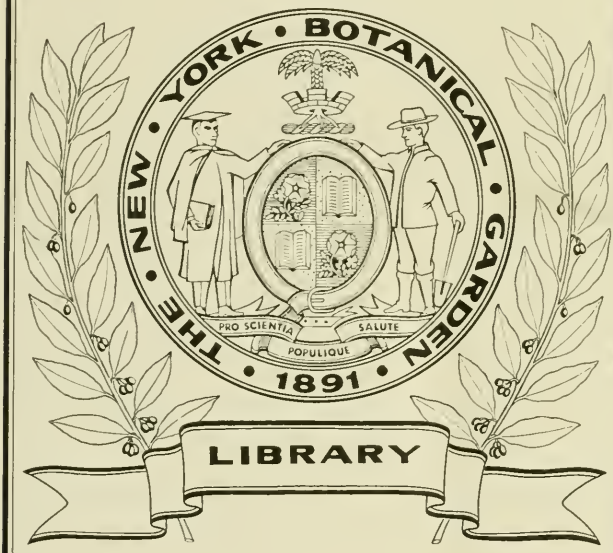
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NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, I.

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Reprinted from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government, Manila, P. I.
Vol. IV, No. 5, Section C, Botany, November, 1909

MANILA
BUREAU OF PRINTING
1909

39218

THE PHILIPPINE

JOURNAL OF SCIENCE

C. BOTANY

VOL. IV NOVEMBER, 1909 No. 5

NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, I.*

By OAKES AMES.

(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

It has been suggested by Dr. Fritz Kränzlin that the species of *Dendrochilum* which I have assigned to the section *Acoridium* ought to constitute a distinct genus. Dr. Kränzlin asserts that the form of the labellum is quite distinctive in *Acoridium* on account of its likeness to the letter E. When I studied *Dendrochilum tenellum* in the preparation of Fascicle I of "Orchidaceae" I felt strongly that it belonged to a genus entirely distinct from *Dendrochilum* because of the absence of stelidia from the column and of the peculiar subfiliform leaves. Since then I have been convinced by a study of more material that *Acoridium* belongs to *Dendrochilum*. In the first place, the E-formed labellum on which Dr. Kränzlin lays emphasis is only characteristic of a majority of the species of the section *Acoridium* and is not found in *D. turpe, D. oliganthum, D. hastatum, D. Merrillii* and *D. ocellatum,* which clearly belong to the section. In the second place the lack of stelidia in the species of § *Acoridium* is not a wholly satisfactory differentiating character between it and § *Platyclinis*. It is not satisfactory because the lack of stelidia expresses a condition which is approached by well-defined species of *Dendrochilum* such as *D. palawanense* and because *D. Merrillii* in which the stelidia are absent from the column is in every other respect a well-marked species of *Dendrochilum* § *Platyclinis*. Furthermore, there is no habital distinction by which to separate the species of *Acoridium* from *Dendrochilum*. The linear leaf characteristic of *D. tenellum, D. sphacelatum*

* Proof corrected by E. D. Merrill and C. B. Robinson.

and *D. luzonense* passes into the broadly lanceolate leaves of *D. Merrillii* through such species as *D. graminifolium, D. tenuifolium, D. turpe* and *D. philippinense*. The calli on the labellum of *D. tenue, D. parvulum* and *D. venustulum* are not characteristic of *Acoridium* as a whole and consequently are worthless in the consideration of generic segregation. After eliminating the characters which I have named there is nothing further, in my opinion, which may be reasonably regarded in an attempt to form a distinct genus with the species of § *Acoridium*.

Through an unfortunate oversight on the part of Dr. Kränzlin, who completed the *Coelogyninae* for "Das Pflanzenreich," left unfinished by Dr. Pfitzer, the titles on my plates of *Dendrochilum* species were overlooked. These plates were practically duplicates of the set prepared for Fascicle II of "Orchidaceae," and were loaned to Dr. Kränzlin to facilitate his work on species which I had recently described. I believed that Dr. Kränzlin would understand from the legends on the plates that in my forthcoming volume *Acoridium* would be displaced by *Dendrochilum*. As it turned out Dr. Kränzlin failed to observe the change in my work indicated by the plates and as a result an unlooked-for controversy ensued in which Dr. Kränzlin insisted [1] that the plates loaned to him were inscribed with the generic name *Acoridium*. Here again Dr. Kränzlin erred, as a subsequent examination proved the correctness of my assertion to the effect that the loaned plates were inscribed with the generic name *Dendrochilum*. Dr. Kränzlin's work preceded mine, for which the plates were prepared, and consequently the changes in "Orchidaceae" Fasc. II, which were made at the end of the introduction were necessary. Dr. Kränzlin himself directed my attention to his unfortunate oversight.

DENDROCHILUM Bl.

D. (§ Acoridium) pulogense sp. nov.

Pseudobulbi congregati, pyriformes, in sicco rugosi plus minus 1 cm longi, juniores vaginis subacutis mox in fibras solutis inclusi. Folia acuta vel obtusa, linearia, 2–7.5 cm longa, circa 2 mm lata. Petiolus pergracilis. Pedunculus gracilis, filiformis, 4–10 cm longus. Bracteae inflorescentiae glumaceae, pedicellum brevem et ovarium multo excedentes. Inflorescentia laxiflora. Flores 6–10. Rhachis vix flexuosa. Sepala lanceolata, acuminata, acuta, 1-nervia, circa 3 mm longa plus minus 1 mm lata. Petala sepalis similia, ovata vel rotundata, valde acuminata, 1-nervia, 3 mm longa. Labellum 3-lobatum, lobi laterales membranacei semicrescentiformes, obtusi, lobus medius tridentatus. Calli 3, unus ad basim lobi lateralis utriusque, unus in medio partis saccatae labelli. Columna minuta, columnae *Dendrochili tenelli* similis.

This species is represented in the herbarium of the Bureau of Science by two collections, both of which were made by the same collectors on Mount Pulog.

[1] Orchis 2: 78.

No. 16342 was found at an altitude of 2,500 m, and according to the notes made by the collectors had flesh-colored flowers. The foliage of no. 16347 is very variable, (only one plant of no. 16342 was found), so much so that at first glance two distinct species appear to be mingled. *Dendrochilum tenue* (Ames) Pfitzer and *D. parvulum* (Ames) Pfitzer are very close affinities of *D. pulogense*.

Mount Pulog, Province of Benguet, Luzon, January, 1909, *For. Bur. 16347* (type), *16342 Curran, Merritt & Zschokke.*

D. (§ Acoridium) auriculare sp. nov.

Pseudobulbi congregati, longitudinaliter rugosi, subpyriformes, circa 2 cm longi, juniores vaginis subacutis mox in fibras solutis inclusi. Folium cum petiolo 1–2 dm longum. Lamina 6.5–13 cm longa, 1.5–2.7 cm lata, oblongi-lanceolata, acuminata, acuta vel subobtusa. Petiolus gracilis, 1.7–6 cm longus. Pedunculus subfiliformis, multo folium excedens, plus minus 2 dm longus. Bracteae inflorescentiae glumaceae, pedicellum brevem et ovarium multo excedentes. Flores in racemo laxo dispositi, albi. Sepala lateralia ovato-lanceolata, 3-nervia, 7 mm longa, 4 mm lata. Sepalum superius oblongum vel oblongi-ellipticum, 7 mm longum, 3.5 mm latum. Petala rotundato-elliptica vel rotundato-ovata, 6.5–7 mm longa, 4.5–5 mm lata, 3-nervia. Labellum 4.5 mm longum, 3-nervium, 3-lobatum; lobus medius subreniformis, lateralibus major, 3.5 mm longus; lobi laterales auriculares, 1.5 mm longi, inter eos in disco labelli callus magnus. Columna sectionis, circa 2 mm longa.

In general aspect *Dendrochilum auriculare* suggests *D. Hutchinsonianum* Ames, although analysis of the flowers shows clearly the differences between the two species. The lateral lobes of the labellum in *D. Hutchinsonianum* are distinctly linear-falcate, while in *D. auriculare* they are auriculate, much reduced in size and much shorter than the middle lobe (cf. Orchidaceae **2**: 96, *fig.*). *D. auriculare* is one of the largest-flowered species of the *Acoridium* section.

Province of Benguet, Luzon, December, 1908, Maximo Ramos, *Bur. Sci. 5818* (type). Mount Ugo, Province of Benguet, December 17, 1908, Maximo Ramos, *Bur. Sci. 5771.* Collector's note.—"The color of the flowers is nearly white."

D. venustulum (Ames) Pfitzer in Das Pflanzenreich **32** (1907) 116.

Mount Ugo, Province of Benguet, Luzon, December, 1908, Maximo Ramos, *Bur. Sci. 5840.* This species was originally described as *Acoridium venustulum* in the Proceedings of the Biological Society of Washington **19** (1906) 147 and later illustrated in Orchidaceae **2**: 88. It is apparently a rare species as the specimens gathered by Ramos are the only ones, with the exception of the type material, which have been collected for the Bureau of Science.

D. philippinense (Ames) Pfitzer in Das Pflanzenreich **32** (1907) 118.

A very odd form of this species has come from the Lusod-Bayabas trail, Province of Benguet, Luzon, which appears to have smaller flowers than the type. At first I felt no little hesitation in identifying the plants as *D. philippinense*. As all the racemes examined exhibit the peculiarity referred to I have prepared the following description.

Lateral sepals lanceolate, acuminate, acute, about 3.5 mm long, 1.5 mm wide; upper sepal oblong, acute, 3 mm long, about 1 mm wide. Petals acute, 3 mm long, 1.75 mm wide. Labellum 3-lobed, the lateral lobes equaling the middle lobe, linear falcate, about 1 mm long, middle

lobe broader than the laterals, middle lobe oblong, rounded, acute at the apex, 1 mm long, 0.75 mm wide. At the base of each lateral lobe there is a minute rounded callus. Column typical of the section.

The flowers are fleshy and most difficult to dissect as the sepals and petals break under very slight pressure. The labellum is thick and has a conduplicate middle lobe. No comments by the collectors have been made regarding the color of the flowers but in dried specimens those near the base of the raceme are brownish with the labellum yellow, those near the apex yellow. Although the racemes appear to be perfectly normal, flowers have the appearance of keeping partly closed so that even the old ones look like buds. The texture of the flowers is extraordinary and unlike that of any other known species of the genus from the Philippine Islands.

Province of Benguet, Luzon. December 16, 1908, altitude 2,000 m, *For. Bur. 15763 Curran & Merritt.*

D. ocellatum (Ames) Pfitzer in Das Pflanzenreich **32** (1907) 117.

This species, the type of which is represented by a small plant in the herbarium of the Bureau of Science, has been again collected by Bacani. The flowers exhibit the same hyaline dots from which the specific name was derived. These dots are in the form of minute protuberances which give the sepals and petals a verruculose character. According to the collector's notes the flowers are brown.

In the top of a mango tree, Lusod, Province of Benguet, Luzon, December 14, 1908, *For. Bur. 15908 Bacani.*

D. bicallosum Ames Orchidaceae **2** (1908) 117.

This species was originally collected in Mindoro by Elmer D. Merrill at an altitude of about 950 m on Mount Halcon. On October 23, 1907, Curran and Merritt obtained material in Laguna Province, Luzon, which I unhesitatingly refer to *D. bicallosum.* The leaves of several of the specimens from Luzon are longer and broader than those of the Mount Halcon plants, in several being nearly 2 dm long and 5 cm wide. Otherwise there are no conspicuous differences although the plants from Luzon are more luxuriant, a character which may be accounted for by more favorable conditions for growth.

Mount Maquiling, Laguna Province, Luzon, at an altitude of 550 m, in ridge forest; flowers brownish-yellow, October 23, 1907, *For. Bur. 7797 Curran & Merritt.*

D. pumilum Reichb. f. Bonplandia **3** (1855) 222.

Specimens which agree almost perfectly with the Cuming plant in the herbarium of the British Museum of Natural History numbered 2102, the number on which Reichenbach f. founded *D. pumilum,* have been collected in Laguna Province, Luzon, by Curran and Merritt. *Dendrochilum pumilum* is placed among the doubtful plants in the Pfitzer-Kränzlin monograph in Engler's "Pflanzenreich" without reference to the specimen of the type number in the British Museum. From my studies I have been unable to discover any sufficient reason for a total disregard of the evidence which this specimen furnishes. An interesting sidelight on the subject is supplied by a single plant in the Gray Herbarium which was collected in the Philippines by the Wilkes Expedition. This plant is inadequate for a sure diagnosis although it clearly belongs to *Dendrochilum* and is probably conspecific with *D. tenue* Pfitzer. In Reichenbach's handwriting it has been referred with a query to *Dendrochilum pumilum!* Together with Reichenbach's original description and the specimen in the British Museum, the

specimen in the Gray Herbarium seems to me to be of very great interest and value.

Mount Banajao, Laguna Province, Luzon, very common on trees, flowers yellowish-green, November 10, 1907, H. M. Curran and M. L. Merritt, *For. Bur. 8019;* at an altitude of 2,000 m, November 10, 1907, Curran and Merritt, *For. Bur. 8034;* at an altitude of 1,400 m, November 10, 1907, Curran and Merritt, *For. Bur. 8023, 8021.*

D. strictiforme (Ames) Pfitzer in Das Pflanzenreich **32** (1907) 116.

This species was first discovered by Elmer D. Merrill between Suyoc and Pauai in Benguet Province. The present specimen was collected in Laguna Province.

Mount Banajao, Laguna Province, Luzon, at an altitude of 1,400 m, flowers white, November 1, 1907, H. M. Curran & M. L. Merritt, *For. Bur. 8024.*

D. cinnabarinum Pfitzer in Das Pflanzenreich **32** (1907) 104; Ames Orchidaceae **2**: viii; **3**: 10, *pl. 27, II, B, b.*

This very interesting species of the *Dendrochilum pumilum* group has again been found. Messrs. Curran, Merritt and Zschokke collected specimens at an altitude of 2640 m, January 5, 1909, on Mount Pulog, Province of Benguet, Luzon, *For. Bur. 16348.* Until the rediscovery of the species *D. cinnabarinum* was only known through the specimens gathered in Benguet by A. Loher (no. 461).

CESTICHIS Pfitzer.

