; lobus medius suborbicularis vix unguiculatus, obtusus, leviter retusus vel unguiculatus, vix 4 mm. longus, 6 mm. latus, latior quam longior. Gynostemium 5 mm. longum in pedem brevem productum.

This is undoubtedly a close ally of *Eulophia venosa* Reichb. f. and of *E. papuana* J. J. Smith. *E. Versteegii* J. J. Smith, which Schlechter considers conspecific with *E. papuana*, is very closely

related, differing from *E. Merrillii* in only slight details, on the sum of which I rely for specific distinction. Unfortunately *E. Versteegii* is known to me only through the original description and the very clear figure in Nova Guinea (8 : 25, t. 9, fig. 25). Another close ally of *E. Merrillii* is *E. bicarinata* Hook. f. This is an Indian species, which is known to me through several specimens received from the Botanical Department of Northern India. The flowers are much larger than in *E. Merrillii* (labellum 1.7 cm. long in a specimen before me) and the racemes much more densely flowered. *E. Versteegii* appears to be intermediate between the Indian and the Philippine species in the size of the flowers. It may be found that *E. papuana*, *E. Versteegii*, *E. bicarinata*, *E. Merrillii*, and several other closely related species, which have been referred to the synonymy of *E. papuana*, are one and the same, representing a widely distributed polymorphic species.

Mindanao, Province of Surigao, Caraga, *E. D. Merrill 5452*, October 6, 1906. Open grassy slopes, ± 100 meters altitude. Only one plant seen in six miles. Flowers pale purple.

6. Eulophia squalida *Lindl.* in Bot. Reg. (1841) Misc. 77.

Luzon, Palawan.
Also Sumatra, Borneo, Java, Celebes.

7. Eulophia Vanoverberghii *Ames* in Phil. Journ. Sci. 7 : 13. This is a near ally of *E. Merrillii*, at once distinguishable from it by the almost obsolete lateral lobes, and the more scattered verruciform papillæ of the labellum. In *E. Merrillii* the verruciform papillæ are gathered into three series in front of the parallel fleshy keels which arise at the base of the labellum; in *E. Vanoverberghii* these papillæ are distributed over the five or more main nerves of the disc. *E. dentata* is easily distinguished from *E. Vanoverberghii* and its allies by the conspicuous spur and by

the absence of the fleshy parallel keels on the disc of the labellum. The root is said to be edible.

Luzon.

62. GEODORUM *Jackson.*

Eleven species are apparently distinct. Geodorum is closely allied with Eulophia. *Geodorum nutans*, the only representative of the genus in the Philippines, is well characterized by the nodding inflorescence of pale pinkish flowers.

1. Geodorum nutans *Ames* Orchidaceæ 2 : 164. G. semicristatum *Lindl.* Fol. Orch. Geodorum, no. 7. For a study of synonymy the second volume of Orchidaceæ should be consulted.

Luzon, Palawan, Mindanao, Babuyanes Islands, Polillo, Negros.

63. DENDROBIUM *Sw.*

Dr. F. Kränzlin in his recent monograph of the Dendrobiinæ (1910) admitted over six hundred species in the seven genera, Dendrobium, Callista, Inobulbon, Sarcopodium, Diplocaulobium, Desmotrichum, and Adrorhizon. In Dendrobium, as limited in the monograph, 571 species are given place. If we should adopt the generic groups recognized by Kränzlin, the Philippine species would be distributed among the following: Dendrobium, Sarcopodium (*Dendrobium acuminatum* Rolfe, *D. Lyonii* Ames, *D. stella silvæ* Ames), Diplocaulobium (*Dendrobium Clemensiæ* Ames), and Desmotrichum (*Dendrobium chrysographatum* Ames, *D. Eurorum* Ames, *D. interjectum* Ames, *D. pseudoconvexum* Ames, *D. purpureo-stelidium* Ames, and several other species).

Dr. R. Schlechter, in Die Orchidaceen von Deutsch-Neu-Guinea, criticizes the Kränzlin monograph severely, and with the exception of Cadetia keeps Dendrobium intact and expresses the opinion that *Adrorhizon* Hook. f. does not belong to the

Dendrobiinæ, but rather to Adrorhizinæ. Schlechter admits four subgenera, as follows:

A. Leaves at the base without sheaths. 1. *Athecebium.*
B. Leaves on conspicuous sheaths.
I. Pseudobulbs or stems fleshy, or with a fleshy swollen zone.
1. Pseudobulbs or stems fleshy or thickened throughout their length. 2. *Eu-Dendrobium.*
2. Pseudobulbs or stems with only 1–3 fleshy, thickened internodes near the base. 3. *Rhopalolobium.*
II. Stems wiry, dry, always very slender. 4. *Xerobium.*

SYNOPSIS OF THE SPECIES

AUTHENTICALLY REPORTED FROM THE PHILIPPINES

THE genus Dendrobium is of sufficient importance in the Philippines to warrant an effort to distribute the species into groups, according to their alliances, with brief characterizations. As a basis of distribution I have chosen the sections admitted by Schlechter in his studies of the orchids of New Guinea. From this arrangement I have excluded doubtful species. In each section the important distinguishing characters are printed in italics. Those species which are described in this volume are marked with an asterisk.

Schlechter's arrangement is a very natural one. Although he admits forty-one sections, of which sixteen are represented in the Philippine Islands, it is much to be preferred to the briefer arrangement adopted by Kränzlin in the monograph of the Dendrobiinæ in Engler's Das Pflanzenreich. One cannot help but feel, however, that Schlechter proposes an unnecessarily large number of sections in his revisions of genera, and that his tendency is toward complexity rather than simplicity, notwithstanding his efforts to establish a workable system. His scheme in Die Orchidaceen von Deutsch-Neu-Guinea is admirable, and indicates tireless efforts to bring into conformity with modern

botanical thought critical groups which have been neglected until they present hopeless confusion to one who attempts to understand them. His severe criticism of the Kränzlin monograph, however, which opens the way to him for a new arrangement of the species, although justified, does not take into account the task which Kränzlin had to perform, and overlooks the significant truth that Kränzlin in blazing the way for a comprehensive treatment of the genus Dendrobium was overwhelmed by the difficulties he encountered in laying the foundations for subsequent monographers. At the same time Schlechter, in the presentation of his views relative to Dendrobium, is not beyond criticism. In his Die Orchidaceen von Deutsch-Neu-Guinea, in spite of his explanation of the forty-one sections into which he proposes to distribute the species of Dendrobium (thirty of which are accounted for by the New Guinea flora), he treats of 256 species, the greater part new to science, without a key to clarify them. It is true that his sections indicate the systematic affinities of his species, but even they fail to give the assistance they should, as in his diagnoses, if such they may be called, he does not make his points so clear that one not a student of the group can understand them and apply them to species which are not natives of New Guinea, or which are not cited in the work.

Subgenus ATHECEBIUM.

1. § Desmotrichum. This group is characterized by *a marked tendency to branch.* The leaves, *one* at the summit of each pseudobulb, *are not articulated with a sheath.* The pseudobulbs *terminate* the branches.

* 1. D. chrysographatum *Ames.*

* 2. D. Eurorum *Ames.*

* 3. D. interjectum *Ames.*

4. D. plicatile *Lindl.* The middle lobe is nearly quadrate, fleshy, and oddly folded.

* 5. D. pseudoconvexum *Ames.*

* 6. D. purpureostelidium *Ames.*

7. D. scopa *Lindl.* The terminal lobe of the labellum is deeply fringed, the lateral lobes are triangular, minutely toothed in front.

* 8. D. unicorne *Ames.*

Nos. 1, 2, 3, 5, 6, and 8 are described in detail below.

2. § Diplocaulobium. In the Philippine flora, if we except *D. longicolle* Lindl., which I have not seen among the collections I have examined, only one species of this group is known. It is characterized by an *elongated, rigid, unbranched, erect stem,* at the summit of which is a single, ligulate, leathery leaf. In the axil of the leaf is an *erect sheath* from which the elongated slender pedicel and its solitary purplish flower arises. *The sepals are caudate.*

1. D. Clemensiæ *Ames.*

3. § Bolbidium. This group is recognized by means of its *short, rigid,* slender, erect, thickened stems, *terminated by a pair of leathery leaves* and ephemeral flowers.

* 1. D. cabadbarense *Ames.*

2. D. hymenanthum *Reichb. f.*

4. § Euphlebium. The swollen, fusiform pseudobulb which terminates the stem *rises weakly from the rhizome and droops;* the stem between the pseudobulb and the rhizome is very slender. *Leaves, two* at the summit, lanceolate, 1 dm. long. Flowers of brief duration, *not hairy.*

1. D. spurium *J. J. Smith.*

5. § Sarcopodium. Readily distinguished by the *tetragonal,* yellow, *glossy pseudobulbs close to the rhizome,* terminated by a pair of oblong-elliptical leathery leaves and a *showy raceme* of yellowish or purplish flowers.

1. D. acuminatum *Rolfe.* Flowers not purplish. Raceme several decimeters long.
2. D. stella silvæ (*Loher & Kränzlin*) *Ames.* Raceme few-flowered, short.
3. D. Lyonii *Ames.* Flowers purple, fragrant.

6. § LATOUREA. Pseudobulbs *elongated,* erect, *not drooping* from a slender base, diphyllous. *Flowers hairy,* fleshy, white, with purple streaks and dots.

1. D. ternatense *J. J. Smith.*

Subgenus EU-DENDROBIUM

7. § EUGENANTHE. *Stems clavate, leafy,* flowers showy, yellow, purple, or violet, *mostly in pairs from leafless stems.*

1. D. aureum *Lindl.* Flowers cream yellow.
2. D. superbum *Reichb. f.* Flowers showy, purple, labellum deep purple.
3. D. Victoriæ reginæ *Loher.* Flowers violet ("blue") and whitish, often in threes.

8. § PLATYCAULON. A very distinct group. *Pseudobulbs strongly flattened,* 1 dm. high, leafy, about 2.5 cm. wide, *only a few millimeters thick.*

1. D. platycaulon *Rolfe.* Flowers 3–6 in short racemes, yellowish. The elongated mentum suggests the next section.

9. § PEDILONUM. Stems more or less *cane-like,* never *strongly flattened.* This is a large section, characterized in part by an elongated mentum. Flowers in racemes, few or many, rarely individually showy, *never exceeding 2 cm. in diameter.*

1. D. amethystoglossum *Reichb. f.* Flowers about 3 cm. long, white, labellum purplish. Racemes 1 dm. long.
2. D. chameleon *Ames.* Flowers white striped with pink, soon turning yellow.
3. D. epidendropsis *Kränzl.* Flowers wax-like, yellow, glossy, nearly 3 cm. long.
4. D. O'Brienianum *Kränzl.* Flowers greenish yellow, mentum bent near the tip, forming a right angle.

*5. D. pristinum *Ames.* Flowers white or pale yellow, about 1 cm. long.

*6. D. pseudaclinia *Lindl.* (§ *Aclinia* of Kränzlin's monograph). Sepals, petals, and labellum similar, yellow. Column quadridentate.

7. D. Ramosii *Ames.* Flower purplish, 1–1.8 cm. long.

8. D. secundum *Lindl.* Flowers purple, racemes one-sided.

*9. D. topaziacum *Ames.* Flowers yellow and red, about 1.5 cm. long.

10. § Oxygenianthe. *Stems elongated. Flowers 4 cm. in diameter*, in showy racemes that *exceed the leaves. Peduncle itself shorter than the leaves.* Leaves distichous, leathery.

1. D. Dearei *Reichb. f.* Flowers white, mentum acuminate.

2. D. Sanderæ *Rolfe.* Flowers white and purple. Labellum below the middle heavily stained or streaked with purple, mentum acuminate.

3. D. Schuetzei *Rolfe.* Flowers white, mentum short, obtuse.

11. § Ceratobium. Stems elongated, stout, leafly, leaves very thick, *peduncles* lateral, elongated, *2 dm. long*, produced near the summit of the stem, bearing loose racemes of white and purple flowers.

1. D. taurinum *Lindl.* Flowers ± 5 cm. in diameter on an elongated peduncle.

12. § Distichophyllum. Stem elongated. Leaves thick, distichous, close together along the stem. *Flowers very fleshy*, whitish, *solitary*, labellum yellowish. *Peduncle 3 cm. long, shorter than the leaves*, lateral.

1. D. revolutum *Lindl.* Flowers hardly equalling the leaves.

Subgenus RHOPALOBIUM.

13. § Rhopalanthe. This section is clearly distinguished by the *pseudobulbous thickening of the basal nodes of the otherwise slender stem.* The leaves are flat or terete, and the flowers are produced along the naked termination of the stems.

1. D. crumenatum *Sw.* Leaves 7 cm. long, 1.5 cm. wide. Flowers white or tinged with pink, 4 cm. long.

*2. D. multiramosum *Ames.* Leaves linear, about 4 cm. long. Stem much

branched above the fusiform basal thickening. Labellum 1.4 cm. long, three-lobed.

3. D. philippinense *Ames.* Leaves terete, 6 cm. long. Labellum entire, oblong-elliptic.
4. D. planibulbe *Lindl.* Leaves about 4 cm. long, 5 mm. wide. Labellum with a conspicuous three-toothed callus at the base of the middle lobe.
5. D. polytrichum *Ames.* Leaves terete, 1 dm. long. Labellum deeply fringed on the middle lobe.
6. D. Robinsonii *Ames.* Leaves 5 cm. long, about 2 mm. wide. Labellum obscurely three-lobed.
7. D. Usteri *Schltr.*

*8. D. Usterioides *Ames.*

14. § STRONGYLE. This is an artificial group, which is distinguished by unthickened stems and *terete* or *awl-shaped* acute leaves. Probably best joined with § *Aporum.*

1. D. mindanaense *Ames.*
2. D. marivelense *Ames* ORCHIDACEÆ 2 : 180. D. parciflorum *Kränzl.* non *Reichb. f.*

15. § APORUM. The flowers arise from a *cushion of fibrous scales* and are often at the nodes of the stem opposite rudimentary leaves.

1. D. albayense *Ames.*
2. D. basilanense *Ames.*
3. D. distichum *Reichb. f.*

*4. D. Escritorii *Ames.*

5. D. lunatum *Lindl.*
6. D. McGregorii *Ames.*
7. D. Merrillii *Ames.*
8. D. ventricosum *Kränzl.*

*9. D. Wenzelii *Ames.*

D. Escritorii and *D. ventricosum* are, as it were, transitional forms between § *Rhopalanthe* and § *Aporum.* They suggest *D. Macfarlanei* Müll., but the stems are not at all thickened at base.

16. § OXYSTOPHYLLUM. In this section the flowers are sub-

tended by *imbricating scarious bracts*, and are never borne at the nodes of the stem opposite rudimentary leaves.

1. D. Brongniartii *Kränzl.* This has the aspect of an Aporum species, but the inflorescence is abnormal in the section. Lindley described it under Eria as *Eria Aporoides*, but the number of pollinia indicates closer affinities with Dendrobium. Probably a new section is necessary.
2. D. cultratum *Schltr.*
3. D. Elmeri *Ames.*

17. § Grastidium. The species of this section are characterized by small *flowers produced in pairs*. Peduncle arising from between *two rigid scale-like bracts on the stems. Leaves grass-like* except in *D. leytense* Ames.

1. D. acuminatissimum *Lindl.* Sepals extraordinarily elongated.
2. D. leytense *Ames.* Leaves rarely exceeding 5 cm. in length, 7 mm. in width.
3. D. luzonense *Lindl.* Labellum three-lobed, terminal lobe obtuse, lateral lobes much reduced.
4. D. ornithoflorum *Ames.* Labellum three-lobed, sepals triangular, stems much branched.
5. D. pergracile *Ames.* Lateral sepals linear-lanceolate. Labellum 5 mm. long.
6. D. verruculosum *Ames.* Similar in its flowers to *D. ornithoflorum.* Stems not branched.

18. § Dolichocentrum. To this section *D. papilio* Loher seems to belong. In habit it resembles closely *D. furcatum* Reinw. The mentum of the labellum, however, is not so spur-like as in *D. furcatum.*

1. D. papilio. *Loher.* Flowers conspicuous, solitary.

. . .

1. Dendrobium aciculare *Lindl.* in Bot. Reg. (1840) Misc. 81. "Caule basi conico angulato sursum tereti, foliis orbicularibus, flore solitario? terminali galeato, labelli postici trilobi per medium

tricarinati lobi lateralibus rotundatis antice et intermedio ovato serrulatis." Lindl. *l. c.*

The type sheet in the Lindley Herbarium bears two specimens. The one that I understand to be the type is a small plant with "three acicular leaves from the axil of the uppermost of which springs the short peduncle bearing at its end a cluster of small dry scales, from which proceeds a single yellowish flower slightly tinged with pink." This is the Loddiges plant referred to in Lindley's original notice of *Dendrobium aciculare*. The other specimen on the type sheet bears three flowers on an elongated leafless stem. A flowerless leafy stem from the same rhizome bears four acicular leaves. This specimen is a counterpart of *Dendrobium philippinense* Ames. Kränzlin refers to Cuming 2112 and Loher 487 as the Philippine representatives of the species. The Cuming plant, numbered 2112, as I understand it, is the tall, three-flowered one in the Lindley Herbarium which I regard as distinct from the type. Loher's 487 in the specimens I have examined is flowerless, but is a perfect match in habit for specimens of *D. philippinense* Ames. The labellum of *D. philippinense* is not three-lobed. I have not seen any Philippine material referable to *D. aciculare*.

2. Dendrobium (§Grastidium) acuminatissimum (*Bl.*) *Lindl.* Gen. & Sp. Orch. 86; *J. J. Smith* Orch. Jav. 350, fig. 265. Grastidium acuminatissimum *Bl.* Bijdr. 333.

LEYTE, Dagami, *C. A. Wenzel 047*, November 8, 1912. On trees 100–200 feet above ground. Altitude 60 meters. Flowers odorless, pure white.

3. Dendrobium acuminatum *Rolfe ex Ames* in Ames ORCHIDACEÆ 1 : 86; 2 : t. 17.

LUZON.

4. Dendrobium aduncum *Wall. MS. ex Lindl.* in Bot. Reg.

(1842) Misc. p. 58 (1846), t. 15. The Gardeners' Chronicle (1886, 1 : 726) informs us that this species was originally introduced from Manila, but I do not find any authoritative source which warrants such a statement. Under t. 6784 of the Botanical Magazine Sir J. D. Hooker made the following significant statement: "It is a remarkable fact that though first published forty years ago, the native country of *D. aduncum* has hitherto been a mystery, Wallich having sent it from India under the name it bears with no further information." The species is figured in King & Pantling's work on the Orchids of the Sikkim-Himalaya. I have not seen any Philippine material referable to this species, and I doubt very much if it has ever been found on the islands.

5. Dendrobium albayense *Ames* in Phil. Journ. Sci. 7 : 14.

Luzon, Negros, Mindanao.

6. Dendrobium aloefolium *Reichb. f.* in Walp. Ann. 6 : 279. Kränzlin refers *D. Merrillii* Ames to this species, but without right. *D. aloefolium* has not been found in the Philippines. Cf. Ames in Philippine Journal of Science 4 : 599.

7. Dendrobium amethystoglossum *Reichb. f.* in Gard. Chron. (1872) 109; *Hook. f.* in Bot. Mag. t. 5968.

Luzon, Province of Benguet, *W. S. Lyon 157*. Epiphyte, growing in moss, 1400 meters altitude. Flowers milk white. Labellum deeply stained with amethyst purple. Plant robust, forming clumps of 15 to 20 canes, 1 meter tall.

8. Dendrobium aureum *Lindl.* Gen. & Sp. Orch. 77 (1830). D. heterocarpum *Lindl.* Gen. & Sp. Orch. 78.

Luzon, Mindanao.
Also tropical Himalaya, Malabar Coast, Ceylon, Burma, Java.

9. Dendrobium auroroseum *Reichb. f.* Bonpl. 5 : 56. I only know this from the original description. J. J. Smith refers it to

the synonymy of D. nudum *Lindl.* Kränzlin doubts the correctness of this treatment.

"Aff. *D. sanguinolento* (labello tamen subintegro): caule simplici, foliis lanceolatis acutis, sepalis lateralibus in perulam æqualem obtusam productis, labello cuneato dilatato bilobo, callo obtusangulo ante sinus loborum. Caulis bipedalis pleistophyllus. Vaginæ foliorum dejectorum retuso cupulatæ (igitur amplæ). Foliorum tela membranaceam inter et carnosam. Racemi lateralis bi- triflori. Bracteæ lanceolatæ acutæ ovarii longe pedicellati sextam–septimam æquantes. Flores illis Dendrobii crumenati; longitudine sc. diametro per ovarium verticali, contra altera diametro breviores. Sepalum summum ovatum acutiusculum. Sepala lateralia triangula longe producta apice libero obtusa. Labellum ante imum pedem gynostemii ibi insertum, ubi coalescunt sepala lateralia per longitudinem anticam prope fissa (more Eriarum Dendrobiorum quorundam, Pelexiæ, Diadenii).

"Blüthen rosa-orange. An Baümen des Berges Smiru, 4–5, 2–4. x. 44. Nr. 231." Reichb. *l. c.*

10. Dendrobium basilanense *Ames* in Phil. Journ. Sci. 7:14.
MINDANAO, BASILAN.

11. Dendrobium Brongniartii *Kränzl.* Dendrobiinæ 210. *Eria aporoides* Lindl. belongs here if Kränzlin's conclusions are adopted. His treatment of *Aporum incrassatum* Brong., which he regards as conspecific with *Eria aporoides*, is from my point of view absolutely defensible. The drawing of the labellum in the original plate of *A. incrassatum*, even with its supposed inaccuracies, is too much like the labellum of *E. aporoides* to be relied on for specific differentiation. Schlechter's treatment of *E. aporoides*, for which he proposes a new section under Eria, is without botanical support if we regard the number of pollen masses as a

generic difference between Eria and Dendrobium. *E. aporoides* has four pollen masses cohering in pairs and is a true Dendrobium. Schlechter's *E. decipiens* from Celebes is a near ally of *D. Brongniartii*, differing from it in having a smooth labellum.

Luzon, Leyte, Mindanao, Basilan.

12. Dendrobium Bullenianum *Reichb. f.* in Bot. Zeit. 20 : 214. D. erythroxanthum *Reichb. f.* in Gard. Chron. (1874) 2 :162. This may include *D. topaziacum* Ames. It has larger flowers.

13. Dendrobium bursigerum *Lindl.* in Journ. Linn. Soc. 3 : 17. This is hardly distinct from *D. secundum* Lindl.

14. *Dendrobium cabadbarense sp. nov.* Aff. *D. hymenantho* Reichb. f. Pseudobulbi conferti, flavidi, 1.5–3.5 cm. longi, quadrangulari. Caulis infra pseudobulbos gracilis, internodia 2 vel 3 basilaria subteretia, caules cum pseudobulbis usque ad 7 cm. longi. Folia duo ad apicem pseudobulbi, coriacea, oblongi-elliptica, usque ad 2.8 cm. longa, 7 mm. lata, obtusa. Flores terminales, longi-pedicellati, vix 1 cm. longi, in sicco flavidi. Pedicellus cum ovario circiter 13 mm. longus, pergracilis. Sepala lateralia, oblique triangularia, acuta, mentum valde obtusum fere 7 mm. longum formantia, cum mento 9 mm. longa. Sepalum dorsale lanceolatum, 4 mm. longum, 1.75 mm. latum subacutum. Petala quam sepalum dorsale multo angustiora, oblonga, subacuta, 4 mm. longa. Labellum simplex, oblongum, ad apicem leviter retusam et denticulatum vel crenulatum, 8 mm. longum, 3.5 mm. latum, in disco prope apicem labelli irregulariter cristatum. Gynostemium brevissimum.

This species differs from *Dendrobium hymenanthum* Reichb. f. in its smaller flowers and more slender habit.

Mindanao, Province of Agusan, Cabadbaran, *C. M. Weber 192* (Hb. Ames 12651), August 8, 1911. Epiphyte on trees in swamp.

15. Dendrobium carinatum *Willd.* Sp. Pl. 4 : 133. An unknown species which Kränzlin referred doubtfully to § Aporum. All references to this species agree in citing Petiver's *Bontia luzonica* as the type, but no adequate description was ever published. The only satisfactory evidence as to the identity of the plant is Petiver's figure on Plate 44 of his Gazophylacium. This figure exhibits a species of § Rhopalanthe, and suggests *D. Robinsonii* Ames. It has the characteristic habit of *D. crumenatum* Sw., but the leaves are terete and rigid. The likelihood of *D. carinatum* being conspecific with *D. Robinsonii* is increased when the distribution of *D. Robinsonii*, which is common in Luzon, is considered. In view of Petiver's figure I am unable to understand Kränzlin's suggestion that *D. carinatum* might be a representative of § Aporum.

16. Dendrobium ceraula *Reichb. f.* in Linnæa 41 : 40. "Caule gracili, foliis densis, vaginis apice laxis, laminis oblongo lanceolatis apice subtilier tridentatis papyraceis, floribus geminatis, sepalo dorsali lanceo, reliquis sepalis tepalisque breviori, omnibus lanceolatis acutis, sepalis lateralibus in cornu gracile ascendens, curvum, dimidiam longitudinem æquans extensis, labello ima basi unguiculato dein humerato (si mavis utrinque semicordato) oblongo lanceolato, antrorsum ante apicem dilatato, callo parvulo cornuto utrinque in basi ante unguem, carinis interjectis ternis, columna brevi, angulo dorsali lineari, angulis lateralibus obtusangulis lobulatis.

"Flos illi Dendrobii transparentis æqualis, inde unciam paulo longitudine sepalorum excedens. Folia ad tres pollices longa, vix dimidium pollicem lata.

"Luzon, Jagor 895, 896 (Ex herb. regio. Berolinensi)."

In a note Kränzlin said of this species: "Planta parvula, flores fere hyalini illis *D. transparentis* Lindl. subsimilis, mento circu-

lum formante inter omnes eximia." The circle formed by the mentum must have suggested the specific name *ceraula*, which means a trumpeter or hornblower. Sepals and petals white, 2.3–2.5 cm. long, 6–7.5 mm. wide.

17. Dendrobium cerinum *Reichb. f.* in Gard. Chron. (1879) 2 : 554. The original account of the species gives the habitat as the Malay Archipelago, which is, of course, indefinite. Ridley (Journ. Linn. Soc. 32 : 263) under *D. sanguinolentum* Lindl. ascribes *D. cerinum* to the Sulu Archipelago, where it was collected by Burbidge. Ridley regards this species as a variety of *D. sanguinolentum*, at least he says that it is hardly distinct from *D. sanguinolentum* var. *cerinum*. I have not seen any material from the Philippines comparable with this species.

18. Dendrobium chameleon *Ames* Orchidaceæ 2 : 174.

Luzon.

19. *Dendrobium chrysographatum sp. nov.* Aff. *D. angustifolio* Lindl. Caules ramosi, penduli, 1.5–3 dm. longi, lutei, nitidi, 2 mm. in crassitudine, teretes. Pseudobulbi monophylli, in sicco valde rugosi, lutei, nitidi, 2.5–3 cm. longi, cylindracei, ad basim apicemque leviter fastigati. Folium lanceolatum, obtusum vel subacutum, usque ad 7.5 cm. longum, circiter 1 cm. latum, subcoriaceum, ad basim apicemque fastigatum. Racemi brevissimi, bracteæ paucæ, scariosæ in basi. Flores singuli, succedanei, flavidi, 14–15 mm. longi. Sepala lateralia oblique triangula obtusa, mentum magnum, 9 mm. longum formantia, cum mento 11 mm. longa, 6–7 mm. lata. Sepalum dorsale vix 5 mm. longum, ovatum. Petala circiter 4 mm. longa, oblonga, ad apicem rotundata. Labellum vix 12 mm. longum, ad apicem 6 mm. latum, ad basim circiter 1 mm. latum, trilobatum, lobi laterales rotundati ad apicem, latiores quam longiores, circiter 2 mm. lati, 1 mm. longi,

lobus medius in ambitu quadrato-orbicularis, antice profunde bifidus, latior quam longior, 4.5 mm. longus, 6 mm. latus, lobuli 2.5 mm. lati, 2 mm. longi; lamellæ in disco duæ, ad basim lobi medii crista carnosa stat.

To this species I refer specimens previously identified with *Dendrobium angustifolium* Lindl., namely Vanoverbergh 708, 709, 1346, Ramos 12123, Williams 674, all from Luzon.

From *D. angustifolium*, *D. chrysographatum* differs in the lobing of the labellum and in the crest at the base of the middle lobe.

Luzon, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 1522*, August 10, 1912. Altitude 1650 meters.

20. Dendrobium Clemensiæ *Ames* in Phil. Journ. Sci. 7 : 16. This may be the species which has been referred to *D. longicolle* Lindl.

Negros, Mindanao.

21. Dendrobium cœleste *Loher* in Gard. Chron. (1897) 2 : 1. Kränzlin suspected that this and *D. Victoriæ reginæ* Loher are conspecific. Loher states that *D. cœleste* grows at an elevation of about 2500 meters. "Oaks, Rhododendrons, Azaleas and Myrtles are its only companions." The habit suggests *D. Victoriæ reginæ* and *D. sanguinolentum*.

22. Dendrobium conostalix *Reichb. f.* in Walp. Ann. 6 : 292. Kränzlin cites Cuming 2053 as of Philippine origin. In Vidal's Phanerogamæ Cumingianæ Philippinarum this number of Cuming's collections is referred to Singapore. Vidal cites *Eulophia squalida* Lindl. under Cuming 2053. I have examined Hose 145 from Borneo (Kränzlin cites this number under *D. conostalix*), but I do not find any material among the collections from the Philippines that matches it. I have also examined specimens of

D. paludicola Schltr., a species which Kränzlin refers to *D. conostalix*, but it does not suggest any Philippine material that I have studied. *D. conostalix* belongs to § Grastidium; the leaves are about 2 cm. long, 1 cm. apart, and at the apex deeply bifid. The sheaths of the leaves are covered with dark brown hairs. In Beit. z. Kenntnis der Phil. u. ihrer Veg. etc. A. Usteri reports this species from Negros on the strength of an identification made by Schlechter.

23. Dendrobium crumenatum *Sw.* in Schrad. Journ. 2 : 237. This is a widely distributed species in the Philippines.

Mindanao, Camiguin, Polillo, Leyte, Palawan, Luzon.
Also reported from Tenasserim, Ceylon, Andaman Islands, Malay Peninsula, southern China, Sumatra, Java, Borneo, Timor, Amboina, Moluccas.

24. Dendrobrium cultratum *Schltr.* in Fedde Rep. 10:71. D. atropurpureum *Auth.* not *Miq.* As represented in the Philippines *D. cultratum* Schltr. is extremely variable and may include more than one species. The labellum is ligulate fleshy, somewhat dilated and rounded above the middle with a sharp triangular tooth underneath near the tip, and a densely, but very shortly papillose surface and margin above the middle. E. D. Merrill's 592 from Culion Island is known to me through a specimen in the United States National Herbarium. The plants are flowerless. In habit they agree with *D. cultratum*. This number of Merrill's collection is published under *D. sinuatum* Lindl. in Perkins's Fragmenta, and was determined by Schlechter. Kränzlin cites this same number under *D. sinuatum* in his monograph.

Polillo, Mindanao, Palawan, Luzon, Sibutu, Negros, Mindoro, Culion.
Also Celebes.

25. Dendrobium cumulatum *Lindl.* in Gard. Chron. (1855) p. 756. Kränzlin cites Loher 491 under this species in his monograph.

In the United States National Herbarium there is a specimen from Loher's collection bearing this number which is conspecific with *D. crumenatum* Sw. Kränzlin also cites Cuming 2045 under *D. cumulatum*, but Cuming's 2045 in the British Museum is conspecific with *D. crumenatum* Sw. Under *D. crumenatum* Kränzlin cites this Cuming number again. The question arises, was Cuming's 2045 a mixture of *D. crumenatum* and *D. cumulatum?* Even so, it is almost beyond belief that Loher's 491 was also a mixture of these two very dissimilar species. Such likelihood of confusion is scarcely borne out by the evidence that *D. cumulatum*, if a Philippine species at all, must be extremely rare. In the Gray Herbarium there is a specimen of *D. cumulatum* Lindl. from the Sikkim-Himalayan region, distributed by King and Pantling, which is quite distinct from any Philippine species of which I have any knowledge. Kränzlin's citation of specimens, which I regard as wholly incorrect, is the only evidence of a Philippine origin for *D. cumulatum* which I have been able to detect. I have included *D. cumulatum* in this list simply for the purpose of correcting what appears to be an extraordinary error in citation of specimens in Kränzlin's Dendrobiinæ (Engler's Das Pflanzenreich). It is very unlikely that *D. cumulatum* Lindl. is a native of the Philippines.

26. Dendrobium Dearei *Reichb. f.* in Gard. Chron. (1882) 2: 361.

Mindoro, Dinagat.

27. Dendrobium distichum *Reichb. f.* in Linnæa 41: 39. Schismoceras disticha *Presl* Rel. Haenk. 1: 96, t. 13. *D. thysanophorum* Schltr. is a nearly allied species. In habit I find it difficult to distinguish between them. My material of *D. thysanophorum* is flowerless. Petiver (Gazophylacium, pl. 103, fig. 16) figured a

specimen probably from a plant collected by Camelli and referred to in Ray's Historia Plantarum, vol. 3 : App. 34, no. 21.

Luzon, Polillo, Sulu Archipelago.

28. Dendrobium Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1573. In habit practically inseparable from *D. hypodon* Schltr., a species from Celebes, but in the structure of the labellum clearly distinct. My specimens of the co-types of *D. hypodon* Schltr. are flowerless, but Schlechter's description of the labellum of the type does not apply to the labellum of *D. Elmeri*, which is most conspicuously toothed underneath near the apex, and which is verruculose on the upper surface. In *D. Elmeri* the flowers are lateral. In *D. hypodon* they are terminal.

Luzon.

29. Dendrobium epidendropsis *Kränzl.* in Orchis 2 : 79, t. 12.

Luzon.

30. *Dendrobium Escritorii sp. nov.* Caulis a basi medium usque foliatus, supra nudus. Caules elongati, ancipites, usque ad 3 dm. alti, supra graciles. Folia disticha, ad 1 cm. inter se distantia, vaginantia, pars vaginans circiter 1 cm. longa, valde complanata, totum folium ensiforme, a latere visum falcato-lanceolatum, circiter 2.5 cm. longum, vix 5 mm. altum, acutum, folia suprema minora deinde subito desinentia, pars aphylla caulis usque ad 21 cm. longa, pluri-articulata. Flores flavidi (succedanei?), 12 mm. longi. Sepala lateralia oblique lanceolata, acuta, 7 mm. longa, vix 4 mm. lata, mentum obtusum, 5 mm. longum formantia. Sepalum dorsale lanceolatum, acutum. Petala lineari-spathulata, acuta, 6 mm. longa, circiter 1 mm. lata. Labellum a basi cuneatum, deinde trilobatum, lobis lacerato-dentatis; lobi laterales vix distincti, aliquando obscuri, lamina labelli flabellata margine lacerata. Ultra medium disci callus cristatus, lineæ duæ elevatulæ per discum,

totum labellum 1 cm. longum, 1 cm. latum. Gynostemium sectionis.

In general habit *Dendrobium Escritorii* resembles *D. chrysotainium* Schltr. from Celebes, but the stems are not swollen at base. *D. chrysotainium*, aside from the equitant leaves, agrees with the species of § Rhopalanthe. The labellum is very obscurely trilobed. In several flowers examined the lobing was obsolete, the general outline of the labellum being cuneate-flabellate. The divisions of the fringed margin are about 1 mm. long.

Luzon, Province of Tayabas, Guinayangan, *L. Escritor Bur. Sci. 20683*, March 20, 1913; Camarines Province, Mount Isarog, *M. Ramos Bur. Sci. 22019*, November and December, 1913. Flowers white.

31. *Dendrobium Eurorum sp. nov.* Sympodium productum 1–4 dm. longum, longe vel breve pendulum, ramosum, articulatum, terete. Pseudobulbi monophylli, fusiformes, complanati, usque ad 4 cm. longi, circiter 1 cm. in crassitudine, flavidi in sicco, rugosi, oblique ascendentes, 4–9.5 cm. distantes. Folium lanceolatum, acuminatum, valde acutum, in sicco subcoriaceum, ad basim rotundatum, 7.5–10 cm. longum, 2–3 cm. latum. Flores semper singuli (succedanei?) ex axilla folii orientes; bracteæ scariosæ, quam pedicelli tenues multo breviores, congestæ. Sepala lateralia oblique triangula, mentum obtusum, 4 mm. longum formantia, circiter 5 mm. longa, cum mento 7 mm. longa, ad apicem obtusa, vix acuta. Sepalum dorsale ovato-ellipticum, concaviusculum, 4 mm. longum, circiter 2 mm. latum. Petala oblongi-lanceolata, vel anguste ovata, valde obtusa, 4 mm. longa, vix 2 mm. lata. Labellum e basi cuneatum, deinde trilobatum; lobi laterales obtusi, circiter 1 mm. longi, e basi labelli usque ad apicem loborum lateralium 4 cm., lobus intermedius multo major, oblongus, antice profunde bilobulus, 4.5 mm. longus, 2 mm. latus; lobuli semiorbiculares, obtusi, 1.5 mm. longi, vix 1.5 mm.

lati; totum labellum 7 mm. longum; lamellæ crenulatæ duæ per discum ab ipsa basi pæne ad basim lobulorum anteriorum, lamella brevissima in disco lobi medii interposita. Gynostemii pars libera brevis, stelidia magna.

Not unlike *Dendrobium appendiculatum* (Bl.) Lindl. in habit. The keels of the labellum are distinctly crenulate or wavy along the free edge. The median keel is much shorter than the laterals, and extends along the centre of the middle lobe to the base of the sinus formed by the terminal lobules.

LEYTE, *C. A. Wenzel 065*, May 17, 1913. On trees at great height. Altitude 120 meters above sea level. Flowers flesh-colored.

32. Dendrobium Gerlandianum *Kränzl.* in Fedde Rep. 6 : 317. From the original description this would seem to approach *D. philippinense* Ames. I have not seen the type.