C. nutans sp. nov.

Pseudobulbi 3 cm longi, pyriformes. Folia oblonga, acuta, 3 dm longa, 2–3 cm lata. Sepala 7 mm longa, 3 mm lata. Petala linearia, 7 mm longa, 0.5 mm lata. Labellum cuneato-flabellatum, 8 mm longum, prope apicem 8 mm latum, callo ad basim. Columna arcuata, 6 mm longa.

C. nutans is a robust species, allied to *C. Merrillii,* with oblong acute leaves which are considerably longer than the winged scape. The raceme is slender and nutant. The flowers according to the collector's notes are brick-red. The labellum is cuneate-flabellate in outline, 2 mm wide at the base, and near the point of union with the column very fleshy, and somewhat channelled.

Camp Keithley, Lake Lanao, Mindanao, May 1907, *Mary Strong Clemens s. n.:* Province of Surigao, April 6, 1906, *F. H. Bolster 289.* Here also belongs the plant collected on Mount Victoria, Island of Palawan, in March, 1906, by F. W. Foxworthy, *Bur. Sci. 638.*

ANGRAECUM Thou.

A. philippinense Ames in Philip. Journ. Sci. **2** (1907) Bot. 336; Orchidaceae **2**: 246; **3**: 69, *pl. 50.*

This species which was originally collected on Mount Halcon by E. D. Merrill, has been found at Imogen, Province Nueva Viscaya, Luzon, where H. M. Curran collected specimens on December 22, 1908, *For. Bur. 10860.* The flowers of the plant collected by Curran have spurs or nectaries about 10 cm long. A comparison between the plants from Luzon and those from Mindoro clearly proves that the spur of the type was not fully developed on the date of collection. This statement is sufficient to account for the discrepancy between the measurements given above and those published in the original description. It is a well established fact that the spurs in orchids increase in length as the flowers

develop. This characteristic is frequently misleading and not unlikely to cause confusion. The leaves of the specimens from Luzon measure 6.5 cm in length and 1.5 cm in width.

The collector's notes state that the plants were found at an altitude of 1,400 m and that the flowers are white and fragrant and very ornamental.

DENDROBIUM Sw.

D. hymenanthum Reichb. f. in Bonplandia 3 (1855) 222; Walpers Annales Botanices Systematicae 6: 302.

This very rare species which was among the novelties secured by H. Cuming (no. 2135) in the Philippine Islands has been twice collected by the botanists of the Bureau of Science. It is closely related to *Dendrobium Micholitzii* Rolfe (cf. Ames Orchidaceae 1: 41, *pl. 11*). The stems are yellow, about 8 cm long, quadrangular, very slender, bifoliate at the summit, with the oblong-elliptic leaves 2–3.5 cm long, 8 mm wide. The flowers, which are borne at the summit of the stem, are fragrant; the mentum is tinged with "purple" outside. Pedicels slender, subfiliform, about 2 cm long. Lateral sepals triangular, acute, prolonged into a stout, curved, obtuse mentum; from tip of sepals to tip of mentum 16 mm long. Upper sepal lanceolate, 7 mm long. Petals similar to the upper sepal, but narrower, 5 mm long. Labellum about 2 cm long, somewhat oblanceolate, dilating gradually from the cuneate base to the rounded, 7 mm wide apex; near the apex is a small crest of short, yellowish hairs.

The director of the Royal Botanic Gardens at Kew has very kindly compared my material with the Cuming specimen preserved in the Kew Herbarium and has assured me that the specimens collected by Ramos are conspecific with the Cuming plant.

Montalban, Province of Rizal, Luzon, W. Schultze, May, 1908, *Bur. Sci. 5610;* Maximo Ramos, July 29, 1907, *Bur. Sci. 3035.* According to Ramos the flowers last a very short time.

Note.—From an excellent photograph which accompanies the plants collected by Ramos it appears that the flowers are produced singly at the summit of the stem.

D. epidendropsis Kränzlin in Orchis 2 (1908) 79, *fig.*

The material which I have identified as *D. epidendropsis* was collected by W. S. Lyon (no. 118). Although a native of the Philippine Islands the exact locality from which Mr. Lyon's plant came is not known. Mr. Lyon flowered it in his garden in November, 1908. He described the flowers as greenish-yellow, coriaceous in texture, wax-like, and both within and without glossy as if varnished. A single leaf, and what appears to be an undersized stem and three flowers constitute the specimen at hand. The leaf is oblong-lanceolate, 7 cm long, 1.5 cm wide, subcoriaceous. The stem is fusiform, clothed with several scarious sheaths, at the summit is a short raceme, 2 cm long, which bears three 3 cm long flowers. The flowers are conspicuous because of the long subfalcate mentum which is 2 cm long and about 3 mm in diameter.

In the herbarium of the Bureau of Science there are three specimens which agree with my interpretation of *Dendrobium epidendropsis.* Two of these were collected on Mount Mariveles, Province of Bataan. The third specimen was taken in the Province of Rizal.

Lamao River, Mount Mariveles, Province of Bataan, Luzon, growing on trees on exposed ridges, at an altitude of 900 m, flower odorless, lip bright, pale-green, petals pale-green with 3 or 4 brown stripes from base to tip, December 10, 1904, T. E. Borden, *For. Bur. 2109;* near same locality, on trees, flowers yellow with

a tinge of red, November, 1904, *A. D. E. Elmer 6839:* Province of Rizal, Luzon, November 23, 1907, Maximo Ramos, *Bur. Sci. 3060.*

NOTE.—The specimens collected by Elmer and Borden have stems up to 2 dm long and narrowly lanceolate leaves, 1.3 dm long, 1–1.9 cm wide. The flowers of the specimen collected by Elmer are, in a dried state, strongly tinged with purple and resemble large flowers of *Dendrobium secundum.* The racemes on all the specimens examined appear to have been few-flowered.

D. Dearei Reichb. f. in Gard. Chron. 52 (1882) 361.

MINDORO, January, 1908, *For. Bur. 8525 Merritt.*

D. (§ Aporum) Merrillii Ames Orchidaceae 2: 181, *fig.*

In Orchis 2: 96, Dr. Kränzlin in a review of "Orchidaceae Fasc. II," criticises rather severely my description of *Dendrobium Merrillii* and suggests that to me the genus *Dendrobium* is a *seven-sealed book.* His reason for this unkind remark is based on the words "Folia . . . conduplicata, explanata 14 mm lata." By these words he understands that *D. Merrillii* is a species with broad leaves and consequently inadmissible as a member of § *Aporum.* Unfortunately the word "explanata" is misleading, although it was intended to indicate that the leaves if spread out would then measure 14 mm in width. As a matter of fact the leaves are characteristic of § *Aporum* and resemble the leaves of such species as *D. atropurpureum* Miq. and *D. sagittatum* J. J. Smith. In his criticism Dr. Kränzlin has quoted from my description and has omitted the word "conduplicata" which I thought was a sufficient offset to the problematical condition expressed by "explanata." The leaves of *D. Merrillii* are in reality equitant and in the type measure 7 mm across in the vertical direction of the stem.

BULBOPHYLLUM Thou.

B. bataanense Ames Orchidaceae 1: 96.

Among living plants sent from Mount Mariveles this species bloomed in May, 1909, in my greenhouse. The flowers are yellowish, faintly tinged with purple and conspicuously nerved with pale-green. The sepals, especially the upper one, are sprinkled with fine purple dots. The labellum is similarly marked with the addition of a bright yellow spot at the base of the cordate apical portion. The original description of this species was prepared from dried material, consequently the color of the flowers could not be given accurately.

Mount Mariveles, Province of Bataan, Luzon, *Elmer D. Merrill,* 1905.

PHALAENOPSIS Bl.

P. Lindenii Loher in Journ. des Orch. 6 (1895) 103.

Among the orchids collected by W. S. Lyon is a specimen of *Phalaenopsis* which is surely conspecific with *P. Lindenii.* It agrees in every detail with the description published in "Le Journal des Orchidées." *P. Lindenii* is described as resembling *P. Schilleriana* in its foliage and as having flowers which suggest those of *P. rosea* (*P. equestris*). Mr. R. A. Rolfe has suggested that Mr. Loher's species may be a natural hybrid resulting from a cross between *P. Schilleriana* and *P. rosea* which would give *P. Veitchiana* Reichb. f. The specimen at hand is not at all in agreement with *P. Veitchiana* as figured and described in horticultural literature. The flowers are about 2.5 cm in diameter and the apical lobe of the labellum is rotund apiculate, 1 cm long by 8 mm wide. The lateral lobes are oblong, obtuse, somewhat dilated at the apex, about 7 mm long, the fleshy callus between the lateral lobes is disc-shaped when spread out. The lateral sepals are somewhat ovate-falcate, 13 mm long, 7 mm wide. The petals are spathulate, obtuse, 16 mm long, 6 mm wide.

Mr. Lyon says that the flowers are very persistent. According to his notes the anterior surface of the column and the lip are rich-purple, otherwise the perianth is light-rosy-purple, each segment marked with seven well defined lines, those on the lip continuous or uninterrupted, those on the sepals and petals broken or formed by dots. The leaves are mottled gray and green and are almost identically like those of *Phalaenopsis Schilleriana* in coloration.

In addition to Mr. Lyon's specimen I have studied three others from the Philippines which I do not hesitate to refer to *P. Lindenii*. Two of these are in the herbarium of the Bureau of Science, the third in the herbarium of the New York Botanical Garden. All of these were collected in Benguet Province, Luzon. The specimen in the New York Botanical Garden collection has larger flowers than the others, these being about 3 cm across, with the rotund apical lobe of the lip about 1.3 cm long by 1.2 cm wide. The tip of the lip is in no way divided and is not at all in agreement with the lip of *P. Veitchiana* as represented in *plate 213* of the Floral Magazine. Until more material has been studied it seems best to adopt Mr. Loher's name for this *Phalaenopsis*. The specimens in the herbarium of the Bureau of Science have a branched inflorescence not unlike that of *Ionopsis utricularioides* Lindl. in general aspect, although much stouter. In Orchis (1: 82, *fig. 37*) this species has been very fully illustrated. The analysis of the flowers is very detailed.

Baguio, Province of Benguet, Luzon, August 24, 1906, H. M. Curran, *For. Bur. 5121, 5122*, flowers light-pink and white; October 21, 1904, R. S. Williams (no. 1947 bis) in hb. New York Botanical Garden; W. S. Lyon (no. 39).

Note: Mr. Lyon says the plant is called *P. Lindenii* at Manila.

AERIDES Lour.

A. Lawrenceae Reichb. f. Gard. Chron. N. S. **20** (1883) 640, 307, 368.

In Orchidaceae **2**: 249. I listed this species, basing my conclusions on a specimen collected by the Rev. R. F. Black in Mindanao. This specimen was fragmentary and my identification was in a way provisional. Another specimen has come to hand from W. S. Lyon which is undoubtedly *A. Lawrenceae*. The flowers are large, about 2.5 cm in diameter and very ornamental. Unfortunately Mr. Lyon forgot the exact locality from which he obtained his specimens which flowered in his garden at Manila.

Philippine Islands, *W. S. Lyon 25*.

HABENARIA Willd.

H. Leibergii Ames Orchidaceae **2**: 34. *fig.*

This species has been collected in Rizal Province by D. LeRoy Topping who found specimens in July, 1908. The type was discovered by J. B. Leiberg on Mount Mariveles in 1904. One of the specimens found by Topping shows an interesting variation from the type in its larger leaves which measure nearly 1 dm in length and 4–5 cm in width. On this luxuriant form the flowers are in a dense raceme, about 20 in number.

Montalban, Rizal Province, Luzon, July, 1908, *Bur. Sci. 5226 Topping*.

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Reprinted from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government, Manila, P. I.
Vol. IV, No. 6, Section C, Botany, December, 1909

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THE PHILIPPINE

JOURNAL OF SCIENCE

C. BOTANY

VOL. IV DECEMBER, 1909 No. 6

NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, II.[1]

By OAKES AMES.

(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

In the following notes I have arranged the genera according to the system adopted by Pfitzer in Engler and Prantl's "Die natürlichen Pflanzenfamilien." The species included were, with few exceptions, collected for the Bureau of Science. In all thirty-one species are treated of which twenty-two are additions to my previously published lists of Philippine orchids.

EPIPACTIS Boehmer.

Epipactis clausa A. A. Eaton ex Ames Orchidaceae 3 (1908) 41, *pl. 38.*

In addition to the solitary specimen which constitutes the type, preserved in the herbarium of the Bureau of Science, I have now seen two sets of specimens which make possible the following emendations of the description published in Fascicle III of "Orchidaceae":

Lateral sepals broadly ovate to ovate-lanceolate, 4 mm long. *Upper sepal* similar to the laterals and nearly equal to them, strongly reflexed at the tip. *Petals* dolabriform, 4 mm long. *Labellum* 2.5 to 3 mm long, saccate, somewhat cymbiform, obtuse, with unequal clavate hairs or emergences inside.

The plants exceed 2 dm in height and arise from a creeping, fleshy rhizome. The leaves, about four in number, 4 cm apart, on the succulent stem, appear to have been dark-green when fresh, ornamented with whitish nerves. The margins of the leaves in dried specimens are usually strongly crenulate and in fresh

[1] Proof corrected by E. D. Merrill and C. B. Robinson.

material it is highly probable that this character is a peculiarity of the species.

When the plants mature their fruit, the racemes enlarge in diameter and the slender raceme represented in "Orchidaceae" Fasc. III is hardly characteristic. Notes made by the collectors indicate that the flowers are white.

According to Mr. Eaton's notes, *E. clausa* is nearly related to *E. pusilla*, from which it differs in its broader petals and deeply cymbiform but not saccate labellum.

Luzon. District of Lepanto, Mount Data, *Merrill 4591*, October 29, 1905, terrestrial in the mossy forest at an altitude of about 2,200 m; Province of Benguet, Mount Santo Tomas, *R. S. Williams 1922*, October 30, 1904.

The specimens gathered by Williams are in fruit, and are preserved in the herbarium of the New York Botanical Garden.

Epipactis rubicunda (Bl.) A. A. Eaton in Proc. Biol. Soc. Wash. 21 (1908) 65.

Of this species there are two specimens in the herbarium of the Bureau of Science which A. A. Eaton identified as *E. rubicunda*. In accordance with the rules of priority and in conformity with the articles of the Vienna code governing nomenclature, Eaton referred to the genus *Epipactis* all the species formerly grouped under *Goodyera*, asserting that the name *Epipactis* appears to have been first used by Boehmer in the third edition of Ludwig's "Definitiones Generum Plantarum." Although Boehmer published no binomial combination he gave several references to the plant designated by Linnaeus as *Satyrium repens*, now generally known as *Goodyera repens* R. Br. or *Peramium repens* Salisb.