33. Dendrobium gracile *Lindl.* Gen. & Sp. Orch. 91. Onychium gracile *Bl.* Bijdr. 327. J. J. Smith suspected that this and *D. tenellum* Lindl. might be conspecific. I have seen the type of *D. tenellum*, and if Smith's suspicions are justified, no Philippine species referable to *D. gracile* is represented in the Bureau of Science collections, nor in the collections made for me by Vanoverbergh in Luzon, by Weber in Luzon, Mindanao, and Palawan, and by Wenzel in Leyte.

34. Dendrobium hymenanthum *Reichb. f.* in Bonpl. 3 : 222.

LUZON, MINDANAO.

35. *Dendrobium interjectum sp. nov.* Sympodium productum, terete, circiter 1.5 dm. longum. Pseudobulbi subcylindracei vel fusiformes, in sicco valde rugosi, monophylli, circiter 1.5 cm. distantes. Folium lineari-lanceolatum ad apicem inæqualiter bilobum, ad basim profunde sulcatum, circiter 6 cm. longum, usque ad 9 mm. latum, in sicco subcoriaceum. Flores semper singuli,

succedanei, ex axilla folii orientes vix 1 cm. longi. Sepala lateralia cum mento, 7 mm. longa, oblique triangula, acuta, mentum obtusum 4 mm. longum formantia, in sicco flavida. Sepalum dorsale ovatum, circiter 3 mm. longum, vix 2 mm. latum, subacutum. Petala linearia, acuta, trinervia, 3.5 mm. longa, 1 mm. lata. Labellum circiter 8 mm. longum, e basi cuneatum, deinde trilobatum. Lobi laterales rotundati, obtusi, e basi labelli ad apicem loborum lateralium 4 mm. Lobus medius oblongus, multo major quam lobi laterales, ad apicem forcipatus, divisionibus 2 mm. longis, 1 mm. latis, divaricatis. Lineæ elevatæ duæ per discum, inter lobos laterales, in lamellas permagnas in lobo medio expansæ. Gynostemii pars libera brevis, androclinio denticulato.

This species was found mingled with specimens of *Dendrobium Eurorum* Ames. The type consists of three plants preserved in my herbarium. *D. interjectum* is a close ally of *D. angustifolium*. From dried specimens the flowers appear to have been whitish or yellowish, with the apical third of the labellum yellow and the basal two-thirds deep purple. Through the basal portion of the labellum run two raised lines which suddenly dilate at the base of the midlobe into large deep purple lamellæ. The midnerve of the labellum is prominent.

Leyte, *C. A. Wenzel 065a*, May 17, 1913.

36. *Dendrobium leytense sp. nov.* Rhizoma breve, radicosum. Caules aggregati, stricti, infra teretes, superne complanati, ± 3 dm. alti, pluri-articulati, foliosi, internodia 1–3 cm. longa, foliorum vagina tecta, vaginæ scabræ nitidæ. Foliorum laminæ oblongi-lanceolatæ, obtusæ, apice bilobulæ, paulum inæquales, coriaceæ, siccæ viridi-luteæ, valde nervosæ, usque ad 5 cm. longæ, 11 mm. latæ, suberectæ. Racemi brevissimi, vaginis duabus conchiformibus vestiti, biflori. Pedicelli circiter 5 mm. longi. Sepala

lateralia e basi triangula, subfalcata, acuminata, acuta, mentum conicum curvulum, obtusum formantia, 6 mm. longa. Sepalum dorsale lanceolatum, acutum, concaviusculum, 5 mm. longum. Petala linearia, acuta, trinervia, 6 mm. longa, circiter .5 mm. lata. Labellum 7 mm. longum brevi-unguiculatum, deinde cuneatum, trilobum, lobi laterales rotundati, circiter 2 mm. lati, leviter crenulati; lobus medius triangularis, 2.5 mm. longus, 2.5 mm. latus, subacutus. Mentum 3–4 mm. longum. In disco labelli linea elevata, sulcata, a basi ipsa medium labelli usque decurrens ibique in processus setiformes mutans.

Dendrobium leytense in general habit resembles *D. piestocaulon* Schltr., from which it differs in its broader leaves and more strongly complanate stems. The labellum is not at all fleshy, or thickened at the tip, in dried specimens. Besides the type I have examined many specimens collected by Wenzel (0415) in Leyte, which bear flowers 1 cm. long with lips 9 mm. long. From the material at hand the sepals and petals appear to have been yellowish, the labellum tinged with pale purple.

LEYTE, Dagami, *C. A. Wenzel 082*, January 15, 1913. On trees at great height. Altitude 60 meters above sea level. Flowers greenish-yellow and pink.

37. Dendrobium longicolle *Lindl.* in Bot. Reg. (1840) Misc. 74. This species has been ascribed to the Philippines, but not with surety. Cf. *D. Clemensiæ.*

38. Dendrobium lunatum *Lindl.* in Journ. Linn. Soc. 3 : 4.

PALAWAN.

39. Dendrobium luzonense *Lindl.* in Bot. Reg. (1844) Misc. 54. D. alagense *Ames* in Phil. Journ. Sci. 2 : 328.

MINDANAO, MINDORO, LEYTE, LUZON.

40. Dendrobium Lyonii *Ames* ORCHIDACEÆ 2 : 177.

LUZON.

41. Dendrobium McGregorii *Ames* in Phil. Journ. Sci. 7:17.

Polillo.

42. Dendrobium marivelense *Ames* Orchidaceæ 2 : 180. D. parciflorum *Kränzl.* non *Reichb. f.*

Mindanao, Luzon.

43. Dendrobium Merrillii *Ames* Orchidaceæ 2 :181. A flowerless and leafless specimen collected in Luzon by the Wilkes Expedition is in the Gray Herbarium. I refer it to this species.

Polillo, Luzon.

44. Dendrobium metachilinum *Reichb. f.* in Bonpl. 3 : 222. Cuming's no. 2057 is referred to this species in Vidal's Phanerogamæ Cumingianæ Philippinarum. Kränzlin refers this Cuming number to the Malacca collections, although the note on page 88 of Vidal's list refers nos. 2053–2058 to the collections made at Singapore. According to R. A. Rolfe (Journ. Linn. Soc. 21 : 287, and Kew Bull. 1908, p. 119), Cuming's nos. 2252–2399 represent the plants from Malacca. Rolfe also states that nos. 1–2252 were collected in the Philippines. Reichenbach described his species from Cuming's no. 2057, and gave the place of origin as the Philippines. Hooker in the Flora of British India (5 :733) cites Cuming without number and gives Malacca as a habitat. Finally, Ridley, in his Materials for a Flora of the Malayan Peninsula, refers the species to Malacca, and states that it is endemic. I have not seen any Philippine material.

45. Dendrobium mindanaense *Ames* in Phil. Journ. Sci. 8 : 423.

Mindanao, Leyte, Polillo, Luzon, Negros.

46. Dendrobium modestum *Reichb. f.* in Bonpl. 3 : 222. I have been unable to recognize this species among the specimens I have examined. Reichenbach records the type as a native of Manila collected by Llanos. Kränzlin in his monograph cites a Cum-

ing specimen preserved in the Lindley Herbarium. Reichenbach referred *D. modestum* to § Strongyle, and ascribed to it affinity with *D. aciculare* Lindl. *D. aciculare* Lindl. is a representative of § Rhopalanthe. Only two species of § Strongyle from the Philippines are known to me, and while neither of them is referable to *D. modestum*, they show no affinity with *D. aciculare*.

47. *Dendrobium multiramosum sp. nov.* Aff. *D. tenuicauli* Hook. f. Caules conferti, a rhizomate breve, 4 dm. alti, supra ramosi, pluri-multi-articulati, basi per 10 cm. (± 4 internodia) leviter fusiformes, sulcati, 5–8 mm. in diametro, internodia 2.5–4 cm. longa. Ramuli ± 5 cm. longi, graciles. Folia pauca dissita, linearia usque ad 9 cm. longa, in sicco circiter 1 mm. lata, rigida. Flores singuli. Ovarium cum pedicello circiter 1 cm. longum, gracile. Sepalum dorsale anguste ellipticum, obtusum, vix 1 cm. longum, circiter 3 mm. latum, membranaceum. Sepala lateralia antice triangula 1 cm. longa, ad apicem leviter cucullata, acuta, postice in mentum obtusum, 1 cm. longum productum. Petala oblonga, rotundata, subacuta, ad basim leviter attenuata, 9 mm. longa, circiter 3 mm. lata, per medium trinervia, pauci-reticulata. Labellum 1 cm. longum, cuneato-unguiculatum, circiter 9 mm. latum, supra medium trilobatum margine subtiliter crenulatum; lobi laterales truncati, labellum e basi gynostemii ad apicem loborum lateralium 1 cm. longum, lobus medius quadratus ad apicem rotundatus, obscure apiculatus, 4 mm. longus, 4 mm. latus, lineæ per discum 3, vix prominentes, discus prope medium lobi medii puberulus. Columna 2 mm. longa, stelidia magna obtusa.

In the type the pseudobulb is covered by a thin grayish membranous sheath. Above the pseudobulb the stem is hardly 2 mm. thick, and at intervals of from 3 cm. to 4 cm. gives off horizontal branches, at the base of which rootlets arise. The flowers are borne

on three branches and spring from a small scarious membranous sheath. R. S. Williams 1934, which Kränzlin referred to *Dendrobium papilio* Loher, appears to belong here. It has the same habit as *D. multiramosum* and a very similar labellum. *D. Blumii* Lindl. and *D. tenuicaule* Hook. f. are near allies, but differ in habit and in the lobing of the labellum. In the specimen collected by Williams there are no rootlets on the lateral branches.

Luzon, Rizal Province, *W. S. Lyon 42* (Hb. Ames 10893), January. Flowers lasting only one day, pale greenish yellow, lateral lobes of the labellum streaked with reddish-brown lines inside. Altitude 100–200 meters.

48. Dendrobium O'Brienianum *Kränzl.* in Gard. Chron. (1892) 71:266. *D. striatum* Hort. Gard. Chron. (1905) 2:382 is probably the variety of *D. O'Brienianum* to which a reference was made in the Orchid Review (1894) 286. Mr. R. A. Rolfe informed me, in a letter dated December 24, 1905, that this is undoubtedly the variety *striatum* of *D. O'Brienianum*. Kränzlin referred *D. striatum* to the imperfectly known species in his monograph. This species is known to me through cultivated specimens only. In my herbarium there is a specimen from F. Sander & Sons said to have been sent by Micholitz from Luzon.

49. Dendrobium ornithoflorum *Ames* Orchidaceæ 3:60, t. 46.

Mindanao.

50. Dendrobium papilio *Loher* in Gard. Chron. (1897) 1:416. D. Vanoverberghii *Ames* in Phil. Journ. Sci. 8:425, t. 13. Shortly after my description of *D. Vanoverberghii* was published, Mr. A. Loher informed me that it was conspecific with his *D. papilio*. In April, 1914, I wrote to Mr. Loher and requested him to send me a traced sketch of the type of his species, or a fragment, or information as to herbaria in which the type or co-types could be found. Up to April, 1915, no reply from Mr. Loher was re-

ceived. The identity of *D. papilio* has been a puzzle, and to make matters worse Kränzlin in his monograph cited only one specimen under it, a plant collected by Williams (1934), which according to material in my herbarium is in no way comparable with *D. papilio*, if *D. papilio* and *D. Vanoverberghii* are conspecific. Kränzlin had not seen the type, but his citation of specimens being that of a monographer, was to my mind conclusive. His description agreed with my duplicate of Williams 1934. In the original description of *D. papilio* in the Gardeners' Chronicle, *D. papilio* is ascribed to § Crumenata and characterized as very much branched. Mr. Loher wrote in his letter of April, 1914, that the original description should be emended so that the word "multicaule" becomes "ramosissimum." In the original description of *D. Vanoverberghii* the racemes were characterized as one-flowered. From the very clear photograph reproduced in Plate XIII of the Philippine Journal of Science the flowers appear to be solitary. In my herbarium there is a fragment of a specimen preserved at Kew for which I am indebted to Sir David Prain. Mr. Rolfe has referred this specimen to *D. papilio* Loher. Kränzlin wrote in his monograph, "Species haud bene nota."

LUZON, MINDANAO.

51. Dendrobium pergracile *Ames* in Phil. Journ. Sci. 8 : 423. A specimen in the Gray Herbarium doubtfully assigned to the Philippines and identified tentatively with *D. biflorum* Sw. by Reichenbach f. suggests this species. This specimen was obtained by the Wilkes Expedition. *D. biflorum* is a near ally.

MINDANAO.

52. Dendrobium philippinense *Ames* in Phil. Journ. Sci. 8 : 424. In habit this species suggests *D. juncifolium* Schltr., a species of Celebesian origin, from which it is separable by its simple labellum, which is oblong and without lobes. In the Gray Herbarium

a specimen collected by the Wilkes Expedition appears to belong here. Reichenbach f. identified this as *D. junceum* Lindl. It is without flowers.

LEYTE, MINDORO, LUZON.

53. Dendrobium planibulbe *Lindl.* in Bot. Reg. (1843) Misc. 54. To this species I refer specimens gathered by Weber in Mindanao. The stems at the base are slender and terete, just above the base they are bulbous, flattened, and about 3 cm. long by 1 cm. wide, above the bulbous portion the stem becomes slender again and bears about eight oblong emarginate leaves, 3.5 cm. long by 7 mm. wide; the upper portion of the stem above the leaves is naked and flower-bearing. Flowers 12 mm. across, white. Petals 5 mm. long, the margin somewhat shortly fringed. Labellum about 8 mm. long, cuneate at the base, three-lobed; lateral lobes equalling the fringed middle lobe; middle lobe 2 mm. long, truncate in front, at the base provided with a three-pointed callus. The specimens before me are from 8–34 cm. tall. *D. planibulbe* has been confused with *D. Blumii* Lindl., a Javan species. The middle lobe of the labellum is hardly linear as described by Lindley. *D. tuberiferum* Hook. f. Ic. Pl. t. 2025 is a near ally of *D. planibulbe*, but differs from it in the middle lobe of the labellum.

MINDANAO, Province of Agusan, Talacogon, Agusan River, *C. M. Weber 174* (Hb. Ames 12300), July 20, 1911.

54. Dendrobium platycaulon *R. A. Rolfe* in Kew Bull. (1892) 139.

55. Dendrobium plicatile *Lindl.* in Bot. Reg. (1840) Misc. 10. Between this species and a cultivated specimen from the Buitenzorg Botanic Garden identified by J. J. Smith with *D. flabellum* Reichb. f. there are slight differences which are surely too inconsequential for specific differentiation. In the specimen from

Java there is a very inconspicuous straight keel between the two undulate carinae which traverse the lower half of the middle lobe of the labellum. In the Philippine specimen taken for comparison there are three undulate carinæ that extend beyond the centre of the middle lobe, the centre one of which in Weber 79 from Mindanao extends nearly to the tip of the lip in a broken chain of wart-like calli. Counting the bilobed ears as two teeth and the filament as one tooth, the column is five-toothed, but in dried specimens this character is difficult to study. In alcoholic material prepared for me by Weber the lateral lobes of the column are emarginate rather than bidentate. The truncate emarginate-apiculate apex of the lip in the Philippine species is narrower than the middle, whereas in the Javan specimen the apical portion exceeds the posterior in width. As a result there is a slight difference in aspect, but this difference may not be constant, and would hardly prove diacritical in such a variable part of the flower. The differences in habit are slight and perhaps individual rather than specific. *Dendrobium Kunstleri* Hook. f., according to the plate in Hooker's Icones, has three undulated keels and in these agrees with the Philippine plant. J. J. Smith regards Hooker's species as identical with *D. flabellum*. *D. plicatile* is the *D. Macræi* Lindl. of my earlier lists of Philippine orchids. In the Gray Herbarium there is a specimen from the vicinity of Manila, Luzon, which Reichenbach f. compared with *D. Scopa* Lindl., that appears to be the same as *D. plicatile*.

Mindanao, Leyte, Luzon.

56. Dendrobium polytrichum *Ames* in Phil. Journ. Sci. 2 : 328.

Luzon, Mindoro.

57. *Dendrobium pristinum sp. nov.* Caules cæspitosi, ± 4 dm. alti. Folia disticha, oblongi-lanceolata. Racemi caulibus aphyllis

1.5 cm. longi, 3–5 flori, infra racemum bracteis tubularibus, 2 mm. longis vaginati. Flores flavidi, circiter 1 cm. longi cum mento, approximati; pedicellus gracilis cum ovario vix 1 cm. longus. Bracteæ inflorescentiæ cymbiformes, 3 mm. longæ, persistentes. Sepala lateralia 7 mm. longa, triangularia, acuta, carinata, præsertim ad apicem. Carina quam apex sepalorum longior. Sepalum dorsale oblongi-lanceolatum, leviter carinatum. Petala oblanceolata, 7 mm. longa, 3 mm. lata prope apicem, sparsim denticulata. Labellum 1 cm. longum, trilobatum, tridentiforme, margine ciliatum et fimbriatum, discus puberulus; lobi laterales oblongi, 2 mm. longi, circiter 1 mm. lati; lobus medius triangularis, circiter 4 mm. longus, 2 mm. latus. Mentum 4 mm. longum. Gynostemium breve, crassum.

Among the Philippine species of Dendrobium examined this one seems most likely to be the normal form of *D. pseudaclinia* Lindl. In the absence of positive information, however, it is best to treat the plant as a distinct species.

I have not seen any leafy stems. My description of the leaves is drawn from an excellent photograph preserved with the type in the Bureau of Science Herbarium. The labellum lobes are all directed forward, the lateral ones slightly divergent. Only the lobes are ciliate or fringed. From the flowers examined it would seem that the middle nerve of the labellum is more prominent than the other nerves.

Luzon, Rizal Province, *Maximo Ramos Bur. Sci. 3041.* Flowered at Manila, August 19, 1907.

58. Dendrobium profusum *Reichb. f.* in Gard. Chron. (1884) 1 : 510. Referred by Kränzlin to Subgenus Dendrocoryne and compared with *D. superbiens* Reichb. f.

59. Dendrobium pseudaclinia *Lindl.* in Journ. Linn. Soc. 3 : 9.

D. Aclinia *Reichb. f.* in Bonpl. 4 : 329. To this interesting species I refer specimens from Luzon. *D. pseudaclinia* is anomalous among Dendrobiums. It belongs to a group of about four species, which agree in detail with Griffith's Aclinia. The sepals, petals, and labellum are similar, about 1.2 cm. long by 2–3 mm. wide. There is no mentum. The stout column is quadridentate, the posterior tooth bearing the anther, the anterior one arising from the region of the rostellum. In dried specimens the flowers are yellow and are described as yellow by the collector. The stems are slender, somewhat fractiflexed, concealed in dried specimens by loose, scarious sheaths (leaf bases). The flowers are borne in twos or threes on the leafless stems. The leaves are subcoriaceous, distichous, oblong, acute, tapering at both ends, about 6 cm. long by 1 cm. wide.

A cultivated specimen under observation at Manila failed to expand its flowers. Mr. Merrill of the Bureau of Science described this specimen as follows: "Calyx *i.e.* pedicel and ovary green, corolla straw colored. Have seen no open flowers in the two months the specimen was in flower. It may open at night or very early in the morning, or possibly does not open at all. Flowers from leafless branches, usually two, each with long pedicel on a very short common pedicel."

Reichenbach informed Lindley that he had seen specimens from Manila.

Luzon, Rizal Province, *Juan Reillo 7* (Hb. Ames 13231), July 10, 1903. Zambales Province, *H. M. Curran Bur. Sci. 5618*, July to September, 1908.

60. *Dendrobium pseudoconvexum sp. nov.* Herba epiphytica, humilior. Caules penduli, usque ad 1.5 dm. longi, circiter 1 mm. in crassitudine, lutei, ramosi. Pseudobulbi monophylli, cylindracei, in sicco valde rugosi, sulcati, lutei, nitidi, ad basim vaginati, 2.5 cm. longi. Folium coriaceum, oblongi-ellipticum, 5 cm.

longum, circiter 9 mm. latum. Racemi brevissimi. Flores singuli, viridi-lutei, labello purpureo, 1.5 cm. longi cum mento. Pedicellus subgracilis. Sepala lateralia oblique triangularia, acuta, cum mento 12 mm. longa, 4.5 mm. lata. Sepalum dorsale ovatum, acutum, 5 mm. longum. Petala oblonga, acuta, 5 mm. longa, 2 mm. lata. Labellum 14 mm. longum, trilobatum, lobo medio triangulari-bifido, a basi lineari-cuneatum; lobi laterales quam lobus medius multo minores, rotundati, 1 mm. longi, 1.5 mm. lati; lobus medius profunde forcipatus, ambitu orbicularis, e lobis lateralibus isthmo oblongo separatus, lobuli semiovati, 3.5 mm. longi, 2.5 mm. lati, isthmus 3 mm. longus, 2.5 mm. latus. Lamellæ in disco duæ, ad medium isthmi valde curvatæ. Mentum 7 mm. longum. Gynostemium crassum, utrinque unidentatum.

Dendrobium pseudoconvexum is much smaller in the flowers than *D. interjectum* Ames. Habitally they are very similar. In both species the lamellæ are sharply bent to form a crescent on the isthmus which separates the lateral lobes from the terminal one. The lobules of *D. pseudoconvexum* are twice as wide as those of *D. interjectum*.

Luzon, Laguna Province, San Antonio, *Maximo Ramos Bur. Sci. 15075*, June 14, 1912. *Ramos Bur. Sci. 16567*, September 16, 1912. Mount Mariveles, *F. W. Foxworthy Bur. Sci. 3013*, April, 1907. Leaves longer than in the type, up to 1 dm. long, 13 mm. wide.

61. *Dendrobium purpureostelidium sp. nov.* Aff. *D. parietiformi* J. J. Smith. Caules ramosi, elongati, penduli, usque ad 25 cm. longi, lutei, nitidi, circiter 1 mm. in crassitudine, teretes. Pseudobulbi circiter 1.5 cm. longi, cylindracei, in sicco rugosi, lutei, nitidi 2 mm. in diametro, monophylli, in caulibus distantes. Folium lanceolatum, rigidum, coriaceum, marginatum, in sicco in longitudinem leviter sulcatum vel nervosum, 3–4 cm. longum, 7–9 mm. latum, acutum. Flores singuli, succedanei, ex axilla folii

orientes, albi et purpurei, circiter 5 mm. longi, submembranacei. Bracteæ scariosæ. Inflorescentia ad summum pseudobulbum orta. Sepala lateralia triangulari-lanceolata, acuta, 5 mm. longa, 2 mm. lata, mentum brevem, 1 mm. longum formantia. Sepalum dorsale oblongi-lanceolatum, 5 mm. longum, vix 2 mm. latum. Petala lineari-lanceolata, valde acuta, uninervia. Labellum subintegerrimum, margine valde involutum, præsertim ad apicem, prope basim lobulis auriculiformibus minutis. Totum labellum circiter 5 mm. longum, 2.5 mm. latum, circuitu quadrato-orbiculare. In disco prope pedem gynostemii callus antice et postice retusus stat. Callus membranaceus 1.25 mm. latus, ad angulos posteriores in lobulos laterales decurrens. Gynostemium antice ad apicem in stelidia 2, bidentata producta; dens anterior quam posterior muto longior.

The type consists of a single plant. The habit suggests the groups to which *Dendrobium angustifolium*, *D. pseudoconvexum*, and *D. Eurorum* belong. The flowers are much smaller than in *D. pseudoconvexum*, and are well characterized by the callus on the labellum, which is flat, spool-shaped, and tinged with purple on the lateral ends. There are no longitudinally placed carinæ as in *D. pseudoconvexum*. The column is provided with two subulate stelidia, one on each side at the summit in front. On the posterior side, at the base, each stelidium is unidentate. The stelidia even in dried specimens are of a deep magenta purple color. The nearest affinity of this species is *D. parietiforme* J. J. Smith, from which it differs in the absence of lobes at the tip of the labellum. The labellum of *D. parietiforme* is fleshier and between the terminal rounded lobules distinctly apiculate in the specimen I have examined.

Leyte, Dagami, *C. A. Wenzel 0193*, July 8, 1913. Epiphyte in forest, 60 meters above sea level. Luzon, Laguna Province, San Antonio, *Maximo*

Ramos Bur. Sci. 15103, June, 1912. I have also seen specimens without flowers from MINDANAO and BASILAN.

62. Dendrobium Ramosii *Ames* in Phil. Journ. Sci. 7 : 18.

LUZON.

63. Dendrobium revolutum *Lindl.* in Bot. Reg. (1840) Misc. p. 51.

LEYTE, MINDANAO, DINAGAT, SIBUYAN, LUZON.

64. Dendrobium Robinsonii *Ames* in Phil. Journ. Sci. 8 : 425. Cf. *D. carinatum* Willd. *supra.*

MINDORO, LUZON.

65. Dendrobium Ruckeri *Lindl.* in Bot. Reg. (1843) Misc. p. 25; t. 60. Lindley wrote: "We presume this plant to be one of Mr. Cuming's discoveries in the Philippines, although no trace of it is to be found among his dried specimens." "A Manila (?) plant which has lately flowered with Mr. Rucker." In the Orchid Review (4 : 87) Mr. Rolfe referred to *D. Ruckeri* as follows: "This rare but pretty little Dendrobium is now flowering freely at Kew from plants recently sent from India, and it is now evident that the locality originally published is erroneous." It is a native of the Khasia Hills, and has been met with at Nimbong in Bhotan.

66. Dendrobium Sanderæ *Rolfe* in Gard. Chron. (1909) 45 : 374.

67. Dendrobium Schuetzei *Rolfe* in Orch. Rev. 19 : 224 ; Bot. Mag. 8495. I have not found this species in any of the material submitted for identification by the Bureau of Science, nor among the specimens collected for me by Weber, Wenzel, and Vanoverbergh. Rolfe describes the mentum as obtuse. In *D. Sanderæ* Rolfe and *D. Dearei* Reichb. f., two closely allied Philippine species, the mentum is prolonged into a slender tip. No exact

locality is given in Mr. Rolfe's account of the species in the Botanical Magazine under plate 8495.

68. Dendrobium Scopa *Lindl.* in Bot. Reg. (1842) Misc. p. 55. Weber's 163 from Province of Agusan, Mindanao, is represented in my collection by both dried and alcoholic material. The labellum in its living condition is very similar to the sketch in the Lindley Herbarium, which was undoubtedly prepared from a fresh specimen. In the labellum drawn by Lindley the elongated filaments that constitute the fringe of the middle lobe are directed up and backward; in the alcoholic material prepared by Weber this same peculiar arrangement is characteristic.

Luzon, Leyte, Mindanao.
Also Guam. Probably Formosa, and Samoa (*Powell 363*).

69. Dendrobium secundum *Lindl.* Wall. Cat. no. 1996; Bot. Reg. t. 1291.

Luzon, Mindanao.

70. Dendrobium spurium *J. J. Smith* Orch. Jav. 343.

Luzon.

71. *Dendrobium stella silvæ* (*Loher & Kränzl.*) *comb. nov.* Sarcopodium stella silvæ *Loher & Kränzl.* in Fedde Rep. 7 : 40.

Luzon.

72. Dendrobium superbum *Reichb. f.* in Walp. Ann. 6 : 282.

Luzon.
Also Celebes, Borneo, Amboina, Ceram, Boeroe, Perak.

73. Dendrobium taurinum *Lindl.* in Bot. Reg. (1843) t. 28.

Luzon, Mindanao.

74. Dendrobium ternatense *J. J. Smith* in Bull. Dép. Agr. Ind. Neérl. (1909) nos. 22, 26. Whitford 1083 from Mount Mariveles, Province of Bataan, Luzon, is referred to this species by Kränzlin. This is the *D. macrophyllum* A. Rich. of my previous list in

ORCHIDACEÆ 2 : 179. Smith relies on the smaller dimensions, the color, the narrower side lobes of the labellum, and the different callus for specific distinction between *D. ternatense* and *D. macrophyllum.*

LUZON. Apparently rare in the Philippines.

75. *Dendrobium topaziacum sp. nov.* Flores aurantiaci. Herba epiphytica, usque ad 6 dm. alta, caules 5–8 mm. in diametro (in sicco) multi-articulati, in longitudinem valde sulcati. Folia submembranacea, oblongi, acuta, ad basim rotundata, 7–14 cm. longa, 1.5–2.8 cm. lata. Vaginæ foliorum internodiis æquilongæ, 2–2.5 cm. longæ. Racemi abbreviati, laxiflori, in caulibus defoliatis. Rhachis vix 1 cm. longus. Bracteæ inflorescentiæ in sicco scariosæ, pellucidæ, quam pedicelli multo breviores. Pedicellus cum ovario circiter 1 cm. longus, usque ad 1.3 cm. longus. Flores usque ad 1.7 cm. longi. Sepala lateralia erecta, oblique triangularia, acuta, cum mento circiter 1.5 cm. longa. Sepalum dorsale lanceolatum 6 mm. longum, circiter 3.25 mm. latum. Petala oblongi-spathulata, subacuta, 6 mm. longa, circiter 2 mm. lata. Mentum 1 cm. longum, obtusum, circiter 3 mm. in diametro, ad basim, antice clausum. Labellum anguste oblanceolatum, vel spathulatum, ecallosum, 1.5 mm. longum, circiter 3 mm. latum. Columna brevissima, circiter 2 mm. longa, in pedem 8 mm. longum, producta.

LEYTE, Dagami, *C. A. Wenzel 0202*, July 17, 1913. Epiphyte in forest. Altitude 60 meters. Flowers red and yellow.

76. *Dendrobium* (§ *Desmotrichum*) *unicorne sp. nov.* Aff. *D. parietiformi* J. J. Smith. Caulis ramosi internodio terminali pseudobulboso, cylindrico monophyllo. Folium oblongi-ellipticum, valdissime coriaceum, in sicco rigidum, 2–2.6 cm. longum, circiter 1 cm. latum, marginatum, ad apicem bidentatum, breviter petiolatum. Pseudobulbi in sicco valde rugosi usque ad 1.7 cm. longi,

internodii 1.5–1.7 cm. longi, graciles, nodii nigro-annulati. Inflorescentia uniflora. Pedicellus cum ovario 4–5 mm. longus. Flores albidi, minuti. Sepala lateralia ovata, acuta, circiter 5 mm. longa, vix 3 mm. lata, trinervia. Sepalum dorsale ovato-lanceolatum 4 mm. longum, vix 2 mm. latum, trinervium ad apicem attenuatum. Petala linearia, ad apicem truncato-apiculata, 4 mm. longa, circiter 1 mm. lata, trinervia. Labellum antice 4–5 mm. longum usque ad apicem pedis columnæ affixum, lobis lateralibus obsoletis, lamina ad apicem profunde bilobum, lobulis divergentibus usque ad 2 mm. longis, 1.5 mm. latis, inæqualiter rotundatis, ad basim lamella transversa, lamella papilla porrecta instructa. Mentum valde obtusum, 2 mm. longum. Gynostemium 2.5 mm. longum, erectum, ad apicem integra.

Dendrobium unicorne is a near ally of *D. parietiforme* J. J. Smith from Celebes. It is distinguished from that species by the more deeply bilobed apex of the labellum, by the obscure lateral lobes, and by the horn-like projections on the callus that stand in front of the opening to thesac. The labellum in *D. parietiforme* is much more fleshy than in either *D. unicorne* or *D. purpureostelidium*, and is distinctly apiculate. The column of *D. unicorne* is entire at the tip with a large membranous hood partly surrounding the androclinium. The flower arises from the pseudobulb at the back of the leaf.

What appears to be the same species is represented in the herbarium of the Bureau of Science by a single specimen.

LEYTE, Jaro, *C. A. Wenzel 0292*, March 8, 1914. Sepals, petals, and labellum white. Epiphyte. Altitude 500 meters. "Leaf thick, pseudobulb channeled." LUZON, Laguna Province, San Antonio, *Maximo Ramos Bur. Sci. 14987*, June 13, 1912.

77. Dendrobium Usteri *Schltr. ex Usteri* Vierteljahrsschrift der Naturforschenden Gesellschaft in Zurich 56 : 450 (1906);

in Bull. Herb. Boiss. 2d ser. 6 : 458 (1906). For a fragment of the type accompanied by analytical drawings I am indebted to Dr. Schlechter. *D. Usteri* is a member of § Rhopalanthe with terete leaves. In my herbarium this species is represented by several specimens collected by W. S. Lyon on Guimaras Island, between the islands of Panay and Negros. *D. Usteri* was originally collected in Negros, where it was found growing on mangroves.

The flowers on my specimens average larger than those described from the type by Schlechter, the labellum in one flower measuring 1 cm. in length. The lateral sepals and petals resemble the sketches prepared for me by Schlechter, but the upper sepal in my material is narrower than that of the type, measuring 8 mm. by 2.5 mm. Mr. Lyon describes the flowers as yellow "veined with pale rosy lines." In outline the labellum suggests *D. crumenatum*. The pseudobulbs are from 3.5 cm. to 5 cm. long, deeply grooved longitudinally in dried specimens, and are terminated by a fleshy terete sharply pointed rigid leaf and by the slender flower shoot. The flower shoot is longer or shorter than the leaf, in one specimen slightly exceeding 1.5 dm. in length. The longest leaf hardly exceeds 8 cm. in length. In the specimens examined the flower shoot exceeds the leaf in five plants and is shorter than the leaf in four.

GUIMARAS, *W. S. Lyon 137*, April, 1909.

78. *Dendrobium Usterioides sp. nov.* Herba epiphytica, erecta, usque ad 1 dm. alta; rhizomate valde abbreviato; caulibus vel potius pseudobulbis subfusiformibus, cylindraceis, mox longitudinaliter sulcatis, vaginis albidis, laxe amplectentibus primum vestitis, apice unifoliatis 2.5–5 cm. longis, supra medium usque ad 7 mm. diametientibus, apicem et præsertim basim versus paullo attenuatis. Folium valde incrassatum, subulatum, ± 5 cm. longum,

prope basim circiter 3 mm. in diametro, flores excedens, in sicco glaucum, mox longitudinaliter sulcatum. Pedunculus rigidus, leviter fractiflexus, vix 5 cm. longus, articulatus. Bracteæ inflorescentiæ hyalinæ albidæ. Flores flavidi, non striati, circiter 1.5 cm. longi. Sepala lateralia oblique triangularia, acuta, mentum obtusum circiter 5 mm. longum formantia, 8 mm. longa. Sepalum dorsale oblongi-lanceolatum, obtusiusculum circiter 8 mm. longum, vix 3 mm. latum. Petala oblongi-lanceolata, acuta ad basim apicemque attenuata, membranacea, 7 mm. longa, circiter 2 mm. lata. Labellum 9 mm. longum, trilobatum, e basi cuneatum; lobi laterales subtruncati, rotundati, obtusi, margine leviter denticulati quam lobus medius multo breviores; lobus medius oblongus, apiculatus, ad apicem paullo dilatatus, vix 5 mm. longus, prope apicem circiter 3 mm. latus, lineæ elevatulæ in disco 3, ad medium lobi medii fimbriatæ. Gynostemium brevissimum.

Dendrobium Usterioides is a close ally of *D. Usteri* Schltr., differing from it in the stouter pseudobulbs, and in having the flower shoots much shorter than the fleshy leaves. In *D. Usteri* the middle lobe of the labellum is oblong-quadrate, hardly if at all dilated near the tip. In his field notes which accompany specimens of *D. Usteri* Mr. Lyon wrote: "This Dendrobium in habit of growth and leaf, but not in inflorescence, much resembles my no. 22 [*D. Usteri*]. Flowers paler yellow and *exterior* of perianth veined with pale rosy lines."

The immature pseudobulb and leaf are for the most part concealed by about three loose, tubular, whitish sheaths, which soon pass away (?). The mature pseudobulbs are yellowish, either wholly or in part clothed with a closely appressed grayish covering. The inflorescence is also covered with whitish or grayish sheaths

before the period of anthesis begins. In mature specimens the remains of these sheaths may be detected after anthesis.

Luzon, *W. S. Lyon 22*, 1907. Flowers clear greenish yellow, fugacious, lasting only one or two days. Mindoro, Bongabong River, *M. L. Merritt For. Bur. 3693*, March 12, 1906. On tops of trees.

79. Dendrobium verruculosum *Ames* in Phil. Journ. Sci. 8 : 426.

Leyte, Luzon?

80. Dendrobium Victoriæ reginæ *Loher* in Gard. Chron. (1897) 81 : 399. See *D. cœleste, supra.*

Mindoro, Negros, Luzon, Mindanao.

81. Dendrobium ventricosum *Kränzl.* Dendrobiinæ 209. *D. nycteridoglossa* Reichb. f. is said to be closely allied.

82. *Dendrobium Wenzelii sp. nov.* Caulis per totam longitudinem foliatus, 4–10 cm. altus. Radices fibratæ. Folia a latere visa triangula, acuta, supra vix decrescentia, maxima ad 12 mm. longa, 5 mm. alta, disticha, ad apicem deflexa, sæpe triangulari-falcata, in sicco nervosa, rigida, coriacea, valde complanata, infra medium caulis folio decrescentia, prope basim caulis vix 3 mm. longa ad apicem caulis folia duo aurantiaca, petaloidea. Flores terminales, nunquam laterales, circiter 8 mm. longi. Sepala lateralia supra triangula, obtusa, leviter falcata, postice in mentum obtusum producta, circiter 4 mm. longa, 3.5 mm. lata, mentum 6–7 mm. longum. Sepalum dorsale oblongi-ellipticum, obtusum, circiter 4.5 mm. longum, circiter 2 mm. latum. Labellum simplex, ad apicem bilobum, a basi cuneato-oblongum, circiter 8 mm. longum, vix 3.5 mm. latum; lobi rotundati, leviter denticulati, papulosi, androclinii margo lævis: filamentum satis longum.

Among Philippine species of Dendrobium heretofore described *Dendrobium Wenzelii* is readily distinguishable by means of the terminal pair of orange-colored glossy leaves, between which the

inconspicuous flowers appear, usually one at a time. Mr. Wenzel describes the flowers as white, purple, and yellow. From dried material the sepals and petals appear to have been white, the labellum purplish with a yellow tip.