The specimens of *Epipactis rubicunda* already referred to are showy plants with elliptic, acuminate leaves nearly 1.5 dm long and with channeled petioles, 3 to 6.5 cm long, which clasp the stems.

The inflorescence is rather densely many-flowered, 1.8 to 3 dm long. The pubescent flowers are about 8 mm long, nearly exceeded by the narrowly lanceolate, pubescent, acute floral bracts.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, September, October, 1906. Luzon, Province of Laguna, *Bur. Sci. 6049 Robinson*, March 5–11, 1908.

For a detailed account of Eaton's reasons for taking up the name *Epipactis* for the species formerly referred to *Goodyera*, his paper cited above should be consulted. The species formerly included in *Epipactis* are placed by Eaton in *Serapias*.

COELOGYNE Lindl.

Coelogyne Rochussenii De Vriese Illustr. Orchid. Indes Oriental. (1854) *t. 2: t. 11, f. VI.*

This species is represented in the herbarium of the Bureau of Science by a single specimen. The leaf is broadly lanceolate or elliptic, acuminate, conspicuously nerved. The lamina is 2.5 dm long, 11 cm wide; the slender petiole exceeds 5 cm in length. The flowers are produced in elongated, flexuose racemes. A scarious elliptic bract, 1.8 cm long, subtends each flower. The sepals and petals are narrowly lanceolate, about 2.5 cm long. The labellum up to the base of the middle lobe is provided with three denticulate carinæ, and beyond the base of the middle lobe two additional, abbreviated carinæ arise. The middle lobe is acuminate.

Although *C. Rochussenii* is referred to the § *Tomentosae* in Pfitzer's monograph of the *Coelogyninae*, the material at hand is sparsely furfuraceous and, with the exception of the ovaries, nearly smooth.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, September, 1907. Flowers yellowish, hillside forests. This species has not hitherto been reported from the Philippines.

Coelogyne integerrima sp. nov.

Aff. *C. cinnamomeae*. *Pseudobulbi* plus minus 6 cm longi, ovoidei, diphylli. *Folia* lanceolata, acuminata, valde 3- ad 5-nervia, plus minus 2 dm longa, circa 3.5 cm lata. *Pedunculus* erectus plus minus 30 cm longus. *Racemus* laxus, bracteis jam dejectis. *Sepala lateralia* carinata, lanceolata, acuta, 2.5 cm longa, 9 mm lata. *Sepalum dorsale* simile. *Petala* linearia, acuta, 3-nervia, 2.5 cm longa, 5 mm lata. *Labellum* integerrimum, oblanceolatum, acuminatum, 2.4 cm longum, 1 cm latum, prope apicem in disco carinae 3.

Coelogyne integerrima belongs to the § *Carinatae* and appears to be closely allied to *C. cinnamomea*, from which it differs in its larger flowers and entire labellum. The leaves are much broader in relation to their length than those of *C. cinnamomea*. The labellum is entire, without lobes. The keels on the disc are smooth and extend from the base to the tip, the lateral ones being more prominent near the middle.

Luzon, Province of Benguet, Mount Pulog, *Merrill 6350*, May, 1909, in the lower mossy forest, altitude about 2,200 m. Flowers greenish-yellow.

PHOLIDOTA Lindl.

Pholidota ventricosa (Bl.) Reichb. f. in Bonplandia 5 (1857) 43.

Dr. Kränzlin has described *Pholidota sesquitorta*, a species which is very close to *P. ventricosa*. J. J. Smith considers them conspecific. In the key to the species of *Eupholidota* in Engler's "Pflanzenreich," *P. ventricosa* is distinguished from *P. sesquitorta* by means of the floral bracts, which exceed the flowers in the former, and in the latter are usually shorter than the flowers. The material which I refer to *P. ventricosa*, including the specimen cited in "Orchidaceae" Fasc. II, has floral bracts which are about equal to the flowers. The key in "Das Pflanzenreich" distinguishes the bracts of *P. ventricosa* by their tips; these being obtuse. In my material the bracts are acute. The description of *P. ventricosa*, in "Das Pflanzenreich" however, says "acutae." The type of *Pholidota ventricosa* in the Leiden Herbarium lacks flowers, so that it is quite difficult to tell much about it except for the analysis published by Blume in his "Tabellen." On the type only the leaves and a naked peduncle remain. On the same sheet with the type a good specimen is mounted which J. J. Smith has identified as *P. ventricosa*. The material I have studied agrees very well with this specimen.

Until the status of *P. sesquitorta* is finally established, I am of the opinion that the Philippine material should be referred to *P. ventricosa*.

Luzon, District of Lepanto, *For. Bur. 5715 Klemme*, October, November, 1906. Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, February, 1907.

DENDROCHILUM Blume.

Dendrochilum anfractoides Ames Orchidaceae 3 (1908) 13, *pl. 28*.

Another specimen of this rare species has come to hand which exhibits all the characters that were referred to in the original description as of value in separating it from *Dendrochilum anfractum*. The middle lobe of the labellum is conspicuously tridentate, the lateral teeth being fleshy and almost like marginal

calli at the base of the membranaceous deflexed middle tooth. The lateral lobes are setaceous, and, when in their normal position, strongly curved upward at the tip. The calli at the base of the labellum are peculiar in that they are linear and curved, not like papillæ. The leaves in the present specimen are scarcely 4 cm long and about equal in length to the naked part of the peduncle.

Luzon, Province of Benguet, Pauai, *Bur. Sci. 4312a Mearns*, July, 1907.

CESTICHIS Thou.

Cestichis Clemensiae sp. nov.

Aff. *C. vestitae* Ames. *Planta* parvula, erecta. *Caules* 3 ad 6 cm alti. *Folia* 2, oblonga, obtusa, 5.8 cm longa, circa 1 cm lata, coriacea, rigida. *Racemus* circa 8 cm longus. *Bracteae inflorescentiae* lineari-lanceolatae, acutae, pedicellis breviores. *Sepala lateralia* oblonga vel elliptica, obtusa, 2 mm longa. *Sepalum dorsale* simile. *Petala* linearia, 2 mm longa. *Labellum* lanceolatum, 2 mm longum, ad apicem valde retusum vel bidentatum. *Columna* arcuata.

C. Clemensiae appears to be a near affinity of *C. vestita* which is a more robust species with much larger leaves and flowers. It is also closely related to *Liparis confusa* J. J. Smith, from which it is readily distinguished by its smaller stems and leaves and by its smaller flowers. The lips of *C. vestita*, *Liparis confusa*, and *C. Clemensiae* are very similar. These species are most easily recognized by the differences in their vegetative parts. It may be that they represent forms of a polymorphic species, but until more material has been studied with this suggestion in mind they should be regarded as distinct from one another. I have seen six plants of *C. Clemensiae*.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens 129*, February, 1906.

OBERONIA Lindl.

Oberonia aporophylla Reichb. f. Bonplandia 3 (1855) 223.

In my second list of the orchids collected in the Philippines for the Bureau of Science this species was included. The material on which determination was attempted consisted of fruiting specimens. Since the publication of Fascicle II of "Orchidaceae" more material has come to hand in which the flowers are in excellent condition for study. The labellum, petals, and sepals agree perfectly with the sketch of a flower of *O. aporophylla* in Lindley's herbarium at Kew, and the habit of the plant is like that of the material, numbered 2113, collected in the Philippines by Cuming. *O. aporophylla* is a slender caulescent species about 2 dm tall with from 10 to 20, triangular, acute, obliquely ascending leaves which are about 2 cm long. The leafy stem terminates in a slender, rather loosely flowered, spicate raceme about 1 dm long. The labellum is subpandurate, emarginate, somewhat auriculate on each side at base, 1.5 mm long, the terminal portion is finely toothed. The petals are linear.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens 699*, September, October, 1906.

POLYSTACHYA Lindl.

Polystachya luteola Hooker Exotic Flora 2: *t. 103.*

I have seen a single plant of this species from Mindanao. In every detail its vegetative and floral parts agree with specimens in my herbarium from Florida, U. S. A., and from Cuba. Flowers from a plant collected near Miami, Florida, when moistened in water and laid beside flowers from the Philippines resembled them so closely that it was quite impossible to distinguish between them by any

evident characteristic. The neuration, the form of the sepals and petals, and the outline of the labellum proved similar in both.

MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, September, October, 1907.

PODOCHILUS Blume.

Podochilus Clemensiae sp. nov.

Planta 4 dm alta vel etiam altior, gracilis. *Folia* linearia, disticha, 4 ad 6 cm longa, 4 ad 6 mm lata, obtusa, ad apicem inaequaliter bilobata cuspidata. *Flores* circa 20, distichi, in racemis laxis ex axillis foliorum emergentibus. *Racemus* 2.5 ad 3 cm longus. *Bracteae inflorescentiae* lanceolatae, acutae, ovariis breviores, 2 mm longae. *Sepala lateralia* ovata, acuta vel subobtusa, 3 ad 3.5 mm longa, 2 mm lata. *Sepalum dorsale* ovato-lanceolatum, lateralibus brevius. *Petala* oblonga, obtusa vel subtruncata, circa 2 mm longa, 1 mm lata. *Labellum* cuneatum, obtusum, 2 mm longum. *Columna* brevissima.

Podochilus Clemensiae is a slender, extremely graceful species which suggests *P. pendulus* in habit, although the leaves are narrower in relation to their length than those of *P. pendulus* and longer than the racemes. The labellum resembles that of *P. lancifolius*, but is entire, and the membrane at the base which forms a pocket or cup is very strongly developed and extends nearly to the middle of the labellum. Although the racemes are prevailingly axillary, they are sometimes, perhaps frequently, terminal. The material at hand is very copiously flowered.

MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, September, 1907.

Podochilus crotalinus sp. nov.

Glaberrimus, erectus (?), circa 3 dm altus, pluricaulis; *foliis* distichis, lineari-oblongis, ad vaginam articulatis, bilobulatis, nervo intermedio in apiculum setiforme minutum producto, basi vix attenuatis, 1 ad 2 cm longis, medio 3 ad 5 mm latis; *spica* terminale, disticha, multiflora, 2.3 cm longa; *bracteis* lanceolato-ellipticis, 8 ad 10 mm longis, *flores* plus minusve excedentibus; *sepalis lateralibus* valde obliquis, acuminatis, trinerviis, 6 mm longis; *sepalo intermedio* ovato; *petalis* lineari-oblongis obtusis, sepalis paulo brevioribus; *labello* 5 mm longo, circuito oblongo supra medio dilatato obscure trilobato.

In the specimens examined the flowers are old and badly shrivelled so that the form of the labellum is difficult to observe. The basal half is almost rotund, slightly concave, the apical half is subflabelliform and apparently truncate. Near the point of origin of the apical lobe or half there are two thickened lines. The extreme base of the lip resembles that of *P. distichus* Schlechter. The floral bracts, which are scarious and so arranged as to resemble the rattles of *Crotalus horridus*, are elliptic-lanceolate or ovate, about 6 mm wide near the base and at the apex subobtuse, scarcely acute, and obscurely, if at all, cuspidate. The distichous inflorescence is from 1.8 to 2 cm wide in its greatest diameter. The nearest affinity of *P. crotalinus* is *P. distichus* Schlechter. The form of the inflorescence, however, and the very broad floral bracts are differentiating characters.

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

Podochilus Cumingii Schlechter in Fedde's Repertorium 3 (1907) 19.

I refer here specimens gathered in Mindanao and Luzon. The mentum formed by the lateral sepals is deeply saccate. The labellum is lanceolate and at the base where it joins the slender claw produced into a subquadrate appendage. This appendage is truncate and not at all emarginate or bifid. Hooker's description of *P. microphyllus* Lindl. in the "Flora of British India" agrees in detail with my material except for the height of the plants which in Hooker's material is greater than in mine. Schlechter refers the species described by Hooker to *P. sciuroides*. *P. sciuroides* appears to be closely related to *P. Cumingii*. In his monograph of the *Podochilinae* Schlechter describes the labellum of *P. Cumingii* as 5-nerved. My material has the labellum 3-nerved with the lateral nerves branched. Schlechter describes the labellum of *P. sciuroides* as 3-nerved with the laterals branched. *P. sciuroides* is a taller species than *P. Cumingii*. In the specimens from Mindanao the stems are rarely more than 1 dm long. For the present it seems best to adopt for the Philippine species the name proposed by Schlechter.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, September, 1907. Luzon, Province of Bataan, Mount Mariveles, *Copeland s. n.*, November 23, 1907, in moss on trees, flowers white; *Bur. Sci. 1678 Foxworthy*, October 17, 1906: Province of Pampanga, Mount Arayat, *Merrill 4260*. September 15, 1905, epiphyte on mossy trees at an altitude of 820 m.

Although the flowers are described as white by the collectors, they appear, when dried, to have been tinged with purple.

Schlechter, in his monograph, does not use the name *P. Cumingii*. In the "Repertorium" *l. c.*, however, he asserts that the Philippine plant referred to *P. Zollingeri* in his monograph constitutes a new species for which he proposes the name *P. Cumingii*.

Podochilus plumosus sp. nov.

Planta parvula, glabra, plumosa, simplex. *Folia* disticha, linearia, circa 1 cm longa, 1 mm lata, acuta, approximata. *Flores terminales* et *laterales*. *Pedunculus* folio brevior. *Bracteae inflorescentiae* imbricatae. *Sepala lateralia* lanceolata, acuta, 1-nervia, circa 3 mm longa. *Sepalum dorsale* ovato-lanceolatum, acutum, 1-nervium. *Petala* oblanceolata vel elliptica, subacuta vel obtusa, 1-nervia, 2 mm longa, 1 mm lata. *Labellum* rhombicum, ad basim sagittatum, 3 mm longum, 2 mm latum. *Rostellum* quadridentatum. Capsula 6 mm longa.

P. plumosus is a graceful species, the leafy stems of which have the appearance of feathers and suggest the leaves of *Taxodium distichum*. The flowers are produced singly on short peduncles which are almost completely hidden by scarious imbricating bracts. The labellum is rhombic above the sagittate base and hardly acute at the apex. *P. plumosus* belongs doubtfully to § *Apista*. Doubtfully, because according to Schlechter's remarks § *Apista* is always characterized by having the inflorescence terminal. Our species is hardly a member of § *Appendiculа* and probably forms a transition between it and § *Apista*, having all the characters of the latter group and in addition a lateral as well as a terminal inflorescence.

From *P. Cumingii*, *P. plumosus* is readily distinguished by the more slender, longer leaves and by the very different inflorescence, as well as by the position of the flowers.

Luzon, Province of Zambales, Mount Tapulao, *Bur. Sci. 4763 Ramos*, December, 1907, *Bur. Sci. 3986 Curran* (flowered in orchid house, Manila, March, 1908): Province of Tayabas (Infanta), *Whitford 803*, September 11, 1904, on rocks and trees along the Tinuan River, altitude about 80 m.

Podochilus strictus sp. nov.

Caules 1 ad 2 dm alti. *Folia* disticha, linearia, apiculata, 11 mm longa, circa 1 mm lata. *Pedunculus* terminalis. *Racemus* usque 5 ad 10 mm longus. *Bracteae inflorescentiae* lanceolatae, acutae, 1 mm longae. *Flores* 2.5 ad 3 mm longi. *Sepalum dorsale* lanceolatum, subacutum, concavum, 1-nervium, usque ad 3 mm longum. *Sepala lateralia* ovato-lanceolata, acuta. *Petala* lanceolata, 1-nervia, obtusa, circa 2.5 mm longa, 1 mm lata. *Labellum* supra medium circa 1 mm latum, breviter unguiculatum, subquadratum, 3-nervium, obtusum, prope basim sagittatum vel auriculatum. *Rostellum* bipartitum.

Podochilus strictus is a slender species which appears to be very near *P. microphyllus* Lindl. and *P. bicaudatus* Schlechter. The racemes, which are clothed at the base with several imbricating scarious bracts, are comparatively many-flowered, with rigid, distichous, cymbiform floral bracts. In dried specimens, the leaves, which are directed obliquely upwards, are sometimes twisted and consequently give the plant a very strict appearance. Near the summit of the stems, lateral growths arise which produce roots at the point of origin.

I have not seen the type specimen of *Podochilus bicaudatus* but according to Schlechter's description that species differs from *P. strictus* in its shorter leaves, smaller, fewer flowers and shorter racemes. *Podochilus acicularis* Hooker f., which Schlechter refers to *P. tenuis*, is similar to *P. strictus*, but has a very different lip from that species and a very different habit (cf. Hooker's "Icones Plantarum" *pl. 2147*).

MINDANAO, Lake Lanao, Camp Keithley, *Bur. Sci. 3002 Mrs. Lyon* (specimen flowering in orchid house, Manila, January, 1906), *Mrs. Clemens 132:* District of Zamboanga, *For. Bur. 9193 Whitford & Hutchinson*, December 12, 1907.

Podochilus bicaudatus Schlechter in Fedde's Repertorium 3 (1907) 19.

In the herbarium of the Bureau of Science there is a single specimen collected by Elmer D. Merrill in February, 1903, on the Island of Paragua which may prove to be conspecific with *Podochilus bicaudatus*. Unfortunately only one flower was preserved on this specimen and that one, imperfect to begin with, was destroyed by dissection. The leaves are 5 mm long, twisted when dry, linear, acuminate. They agree perfectly with Schlechter's description in Fedde's "Repertorium." In general habit the plant resembles *P. tenuis* as illustrated in Hooker's "Icones Plantarum" (*pl. 2147*) but is not so stout nor so tall. The labellum is oblong, obtuse, sagittate at base, and measures 2 mm in length. The specimen collected by Merrill is numbered 775.

AGROSTOPHYLLUM Blume.

Agrostophyllum philippinense sp. nov.

Aff. *A. papuano* Schltr. et *A. formosano* Rolfe. *Habitu* simile *A. majori* Hook. f. *Caules* aliquid compressi. *Planta* 5 dm alta. *Folia* disticha oblongi-lanceolata, obtusa, plus minus 1.5 dm longa, prope basim plus minus 2.5 cm lata. *Inflorescentia* capitata, circa 4 cm lata, densa. *Sepala lateralia* 3-nervia, oblonga, acuta, 5 mm longa, 2 mm lata. *Sepalum dorsale* valde concavum, 4 mm longum. *Petala* ovata, subacuta, 4 mm longa, 2 mm lata. *Labellum* 4.5 mm longum, ad basim concavum

vel ventricoso-saccatum, antice in lamella cordiformi instructum. *Columna* clavata, 4 mm longa.

Agrostophyllum philippinense is perplexingly near *A. majus* Hook. f., but differs from it among other characters in its petals and longer leaves. It is also near *A. papuanum* Schlechter, but has the leaves longer in relation to their width, and larger heads of flowers. According to Mr. Rolfe's description in the "Annals of Botany" 9: 157, it must be closely allied to *A. formosanum*. The labellum resembles closely that of *A. majus* but the epichil is cordate. J. J. Smith refers *A. majus* to *A. longifolium* Reichb. f. In my herbarium there is an excellent photograph of a specimen preserved in the herbarium at Leiden which is labeled *Appendicula longifolia* Bl. This specimen has narrower, longer leaves and a smaller inflorescence than my Philippine specimens. Further study may show that *Agrostophyllum philippinense* is merely a form of *A. majus*, and that both should be referred to the older *A. longifolium*. For the present, however, I believe that the Philippine species should be regarded as distinct from *A. majus* and *A. longifolium*.

Luzon, Province of Bataan, Mount Mariveles, *For. Bur. 1900 Borden*, September 16, 1904, on trees, rocky mountain ridge, altitude about 1,000 m, "corolla cream-white, lip whiter, no odor:" Province of Rizal, Mount Batay, *Loher 6020* (specimen flowering in Manila).

CERATOSTYLIS Blume.

Ceratostylis rubra sp. nov.

Aff. *C. grandiflorae* J. J. Smith. *Planta* robusta. *Caulis* ramosus plus minus 4 dm longus, *bracteis* chartaceis, imbricatis, arcte vaginantibus, dense vestitus. *Folia* coriacea, rigida, linearia, ad apicem bilobata, plus minus 1 dm longa, circa 5 mm lata. *Sepala lateralia* oblongi-lanceolata, acuta, 7-nervia, membranacea, mentum obtusum formantia, ad basim cohaerentia, 2 cm longa, 4 mm lata. *Sepalum dorsale* oblongum, 1.7 cm longum, circa 5 mm latum. *Petala* oblanceolata, subacuta, 7-nervia, 1.9 mm longa, prope apicem 4.5 mm lata. *Labellum* lanceolatum, acuminatum, 3-nervium, 8 mm longum. *Gynostemium* 5 mm longum, brachiis magnis, rotundatis.

Ceratostylis rubra is perhaps most nearly allied to *C. grandiflora* J. J. Smith. From that species it differs in the form of the leaves, in its labellum, which is lanceolate-acuminate or acuminate from a rounded base, and in the nerves of the sepals and petals. For the genus the flowers are extraordinarily large and according to the collectors' notes and dried specimens are red. In a photograph of living specimens cultivated at Manila the leaves appear to be thick, fleshy, recurved, and on the upper surface strongly channeled. When alive the perianth-organs are spreading and in the center of the flower the characteristic column is erect and very conspicuous. The flowers arise from among large, reticulated bracts. These bracts when dry are rufous and prominently veined.

I have not seen *Ceratostylis retisquama* Reichb. f., which was based on No. 2152 of Cuming's Philippine plants. This species is very inadequately described in "Bonplandia" 5: 53. The specific name of Reichenbach's plant might easily apply to the species in hand.

Luzon, Province of Rizal, *Bur. Sci. 3042 Ramos*, August 19, 1907: Province of Bataan, Mount Mariveles, *Bur. Sci. 3070 Foxworthy*, "flowers red with white center." Mindanao, Lake Lanao, Camp Keithley, *Bur. Sci. 3046, 3072 Mrs. Clemens* (specimens flowering in Manila): without locality, *W. S. Lyon 36*.

Ceratostylis latipetala sp. nov.

Aff. *C. rubrae,* speciei quam habitu et structura haec species conspicue simulat. *Planta* robusta. *Caulis* ramosus. *Folia* coriacea, rigida, linearia, 9 ad 15 cm longa, 5 ad 10 mm lata. *Sepala lateralia* ovata vel ovato-oblonga, obtusa, 9-nervia, 1.8 cm longa, 6.5 mm lata, mentum obtusum formantia. *Sepalum dorsale* oblongi-lanceolatum, obtusum, 1.5 cm longum, 6 mm latum. *Petala* cuneato-ovata, ad apicem rotundata, 1.5 ad 1.8 cm longa, 8 ad 9 mm lata. *Labellum* minutum, unguiculatum, subhastatum vel suborbiculare, acuminatum, obtusum, 3-nervium, 2.25 ad 3 mm longum, lamellis 2 intramarginalibus; *unguis* circa 2 mm longus. *Gynostemium* brachiis magnis, rotundatis.

In habit *Ceratostylis latipetala* is almost indistinguishable from *C. rubra.* In its flowers, however, it exhibits unmistakable differences from that species. The labellum alone will serve as a constant differentiating character. This organ is concealed in the sac formed by the coherent lateral sepals. From studies of several flowers the labellum appears to vary to a large extent in the nature of the calli. Sometimes they are very conspicuous, at other times difficult to observe. As in *C. rubra* so in *C. latipetala* the peduncles of the flowers are invested with a series of nervose bracts, the outer one forming a closely appressed sheath which reaches to the base of the perianth. The ovary is always concealed in the bracts. The flowers are described as orange-red. The petals are very characteristic of this species and are the broadest yet recorded for the genus.

Mindanao, Province of Misamis, Mount Malindang, *For. Bur. 4661 Mearns & Hutchinson.* May, 1906; altitude about 1,400 m.

PHAIUS Lour.

Phaius grandifolius Lour. Fl. Cochinchinensis (1790) 529.

I have seen of this species two specimens which were collected in Mindanao. Along roadsides not far from Malabang, Province of Cotabato, Mindanao, November, 1906. *Mary Strong Clemens 815.*

EULOPHIA R. Br.

Eulophia squalida Lindley Bot. Reg. (1841) Misc. 77.

I refer to this species specimens from Luzon. The plants bear two flower-shoots between which the leaves arise after the flowers are expanded. The sepals are very fleshy, the lateral ones oblong, acute, strongly falcate, about 2 cm long. The petals are oblong-elliptic, obtuse, with raised longitudinal nerves. The labellum is 2 cm long, obscurely 3-lobed, blunt and rounded at the apex, where there are several conspicuously raised nerves. At the base it is contracted into a sulcate claw. The outline of the labellum agrees with the figure of *E. squalida* published by J. J. Smith in the second volume of plates which illustrate "Die Orchideen von Java" (*Plate CLXV*). According to the notes made by Doctor Foxworthy the plants found on Mount Pinatubo grew in very coarse gravelly soil where they received the most intense heat of the sun and where they bloomed in the latter part of the dry season.

Luzon, Province of Benguet, *Bur. Sci. 2818 Mearns,* April, 1907: Province of Zambales, Mount Pinatubo, *Bur. Sci. 2575, 2619, 2613 Foxworthy,* April, 1907, flowers white with purple markings, altitude 700 m. Palawan, *Bur. Sci. 898 Foxworthy,* May 22, 1906, edge of forest along trail, flowers white, marked with yellow.

DENDROBIUM Sw.

Dendrobium Lyonii Ames Orchidaceae 2 (1908) 177.

D. acuminatum Kränzl. in Orchis 2: 73, not Rolfe.

Dr. F. Kränzlin in "Orchis" reduces this species. He refers it to the synonymy of *Dendrobium acuminatum* Rolfe. The colored plate which accompanies his article is a fair portrait of *D. Lyonii* and very unlike *Dendrobium acuminatum*. As Dr. Kränzlin has expressed the opinion that *D. Lyonii* is not specifically distinct from *D. acuminatum* and as he has treated it as a variety of this species, supplementary remarks to those I published in "Orchidaceae" seem called for, especially as Dr. Kränzlin has asserted that the illustration of *D. acuminatum* in "Orchidaceae" (*plate 17*) is erroneous and worthless as scientific evidence.

Aside from the structural differences between *D. Lyonii* and *D. acuminatum*, outlined in the original descriptions, there are constitutional differences, if we may rely on the authority of Mr. Lyon, who has collected both species and who has grown them in his garden at Manila. Mr. Lyon assures me that the elevations along the mountains of Bataan where these species grow have been carefully estimated and that *D. acuminatum* is not found below three thousand feet and that it is abundant at an altitude of 3,700 feet. *D. Lyonii*, on the other hand, does not occur above the third Forest Station (2,200 feet) and is found in a narrow zone between 1,700 and 2,000 feet. This difference in distribution is accentuated by the behavior of the plants under culture. At sea level in Manila *D. acuminatum* is tractable and easily brought to flower, while *D. Lyonii* is with difficulty kept alive.

Mr. Lyon who has studied both species in the field and in his gardens of Nagtahan, Manila, writes in a letter dated January 14, 1909: "I notice of course in reading your diagnoses that you lay little if any stress upon vegetative features, but the one I have called your attention to, the presence of an *awn* or short *hard tooth*, at the apex of pseudobulbs of *D. Lyonii*, is a constant feature." "Since the receipt of your letter I have gone over my entire collection, 85 plants of *D. Lyonii* and 34 of *D. acuminatum* and I find that this holds universally good. The apical tooth (rather than awn) is very persistent as well as the old flower-scape. The old flower-scapes decay and fall away from *D. acuminatum* the same season, while those on *D. Lyonii* persist certainly for three or more years."

Mr. Lyon asserts that *D. acuminatum* is practically scentless, while *D. Lyonii*, especially in the morning, and more or less all the time, is strongly and delightfully fragrant.

Dr. Kränzlin's criticism of *plate 17* of "Orchidaceae" is not justified by facts. The plate in question was prepared from a co-type of *D. acuminatum*, as is stated on the second page of Fasc. II. The flowers were drawn with reasonable regard to accuracy and the material which furnished them was carefully preserved for reference. Dr. Kränzlin assumes that the flowers were drawn smaller than they are in nature and that failure to designate the amount of reduction renders the plate worthless as scientific evidence. He bases his remarks on the measurements given in Mr. Rolfe's original description of *D. acuminatum*. In my redescription on page 171 the sepals are given as "up to 3 cm long." In the plate the uppermost flower has lateral sepals that measure 2.7 cm long. In the specimen from which the plate was prepared the lateral sepals are 2.3 to 3 cm in length. Dr. Kränzlin fails to make allowance for foreshortening in the drawing, and, therefore, makes an unjust criticism.