I have seen specimens without flowers, collected in Mindoro, which may be conspecific with *D. Wenzelii*. From Mindanao I have material, also without flowers, which represents a species closely related to *D. Wenzelii*, but stouter in all its parts and much branched. In the Bureau of Science Herbarium at Manila there is a single specimen (H. N. Whitford 806) from the Province of Tayabas, Luzon, that appears to be conspecific with *D. Wenzelii*. There are no flowers with this specimen, which in general habit resembles an undescribed Dendrobium from Bangarmassing, Borneo (J. Motley 722), preserved in the Kew Herbarium.

LEYTE, *C. A. Wenzel 0139*, March 20, 1913.

83. *Dendrobium zamboangense sp. nov.* Radices fibratæ, glabræ. Caules graciles, ad basim attenuati, 1–2 mm. in crassitudine, ad apicem circiter 3 mm. in diametro, 20–31 cm. longi, foliosi, internodiis 1 cm. longis. Folia coriacea, 3.5–3 cm. longa, usque ad 8 mm. lata ad basim, usque ad apicem leviter attenuata, inæqualiter bilobata, obtusa, vaginis caulem obtegentibus, in sicco valde rugosis. Flores laxe racemosi, purpurei, membranacei, ± 6. Pedunculus ± 5 mm. longus, a nodis caulis post abjectionem foliorum ortus, purpureus. Pedicellus ovariumque gracilis, circiter 1 cm. longus. Bracteæ florales purpureæ, acutæ, 2 mm. longæ. Sepala lateralia antice oblonga, acuta, 6 mm. longa, 3 mm. lata, postice mentum ter vel quater longius, longe attenuatum, fere omnino clausam formantia; mentum calcariforme usque ad 1.7 cm. longum leviter ad apicem dilatatum, circiter 1 mm. in diametro, obtusum, quam pedicellus multo longius leviter curvatus. Sepalum dorsale elliptico-lanceolatum, acutum, 6 mm. longum, 3.5 mm.

latum. Petala anguste oblongi-lanceolata, acuta ad apicem minutissime denticulata 6 mm. longa, 1.5 mm. lata, membranacea. Labellum antice spathulatum vel oblanceolatum, acutum, integerrimum, 3.5 mm. latum, sepalis adhærens, calcar elongatum formans. Gynostemium in pedem elongatum productum.

Allied to *Dendrobium hymenophyllum* Lindl. The leaves in outline are not unlike the leaves of *D. clavipes* Hook. f.

Mindanao, District of Zamboanga, Sax River Mountains, *E. D. Merrill 8174*, November 28, 1911. Altitude 1100 meters. Epiphyte. Flowers purple.

63. ERIA *Lindl.*

In 1909 Dr. Robert G. Leavitt prepared a descriptive list of the species of Eria native to the Philippines (Phil. Journ. Sci. 4 : 201-244 (C) Bot.). To this list he admitted forty species, all but six of which were thought to be endemic. Probably three hundred species constitute the genus. In the monograph prepared for Engler's Das Pflanzenreich, Kränzlin recognized § Trichotosia as a genus. This treatment is hardly commendable. In the following list Trichotosia is kept as a section.

1. Eria anceps *Leavitt* in Phil. Journ. Sci. 4 : 219.

Palawan.

2. Eria binabayensis *Ames* in Phil. Journ. Sci. 2 : 329.

Mindoro.

3. Eria bontocensis *Ames* in Phil. Journ. Sci. 8 : 427.

Luzon.

4. Eria brachystachya *Reichb. f.* in Bonpl. 3 : 223. E. Wenzelii *Ames* in Phil. Journ. Sci. 8 : 428.

Camiguin, Leyte, Babuyanes Islands, Mindanao, Luzon.

5. Eria bractescens *Lindl.* in Bot. Reg. (1841) Misc. 18. *Var.*

latipetala *Leavitt* in Phil. Journ. Sci. 4 : 210 is referred to E. rhodoptera *Reichb. f.* Cf. Bot. Mag. 8296.

Luzon, Mindanao.

6. Eria Clemensiæ *Leavitt* in Phil. Journ. Sci. 4 : 220.

Leyte, Mindanao.

7. Eria compacta *Ames* in Phil. Journ. Sci. 2 : 329.

Mindoro.

8. Eria Copelandii *Leavitt* in Phil. Journ. Sci. 4 : 203. Kränzlin refers this species to *E. formosana* Rolfe. The smooth sepals and smaller flowers of *E. Copelandii* indicate differences which Kränzlin has apparently overlooked. The description of *E. formosana* in Kränzlin's monograph was apparently reconstructed from Leavitt's description of the type of *E. Copelandii*. The measurements given agree almost point for point with Leavitt's measurements, and are not in agreement with Rolfe's in the original description of *E. formosana*. It would seem that Kränzlin prepared his description from Philippine specimens, probably from the type of *E. Copelandii* (Copeland 1423) which was loaned to him by the Bureau of Science.

Luzon, Mindanao.

9. Eria Curranii *Leavitt* in Phil. Journ. Sci. 4 : 210.

Palawan.

10. Eria cylindrostachya *Ames* Orchidaceæ 2 : 190.

Mindanao.

11. Eria cymbiformis *J. J. Smith* in Rec. Trav. Bot. Neérl. 1 : 152.

Luzon, Mindanao, Mindoro.

12. *Eria dagamensis sp. nov.* Sympodium productum. Caules in sicco usque ad 7 mm. in diametro, 3.5–5 cm. longi, rugosi, vaginis laxis instructi. Folia prope apicem caulium conferta, in caule

florigero 4–5, lanceolata, acuta, usque ad 1 dm. longa, ± 17 mm. lata, rigida. Vaginæ infra folia infundibuliformes, circiter 1.5 cm. longæ, rufescentes. Inflorescentiæ 2–5, circiter 1.5 dm. longæ, pedunculo ± 2 cm. longo, racemo dense plurifloro. Tota inflorescentia dense pubescens, tomento brunneo. Bracteæ flores subtendentes glabræ, lanceolatæ, ± 7 mm. longæ. Pedicellus cum ovario circiter 7 mm. longus, brunneo-pubescens. Sepala lateralia oblique triangulari-lanceolata, pubescentia, acuta, 11 mm. longa, mentum obtusum, 4 mm. longum, formantia. Sepalum dorsale oblongi-lanceolatum, acutum, 11 mm. longum. Petala ovato-lanceolata, acuta, trinervia, 1 cm. longa, vix 3 mm. lata, membranacea, glabra. Labellum ovatum, subacutum, margine ad medium denticulatum, prope basim bicallosum, calli crescentiformes, 3.5–4 mm. longum, ad basim circiter 4 mm. latum, glabrum, prope unguem tuberculi duo stant. Gynostemium gracile 2 mm. longum; pes gynostemii 4–5 mm. longus.

The flowers of *Eria dagamensis* resemble those of *Eria polyura* Lindl. In general habit it resembles most closely *E. philippinensis* Ames, from which it may be distinguished by its shorter stems and by the details of the labellum. In front of the claw at the base of the labellum there are two minute, tubercular projections.

The color of the flowers according to Mr. Wenzel's notes is variable, ranging between deep pink and white, with the labellum yellow or pink and yellow.

LEYTE, Jaro, *C. A. Wenzel 0314*, March 9, 1914. Epiphyte in forest, 600 meters above sea level. Sepals and petals pink, labellum yellow. *Wenzel 0320*, March 9, 1914. Epiphyte in forest, 600 meters above sea level. Sepals and petals pink, labellum red and yellow. *Wenzel 0321*, March 9, 1914. Altitude 600 meters. Sepals and petals white, labellum pink and yellow. *Wenzel 0323*, March 9, 1914. Altitude 600 meters. Sepals and petals white, labellum pink and yellow. *Wenzel 0317*, March 9, 1914. Altitude 600 meters. Sepals and petals flesh-color and red, labellum flesh-

color and yellow. Dagami, *Wenzel 0123*, January 31, 1913. Forest foothills, 60 meters above sea level. Flowers purple.

13. Eria davaensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1572.

MINDANAO.

14. Eria Elmeri *Ames* ORCHIDACEÆ 2 : 93. *E. Elmeri* is closely related to *E. ovata* Lindl. It has broader, shorter leaves than the type of *E. ovata*, according to notes made by Leavitt, and the flowers are smaller. I have examined several specimens referable to *E. Elmeri* in comparison with Leavitt's detailed herbarium notes relative to *E. ovata*, also sketches and a photograph made from the type, and while I am convinced that *E. Elmeri* is very close to *E. ovata*, I am inclined to keep them distinct.

LUZON, NEGROS, LEYTE.

15. Eria fastigatifolia *Ames* ORCHIDACEÆ 2 : 191. Trichotosia fastigatifolia *Kränzl.* in Engler's Pflanzenr. Dendrobiinæ–Eria 162.

LUZON, NEGROS.

16. Eria floribunda *Lindl.* Wall. Cat. no. 7408.

PALAWAN, MINDANAO.

17. Eria fusca *Bl.* Mus. Bot. Lugd. 2 : 183.

LEYTE, NEGROS.

18. Eria gigantea *Ames* ORCHIDACEÆ 2 : 192.

LUZON, MINDANAO.

19. Eria graciliscapa *Rolfe ex Ames* ORCHIDACEÆ 1 : 93.

LUZON.

20. Eria halconensis *Ames* in Phil. Journ. Sci. 2 : 830. Trichotosia halconensis *Kränzl.* in Engler's Pflanzenr. Dendrobiinæ–Eria 149.

MINDORO.

21. Eria Hutchinsoniana *Ames* in Phil. Journ. Sci. 2 : 330.

MINDORO.

22. *Eria* (§ *Urostachya*) *jarensis sp. nov.* Caules elongati, in sicco graciles, ad basim attenuati, ± 2 dm. alti, rugosi. Folia prope apicem caulium conferta, in caule florigero ± 5, lanceolata, acuta, usque ad 2 dm. longa, ± 3.5 cm. lata, in sicco vix rigida. Inflorescentiæ prope apicem caulium confertæ, densifloræ, ± 4, circiter 6 cm. longæ. Pedunculus breviter pubescens. Rhachis inflorescentiæ pubescens tomento brunneo. Bracteæ flores subtendentes ± 1 cm. longæ. Ovarium cum pedicello usque ad 12 mm. longum, pubescente tomento brunneo. Flores extus glabri. Sepala lateralia oblique triangularia, subacuta, 7 mm. longa, mentum 5–6 mm. longum formantia. Sepalum dorsale oblongi-ellipticum, 7 mm. longum, circiter 3 mm. latum. Petala lanceolata, 6 mm. longa, ± 2.5 mm. lata. Labellum supra medium, trilobatum, infra medium cuneatum, circiter 9 mm. longum; lobi laterales quam lobus medius angustiores et minores, oblongi, obtusi circiter 2.5 mm. longi, 1–2 mm. lati; lobus medius suborbicularis, ad apicem emarginatus, apiculatus vel subapiculatus, quam lobi laterales longior, 3.5–4 mm. longus, 4 mm. latus, in disco lineæ tres elevatæ, ad basim medium lobi medii extendentes, in disco ad medium calli 3 tuberculosi. Columna gracilis.

The middle lobe of the labellum of Wenzel 0357 is roughish, almost glandular pubescent, and the nerves are elevated and wavy.

LEYTE, Jaro, *C. A. Wenzel 0358*, March 15, 1914. Epiphyte in forest, 500 meters above sea level. Sepals and petals flesh-color. Labellum yellow and purple, the middle lobe yellowish, the lateral lobes purplish. *Wenzel 0357*, March 15, 1914. Altitude 500 meters.

23. *Eria* (§ *Trichotosia*) *lagunensis sp. nov.* Radices fibratæ, ramosæ, elongatæ. Caules rigidi, 4.5–7.5 dm. longi, vaginis persistentibus foliorum obtecti, ad basim teretes sæpius rubro-tincti,

per totam longitudinem foliati, usque ad 6 mm. in diametro. Folia anguste lanceolata, sæpe lineari-lanceolata, 5–10.5 cm. longa, 11–22 mm. lata, coriacea, rigida, acuta, subtus pilosa, ante maturitatem utrinque pilosa, pilis rufis vel brunneis. Foliorum vaginæ 1.5–4 cm. longæ, cylindraceæ, internodiis æquilongæ, hirsutæ, pilis rufis vel brunneis, ad summum caulem dense hirsutæ pilis rufis. Pili arte adpressi, vel oblique ascendentes. Racemi foliis breviores, circiter 4 cm. longi, dense pilosi, subfractiflexi. Flores ± 6. Bracteæ late ovatæ, acutæ, coriaceæ, concaviusculæ, pedicellis longiores, circiter 6 mm. longæ, 4.5 mm. latæ, hirsutæ. Sepala lateralia oblique triangulari-lanceolata, acuta, ad apicem carinata vel incrassata, extus sparse pilosa, cum mento usque ad 13 mm. longa. Mentum obtusum 4 mm. longum. Sepalum dorsale oblongi-lanceolatum, concaviusculum, extus sparse pilosum, 6 mm. longum. Petala lineari-oblonga, obtusa, trinervia, membranacea, 7 mm. longa, 1.5 mm. lata. Labellum trilobatum, unguiculatum, totum labellum 8–10 mm. longum, e basi oblongo-cuneatum; lobi laterales parvi, rotundati, quam lobus medius multo minores; lobus medius latior quam longior, obreniformis, ± 5 mm. latus, ± 2.5 mm. longus, profunde retusus. Discus manifeste bicarinatus, pubescens, carinæ ad basim obsoletæ pertinent ad mediam partem disci. Labellum ambitu supra unguem panduriforme. Gynostemium cum pede circiter 1 cm. longum.

This species is closely related to *Eria leytensis* Ames and *E. fusca* Bl. From the former it is in part distinguished by its less strict habit and by the deeply retuse, reniform middle lobe of the labellum. *E. leytensis*, in dried specimens, is less pubescent and on the under side of the mature leaves appears to be smoother than *E. lagunensis*. *E. fusca* is in part characterized by having a tricarinate labellum. In several flowers examined the petals were

provided with one or two marginal hairs, but in no case were hairs numerous. In both *E. lagunensis* and *E. leytensis* the labellum is pubescent, but much more so, especially toward the base, in the latter than in the former. In both species, in the centre of the disc just above the keels, the mid-nerve is thickened and densely pubescent.

Luzon, Laguna Province, *Juan S. Serrato s. n.* September, 1912. Flower white, brown, and pink.

24. Eria lamellata *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1576.

Mindanao.

25. Eria leytensis *Ames* in Phil. Journ. Sci. 8 : 427.

Leyte.

26. Eria longibracteata *Leavitt* in Phil. Journ. Sci. 4 : 219.

Mindanao, Luzon.

27. Eria longicruris *Leavitt* in Phil. Journ. Sci. 4 : 205.

Mindanao.

28. Eria longilabris *Lindl.* in Bot. Reg. (1841) Misc. 38. Probably a variety of *E. bractescens.*

29. Eria Lyonii *Leavitt* in Phil. Journ. Sci. 4 : 212.

Luzon.

30. *Eria* (§ *Hymeneria*) *maquilingensis sp. nov.* Sympodium productum. Caulis in sicco 4–8 mm. in diametro, vaginis laxis instructus, ± 8 cm. longus. Folia prope apices caulium conferta, in caule florigero 4–6, anguste lanceolata, acuminata, acuta, utrinque attenuata, 1–1.5 dm. longa, usque ad 2.4 cm. lata. Inflorescentiæ 2–4, circiter 1.5 dm. longæ, graciles, folia excedentes, racemo laxe plurifloro, glabro. Bracteæ inflorescentiæ ± 5 mm. longæ, acutæ. Flores glabri. Ovarium glabrum, cum pedicello circiter 5 mm. longum. Sepala lateralia 5–6 mm. longa, circiter 1.5

mm. lata, triangula, vix acuta, quinquenervia, membranacea in sicco, glabra. Sepalum dorsale oblongum, obtusum, circiter 6 mm. longum. Petala anguste oblongi-lanceolata, acuta, 5.5 mm. longa, circiter 1.5 mm. lata. Labellum trilobatum, 3.5 mm. longum; lobi laterales prope basim labelli, circiter 1 mm. longi, obtusi; lobus intermedius productus, 2.5 mm. longus, ad basim 1.5 mm. latus, anguste triangulari-ovatus, trinervius, ad apicem minute fimbriatus, vel crispatus, in disco carinæ duæ, in disco prope basim labelli callus. Mentum circiter 2 mm. longum.

The form of the labellum suggests *Eria longicruris* Leavitt, a species with which *E. maquilingensis* is allied. The color of the flowers is not referred to by the collector. From dried specimens the labellum appears to have been tinged with purple when fresh. The calli on the labellum are three in number, the lateral ones carinate and much longer than the middle one, which is basal and fleshy, somewhat lanceolate in outline.

Luzon, Laguna Province, Mount Maquiling, *W. H. Brown Bur. Sci. 17909*, May 8, 1913. On trees in forest, 700 meters above sea level.

31. *Eria* (§ *Trichotosia*) *McGregorii sp. nov.* Aff. E. halconensi sed in floribus major. Caules elongati, 3 dm. excedentes, usque ad 6 mm. in crassitudine, flexuosi. Folia anguste lanceolata, acuminata, in sicco verruculosa, valde acuta, coriacea, præsertim juniores hirsuta pilis rufis vel brunneis, usque ad 1.5 dm. longa, circiter 1.5 cm. lata prope basim. Foliorum vaginæ artæ, cylindraceæ, supra paulo dilatatæ, internodiis æquilongæ, hirsutæ, pilis rufis, circiter 3 cm. longæ, in sicco verruculosæ. Inflorescentia lateralis, foliis brevior, pilis rufis vestita, usque ad 5 cm. longa, subgracilis, bracteis ± 6, late ovatis, cymbiformibus, 5–10 mm. longis. Flores flavidi, circiter 1 cm. distantes, circiter 1.5 cm. longi cum mento, in racemo laxo dispositi. Sepala lateralia oblique

triangulari-lanceolata, acuta, ad apicem breviter carinata, cum mento 1.4–1.5 cm. longa, extus dense pilosa. Sepalum dorsale anguste lanceolatum, concaviusculum, circiter 12 mm. longum, quam sepala lateralia multo angustius, extus dense pilosum. Petala linearia, obtusa, sparse hirsuta extus, circiter 1 cm. longa, vix 2 mm. lata. Labellum trilobatum, e basi cuneatum, 12 mm. longum; lobi laterales parvi, rotundati, denticulati; lobus medius orbicularis, vel subquadratis, ad apicem retusus cum mucro, denticulatus, 3–3.5 mm. longus. Totum labellum extus glabratum et per medium carinatum, intus ecarinatum, pilosum præsertim in lobo medio. Mentum obtusum 5 mm. longum. Columna cum operculo et pede circiter 1 cm. longa.

From *Eria halconensis* Ames, *E. McGregorii* is easily distinguished by its larger flowers. From *E. odorifera* Leavitt, where dried specimens are considered, it is separable by the verruculose foliage and closely appressed rather than spreading pubescence. It also differs from *E. odorifera* in its denticulate labellum lobes and in its longer racemes. In proposing McGregor's material for specific rank I have relied wholly on dried specimens and on a careful study of the types of *E. halconensis* and *E. odorifera*, which among the species of §Trichotosia appear to be most closely allied with *E. McGregorii*.

The Trichotosia section of the genus Eria is at present known to contain nine species which are natives of the Philippine Islands. With the exception of *E. Ramosii* Leavitt, a dwarf species with distinctly creeping habit and with small leaves about 8 mm. long, they are extremely difficult to differentiate if reliance is placed on descriptions alone. The following key, based on a restudy of herbarium material, is offered with the hope that it may show the important characteristics serviceable for differentiation

and emphasize the details to which attention should be given in an effort to recognize the species heretofore described from the Philippines as well as the species herein proposed.

A. Plant creeping. Leaves about 8 mm. long. 1. E. Ramosii *Leavitt.*
AA. Plant tall. Leaves much exceeding 1 cm. in length.
B. Labellum obscurely lobed, rounded at the tip. 2. E. vulpina *Reichb. f.*
BB. Labellum distinctly three-lobed, more or less retuse at the tip.
* Disc three-carinate. 3. E. fusca *Bl.*
** Disc bicarinate, with two short supplementary keels near the base of the middle lobe, minutely pubescent. 4. E. binabayensis *Ames.*
*** Disc bicarinate, hairy.
† Middle lobe slightly retuse. 5. E. leytensis *Ames.*
†† Middle lobe deeply retuse. 6. E. lagunensis *Ames.*
**** Disc ecarinate or with the nerves simply thickened, smoothish, or only minutely pubescent. 7. E. halconensis *Ames.*
***** Disc ecarinate, hairy.
† Petals smooth. 8. E. odorifera *Leavitt.*
†† Petals hairy. 9. E. McGregorii *Ames.*

Eria vulpina, the commonest of the species, has elongated racemes, which usually equal the leaves.

Luzon, Subprovince Ifugao, Mount Polis, *R. C. McGregor Bur. Sci. 19876*, February 9, 1913.

32. Eria major *Ridl. ex Stapf* in Trans. Linn. Soc. Bot. ser. II, 4 : 237 in synonymy.

Mindanao.

33. Eria Mearnsii *Leavitt* in Phil. Journ. Sci. 4 : 216.

Mindanao.

34. Eria Merrillii *Ames* in Phil. Journ. Sci. 2 : 331.

Leyte, Luzon, Mindoro.

35. Eria Merrittii *Ames* in Phil. Journ. Sci. 2 : 331.

Luzon, Mindoro.

36. Eria mindanaensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1577.

Sibuyan.

37. Eria odorifera *Leavitt* in Phil. Journ. Sci. 4 : 223. Trichotosia odorifera *Kränzl.* in Engler's Pflanzenr. Dendrobiinæ–Eria 153.

Mindanao, Negros.

38. Eria ornata *Lindl.* Gen. & Sp. Orch. 66.

Luzon, Negros, Mindanao.

39. Eria ovata *Lindl* in Bot. Reg. (1844) sub t. 29. Cf. *E. Elmeri, supra.*

40. Eria palawanensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1578.

Palawan.

41. *Eria* (§ *Cylindrolobus*) *perspicabilis sp. nov.* Caules validi, 5–10 dm. longi, ad basim teretes, superne leviter complanati, vaginis persistentibus foliorum laxe obtecti. Folia in sicco chartacea, nervosa, glabra, lineari-lanceolata, ad basim apicemque attenuata. Præsertim usque ad apicem acuminata, acuta, ± 1.5 dm. longa, circiter 1.5 cm. lata, decidua. Vaginæ foliorum arte adpressæ, supra valde dilatatæ, complanatæ, nervosæ, imbricatæ, ± 3 cm. longæ. Flores albidi. Racemi uniflori, bracteis 4, oblongi-lanceolatis, acutis, 1.5 cm. longis, 3 mm. latis, patentibus. Tota inflorescentia quam folia multo brevior, circiter 6 cm. longa, glabra. Pedicellus cum ovario usque ad 1.8 cm. longus. Sepala lateralia oblonga, valde obtusa, usque ad apicem subtiliter angustata, ± 1.8 cm. longa, ad basim 8 mm. lata, mentum valde obtusum formantia. Mentum circiter 5 mm. longum. Sepalum dorsale oblongum usque ad apicem obtusam sensim angustatum, usque ad 9.1 cm. longum, prope basim circiter 7 mm. latum, concavum. Petala quam sepala latiora, anguste ovata, ad apicem rotundata, 2 cm. longa, 9 mm. lata. Labellum integrum, anguste ovatum, ad apicem truncatum vel valde obtusum, circiter 1.8 cm. longum,

7 mm. latum, bilamellatum, lamellæ carnosæ, e basi labelli pæne usque ad apicem productæ. Gynostemium 7 mm. altum. Pollinia?

Eria perspicabilis is a near relative of *E. brachystachya* Reichb. f., from which it is at a glance distinguishable by the larger flowers and entire, conspicuously bicarinate labellum. The flowers are rather delicate in texture and among the largest of the genus.

The pollinia in the flowers examined were so mutilated by drying that it was not possible to ascertain the number present in a normal anther.

Luzon, Subprovince Ifugao, Mount Polis, *R. C. McGregor Bur. Sci. 19733*, February 3, 1913. "Vine like, each branch about .5–1 meter long, flower white; large patch of reddish brown inside. Only one or two flowers open at a time, the lower ones falling first."

42. Eria philippinensis *Ames* Orchidaceæ 1 : 94.

Luzon.

43. Eria polyura *Lindl.* in Bot. Reg. (1841) Misc. 55.

Luzon, Leyte, Sibuyan, Mindanao.

44. Eria profusa *Lindl.* in Bot. Reg. (1842) Misc. 2.

Negros, Luzon.

45. *Eria puguahaanensis sp. nov.* Radices fibratæ, elongatæ, ramosæ. Pseudobulbi conferti, circiter 4.5 cm. longi, bracteis obtecti, ad apicem 2–3 foliati. Folia lineari-lanceolata, 11–18 cm. longa, 1.3–1.8 cm. lata. Racemi ad summum caulem orti, pedunculati, foliis multo breviores, lanugine alba. Inflorescentia omnis ad 5 cm. longa. Pedunculus circiter 2 cm. longus, lanugine alba, bracteas chartaceas gerens, rhachis lanuginosus, bracteæ flores subtendentes lanceolatæ, in sicco fulvæ. Pedicellus cum ovario 2–3 mm. longus. Sepala lateralia oblique triangularia mentum curvatum, obtusum, formantia, 4 mm. longa, extus dense lanuginosa, pilis albidis. Sepalum dorsale anguste ellipticum, obtu-

sum, circiter 4 mm. longum, vix 2 mm. latum, extus lanugine albida, vestitum. Petala oblonga, obtusa, trinervia, circiter 4 mm. longa, vix 2 mm. lata, glabra. Labellum trilobatum, pubescens, circiter 5 mm. longum, vix 4 mm. latum, ambitu ovatum; lobi laterales supra medium labelli circiter 1 mm. longi, vix 1 mm. lati; lobus medius triangulus, 2 mm. longus, ad basim 2 mm. latus, incrassatus, obtusus, in disco lamellæ duæ, incrassatæ stant. Columna 1.5 mm. longa supra pedem.

This species appears to belong to Reichenbach's § Mycaranthes as interpreted by Dr. R. G. Leavitt in his monograph of the Philippine species of Eria (Phil. Journ. Sci. 4 : 217 (C) Bot.). Among Philippine Erias *E. puguahaanensis* is very distinct and has no near ally. The fleshy calli or keels of the labellum extend from near the base of the disc to the base of the middle lobe.

LEYTE, Dagami, *C. A. Wenzel 0221*, July 31, 1913. Epiphyte in forest. Altitude 60 meters above sea level. Flowers white.

46. Eria racemosa *Leavitt* in Phil. Journ. Sci. 4 : 206.

MINDANAO.

47. Eria Ramosii *Leavitt* in Phil. Journ. Sci. 4 : 224.

NEGROS, MINDANAO, LUZON.

48. Eria retroflexa *Lindl.* in Journ. Linn. Soc. 3 : 60.

LEYTE, LUZON, NEGROS.

49. Eria rhodoptera *Reichb. f.* in Gard. Chron. (1882) 2 : 586. E. bractescens *var.* latipetala *Leavitt* in Phil. Journ. Sci. 4 : 210.

LUZON, MINDANAO, BUSUANGA.

50. Eria ringens *Reichb. f.* in Bonpl. 3 : 222. Cf. Ames in Elmer's Leaflets of Phil. Bot. 5 : 1579.

NEGROS.

51. Eria rugosa *Lindl.* Gen. & Sp. Orch. 66.

LUZON, LEYTE, MINDANAO.

52. *Eria* (§ *Hymeneria*) *senilis sp. nov.* Radices fibratæ, ramosæ. Pseudobulbi approximati, uniarticulati, 3.5–4 cm. longi, circiter 1 cm. in diametro, vaginis foliaceis obtecti, diphylli. Folia oblongi-lanceolati, utrinque attenuati, petiolati, ± 3 dm. longi, usque ad 3 cm. lati. Petiolus rigidus 2–8 cm. longus, in laminam folii attenuatus. Pedunculus quam folia multo brevior cum racemo 6–10 cm. longus, prope apicem pseudobulbi ortus, albido-tomentosus, pauci-bracteatus. Racemus densiflorus, erectus, albido-tomentosus. Bracteæ flores subtendentes lanceolatæ, sparse albido pubescentes. Pedicellus cum ovario ± 3 mm. longus, dense albido-tomentosus. Sepala lateralia triangulari-ovata, concava, extus albido-pubescentia, 5.5 mm. longa, mentum obtusum formantia. Sepalum dorsale anguste ellipticum, extus albido-pubescens. Petala oblongi-elliptica, obtusa, trinervia, glabra, circiter 5.5 mm. longa, circiter 2.5 mm. lata. Labellum valde saccatum, saccus bilobus, rotundatus, lamina labelli triangulari-ovata, obtusa circiter 4 mm. longa, ad basim bicallosum. Pes columnæ vix 3 mm. longus.

Eria senilis in general aspect resembles *E. ventricosa* Leavitt, and is more nearly related to it than to any other Philippine species heretofore described. The strongly saccate labellum with an entire lamina distinguishes it from the older species.

LEYTE, Jaro, *C. A. Wenzel 0333*, March 9, 1914. Epiphyte in forest. Altitude 600 meters above sea level. Sepals and petals white. Labellum purple tinged with yellow.

53. Eria tridens *Ames* in Elmer's Leaflets of Phil. Bot. 5:1580.

MINDANAO.

54. Eria Vanoverberghii *Ames* in Phil. Journ. Sci. 7:20.

LUZON.

55. Eria ventricosa *Leavitt* in Phil. Journ. Sci. 4:211.

LUZON.

56. Eria vulpina *Reichb. f.* in Bonpl. 3 : 222.

Luzon, Mindanao, Leyte, Basilan, Mindoro, Sibuyan.

57. Eria Whitfordii *Leavitt* in Phil. Journ. Sci. 4 : 215. Kränzlin in his monograph referred this species to *E. æridastachya* Reichb. f., but in view of Leavitt's careful studies of the group to which *E. Whitfordii* belongs, I am inclined to uphold his species. As Leavitt stated in his paper in the Philippine Journal of Science, the species of this group differ from one another in characters which are difficult to describe, but which are noticeable at once when the species are compared side by side. Leavitt based his conclusion on a thorough study of specimens in European herbaria and on a Seeman specimen in the Gray Herbarium which had been identified by Reichenbach f. Cf. Leavitt's paper, "The Genus Eria in the Philippine Islands," in Phil. Journ. Sci. 4 : 213–215.

Mindoro, Luzon, Negros, Leyte.

58. Eria Woodiana *Ames* in Phil. Journ. Sci. 2 : 332.

Luzon, Mindoro.

59. *Eria zamboangensis sp. nov.* Aff. *E. palawanensis* sed in habitu major. Tota planta cum pedunculo circiter 3.5 dm. alta. Caulis vaginis foliaceis obtectus. Folia 2–3, oblonga, 3 dm. longa, usque ad 2.7 cm. lata, rigida, coriacea, utrinque fastigata, ad apicem acuta. Vaginæ imbricatæ. Pedunculus ± 1.5 dm. longus, bracteis paucis adpressis. Inflorescentiæ vaginas ad basim perforantes, foliis breviores, multifloræ, lanuginosæ. Bracteæ inflorescentiæ, squamiformes, minutæ, in sicco scariosæ, 1 mm. longæ. Racemus usque ad 1 dm. longus, sublaxiflorus. Pedicellus cum capsula 1.5 cm. longus. Sepala lateralia ad pedem gynostemii decurrentia, mentum magnum, obtusum, 3 mm. longum formantia, late oblique ovato-triangularia, obtusa, circiter 5 mm. longa, 4.5 mm. lata, extus disperse pilosa. Sepalum dorsale valde con-

cavum quam sepala lateralia angustius, vix 6 mm. longum. Petala oblonga, obtusa, trinervia, 5 mm. longa, vix 2 mm. lata. Labellum erectum, concavo-cymbiforme, basi fere saccatum, suborbiculare, integrum, 6 mm. longum, 4 mm. latum, acutum, intus costis tribus, media duplici apicem versus evanescenti, lateralibus ultra medium disci terminantibus. Gynostemium breve.

Eria zamboangensis is a near relative of *E. cymbiformis* J. J. Smith, from which it is readily distinguishable by means of the entire labellum. From *E. palawanensis* Ames, which has an entire labellum, it is in part distinguished by its much broader leaves. The central callus on the labellum is very fleshy and terminates rather abruptly. The lateral calli or keels are membranaceous and in dried specimens lie flat, the margin overlapping the margin of the labellum. At the apex each keel is free and from the material examined appears to be thickened and tubercular.

MINDANAO, District of Zamboanga, *E. D. Merrill 8143*, Sax River Mountain. Altitude ± 1100 meters. November to December, 1911.

65. BULBOPHYLLUM *Thou.*

This is a vast genus, which contains approximately seven hundred species. As at present understood, it is the richest in species of all orchid genera. Eighty-six members of the genus have been reported from the Philippines on reliable information. To this number one might add at least a dozen species which have been credited with Philippine origin, but which are undoubtedly extra-limital. The section Racemosæ, represented by forms which belong to Schlechter's § Aphanobulbon, is characterized by the absence of distinct pseudobulbs, and is one of the largest sections in the Philippines. A key to this section was published in the Philippine Journal of Science (7:128), which includes all species described up to August, 1912, to which a Philippine origin could be assigned.

In the following list no attempt has been made to separate Bulbophyllum from Cirrhopetalum. The section Cirrhopetalum is characterized usually by an umbel-like inflorescence and united lateral sepals. Schlechter recognizes Cirrhopetalum. J. J. Smith in his Die Orchideen von Java united it with Bulbophyllum. I am not prepared to adopt the view which upholds the section as a distinct genus, although I agree with Dr. Schlechter that there are several reasons why Cirrhopetalum would be better treated as a distinct group. Most of the species are very easily recognized through their appearance and floral structure, and with the exception of a few species are separable from Bulbophyllum at a glance. In my own herbarium I keep all Cirrhopetalum species under separate covers, which practice is an admission of the convenience experienced by the recognition of a clearly characterized group. But until Bulbophyllum is taken in hand by the monographer and thoroughly studied, a work which must soon be undertaken, I am inclined for purposes of publication to keep Bulbophyllum and Cirrhopetalum inseparable.

1. Bulbophyllum adenopetalum *Lindl.* in Bot. Reg. (1842) Misc. 85. ***B. anguipes*** Schltr. from Celebes is a near ally of this species. In Phanerogamæ Cumingianæ Philippinarum Cuming's 2076 is referred to *Bulbophyllum penicillium* Par. and Reichb. f. I have seen a duplicate of this number preserved in the herbarium of the British Museum of Natural History which is referable to ***B. adenopetalum*** Lindl. (as that species is at present understood), and in no way comparable with ***B. penicillium***, a species that I have not seen among the Philippine species I have examined. In my herbarium there is a note which accompanies a specimen of Merrill's 3853. This note I made at the British Museum of Natural History, and it reads as follows:" Probably near *Bulbophyllum penicillium*, Cuming 2076 Ins. Philipp. in

Brit. Mus." Under this note is written, "Not *B. penicillium*." In my note-book there are sketches of drawings in color by Lindley of *B. adenopetalum* from Singapore, designated as follows: "Singapore Loddiges no. 177, Oct. 10, 1842." My notes are as follows: "These drawings occur on a sheet which carries two Philippine species collected by Cuming. They [the plants] may match Merrill's 3853 in my herbarium. They have a similar leaf! I take it that these are type specimens of Lindley's *Bulbophyllum adenopetalum*. There are no other sheets representing the species in his herbarium." Lindley's sketches agree in essential details with the flowers of Merrill's 3853. Lindley's description in the Botanical Register (1842) Misc. 85, was prepared from specimens imported by Messrs. Loddiges from Singapore. This description agrees very well with the Philippine specimens in the Lindley Herbarium.

In the Flora of British India (5 : 770) Sir J. D. Hooker placed *B. adenopetalum* under species excluded and unknown with the following brief note: "*B. adenopetalum* Lindl. in Bot. Reg. 1842, Misc. 85, which was supposed to be a native of Singapore, is a Philippine Island species." In the sixth volume of his Flora, on page 188, I find the following: "Two different Philippine species in Hb. Hook. and in Hb. Lindley, both labelled by that author *B. adenopetalum*, led me to suppose that the latter had been erroneously attributed to Singapore, whence my exclusion of it from the Flora."

The type of *B. adenopetalum* may have come from Singapore, and may be unlike the Philippine specimens later referred to it. Ridley in his Materials for a Flora of the Malayan Peninsula does not help us to a solution of the problem; he includes *B. adenopetalum* among the species cited, but his reference to distribution adds another perplexing question. It is as follows:

"'Singapore' Hort. Loddiges. Cult. in Hort. Bot. Singap. without locality. August, 1893. Perak, Kamuning (Machado)."

In my herbarium there is a duplicate of Elmer's 7572 from Luzon which Dr. R. Schlechter referred to *B. adenopetalum* Lindl. Reichenbach f. cited *B. adenopetalum* as a near ally of the Philippine *B. braccatum*.

For the present it seems best to await more complete information before abandoning the name *B. adenopetalum* for the Philippine species represented by Cuming 2076 and Merrill 3853.

Luzon, Mindoro.

2. Bulbophyllum æolium *Ames* in Phil. Journ. Sci. 8 : 429.

Luzon, Leyte.