In his description of *D. acuminatum* in "Orchis," Dr. Kränzlin gives the length of the sepals and petals as 3 to 3.5 cm. In the plate which accompanies his description the lateral sepals exceed 4.5 cm in length and in one flower are 5 cm long. Dr. Kränzlin's plate on the other hand portrays *D. Lyonii* which produces larger flowers than *D. acuminatum*.

Notwithstanding Dr. Kränzlin's remarks regarding the color of the flowers of *D. acuminatum* and *D. Lyonii* no change is necessary in the descriptions published in "Orchidaceae." *D. Lyonii* bears purplish flowers according to Mr. Lyon's notes and the type material. *D. acuminatum* has whitish or yellowish sepals and petals and a deeper-colored labellum (brownish when dry).

In Fedde's "Repertorium novarum Specierum regni vegetabilis."[2] Dr. Kränzlin takes up the name *Sarcopodium* and refers to it in addition to a new species, namely *S. stella silvae, Dendrobium acuminatum* and *D. Lyonii*. This last he now calls *Sarcopodium acuminatum* var. *Lyonii! Sarcopodium stella silvae* was collected in Luzon by A. Loher and is described as a near affinity of *Dendrobium acuminatum*.

Dendrobium Sanderae Rolfe in Gard. Chron. III 45 (1909) 374, *fig. 163;* Orchid Review 17 (1909) 209, *fig. 17.*

I refer to this species two specimens of *Dendrobium* from Luzon. My material agrees with Mr. Rolfe's description and with the illustration which accompanies it. No habitat is given for *Dendrobium Sanderae* either in the "Gardeners' Chronicle" or in the "Orchid Review," so that we may presume that the place of origin of the species is unknown to Mr. Rolfe or else a trade secret. Mr. Rolfe received the type material from Messrs. Sander and Sons of St. Albans, England, who probably introduced it from the East Indies, as it is nearly allied to *Dendrobium Dearei* and *D. parthenium*. The petals of the Philippine material are white, about 4 cm long, and nearly 3 cm wide, rounded at the tip and cuneate at the base. The white sepals are much narrower than the petals and are acute. The middle lobe of the labellum is obcordate or obovate with the margin dentate or crenate. The lateral lobes are much smaller than the middle one and rounded. The throat and lateral lobes are conspicuously striated with purple. In habit *D. Sanderae* resembles *D. Dearei* very closely. The flowers, however, are larger than those of the older species. The striations on the labellum help to distinguish the one from the other. *D. Dearei* has a white and yellow labellum.

Luzon, Province of Benguet, *Bur. Sci. 3497 Mearns*, July, 1907: District of Lepanto-Bontoc, *Bur. Sci. 5614 Dean C. Worcester*, July, 1908, "flowers white, faint odor, throat and tube with purple lines inside:" northern Luzon. *W. S. Lyon 114*, on pine trees, altitude 1,000 to 1,200 m.

ERIA Lindl.

Eria philippinensis Ames Orchidaceae 1 (1905) 94.

To this species I refer, with some hesitation, specimens from Benguet which Curran and Merritt collected in December, 1908. The flowers are much larger than in the type, the labellum measures 9 mm in length. The color of the flowers is a deep-wine-purple. Near the apex of the labellum there is a linear thickening.

Luzon, Province of Benguet, Lusod-Bayabas trail, *For. Bur. 15717 Curran & Merritt*, December 16, 1908, altitude 1500 m, flowers deep-coral-red.

PHREATIA Lindl.

Phreatia bracteata sp. nov.

Pseudobulbi congregati, rotundati, circa 2 cm longi. *Folia* 2, oblongi-lanceolata, acuta, coriacea, 8 ad 10.5 cm longa, circa 1.5 cm lata, ad basim sulcata. *Scapus* usque ad 2.2 dm longus, bracteatus. *Bracteae* scariosae, 9 ad 20 mm longae, acutae. *Racemus* elongatus, usque ad 6 cm longus. *Bracteae inflorescentiae* scariosae, ovato-lanceolatae, acutae, pedicellum cum ovario excedentes, 3 ad 4 mm longae, circa 2 mm latae. *Sepala lateralia* late ovata, obtusa, mentum formantia, 3.5 mm longa, ad basim 2.5 mm lata. *Sepalum dorsale* oblongum, obtusum vel quadratum, 2 mm longum. *Petala* oblonga, obtusa, 2 mm longa, 1.25 mm lata. *Labellum* ovatum, obtusum, 2 mm longum, 1.5 mm latum, ad basim saccatum. *Columna* minuta. *Rostellum* bifidum.

The floral bracts are very conspicuous, slightly rigid and in dried specimens brownish at the center with a wide hyaline margin. The bracts of the scape are tubular, closely appressed and somewhat hyaline when dry. In general habit the plants resemble *Phreatia scaphioglossa* Schlechter.

Luzon, Province of Tayabas, *For. Bur. 7815 Curran & Merritt*, November, 1907: Province of Bataan, Mount Mariveles, *Bur. Sci. 5180 Topping, R. S. Williams 910*, along the Lamao River at an altitude of about 1000 m: Province of Pampanga, Mount Arayat, *Merrill 3916*, October 23, 1904, altitude 820 m, flowers white, odorless.

BULBOPHYLLUM Thou.

Bulbophyllum cuneatum R. A. Rolfe in Ames Orchidaceae 1 (1905) 98.

This, apparently rare species, has been discovered again on Mount Mariveles by D. Le Roy Topping. In his original diagnosis Mr. Rolfe described the scapes as recurved. In my observations I find that this characteristic is always strongly developed and gives the scape below the raceme the appearance of a shepherd's crook. Just at the point of curvature the scape is thickened and below the inflorescence conspicuously dilated. The bracts appear to have been purplish and in the dried specimens examined the petals and lips are deep-purple.

Luzon, Province of Bataan, Mount Mariveles, *Bur. Sci. 5183 Topping*.

Bulbophyllum Dearei Reichb. f. in Flora 71 (1888) 156.

In the herbarium of the Bureau of Science there are seven flowers of this species sent by Mary Strong Clemens from Camp Keithley. When alive they were described by the collector as orange-yellow marked with purple. The plants from which the flowers were taken were found on large *Ficus* and *Vitex* trees. The specimens from Camp Keithley agree very well with specimens of *B. Dearei* preserved in my herbarium. The upper sepal is beautifully veined and cross-veined with brown so that the yellow ground-color is bright and suggests sunlight as seen when filtered through the leaves of trees upon the forest flora. The lateral sepals are conspicuously marked with purple and strongly falcate. The petals are yellow and slightly falcate. *B. bataanense* Ames is a near ally of *B. Dearei*, but is smaller in all its parts and has a narrow upper sepal.

Mindanao, Lake Lanao, Camp Keithley, *Mary Strong Clemens s. n.*, June, July, 1907.

THELASIS Blume.

Thelasis obtusa Blume Bijdr. (1825) 386.

I refer to this species the material collected by Leiberg on Mount Mariveles, Luzon. This material has monophyllous pseudobulbs which are much shrivelled in the dried state. They appear to have been globular when alive. The general habit of the plants recalls *T. capitata* Bl. but the raceme is elongated, slightly less than 4 cm long, and comparatively lax. The labellum is somewhat saccate and has a minute crest along the median line. Schlechter regards *T. obtusa* as closely related to *T. macrobulbon* Ridl., from which it differs in part through its monophyllous pseudobulbs. *T. macrobulbon* is diphyllous.

In the herbarium of the Bureau of Science there are four flowering scapes of a species of *Thelasis*, presumably from Java, which J. J. Smith has identified as *T. obtusa* Bl. I have compared Leiberg's specimens with these and I find that the floral parts are in almost perfect agreement.

T. obtusa has not been reported, heretofore, as native to the Philippines.

Luzon, Province of Bataan, Mount Mariveles, *J. B. Leiberg 6046*, July 20, 1904, epiphytic, altitude about 900 m.

SACCOLABIUM Blume.

Saccolabium chionanthum Lindl. Journ. Linn. Soc. Bot. 3 (1859) 35.

I follow the authority of J. J. Smith in referring to this species *S. perpusillum* Hook. f. The material from the Philippines which I have studied is in almost perfect agreement with the illustration published in Hooker's "Icones Plantarum" (*pl. 2129*). The flowers are not so pubescent as shown in Hooker's plate, but are papillose. Ridley states that the flowers when alive are hardly pubescent and are rather minutely papillose. His observations in regard to this character convince me that Hooker's illustration may exaggerate it.

The sepals and petals of the Philippine specimens agree perfectly with the figures published by Hooker (although they are very obscurely ciliolate on the margin). The labellum terminates in the same kind of a fleshy apex and at the base produces the same kind of a scrotiform sac as shown by Hooker. The structure of the column in Hooker's plate agrees with my material.

In general habit *Saccolabium chionanthum* suggests *Phreatia parvula*, and unless carefully examined might readily be confused with it when dried.

Luzon, Province of Rizal. *Bur. Sci. 3055 Ramos*, November 14, 1907, flowers small, white.

Java, Sumatra, Singapore.

TRICHOGLOTTIS Blume.

Trichoglottis latisepala sp. nov.

Caulis tenuis, subflaccidus, elongatus, plus minus 3 dm longus, 2.4 mm in diametro. *Vaginae* 1.5 ad 1.7 cm longae. *Folia* lineari-lanceolata, acuta, 7 ad 12 cm longa, 7 ad 10 mm lata, coriacea. *Pedunculi* pauciflori. *Flores* parvuli. *Sepala lateralia* 5 mm longa, subbipartita, vel biloba; lacinia posterior 4 mm longa, obtusa, lacinia anterior similis sed angustior et subbrevior, 2 mm longa. *Sepalum dorsale* oblongum, obtusum, 3-nervium, 6 mm longum. *Petala* oblonga, subspathulata, obtusa, 5 mm longa, 2 mm lata. *Labellum* 3-lobatum, *lobi laterales*

parvi, uncinati, obtusi; *lobus medius* suborbicularis vel ellipticus. *Callus* pilosus prope basim. *Calcar* 3 ad 3.5 mm longum.

Trichoglottis latisepala is very closely allied to *T. lanceolaria* Bl. It is distinguished from that species by its stouter stems, larger leaves and larger flowers. The lateral sepals are shaped like the wing of a bird; the lobes are rounded. The anterior or lower lobe is only slightly shorter than the spur, against which it is closely appressed. The posterior or upper lobe is oblong-lanceolate with a prominent rib along the middle. The pubescent callus at the base of the middle lobe of the labellum is triangular at the free end.

In the Herbarium Hookerianum at Kew there is a specimen from Java, collected by Lobb, which resembles *T. latisepala* and may prove to be conspecific with it. With this specimen there are sketches which show a flower very similar to the flower of *T. latisepala*. The lateral sepals are referred to in a note as being decurrent on the spur. This Javan specimen was originally identified as *T. lanceolaria*. *T. latisepala* may prove to be a variety of *T. lanceolaria* but it does not agree with Javan material in my herbarium identified by J. J. Smith.

Mindanao, District of Zamboanga, on an island in Cumalarang Bay, *For. Bur. 12345 Hutchinson*, April 19, 1908, in coast forests, flowers light-pinkish-white. Negros, *For. Bur. 7241 Everett*, March 19, 1907.

Trichoglottis retusa Blume Bijdr. (1825) 360.

Several specimens collected in different parts of the Philippines appear to belong here. *T. retusa* differs from other Philippine species in its very fleshy oblong leaves which are unequally and conspicuously bilobed or retuse at the tip. The ovate-lanceolate, acuminate, pubescent or densely papillose labellum is also characteristic.

Mindanao, Province of Surigao. *Bolster 225*, January 17, 1906, flowers yellow, spotted with red. Negros, *For. Bur. 5553 Everett*, July-October, 1906. Luzon, Province of Tayabas, *For. Bur. 9653 Curran*, March 22, 1908. Basilan, *For. Bur. 6103 Hutchinson*.

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NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, III

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(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

Reprinted from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government, Manila, P. I.
Vol. VI, No. 1, Section C, Botany, F ARY 1911

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The Philippine Journal of Science, C. Botany.
Vol. VI, No. 1, March, 1911.

NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, III.

By Oakes Ames.

(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

The orchid flora of the Philippines, although rich and varied, is not distinctive. If we except the sections of one or two genera which appear to have their center of distribution in these Islands, it is very similar in type to that of adjacent regions. According to our present information nearly one-fourth of the recognized orchid genera of the world are known to inhabit the Philippines,[1] but with surprisingly few exceptions they are poorly represented in the number of species assigned to them. It is safe to say that our acquaintance with Philippine orchids is extremely limited and that further explorations are sure to add substantially to our lists of recorded species; for rarely a collection comes to hand from the Bureau of Science which does not contain either novelties, or species heretofore unknown to be natives of the Islands. Furthermore, these collections fall far short of being exhaustive in their nature. Frequently they represent only the plants that were in flower at the time the collectors were in the field. Then again, the Islands have not been botanized with equal thoroughness; Luzon, for example, being much better known than any of the others.

In my previously published lists of Philippine orchids about seventy genera and three hundred and forty-seven species have been recorded. Including the species described in "Orchidaceae" by Mr. R. A. Rolfe, and the Erias published in this Journal by Dr. R. G. Leavitt, about one hundred and sixty-five novelties have been recognized among recent collections. In addition to these there is a mass of material in the herbarium of the Bureau of Science which still remains for critical study and final identification.

I have prepared for this paper a list of the genera which have been ascribed to the Philippines, together with the number of species which have been referred to them. I have omitted genera and species which in my estimation are doubtful or which have been attributed to the

[1] According to Pfitzer's enumeration in "Die natürlichen Pflanzenfamilien."

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Philippines on unreliable information or by disputable authority. Perhaps my enumeration is ultraconservative, but I have endeavored to make it accurate, exercising rather severe censorship where adequate proof regarding a reference was not to be obtained.

In 1884, R. A. Rolfe[2] published a paper on the flora of the Philippine Islands and its probable derivation, in which he recorded for the *Orchidaceae* sixty-seven genera and four hundred and sixty species. When it is borne in mind that my list includes ten additional genera and more than one hundred species which were described after Mr. Rolfe's paper appeared, the discrepancy between his estimate and mine may be accounted for on the assumption that a more rigid exclusion was made on my part of data furnished by questionable authority. It is also possible that Mr. Rolfe possessed information which I have failed to secure. In any event it must be conceded that estimates based on printed records are never conclusive and that one author may accept what another will reject.

One source of error and uncertainty which it is extremely difficult to avoid in making provisional lists is the tendency of horticultural houses to conceal, for business reasons, the native country from which desirable orchids have been introduced. In this case species are sometimes referred to a region far distant from the real one, or are distributed among horticulturists as natives of a country from which they may not have come. Although many collectors have been in the field for the Bureau of Science during the past five years, several horticultural orchids supposedly of Philippine origin, which would have attracted attention by their size and beauty, have failed to appear in the rich collections which have been forwarded to me for identification. The explanation of this may be the one offered above. If so it indicates that horticultural records regarding distribution should be cautiously used.

Of the large Philippine genera which have been exhaustively studied, *Eria* and *Dendrochilum* occupy the foremost position. If we exclude *Dendrobium* with its fifty or more species, these two genera are the largest. *Dendrochilum* is the most interesting from a botanical viewpoint as it is the only large group which is characteristically Philippine. The section *Acoridium*, which for many years was known only through *Dendrochilum tenellum*, has grown rapidly since the botanical explorations were instituted which followed the American occupation of the Islands, until it now numbers over thirty species. Of these not one is known to be a native of any other part of the eastern Tropics and none so far as I have been able to ascertain has any near allies outside of the Philippines. When J. J. Smith monographed *Dendrochilum* in 1904 only forty-three species had been described. At present more than fifty

[2] Journ. Linn. Soc. Bot. 21: 283.

have been identified as natives of the Philippines and of these over forty have been described since 1905. In other words the genus has, computed on the basis of Smith's monograph, been doubled since botanical explorations were begun by the Bureau of Science, and of the species discovered more than half belong to the section *Acoridium*. Furthermore, of the new species of orchids published in my contributions to our knowledge of the Philippine flora about one-third have been members of *Dendrochilum*.

No similar result has been obtained in any other orchid group, the only approach to it being that experienced in the study of the section *Distichae* of the genus *Cestichis;* more species of this section being found in the Philippines than in all other regions combined.

One point worthy of remark concerning Philippine genera of *Orchidaceae* is that according to our present knowledge none are endemic. Attention was directed to this fact by Mr. Rolfe in his paper to which reference has already been made, and no exception to it has yet been noted. In connection with Mr. Rolfe's suggestions as to the probable derivation of the Philippine flora it is interesting to consider not only genera but subgenera or sections, and especially the species of *Dendrochilum* which belong to *Acoridium* and *Pseudacoridium*. If the Philippine flora is to be regarded as of comparatively recent formation by the introduction of species from neighboring territory, it is intensely interesting to study such subgenera or sections as *Acoridium* in *Dendrochilum* and *Distichae* in *Cestichis*, and to contemplate the cause of the remarkable development they seem to have experienced. Unfortunately, the orchid flora of the neighboring islands, if we except Java, has not been sufficiently investigated to warrant any definitive conclusions, but what is known makes possible a fascinating comparative study which indicates that in certain Philippine orchid genera there has been unusual development, or a minimum of extinction after introduction from regions less favorable to the species introduced. When the flora of adjacent islands is more thoroughly studied as we may find other centers of distribution for *Acoridium* and an extension of range for species now believed to be endemic. But on the basis of existing records this group is localized in the Philippines with only a few representatives in other parts of the Malayan Archipelago.

From a horticultural or economic viewpoint the orchid flora of the Philippines is of little importance. With the exception of a few species of *Aerides, Dendrobium, Eria, Paphiopedilum, Phalaenopsis* and *Vanda* there are none which may be assigned to the first rank of horticultural acquisitions.

If we distribute the Philippine genera among the five tribes admitted by Bentham in the "Genera Plantarum," which for conciseness and ease of comprehension are very useful and much less confusing than Pfitzer's

cumbersome system in Engler and Prantl's "Die natürlichen Pflanzenfamilien," we have the following result:

1. *Cypripedieae*, 3 genera 10 species.
2. *Ophrydeae*, 2 genera 20 species.
3. *Neottieae*, 24 genera 42 species.
4. *Epidendreae*, 21 genera 301 species.
5. *Vandeae*, 27 genera 122 species.

THE GENERA OF PHILIPPINE ORCHIDACEAE[3] WITH THE NUMBER OF SPECIES ASSIGNED TO THEM, ALPHABETICALLY ARRANGED IN FIVE TRIBES ACCORDING TO BENTHAM AND HOOKER'S "GENERA PLANTARUM."

EPIDENDREAE.		
230. *Acanthophippium*	1	
176. *Agrostophyllum*	3	
227. *Bletia?=Eulophia?*[4]		[5]1
286. *Bulbophyllum*	16	14
219. *Calanthe*	9	4
178. *Ceratostylis*	7	2
161. *Cestichis* (*Liparis*)	16	1
147. *Chrysoglossum*	1	
150. *Coelogyne*	7	4
276. *Dendrobium*	26	25
155. *Dendrochilum*	56	2
278. *Eria*	44	3
157. *Malaxis* (*Microstylis*)	23	
145. *Nephelaphyllum*	1	
162. *Oberonia*	7	1
232. *Pachystoma*	1	
218. *Phaius*	4	1
154. *Pholidota*	2	1
280. *Phreatia*	11	
276. *Sarcopodium* (*Dendrobium*)	2	1
228. *Spathoglottis*	4	
	241	60
VANDEAE.		
296. *Acriopsis*	1	1
404. *Aerides*	4	3
392. *Angraecum*	1	
383. *Cleisostoma*	4	7
302. *Cymbidium*	2	1
299. *Dipodium*	1	
381. *Doritis*	1	
235. *Eulophia*	6	1
VANDEAE—Continued.		
233. *Geodorum*	1	
297. *Grammatophyllum*	2	3
376. *Luisia*	2	1
380. *Phalaenopsis*	4	10
226. *Plocoglottis*	3	
172. *Podochilus*	19	
169. *Polystachya*	1	
373. *Renanthera*	1	1
408. *Rhynchostylis*	2	
387. *Saccolabium*	3	3
382. *Sarcanthus*	2	2
406. *Sarcochilus*		5
378. *Stauropsis*	1	1
402. *Taeniophyllum*	3	
295. *Thelasis*	5	
406. *Thrixspermum*	2	
410. *Trichoglottis*	4	3
391. *Vanda*	4	
375. *Vandopsis*	1	
	80	42
OPHRYDEAE.		
32. *Habenaria*	15	4
14. *Herminium*	1	
	16	4
NEOTTIEAE.		
111. *Adenostylis* (*Zeuxine*)	3	1
94. *Aphyllorchis*	2	
112. *Cheirostylis*	2	
140. *Chloidia* (*Corymbis*)	1	
73. *Corybas* (*Corysanthes*)	1	
80. *Cryptostylis*	1	

[3] The numbers before the generic names indicate the position or the approximate position of each genus in Pfitzer's treatment of the *Orchidaceae* in Engler & Prantl's "Die natürlichen Pflanzenfamilien."

[4] *Bletia stricta* Presl. Placed by Lindley in "The Genera and Species of Orchidaceous Plants" among *Species valde dubiae*, under *Eulophia*.

[5] The figures in the second column indicate species of which I have seen no Philippine material.

NEOTTIEAE—Continued.		
106. *Cystorchis*	2	
95. *Didymoplexis*	1	
113. *Epipactis* (*Goodyera*)	4	
107. *Erythrodes*	1	
93. *Epipogum*	1	
86. *Galeola*	1	
121. *Haemaria*	1	
116. *Hetaeria*	1	
122. *Hylophila*	1	
55. *Microtis*	1	
118. *Myrmechis*	2	
74. *Pogonia*	3	
99. *Spiranthes*	1	
81. *Stereosandra*	1	
51. *Thelymitra*	1	
139. *Tropidia*	2	3
89. *Vanilla*	1	2
105. *Vrydagzynea*	1	
	36	6
CYPRIPEDIEAE.		
2. *Apostasia*	1	
1. *Neuwiedia*	1	1
5. *Paphiopedilum*	4	3
	6	4
Total number of genera		77
Total number of species		[6]495

LIST OF SPECIES.

The following list of species includes descriptions of novelties, additions to my previous records, and notes on species which supplement previously published data. The genera are arranged in accordance with the sequence adopted by Pfitzer in Engler and Prantl's "Die natürlichen Pflanzenfamilien." Two genera are added to the number already known to be indigenous, namely *Pachystoma* and *Dipodium,* twenty-two new species are described, and fifteen additions made to the number of species in my lists of Philippine orchids.

5. PAPHIOPEDILUM Pfitzer.

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

Specimens of this well-known horticultural orchid have been received from Mr. W. S. Lyon. It was originally collected by Wallis near Manila in 1874.

LUZON, Tarlac Province, *Lyon 49,* not much above sea level.

Paphiopedilum ciliolare (Reichb. f.) Stein Orchideenb. 462, *f. 145.*

This species which has been reported from Mindanao was collected by Mr. W. S. Lyon on Dinagat Island in February, 1909 (No. 142).

I have as yet found no specimens among the collections of the Bureau of Science of *P. philippinensis, P. Lowii,* and *P. Rothschildianum,* all of which have been ascribed to the Philippine Islands.

106. CYSTORCHIS Bl.

Cystorchis javanica Blume Fl. Jav. Orch. (1858) 87.

Cystorchis variegata var. *purpurea* Ridl. in Journ. Linn. Soc. Bot. 32: 399.

What I take to be a representative of *C. javanica* proper comes from the Island of Polillo. According to notes made by the collector the leaves are purplish, a characteristic of the species. *C. variegata,* which is a variety of *C. javanica,* has green leaves. Only a single specimen was found.

Plant 1.5 dm tall from a creeping rhizome, leafy. *Leaves* petiolate, the lamina ovate-lanceolate about 3 cm long. *Peduncle* puberulous,

[6] The species to which reference is made in this paper are included in this enumeration.

slender, bracteate. *Flowers* 5 to 6 mm long. *Lateral sepals* oblong, obtuse, 1-nerved, with the upper sepal forming a hood over the gynaecium. *Labellum* saccate at the base, with two globose appendages, one on each side, base of the sac acute, protruding between the lateral sepals; lamina elongated, entire, obtuse.

Polillo, *Bur. Sci. 9282 C. B. Robinson*, August 19, 1909, terrestrial, 100 m above the sea.

150. COELOGYNE Lindl.

Coelogyne integerrima Ames in Philip. Journ. Sci. 4 (1909) Bot. 665.

Another collection of this species has come to hand from Pauai where it was found at an altitude of 2,100 m. The flowers are described by the collector as pale-green. In dried specimens the labellum appears to have been brownish at the base and near the middle. The graceful racemes are nearly erect or drooping, with about eight large flowers. From its appearance when dried this species ought to be worthy of cultivation for horticultural purposes.

Luzon, Benguet Subprovince. Pauai, *Bur. Sci. 8454, 8519 R. C. McGregor*, May, 1909, at an altitude of about 2,100 m.

Coelogyne Merrillii sp. nov.

Pseudobulbi fasciculati, pyriformes vel ovoideo-oblongi, rugosi, *diphylli*, circiter 4 cm longi, plus minus 2.4 cm in diametro. *Folia* oblongi-lanceolata, acuminata, acuta, nervosa, breviter petiolata, 9.5–15 cm longa, 1.6–3.6 cm lata, prominente 3–5-nervia, subcoriacea. *Pedunculi* terminales, a pseudobulbo immaturo producti, erecti, 8.5–15 cm longi, ancipites, bialati. *Racemus* flexuosus, circa 2–4-florus. *Bracteae* deciduae ? circa 3 cm longae, lanceolatae, acutae. *Sepala lateralia* oblonga, acuta, 3.4 cm longa, 1 cm lata. *Sepalum dorsale* lanceolatum, 3.7 cm longum, 11 mm latum. *Petala* linearia, 3.5 cm longa, 2 mm lata, acuta, prominente 1-nervia. *Labellum* ovatum, 3-lobatum, 3.7 cm longum, 2 cm latum; *lobus medius* lateralibus major, oblongus cum apiculo, 1.5 cm longus, 1 cm latus; *lobi laterales* obtusi, 3 mm longi, carinae 5, flexuosae, margine lacerae, usque ad basim lobi medii extensae. *Columna* clavata, 3 cm longa.

Luzon, Benguet Subprovince, Pauai, *Merrill 6620*, May, 1909, on boulders in upper pine region, about 1,800 m altitude, flowers somewhat straw-colored, very fragrant, odor of *Nymphaea*.

This species belongs in Pfitzer's ninth section, *Cristatæ*, and appears to be distinct from all known species of the genus. The carinae of the lip, five in number, are various in length, the middle one hardly extends to the base of the middle lobe while the outer ones are abbreviated, about 4 mm long, and situated near the lateral lobes.

Coelogyne marmorata Reichb. f. is, from the description, a closely allied species. I have seen no material. *C. Loheri* Rolfe is another near ally, but belongs to quite another section of the genus. My conception of *C. Loheri* is based on a specimen in the U. S. National Herbarium which is a duplicate of the type number (*Loher 549*).

155. DENDROCHILUM Bl.

Dendrochilum (§ Platyclinis) cagayanense sp. nov.

Aff. D. Cobbiano. *Pseudobulbi* 8 cm longi, 1.5 cm in crassitudine, cylindracei, vaginis tubularibus, arcte appressis, acutis vestiti. *Folia* magna, petiolata, 3 dm longa, 6 cm lata, coriacea, elliptico-lanceolata, subacuta; petiolus 1.5 dm longus. *Pedunculus* multo folium excedens, 4.5 dm longus. *Racemus* circiter 2.5 dm longus. *Bracteae inflorescentiae* glumaceae, acutae, pedicellum cum ovario excedentes ad basim flores amplectentes, 1 cm longae, 7 mm latae. *Sepala lateralia* linearilanceolata, acuta, 11 mm longa. *Sepalum dorsale* simile. *Petala* linearilanceolata, 3-nervia, 9 mm longa, 2 mm lata. *Labellum* 3-lobatum; *lobi laterales* minuti, triangulares, 0.75 mm longi; *lobus medius* oblongus, ad apicem rotundatus, 3.5 mm longus, 2 mm latus. *Columna* apice crenulato; alae laterales a basi ortae.