3. *Bulbophyllum æstivale sp. nov.* Herba pusilla, epiphytica. Radices fibratæ, glabræ. Rhizoma repens. Pseudobulbi approximati, erecti, pyriformes, in sicco rugosi, superne fastigati, 5–6 mm. longi, 3 mm. in diametro, monophylli. Folium elliptico-oblongum, coriaceum, obtusum, ad apicem integerrimum, utrinque attenuatum, 1.5–3.3 cm. longum, usque ad 7 mm. latum, quam scapus multo brevius. Scapus filiformis, glabrus, erectus vel ascendens, uniflorus, usque ad 6 cm. longus, bractea minuta infundibuliforme infra florum. Pedunculus cum ovario usque ad 1 cm. longus. Flos usque ad 6 mm. longus, sepalis petalisque flavidis, labello purpureo. Sepala lateralia circiter 6 mm. longa, 2.5 mm. lata, oblongi-elliptica, acuta, trinervia, ad marginem inferiorem minute pubescentia. Sepalum dorsale anguste ellipticum, acutum, trinervium, ad marginem hirsutum, 6 mm. longum, 2.5 mm. latum. Petala anguste elliptica quam sepalum dorsale multo minora, uninervia, ad marginem hirsuta, 3.5 mm. longa, 1.5 mm. lata. Labellum lingulatum carnosum, obtusum, obcuneatum vel anguste spathulatum, extus ad basim glanduloso-

pubescens, ad basim bilobatum, lobis auriculatis, erectis, minutis, vix 1 mm. longis, glabris; totum labellum vix 4 mm. longum, prope apicem vix 1.5 mm. latum. Gynostemium breve, antice utroque ad apicem longe bicuspidatum; pes ad apicem dilatatus, subsagittatus; anthera glandulosa, pubescens.

Bulbophyllum æstivale is related to *B. chryseum* (Kränzl.) Ames.

LEYTE, Jaro, *C. A. Wenzel 0395*, May 25, 1904. Epiphyte in forest. Altitude 600 meters.

4. Bulbophyllum alagense *Ames* in Phil. Journ. Sci. 2 : 233.

LUZON, MINDORO.

5. Bulbophyllum alsiosum *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1583.

LUZON, NEGROS.

6. Bulbophyllum antenniferum *Reichb. f.* in Walp. Ann. 6 : 248. Cirrhopetalum antenniferum *Lindl.* in Bot. Reg. (1843) sub t. 49. I know this from the type in the Lindley Herbarium. As yet I have not succeeded in identifying it with any Philippine species that has come to hand except *B. Blumei.*

7. Bulbophyllum auratum *Reichb. f.* in Walp. Ann. 6 : 261.

MINDANAO, LEYTE.

8. Bulbophyllum balæniceps *Reichb. f.* in Hamb. Gartenz. 19 : 280 is referred to the Philippines. The original description was entirely prepared from a flower of which the native country was unknown to Reichenbach. In Xenia Orchidacea Reichenbach described the species in detail from a plant cultivated in the collection of Consul Schiller, and stated that the Philippine origin of the species was by no means sure. Plate 157 of Xenia shows the plant in detail. I do not know of any Philippine Bulbophyllum referable to it. Pfitzer in Engler & Prantl's Die natür-

lichen Pflanzenfamilien based his section Balænoidea on this species, and ascribed *B. balæniceps* to it as a native of the Philippines. In Kew Index *B. balæniceps* is referred to *B. Napelli* Lindl., a species which was described in 1842 from material collected by Descourtilz in Brazil. The specific name, "Napelli," was suggested by the resemblance of the flower to *Aconitum Napellus*. Under this species in Martius' Flora Brasiliensis, Cogniaux does not cite *B. balæniceps* in the synonymy of *B. Napelli*.

9. Bulbophyllum bataanense *Ames* Orchidaceæ 1 : 96.
Luzon, Mindanao.

10. *Bulbophyllum* (§ *Cirrhopetalum*) *baucoense sp. nov.* Rhizoma longe repens. Radices elongatæ, crassæ. Pseudobulbi conico-cylindracei, angulati vel tetragoni, nitidi, flavidi, usque ad 3 cm. longi, ±1 cm. in diametro, unifoliati. Folium oblongi-ellipticum vel late ellipticum, coriaceum, nervosum, ad apicem leviter et æqualiter bilobum, ad basim fastigatum, in petiolum sulcatum, 2 cm. longum, contractum; lamina folii usque ad 1.5 dm. longa, circiter 5 cm. lata, aliquando angustior. Scapus elongatus, foliis adultis brevior vel multo longior, bracteatus, 1–3.5 dm. longus, ± 9-florus. Flores hermosi, racemo in umbellam constricto. Bracteæ inflorescentiæ confertæ, lineari-lanceolatæ, acutæ, usque ad 1 cm. longæ, pedicellis breviores. Pedicellus cum ovario gracilis vix 2 cm. longus. Sepala lateralia usque ad apicem cohærentia, sed prope basim libera, lineari-oblonga, acuta, 2.5 cm. longa. Sepalum dorsale multo brevius, cucullatum, ellipticum, in caudam filiformem prolongatum, totum sepalum 12 mm. longum (cauda filiformis 4 mm. longa). Petala lanceolata 5 mm. longa, subtiliter dentata, vix fimbriata, ad apicem mucronata, trinervia, atropurpurea. Labellum lingulatum, valde incrassatum, ad basim bilobulatum, 4 mm. longum. Columna brevis, ad apicem longe

bicuspidatum, utraque cuspis inæqualiter bilobata, lobulo anteriore elongato, subulato; lobulo posteriore dentiformi.

Bulbophyllum baucoense is closely allied to *B. trisetum* Ames and *B. Weberi* Ames.

Luzon, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 2613*, March 9, 1913. Epiphyte, 1500 meters above sea level. Flowers yellow with red spots, labellum red.

11. Bulbophyllum Blumei *J. J. Smith* Orch. Jav. 459. B. cuspidilingue *Reichb. f.* in Walp. Ann. 6 : 264. Ephippium ciliatum *Blume* Bijdr. 309, f. 65. Cirrhopetalum Blumei *Lindl.* Gen. & Sp. Orch. 59. Phyllorchis Blumei *O. K.* Rev. Gen. Pl. 2 : 676. In the Philippine Journal of Science (7 : 127) I gave a list of all the species of Bulbophyllum reported on reliable authority to be natives of the Philippine Islands. In this list *B. Blumei* was included, although no material of Philippine origin had passed through my hands. Since my list was published I have examined a series of specimens from Leyte which correspond, so far as the details of the flower are concerned, with a specimen in the herbarium of the Bureau of Science sent from Java by J. J. Smith and referred by him to *B. Blumei*. This specimen consists of a single flower and lacks both pseudobulbs and leaves. My specimens also agree with the figure published by Smith in his supplementary plates to Die Orchideen von Java.

In my herbarium there is a sketch of the type of Lindley's *Cirrhopetalum maxillare* (*Bulbophyllum maxillare* Reichb. f.), which resembles so closely the specimens which I have referred to *B. Blumei* that I am inclined to believe that Lindley's plant may prove to be conspecific with *B. Blumei*. The flower of *B. Cheiri* Lindl. resembles *B. Blumei*. Lindley's sketch of the labellum resembles very closely the form of the labellum of *B. Blumei*.

LEYTE, Dagami, *C. A. Wenzel 0107*, June 1, 1913. On trees at great height, 60 meters above sea level. Flowers purple.

12. Bulbophyllum Bolsteri *Ames* in Phil. Journ. Sci. 7 : 139.

MINDANAO, LUZON.

13. Bulbophyllum bontocense *Ames* in Phil. Journ. Sci. 7 : 135.

LUZON.

14. Bulbophyllum braccatum *Reichb. f.* in Linnæa 41 : 117. "Vaginis basilaribus pedunculorum amplis ancipitibus latere fisso obtusangulis, quaternis, racemo subsecundo plurifloro, bracteis lanceoacuminatis uninerviis, ovaria pedicellata superantibus, sepalo impari triangulo acuminato, sepalis lateralibus latioribus, longioribus, tepalis linearibus apiculatis uninerviis, labello trilobo, lobis lateralibus semiovatis, lobo medio ligulato obtuso producto, columnæ setis validis.

"Pone B. adenopetalum Lindl. tepalis valde diversum. Inflorescentia Tibi illam Pediloni cujusdam in mentem revocat. Flores illis B. cocoini Lindl. submajores. Manila." Reichb. f. *l. c.*

LUZON, Manila, *Wallis*.

15. Bulbophyllum canlaonense *Ames* in Phil. Journ. Sci. 7 : 136. The following description from alcoholic material is offered in amplification of the original diagnosis : Rhizome very slender, wiry, less than 1 mm. thick. Pseudobulbs about as large as a small pea, rounded, grooved lightly, at the summit slightly depressed. Leaves nearly sessile, elliptic-oblong, entire at the apex, very fleshy, with a longitudinal median groove above. Scape slender, erect, from beneath the pseudobulb with a tubular bract at base. Flowers bell-shaped, nodding. Sepals reflexed from about the middle, elliptic-lanceolate. Petals obovate spathulate, obscurely apiculate, one-nerved. Labellum strongly arched, lightly sulcate along the middle, ecallose. Gynostemium fleshy, 2 mm. high,

somewhat conical, with a little tooth beneath the stigmatic cavity; foot elongated, triangular at the base, abruptly upcurved beyond the middle.

NEGROS, LUZON.

16. Bulbophyllum Cheiri *Lindl.* in Bot. Reg. (1844) Misc. p. 44. Lindley's specimen from the Philippines surely approaches *B. Blumei*. The very characteristic labellum of *B. Blumei* is duplicated in *B. Cheiri*, and the general aspect of the solitary flower is similar in both species.

17. *Bulbophyllum* (§ *Umbellata*) *chrysendetum sp. nov.* Rhizoma longe repens. Pseudobulbi oblique ascendentes, pyriformes, in sicco rugosi, superne fastigati, 8–9 mm. longi, circiter 5 mm. in crassitudine, monophylli, 2 cm. distantes inter se. Folium coriaceum, late oblongum, vel oblongi-ellipticum, ad apicem bilobatum, ad basim rotundatum, in petiolum brevem contractum, circiter 3 cm. longum, 1.3 cm. latum, vix fastigatum. Petiolus 2 mm. longum. Scapi foliis breviores, a basi pseudobulbi vel a rhizomate in medio inter pseudobulbos orti, usque ad 2.1 cm. longi, bracteatus, bracteis vaginantibus, ± 3 mm. longus. Bracteæ inflorescentiæ, lanceolatæ, circiter 3 mm. longæ. Pedicellus cum ovario quam bracteæ inflorescentiæ brevior. Sepala lateralia circiter 6 mm. longa, elongato-triangula, superne incrassata, subcaudata, acuta, sepalo dorsali multo longiora. Sepalum dorsale lanceolatum, prope apicem incrassatum, concavum, circiter 4 mm. longum. Petala quam sepala multo breviora, pellucida in sicco, oblongi-elliptica, obtusa, 2 mm. longa, vix 1 mm. lata, gynostemium excedentia. Labellum crassum, linguiforme, circiter 1.5 mm. longum, ecallosum. Gynostemium ad apicem bicuspidatum.

Nearly related to *Bulbophyllum multiflorum* Kränzl., but with very much smaller and differently formed pseudobulbs.

Leyte, Dagami, *C. A. Wenzel 0219*, July 31, 1913. Epiphyte in forest, 60 meters above sea level.

18. Bulbophyllum chryseum *Ames* in Phil. Journ. Sci. 6 : 54.
Leyte, Luzon.

19. Bulbophyllum Clemensiæ *Ames* in Phil. Journ. Sci. 7 : 129.
Mindanao.

20. Bulbophyllum Copelandii *Ames* Orchidaceæ 1 : 97.
Luzon, Mindanao.

21. Bulbophyllum Cumingii *Reichb. f.* in Walp. Ann. 6 : 261.
Luzon, Negros.

22. Bulbophyllum cuneatum *Rolfe ex Ames* in Ames Orchidaceæ 1 : 98.
Luzon.

23. Bulbophyllum Curranii *Ames* in Phil. Journ. Sci. 7 : 130.
Luzon.

24. ***Bulbophyllum*** (§*Sestochilus*) ***dagamense sp. nov.*** Pseudobulbi cylindracei, leviter fastigati, 3.5 cm. longi, in sicco circiter 4 mm. in diametro, rugosi, rigidi, monophylli. Folium longipetiolatum, usque ad 3 dm. longum, usque ad petiolum paulatim fastigatum, supra medium oblongum, subito acuminatum, acutum, lamina in sicco subchartacea, 1.7 dm. longa, supra medium 4 cm. lata. Petiolus circiter 3 cm. longus, sulcatus. Scapus uniflorus, a basi pseudobulbi ortus, 5 cm. longus, bracteatus, bracteis arcte adpressis, vaginatis, acutis, usque ad 11 mm. longis. Ovarium alatum. Pedicellus gracilis. Flos 2 cm. longus, carnosus. Sepala lateralia oblique triangularia, acuta, 1.7 cm. longa, 7 mm. lata, in sicco flavida, deflexa. Sepalum dorsale anguste triangulum, acuminatum, acutum, 1.9 cm. longum, ad basim circiter 5 mm. latum, flavidum. Petala anguste triangula vel triangulari-lanceolata, acuminata, acuta, leviter falcata, flavida, 1.7 cm. longa, ad

basim circiter 3.5 mm. lata. Labellum fulvum, valde arcuatum, carnosum, subtus pubescens, carinatum, superne sulcatum, ad apicem subtruncatum, leviter retusum, in disco bicarinatum, carinis carnosis. Totum labellum circiter 5 mm. longum. Gynostemium brevissimum, in pedem perlongum productum.

In dried specimens the sepals and petals are yellowish, the labellum brownish purple. In habit *Bulbophyllum dagamense* resembles *B. maculosum* Ames and *B. uniflorum* Hassk. The type consists of a single specimen.

LEYTE, Dagami, *C. A. Wenzel 057*, December 31, 1912. On trees at medium height, 60 meters above sea level. Flower yellow, green, and brown.

25. Bulbophyllum dasypetalum *Rolfe ex Ames* in Ames ORCHIDACEÆ 1:98.

LUZON, MINDORO.

26. Bulbophyllum Dearei *Veitch* Man. Orch. Pl. 3:95.

MINDANAO.

27. *Bulbophyllum* (§*Racemosæ*) *deceptum sp. nov.* Aff. *B. mindanaensi.* Radices numerosæ crassæ. Rhizoma repens. Pseudobulbi minuti cylindracei, abbreviati, 2 mm. alti, circiter 5 mm. in diametro, monophylli, approximati. Folium longipetiolatum, oblongi-ellipticum, permagnum, ad apicem rotundatum, in sicco subcoriaceum; lamina usque ad 2 dm. longa, 6.5 cm. lata, quam scapi multo brevior. Petiolus rigidus, valde sulcatus, usque ad 6 cm. longus. Scapi a basi pseudobulbi orti, flaccidi, graciles, usque ad 3.5 dm. longi, pauci-bracteati infra racemum. Racemi elongati, circiter 2.5 dm. longi, multiflori. Flores minuti, flavidi. Bracteæ inflorescentiæ lanceolatæ, acuminatæ, valde acutæ, circiter 4 mm. longæ. Pedicellus cum ovario circiter 2 mm. longus. Sepala lateralia triangulari-lanceolata, subacuta, 2.5 mm. longa, 1.5 mm. lata, mentum obtusum, 1 mm. longum formantia, ad

apicem valde incrassata. Sepalum dorsale oblongi-lanceolatum, 2 mm. longum, circiter 1 mm. latum, concaviusculum, ad apicem valde incrassatum. Petala minuta, circiter 1 mm. longa, .5 mm. lata, oblonga, obtusa. Labellum minutum, 1 mm. longum, oblongum, obtusum, incrassatum, sulcatum, leviter arcuatum. Gynostemium brevissimum.

Bulbophyllum deceptum is not unlike *B. mindanaense* Ames in general aspect, and is a near ally of the Bornean *B. elatius* Ridl. *B. mindanaense* is a more robust plant, with longer, stouter scapes, larger leaves, and a much thicker rhizome. The lateral sepals of *B. mindanaense* are much blunter, and at the base much broader than those of *B. deceptum*.

Leyte, Dagami, *C. A. Wenzel 0148*, June 21, 1913. Epiphyte in forest.

28. Bulbophyllum dissolutum *Ames* in Phil. Journ. Sci. 8: 429.

Luzon.

29. *Bulbophyllum Doryphoroide sp. nov.* Rhizoma repens fibris tectus. Pseudobulbi parvuli, oblique ascendentes, in sicco rugosi, irregulariter pyriformes vix 1 cm. longi, ± 7 mm. in diametro, subconferti, monophylli. Folium coriaceum, ad apicem minute bilobum, a basi cuneatum, oblongi-ellipticum vel oblanceolatum, usque ad 14 cm. longum, 3.5 cm. latum. Scapus gracilis foliis longior, circiter 15 cm. longus, pauci-bracteatus. Flores conferti, in racemo denso dispositi, atropurpurei, vix 1 cm. longi. Racemus circiter 1.5 cm. longus. Pedicellus cum ovario circiter 2 mm. longus. Sepala lateralia ad basim cohærentia, oblique ovata, obtusa, 7 mm. longa, 3.5 mm. lata, insigniter trinervia, nerviis atropurpureis. Sepalum dorsale simile, late ovatum, valde obtusum, insigniter quinquenervia, nerviis atropurpureis. Petala elliptica, valde obtusa, margine minute denticulata, vix 4 mm. longa, circiter

2 mm. lata, uninervia. Labellum crassum, orbiculare ad apicem, leviter retusum, prope basim bicallosum, minute papulosum, vel scabridum. Gynostemium brevissimum, antice utroque ad apicem processus trilobatus, lobo mediano valde acuto, lobis lateralibus rotundatis.

According to the collector's notes the flowers of this species are deep wine red. From dried specimens it would seem that the ground color of the sepals is yellowish with broad longitudinal bands of deep purple. The petals have a broad median band similar in color to the characteristic bands of the sepals.

Luzon, Subprovince Ifugao, Mount Polis, *R. C. McGregor Bur. Sci. 19873*, February 5, 1913.

30. Bulbophyllum Elmeri *Ames* in Phil. Journ. Sci. 7 : 136.

Luzon.

31. Bulbophyllum elongatum *Hassk.* (not *Kränzl.*) Cat. bog. 39. B. sceptrum *Reichb. f.* in Walp. Ann. 6 : 254. B. gigas *Ridl.* in Journ. Linn. Soc. 32 : 277. Ephippium elongatum *Bl.* Bijdr. 309. Cirrhopetalum elongatum *Lindl.* in Bot. Reg. (1843) sub t. 49. *Reichb. f.* in Walp. Ann. 6 : 264. Phyllorchis elongata *O. K.* Rev. Gen. Pl. 2 : 677.

The plant on which my determination is based agrees in general aspect with Blume's type at Leiden. The leaves are not so large as those described by J. J. Smith in his Die Orchideen von Java, nor are the sheathing bracts of the scape so long, but the other details of structure are in pretty close agreement with the analysis of *Bulbophyllum elongatum*. I have referred *B. gigas* Ridley to the synonymy of *B. elongatum* on the authority of J. J. Smith.

Mindanao, District of Cottabato, *C. M. Weber 227*, August 25, 1911. Altitude 2800 feet. Epiphyte. Flower yellow and purple.

32. *Bulbophyllum* (§ *Racemosæ*) *Escritorii sp. nov.* Aff. *B. dasypetalo.* Rhizoma repens. Folia circiter 1.5 cm. distantia, coriacea, oblonga, ad apicem basimque fastigata, petiolata, in sicco subtiliter rugosa, 8–13.5 cm. longa, 9–18 mm. lata, erecta, lamina 6–10 cm. longa, petiolo circiter 2.5 cm. longo, sulcato, rigido. Scapi graciles, flexuosi, foliis multo longiores, bracteis tubularibus, ad basim folii orti, usque ad 2.5 dm. longi, vix 1 mm. in diametro. Flores flavidi in racemo laxo dispositi. Racemus circiter 1 dm. longus, gracilis, flexuosus. Bracteæ inflorescentiæ in sicco scariosæ, lanceolatæ, pedicellis longiores, usque ad 3 mm. longæ. Pedicellus cum ovario circiter 2 mm. longus. Sepala lateralia oblique triangula, acuta, ad apicem leviter carinata, glabra, mentum obtusum formantia, 4 mm. longa, circiter 2 mm. lata. Mentum 2 mm. longum, valde obtusum. Sepalum dorsale oblongum, acutum, ad apicem conduplicatum, ad basim concaviusculum, 4.5 mm. longum, 1.5 mm. latum. Petala rhombico-spathulata, vix acuta, manifeste uninervia, circiter 2 mm. longa, vix 1 mm. lata, quam sepala multo minora. Labellum lingulatum, glabrum, antice anguste ellipticum, obtusum, manifeste trinervium in sicco, ad basim breviter unguiculatum; totum labellum 3.5 mm. longum, pars anterior 1.25 mm. lata. Calli nulli. Gynostemium breve, ad apicem bicuspidatum.

The elongated scapes, which are about twice as long as the leaves, with the flowers 6–7 mm. apart in slender racemes, give to *Bulbophyllum Escritorii* a very characteristic appearance. *B. dasypetalum* Rolfe and *B. Vanoverberghii* Ames are the most closely allied to *B. Escritorii* of all known Philippine species. *B. Vanoverberghii* has much broader leaves and is easily distinguishable by means of its different inflorescence. The elongated scapes of *B. Escritorii* and the less acuminate lateral sepals

are distinguishing characteristics when compared with *B. dasypetalum.*

Luzon, Province of Tayabas, Guinayangan, *L. Escritor Bur. Sci. 20734,* March 7, 1913.

33. Bulbophyllum exile *Ames* Orchidaceæ 2 : 208.

Mindanao.

34. Bulbophyllum Fenixii *Ames* in Phil. Journ. Sci. 8 : 430.

Camiguin.

35. Bulbophyllum gimagaanense *Ames* in Phil. Journ. Sci. 7 : 130.

Negros.

36. Bulbophyllum gnomoniferum *Ames* Orchidaceæ 2 : 209.

Mindanao.

37. ***Bulbophyllum graciliscapum Ames & Rolfe sp. nov.*** Radices fibratæ, copiosæ, graciles, glabræ. Pseudobulbi aggregati, anguste pyriformes, in sicco rugosi, circiter 1 cm. longi, monophylli. Folium ligulato-lanceolatum, acutum, utrinque attenuatum, 5–8 cm. longum, 1 cm. latum, in sicco subchartaceum. Scapi numerosi, graciles, 3 cm. longi, erecti, foliis multo breviores, uniflori, a basi pseudobulbi vel a rhizomate in medio inter pseudobulbos orti. Flos 6 mm. longus. Sepala lateralia anguste triangularia, 5.5 mm. longa, ad basim circiter 2 mm. lata, acuta. Sepalum dorsale lanceolatum acutum ad marginem pubescens. Petala triangulari-lanceolata, ad marginem pubescens, circiter 5 mm. longa, uninervia. Labellum lingulatum, vix 4 mm. longum, carnosum. Gynostemium breve, circiter 1 mm. longum, ad apicem, antice, utroque bicuspidatum. Processus setiformis, usque ad 1.5 mm. longus. Capula arcuata.

The elongated processes at the summit of the column and the numerous flower scapes are characteristic. In dried specimens the

labellum appears to have been deep purple in color when fresh. The petals near the tip are greenish blue in dried specimens.

MINDANAO, Mount Apo, *E. B. Copeland 1127*, April, 1904. On limbs of mossy trees.

38. Bulbophyllum halconense *Ames* in Phil. Journ. Sci. 2:334.

MINDORO.

39. Bulbophyllum lancifolium *Ames* in Elmer's Leaflets of Phil. Bot. 5:1583.

MINDANAO, NEGROS.

40. *Bulbophyllum lancilabium sp. nov.* Aff. *B. parvilabio* Schltr. et *B. angustifolio* Lindl. Rhizoma longe repens, pseudobulbis arcte adpressis, recumbentibus. Pseudobulbi in sicco nigrescentes, 1 cm. longi, circiter 4 mm. in diametro, monophylli, approximati. Folium coriaceum, incrassatum, oblongi-ellipticum, usque ad 3 cm. longum, circiter 1 cm. latum, acutum. Petiolus nullus. Pedunculus a rhizomate ortus, uniflorus, quam pseudobulbus brevior, cum capsula circiter 1 cm. longus. Flores 5 mm. longus. Sepala lateralia triangulari-lanceolata, acuta, circiter 5 mm. longa, carnosa. Sepalum dorsale oblongi-lanceolatum, acutum, carnosum, rigidum. Petala quam sepala multo minora, elliptica, 1.25 mm. longa, uninervia, membranacea. Labellum lanceolatum, purpureum, carnosum, unguiculatum, obtusum, circiter 2 mm. longum, pæne 1 mm. latum. Gynostemium breve, antice ad apicem bicuspidatum.

The material at hand is a fruiting specimen with the flowers still in serviceable condition for analysis. The pseudobulbs are closely adpressed to the rhizome, the apex pointing in the direction of growth. The old pseudobulbs from which the leaves have fallen form a chain-like series, the summit of each overlapping the base of the pseudobulb in front. The flowers are inconspicu-

ous, and, in herbarium specimens, appear to arise from a simple leafy stem.

Luzon, Laguna Province, San Antonio, *Maximo Ramos Bur. Sci. 20439*, February 23, 1913. On branches of trees. Altitude 1000 meters.

41. Bulbophyllum lancipetalum *Ames* in Phil. Journ. Sci. 7:23.

Mindanao.

42. Bulbophyllum lasioglossum *Rolfe ex Ames* in Ames Orchidaceæ 1:100.

Luzon.

43. *Bulbophyllum Leibergii Ames & Rolfe sp. nov.* Radices fibratæ. Pseudobulbi nulli vel minuti. Folium valde carnosum, rigidum, ad apicem rotundatum, ad basim attenuatum, vix in petiolum productum, oblanceolatum, usque ad 9 cm. longum, 2–3 cm. latum, scapo duplo brevius. Scapus circiter 1.5 dm. longus, gracilis, pauci-bracteatus. Flores minuti, in racemo denso dispositi. Racemus circiter 2.5 cm. longus, cylindraceus. Bracteæ inflorescentiæ minutæ. Sepala lateralia 2.5 mm. longa, infra medium cohærentia, oblongi-lanceolata, obtusa, laminam late ellipticam, bifidam, 2.5 mm. longam formantia, ad margines pubescentia. Sepalum dorsale circiter 2.5 mm. longum, 1.5 mm. latum, oblongi-ellipticum, obtusum, ad marginem pubescens, ad basim concavum. Petala 2 mm. longa, vix 1.75 mm. lata, lanceolata vel rhombico-lanceolata, valde acuta, pubescentia. Labellum ovato-cordatum, 1.5 mm. longum, circiter 1 mm. latum, subacutum, pubescens. Gynostemium breve, ad apicem bicuspidatum.

Related to *Bulbophyllum Doryphoroide* Ames, but with much smaller flowers.

Luzon, Province of Bataan, Mount Mariveles, *J. B. Leiberg 6034*, July 20, 1904. Altitude 900 meters, near Lamao Nurseries. Epiphytic. Palawan, Mount Victoria, *F. W. Foxworthy Bur. Sci. 702*, March 23, 1906.

Altitude 1000 meters, on bark of tree. Flowers dark purple with disagreeable odor.

44. Bulbophyllum lepantense *Ames* in Phil. Journ. Sci. 7 : 131.

LUZON.

45. ***Bulbophyllum Levanæ sp. nov.*** Radices fibratæ. Pseudobulbi approximati, pyriformes, in sicco valde rugosi et angulati, superne fastigati, 2–3 cm. longi, 1.5–2 cm. in diametro, contigui, erecti vel ascendentes, monophylli. Folium valde coriaceum, in petiolum elongatum contractum; lamina ligulato-oblonga, usque ad 22 cm. longa, 3–4 cm. lata, erecta, quam pedunculus multo longior; petiolus rigidus, circiter 4.5 cm. longus, sulcatus. Scapus ascendens a basi pseudobulbi ortus, rigidus, pauci-bracteatus, circiter 1 dm. longus, 2–3 florus. Bracteæ usque ad 1.5 cm. longæ, vaginatæ. Pedicellus cum ovario circiter 1.5 cm. longus. Flores flavidi circiter 4 cm. longi. Sepala lateralia triangulari-linearia, valde acuta, carinata, 4 cm. longa, prope basim 5 mm. lata, ad apicem subcaudata, carnosa. Sepalum dorsale lineari-lanceolatum, acutum, subcaudatum, prope apicem carinatum, ad basim ecarinatum, circiter 3 cm. longum, prope basim 6 mm. latum. Petala triangulari-lanceolata, acuta, ad apicem breviter apiculata, 12 mm. longa, prope basim ± 4 mm. lata, quam labellum longiora. Labellum anguste lingulatum, trilobatum, lobis lateralibus rotundatis, erectis, 4 mm. longis, lobo medio 7 mm. longo, 2 mm. lato, convexo, obtuso. Gynostemium circiter 7 mm. longum, antice ad apicem utrinque in stelidium subulatum productum. Stelidia gynostemii usque ad 2 mm. longa.

LEYTE, Jaro, *C. A. Wenzel 0387*, May 13, 1914. Epiphyte in forest. Altitude 500 meters. Sepals and petals yellow, labellum brown.

46. ***Bulbophyllum leytense sp. nov.*** Rhizoma longe repens, lignosum, foliis oblongis obtusis petiolatis basi vix bulbosis, 3.5–6 cm. distantibus. Petiolus elongatus, rigidus, usque ad 5 cm. longus,

sulcatus, erectus. Lamina folii 1–1.5 dm. longa, 2–3 cm. lata, valde coriacea, ad basim attenuata. Scapus circiter 1 dm. longus, infra racemum bracteatus, bracteis vaginantibus imbricantibus obtectus. Flores flavidi, sublaxi, in racemo elongato dispositi. Racemus usque ad 7 cm. longus. Bracteæ inflorescentiæ lanceolatæ, acuminatæ, acutæ, usque ad 6 cm. longæ, in sicco fusco-luteæ. Pedicelli circiter 3 mm. longi, graciles. Sepala lateralia circiter 6 mm. longa usque ad 2 mm. lata, triangulari-lanceolata, valde acuta, acuminata, ad apicem carinata, ad basim mentum brevem, obtusum, formantia. Sepalum dorsale lanceolatum, acuminatum, acutum. Petala subspathulata, ad apicem incrassata, obtusa, vix 3 mm. longa, uninervia. Labellum elongatum, lingulatum, vix 5 mm. longum, incrassatum, acutum, prope basim deflexum, conduplicatum vel sulcatum, ad basim leviter bicallosum. Columna brevis, breviter bicuspidata.

Bulbophyllum leytense is a member of the puzzling group to which *B. dasypetalum* Rolfe and *B. Vanoverberghii* Ames belong, a group without the well-developed pseudobulbs that characterize the section Aphanobulbon proposed by Schlechter. The inflorescence is much shorter than the leaves; the scape below the raceme is concealed by inflated, loose, imbricating sheaths. In *B. Vanoverberghii* and *B. dasypetalum* the scape normally exceeds the leaves in length and lacks, at least when mature, the distinctive appearance caused by the imbricating bracts of *B. leytense*. Another characteristic of *B. leytense* which is serviceable for purposes of identification is the elongated labellum, which is 4 mm. long from the tip to the point where the sides become conduplicate.

LEYTE, Ormoc, *C. A. Wenzel 098*, May 18, 1913. On trees near streams in the foothills.

47. Bulbophyllum longipetiolatum *Ames* in Elmer's Leaflets of Phil. Bot. 5:1584.

MINDANAO.

48. Bulbophyllum luzonense *Ames* in Phil. Journ. Sci. 7:141. This is very closely allied to *B. laxiflora* Lindl., and may prove to be conspecific with it or only a variety. It belongs to the section Umbellata. *B. laxiflora* has been reported from Celebes, and is also a native of Java.

MINDANAO, LUZON, LEYTE.

49. Bulbophyllum MacGregorii *Ames* in Phil. Journ. Sci. 7:137.

LUZON.

50. *Bulbophyllum* (§ *Sestochilus*) *maculosum sp. nov.* Radices fibratæ, ramosæ. Rhizoma repens. Pseudobulbi cylindracei, quam pedicellus cum ovario longiores, 3.5–4.5 cm. longi, in sicco 4 mm. in diametro, vix fastigati, erecti vel ascendentes, monophylli. Folium breviter petiolatum subcoriaceum; lamina oblonga, abrupte acuminata, valde acuta, 1.5–1.9 dm. longa, circiter 4 cm. lata, ad basim leviter attenuata, in petiolum 1–1.5 cm. longum contracta. Scapus uniflorus erectus, a basi pseudobulbi ortus, bracteis scariosis obtectus. Bracteæ circiter 1 cm. longæ, erectæ, acutæ. Pedicellus cum ovario vix 2 cm. longus, leviter arcuatus. Flos viridi-flavus, brunneo-punctatus, perspicabilis. Sepala lateralia triangulari-falcata, acuta, ± 2 cm. longa, ad basim circiter 1 cm. lata, carnosa. Sepalum dorsale oblongi-lanceolatum, ± 2.3 cm. longum, circiter 7 mm. latum. Petala oblongi-lanceolata, acuminata, acuta, 2.2 cm. longa, circiter 7 mm. lata, septemnervia. Labellum carnosum, valde curvatum, circiter 7 mm. longum, infra medium rotundatum, margine denticulato, supra medium linguiforme, papillosum. Gynostemium breviter bicuspidatum.

The pseudobulbs and leaves resemble *Bulbophyllum uniflorum* Hassk. Among the species of the section Sestochilus now known to be natives of the Philippine Islands *B. maculosum* is distinguishable by means of its elongated pseudobulbs, which are longer than the flower scapes, and by means of the greenish-yellow, conspicuously spotted sepals and petals.

LEYTE, Dagami, *C. A. Wenzel 0199*, July 10, 1913. Epiphyte in forest, 60 meters above sea level.

51. Bulbophyllum Makoyanum *Reichb. f.* in Gard. Chron. (1879) 1:234.

LUZON, MINDANAO, POLILLO.

52. Bulbophyllum marivelense *Ames* in Phil. Journ. Sci. 7: 132.

LUZON, MINDANAO.

53. Bulbophyllum maxillare *Reichb. f.* in Walp. Ann. 6:248. From a sketch of Lindley's type of *Cirrhopetalum maxillare* it would appear that this species is a near ally of *B. Cheiri* and *B. Blumei*. The labellum of *B. maxillare* was not observed by Lindley. The lateral sepals were described as being free. In the type of *B. Cheiri* the lateral sepals are coherent according to the original diagnosis.

54. Bulbophyllum Mearnsii *Ames* in Phil. Journ. Sci. 8:430. B. carinatum *Ames* not *Smith*.

MINDANAO.

55. Bulbophyllum Merrittii *Ames* in Phil. Journ. Sci. 2:334.

MINDORO.

56. Bulbophyllum mindanaense *Ames* in Elmer's Leaflets of Phil. Bot. 5:1585.

MINDANAO, LEYTE.

57. Bulbophyllum mindorense *Ames* in Phil. Journ. Sci. 2: 334.

Mindoro, Luzon.

58. *Bulbophyllum monstrabile sp. nov.* Rhizoma repens, validum. Pseudobulbi elongati, in sicco sulcati, circiter 1 dm. longi, in sicco 1.5 cm. in diametro, monophylli. Folium petiolatum, ellipticum, ± 2 dm. longum, circiter 1.2 dm. latum, rigidum. Petiolus sulcatus, 5 cm. longus. Scapus vaginatus, a rhizomate ortus, pauciflorus, pseudobulbo et petiolo fere æqualis vel brevior. Bracteæ infundibuliformes usque ad 4 cm. longæ. Flores tres, approximati, rubri. Sepala lateralia ad basim cohærentia, valde carinata, ± 8 cm. longa, circiter 1.5 cm. lata, anguste lanceolata, acuminata, caudata. Carina 5 mm. alta. Sepalum dorsale elliptico-lanceolatum, valde acuminatum, subcaudatum, extus scabridum, 2.5 cm. latum. Petala ovato-lanceolata, valde acuminata, quam sepala multo minora, 3 cm. longa, circiter 1.4 cm. lata. Labellum vix 1.5 cm. longum, scabridum, lingulatum. Gynostemium circiter 5 mm. longum, ad apicem bifurcatum.

By far the largest species of the genus in the Philippines and one of the largest heretofore discovered. In the dried specimens from which the description was prepared the pseudobulbs are notably elongated, and as thick at the summit as at the base. The lateral sepals are rough on the outer surface, and conspicuously keeled. The petiole of the leaf together with the pseudobulb exceeds the erect inflorescence.

Leyte, Jaro, *C. A. Wenzel 0443*, June 10, 1914. Epiphyte in forest. Altitude 500 meters. Flowers red.

59. Bulbophyllum negrosianum *Ames* in Elmer's Leaflets of Phil. Bot. 5: 1586.

Negros.

60. Bulbophyllum Othonis *J. J. Smith* in Bull. Jard. Bot. Buit. 2d ser. 8 : 26. B. nutans *Reichb. f.* in Walp. Ann. 6 : 260 not *Thou.*

Leyte, Polillo.

61. Bulbophyllum orthoglossum *Wendl. & Kränzl.* in Gard. Chron. (1896) 1 : 326. "In general appearance and habit the plant may be compared with *Bulbophyllum mandibulare*, one of the giants of the genus. . . . The lip of this new species is, perhaps, unique in the genus. At first it is really three-lobed, the side lobes being comparatively small, bent forward, toothed at the margin, and covered with little warts on the inside; the mid-lobe has a cushion-shaped thick base, and a tongue-shaped, fleshy, acute, straight apex. The column is at each side produced into a long bristly acute tooth. The flowers are comparatively showy, the sepals and petals being yellowish-green, with numerous brown stripes throughout their whole length."

"(Sarcopodium.)—Caulibus secundariis s. bulbis approximatis ovalibus subcompressis ad 5 cm. longis ad 2 cm. latis monophyllis; folio petiolato basi canaliculato oblongo obtuse acutato ad 20 cm. longo ad 5 cm. lato; scapo folium subæquante, cataphyllis 3 arcte vaginantibus vestito, paucifloro; floribus succedaneis inter majores generis, bracteis quam ovaria brevioribus; sepalis e basi ovata productis acuminatis, lateralibus basi tantum in mentum subnullum coalitis dorso apicem usque carinatis; petalis semilongis ovatis acutis; labelli hypochilio v. pede brevi, epichilio re vera trilobo lobulis lateralibus antrorsis falcatis intus verrucosis margine antico denticulatis, lobo intermedio protenso recto basi ipsa pulvinari spongioso medio sulcato, parte anteriore triangula carnosa acuta; gynostemio utrinque in dentem triangulum acutum producto. Sepala ad 4 cm. longa viridi lutea brunnea striata, petala semilonga eodem colore, labellum paulo longius pur-

pureum. In Sarangui insula det. W. Micholitz, Freder. Sander Verulamensis collecta indefessus." Kränzl. *l. c.*

Sarangani.