Luzon, Province of Cagayan, *For. Bur. 16772 H. M. Curran*, March 4, 1909.

Dendrochilum cagayanense is a near ally of *D. Cobbianum*. It is a more robust species with narrow sepals and petals and a very different labellum. As in *D. Cobbianum* the lateral lobes of the labellum are inconspicuous and much reduced, but are somewhat setaceous. The stelidia of the column are linear-triangular and basal. Their tips reach to the base of the obscurely crenulate or denticulate terminal wing.

Dendrochilum (§ Acoridium) confusum sp. nov.

Sepala lateralia 3-nervia, 3 mm longa, 1.75 mm lata. *Sepalum intermedium* lateralibus simile. *Petala* oblanceolata, obtusa, 3-nervia, 3 mm longa, 1.75 mm lata. *Labellum* spathulatum vel cuneato-obovatum, 2.75 mm longum, 2 mm latum prope apicem.

This is the small flowered plant which I described in "Orchidaceae" II as *D. bicallosum* var. *minor*. More material has come to hand which necessitates a revision of my former views. Aside from the constant difference in the form of the labellum and the size of the flowers there are other points of dissimilarity which I think can not be passed over as merely varietal. These, however, are difficult to describe although apparent when flowers of the two species are compared side by side. The flowers of *D. bicallosum* are more stellate in aspect, when flattened out, than those of *D. confusum*, and their general shape gives the impression that the sepals, petals and labellum are longer in proportion to the width than the corresponding parts of *D. confusum*. The racemes of *D. confusum* are much more densely flowered and shorter than those of *D. bicallosum*.

Luzon, Province of Laguna, Mount Maquiling, *Bur. Sci. 5640 H. M. Curran*, flowers somewhat salmon-colored, odorless.

Dendrochilum bicallosum has also been found on Mount Maquiling, where it was collected in 1907 by *H. M. Curran & M. L. Merritt, For. Bur.* 7797.

Dendrochilum (§ Platyclinis) cymbiforme sp. nov.

Pseudobulbi pyriformes, in sicco rugosi, 2 cm longi, 6 cm in crassitudine prope basim, *vaginis* tubularibus, arcte appressis, acutis, vestiti. *Folia*

lineari-lanceolata, acuta, coriacea, nitida, 1.5–1.6 dm longa, 1.5 cm lata, petiolata; *petioli* 4 cm longi. *Bracteae inflorescentiae* 4 mm longae, cymbiformes. *Pedunculus* multo folium excedens, gracilis, flexuosus, 3 dm longus. *Racemus* 1.5 dm longus. *Sepala lateralia* oblonga, acuta, subfalcata, 4 mm longa, 1.5 mm lata. *Sepalum dorsale* oblongum, acutum, 3 mm longum. *Petala* oblonga, acuta, uninervia, ad basim angustata, 3 mm longa, 1 mm lata. *Labellum* cymbiforme, 4 mm longum, rotundatum vel ellipticum, apiculatum, integerrimum. *Columna* rigida, 3 mm longa; alae laterales in dentes perbreves triangulares reductae, quorum unus utroque ad basim columnae stat.

Luzon, Abra Subprovince, Mount Bawagan, *Bur. Sci. 7133, 7135 Maximo Ramos*, February 9, 1909, flowers yellow, altitude about 550 m.

From all other Philippine species *Dendrochilum cymbiforme* is clearly separable by means of its cymbiform, entire labellum and triangular, reduced, basally situated stelidia. In dried specimens the leaves are glossy above and leathery in texture. *C. cymbiforme* appears to be very distinct from all known species of the genus.

Dendrochilum (§ Acoridium) Macgregorii sp. nov.

Pseudobulbi pyriformes, in sicco rugosi, 8–15 mm longi, vaginis tubularibus, arcte appressis, acutis, vestiti. *Folia* linearia, rigida, acuta, submembranacea, 6.5–10.4 cm longa, 2 mm lata, petiolata. *Bracteae inflorescentiae* 2 mm longae, 2 mm latae, cymbiformes. *Pedunculus* filiformis, folio longitudine fere aequalis, vel brevior. *Racemus* 4.5 cm longus, distichus. *Sepala lateralia* ovato-lanceolata, acuta, 2–2.5 mm longa, 1.25 mm lata. *Sepalum* dorsale oblongum, obtusum, 2 mm longum. *Petala* obovata, 3-nervia, 2 mm longa, obtusa vel subacuta. *Labellum* cuneato-ovatum, apiculatum, integerrimum, ad basim subcordatum, 1 mm longum, ad basim labelli prope columnam callus incrassatus. *Columna* ut in D. pumilo.

Luzon, Benguet Subprovince, Mount Pulog, *Bur. Sci. 8849 R. C. McGregor*, July 4, 1909.

Dendrochilum Macgregorii is a slender species which resembles *D. exile* in habit, although it is more closely related to *D. Whitfordii* than to any other known species of the genus. The labellum resembles that of *D. Whitfordii* very closely. The narrow grass-like leaves which usually exceed the inflorescence, the shorter, denser racemes and the smaller flowers are characters which clearly distinguish *D. Whitfordii*. The flowers in dried specimens are deep-madder.

157. **MALAXIS** Soland. ex Sw.

Malaxis balabacensis sp. nov.

Planta 1–4 dm alta, foliosa, floribus flavis in racemo gracili, spicato, ±1.5 dm longo. Folia 6, ovato-lanceolata, acuminata, acuta, nervosa, 5–12 cm longa, usque ad 5 cm lata, in sicco chartacea glabra. *Pedunculus* angulatus, 1–2.5 dm longus, foliis longior. *Bracteae* lineari-lanceolatae, acuminatae, acutae, 4–7 mm longae, scariosae, dependentes.

Racemus sublaxiflorus, usque ad 13 cm longus. *Sepala lateralia* ovata, 3–3.5 mm longa, prope basim 3 mm lata, 3-nervia. *Sepalum dorsale* ovatum, acutum, 3–4 mm longum, 3-nervium. *Petala* rhombico-lanceolata, 4 mm longa, 2 mm lata, 1-nervia. *Labellum* integerrimum, subrotundatum, a basi labelli ad apicem 2 mm longum, prope apicem callus incrassatus; *auriculae* oblongae, obtusae, 1 mm longae. *Columna* brevis, stelidiis obtusis truncatis; ad basim columnae a tergo dens, vel papilla.

BALABAC, *Merrill 5374*, October 16, 1906 (type), in forests, terrestrial, altitude about 20 m. SIBUTU (Sulu Archipelago), *Merrill 5296*, October 13, 1906, in dry thickets near the seashore.

This species is clearly distinguished from all others from the Philippines, except *M. Ramosii*, of which I have any knowledge, through its rhombic-lanceolate petals. At the base of the column on its outer surface there is a conspicuous decurved tooth or papilla. The labellum is rotundate, deeply cordate-cleft at the base, and near the tip bears a curious callus which in dried specimens is blackish and which at its posterior end terminates in a minute fovea.

Malaxis bataanensis sp. nov.

Caulis brevis, circiter 3 cm longus. *Folia* 2 (vel 3 ?), chartacea, lanceolata superne, inferne late ovata, acuminata, acuta, 6–7 cm longa, 1.5–3.5 cm lata, in petiolum latum vaginantem transiens. *Pedunculus* elongatus, inferne nudus, bialatus, gracilis, 2–2.8 dm longus, 1–1.5 mm in crassitudine. *Racemus* spiciformis, valde elongatus, usque ad 2 dm longus. *Flores* multi, color luteus, qualis est mali aurantii. *Bracteae inflorescentiae* valde dependentes, triangulares, acutae, setaceae, ±4 mm longae. Pedicelli cum ovario 4 mm longi. *Sepala lateralia* orbicularia, 3-nervia, 2.5 mm longa, 2 mm lata. *Sepalum posticum* lateralibus majus, ellipticum, subacutum, 3.75 mm longum, 2 mm latum. *Petala* lanceolata, 1-nervia, subacuta, basi attenuata, 3 mm longa, 1.5 mm lata. *Labellum* integerrimum, rotundatum, cordatum, a basi labelli ad apicem 1.5 mm longum; *auriculae* minutae, obtusae; in disco callus elongatus. *Columna* crassiuscula, circiter 1.5 mm longa. *Capsula* ellipsoidalis 9 mm longa.

LUZON, Province of Bataan, Mount Mariveles, *Bur. Sci. 1674 F. W. Foxworthy*, October 17, 1906, terrestrial, 800 m above sea level. (Type in Hb. Bur. Sci.; duplicate in Hb. Ames.)

The flowers of this species are similar to those of *M. balabacensis* and *M. Ramosii*. In aspect, however, the plant is quite distinctive. The elongated peduncles, which are wand-like and conspicuously tall, are characteristic. Three-fourths of the peduncle, at least, is floriferous. The specimens examined bear two large leaves, the upper one lanceolate, the lower one ovate, and near the base a foliaceous bract. The flowers are caducous, consequently the peduncles, in mature specimens, seem to have the flowers crowded in short racemes.

Malaxis benguetensis sp. nov.

Herba 1–2.2 dm alta. *Caulis* crassus vix bulbosus, vaginis tectus, usque ad 4 cm longus. *Folia* 3 vel 4, vix petiolata, ovato-lanceolata, acuminata, acuta, 3–9 cm longa, 1.2–3.7 cm lata (rarissime 3 cm longa),

nervosa, chartacea. *Pedunculus* erectus, 8–15 cm longus, foliis longior. *Racemus* cylindricus, sublaxiflorus, 3–7.5 cm longus, in sicco 1.5 cm in diametro. *Bracteae* lineari-lanceolatae, acuminatae, circiter 6 mm longae, dependentes. *Flores* numerosi, fusco-virides vel purpurascentes. *Sepala lateralia* elliptica, circiter 2 mm longa, 1.5 mm lata, 1-nervia. *Sepalum dorsale* ovatum, 2.5 mm longum, 1–1.25 mm latum, obtusum, 1-nervium. *Petala* linearia, obtusa, 1-nervia, circiter 2.5 mm longa, 0.75 mm lata. *Labellum* obscure trilobatum, concavum, late cordato-hastatum, 2.5 mm longum, 3 mm latum: *lobis lateralibus* vix distinctis, rotundatis; *lobus medius* rotundatus, obtusus, callo crescentiforme in margine. *Columna* brevis, crassiuscula.

Luzon, Benguet Subprovince, Pauai, *Bur. Sci. 8362 McGregor*, June, 1909, altitude 2,100 m.

The material at hand exhibits a wide range of variation in measurements. The labellum is round heart-shaped or broadly and bluntly hastate. From the base a distinct vein emerges on each side and extends round the circular depression of the lip and is thickened along the innner margin of the middle lobe to form a crescent-shaped membranaceous callus.

Malaxis Curranii sp. nov.

Aff. M. latifoliae, at triplo minor. *Herba* usque ad 2 dm alta, gracilis, folia 3. *Caulis* ±3 cm longus vix incrassatus. *Folia* lanceolata, acuminata, acuta, breviter petiolata, 5–10 cm longa, circiter 1.5 cm lata, chartacea, nervosa. *Pedunculus* gracilis, angulatus, foliis longior, 9–15 cm longus. *Racemus* compactus, cylindricus, 1–2.5 cm longus, 5 mm in diametro; flores plures, parvi, luteo-virides. *Bracteae* lineari-lanceolatae, setaceae. *Sepala lateralia* elliptico-oblonga, obtusa, 3-nervia, 3 mm longa, 1.5 mm lata. *Sepalum dorsale* simile. *Petala* lineari-oblanceolata, acuta, 1-nervia, 3 mm longa, 0.5 mm lata. *Labellum* cymbiforme, 2 mm longum, auriculis parvis, apice trilobo. *lobis lateralibus* obtusis, *medio* subacuto longiore, lanceolato: *lobi laterales* minuti; lobus medius 1 mm longus. *Columna* brevis.

Luzon, Benguet Subprovince, *For. Bur. 5105 Curran*, August 16, 1906, open pine forest.

The differences between *M. Curranii* and typical *M. latifolia* are chiefly habital. The habit of the species here proposed is quite distinctive. The floral details, however, are not sufficiently unlike *M. latifolia* to be easily emphasized in a description. The shorter, more slender peduncle and raceme, and the acute middle lobe of the labellum must be relied on in differentiating the Philippine material from typical *M. latifolia*.

Malaxis latifolia Smith in Rees's Cycl. 22, No. 3.
Microstylis congesta Reichb. f. in Walp. Ann. 6: 206.
Malaxis plicata Roxb. Fl. Ind. 3: 456.
Dienia congesta Lindl. in Wall. Cat. no. 1936.

In the Herbarium of the Bureau of Science there are two specimens which in my opinion belong to this species. One of these is typical, the other has purplish flowers and probably represents the variety *fusca*.

LUZON, Rizal Province, *Bur. Sci. 4667 Maximo Ramos*, August, 1907.

Var. **fusca** cf. Ridley in Journ. Linn. Soc. Bot. 24: 335.

LUZON, Benguet Subprovince, *Bur. Sci. 3492 Major E. A. Mearns*, July, 1907.

M. latifolia is a variable species which is found in Java, Sumatra, Borneo, Siam, China, New Guinea and Australia. (Cf. *fig. CLXXXV* in the third volume of plates which accompany J. J. Smith's "De Orchideen von Java").

Malaxis Macgregorii sp. nov.

Planta foliosa. *Caulis* vix incrassatus. *Folia* 6–9, lanceolata, acuminata, acuta, multinervia, 5–11 cm longa, 3 cm lata. *Petiolus* latus, vaginans, 3 cm longus. *Inflorescentia* cum pedunculo 1.5 dm longa, foliis longior. *Flores* in racemo laxo languente, circiter 1 cm distantes. *Bracteae* lineari-lanceolatae dependentes. *Sepala lateralia* elliptica, obtusa, 3 mm longa. *Sepalum dorsale* simile. *Petala* lineari-oblonga, circiter 2 mm longa. *Labellum* 4 mm longum, auriculatum; lobus medius subquadratus, ad apicem bifidus; auriculae magnae; in sinu utroque prope basim lobi medii dentes 2 stant.

POLILLO, *Bur. Sci. 10440 R. C. McGregor*, October 19, 1909, terrestrial.

Malaxis Macgregorii is nearly allied to *M. dentata* Ames and to *Microstylis micrantha* Hook. f. (cf. "Icones Plantarum" *pl. 1834*). The flowers of *Malaxis dentata* are smaller, however, and the different middle lobe of the labellum is quite distinctive. According to field notes the flowers of *M. Macgregorii* are rose-carmine.