62. Bulbophyllum pauciflorum *Ames* in Phil. Journ. Sci. 7 : 132.

Luzon.

63. Bulbophyllum peramœnum *Ames* in Phil. Journ. Sci. 8 : 430.

Mindanao.

64. Bulbophyllum pleurothalloides *Ames* in Phil. Journ. Sci. 2 : 335.

Mindoro.

65. *Bulbophyllum* (§ *Cirrhopetalum*) *plumatum sp. nov.* Aff. *B. ornatissimo* Lindl. Rhizoma longe repens, in sicco usque ad 2 mm. in diametro. Radices patentes, fibratæ. Pseudobulbi 2–3 cm. distantes, obliqui ascendentes, in sicco flavidi, obpyriformes, ad basim rotundati, superne fastigati, tetragoni (?) sulcati, 1.5 cm. longi, circiter 9 mm. in crassitudine ad basim, 2 mm. in diametro ad apicem, monophylli. Folium breviter petiolatum, lamina 7–9.5 cm. longa, circiter 1.5 cm. in diametro, utrinque attenuata, valde coriacea, quam scapus brevior. Scapus gracilis, pauci-bracteatus. Rhachis abbreviatus. Inflorescentia umbelliformis, bracteis lineari-lanceolatis, 8 mm. longis. Flores purpurei, hermosi. Sepala lateralia ± 6.5 cm. longa, linearia, infra medium puberula, pæne ad apicem agglutinata, circiter 2 mm. lata. Sepalum dorsale ovato-orbiculare, intus et extus minute puberulum, quinquenervia, purpurea, valde concava, ad apicem vix apiculata, margine non fimbriata, 7 mm. longa, circiter 6.5 mm. lata. Petala quam sepalum dorsale multo minora, rotundata, circiter 1.5 cm. longa, marginibus paleis sanguineis mobilibus creberrime ornusta. Labellum carnosum, triangulari-linguiforme, acutum, 2 mm. longum.

This is an ally of *Bulbophyllum ornatissimum* and *B. Collettii*, from both of which it is quite distinct. The very odd, feather-like processes on the petals (which are brilliant carmine in color, nearly 2 mm. long, and shortly stalked) are found in no other Philippine species. They look exactly like little feathers, or like the divisions of the plumes of *Celosia plumosa*, and are about twenty in number on the upper margin of the inconspicuous petals.

MINDANAO, Bukidnon Subprovince, *L. Escritor Bur. Sci. 21479*, July 30, 1913.

66. Bulbophyllum profusum *Ames* in Phil. Journ. Sci. 7 : 137. This belongs to § Oxysepalum. *B. myrianthum* Schltr. from Celebes is a near ally of this species.

LEYTE, BASILAN, LUZON, PALAWAN, SIBUYAN, MINDANAO.
Also Guam.

67. *Bulbophyllum* (§ *Cirrhopetalum*) *puguahaanense sp. nov.* Pseudobulbi conferti, tetragoni, in sicco rugosi, pyriformes, 15–21 mm. longi, superne fastigati, monophylli. Folium coriaceum, erectum, vix petiolatum, oblongi-ellipticum, ad apicem leviter bilobatum, 3.5–4.5 cm. longum, circiter 1.5 cm. latum, in sicco nervosum. Scapus foliis brevior, a basi pseudobulbi ortus, biflorus, infra flores bibracteatus, bracteis approximatis, subimbricantibus, 4 mm. longis. Pedicellus cum ovario 7–8 mm. longus, gracilis, sæpe fractiflexus. Flores circiter 1 cm. longi, membranacei. Sepala lateralia leviter cohærentia vel libera usque ad pedem columnæ, oblonga, acuta, ad basim leviter concaviuscula, mentum brevem formantia, 1 cm. longa, circiter 2.5 mm. lata. Sepalum dorsale 4 mm. longum, cum mucro ad apicem, concaviusculum vel cucullatum. Petala oblonga, ad apicem rotundata, mucronata, uninervia, vix 2 mm. longa, circiter 1 mm. lata. Labellum carnosum, lingulatum, valde arcuatam, obtusum, vix 3 mm. longum

(flavidum?), ecallosum. Gynostemium brevissimum androclinium non satis denticulatum.

The lateral sepals are hardly coherent in dried flowers. In all the specimens examined the inflorescence is two-flowered. *Bulbophyllum puguahaanense* is the smallest of the species referable to § Cirrhopetalum heretofore reported from the Philippine Islands.

LEYTE, Dagami, Puguahaan, *C. A. Wenzel 0128*, May 17, 1913. On trees at medium height, 120 meters above sea level. Flower pink, yellow, and white.

68. Bulbophyllum Ramosii *Ames* in Phil. Journ. Sci. 7 : 25.

LUZON.

69. Bulbophyllum Reilloi *Ames* in Phil. Journ. Sci. 8 : 431.

LUZON.

70. *Bulbophyllum Santosii sp. nov.* Rhizoma longe repens, usque ad 5 mm. in crassitudine. Pseudobulbi distantes, circiter 5 cm. inter se, pyriformes, in sicco rugosi, ± 1.5 cm. longi, monophylli. Folium oblongi-ligulatum, coriaceum, breviter petiolatum, ± 8 cm. longum, ± 1.5 cm. latum, acutum. Scapus a basi pseudobulbi ortus, foliis brevior, ad basim bracteatus, 2–4 florus. Flores circiter 2 cm. longi. Bracteæ flores subtendentes infundibuliformes, usque ad 1.5 cm. longæ, glabræ. Sepala lateralia late ovata, glabra, acuta, 1.3 cm. longa, vix 1 cm. lata ad medium. Sepalum dorsale oblongi-ellipticum, acutum, 1.5 cm. longum, circiter 5 mm. latum. Petala anguste elliptica, circiter 1.4 cm. longa, circiter 5 mm. lata, glabra. Labellum 8 mm. longum, incrassatum carnosum, crescentiforme a latere visum. Gynostemium breve; pes circiter 8 mm. longus.

Bulbophyllum Santosii is not unlike *B. Wenzelii* Ames in general appearance, but very different from it in the inflorescence and in the color of the flowers. *B. œolium* Ames is a near relative

of *B. Santosii*, but is larger. The flowers of *B. Santosii* were described by the collector as white. In dried specimens the wrinkled pseudobulbs are gamboge yellow.

LUZON, Province of Camarines, Mount Iriga, *F. Santos s. n.* December, 1913.

71. *Bulbophyllum sapphirinum sp. nov.* Herba epiphytica. Pseudobulbi approximati, fusiformes, teretes, monophylli, erecti vel ascendentes, ± 8 mm. longi, in sicco circiter 2 mm. in diametro. Folium oblongum, ad basim apicemque fastigatum, valde acutum, coriaceum, breviter petiolatum, usque ad 6 cm. longum, circiter 6.5 mm. latum, quam pedunculi multo longius. Pedunculi erecti, usque ad 2 cm. alti, graciles, filiformes, uniflori, paucibracteati, bracteis tubularibus prope basim confertis. Bractea sub florem infundibuliformis, apiculata, vix 1 mm. longa. Flores 5–6 mm. longi, bicolores. Petala et labellum purpureum. Sepala lateralia falcata, oblongi-triangularia, acuminata, acuta, trinervia, mentum brevem formantia, ± 6 mm. longa, ad basim vix 2 mm. lata. Sepalum dorsale lanceolatum, acutum, trinervium, circiter 6 mm. longum, supra basim vix 2 mm. latum. Petala lanceolata, valde acuta, 4.5 mm. longa, circiter 1.5 mm. lata. Labellum lingulatum, crassum, 4 mm. longum, obtusum, explanatum lanceolatum, quinquenervium. Gynostemium antice ad apicem bicuspidatum.

In dried specimens the sepals are yellowish tinged with pink, the petals indigo, with maculations of a deeper color; the labellum is colored like the petals.

LEYTE, Dagami, *C. A. Wenzel 0125*, May 20, 1913. On trees at great height, 60 meters above sea level, in forest foothills. Flower purple and flesh-color; *Wenzel 092*, May 14, 1913; *Wenzel 0136*, June 5, 1913.

72. Bulbophyllum saurocephalum *Reichb. f.* in Gard. Chron. (1886) 2 : 262. *R. A. Rolfe* in Orch. Rev. 11 : 190; 13 : 244. "It

combines as some Bulbophyllums do, the common habit of a Bulbophyllum with a curious thick light red rhachis," etc. "Ex insulis Philippinis dicitur." Reichb. f. *l. c.* Rolfe wrote of this species: "*B. saurocephalum* Reichb. f. is a Philippine species which appeared in 1886." I have not seen any material among the collections made for the Bureau of Science.

73. *Bulbophyllum* (§*Monanthaparva*) *sensile sp. nov.* Radices fibratæ, elongatæ. Rhizoma repens. Pseudobulbi conferti conico-cylindracei, subtiliter rugosi, erecti, unifoliati, 5–10 mm. longi, in sicco circiter 4 mm. in diametro. Folium erectum oblongi-lanceolatum, aliquando ellipticum, obtusum, leviter et inæqualiter bilobum, ad basim fastigatum, vix petiolatum, 12–21 mm. longum, circiter 4 mm. latum, scapo multo brevius. Scapus elongatus, pergracilis, subcapillaceus, inter basim et bracteam floris nudus, 4–7 cm. longus, flexuosus, uniflorus. Bractea infra florem oblique infundibuliformis, circiter 1 mm. longa. Pedicellus gracilis, cum ovario 5–12 mm. longus, glaber. Sepala lateralia oblonga, acuta, trinervia, mentum obtusum 2 mm. longum formantia, usque ad 7 mm. longa, ad basim circiter 2.5 mm. lata. Sepalum dorsale lanceolatum, trinervium, acutum, 8 mm. longum, circiter 2.5 mm. latum, ad basim concaviusculum. Petala sepalis multo breviora, circiter 3 mm. longa, ± 1 mm. lata, uninervia, spathulata, ad apicem rotundata. Labellum trilobatum, 4 mm. longum; lobi laterales auriculati, rotundati, basi labelli usque ad apicem utriusque lobi 2 mm.; lobus medius lanceolatus, obtusus, crassus, quinquenervius, 2.5 mm. longus, prope basim 1.5 mm. latus. Columna brevis ad apicem longe bicuspidata.

This species resembles in general aspect *Bulbophyllum chryseum* Kränzl., from which it differs in the crowded pseudobulbs, smaller, much narrower leaves, and in the conspicuously three-

lobed labellum. From dried specimens the flowers appear to have been tinged with violet, the sepals becoming yellowish at the tip. In no. 1134 the sepals and petals are distinctly veined longitudinally with violet or purple. The lateral lobes of the labellum are purple, the middle lobe yellowish.

Luzon, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 2816*, April 4, 1913. Flower violet and green. Altitude 1700 meters above sea level; *Vanoverbergh 1134*, February to March, 1911. Altitude 1600 meters above sea level. Flower yellow with violet stripes, labellum violet.

74. Bulbophyllum sibuyanense *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1587.

Sibuyan.

75. *Bulbophyllum* (§ *Racemosæ*) *simulacrum sp. nov.* Aff. *B. Ramosio.* Rhizoma repens, circiter 2 mm. in diametro. Radices fibratæ, glabræ. Pseudobulbi nulli vel subobsoleti. Folium erectum, 6.5–7.9 cm. longum, 10–13 mm. latum, coriaceum, rigidum, petiolatum, oblongum, utrinque attenuatum, obtusum, ad apicem integerrimum, costa media supra sulcata, subtus carinata. Scapus erectus, 7–8 cm. longus, circiter 10-florus, infra racemum bracteatus, bracteis tribus, vaginatis, laxis, prope apicem dilatatis, 7–8 mm. longis, oblique truncatis. Racemus ± 3 cm. longus, laxiflorus, floribus circiter 3 mm. distantibus. Bracteæ inflorescentiæ lanceolatæ, acutæ, circiter 4 mm. longæ. Sepala lateralia triangulari-lanceolata, 5 mm. longa, ad basim circiter 3 mm. lata, mentum obtusum 2 mm. longum formantia, ad apicem brevissime caudata, glabra. Sepalum dorsale oblongum, acutum, ad apicem brevissime caudatum, ad basim concavum, 5 mm. longum, glabrum. Petala 3 mm. longa, vix 1 mm. lata, supra medium subito contracta, minute glandulosa, prope apicem leviter incrassata. Labellum lingulatum, acutum, trilobatum, lobi laterales erecti, rotundati, glabri, 2 mm. longi, 1 mm. alti, late crescentiformes;

lobus medius ovato lanceolatus, subacutus, trinerviis, ad marginem glanduloso-pubescens, 2 mm. longus, 1.5 mm. latus. Totum labellum 3.5 mm. longum, ad basim bicallosum. Gynostemium breve, antice, utroque, breviter triangulari-cuspidatum. Pes gynostemii valde curvatus, ad apicem leviter dilatatus. Anthera glabra.

In habit *Bulbophyllum simulacrum* resembles *B. Ramosii* Ames very closely. The flowers of *B. simulacrum* are distinguished by the very short caudate tips of the lateral sepals (.5 mm. long). The pseudobulbs are represented by cylindrical projections from the rhizome as in *B. adenopetalum* and its allies.

Leyte, Jaro, *C. A. Wenzel 0268*, February 11, 1914. Epiphyte in forest. Altitude 750 meters.

76. Bulbophyllum stellatum *Ames* in Phil. Journ. Sci. **7 : 141.**

Luzon.

77. *Bulbophyllum* (§*Cirrhopetalum*) *stramineum sp. nov.* Rhizoma repens. Radices fibratæ, elongatæ. Pseudobulbi tetragoni, in sicco flavidi, oblique ascendentes, 1.5–2 cm. longi, pyriformes, superne fastigati, ad basim circiter 1 cm. in diametro, in sicco nitidi, monophylli, ad apicem tetragoni. Folium coriaceum, oblongi-ellipticum, ad apicem rotundatum, usque ad petiolum sulcatum brevem subtiliter attenuatum, 8 cm. longum (rarissime usque ad 14 cm. longum), 2.5 cm. latum, in sicco sæpe flavidum. Petiolus 1–1.5 cm. longus, rigidus. Scapus pauci-bracteatus, erectus, gracilis, glaber, folia excedens, 1.5 cm. longus. Flores straminei, in racemo in umbellam contracto. Bracteæ inflorescentiæ lineari-lanceolatæ, acutæ, circiter 4 mm. longæ, confertæ, pedicellis breviores. Pedicelli circiter 5 mm. longi, graciles. Sepala lateralia pæne ad apicem cohærentia, prope basim libera, laminam anguste ellipticam, 3–3.5 cm. longam, 5–8 mm. latam, forman-

tia. Sepalum dorsale valde concavum, in caudam filiformem contractum, totum sepalum cum cauda usque ad 8 mm. longum, margine longe hirsuto, extus vix puberulum, infra caudam concavo-ovatum. Petala lineari-triangularia, circiter 5 mm. longa, margine pubescente flavido et hirsuto, ad apicem in caudam setiformem, elongatam, producta. Labellum linguiforme, inæqualiter crescentiforme a latere visum, carnosum, obtusum, glabrum, circiter 3 mm. longum. Gynostemium 1.5 mm. longum, in pedem 2 mm. longum productum, antice bialatum alis utrinque in lobum obtusum productis. Anthera integerrima.

Except for the color of the flowers, similar to *Bulbophyllum Cumingii*. The arms of the column are very short, hyaline, and in dried specimens membranaceous, and very obtuse. The hairs on the upper sepal attain a length of 2 mm. The elongated setiform tips of the upper sepal, which is about 2 mm. long with several hairs originating from it, suggests *B. trisetum*, but from that species the details of the column easily separate *B. stramineum*.

PALAWAN, Lake Manguao, *E. D. Merrill 9567*, May, 1913. Epiphytic on mangrove trees and on dry forest slopes up to 500 meters. Flowers deep straw yellow.

78. Bulbophyllum Toppingii *Ames* in Phil. Journ. Sci. 8 : 432.

LUZON.

79. Bulbophyllum trisetum *Ames* in Phil. Journ. Sci. 7 : 142.

LUZON.

80. Bulbophyllum vagans *Ames & Rolfe* in Ames ORCHIDACEÆ 2 : 210.

LUZON, MINDANAO, MINDORO (var. *linearifolium*).

81. Bulbophyllum Vanoverberghii *Ames* in Phil. Journ. Sci. 7 : 133.

LUZON.

82. Bulbophyllum Weberi *Ames* in Phil. Journ. Sci. 7 : 142.

Luzon.

83. Bulbophyllum Wenzelii *Ames* in Phil. Journ. Sci. 8 : 432.

Leyte.

84. Bulbophyllum Whitfordii *Rolfe ex Ames* in Ames Orchidaceæ 1 : 100.

Mindanao, Busuanga, Luzon.

85. Bulbophyllum zambalense *Ames* in Phil. Journ. Sci. 7 : 134.

Luzon.

86. Bulbophyllum zamboangense *Ames* in Phil. Journ. Sci. 8 : 433.

Mindanao.

66. OCTARRHENA *Thw.*

Octarrhena is separated from Phreatia by the structure of the gynostemium. In Phreatia the gynostemium is produced into a distinct foot. In Octarrhena the foot is obsolete.

1. Octarrhena Amesiana *Schltr.* in Fedde Rep. 9 : 439. Phreatia parvula *Ames* not *Benth. ex Hook. f.*

Mindanao.

2. *Octarrhena caulescens Ames comb. nov.* Phreatia caulescens *Ames* Orchidaceæ 2 : 200.

Luzon.

3. *Octarrhena Elmeri comb. nov.* Phreatia Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1581.

Luzon, Mindanao.

4. Octarrhena ensifolia *Schltr.* in Fedde Rep. 9 : 217. Phreatia ensifolia *Ames* Orchidaceæ 2 : 200.

Mindanao, Negros, Luzon.

5. *Octarrhena gemmifera sp. nov.* Herba epiphytica, minutissima, caulescens. Caules 1–3 cm. alti, superne complanati, vaginis foliorum obtecti, conferti, ad basim radicantes. Folia disticha, valde linearia, prope caulem articulata, vaginis imbricatis, lamina 1–2.5 cm. longa, circiter 1 mm. lata, coriacea, in sicco viridis, ascendens, patens, leviter curvata, acuta. Vaginæ 2 mm. longæ, superne dilatatæ, complanatæ. Pedunculi ascendentes, folia æquantes vel breviores, axillares, 1.5–2 cm. longi, sæpe fractiflexi, infra racemum bracteis scariosis, infundibuliformibus, superne oblique truncatis acutis, circiter 2 mm. longis. Racemus usque ad 1.5 cm. longus, laxiflorus. Bracteæ inflorescentiæ flores subtendentes rhachidem amplectentes, cordato-ovatæ, acuminatæ, acutæ, flores æquantes, vix 2 mm. longæ. Pedicelli abbreviati circiter .5 mm. longi, quam bractea subtendens breviores. Ovarium 1 mm. longum. Flores minuti, globosi, 1–1.25 mm. longi. Sepala lateralia triangulari-ovata, acuta, 1 mm. longa, ad basim circiter 1 mm. lata. Sepalum dorsale simile. Petala minuta, ad apicem rotundata, breviter spathulata, quam sepala multo minora, circiter .5 mm. longa. Labellum ellipticum, obtusum, vix unguiculatum, circiter .75 mm. longum, .5 mm. latum, leviter convexum. Gynostemium brevissimum apodum. Pollinia 8.

In habit *Octarrhena gemmifera* resembles *Phreatia luzoniensis* Rolfe more closely than any other Philippine species. The bracts of the inflorescence, however, are serviceable for purposes of separation. In *P. luzoniensis* the bracts are lanceolate and hardly embrace the pedicels of the flowers, whereas in *O. gemmifera* the bracts not only enclose the pedicels but embrace the rhachis of the inflorescence. Among the specimens examined, the plants in flower hardly exceeded 2 cm. in height. Plants with fruit or flowerless racemes measured 3 cm. in height. *Octarrhena Amesiana* is a

larger, more robust species. The caulescent habit, footless column, and general aspect suggest Octarrhena. Although through its caulescent habit quite distinct from them, *O. gemmifera* resembles *Phreatia secunda* Lindl. and *P. brachystachys* Schltr. It is among the smallest species of either Octarrhena or Phreatia, and much smaller than any of the specimens of *P. secunda* or *P. brachystachys* I have examined.

LEYTE, Jaro, *C. A. Wenzel 0293*, March 8, 1914. Epiphyte in forest. Altitude 500 meters. Sepals and petals flesh-color (pinkish). Labellum purple.

67. THELASIS *Bl.*

Five Philippine species have been recognized. Thelasis is made up of two distinct sections, Euphroboscis and Oxyanthera, which are separated by vegetative characters. §Euphroboscis includes those species which have a conspicuous pseudobulb and a fleshy leaf. §Oxyanthera has a flattened pseudobulbous stem which is concealed by the equitant spreading leaves. Dr. Schlechter upholds §Oxyanthera as a distinct genus. Twenty or more species of Thelasis have been described.

1. Thelasis (§ Euphroboscis) capitata *Bl.* Bijdr. 386.

MINDORO.

2. Thelasis (§ Oxyanthera) carinata *Bl.* Bijdr. 386.

MINDORO, CAMIGUIN, MINDANAO, LEYTE, BASILAN, NEGROS, LUZON, BATANES ISLANDS.

3. Thelasis (§ Euphroboscis) elongata *Bl.* Orch. Arch. Ind. 23, t. 7, fig. 2, t. 5, f.

MINDANAO, LEYTE, POLILLO, SULU.

4. Thelasis (§ Oxyanthera) micrantha *J. J. Smith* Orch. Jav. 495.

LEYTE, LUZON, MINDANAO.

5. Thelasis (§ Euphroboscis) obtusa *Bl.* Bijdr. 386.

68. PHREATIA *Lindl.*

Thirteen species have been reported from the Philippines.

1. Phreatia Amesii *Kränzl.* in Das Pflanzenreich Thelasinæ 16. P. myosurus *Ames* not *Forst.* fide *Kränzl.*

Luzon, Negros.

2. Phreatia aristulifera *Ames* Orchidaceæ 2 : 199.

Luzon.

3. Phreatia densiflora *Lindl.* Gen. & Sp. Orch. 64.

Luzon.

4. Phreatia infundibuliformis *Ames* in Phil. Journ. Sci. 7 : 20.

Mindanao.

5. Phreatia luzoniensis *Rolfe ex Ames* in Ames Orchidaceæ 1 : 96.

Mindanao, Luzon, Leyte, Negros.

6. Phreatia Mearnsii *Ames* in Phil. Journ. Sci. 7 : 21.

Mindanao, Luzon.

7. Phreatia minutiflora *Lindl.* in Journ. Linn. Soc. 3 : 62.

8. Phreatia negrosiana *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1582.

Negros.

9. Phreatia prorepens *Reichb. f.* Otia bot. Hamb. 54.

Luzon, Mindanao, Leyte, Negros, Mindoro.

10. Phreatia Ramosii *Ames* in Phil. Journ. Sci. 7 : 22.

Luzon.

11. Phreatia sulcata *J. J. Smith* Orch. Jav. 505. P. bracteata *Ames* not *Schltr.*

Luzon, Mindanao, Basilan, Mindoro.

12. Phreatia Vanoverberghii *Ames* in Phil. Journ Sci. 7 : 22.

Luzon.

13. *Phreatia Wenzelii sp. nov.* Herba epiphytica ± 23 cm. alta. Pseudobulbi pyriformes, rugosi, circiter 1 cm. longi, ±6 mm. in diametro, diphylli. Folia coriacea, usque ad 7 cm. longa, circiter 1 cm. lata, ad apicem inæqualiter bilobata, petiolata. Scapi a basi pseudobulbi orti, folia multo excedentes, 2.4 dm. longi, bracteati, cum bracteis sex tubularibus infra racemum. Flores minuti, punicei, in racemo elongato dispositi. Racemus ±1 dm. longus, gracilis. Bracteæ flores subtendentes lanceolatæ, acuminatæ, valde acutæ, quam pedicellus cum ovario longiores, usque ad 5 mm. longæ, subrigidæ, vix cymbiformes, patentes. Pedicellus cum ovario circiter 3 mm. longus. Sepala lateralia ovata, acuta, uninervia, 1.75–2 mm. longa, infra medium vix 1.5 mm. lata, mentum obtusum, brevem, formantia. Sepalum dorsale ellipticum, obtusum, circiter 1.75 mm. longum, quam sepala lateralia angustius. Petala suborbicularia, obtusa, circiter 1.5 mm. longa, 1 mm. lata, valde membranacea. Labellum unguiculatum ad basim concaviusculum vel sulcatum; lamina suborbicularis, 1.25 mm. lata, circiter 1 mm. longa, valde obtusa, ad basim prope unguem truncata. Unguis curvatus, circiter .5 mm. longa. Gynostemium brevissimum, antice ad apicem bifidum.

Phreatia Wenzelii belongs to § Thelasiformes, and among Philippine species is most closely related to *Phreatia sulcata* J. J. Smith. From the single specimen which constitutes the type the pseudobulbs appear to be diphyllous.

Leyte, Ormoc, Masaganet, *C. A. Wenzel 089*, April 13, 1913. On trees in mountain forest, 1000 meters above sea level. Flower flesh-color and white.

69. ACRIOPSIS *Reinw.*

This is a small genus of about ten species found in Java, Sumatra, Borneo, Celebes, New Guinea, Singapore, and Tenasserim.

1. Acriopsis javanica *Reinw.* Flora Lit. 2 : 4. A. philippinensis *Ames* Orchidaceæ 2 : 215.

Mindanao.

70. THECOSTELE *Reichb. f.*

One species has been discovered in the Philippines.

1. Thecostele alata *Par. & Reichb. f.* in Trans. Linn. Soc. 30 : 144, t. 29. T. Elmeri *Ames* in Phil. Journ. Sci. 8 : 434. The characters on which I relied in describing *T. Elmeri* have proved inconsequential. *T. alata* has been reported from Java, Borneo, etc. In the Orchid Review (20 : 237) an interesting account of Thecostele is given by R. A. Rolfe.

Palawan, Leyte.

71. GRAMMATOPHYLLUM *Bl.*

The extent of the synonymy in comparison with the number of species is surely an indication that variation is characteristic of Grammatophyllum. Four or more species have been ascribed to the Philippines, but only three of these are known to me. They appear to be quite distinct. *Grammatophyllum Measuresianum* has been referred to the synonymy of *G. Fenzlianum* Reichb. f., and *G. Fenzlianum* has been referred to the synonymy of *G. scriptum* Bl. In Die Orchideen von Ambon J. J. Smith suggested that perhaps *G. scriptum* and *G. multiflorum* are forms of the same species. It is not unlikely that *G. Measuresianum*, as Sir Joseph Hooker suspected, is merely a garden form of *G. Fenzlianum*. *G. Fenzlianum* is a near ally of *G. Rumphianum*. J. J. Smith has referred both to the synonymy of *G. scriptum* in Die Orchideen von Ambon.

1. Grammatophyllum Measuresianum *Weathers* in Gard. & For. 2 : 524.

Lumbucan, Mindoro, Palawan.

2. Grammatophyllum multiflorum *Lindl.* in Bot. Reg. (1838) Misc. p. 46 and (1839) t. 65.

Leyte, Palawan, Mindoro, Luzon.

3. Grammatophyllum speciosum *Bl.* Bijdr. 378. I have not seen a specimen from the Philippines. Probably this and the next are conspecific.

4. Grammatophyllum Wallisii *Reichb. f.* in Linnæa 41 : 107. "Aff. Gr. gigantea *Bl.* et G. macrantho *Reichb. f.* sepalis cuneato oblongis margine minute nunc lobulatis, tepalis subæqualibus nunc latioribus, omnibus apice attenuato obtusatis, labello altius adnato a basi anteunguiculari cordato, expanso, laciniis lateralibus triangulis erectis, ubi arte expansis divaricatis, lacinia mediana triangula porrecta, carinis crassis ternis in disco, superficie cingente pilosula.

"Planta gigantea. Flores illis specierum dictarum æquimagni, sicci pallide brunnei maculis intus multis nigris. Quantum memini dom. Wallis dixit, flores esse albidos, olivaceo guttatos. Manilla." Reichb. f. *l. c.*

A specimen in fruit described by the collector as a gigantic orchid is the only material in the Bureau of Science Herbarium referable to this species. I submitted the specimen in question to Sir David Prain, who kindly reported as follows: "The fruiting specimen received for determination is a Grammatophyllum, and is believed to be *G. Wallisii* Reichb. f. in Linnæa, 41 : 107. This species was described from dried specimens collected at 'Manilla' by Wallis, and to it a flowering specimen collected by Loher at Tayabas in June, 1904, has been referred. The fruiting specimen agrees quite well with this so far as comparison is possible."

Grammatophyllum Wallisii is known to me only from the original description and the fruiting specimen in the Bureau of

Science Herbarium. The two species which Reichenbach cited as near allies, *G. macranthum* and *G. giganteum*, are conspecific with *G. speciosum* Bl.

Luzon, Province of Nueva Écija, *R. J. Alvarez For. Bur. 22174*, December 9, 1911. In fruit.

72. DIPODIUM *R. Br.*

About eleven species are recognized. Only one representative of the genus is a native of the Philippines. The flowers of all the species are strikingly similar in construction, and identification of specimens is extremely difficult in the absence of authentic material for comparison.

1. Dipodium paludosum *Reichb. f.* Xen. Orch. 2 : 15. I have seen specimens from Leyte which surely belong to this species.

Leyte, *Wenzel 0198, 0400, 0418*, May 12, 1914. Roots in soil, a climber on low trees in forest, 500 meters above sea level. Sepals and petals brown and yellow. Labellum brown, yellow, and white. Mindanao, Sibuyan. Also Borneo.

73. CYMBIDIUM *Sw.*

Two species from the Philippines are known to me.

1. Cymbidium atropurpureum *R. A. Rolfe* in Orch. Rev. 11: 190.

Leyte, Luzon, Mindanao.

2. Cymbidium Finlaysonianum *Lindl.* Wall. Cat. no. 7358.

Luzon, Mindanao, Palawan, Polillo, Bohol.

74. CHAMÆANTHUS *Schltr.*

This is a small genus with one representative in the Philippines. Five species are now known from Java and New Guinea. *Chamœanthus Wenzelii* is the sixth species to be described. The genus Chamæanthus has not heretofore been ascribed to the Philippine Islands.

1. *Chamæanthus Wenzelii sp. nov.* Planta parvula, epiphytica. Radices fibratæ, elongatæ. Caules abbreviati, circiter 2 cm. longi, ±10-foliati. Folia disticha, linearia, ad basim apicemque fastigata, 2–10 cm. longa, 3–5 mm. lata, leviter falcata, oblique bilobata, acuta, in longitudinem manifeste uninervia, curvata. Pedunculi axillares, foliis multo breviores, ascendentes, graciles, glabri, infra racemum pauci-bracteati, 2–4 cm. longi. Bracteæ oblique infundibuliformes, acutæ. Racemi breves, usque ad 1 cm. longi, axi incrassato. (Racemi sub anthesi grandescunt.) Bracteæ inflorescentiæ lineari-lanceolatæ, longe acutæ, leviter carinatæ, circiter 3 mm. longæ, confertæ, ad basim decurrentes. Flores in sicco flavescentes, duo vel tres in eodem tempore aperti, in numero ± viginti, erecti. Pedicello curvato. Sepala petalaque vix patentia. Sepala lateralia lineari-lanceolata, longe acuminata, extus carinata, ad apicem subcaudata, acuta, 5 mm. longa, ad basim circiter 1 mm. lata, membranacea. Sepalum dorsale simile, concavum, 5 mm. longum. Petala sepalis lateralibus minora, lanceolata, longe acuminata ad apicem breviter conduplicata, leviter carinata, 4 mm. longa, prope basim circiter 1 mm. lata. Labellum mobile, trilobatum, ecalcaratum. Lobi laterales indistincte producti, erecti, valde membranacei, rotundati, in margine indistincte denticulati; lobus medius valde incrassatus, triangularis, acutus, vix 1 mm. longus. Totum labellum circiter 2 mm. longum, valde carinatum. Gynostemium breve. Pes gynostemii 1 mm. longus.

The material which I have referred to the genus Chamæanthus *Schltr.*, and for which I propose the name *Chamæanthus Wenzelii*, came to me mingled with other specimens which Mr. C. A. Wenzel gathered on the island of Leyte, at Dagami, sixty meters above sea level, on March 8, 1913. This material agrees so well in its generic characters with Chamæanthus that I feel no uncertainty

regarding it. From *C. brachystachys* Schltr., with which it is closely allied, it differs chiefly in habit. The flowers of the two species are somewhat similar. There are differences in the labellum.

Leyte, *C. A. Wenzel 0110 A*, March 8, 1913.

75. THRIXSPERMUM *Lour.*

Eleven species, all but two of which are endemic, have been found natives of the Philippine Islands. The flowers are produced one or two at a time and are of brief duration.

1. Thrixspermum acuminatissimum *Reichb. f.* Xen. Orch. 2 : 121. T. notabile *Ridl.* in Journ. Linn. Soc. 32 : 379. Dendrocolla acuminatissima *Bl.* Bijdr. 288. Aërides acuminatissimum *Lindl.* Gen. & Sp. Orch. 240. Sarcochilus acuminatissimus *Reichb. f.* in Walp. Ann. 6 : 498. S. notabilis *Hook. f.* Fl. Brit. Ind. 6 : 42; Ic. Pl. t. 2126. I refer to this species several specimens from the island of Leyte and one from Laguna Province, Luzon, which agree satisfactorily with the material of *T. acuminatissimum* that I have examined.

Leyte, Dagami, *C. A. Wenzel 0101*, May 27, 1913. On trees at medium height, forested foothills, 60 meters above sea level. Height of plant 12 cm. Flower white, yellow, and brown. From dried material the flowers appear to have been yellowish or whitish when fresh, with small but conspicuous brownish spots on the labellum. Luzon, Laguna Province, *Juan Reillo 56*, July 1, 1912; San Antonio, Laguna Province, *M. Ramos Bur. Sci. 16560*, September to October, 1912 (specimen in fruit, no flowers). *Ramos Bur. Sci. 20447*, February, 1913; *Ramos Bur. Sci. 20455*, February, 1913.

2. *Thrixspermum* (§ *Dendrocolla*) *agusanense sp. nov.* Caules elongati, dense foliosi, rigidi, foliis approximatis. Folia oblonga, ad basim fastigata, ad apicem inæqualiter et obtuse biloba, breviter mucronata ± 5 cm. longa, circiter 1.5 cm. lata, valde coriacea, in sicco rugosa, oblique ascendentia, inter se 5 mm. distantia, vaginis persistentibus caulem obtegentibus. Pedunculus valde elon-

gatus, foliis multo longior, gracilis, flexuosus, ad 3 dm. longus, infra racemum pauci-bracteatus. Bracteæ inflorescentiæ rigidæ, triangulares, imbricatæ, oblique ascendentes, valde acutæ, congestæ, circiter 4 mm. longæ. Racemus usque ad 2 cm. longus. Flores succedanei. Pedicellus cum ovario bracteis longior, circiter 8 mm. longus, gracilis. Sepala lateralia membranacea, lanceolata, ad basim unguiculata, 7 mm. longa, 3.5 mm. lata, unguis oblongus. Sepalum dorsale simile, sed angustius, 7 mm. longum, circiter 2.5 mm. latum. Petala membranacea, spathulata, subacuta, prope basim attenuata, 6.5 mm. longa, circiter 2 mm. lata. Labellum saccatum, trilobatum, lobi laterales oblongi, obtusi, circiter 2 mm. longi, 1.5 mm. lati (porrecti?); lobus medius quam lobi laterales multo major, triangularis, obtusus, 2 mm. longus, circiter 5 mm. latus. Margo labelli antice fimbriatus, callus subcrescentiformis in disco prope basim lobi medii. Saccus vix 3 mm. longus, valde obtusus. Gynostemium circiter 2 mm. longum.

Thrixspermum agusanense resembles somewhat closely *T. pardale* (Ridl.) Schltr., but is very distinct from that species in detail.

MINDANAO, Province of Agusan, *C. M. Weber 147*, June 20, 1911. Epiphyte on shrubs along the Agusan River, 15 meters above sea level. Flowers white with slight tinge of purple.

3. Thrixspermum amplexicaule *Reichb. f.* Xen. Orch. 2 : 121.

LUZON, MINDANAO.

4. *Thrixspermum bicristatum sp. nov.* Herba epiphytica usque ad 1 dm. alta. Caulis ± 6 cm. longus. Folia disticha, anguste oblonga, valde coriacea, 4.5 cm. longa, ± 5 mm. lata. Vaginæ foliorum caulem obtectæ, persistentes, laxe adpressæ, ± 1 cm. longæ, rigidæ. Pedunculi glabri, graciles, suberecti, folia excedentes, cum racemo usque ad 6 cm. longi, pauci-bracteati, bracteis tubularibus arcte adpressis. Racemus ± 1 cm. longus, dense bracteatus. Bracteæ

inflorescentiæ carnosæ, imbricatæ, triangulæ, acuminatæ, valde acutæ, ± 3 mm. longæ. Pedicellus cum ovario bracteis longior, circiter 4 mm. longus. Flores succedanei, albidi et flavidi, labello purpureo. Sepala lateralia elliptica, obtusa, vix acuta, membranacea, 4 mm. longa, ± 2.5 mm. lata, mentum brevem formantia. Sepalum dorsale simile, usque ad basim leviter fastigatum. Petala anguste elliptica, vix acuta, circiter 3.5 mm. longa, 2 mm. lata. Labellum leviter concaviusculum, late subpanduriforme, in disco utrinque supra medium callus papilliformis stat; ad apicem utrinque crista comosa stat. Totum labellum 3 mm. longum, ad basim 4.5 mm. latum, ad apicem 2.5 mm. latum. Gynostemium 1.5 mm. longum.

LEYTE, Jaro, *C. A. Wenzel 030*, October 24, 1912. On small trees not far above ground, 40 meters above sea level. Flower odorless, purple, white, and yellow.

5. *Thrixspermum* (§ *Orsidice*) *elongatum sp. nov.* Caules elongati, ± 3 dm. longi, circiter 5 mm. in diametro, rigidi. Folia disticha, coriacea, ad apicem leviter bilobata, oblongi-elliptica, usque ad 13 cm. longa, 2.5 cm. lata, ad basim apicemque leviter fastigata, inter se 2–3 cm. distantia. Vaginæ foliorum arcte adpressæ, ± 2 cm. longæ, caulem obtectæ, in sicco nervosæ. Pedunculi cum racemo folia æquantes vel excedentes, alati, usque ad 11 cm. longi. Racemi 3–10 cm. longi. Bracteæ inflorescentiæ distichæ, valde complanatæ, subfalcatæ, 5 mm. longæ, circiter 2 mm. latæ. Flores majusculi, intervallis aperti, 3–5 cm. longi. Pedunculus cum ovario circiter 1.5 cm. longus, gracilis. Sepala lateralia longe caudata, 3–5 cm. longa linearia ad basim triangularia, usque ad 3.5 mm. lata. Sepalum dorsale simile. Petala longe caudata. Labellum ad basim leviter saccatum, trilobatum, ± 1 cm. longum, lobi laterales semi-ovati, circiter 2 mm. longi, quam lobus medius multo breviores; lobus medius porrectus, laterales multoties superans,

triangulus, puberulus, ad apicem complanatus, circiter 5 mm. longus. Discus puberulus prope medium ad basim lobi medii callus bilobus vel sulcatus, incrassatus, puberulus, stat.

Apparently a near relative of *Thrixspermum Raciborskii* J. J. Smith, and of *T. longicauda* Ridl. which has smaller flowers and a labellum without a median fleshy callus. The flowers usually open singly throughout a long period of anthesis, the rhachis elongating until the last flower appears. Each flower lasts only a day or two. In several specimens examined three flowers were open at one time on the odd bracteate rhachis, which in *T. elongatum* resembles in outline a slender plant of *Oberonia anceps*. The stems appear to be scandent, and even near the tips stout whitish roots burst through the leaf sheaths.

There are several species of § Orsidice which are very near this one, but from the material I have studied differences exist which to my mind indicate specific dissimilarity. The ephemeral nature of the flowers of all these species is accountable for the fact that in herbaria one rarely finds complete specimens.

To *Thrixspermum elongatum* specimens collected by C. A. Wenzel in Leyte may be referred. Under the field number 095 Wenzel assembled many fragments of several plants. The leaves of some of these fragments exceed 1.5 dm. in length, and the inflorescence bears flowers that are about 5 cm. long. The conclusion to be drawn from this material is, it seems to me, that *T. elongatum* is a variable species.

In Petiver's Gazophylacium, plate 103, fig. 8, this species is probably represented and was prepared from one of Camelli's specimens referred to in Ray's Historia Plantarum.

Luzon, Laguna Province, *Native Collector s. n.* February, 1913. Leyte, Dagami, *C. A. Wenzel 095*, February 18, 1913. On trees at medium height, 60 meters above sea level. Height of plant, 50 cm. Flower purple and

yellow. (In dried specimens the sepals and petals are yellowish, the labellum yellow tinged with purple on the lateral lobes.) MINDANAO, PALAWAN, POLILLO.

6. *Thrixspermum* (§ *Orsidice*) *linearifolium sp. nov.* Caules elongati, graciles, circiter 3 mm. in diametro, flexuosi (scandentes?). Folia linearia, ± 8 cm. longa, circiter 3 mm. lata, coriacea, acuta, approximata, inter se 4–10 mm. distantia, vaginis persistentibus caulem obtegentibus. Pedunculi quam folia longiores, graciles, pauci-bracteati, usque ad 1 dm. longi. Bracteæ inflorescentiæ distichæ, rigidæ, complanatæ, subtriangulares, 3–4 mm. longæ. Racemus 1–7 cm. longus. Flores succedanei, sepala petalaque ecaudata. Sepala lateralia elliptica, obtusa, 7–8 mm. longa, circiter 5 mm. lata, membranacea. Sepalum dorsale simile. Petala membranacea, inæqualiter obovata, valde obtusa, 7 mm. longa, circiter 4 mm. lata, ad basim leviter cuneata. Labellum saccatum, trilobatum, lobi laterales late falcati, vel semicrescentiformes, 2.5 mm. longi, 2 mm. lati, acuti (erecti?), membranacei; lobus medius abbreviatus, carnosus, obtusus. Saccus obtusus, circiter 3 mm. longus, intus, in pariete antico, pubescens. Gynostemium brevissimum.

The material on which the above species is based is not all that one might wish for the preparation of a detailed description, but is sufficiently characteristic to make the new species readily distinguishable from all other members of the section Orsidice known to be natives of the Philippines. The middle lobe of the labellum is difficult to make out in dried specimens. On the front wall of the sac there is a conspicuous mass of fine, delicate hairs along the perpendicular median line.

MINDANAO, Province of Misamis, Mount Malindang, *Major E. A. Mearns & W. I. Hutchinson For. Bur. 4734*, May 25, 1906, 5700 feet above sea level.

7. *Thrixspermum quinquelobum sp. nov.* Radices fibratæ, glabræ, elongatæ. Caules abbreviati, ± 1 cm. longi, complanati, foliosi, circiter 5 mm. in diametro. Folia valde incrassata, carnosa, in sicco rugosa, lineari-ligulata, anguste ensiformia, oblique ascendentia, 3.5–10 cm. longa, ± 4 mm. lata. Pedunculi, infra racemum, graciles, sub-filiformes, circiter 8 cm. longi, uni-bibracteati, bracteis triangulis, minutis. Racemus dense bracteatus, usque ad 1.5 cm. longus, bracteis rigidis, imbricantibus, patentibus, acutis, 2 mm. longis. Flores albidi, succedanei, membranacei. Sepala lateralia suborbicularia, obtusa, 4 mm. longa, vix 4 mm. lata. Sepalum dorsale galeam formans, valde concavum. Petala ellipticoovata, membranacea, 3.5–4 mm. longa. Labellum unguiculatum, leviter saccatum vel concavum, quinquelobum; lobi posteriores quam lobi anteriores multo majores, falcato-lanceolati, 4 mm. longi, circiter 1 mm. lati, acuminati, acuti; lobi laterales anteriores triangulari-lanceolati, valde acuti, 3 mm. longi, prope medium .5 mm. lati, membranacei; lobus medius triangulus, carnosus, vix 1 mm. longus, ad marginem comosus, capilli elongati, ± 1 mm. longi, extus dense pubescens. Discus pubescens. Gynostemium ± 3 mm. longum, in pedem membranaceum productum.

The labellum recalls that of *Sarcochilus hirtulus* Hook. f. (Ic. Pl. 2121), but the posterior lobes are larger than the anterior lateral lobes, the middle or terminal lobe is densely long hairy on the margin, as in *Dendrobium scopa* Lindl., and in place of a distinct sac there is merely a depression of the disc. The habit is also suggested by *Sarcochilus hirtulus*, but in *Thrixspermum quinquelobum* the leaves are narrower, usually conduplicate (in dried specimens), and the bracts recall those of the raceme of *T. pardale* Schltr.

Luzon, Laguna Province, San Antonio, *M. Ramos Bur. Sci. 16562*, September 22, 1912. On tree in forest.

8. *Thrixspermum Robinsonii sp. nov.* Aff. *T. Vanoverberghio.* Radices fibratæ, verrucosæ, elongatæ. Caules usque ad 2.5 cm. longi, complanati, foliosi. Folia disticha, non conferta, valde coriacea, carnosa, in sicco profunde rugosa, 2.5–3.5 cm. longa, 6 mm. lata, ad apicem inæqualiter biloba, ad marginem denticulata, oblongi-lanceolata, vaginis persistentibus caulem obtegentibus. Bases foliorum circiter 6 mm. longi. Pedunculi graciles, paucibracteati, glabri, usque ad 8 cm. longi. Rhachis inflorescentiæ, incrassatus, bracteis imbricantibus, confertis, triangulari-cymbiformibus, rigidis, acutis, patentibus, circiter 2 mm. longis. Flores succedanei, membranaceæ. Pedicellus cum ovario usque ad 5 mm. longus, gracilis, bracteis multo longior. Sepala lateralia inæqualiter ovata, 5.5 mm. longa, 4 mm. lata, obtusa. Sepalum dorsale elliptico-lanceolatum, subacutum, 6 mm. longum, 4 mm. latum. Petala simile, 5.5 mm. longa, 3 mm. lata. Labellum breviter unguiculatum, leviter saccatum, a basi trilobatum, lobis æqualis, rotundatis, semi-orbicularibus, sacco obtuso, rotundato, hemispherico, antice ad marginem sacci calli duo, complanati, membranacei, obtusi, erecti stant, prope medium callus pubescens. Lobus medius labelli pubescens.

In the structure of the flower *Thrixspermum Robinsonii* is very similar to *T. Vanoverberghii* Ames. The vegetative characters, however, are a simple means for distinction. In *T. Vanoverberghii* the leaves appear to arise more or less from the same place and ascend obliquely, whereas in *T. Robinsonii* the leaves are distinctly distichous and spread horizontally. The structure of the labellum in both species is similar. Whether or not the vegetative distinctions are constant it is quite impossible to determine from the material I have examined.

Luzon, Laguna Province, Mount Maquiling, *C. B. Robinson Bur. Sci. 17096*, December 7, 8, 1912. Altitude 900–1000 meters. Flower white

or with very pale purple tinge. Labellum with purple lines inside. NEGROS, Canlaon Volcano, *E. D. Merrill 7012*, April, 1910. Epiphyte. Altitude 5000 feet. CAMIGUIN DE MINDANAO, *M. Ramos Bur. Sci. 14417*, April 20, 1912. Flower violet pink. LEYTE.

9. *Thrixspermum* (§ *Orsidice*) *rostratum sp. nov.* Herba epiphytica, scandens. Folia valde ligulata, coriacea, ± 2.7 dm. longa, ±2.5 cm. lata, subacuta. Pedunculi cum racemo foliis longior. Racemus usque ad 3.5 dm. longus. Bracteæ oblique ascendentes, breviter falcatæ, subacutæ, rigidæ, persistentes, distichæ, complanatæ. Sepala petalaque flavida; labellum cinnabarinum. Sepala lateralia linearia, ad apicem incrassata, ± 3.5 cm. longa, prope basim circiter 4 mm. lata, septemnervia. Sepalum dorsale simile. Petala linearia, circiter 3.5 cm. longa, prope basim circiter 3 mm. lata. Labellum 1.5 cm. longum, ad basim profunde saccatum; saccus obtusus. Lobi laterales semi-ovati, curvati, obtusi, circiter 1.5 mm. longi. Lobus medius 9 mm. longus, rostratus, glabrus, incrassatus, acutus, superne sulcatus, ad basim, ad faucem sacci, callo sulcato. Gynostemium brevissimum.

The material from which the description was prepared consists of several inflorescences, two leaves, and four flowers.

From *Thrixspermum elongatum* Ames, to which *T. rostratum* is closely allied, it is readily distinguished by the long, strap-shaped leaves, and by the elongated beak-like middle lobe of the cinnabar red labellum. As in the other species of this section of Thrixspermum, the rhachis of the inflorescence elongates during anthesis, producing short-lived flowers, for the most part one at a time, throughout several weeks. The shortest rhachis in the type specimen bears about eighteen floral bracts and is hardly 9 cm. long. The longest rhachis bears about eighty floral bracts and is 36.5 cm. long.

Panay, Patolan, *W. S. Lyon 159*. Flowers produced in December. Plants climbing over bushes. Labellum cinnabar red. Sepals and petals yellow.

10. Thrixspermum Vanoverberghii *Ames* in Phil. Journ. Sci. 8 : 438.

Luzon.

11. *Thrixspermum Wenzelii sp. nov.* Herba epiphytica 6 cm. usque ad 3 dm. longa, polyphylla, racemis numerosis, pendula. Caules radicantes usque ad apicem ± 3 mm. in diametro, basibus foliorum obtecti. Internodia circiter 1 cm. longa. Folia disticha, valde coriacea, ad apicem inæqualiter bilobata cum mucro inter lobos, lamina oblonga, ad basim leviter attenuata, prope apicem rotundata, ± 6 cm. longa, circiter 8 mm. lata. Pedunculi glabri, librati, folia æquantes vel subæquantes, usque ad 5.5 cm. longi, rigidi, infra racemum uni-bibracteati, bracteis arcte adpressis, tubularibus. Racemus usque ad 3 cm. longus. Rhachis incrassatus cum bracteis clavatus. Bracteæ flores subtendentes squamiformes, triangulares, rigidæ, 2 mm. longæ quam pedicellus cum ovario multo breviores. Flores flavidi, purpureo-maculati, succedanei, circiter 1 cm. longi, membranacei. Pedicellus cum ovario circiter 5 mm. longus, gracilis. Sepala lateralia lanceolata, acuta, 7 mm. longa, 3 mm. lata. Sepalum dorsale simile. Petala spathulata, obtusa, 7 mm. longa, supra medium 2.5 mm. lata. Labellum trilobatum, saccatum; lobi laterales rotundati, margo glanduloso-pubescentes. Lobus medius 2.5 mm. longus, 1.5 mm. latus, glanduloso-pubescens. Ad basim lobi medii callus squamiformis stat. Saccus obtusus, 4 mm. longus. Gynostemium 2 mm. longum. Capsula ± 6 cm. longum.

A near relative of *Thrixspermum trichoglottis* (Hook. f.) O. K. but with a very different labellum. The flowers appear one at a time in each raceme, and in dried specimens have the appearance of being naturally ephemeral.

LEYTE, Dagami, *C. A. Wenzel 0182*, August 22, 1913. Epiphyte in forest, 60 meters above sea level. PALAWAN, LUZON.

76. SARCOCHILUS *R. Br.*

Of the nine species known to be natives of the Philippines, six are endemic. By some authors Sarcochilus and Thrixspermum have been regarded as congeneric. The modern tendency is to keep them distinct. The chief difference between them is found in the labellum, which in Sarcochilus is movably articulated with the column, while in Thrixspermum it is rigidly attached. The sac of the labellum in Thrixspermum has a wide opening, and is not, as a rule, terminated by a more or less porrect anterior utricle.

Although *Sarcochilus calceolus* Lindl. was originally reported as a Philippine plant, I have not included it in this list, as there is an element of doubt about it. *S. calceolus* is common at Singapore, and it is not improbable that the Cuming plant described by Lindley was collected there and not at Manila.

Sarcochilus compressus Reichb. f. in Walp. Ann. 6 : 498 has been reported from the Philippines.

Sarcochilus croceus Lindl. in Bot. Reg. (1846) 32 : sub t. 19 was described from a single leaf and a flower bud sent to Lindley by Messrs. Loddiges. I have been unable to recognize it among the specimens I have examined.

1. Sarcochilus appendiculatus *J. J. Smith* Orch. Jav. 564. S. pusillus *Reichb. f.* in Walp. Ann. 6 : 500. Dendrocolla appendiculata *Bl.* Bijdr. 289. Aërides pusillum *Lindl.* Gen. & Sp. Orch. 241. Grosourdya appendiculata *Reichb. f.* Xen. Orch. 2 : 123. Thrixspermum appendiculatum *O. K.* Rev. Gen. Pl. 2 : 682.

PALAWAN, Alfonzo XIII, *C. M. Weber 605*, October 4, 1912. On mangrove trees, at sea level. Flower brown-purple. Labellum white. Also from Java.

2. *Sarcochilus leytensis sp. nov.* Herba epiphytica, pusilla, tota planta circiter 7 cm. alta. Caules incrassati, radicantes vaginis foliorum obtecti, circiter 3 cm. longi. Folia disticha, coriacea, oblongi-lanceolata, ad apicem inæqualiter dentata vel bilobata, ad basim fastigata, ± 6.5 cm. longa, 6–10 mm. lata, erecta vel recurvata, ad basim imbricata. Pedunculus foliis brevior, hystriculus, usque ad 5 cm. longus, subpendulus, infra racemum paucibracteatus. Rhachis inflorescentiæ incrassatus, glaber. Racemus pauciflorus, abbreviatus, circiter 1 cm. longus, laxus. Bracteæ inflorescentiæ squamiformes, ovatæ, acutæ, ad basim decurrentes, pedicellis multo breviores. Pedicellus cum ovario glaber circiter 5 mm. longus. Sepala lateralia spathulato-lanceolata, subfalcata, trinervia, subacuta, 3 mm. longa, vix 2 mm. lata. Sepalum dorsale lanceolatum, subspathulatum, trinervium, subacutum, 3 mm. longum, 1.5 mm. latum. Petala oblonga, falcata, obtusa, 3 mm. longa, 1 mm. lata. Labellum cylindrico-saccatum, complanatum, manifeste bilobatum, lobo medio pæne obsoleto, triangulo, acuto, lobis lateralibus magnis, erectis, obtusis. Saccus vel calcar ad orem leviter constrictum, 2.5 mm. longum, intus in pariete antico callosum, callo carnoso. Lobi laterales circiter 1 mm. longi, vix 1 mm. lati. Gynostemium clavatum 1.75 mm. longum. Pollinia 2.

I have referred this species to Sarcochilus not without doubt as to the correctness of my diagnosis of its generic characters. With the exception of the callus on the front wall of the spur, which appears to be partly formed by the inflection of the nearly, or almost entirely, obsolete middle lobe, the labellum is smooth. The column is scarcely developed into a foot and the labellum joins it without articulation.

Leyte, Dagami, *C. A. Wenzel s. n.* March 9, 1913. On trees at medium height. Altitude 60 meters. Flower white and yellow, odorless. Basilan?

3. *Sarcochilus longicalcarus Ames & Rolfe sp. nov.* Herba epiphytica, pendula. Caules radicantes, circiter 3 mm. in diametro. Folia alterna, inter se 1.5–2 cm. distantia, oblonga, obtusa, ad apicem inæqualiter biloba, ±1 dm. longa, usque ad 2 cm. lata, coriacea. Vaginæ foliorum subarcte adpressæ, supra paullo dilatatæ, persistentes, caulem obtectæ. Pedunculi folia excedentes, ±3 dm. longi, leviter alati, glabri. Bracteæ inflorescentiæ squamiformes, latiores quam longiores, circiter 1 mm. longæ, valde obtusæ, quam pedicellus multo breviores. Pedicellus cum ovario circiter 9 mm. longus, gracilis. Flores flavidi purpureo-maculati, membranacei. Sepala lateralia oblique obovata, valde obtusa, 7 mm. longa, 4 mm. lata. Sepalum dorsale ovatum, obtusum, 7 mm. longum, prope medium 4 mm. latum. Petala ad basim cuneata, oblanceolata, obtusa, membranacea, 7 mm. longa, circiter 4 mm. lata. Labellum unguiculatum, trilobatum, unguis cum pede labelli 2.5 mm. longus; lobi laterales minuti, curvati, oblongi, obtusi prope apicem, circiter 1 mm. longi, .75 mm. lati; discus inter lobos laterales callosus; lobus medius elongatus, calcaratus, curvatus, ad apicem tumidus, supra medium gracilis, prope lobos laterales, a latere visus, disciformis. Totum labellum cum pede gynostemii 1 cm. longum; lobus medius circiter 7 mm. longus. Gynostemium 2 mm. altum.

"This very closely resembles *S. suaveolens* Hook. f. in habit, but has a remarkably elongated spur. Identical with a specimen collected by A. Loher (590), and unlocalized except for the general ticket 'Central Luzon.'" R. A. Rolfe in note on Elmer 6784.

The middle lobe of the labellum in side view resembles very much in outline the curved leg with ball foot of a Chippendale chair.

Mindoro, *J. Bermejas Bur. Sci. 1516*, August to September, 1906. Balut Island, *Merrill 5406*, October 8, 1906. Luzon, Province of Bataan, Mount

Mariveles, *A. D. E. Elmer 6784*, November, 1904. Flowers yellow. MINDANAO, District of Davao (Santa Cruz), Mount Binatun, *C. M. Weber 268*, October 24, 1911. Epiphyte on trees, 381 meters above sea level. Flowers cream to yellow with purple dots. MINDORO, *Lyon 17* (Hb. Ames 10568).

The following specimens appear to belong to *S. longicalcarus:*

LEYTE, Jaro, *C. A. Wenzel 0147*, June 9, 1913. LUZON, Bontoc Subprovince, *Vanoverbergh 2118*, December 10, 1912, 500 meters above sea level; Camarines Province, *H. M. Curran For. Bur. 11353*, May, 1908, 100 meters above sea level; Bulacan Province, *H. M. Curran Bur. Sci. 3045*, 1907.

4. *Sarcochilus McGregorii comb. nov.* Thrixspermum McGregorii *Ames* in Phil. Journ. Sci. 2 : 337.

MINDORO.

5. *Sarcochilus Merrillii sp. nov.* Radices validæ, elongatæ, numerosæ. Caules abbreviati, vix elongati. Folia coriacea, conferta, oblonga, utrinque attenuata, obtusa, ± 4, patentia, 5.5–9 cm. longa, usque ad 2 cm. lata, quam scapi multo breviora. Scapi ascendentes, graciles, paniculati vel ramosi, ± 2 dm. longi, bialati, ramis divergentibus. Bracteæ infra inflorescentiam tubuliformes; bracteæ flores subtendentes squamiformes, rigidæ, vix 1 mm. longæ, quam pedicellus breviores. Flores minuti, albidi numerosi, eodem tempore perpauci aperti. Sepala lateralia inæqualiter oblanceolata, unguiculata, leviter apiculata, 3 mm. longa, vix 1.5 mm. lata supra medium, uninervia. Sepalum dorsale oblanceolatum, obtusum, uninervium, circiter 2.5 mm. longum. Petala anguste oblanceolata, 2.5 mm. longa. Labellum membranaceum, saccatum, trilobatum, lobi laterales erecti, circiter 2 mm. longi, .75 mm. lati, triangulares vel semicrescentiformes, membranacei, lobus medius pæne obsoletus, rotundatus, incrassatus, concavus, subtus dente obtuso instructus. Stelidia columnæ triangularia acuta, elongata, erecta.

The flowers suggest those of *Sarcochilus Teysmannii* J. J. Smith in the general form of the labellum. The inflorescence is branched with the branches branched again. Flowers and fruits are present at the same time. The first branch springs forth about 4 cm. above the leaves. The branches in dried specimens are conspicuously two-winged. The claw of the labellum forms a wide canal, with erect sides, which leads into the saccate termination; the lateral lobes rise perpendicularly above the very small, somewhat thickened middle lobe, with their acute tips pointing outward from the column. Seen from the side the sac and lobes suggest the head of a horse with erect ears.

MINDANAO, Province of Surigao, Baganga, *E. D. Merrill 5432*, October 6, 1906. On tree overhanging river, near sea level.

6. *Sarcochilus mindanaensis comb. nov.* Thrixspermum mindanaensis *Ames* in Phil. Journ. Sci. 8 : 436. This is closely allied to *S. emarginatus* Reichb. f., but is distinguishable from it by its much smaller flowers.

LEYTE, MINDANAO.

7. *Sarcochilus palawanensis sp. nov.* Aff. *S. suaveolenti* Hook. f. Maxime *S. longicalcaro* affine, speciei quam habitu hæc species conspicue simulat. Radices fibratæ, elongatæ, glabræ, usque ad summum caulem productæ. Caules (penduli?) elongati, circiter 3 mm. in diametro, flaccidi, foliosi. Internodii ± 5 mm. longi. Folia ligulata, utrinque attenuata, pendula, inæqualiter biloba, 3–10 cm. longa, usque ad 2.5 cm. lata, coriacea. Pedunculi foliis longiores ± 1 dm. longi, bracteis squamiformibus, obtusis, 1 mm. longis. Flores succedanei, albidi, fulvo-maculati; saccus flavidus. Pedicellus cum ovario circiter 7 mm. longus, gracilis. Sepala lateralia inæqualiter elliptica, obtusa, 7 mm. longa, 3 mm. lata, membranacea. Sepalum dorsale ellipticum, obtusum, 7 mm. longum, 3 mm. latum. Petala membranacea, elliptica, vel oblanceolata,

valde obtusa, vix 7 mm. longa, circiter 3 mm. lata. Labellum unguiculatum, a latere compressum, hypochilio in calcar compressum, clavellatum, antice producto, basi bibrachiatum, brachiis erectis, falcatis, obtusis, pubescentibus, 2 mm. longis; epichilii lobulis duobus dentiformibus calcari impositis. Unguis pubescens. Saccus obtusus, pubescens, 3 mm. longus. Gynostemium 2 mm. longum.

The labellum suggests *Sarcochilus suaveolens* Hook. f. It is minutely pubescent with the exception of the underneath surface of the elongated claw. The very different sac distinguishes it from *S. longicalcarus* Ames and Rolfe.

PALAWAN, Alfonzo XIII, *C. M. Weber 614*, November 2, 1912. Habitat in beach forest, at sea level.

8. Sarcochilus pallidus *Reichb. f.* in Walp. Ann. 6 : 500. Cf. ORCHIDACEÆ 2 : 253 for synonymy. In Petiver's Gazophylacium (plate 103, fig. 2) this species, if my conclusions are not at fault, is represented, and was taken from Camelli's plant from Luzon to which reference is made in Ray's Historia Plantarum.

POLILLO, MINDANAO, LUZON, LEYTE, BASILAN.

9. *Sarcochilus philippinensis Ames comb. nov.* Thrixspermum philippinense *Ames* in Phil. Journ. Sci. 8 : 437. *Sarcochilus philippinensis* Vidal is a synonym of *Camarotis philippinensis* Lindl.

LEYTE, MINDANAO, LUZON, POLILLO.

77. DORITIS *Lindl.*

A small genus of about five species closely allied with Phalænopsis.

1. Doritis philippinensis *Ames* ORCHIDACEÆ 2 : 255. This is closely allied with *D. Wightii* Lindl. and *D. Steffensii* Schltr., the latter a recently described species from Celebes.

LUZON, PALAWAN.

78. PHALÆNOPSIS *Bl.*

This is a genus of showy orchids which is of horticultural importance and consequently very difficult to systematize. Numerous varieties have been described for horticultural purposes which depend largely on color, size, and form, characteristics impossible to distinguish in dried material. In the following list no attempt has been made to differentiate between forms which are purely horticultural. An instructive paper on Phalænopsis was published by R. A. Rolfe in the August number of the Orchid Review for 1905, in which references are made to Philippine species. I have marked with an asterisk those species that have not been represented in collections made for the Bureau of Science, and which are known to me only through cultivated specimens.

1. Phalænopsis amabilis *Lindl. var.* Aphrodite *Ames* ORCHIDACEÆ 2 : 226. This variety is regarded as a distinct species by several authorities, but on characteristics which appear to me negligible. For synonymy and varieties ORCHIDACEÆ, volume 2, pages 224 to 229, should be studied. In Petiver's Gazophylacium, plate 103, fig. 10, this species is represented. Probably from the Camelli specimens referred to in Ray's Historia Plantarum.

LUZON, MINDANAO, PALAWAN, LAMBUCAN (like var. *Rimestadtiana*, flowers 9.5 cm. across).

*2. Phalænopsis Boxallii *Reichb. f.* in Gard. Chron. (1883) 1 : 274. See also Gard. Chron. (1886) 2 : 276. Related to *P. Mannii* Reichb. f.

3. Phalænopsis equestris (*Schauer*) *Reichb. f.* Linnæa 22 : 864. P. rosea *Lindl.*, P. Esmeralda *Cogn.*

LUZON, MINDANAO, BOHOL, PANAY.

*4. Phalænopsis fuscata *Reichb. f.* in Gard. Chron. (1874) 2 : 6. P. Denisiana *Cogn.* in Gard. Chron. (1899) 2 : 82.

*5. Phalænopsis fasciata *Reichb. f.* in Gard. Chron. (1882) 2 : 134. Supposed to have been introduced from the Philippine Islands by Messrs. Hugh Low & Co.

6. Phalænopsis Lindenii *A. Loher* in Journ. des Orch. (1895) 103.

Luzon.

7. Phalænopsis Lueddemanniana *Reichb. f.* in Bot. Zeit. 23 : 146.

Luzon, Leyte, Mindanao, Palawan, Polillo.

8. Phalænopsis Mariæ *Burbidge* in Warn. Orch. Alb. 2 : t. 80. Cf. note under t. 87. Plate 6964 in the Botanical Magazine is more accurate than the plate in the Orchid Album.

Mindanao, Luzon.

9. Phalænopsis Micholitzii *Rolfe* in Gard. Chron. (1890) 2 : 197. See also Orch. Rev. 13 : 229. I have specimens of the original flowers collected by Micholitz which have been compared with the type and verified by Mr. Rolfe. This species is closely related to *Phalænopsis Lueddemanniana* Reichb. f. The labellum in its form and calli is very much like the labellum of *P. Lueddemanniana*, and differs chiefly from it in the hairs on the disc being scattered and not gathered into a tuft. But even this distinction only holds in special cases. From C. A. Wenzel (054 Leyte) I have specimens which are very similar to *P. Micholitzii*, although they match flowers of *P. Lueddemanniana* equally well. Mr. Wenzel describes the flowers as *odorless*, green, brown, white, yellow, and purple. Mr. Rolfe in the Orchid Review (*l. c.*) compares *P. Micholitzii* to *P. tetraspis* Reichb. f., which has white flowers. Unfortunately no technical description of Mr. Rolfe's species is known to me. The name occurs in Garden Journals with brief characterizations. In the Orchid Review

(*l. c.*) Mr. Rolfe stated that his description had never been published.

*10. Phalænopsis Reichenbachiana *Reichb. f.* & *Sander* in Gard. Chron. (1882) 2 : 586.

11. Phalænopsis Schilleriana *Reichb. f.* in Hamb. Garten und Blumenz. 16 : 115.

LUZON.

12. Phalænopsis Stuartiana *Reichb. f.* in Gard Chron. (1881) 1 : 748.

LUZON?

*13. Phalænopsis Veitchiana *Reichb. f.* in Gard. Chron. (1872) 935.

79. AËRIDES *Lour.*

Although numerous garden forms have been described from Philippine specimens, the genus Aërides is represented by few species in the Philippines. *Aërides quinquevulnerum* is by far the most common species. From dried specimens it is extremely difficult to recognize many of the forms that are cultivated under various names.

1. Aërides Augustianum *Rolfe* in Lindenia 5 : 39, pl. 210; Gard. Chron. (1890) 1 : 9. I have not seen any specimens of this among the collections from the Bureau of Science. It has purplish flowers and a very long spur on the labellum.

2. Aërides Lawrenciæ *Reichb. f.* in Gard. Chron. (1883) 2 : 460, 307, 368.

MINDANAO.

3. Aërides odoratum *Lour.* Fl. Cochinch. 525.

MINDORO.

4. Aërides Ortgesianum *Reichb. f.* in Gard. Chron. (1885) 501,

a species which I have not seen among specimens from the Philippines, is a near ally of *A. quinquevulnerum*.

5. Aërides quinquevulnerum *Lindl.* Sert. Orch. pl. 30.

Luzon.

6. Aërides Rœbelenii *Reichb. f.* in Gard. Chron. (1884) 1 : 510 is near *A. quinquevulnerum*. I have not seen any specimens referable to it from the Philippines.

7. Aërides Rohanianum *Reichb. f.* in Gard. Chron. (1884) 1 : 206, and A. suavissimum *Lindl.* Journ. Hort. Soc. 4 : 264, belong to *A. odoratum* Lour. Undoubtedly several species which are still upheld will prove to be forms of this very variable and widely distributed species.

8. Aërides Savageanum *Veitch* Man. 7 : 78.

80. RHYNCHOSTYLIS *Bl.*

Two species are natives of the Philippines. About three species constitute the genus. The synonymy is copious.

1. Rhynchostylis retusa *Bl.* Bijdr. 286.

Luzon, Palawan.

2. Rhynchostylis violacea *Reichb. f.* in Bonpl. 2 : 93. Vanda violacea *Lindl.* in Bot. Reg. (1841) Misc. p. 12; (1847) t. 30. The flowers of this species are larger than in *R. retusa* Bl. and possess a distinctly retuse-apiculate labellum. Lindley's description and the accompanying plate in the Botanical Register of 1847 were prepared from material introduced from the Philippine Islands. Lindley reported that Cuming found the species in Manila and introduced it to Europe. In the Botanical Magazine of 1864 plate 5433 depicts a white-flowered species that is hardly different from *R. violacea*. This species was described by Hooker under the name *Saccolabium Harrisonianum* and separated specifically

from the species illustrated in the Botanical Register by slight differences discoverable in the flower. Hooker's species was imported from "Pulo Copang, in the Chinese seas."

Luzon, *W. S. Lyon 50*, 1908. Referred by the collector to *Aërides quinquevulnerum* Lindl. with the following note: "But the wounds *i.e.* spots (now faded), are sometimes two or three instead of one on each perianth segment." In addition to the specimens collected by Lyon I possess a number of plants, presumably discovered in Luzon by a native collector. This appears to be the species figured by Petiver in his Gazophylacium (plate 103, fig. 11) from Camelli's plants gathered in Luzon and published by Ray in Historia Plantarum.

81. LUISIA *Gaudich.*

Probably thirty species constitute the genus, of which four come from the Philippine Islands. All of them are endemic with the exception of *Luisia teretifolia*, which is a native of Java, Amboina, New Caledonia, and Ceylon.

1. Luisia Foxworthii *Ames* ORCHIDACEÆ 2 : 222.

   Luzon, Polillo.

2. Luisia Ramosii *Ames* in Phil. Journ. Sci. 6 : 55.

   Luzon.

3. Luisia teretifolia *Gaudich.* Voy. Uranie 427, t. 37.

   Luzon, Palawan, Leyte, Mindanao, Negros?

4. Luisia valida *Reichb. f.* in Bonpl. 10 : 335. "Tepalis oblongo ligulatis sepala paulo excedentibus, labello bene ventricoso trifido, laciniis posticis triangulis erectis juxta columnam, lacinia antica hastato triangula excavata.—Folia valida." Reichb. f. *l. c.* This species is unknown to me. *L. teretifolia* is well characterized by linear-oblong, obtuse petals, which slightly exceed the upper sepal in length. The labellum is panduriform, and concave near the column. Reichenbach's description of the petals of *L. valida* applies equally well to the petals of *L. teretifolia;* in

fact, it applies only to *L. teretifolia* of all the species from the Philippines that I have seen, and taken in conjunction with his description of the labellum of *L. valida*, arouses a strong suspicion in my mind that *L. teretifolia* and *L. valida* are conspecific, or that my conception of *L. teretifolia* is erroneous. From both species *L. Foxworthii* and *L. Ramosii* are clearly distinct, through the broad petals, which in *L. Foxworthii* are oblong-lanceolate and in *L. Ramosii* unequally ovate.

82. ARACHNIS *Bl.*

About fifteen species are referable to this genus. Only one species has been discovered in the Philippines. Also represented by species in Annam, Borneo, New Guinea, Java, and Celebes.

1. *Arachnis Lyonii sp. nov.* Radices elongatæ, vaginas perforantes, vermiformes. Caules erecti, rigidi, ± 1 cm. in diametro, teretes, usque ad apicem complanatum, internodiis 2.5–3 cm. longis. Folia patentissima, coriacea, ligulata, oblonga, ad apicem inæqualiter obtuse biloba, usque ad 12 cm. longa, 2.5 cm. lata. Vaginæ internodia æquantes, tubulosæ, in sicco valde transverse rugosæ, prope apicem leviter dilatatæ. Inflorescentiæ vaginas ad basim perforantes, breves, circiter trifloræ, laxæ. Pedunculo valdiusculo, 3–7 cm. longo, vaginis tubulosis tecto, rhachide ± 3 cm. longa. Bracteæ flores subtendentes breviter tubulares, in sicco scariosæ, circiter 3 cm. longæ. Flores circiter 3 cm. in diametro, carnosi, flavidi, bruneo-maculati, sepalis petalisque patentissimis. Sepala lateralia spathulata, coriacea, obtusa, 1.8 cm. longa, 8 mm. lata, ad basim vix 4 mm. lata, ad margines undulata. Sepalum dorsale unguiculatum, ellipticum, obtusum, circiter 22 mm. longum, prope apicem 9 mm. latum. Petala coriacea, falcato-spathulata, obtusa, 1.8 cm. longa, supra medium 1 cm. lata. Labellum parvum, circiter 6 cm. longum, carnosum, intus ad basim

lobi medii callo longitudinali magno, carnoso, lateraliter compresso, 2–5 mm. alto, valde elevato donatum; lobi laterales late obtusi, lobus medius erecto-incurvus, linearis, obtusus, 2 mm. longus, vix 1 mm. latus. Gynostemium crassum, dorso-convexum, 6 mm. longum.

Allied to the Bornean *Arachnis breviscapa* J. J. Smith, but in part distinguishable by its smaller flowers. The hinged or movable labellum separates this species generically from *Vandopsis Lissochiloides* Pfitz. and *V. leytensis* Ames, if the treatment of J. J. Smith is adopted.

Luzon, Isabella Province, *W. S. Lyon 126*, March to April. Terrestrial among rocks, 3000 feet altitude. Flowers straw-yellow, hieroglyphically blotched with brown. Central ridge on labellum bright violet. Fragrance of violets.

83. ESMERALDA *Reichb. f.*

This is a small group which is probably best kept as a section of Vanda.

1. Esmeralda Sanderiana *Reichb. f.* in Gard. Chron. (1882) 1: 588.

Mindanao.

84. VANDOPSIS *Pfitz.*

This is a small genus which is nearly related to Arachnis *Bl.* Two species are known to be natives of the Philippines. It is also represented in Burma, China, New Guinea, and the Liukiu Archipelago.

1. *Vandopsis leytensis sp. nov.* Herba epiphytica usque ad 4 dm. alta. Caules ± 6 dm. in diametro, rigidi. Folia disticha, valde coriacea, ligulato-oblonga, vel elliptico-oblonga, ad apicem inæqualiter biloba, lobis obtusis, ± 10 cm. longa, ± 3 cm. lata, in sicco valde rugosa. Vaginæ foliorum laxe adpressæ, supra dilatatæ,

± 3 cm. longæ, caulem obtectæ, rigidæ. Pedunculus rigidus, circiter 2 mm. in diametro, bracteis cupuliformibus ± 5 mm. longis. Flores ± 5, in racemo ± 1 dm. longo dispositi, circiter 6 cm. in diametro, carnosi. Bracteæ flores subtendentes usque ad 1 cm. longæ, rigidæ. Pedunculus cum ovario circiter 3 cm. longus, glaber. Sepala lateralia in sicco valde nervosa, circiter 3 cm. longa, circiter 1 cm. lata, oblongi-elliptica, acuta. Sepalum dorsale simile sed angustius, apiculatum. Petala quam sepala lateralia multo angustiora, subspathulata, circiter 3 cm. longa. Labellum ad basim concavum, trilobatum, lobus medius lateraliter compressus 1 cm. longus, leviter curvatus, superne valde incrassatus et subtiliter pubescens, sulcatus, lobi laterales trianguli, acuti, vix 1 cm. longi, ad basim circiter 4 mm. lati. Discus labelli in medio dense pubescens. Hypochilium 1 cm. longum, circiter 5 mm. altum, in sicco valde nervosum, rigidum, ad pedem gynostemii adfixum, per medium carina dense pubescens extensa. Gynostemium rigidum 7 mm. longum.

Vandopsis leytensis is readily distinguishable from *Vandopsis Lissochiloides* Pfitz. by the very different labellum and shorter leaves. The labellum is concave at base and is divisible into hypochile and epichile. The epichile is made up of the middle and lateral lobes, the lateral lobes spreading at right angles, or nearly so, to the middle lobe. The hypochile is densely pubescent along the median line. Directly in front of the hypochile the lateral lobes are situated.

LEYTE, Dagami, *C. A. Wenzel 014*, December 14, 1912. On trees at medium height, 60 meters above sea level. Flower red, brown, and white; *Wenzel 0172*, March 24, 1913.

2. Vandopsis Lissochiloides (*Gaudich.*) *Pfitz.* in Engler & Prantl's Pflanzenf. Orchidaceæ 210, fig. 229.

MINDANAO, PANAY.

85. STAUROPSIS *Reichb. f.*

Only one species is known from the Philippines.

1. Stauropsis philippinensis *Reichb. f.* in Hamb. Garten und Blumenz. 16 : 117.

MINDANAO, LUZON, NEGROS, PALAWAN?

86. RENANTHERA *Lour.*

As at present understood this is a small genus confined to the tropics of the Old World. From Mindanao there is a specimen in the Bureau of Science Herbarium, collected by Mary Strong Clemens (773), which consists of the inflorescence only. It appears to be near *R. matutina* Lindl., but the lateral sepals are free.

1. Renanthera elongata *Lindl.* Gen. & Sp. Orch. 218. This species, under the name *R. micrantha* Bl., is referred to the Philippines in Xenia Orchidacea (1 : 92). The *R. micrantha* of Xenia is referred to *R. elongata* Lindl. by J. J. Smith. Plate 41 of the Botanical Register (1843), which represents *R. elongata*, accompanies a brief note by Lindley, who referred to specimens collected by Cuming in the Philippines. I have not seen any material of this species among the Bureau of Science collections.

2. *Renanthera monachica sp. nov.* Aff. *R. angustifoliæ* Hook. f. Radices? Folia disticha, approximata, ligulata, coriacea, ad apicem inæqualiter et obtuse biloba, 5.5–13 cm. longa, 1–1.5 cm. lata.[1] Pedunculus erectus, simplex, 18.5 cm. longus, bibracteatus infra racemum, bracteis tubularibus, circiter 2 mm. longis. Pedicellus cum ovario gracilis, 1.5 cm. longus. Flores ± 6 in racemo laxo dispositi, ± 2.5 cm. in diametro, flavidi, rubro-maculati, circiter 1 cm. distantes, bracteis subtendentibus squamiformibus. Sepala lateralia unguiculata, 2 cm. longa, vix 6 mm. lata, ad basim vix 1 mm. lata, lanceolata, prope apicem processu unciformi. Sepalum

[1] Only the upper part of the stem was secured by the collector.

dorsale anguste lanceolatum, acutum, 1.5 cm. longum, 3 mm. latum, breviter unguiculatum. Petala subfalcata, ad basim attenuata, acuta, acuminata, 1.2 cm. longa, 3.5 mm. lata. Labellum crassum, saccatum, trilobatum, lobi laterales antice trianguli, acuti, postice obtusi columnam attingentes; lobus medius 2.5 mm. longus, 1 mm. latus, oblongus ad apicem rotundato-obtusus. Saccus obtusus, cylindricus, antice 1.5 mm. longus, cum lobis lateralibus 3.5 cm. longus. Columna rigida, crassa, 4 mm. alta, minute puberula, ad apicem annulo pilorum instructa.

This is a near ally of *Renanthera angustifolia* Hook. f. (Ic. Pl. 2138), but distinguishable from it by means of the differently shaped perianth organs. The peduncle is unbranched. The gynostemium is entire at the summit. The lateral sepals just below the tip are provided with a hook-shaped process.

LUZON, Zambales Province, *H. M. Curran Bur. Sci. 3089.* Flowered at Manila under cultivation in February, 1908.

3. Renanthera Storiei *Reichb. f.* in Gard. Chron. (1880) 2 : 296.
LUZON.

87. VANDA *Jones*

This is a large genus widely distributed in the tropics of the eastern hemisphere. Most of the species are cultivated for the beauty of their flowers.

1. Vanda lamellata *Lindl.* in Bot. Reg. (1838) Misc. p. 66.
LUZON, MINDORO, COMIRAN, PANAY, SULU SEA.

Var. Boxallii *Reichb. f.* in Gard. Chron. (1880) 1 : 743.
LUZON.

2. Vanda Rœblingiana *Rolfe* in Kew Bull. (1894) 365.
LUZON.

3. Vanda tricolor *Lindl.* in Bot. Reg. (1847) sub t. 59. I refer

here specimens that are cultivated in Manila under the name *Vanda luzonica*. The material I have examined appears to be a variety of *V. tricolor*, but as it is quite probable that there are differences between *V. tricolor* and *V. luzonica* that are conspicuous in living plants, the name *V. luzonica* may represent a distinct species. The flowers are said to be nearly odorless, white, with the labellum white at base and light purple above.

My specimens are from Mount Balacbac, Bulacan Province, Luzon, *Loher 6006*.

88. ANGRÆCUM *Bory*

A single species is known to be a native of the Philippines,

1. Angræcum philippinensis *Ames* in Phil. Journ. Sci. 2 : 336; 4 : 597.

Luzon, Mindoro.

89. SACCOLABIUM *Bl.*

As at present understood, Saccolabium is a small genus partly distinguished from Sarcochilus by the absence of a foot on the column. It is represented in Java, Celebes, New Guinea, etc. Under Saccolabium numerous species have been reported from the Philippines. *Saccolabium bifidum* Lindl. = *Sarcanthus bifidus* Ames. *S. Blumei* Lindl. = *Rhynchostylis retusa* Bl. *S. chionanthum* Lindl. = *Schœnorchis micrantha* Bl. *S. compressum* Lindl. = *Robiquetia compressa* Schltr. *S. miniatum* Lindl. = *Ascocentrum miniatum* Schltr.

The synonymy of *Rhynchostylis retusa* in Orchidaceæ, volume 2, should be studied in this connection. Several species have been referred to the Philippines under Saccolabium which are unknown to me, or are not represented in the Bureau of Science collection. These I have purposely omitted from my list, as they are doubtful.

1. Saccolabium confusum *Ames* in Phil. Journ. Sci. 8 : 435.
LUZON.

2. *Saccolabium Escritorii sp. nov.* Herba epiphytica, valde carnosa. Caulis contractus, validus, 2–3 cm. altus, leviter complanatus. Folia disticha, valde coriacea, rigida, usque ad 8 cm. longa, 7–11 mm. lata, ad apicem leviter fastigata, in sicco rugosa, vaginis persistentibus caulem obtegentibus. Pedunculus valde incrassatus foliis brevior, usque ad 7 cm. longus, pæne usque ad basim florosus. Rhachis inflorescentiæ incrassatus, clavatus, alatus, bracteis squamiformibus circiter 2 mm. longis, acutis; margo bracteorum denticulata. Flores albidi in racemo cylindraceo laxo dispositi. Pedicellus gracilis cum ovario circiter 1 cm. longus. Sepala lateralia elliptico-ovata, acutiuscula, extra sub apicem cuspide munita, 6 mm. longa, 2.5 mm. lata. Sepalum dorsale simile sed angustius et ad apicem obtusum. Petala oblonga, valde obtusa, 6 mm. longa, 2.5 cm. lata. Labellum crassum, saccatum, lobatum, lobi laterales 1.5 mm. longi, 1.5 mm. lati, erecti, bipartiti, divisiones adhærentes, pars anterior quadrata, pars posterior triangula vel lobi laterales trianguli, callo permagna prædita; lobus medius abbreviatus, carnosus, rotundatus, crescentiformis. Saccus infra lobum medium protumidus, ceteroqui triangulus, complanatus vel obconicus, usque ad apicem liberum fastigatus, circiter 5 mm. longus. Gynostemium breve.

The lateral lobes of the labellum are quadrate and apparently composed of two members, the posterior member being adherent to the outside of the anterior one and above produced into a short obtuse or somewhat pointed lobe. The posterior member when forced apart from the anterior one is narrowly triangular in shape. The middle lobe of the labellum is very fleshy, and is subtended by a fleshy projection of the sac. The sac itself is

triangular, probably flattened laterally in life, without dividing membranes or raised veins on the inner walls. The labellum might be described as three-lobed, with the middle lobe divided and the divisions adherent to the lateral lobes. But this is hardly a correct description, as the structure of the labellum does not warrant it. What I have termed the anterior member of each lateral pair of lobes may be an extraordinarily developed lamina; that it is so seems very probable, as the anterior margin of the posterior member of each pair joins the middle lobe and together with it forms a continuous boundary within which the anterior member of each pair of lateral lobes is contained, appearing like a callus arising from the throat of the fleshy sac or spur.

That this species belongs to the genus Saccolabium seems very probable, but in view of the differing opinions regarding generic limitations in the group, future studies may prove that I have not interpreted its characters properly. The flowers open, more or less, at the same time on a thickened clavate rhachis.

From the description of *Saccolabium sarcochiloides* Schltr. this species must be a near ally, but the flowers as shown by the plate published by Schlechter are structurally dissimilar from *S. Escritorii.*

The specimens from Mount Mariveles collected by Dr. Copeland are smaller than the type, but exhibit the same peculiarities in floral structure. The lateral lobes of the labellum are purple and erect.

Luzon, Province of Tayabas, Guinayangan, *L. Escritor Bur. Sci. 20733*, March 8, 1913. Province of Bataan, Mount Mariveles, Buena Vista Peak, *E. B. Copeland s. n.* November 23, 1907. In moss on trees. Flowers white, slightly fragrant, centre of flower purplish.

3. *Saccolabium Loheri sp. nov.* Epiphyticum, habitu *S. rhopalorrhachis* J. J. Smith. Caulis abbreviatus, dense foliosus, circi-

ter 5 mm. in diametro. Radices elongatæ, glabræ. Folia ligulata, utrinque attenuata, usque ad 1 dm. longa, 1–2 cm. lata, coriacea. Racemus circiter 3 cm. longus, rhachi paulo incrassata. Bracteæ racemi squamiformes, circiter 2 mm. longæ. Pedicellus cum ovario 5–7 mm. longus, gracilis. Flores flavidi purpureo-maculati. Sepala lateralia circiter 9 mm. longa, prope basim 3 mm. lata, lanceolata, apiculata. Sepalum dorsale simile. Petala ligulata, acuta, 8 mm. longa, circiter 3.5 mm. lata. Labellum 6.5 mm. longum, infra lobum medium rostratum, valde protumidum, carnosum, a latere compressum, trilobatum, lobi laterales rotundati; lobus medius minutus, obtusus, crescentiformis, calceiformis, a latere visus. Columna brevis, rostello bipartito.

Saccolabium Loheri is a near ally of *S. sarcochiloides* Schltr., but is very different in the structure of the labellum, which resembles, when seen laterally, a perfect shoe, the toe protruding beneath the small middle lobe, and the heel being formed by an indentation of the sac.

Luzon, Zambales Province, *A. Loher 6026*. Flowering in Manila, July 26, 1905.

4. Saccolabium luzonense *Ames* in Phil. Journ. Sci. 8 : 435.

Luzon.

5. ? Saccolabium pumilio *Reichb. f.* in Gard. Chron. (1875) 2 : 98. "Minutum; foliis oblongis apice inæqualiter bilobis subtus purpureis; racemo densifloro, foliis breviori; bracteis triangulis ovaria pedicellata non æquantibus; sepalis tepalisque ligulatis obtusis; labelli laciniis lateralibus retusiusculis angulo in medio, lacinia media oblonga obtusa, calcari planiusculo cylindrato retuso; columna retusa, rostello bidentato; caudicula sub polliniis utrinque angulata." Reichb. f. *l. c.* "The small flowers stand in a bent cylindraceous dense raceme. They look Sarcanthoid, but

the features of that genus are not to be found. They might, too, be compared to the flowers of *Saccolabium buccosum* and *fragrans*. Their color is yellowish, the lip white, with some purplish marks on the blade." Reichb. f. *l. c.*

6. Saccolabium sarcochiloides *Schltr.* Orchis 5 : 61, t. 8.

7. *Saccolabium Vanoverberghii sp. nov.* Herba epiphytica, usque ad 20 cm. alta. Vaginæ foliorum internodiis paulo longiores, 5–7 mm. longæ, leviter complanatæ, in sicco rugosæ. Caulis radicans erectus. Folia disticha, coriacea, ad apicem inæqualiter bilobata, oblonga, basim apicemque angustata, usque ad 5.5 cm. longa, 9–11 mm. lata, oblique ascendentia. Pedunculi oppositifolii, foliis breviores, pauci-bracteati, glabri, ascendentes. Flores flavidi et albidi, circiter 1 cm. in diametro, succedanei. Rhachis alatus, subcomplanatus, incrassatus. Bracteæ inflorescentiæ squamiformes, vix 1 mm. longæ. Pedicellus cum ovario vix 1 cm. longus. Sepala lateralia elliptico-oblonga, trinervia, ad apicem angustata, obtusa, 6 mm. longa, vix 3 mm. lata. Sepalum dorsale simile. Petala falcato-oblanceolata, 5.5 mm. longa, 2.5 mm. lata, obtusa. Labellum saccatum, saccus obtusus, cylindraceus, superne dilatatus, circiter 5 mm. longus. Lobi laterales quadrati, truncati, erecti, 1.25 mm. longi, circiter 1 mm. lati; lobus medius abbreviatus, semiorbicularis, carnosus, callo transversario in disco, callus semilunatus. Gynostemium crassum 2.5–3 mm. longum.

The middle lobe of the labellum is hardly more than a rounded lip at the summit of the sac, with its edge extending to the lateral lobes, which appear to have been erect in life. Beneath the middle lobe the sac is slightly protuberant and the anterior wall is very much thickened.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 2214*, December

31, 1913. Altitude 1700 meters. On trees; *Vanoverbergh 1712*, November 2, 1912. Altitude 1650 meters. Subprovince Ifugao, Mount Polis, *R. C. McGregor Bur. Sci. 19634*. Flower yellow-buff, lower part white.

90. GASTROCHILUS *Don.*

The dismemberment of the genus Saccolabium necessitated the reinstatement of Gastrochilus to receive those species which have a labellum characterized by a hemispherical, wide-mouthed hypochile and a flat, somewhat triangular, outspread epichile which is more or less fringed at the margin and which gives to the labellum the appearance of an inverted jockey cap. About sixteen species are recognized from Ceylon, Sikkim-Himalaya, Burma, India, Japan, Moulmein, and *G. sororius* Schltr. from Java. *Saccolabium formosanum* Hayata, which I only know from the original description and the figure in Icones Plantarum Formosanarum (4 : 88), is a native of Arisan, Formosa, with the epichile of the labellum entire. (Cf. Schlechter's Die Gattungen Gastrochilus *Don* und Gastrochilus *Wall.* in Fedde Rep. 12 : 313.)

1. *Gastrochilus philippinensis sp. nov.* Radices validæ. Caulis 9 cm. longus, 4–10 mm. in diametro. Folia disticha, ad basim imbricata, 10–14 cm. longa, 2.3–2.7 cm. lata, ad apicem inæqualiter bilobata, oblongi-elliptica, ligulata, valde coriacea, vaginæ foliorum arcte adpressæ, caulem obtectæ. Pedunculus 2.5 cm. longus, incrassatus, bractea vaginata, glaber. Bracteæ flores subtendentes late ovatæ, obtusæ, 2 mm. longæ, rigidæ. Pedicelli 7–10 mm. longi. Sepala petalaque similia, carnosa, oblongi-spathulata, obtusa, 7 mm. longa, usque ad 4 mm. lata. Labellum 5 mm. longum, lobis lateralibus erectis, minutis. Hypochilium saccatum, conicum, carnosum, 3 mm. altum. Epichilium 4 mm. longum, circiter 6 mm. latum, echinatum, ad marginem profunde et inæqualiter fimbriatum. Gynostemium breve.

The type consists of a single specimen and is the only Philippine representative of the genus Gastrochilus that has come to my attention. It is a near ally of *Gastrochilus calceolaris* Don, but the leaves are different from the leaves of that species and the flowers are smaller than those of *G. calceolaris*. *G. sororius* Schltr. is also a nearly related species, but with different leaves. Although I have withheld this species from publication since 1904, in anticipation of additional material to clarify it, it remains unique among the collections of the Bureau of Science.

Luzon, Province of Benguet, Baguio, *A. D. E. Elmer 6517*, June 28, 1904.

91. OMŒA *Bl.*

A small genus with one representative in the Philippines.

1. *Omœa philippinensis sp. nov.* Epiphytica, pusilla. Caulis ±1 dm. altus, foliosus, circiter 3 mm. in diametro. Folia valde carnosa, disticha, 3–5 mm. distantia, patentia, lateraliter compressa, oblonga a latere visa, sulcata supra et subter, ad apicem oblique acuta directe ad perpendiculum, in sicco valde rugosa et angulata, usque ad 3 cm. longa, circiter 2 mm. in crassitudine a latere visa. Inflorescentiæ axillares, brevissimæ, flores circiter 5. Pedunculus quam folia multo brevior, incrassatus, bracteæ flores subtendentes, cymbiformes, triangulares, acutæ, circiter 1.5 mm. longæ. Pedicellus cum ovario circiter 2 mm. longus. Sepala lateralia circiter 4 mm. longa, lanceolata, concava, leviter carinata, ad apicem conduplicata, acuta. Sepalum dorsale simile, concavum. Petala quam sepala angustiora, linearia, acuta, 3 mm. longa. Labellum trilobatum, saccatum, lobi laterales triangulares, membranacei, valde acuti, .5 mm. longi, ad basim circiter .5 mm. lati; lobus medius cordato-sagittatus, carnosus, acutus, 1.5 mm. longus, 1.5 mm. latus. Saccus 2 mm. longus, cylindraceus, obtusus, vix bilobulatus. Columna apoda, 1 mm. longa.

Structurally the specimens on which my description is based appear to belong to Omœa. From *Omœa micrantha* Bl. they differ in the several flowered inflorescence. The floral structure, however, is very similar to that of Blume's species. The general habit of the plants suggests *Microsaccus Wenzelii*, but the leaves are much narrower perpendicularly and not so crowded. From dried specimens the leaves appear to have been deeply sulcate both above and beneath.

Luzon, Province of Pampanga, Mount Arayat, *E. D. Merrill 4208*, September 15, 1905. Altitude 350 meters. Epiphyte on mossy tree. "Lip and spur white. Petals somewhat dark drab."

92. ASCOCENTRUM *Schltr.*

Dr. R. Schlechter has proposed the new genus Ascocentrum to receive those species which are allied to the following species formerly ascribed to Saccolabium: *S. aurantiacum* Schltr., *S. curvifolium* Lindl., *S. ampulaceum* Lindl., and *S. miniatum* Lindl. Saccolabium as at present understood is closely related to Sarcochilus, from which genus it is distinguished chiefly by the footless column. In the Philippines Saccolabium is represented by *S. confusum* Ames, *S. luzonense* Ames, *S. sarcochiloides* Schltr., and *S. Vanoverberghii* Ames.

Ascocentrum miniatum (*Lindl.*) *Schltr.* in Fedde Rep. Beihefte 1 : 975. Saccolabium miniatum *Lindl.* in Bot. Reg. (1847) sub t. 26, t. 58. Gastrochilus miniatus *O. K.* Rev. Gen. Pl. 2 : 661.

Luzon, Mindanao.

93. MALLEOLA *J. J. Smith & Schltr.*

Sepals and petals more or less spreading, oblong. Petals similar to the sepals, erect-spreading. Labellum calcariform, more or less distinctly three-lobed, lateral lobes small, for the most part truncate, middle lobe small with the apex usually incurved, spur

conically cylindrical, or conical, rarely elongated. Column short hammer-shape (malleoliform), fleshy, footless, the very short rostellum bipartite. Pollinia globose, stipe from the slender base gradually dilated upwards, gland rounded, small. Anther cucullate, usually apiculate, smooth. Ovary subsessile, smooth, cylindrical. Epiphytes, caulescent or subcaulescent, leafy, roots filiform, smooth. Leaves ligulate, leathery. Racemes lax or dense, several or many flowered, subpendulus or erect.

1. *Malleola constricta sp. nov.* Herba epiphytica 8–25 cm. alta. Caules elongati, 6–12-foliati, vix 2 mm. in crassitudine, subflexuosi. Folia alterna, anguste oblonga, ad basim apicemque fastigata, coriacea, in sicco rigida, 10–12 mm. distantia inter se, 4.5–7.5 cm. longa, circiter 8 mm. lata, vaginis persistentibus caulem obtegentibus. Vaginæ foliorum arcte adpressæ, internodiis æquilongæ vel longiores in longitudinem striatæ. Pedunculi oppositifolii, 4–9 cm. longi, glabri, infra racemum bibracteati. Bracteæ laxæ, in sicco scariosæ, tubulares, oblique truncatæ, 2–3 mm. longæ. Bracteæ racemi lanceolatæ, acutæ, 3 mm. longæ infra medium racemi. Flores minuti, in racemo laxo dispositi. Pedicellus cum ovario circiter 2 mm. longus. Sepala lateralia late ovata, trilatera, obtusa, 3 mm. longa, vix 3 mm. lata. Sepalum dorsale valde concavo-cucullata, 3 mm. longa, sigmoidea a latere visum. Petala oblongi-elliptica, 3 mm. longa, 1.5 mm. lata, subacuta. Labellum calcaratum, trilobatum. Lobi laterales minuti, trianguli, erecti, acuti; lobus medius erectus, carnosus, triangulus, circiter 1 mm. longus, acutus. Calcar supra basim cylindraceum, circiter 1.5 mm. in diametro, ad basim in pariete postico in sacculum scrotiformem productum; totum calcar 3.5 mm. longum; sacculus 1 mm. longus. Gynostemium breve. Stipes linearis, deinde dilatatus, 1.75 mm. longus.

There is no dividing wall in the sac, and there are no calli or protuberances. At the base of the middle lobe there is a thickening of the tissues which is difficult to understand in dried material. Undoubtedly in generic characters closely related to species of Sarcanthus.

LEYTE, Dagami, *C. A. Wenzel 055*, December 29, 1912. On trees at medium height. Altitude 60 meters. Flower white, yellow, and purple. MINDANAO.

The following belong with *M. constricta:*

POLILLO, *R. C. McGregor Bur. Sci. 10447*, November 11, 1909. LEYTE, *C. A. Wenzel 062*, December 31, 1912.

2. *Malleola Lyonii sp. nov.* Aff. *M. constricta.* Planta ± 4 dm. alta. Caules flexuosi, ± 3 mm. in diametro. Radices ad basim caulis vaginæ perforantes. Folia valde coriacea, oblongi-elliptica, inæqualiter bilobata, disticha, 2.5–4 cm. longa, usque ad 1.4 cm. lata, patentia; vaginæ foliorum internodiis æquilongis, circiter 1 cm. longæ, ad nodos caulis dilatatæ, rigidæ, in sicco valde rugosæ. Pedunculi vaginas foliorum perforantes, elongati, circiter 1 dm. longi, ad basim bracteis tubularibus instructi. Racemus laxiflorus, ± 4 cm. longus, floribus ± 4 mm. distantibus. Bracteæ flores subtendentes 3 mm. longæ, acutæ, quam pedicellus cum ovario breviores. Pedicellus cum ovario circiter 5 mm. longus, rigidus. Sepala lateralia concaviuscula inæqualiter spathulata, obtusa, carnosa, circiter 4.5 mm. longa, 2.5 mm. lata. Sepalum dorsale erectum, cucullatum, prope apicem subito pronum, obtusum, 4 mm. altum, 6 mm. longum, ad basim attenuatum. Petala oblongi-ovata, circiter 3 mm. longa, vix 2 mm. lata. Labellum trilobatum, lobi laterales prope columnam, triangulares, subacuti, erecti; lobus medius minutus, incurvatus, triangulus, ± 1 mm. longus, utroque ad basim lobulus minutus. Saccus 5 mm. longus, infra lobum medium protumidus, prope basim subito constrictus, obtusus,

intus in pariete postico costa. Gynostemium 1.5 mm. longum, superne subito dilatatum.

Among Philippine species this is nearest *Malleola constricta*. In habit it resembles *M. Witteana* J. J. Smith & Schltr., with which species it is closely allied.

Luzon? *W. S. Lyon s. n.*

3. *Malleola Merrillii sp. nov.* Caules ± 1.5 dm. alta, foliosa. Folia breviter ligulata, valde coriacea, ad apicem inæqualiter biloba, lobis obtusis, ± 6 cm. longa, ± 3 cm. lata, imbricata, vaginis persistentibus caulem obtegentibus. Vaginæ foliorum arcte adpressæ internodiis longiores, circiter 1.5 cm. longæ, rigidæ, ancipitæ, complanatæ, in sicco rugosæ. Pedunculi oppositifolii, circiter 12 cm. longi, bracteis infra racemum vaginatis. Bracteæ racemi lanceolatæ, valde acutæ, ± 5 mm. longæ, leviter deflexæ. Flores purpurei et flavidi in racemo denso dispositi. Racemus circiter 5 cm. longus, circiter 2 cm. in diametro. Pedicellus cum ovario circiter 7 mm. longus quam saccus labelli longior. Sepala lateralia vix 5 mm. longa, circiter 4 mm. lata, suborbicularia. Sepalum dorsale simile, valde concavum. Petala orbicularia, 4 mm. longa, 3.5 mm. lata, uninervia. Labellum calcaratum, leviter trilobatum; lobi laterales minuti, rotundati; lobus medius erectus, leviter incurvus, ad apicem triangulus, circiter 1 mm. longus, extus leviter carinatus. Calcar cylindraceum, obtusum, usque ad 7 mm. longum, sæpe inflatum, ad aperturam constrictum. Gynostemium generis.

I have examined several collections from Luzon which appear to be referable to this species, but which are much taller, with longer leaves and freer habit, than the type. It is not unlikely that the plants found by Merrill on rocks in the open show a more compact form of growth than plants which grow in the forest on trees. The spur of the lip is without callosities, septa, or

appendages. The divisions of the rostellum at the base of the column are acute.

Luzon, Benguet Subprovince, *E. D. Merrill 7685*, May, 1911, 50 kilometers north of Baguio on rocks of steep open slope, ± 2000 feet above the sea.

94. ROBIQUETIA *Gaudich.*

This is a small genus with representatives in Amboina, New Guinea, Celebes, Borneo, Sumatra, Tenasserim, etc.

1. Robiquetia compressa *Schltr.* in Fedde Rep. Beheifte 1:983. Saccolabium compressum *Lindl.* in Bot. Reg. (1840) Misc. p. 9; Sert. Orch. t. 32.

The Philippine material which I have referred to Lindley's *Saccolabium compressum* agrees fairly well with that species in the floral structure, although the vegetative parts are not so robust as those shown in the plate published in Sertum Orchidaceum. In the Lindley Herbarium at the Royal Gardens, Kew, there is a sketch of a flower which agrees very well with the details of flowers from Philippine specimens which I have examined.

Dr. Schlechter has referred *Saccolabium compressum* to Robiquetia, in conformity with the present tendency to dismember the genus Saccolabium. The sac is free from callosities.

Luzon, Mindanao.

2. Robiquetia spathulata *J. J. Smith* in Nat. Tijds. v. Ned.-Ind. 72 : 115 (1912). Cleisostoma spatulata *Bl.* Bijdr. 364; *Lindl.* Gen. & Sp. Orch. 227; *Miq.* Fl. Ind. Bat. 3 : 682; *J. J. Smith* Orch. Jav. 609. Cleisostoma spicatum *Lindl.* in Bot. Reg. (1847) sub t. 32; *Miq.* Fl. Ind. Bat. 3 : 682; *Hook. f.* Fl. Brit. Ind. 6 : 72, in Ann. Bot. Gard. Calc. 5 : 55. t. 83; *King & Pantling* in Ann. Bot. Gard. Calc. 8 : 232, t. 311. Sarcanthus densiflorus *Par. & Reichb. f.* in Trans. Linn. Soc. 30 : 136. Sarcanthus castaneus *Ridl.* in

Trans. Linn. Soc. 33:369. Saccolabium densiflorum *Lindl.* in Wall. Cat. no. 7311; Gen. & Sp. Orch. 220; in Bot. Reg. 24, Misc. p. 56. Saccolabium borneense *Reichb. f.* in Gard. Chron. (1881) 563.

The bibliography cited above is taken from J. J. Smith's treatment in Sarcanthus Lindl. und die nächstverwandten Gattungen, published in volume 72 of Natuurkundig Tijdschrift von Ned.-Indië.

Robiquetia spathulata is a widely distributed species. Smith ascribes it to Java, Bangka, Borneo, Sumatra, Hamaheira, Malay Peninsula, Tenasserim, and the East Indies.

In the Botanical Register (24, Misc. p. 56), under the heading *Saccolabium densiflorum*, Lindley wrote as follows: "Among some Orchidaceæ, collected in Manila by Mr. Cuming, this plant has made its appearance, having flowered with Messrs. Loddiges. It has small, pale, dull brownish-yellow flowers of a very fleshy consistence. The specimen that flowered was a small one. The Penang specimens brought home by Dr. Wallich were nearly two feet high."

LEYTE, Dagami, *C. A. Wenzel 0180*, July 15, 1913. Epiphyte in forest 60 meters above sea level. Flower white, red, and yellow.

3. *Robiquetia Vanoverberghii sp. nov.* Herba epiphytica, usque ad 5 dm. alta, rigida. Caules superne valde complanati. Folia disticha, approximata, ligulata, valde coriacea, ad apicem inæqualiter et obtuse bilobulata, circiter 1.3 dm. longa, 2.7–3.5 cm. lata, oblique ascendentia, in sicco longitudinaliter striata, vaginis persistentibus rigidis caulem obtegentibus. Pedunculus foliis longior, rigidus, prope basim bracteis subfoliaceis, obtusis instructus, superne ramosus, vel paniculatus, infra inflorescentiam ±8 cm. longus; rami paniculæ usque ad 1.5 dm. longi, subdensiflori, sæpe secundiflori. Bracteæ inflorescentiæ deflexæ, triangulari-lanceo-

latæ, acutæ, 3 mm. longæ; bracteæ ramos subtendentes ± 1 cm. longæ, acutæ. Flores mediocres, carnosi, circiter 1 cm. longi. Pedicellus cum ovario 1 cm. longus. Sepala lateralia oblongi-elliptica, 4 mm. longa, 2.5 mm. lata. Sepalum dorsale simile. Petala cuneato-obovata, valde obtusa, circiter 4 mm. longa, 3 mm. lata prope apicem. Labellum valde carnosum, calcaratum, vix trilobatum; lobi laterales obsoleti; lobus medius minute triangularis, acutus, calcar elongatum, circiter 5 mm. longum, intus in pariete antico infra lobum intermedium callo membranaceo donatum. Rostellum in basi gynostemii bipartitum.

In general habit similar to *Robiquetia spathulata* J. J. Smith, but very distinct in the construction of the labellum.

Robiquetia Vanoverberghii is a robust plant which is rather well characterized among its near allies in the Philippines by the branched inflorescence and candle-snuffer-shaped labellum. The structure of the column is not unlike that of *Robiquetia spathulata*, but in dried specimens it is often impossible to study the finer details of structure, and errors in judgment are to be expected. There is no posterior callus in the sac.

Luzon, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 1473*, September 12, 1912. On trees. Flower pink and whitish yellow; *Vanoverbergh 790*, August 23, 1910. Province of Benguet, Mount Tonglon, *H. M. Curran For. Bur. 5056*, August, 1906, and *For. Bur. 5055*. Mindanao.

95. SCHŒNORCHIS *Bl.*

A small genus of fifteen or more species, natives of Java, Sumatra, Malay Peninsula, Borneo, Celebes, New Guinea, and the Philippines. The genus is in part characterized by the elongated rostellum produced from the base of the column. It is closely allied with Sarcanthus.

1. Schœnorchis micrantha *Bl.* Bijdr. 362. Saccolabium chionanthum *Lindl.* in Journ. Linn. Soc. 3 : 35. S. perpusillum *Hook.*

f. Fl. Brit. Ind. 6 : 56; Ic. Pl. t. 2129 (A). Gastrochilus chionanthus *O. K.* Rev. Gen. Pl. 2 : 861.

In the Philippine Journal of Science (4 : 675 (C) Bot.) I referred material collected in Luzon by Ramos (Bur. Sci. 3055) to *Saccolabium chionanthum* Lindl. Recently, in a review of several genera of the Sarcanthinæ, J. J. Smith assigned numerous species, which had been retained in Saccolabium, to Lindley's genus Sarcanthus. In Blume's genus Schœnorchis he placed several species of Saccolabium that are partly characterized by linear or terete leaves, among others *Saccolabium chionanthum*. The synonymy proposed by Smith is given above.

To *Schœnorchis micrantha* Bl. I refer the following Philippine specimens which I have recently studied:

LEYTE, Dagami, *C. A. Wenzel 05*, November 8, 1912. On trees at great height above ground, 60 meters above sea level. Flower odorless, white and purple. MINDANAO, Province of Agusan, Sangayan, Agay Trail, *C. M. Weber 319*, December 11, 1911. On prostrate tree, 22 meters above sea level. Also PALAWAN, LUZON.

2. *Schœnorchis mindanaensis sp. nov.* Herba pusilla, epiphytica, usque ad apicem racemi 4 cm. alta. Radices fibratæ, minute pubescentes. Caulis abbreviatus, circiter 5 mm. longus. Folia conferta, oblongi-elliptica, 2–3.2 cm. longa, 9–13 mm. lata, coriacea, patentia, conferta, ad apicem inæqualiter bilobata, lobis obtusis, vaginis caulem obtegentibus. Pedunculus ascendens infra racemum bibracteatus, bracteis cupuliformibus. Bracteæ inflorescentiæ squamiformes, minutæ, acutæ, 1 mm. longæ. Pedicellus cum ovario gracilis, 3 mm. longus. Racemus densiflorus, pyramidalis, 2.5 cm. longus, ad basim circiter 1 cm. in diametro. Flores membranacei. Sepala lateralia lineari-spathulata, obtusa, ad apicem concaviuscula, extus minute pubescentia, 2.5 mm. longa. Sepalum dorsale spathulatum, obtusum, concaviusculum, 2 cm. longum, ad basim valde attenuatum, extus pubescens. Petala oblonga,

subelliptica, obtusa, vix 2 mm. longa, circiter .75 mm. lata, uninervia. Labellum trilobatum, albidum, saccatum; lobi laterales obtusi; lobus medius orbicularis, 1 mm. longus, incrassatus. Saccus 1.5 mm. longus, ad apicem inflatus et leviter trilobatus, superne dilatatus. Gynostemium breve, antice utroque in processum subulatum productum, superne dilatatum.

The structure of the gynostemium resembles that of *Schœnorchis paniculata* Bl. The sac of the labellum is about 1 mm. wide at the dilated tip; in general outline it is not unlike the sac of *Pomatocalpa spicatum* Breda as represented in Ann. Bot. Gard. Calc. 5 : t. 84. The sepals are directed forward. The lateral lobes of the labellum are erect, rounded, as high as the gynostemium, and in front form an acute angle where they join the middle lobe. The middle lobe appears to have been slightly conduplicate when fresh. The type consists of a single plant. I have not seen any other material.

MINDANAO, Province of Agusan, Agusan River, *C. M. Weber 155*, July 3, 1911. On small tree. Altitude 15 meters. Lower surface of the leaves purple. Upper sepal and the petals cream color. Sepals showing a slight tinge of blue, labellum white.

3. *Schœnorchis philippinensis sp. nov.* Aff. *Schœnorchis minimifloro comb. nov.* (*Saccolabio minimifloro* Hook. f. Fl. Brit. Ind. 6 : 59; Ic. Pl. t. 2133). Radices elongatæ, fibratæ. Caules abbreviati, 1–2 cm. alti, vaginis foliorum obtecti. Folia conferta, disticha, rubidio-brunnea, coriacea, 4 cm. longa, 6–13 mm. lata, ad apicem inæqualiter biloba, elliptico-ligulata, utrinque acuta, racemis elongatis, gracillimis, foliis multoties longioribus, multifloris. Bracteæ subulatæ, patentes, pedicellos æquantes, 1 mm. longæ. Racemus usque ad 1 dm. longus. Pedunculus infra racemum 1.5–2 cm. longus, pauci-bracteatus. Pedicellus 1 mm. longus, cum ovario usque ad 2 mm. longus. Flores in racemo, laxo, spicato, dispositi.

minuti, rubidio-brunnei. Sepala lateralia cum sacco labelli cohærentia, oblongi-triangularia, acuta, 2 mm. longa, circiter .5 mm. lata, porrecta. Sepalum dorsale oblongum, obtusum, erectum, 1.5 cm. longum, 1 mm. latum, ad basim subito attenuatum. Petala oblonga, subquadrata, obtusa, circiter 1.25 mm. longa, .75 mm. lata, incurva. Labellum valde saccatum, leviter complanatum, utriculosum; lobi laterales obsoleti; lobus medius triangulus, minutus, incurvus, valde acutum, profunde excavatus, sub apicem pariete antico sacci subtiliter protumido. Saccus obtusus lateraliter complanatus, quam ovarium longior. Gynostemium breve; rostellum in basi gynostemii elongatum, alte bipartitum, laciniis ad apicem dilatatis. Pollinia 4 in corpuscula 2 subglobosa unita, stipite lineari 1.5 mm. longo, ad apicem dilatato, glandula magna, ligulato-oblonga. Anthera valde rostrata.

At first glance this species bears a striking resemblance to *Schœnorchis minimiflora* (Hook. f.), from which it differs in the excavated, not terete, middle lobe of the labellum. In comparing the two species one might almost suppose that the details of the labellum and rostellum were inaccurately interpreted as illustrated in Hooker's Icones. Hooker's figure does not show the attachment of the lateral sepals to the sac of the labellum, nor does it make clear that the petals are wider than the lateral sepals. In *S. philippinensis* the middle lobe of the labellum is deeply excavated so that the erect point resembles the lip of a pitcher.

Luzon, Province of Nueva Viscaya, *R. C. McGregor Bur. Sci. 20117*, January 15, 1913. Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens 1058 bis.* Bukidnon Subprovince, *L. Escritor Bur. Sci. 21396*, July, 1913.

4. *Schœnorchis Vanoverberghii sp. nov.* Aff. *S. paniculatæ* Bl. Herba epiphytica. Radices fibratæ, numerosæ. Caules usque ad

1.5 dm. alti, graciles, in sicco 3 mm. in crassitudine, internodiis 5–10 mm. longis, foliosi rigidi. Folia oblongi-ligulata, coriacea, ad apicem irregulariter tridentata, ± 4 cm. longa, in sicco 4 mm. lata, disticha, in sicco rugosa, vaginis persistentibus caulem obtegentibus. Vaginæ arcte adpressæ, internodiis æquilongæ vel longiores, rugosæ, usque ad 1 cm. longæ. Pedunculi prope summum caulem orti, pedunculi ascendentes, glabri, bialati. Inflorescentiæ paniculatæ, usque ad 1 dm. longæ, ascendentes, bracteis squamiformibus, munitis. Rami paniculæ 1.5–6 cm. longi. Flores minuti, 2–4 mm. distantes. Pedicellus cum ovario 2.5–3 mm. longus, quam bracteæ squamiformes longior. Sepala lateralia oblonga, uninervia, 2 mm. longa, vix 1 mm. lata, acuta. Sepalum dorsale simile. Petala anguste elliptica, ad apicem truncata, 1.5 mm. longa, vix .75 mm. lata, uninervia. Labellum saccatum, trilobatum, lobis lateralibus subobsoletis, rotundatis, in sicco membranaceis, lobo medio carnoso, oblongo, obtuso, circiter 1 mm. longo, .75 mm. lato, inferne prope apicem incrassato, ad medium callo transversali. Saccus valde scrotiformis, 1.5 mm. longus, complanatus, obtusus, ecallosus. Gynostemium breve, carnosum, .5 mm. longum, utrinque processu subulato, ascendente.

This is a compact, interesting little species, which produces from two to three paniculate inflorescences from the axils of the upper leaves. Fruiting and flowering panicles occur at the same time, so that the flowering season is apparently a long one. The lateral lobes of the labellum are distinguishable merely as the rounded-up sides of the sac, and in some specimens pass imperceptibly into the fleshy middle lobe. Plants scarcely 12 cm. tall from base of stem to tip of inflorescence have been noted among the specimens that constitute the original collection of this species. *Schœnorchis Vanoverberghii* is nearly allied to *S. paniculata* Bl.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 3644*, September to November, 1913. Altitude 1750 meters.

96. CAMAROTIS *Lindl.*

1. Camarotis philippinensis *Lindl.* in Journ. Linn. Soc. 3 : 37. Cf. *Ames* in Phil. Journ. Sci. 8 : 438 for full description. Sarcochilus philippinensis *Vidal* Rev. Gen. Pl. Vasc. Filip. 271, not *Ames.*

Luzon, Leyte.

2. *Camarotis utriculosa sp. nov.* Caules radicantes, ± 3 dm. longi, graciles, usque ad 4 mm. in diametro, flexuosi, vaginis foliorum obtecti. Folia coriacea, patentia, disticha, oblongi-linearia, ad apicem inæqualiter biloba, lobis obtusis, usque ad 1 dm. longa, usque ad 1 cm. lata, decurvata, vaginæ foliorum internodiis æquilongæ, arcte adpressæ, 2 cm. longæ, in sicco rugosæ, ad nodos dilatatæ. Pedunculi foliis breviores, vaginas perforantes, 5 cm. longi, rigidi, infra racemum bracteis tubularibus, 1 mm. longis, oblique truncatis, 3–4. Bracteæ flores subtendentes rigidæ, triangulares, squamiformes, ± 1 mm. longæ, acutæ, quam pedicellus breviores, circiter 1 mm. distantes. Flores purpurei, ± 6, pedicellus cum ovario 7 mm. longus. Sepala lateralia inæqualiter obovata, obtusa, circiter 4 mm. longa, vix 3 mm. lata, in sicco membranacea. Sepalum dorsale concaviusculum, oblongi-ellipticum, acutum. Petala inæqualiter oblongi-elliptica, 3 mm. longa, circiter 2 mm. lata, obtusa. Labellum utriculosum, trilobatum. Lobi laterales erecti, carnosi, rotundato-quadrati, circiter 2 mm. longi. Lobus medius 1 mm. longus, quam lobi laterales multo minor, semiorbicularis, obtusus, papilla minuta instructus, prope basim callo erecto, truncato emarginato, antice sulcato. Saccus utriculosus, septatus, ad apicem bilobatus, 5 mm. longus. Gynostemium 2 mm. longum; rostellum elongatum, porrectum ut in Camarotibus typicis. Pollinia 2, globosa, glandula parva orbiculare, stipite lineari 1.25 mm. longo.

The septum of the labellum on the posterior wall of the sac, just above the middle, apparently divides to form a horizontal quadrate plate of tissue; on the anterior wall of the sac the septum forms the dividing wall between two compartments which in front rise as high as the middle of the sac. In habit similar to *Camarotis Mannii* King & Pantling, but with very different inflorescence and labellum. *C. sterrophylla* J. J. Smith from Celebes is different from *C. utriculosa* in the details of the labellum.

Mindanao, District of Cotabato, *C. B. Robinson Bur. Sci. 11701*, June 27, 1910. Altitude 5 meters. Column and base of lip white, otherwise the flowers are deep purple. Luzon, collector unknown. Described from specimens flowering in the collection of the Bureau of Science at Manila, August, 1908. Province of Cavite, *A. R. Ward s. n.* Flower rather light purple. Bloomed in Manila, September, 1913.

97. SARCANTHUS *Lindl.*

The genus Sarcanthus, as now understood, includes those species which bear on the posterior wall of the spur, just below the column, a fleshy, variously formed callus, and on the anterior wall either well-defined calli or conspicuous thickenings. The septum in the labellum, which has usually served as a distinguishing trait of Sarcanthus, may be obsolete.

1. *Sarcanthus bifidus comb. nov.* Saccolabium bifidum *Lindl.* in Bot. Reg. 24, Misc. p. 3. Specimens from Leyte which I have referred to *Saccolabium bifidum* Lindl. are here described in detail, as the original description is very brief. Stems rooting, 4–8 cm. long. Roots fibrous, numerous, elongated. Leaves coriaceous, 5–10 cm. long, 1.5–2.7 cm. wide, oblong or elliptical, variable in the same plant, at the apex unequally bilobed, the sheathing bases concealing the stem. Peduncle 9–17 cm. long, pendulous, smooth, longer than the leaves, with several bracts below the small flowered raceme. Bracts of the inflorescence triangular-lanceolate, acute, shorter than the pedicels, scarious, about 3 mm. long. Pedicels

and ovaries smooth, slender, up to 8 mm. long. Lateral sepals oblong, subfalcate, obtuse, 3 mm. long, up to 1.5 mm. wide. Upper sepal elliptic-oblong, slightly concave, obtuse, 2.5 mm. long. Petals oblong, at the apex attenuated, scarcely acute, about 2 mm. long, 1 mm. wide. Labellum calcarate, three-lobed, middle lobe triangular at base with a jointed, fleshy, narrowly triangular, setaceously bifid appendage. Lateral lobes linear, longer than the gynostemium, erect, obtuse, about 2 mm. long, hardly .5 mm. wide. Spur about 3 mm. long, near the mouth constricted, provided with a small fleshy callus on the posterior wall beneath the column, the tip inflated. Gynostemium fleshy, in front at the apex two-winged, the wings quadrate. Pollinia two.

In Paxton's Magazine of Botany (6 : 262) *Saccolabium bifidum* is referred to in a brief note. Its habit is said to resemble that of some species of Notylia, "the manner in which the flowers are produced, their structure, and exceeding minuteness, being so far as a hasty glance can determine, in complete accordance with the members of that genus." *Sarcanthus bifidus*, of course, has terete stems and is in structure extremely unlike any Notylia species, but to one who knows the characteristics of Notylia the above description in Paxton's Magazine is worth many words of technical description to call to mind the aspect of *S. bifidus*.

The labellum is not unlike that of *Sarcanthus javanicus* J. J. Smith, but the side lobes are oblong and equal the column in length, and the column appears to be different. There is no septum in the spur. The affinities of this species are surely with Sarcanthus, but the structure of the column is that of Robiquetia as I understand that genus. Undoubtedly there will be much more confusion in the group to which this species belongs before matters are simplified, but at the present time the limits of such genera

as Schœnorchis, Sarcanthus, Robiquetia, and Pomatocalpa are so obscure that it is sometimes impossible to ascertain to which one a given species may belong.

To *Sarcanthus bifidus* I refer the following specimens:

LEYTE, Dagami, *C. A. Wenzel 0134*, March 9, 1913. On trees at medium height, 60 meters above sea level. Flowers purple, white, and yellow, odorless. Ormoc, *C. A. Wenzel 058*, December 30, 1912. MINDANAO, Province of Agusan, Cabadbaran, Butuan Road, *C. M. Weber 181*, August 5, 1911. Magugaum, Agusan River, *Weber 142*, June 12, 1911; Tagabaca, *Weber 138*, June 2, 1911. District of Cotabato, Libongan Creek, *Weber 209*, August 20, 1911, *Weber 204*, August 19, 1911. LUZON, Laguna Province, *J. S. Serrato s. n.* (Hb. Ames 13662), September, 1912. MINDORO.

2. Sarcanthus dealbatus (*Lindl.*) *Reichb. f.* in Walp. Ann. 6: 892. Cleisostoma dealbatum *Lindl.* in Bot. Reg. (1843) Misc. p. 5. Herba epiphytica. Caules 1.5–4.5 dm. longi, penduli vel arcuati, internodiis 1.5 cm. longis. Folia linearia, acuta, valde carnosa, in sicco ut videtur teretia, sed vere plana, elongata, ± 2 dm. longa, vix 1 cm. lata, in sicco valde rugosa, ad apicem subulata et fragilis, vaginis persistentibus caulem obtegentibus. Vaginæ internodiis æquilongæ vel longiores, rugosæ, in longitudinem striatæ, usque ad 3.5 cm. longæ. Pedunculi subsimplices vel ramosi, multiflori, folia æquantes vel excedentes, ± 1.5 dm. longi, graciles, glabri, infra racemum pauci-bracteati, bracteis tubularibus, oblique truncatis. Racemi usque ad 1 dm. longi, laxiflori, sæpius ramis alternis. Flores mediocres e basi sacci usque ad apicem sepali dorsalis vix 1 cm. longi. Bracteæ inflorescentiæ minutæ acutæ. Pedicellus cum ovario circiter 4 mm. longus. Sepala lateralia spathulata, obtusa, vix 4 mm. longa, prope apicem 2 mm. lata. Sepalum dorsale subsimile, acuta. Petala oblonga, leviter falcata, subacuta, 3 mm. longa, 1.5 mm. lata. Labellum crassum, trilobatum, calcaratum, basi margine postico loborum lateralium pedi gyno-

stemii brevissime adnatum; lobi laterales oblique triangulares, acuminati, quam lobus medius minores, erecti; lobus medius incrassatus triangularis, concaviusculus, valde acutus, incurvus, circiter 2 mm. longus. Calcar obconicum, 4 mm. longum, subacutum, leviter bilobum, septatum, callo conspicuo carnoso bilobo in pariete postico. Gynostemium 1.5 mm. longum; stipes linearis circiter 1 mm. longus.

Allied with *Sarcanthus subulatus* Reichb. f. What appears to be the same species comes from Palawan (C. M. Weber 602). In the dried state the leaves of the specimens collected by Weber are uniformly flat and lack the terete aspect which is possessed by some of the dried specimens I have examined. In both series of specimens the leaves are more or less subulate, and fragile, near the tip. The sac of the lip is not unlike that of *S. subulatus* Reichb. f. from Java.

A very characteristic representation of this species appeared on plate 103, fig. 14, of Petiver's Gazophylacium. This figure was taken from one of the Camelli specimens described in the third volume of Ray's Historia Plantarum.

For a sketch of Lindley's type at Kew I am indebted to Sir David Prain. This sketch leaves no room for doubt regarding the species Lindley described under *Cleisostoma dealbatum* in the Botanical Register of 1843. A colored sketch of a single flower shows the sepals and petals yellow stained with a brownish-red color, and the labellum white, tinged with pale magenta on the front.

LEYTE, Dagami, *C. A. Wenzel 021*, October 25, 1912. On trees of medium height. Altitude 60 meters. Flower odorless, purple, white, yellow, and brown. LUZON, PALAWAN, MINDANAO.

3. *Sarcanthus micranthus sp. nov.* Herba epiphytica circiter 3 dm. alta, subpendula. Caulis ± 5 cm. in diametro, superne leviter

complanatus. Folia disticha, valde coriacea, ± 1 dm. longa, usque ad 2 cm. lata, ad apicem inæqualiter bilobata, ligulata, linearia vel anguste lanceolata. Vaginæ foliorum arcte adpressæ, internodiis æquilongis, caulem obtectæ, ± 2 cm. longæ. Inflorescentiæ oppositifoliæ, ± 1.5 dm. longæ, rigidæ, paniculatæ. Pedunculus ± 8 cm. longus, circiter 2 mm. in diametro, ascendens, folia æquantes vel excedentes, rami paniculæ ± 4 cm. longi, multiflori. Bracteæ inflorescentiæ rigidæ, squamiformes, acutæ, circiter 1 mm. longæ. Sepala lateralia leviter carinata, oblonga, obtusa, margine involuto, ad apicem cucullata, 3 mm. longa, circiter 1.5 mm. lata. Sepalum dorsale simile. Petala spathulato-lanceolata, subacuta, vix 3 mm. longa, circiter 1 mm. lata supra medium. Labellum trilobatum, lobi laterales triangulares, erecti, valde acuti; lobus medius rotundato-triangularis, obtusus, carnosus, latior quam longior, circiter 1 mm. longus. Saccus scrotiformis, valde obtusus, 2.5 mm. longus, intus in pariete antico bicallosum, in pariete postico callus bilobus in fauce sacci; septatus, septo in carinam reducto. Gynostemium carnosum, breve, pede subobsoleto. Pollinia 4, in corpuscula 2 unita.

Sarcanthus micranthus is related to *S. paniculatus* J. J. Smith, and to *S. racemifer* Reichb. f. The habit of *S. micranthus* is more slender, however, and the smaller flowers are in fewer branched panicles than in *S. racemifer*.

The callus on the posterior wall of the sac is scale-like and retuse rather than bilobed. The calli on the anterior wall near the base of the middle lobe are fleshy and somewhat elongated. On the middle of the lobe itself there are two folds of tissue which are diagonally situated, and which converge, but do not unite, near the tip of the middle lobe. The septum at the base of the sac is very weakly developed. In several flowers examined the calli of the sac were almost absent.

Elmer's 9244 from Taybas Province, Luzon, which is represented in my herbarium by a specimen in fruit, is a duplicate of material referred tentatively by Dr. R. Schlechter to *S. striolatus* Reichb. f. This specimen appears to belong to *S. micranthus*.

LEYTE, Jaro, *C. A. Wenzel 0181*, September 19, 1913. Epiphyte in forest, 60 meters above sea level. Flower green and white. BASILAN, LUZON, MINDANAO.

4. *Sarcanthus pachyphyllus sp. nov.* Herba valida, 5 dm. alta. Caules 3 cm. in diametro. Folia rigida, carnosa, falcata, ad apicem inæqualiter bilobata, lobis obtusis, ±4 dm. longa, circiter 4 mm. lata (in sicco conduplicata), valde rugosa, disticha. Flores inodori, sordido-albidi, in maturitate flavidi. Inflorescentia paniculata, multiflora, floribus confertis, circiter 4 dm. alta. Pedunculus rigidus 4 mm. in diametro, bracteatus, bracteis cupuliformibus, 3 mm. longis, vaginatis. Bracteæ inflorescentiæ squamiformes, triangulares, acutæ, circiter 1 mm. longæ. Pedicellus cum ovario circiter 4 mm. longus. Sepala lateralia inæqualiter elliptica extus leviter carinata, 4 mm. longa, 3 mm. lata, carnosa, subacuta. Sepalum dorsale concavum, ellipticum, obtusum. Petala oblongi-elliptica, obtusa, 4 mm. longa, vix 2 mm. lata, carnosa. Labellum trilobatum, lobi laterales triangulares, acuti; lobus medius rotundato-sagittatus, 2 mm. longus, 3.5 mm. latus, verrucosus, ad basim utrinque callo tuberculato, pubescente, ornatus. Saccus 3 mm. longus, obtusus, in pariete postico lamella subquadrata, carnosa, 1.75 mm. longa, circiter 1 mm. alta, ad apicem truncata, minute pubescens. Gynostemium carnosum, 1.5 mm. longum.

The laterally flattened callus on the posterior wall of the sac of the labellum is situated just below the column and reaches across the opening of the sac nearly to the base of the mid-lobe. The calli on the anterior wall are decurrent on the lateral lobes, and appear to be connected by a thickening of the tissues at the

base of the middle lobe. This thickened area forms a lip or crescent-shaped ridge which is depressed over the opening to the sac. There is no septum in the sac.

Luzon, Albay Province, slopes of Mayon Volcano, *W. Schultze s. n.* Flowering in Manila, May, 1912. Lip pale purple at anthesis, soon turning brown. Rizal Province, *W. S. Lyon 65*. Labellum amethystine purple.

5. Sarcanthus ringens *J. J. Smith* in Nat. Tidjs. von Ned.-Ind. 72 : 93. Cleisostoma ringens *Reichb. f.* in Gard. Chron. (1888) 2 : 724. "Foliis ligulatis apice bilobis brevibus, valde cartilagineis racemo paucifloro, secundifloro; sepalis ligulatis obtusa acutis; tepalis lanceis acutis, labelli calcari amplo apice retuso nunc emarginato, callo carnoso sub columna basi sub columna utrinque retrorsum unicruris, cruribus calcaris apice spectalibus, apice versus calcaris apicem emarginato, septo Sarcanthideo procalcari; columna gracilis. Ex insulis Philippinis." Reichb. f. *l. c.* I only know this from the description. It is said to have been imported with *Phalænopsis Sanderiana*. Leaves 3 to 4 inches long, $1\frac{1}{2}$ inches wide. The purple peduncle bears very few flowers, which are the size of those of *Phalænopsis Parishii* Reichb. f. The stalked ovaries were described as light ochre-yellow. Sepals and petals ochre-yellow. Mid-lobe of the labellum purple.

6. Sarcanthus sagittatus (*Bl.*) *J. J. Smith* Orch. Jav. 607. Cleisostoma sagittata *Bl.* Bijdr. 363, f. 27.

Among the Philippine species of Sarcanthus, *S. sagittatus* is characterized by the sagittate terminal lobe of the labellum, by the fleshy hammer-head shaped callus which closes the opening to the cylindrical obtuse sac, and by the nearly obsolete septum. *S. sagittatus* is a native of Java. The lateral lobes of the lip of the Philippine specimens are not so acute as the lateral lobes in J. J. Smith's figure published in the volume of plates which illustrate his Die Orchideen von Java.

PALAWAN, Alfonso XIII, *C. M. Weber 601*, October 1, 1912. On mangrove trees, at sea level. Flower brown-green. Labellum pink. Also Java.

7. Sarcanthus striolatus *Reichb. f.* in Gard. Chron. (1882) 2: 168. "Aff. *Sarcantho racemigero* (pallido, tricolori); foliis ligulatis sat brevibus apice obtuse et inæqualiter bilobis; floribus paniculatis; sepalis oblongo-triangulis obtuse acutis; tepalis ligulatis obtuse acutis, labelli partitionibus lateralibus triangulis, partitione mediana triangula transversa carnosissima, calcari æqualiter cylindrato apice emarginato.—Ex Philipp. ins. Imp. hort. cl. Low." Reichb. f. *l. c.* In my herbarium there is a specimen in fruit, Elmer 8244, from Luzon. Schlechter has referred this number tentatively to *S. striolatus*. This appears to be conspecific with *Sarcanthus micranthus* Ames.

MINDANAO ? LUZON ?

8. *Sarcanthus Weberi sp. nov.* Herba epiphytica, ± 1.5 dm. alta, gracilis. Folia alterna, subteretia, coriacea, acuta, in sicco longitudinaliter sulcata, ± 5.5 cm. longa, in sicco 2 mm. in diametro. Vaginæ foliorum caulem obtectæ, vix 1 cm. longæ, arcte adpressæ. Pedunculus folia excedens, circiter 1.2 dm. longus, ascendens, rigidus. Racemus laxiflorus, circiter 9 cm. longus. Bracteæ inflorescentiæ squamiformes, pedicello multo breviores. Pedicellus cum ovario circiter 9 mm. longus. Flores mediocres, carnosi. Sepala lateralia ovato-oblonga, obtusa, 3.5 mm. longa, 2 mm. lata. Sepalum dorsale concavum, ellipticum, obtusum, oblique erectum, circiter 3 mm. longum. Petala spathulata, obtusa, 2.5–3 mm. longa, circiter 1.5 mm. lata. Labellum rigidum, carnosum, calcaratum, basi margine postico loborum lateralium pedi gynostemii adnatum, trilobatum, lobi laterales erecti, triangulares, obtusi, minuti, .5 mm. longi; lobus medius quam lobi laterales multo major, 2 mm. longus, minute puberulus, triangulari-cymbiformis,

ad apicem breviter reflexus, truncatus, inferne incrassatus, superne ad basim inter lobos laterales callosus, callo papillari. Saccus scrotiformis 2 mm. longus. Totum labellum circiter 5 mm. longum, intus, ad faucem calcaris, puberulus, callo conspicuo, puberulo, subpanduriformi in pariete postico, prope pedem gynostemii, ad basim calcaris, septatum. Gynostemium minute puberulum.

MINDANAO, District of Davao, *C. M. Weber 252*, September 7, 1911. Epiphyte on mangrove trees in tidal swamp. Sepals brownish green, the upper one with a median purple stripe, petals similar, labellum pink. District of Cotabato, *H. N. Whitford For. Bur. 11825*, March, 1912. LUZON, Province of Bataan, *F. W. Foxworthy Bur. Sci. 5607*, August, 1908.

98. POMATOCALPA *Breda*

A number of species which have been referred by authors to Cleisostoma or Saccolabium belong to the genus Pomatocalpa *Breda*.

Cleisostoma chrysochilum Kränzl. in Fedde Rep. 8 : 545 is unknown to me. From the description J. J. Smith is inclined to believe that it belongs to Trichoglottis. Kränzlin cites *Pomatocalpa bicolor* as a near ally. *Cleisostoma ionosmum* Lindl. is *Trichoglottis ionosma* J. J. Smith. *Cleisostoma rosea* Lindl. in Bot. Reg. 24 : Misc. p. 80 (1838), from a sketch of the type in my herbarium, appears to belong to Trichoglottis. *Cleisostoma subviolaceum* Reichb. f. in Bonplandia 10 : 335 (1882) is unknown to me. "Pedunculo fractiflexo, paucifloro, parvifloro; bracteis navicularibus ovariis pedicellatis brevioribus; labelli auriculis triangulis apice inflexis retusis, lamina ovali apiculata, lineis geminis confluentibus a basi in discum, inter se velutinis, dente lineari subulato antice sulcato sub fovea elongato, androclinio obliquo apice in rostellum prono." Reichb. f. *l. c.* *Cleisostoma vitellinum* Reichb. f. in Linnæa 41 : 76 is unknown to me. "Racemo elongato decurvo, bracteis setaceis decurvis ovaria pedicellata superanti-

bus, sepalis tepalisque ligulatis obtuse acutiusculis, labelli laciniis lateralibus retusis, inter se callo lineari connexis, supra basim laciniæ mediæ transversæ ovatæ apiculatæ, callo tabulari postice in ostio calcaris subglobosi ovario brevioris. — Rhachis viridis guttis atropurpureis multis. Flores vitellini.

"Ex insulis Philippinis introductam vivam misit dom. Berrington." Reichb. f. *l. c.*

1. Pomatocalpa bicolor *J. J. Smith* in Nat. Tijds. von Ned.-Ind. 72 : 104.

Negros, Luzon, Mindanao, Leyte, Palawan, Bohol.

2. Pomatocalpa expansum *J. J. Smith* in Nat. Tijds. von Ned.-Ind. 72 : 104. Merrill's 589, which Schlechter referred to *Cleisostoma densum* Ridl.? in Perkins' Fragmenta Floræ Philippinæ, belongs here.

Mindanao, Leyte, Luzon, Palawan.

3. Pomatocalpa Kunstleri *J. J. Smith* in Nat. Tijds. von Ned.-Ind. 72 : 105. Cleisostoma Kunstleri *Hook. f.* Ic. Pl. t. 2335.

Negros, Polillo.
Also Perak.

4. Pomatocalpa latifolium (*Lindl.*) *J. J. Smith* in Nat. Tijds. von Ned.-Ind. 72 : 106. Cleisostoma latifolium *Lindl.* in Bot. Reg. 26 : Misc. p. 60. J. J. Smith in the volume of plates which illustrates Die Orchideen von Java gives details of the flower which are in almost perfect agreement with the flower of Weber's plant from Palawan.

Palawan, Alfonzo XIII, *C. M. Weber* 600, October 1, 1912. On mangrove trees. Flowers brown-purple, labellum yellow. Mindanao, Luzon ?
Also Java.

99. TRICHOGLOTTIS *Bl.*

1. Trichoglottis atropurpurea *Reichb. f.* in Linnæa 41 : 30.

"'Humilis, foliis oblongis apice obtusis apiculatis, abbreviatis (pollicaribus);' floribus axillaribus solitariis, sepalis tepalisque oblongis acutis, labello basi utrinque obtuse triangulo auriculato, lamina planiuscula medio trifida, laciniis lateralibus ligulatis retusis antrorsis, lacinia media oblonga acuminata, carina pellita retrorsum bicruri per discum.

"Habeo flores siccos et iconem pictam, juxta quam quæ signis inclusa sunt descripta. Sepala et tepala atropurpurea. Columna et labellum læte purpurea. Carina albo pellita.

"Philippinens. insulæ." Reichb. f. *l. c.*

2. Trichoglottis bataanensis *Ames* Orchidaceæ 1 : 105. With a specimen of this species in my herbarium I find the following note, made at Kew and at the British Museum of Natural History: "Like Cuming 2050. *T. rigida* at Brit. Mus."

Luzon, Palawan.

3. Trichoglottis flexuosa *Rolfe ex Ames* in Ames Orchidaceæ 1 : 107.

Panay, Luzon, Mindanao, Bohol.

4. Trichoglottis ionosma *J. J. Smith* Nat. Tijds. von Ned.-Ind. 72 : 109. Cleisostoma ionosmum *Lindl.* in Bot. Reg. (1847) t. 41.

Luzon.

5. Trichoglottis latisepala *Ames* in Phil. Journ. Sci. 4 : 675.

Lumbucan, Palawan, Luzon, Mindanao.

6. *Tricoglottis luzonensis sp. nov.* Radices validæ, elongatæ, glabræ. Caulis abbreviatus, circiter 6 cm. longus, complanatus, validus, quinquefoliatus. Folia disticha, conferta, imbricata, lorata, ad apicem inæqualiter obtuse biloba, usque ad 2 dm. longa, 2.7–3.2 cm. lata, coriacea, patentia, ad basim leviter attenuata, in sicco nervosa, quam pedunculus breviora. Pedunculus vaginam perforans, 8.4 dm. longus, rigidus, circiter 4 mm. in diametro,

glabrus, erectus. Inflorescentia paniculata, 14-flora, rami 3–5 cm. longi, 3–4 flori. Pedicellus cum ovario 14 mm. longus, rigidus, glabrus. Bracteæ inflorescentiæ squamiformes breves, bracteæ caulis tubulares, 2 mm. longæ. Flores usque ad 3.2 cm. in diametro, carnosi. Sepala lateralia unguiculato-spathulata, obtusa, circiter 1.6 cm. longa, 7 mm. lata supra medium, in sicco prominente nervosa. Sepalum dorsale spathulatum, obtusum, 1.8 cm. longum, circiter 6 mm. latum supra medium, ad basim attenuatum. Petala simile. Labellum trilobatum, leviter saccatum, 1.2 cm. longum, pubescens; lobi laterales erecti, triangulares, 4 mm. alti, subacuti, carnosi, intus et extus minute pubescentes; lobus medius carnosus, rigidus, oblongus, 7 mm. longus, dense setigerus, extus prominente carinatus, prope basim callo papilliformi. Ligula carnosa obtusa vel truncata, minute pubescens ante foveam. Calcar brevissimum 2 mm. longum, obtusum, pubescens. Gynostemium 5 mm. longum, dense pubescens. Anthera cucullata dense pubescens. Pollinia 4, in globulos 2 unita, inæqualia.

In habit somewhat similar to *Trichoglottis ionosma* (Lindl.) J. J. Smith. The type consists of a single specimen, which does not show any tendency toward the production of an elongated stem. The labellum suggests the labellum of *T. pantherina* J. J. Smith. At the base of the bristly middle lobe is a slight depression of the disc in which there is a small papilla-like callus, just as in *T. ionosma*. The structure of the labellum and the larger flowers serve to distinguish *T. luzonensis* from *T. ionosma*, its nearest ally in the Philippines. The loosely paniculate inflorescence is generically interesting.

In my herbarium there is a specimen from Agusan Province, Mindanao, collected by C. M. Weber (103), which I assume may be conspecific with *T. luzonensis*. It is a specimen in fruit, but

the remains of one flower show a labellum similar to that of *T. luzonensis*. Should my assumption prove correct, the description of the type would need modification, as Weber's specimen has an elongated stem with the leaves 2–3 cm. apart.

Luzon, Province of Tayabas, Baler, *L. Escritor Bur. Sci. 21199*, June 26, 1913.

7. Trichoglottis mindanaensis *Ames* in Phil. Journ. Sci. 8 : 439.

Luzon, Mindanao.

8. Trichoglottis Solerederi *Kränzl.* in Fedde Rep. 8 : 98.

9. Trichoglottis Wenzelii *Ames* in Phil. Journ. Sci. 8 : 440. T. retusa *Ames* in Phil. Journ. Sci. 4 : 676, not *Bl.*

Leyte, Mindanao, Luzon, Negros, Basilan.

100. MICROSACCUS *Bl.*

1. *Microsaccus Wenzelii sp. nov.* Planta pusilla, epiphytica. Radices in basi caulium. Caules dependentes (?) usque ad 1 dm. alti, circiter 3 mm. in crassitudine, cum foliis usque ad 4 cm. lati, vaginis foliorum persistentibus obtegentibus; internodia brevia vaginis omnino tecta, 3 mm. longa. Folia biseriata, patentissima, equitantia, crasse carnosa, lateraliter compressa, oblonga a latere visa, dorso et apice acutangula, obtusa sed e basi sensim angustata, in sicco valde rugosa, usque ad 2 cm. longa, circiter 5 mm. alta, supra canaliculata. Inflorescentiæ axillares, brevissimæ, 1(–2) floræ. Pedunculus folii vaginis æquilongus. Bracteæ ovatæ vel orbiculares, valde concavæ, extus leviter carinatæ, membranaceæ, usque ad 5 mm. longæ. Flores parvi, albi. Sepala lateralia, leviter falcata, obtusa, extus, prope apicem, carinata, trinervia, vix 5 mm. longa, 2 mm. lata. Sepalum dorsale sepalis lateralibus minus, ad apicem cucullatum et incrassatum vel carinatum, 4 mm. longum. 1.5 mm. latum, trinervium. Petala oblongi-lanceolata, uninervia, obtusa, 3 mm. longa, 1 mm. lata. Labellum calcaratum, sub-

spathulatum vel cuneato-obovatum, ad apicem obscure trilobatum, in disco bicallosum. Lamina incrassata cum calcari 7 mm. longa, ad apicem 3 mm. lata. Calcar circiter 2 mm. longum, scrotiforme, emarginatum. Gynostemium brevissimum. Fructus 7 mm. longus.

Microsaccus Wenzelii is closely related to *M. brevifolius* J. J. Smith, from which it differs in habit and in the form of the sepals and petals. Where the column unites with the labellum in front there are two thickenings on the disc at the entrance to the saccate spur. *Microsaccus Wenzelii* is the first species of its genus recorded as a native of the Philippine Islands.

LEYTE, Dagami, *C. A. Wenzel 039*, October 25, 1912. On trunks and branches of trees, 60 meters above sea level. Flowers with violet odor, pure white.

101. TÆNIOPHYLLUM *Bl.*

1. Tæniophyllum compactum *Ames* ORCHIDACEÆ 2 : 243. Microtatorchis compacta (*Ames*) *Schltr.* in Fedde Rep. 10 : 209.

LUZON.

2. Tæniophyllum Copelandii *Ames* in Phil. Journ. Sci. 8 : 436.

MINDANAO.

3. Tæniophyllum Elmeri *Ames* in Elmer's Leaflets of Phil. Bot. 5 : 1589.

NEGROS.

4. Tæniophyllum Merrillii *Ames* in Phil. Journ. Sci. 6 : 56.

LUZON.

5. Tæniophyllum philippinense *Reichb. f.* Otia bot. Hamb. 53.

LEYTE, MINDANAO, LUZON, PALAWAN.

SUMMARY OF NEW SPECIES

NEW COMBINATIONS AND NEW NAMES PROPOSED IN THE PRESENT VOLUME

NEW PHILIPPINE SPECIES

Habenaria Vanoverberghii, 15; H. Zephyrica, 16.

ADDENDUM

Vanda clitellaria *Reichb. f.* in Flora 55 : 277. Reichenbach described this species from material collected by the Wilkes Expedition. The source of the type is given as Mangs Islands. Mr. Elmer D. Merrill writes that Mangs is a misprint for Mangsi or Mangsee, small islands in the Sulu Sea not far from Balabac. The locality from which *V. clitellaria* was obtained is written Mangsi on the original label that accompanies the Wilkes specimen preserved in the Gray Herbarium. *V. clitellaria* is closely allied to *V. lamellata* Lindl., and is perhaps only a form of it.

Mangsi Islands. *Wilkes Expedition.*

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spathulatum vel cuneato-obovatum, ad apicem obscure trilobatum, in disco bicallosum. Lamina incrassata cum calcari 7 mm. longa, ad apicem 3 mm. lata. Calcar circiter 2 mm. longum, scrotiforme, emarginatum. Gynostemium brevissimum. Fructus 7 mm. longus.

Microsaccus Wenzelii is closely related to *M. brevifolius* J. J.

Luzon.

5. Tæniophyllum philippinense *Reichb. f.* Otia bot. Hamb. 53.
Leyte, Mindanao, Luzon, Palawan.

SUMMARY OF NEW SPECIES

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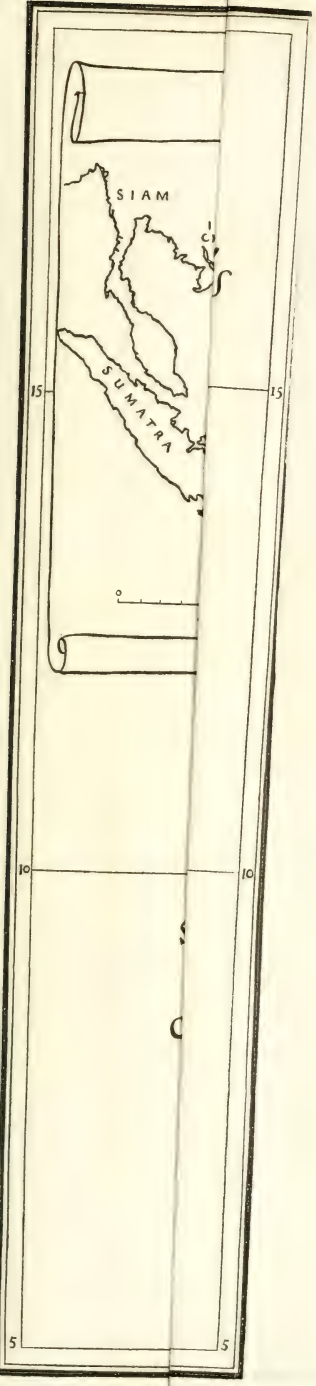
SIAM
SUMATRA
15
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THE
East India
Islands
SIAM
INDO CHINA
Philippine Islands
BORNEO
SUMATRA
JAVA
CELEBES
MOLUCCAS
NEW GUINEA
THE
Philippine Islands
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Babuyanes Is.
Polillo I.
MANILA
Ketanduanes
Lubang I.
Mindoro I.
Burias I.
Masbate I.
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Negros I.
Cebu
Bohol
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Siargao
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Nangalao
Palawan I.
Dumaran I.
Bugsuk I.
Balabac I.
Mindanao I.
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Jolo I.
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120°
125°
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10
5

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