Malaxis Ramosii sp. nov.

Herba 1–2 dm alta in anthesi. *Caulis* brevis, circiter 3 cm longus. *Folia* 3, lanceolata, acuminata, acuta, 4–10 cm longa, 1.5–3 cm lata, nervosa. *Pedunculus* 7–16 cm longus, foliis longior. *Bracteae* lineari-lanceolatae acuminatae, acutae, 3 mm longae, dependentes. *Racemus* usque ad 9 cm longus. *Flores* 3–5 mm distantes, circa 9 mm in diametro. *Pedicelli* circiter 6 mm longi. *Sepala lateralia* ovata, 3-nervia, 4 mm longa, 3 mm lata. *Sepalum dorsale* ovato-lanceolatum, 3-nervium, 5 mm longum, 3 mm latum. *Petala* rhombico-lanceolata, 4.75 mm longa, 3 mm lata, 3-nervium. *Labellum* integerrimum, rotundatum, a basi labelli ad apicem 2 mm longum; *auriculae* oblongae, obtusae, 1 mm longae. *Columna* brevis, ad basim columnae dens, vel papilla a tergo.

LUZON, Rizal Province, Bosoboso, *Bur. Sci. 4567 Maximo Ramos*, August 14, 1907.

M. Ramosii is closely allied to *M. balabacensis* from which it differs in its smaller size and larger flowers. The petals of *M. balabacensis* are narrower in relation to their length and not so rhombic as those of *M. Ramosii*; then again the peduncles of *M. balabacensis* are much longer in relation to the leaves.

Malaxis rizalensis sp. nov.

Aff. M. purpureae. *Caulis* brevis, 3–4 cm longus, vix incrassatus. *Folia* 3–5, lanceolata vel ovato-lanceolata, acuminata, acuta, petiolata; *lamina* 6–13 cm longa, 2.5–4.5 cm lata. *Petiolus* vaginans, 2.5–3.5 cm longus. Tota planta usque ad 2.2 dm alta. *Pedunculus* 9–17 cm longus, foliis longior. *Racemus* circiter 9 cm longus, laxiflorus, *flores* purpurei. *Bracteae* lineari-lanceolatae, 5 mm longae, dependentes. *Pedicelli* usque ad 7 mm longi. *Sepala lateralia* elliptica valde obtusa, 4-nervia, 3.5 mm longa, 1.5 mm lata. *Sepalum dorsale* oblongum, obtusum, 4.5 mm longum, circiter 1.5 mm latum. *Petala* lineari-oblonga, obtusa, 3-nervia, 4 mm longa, 1 mm lata. *Labellum* magnum, ovato-cordatum, obscure 3-lobatum; *lobus medius* bifidus, 3 mm longus, 3 mm latus; *lobi laterales* obtusi, minuti, producti in auriculas magnas, obtusas, inter quas columna prominet. *Auriculae* oblongae 2 mm longae, 1.5 mm latae in sicco nervosae. *Columna* crassiuscula.

Luzon, Rizal Province, Bosoboso, *Bur. Sci. 4561 Maximo Ramos*, August, 1907. (*Type* in Hb. Bur. Sci., no duplicate).

M. rizalensis is a very near ally of *M. purpurea* and when studied with the aid of more material than I possess may prove to be conspecific with it. The stems are short and the leaves are not conspicuously congested. At least my material is clearly differentiated from Zollinger's no. 2536 (Hb. British Museum of Natural History) cited by Ridley under *Microstylis purpurea* in the "Revision of the Genera Microstylis and Malaxis," and by J. J. Smith in "Die Orchideen von Java." The labellum of *M. rizalensis* resembles in general outline that of *M. Hutchinsoniana* (cf. Ames, Orchidaceae 2: 128) but is distinguishable from it by its bifid apex, the divisions of which are oblong, obtuse, 1.5 mm long. *M. Wallichii* is a near ally of our species.

Malaxis uncata sp. nov.

M. sagittatae (J. J. Sm.) affinis. *Caulis* brevis vix incrassatus, usque ad 2 cm longus. *Folia* breviter petiolata, 3, quorum unum parvulum est. *Lamina* lanceolata, breviter acuminata, acuta, glabra, 5-nervia. *Folium* infimum usque ad 2 cm longum. *Folium* superum 8 cm longum, 2.5–3 cm latum. *Pedunculus* elongatus, gracilis, 11–18 cm longus. *Bracteae* dependentes, lineari-lanceolatae, setaceae, valde acutae, plus minus 5 mm longae. *Pedicelli* elongati, usque ad 1 cm longi. *Flores* flavidi. *Sepala lateralia* elliptica, ad apicem rotundata, 3 mm longa, 2 mm lata. *Sepalum posticum* ovato-lanceolatum, obtusum, 3-nervium, 3.5 mm longum, 2.5 mm latum. *Petala* linearia, 1-nervia, 4 mm longa, 0.5 mm lata. *Labellum* integerrimum, late sagittatum; auriculis obtusis 1.5 mm longis. *Discus* usque ad 2 mm longus. *Callus* bilobus in disco medio. *Columna* crassiuscula, 1 mm longa, a tergo, prope basim, dens uncinatus. *Capsula* ellipsoidalis, 6–8 mm longa.

Luzon, Laguna-Tayabas Provinces, *For. Bur. 9552 H. M. Curran*, March, 1908.

M. uncata is closely allied to **Malaxis sagittata** (J. J. Sm.) (*Microstylis sagittata* J. J. Sm. Ic. Bog. 2: *t. CVII, C.*, Die Orchideen von Java 252), from which it differs in its narrower leaves, yellowish-flowers, broader upper sepal and more broadly sagittate lip.

The type collection consists of two plants, preserved in the Herbarium of the Bureau of Science. Unfortunately both plants are in fruit so that my description is based on terminal flowers. The flowers in dried specimens are yellowish.

161. CESTICHIS Pfitzer.

Cestichis Lyonii sp. nov.

Radices multae, fibratae. *Pseudobulbi* fasciculati, 2 cm longi, complanati, in sicco usque ad 1.5 cm in crassitudine, rugosi. *Folia* bina, oblongi-lanceolata, acuta, utrinque glabra, 6.5–8.5 cm longa, 1–1.5 cm lata, coriacea, in petiolos desinentia. *Petiolus* brevis, 5 mm longus. *Pedunculus* terminalis, bialatus, foliis longior, usque ad 23 cm longus, erectus. *Bracteae* lineari-lanceolatae, setaceae, elongatae, 1 cm longae. *Racemus* longissimus, densus, usque ad 12 cm longus. *Bracteae inflorescentiae* lanceolatae, acutae, 2–4 mm longae, pedicellum et ovarium excedentes. *Flores* flavidi. *Sepala lateralia* oblongi-lanceolata, acuta, valde uninervia, 4.5 mm longa, 2 mm lata. *Sepalum intermedium* simile. *Petala* linearia, uninervia, 4 mm longa. *Labellum* orbiculare subito acuminatum, 5-nervium, 4 mm longum, circiter 3 mm latum. *Columna* exalata, crassiuscula, 2 mm longa.

Luzon, Benguet Subprovince, Baguio, *155 W. S. Lyon* (type in Hb. Ames). Mindoro, Mount Inauan, *For. Bur. 9959 M. L. Merritt*, January 22, 1908, 1,300 m altitude (single specimen in Hb. Bureau of Science).

The labellum is orbicular and at the apex abruptly contracted into an obtuse tip. The pseudobulbs in dried specimens have the appearance of having been strongly compressed or flattened when fresh.

162. OBERONIA Lindl.

Oberonia cylindrica Lindl. Bot. Reg. 1840, Misc. 20, Fol. Orch. Oberonia 2; Ames Orchidaceae 1: 77.

This species appears to be very common in northern Luzon. The material from which Lindley obtained his original and very brief description was imported from Manila by Messrs. Loddiges. From Lindley's description, in the "Botanical Register," it is quite impossible to identify with any degree of surety plants which may prove conspecific with *O. cylindrica*. Furthermore, his remarks in "Folia Orchidacea" are inconclusive. In neither work does he refer to foliage, although in "Folia Orchidacea" he places *O. cylindrica* in the same section with *O. iridifolia*, among the acaulescent species which have radical leaves. In order to obtain light on the subject I sent a specimen, representative of material which I had identified with Lindley's species, to Kew, where it was carefully compared with the type. This comparison verified my conclusions and also revealed the fact that Lindley's specimen is destitute of foliage, consisting of the inflorescence only. For a description, supplementary to Lindley's, reference should be made to my list of Philippine orchids published in the first volume of "Orchidaceae."

Luzon, Benguet Subprovince, Mount Pulog, *Elmer D. Merrill 6573*, May, 1909, *Bur. Sci. 8823 R. C. McGregor*, July, 1909, *E. B. Copeland s. n.*, 2,300 m altitude, in mossy forest, May 12, 1909; Mount Tonglon, *Bur. Sci. 5476 Maximo Ramos*, December, 1908; Baguio, *R. S. Williams 1082*, 1904: Bontoc Subprovince, *Father M. Vanoverbergh, 407*, 1910 (specimen in fruit).

172. PODOCHILUS Bl.

This is an intricate genus with which it is almost impossible to do satisfactory work owing to the fragmentary condition of the specimens usually found in herbaria. One must rely to a large extent on descriptions and these are too frequently inadequate because of the similarity between many of the species.

Podochilus fenixii sp. nov.

Caules plus minus 3 dm alti, simplices, graciles. *Folia* oblongi-lanceolata inferne, superne linearia, acuminata, plus minus 5 cm longa, 3–11 mm lata; utrinque glabra, usque ad 4 mm in crassitudine in sicco, nervo intermedio in apiculum minutum producto. *Inflorescentia* terminalis et lateralis brevis. *Racemus* pauciflorus, foliis multo brevior. *Pedunculus* cum racemo usque ad 1.5 cm longus. *Bracteae* cymbiformes ovatae, acuminatae, acutae, 4 mm longae, inferne imbricatae. *Flores* albi. *Sepala lateralia* ovato-lanceolata, acuminata, acuta, 3-nervia, 4 mm longa, ad basim 2.5 mm lata. *Sepalum dorsale* concavum, ovatum, obtusum, plus minus 3 mm longum. *Petala* oblonga vel oblongi-lanceolata, acuta, 3-nervia, 2.75 mm longa. *Labellum* oblongum, obtusum, 4.75 mm longum, ad basim saccatum; prope apicem labelli tuberculum minutum, post quod callus multo major; prope basim labelli callus cucullatus, V-formis.

Batanes Islands, Batan, Santo Domingo de Basco, *Bur. Sci. 3794 Eugenio Fénix*, June 8, 1907.

In habit, if we except the inflorescence, this species resembles very closely *P. dendrobioides* Schlechter. The labellum is distinctive as it bears three calli; one at the apex, a minute protuberance; one near the middle, a transversely situated keel or cushion, and one near the base, this last being V-shaped, cucullate at its closed end. In several of the specimens examined the racemes are numerous. They arise from the axils of the leaves beginning at about the middle of the stem, and are produced with few interruptions from there to the summit.

Podochilus (§ Appendicula) fruticosus sp. nov.

Caulis ramosus, 3 dm longus. *Folia* oblonga, 1–2 cm longa, 2–4 mm lata, ad apicem inaequaliter bilobata. *Flores* terminales et laterales, in capitulis bracteatis. *Bracteae* acutae, 3 mm longae. *Sepala lateralia* triangularia, 3-nervia, acuta, 2.5 mm longa, 2 mm lata ad basim. Petala lineari-oblonga, obtusa, 1-nervia, 1.75 mm longa. *Labellum* 3 mm longum, breviter unguiculatum; lamina obovata vel suborbicularis.

Mindanao, Camp Keithley, Lake Lanao, *Mary Strong Clemens s. n.* (type), September, 1907.

Plant much branched, the branches bearing numerous heads of flowers in the axils of the small linear-oblong leaves. On the same plant flower buds and fruits occur. The fruits, which are about 6 mm long, exceed the rigid, nervose bracts. In all the specimens examined the leaves show a strong tendency to fall off, consequently herbarium specimens consist chiefly of naked stems and the

persistent flower heads. The lip is orbicular when spread out, but in its normal state is rather obovate, obtuse. The callus is basal and V-shaped, the wings extend along the margin to the apical third of the lip where they converge.

Podochilus (§ Appendicula) malindangensis sp. nov.

Planta 5 dm alta, robusta, glabra. *Folia* oblongi-lanceolata vel elliptica, disticha, coriacea, 4 cm longa, 1 cm lata. *Inflorescentia* lateralis, 2.5–3 cm longa; rhachis fractiflexus. *Flores* in racemo brevi. *Bracteae* cymbiformes, acutae, 8.5 mm longae, ovario longiores. *Sepala lateralia* mentum obtusum formantia, triangulari-lanceolata, acuta, 3-nervia, 4.5 mm longa, 4 mm lata ad basim. *Sepalum dorsale* lanceolatum, 3-nervium, 4–4.5 mm longum, subacutum. *Petala* oblonga, 1-nervia, 4 mm longa, 1.5 mm lata. *Labellum* ut in P. pendulo, oblongum vel subquadratum, 4 mm longum, 7-nervium.

MINDANAO, Province of Misamis, Mount Malindang, *For. Bur. 4733 Major E. A. Mearns & W. I. Hutchinson*, May 25, 1906, at 1,700 m altitude.

P. malindangensis is a tall, rather strict species which in general aspect resembles *P. micranthus*. The labellum is oblong or subquadrate, obtuse, with a large pocket or cup near the base formed by a transversely situated membrane. The lateral sepals are united at the base and form a rounded mentum. In the type material the characteristically large flowers are borne on lateral peduncles which occur on stems from which the leaves have fallen. Leafy stems destitute of flowers occur on the same plant with the naked flower-bearing stems. It is probable that as the flowering stems are the most mature the leaves fall off during the drying process, but notwithstanding this probability the specimens are in general aspect unlike others of the genus from the Philippines. When dry the flowers are blackish, when fresh they were described by the collectors as "dark-blue."

Podochilus (§ Apista) Robinsonii sp. nov.

Caules 1 dm alti, graciles, basibus foliorum vaginantibus tecti. *Folia* lanceolata, 1.3 cm longa, 2–3 mm lata, coriacea. *Inflorescentia* terminalis. *Pedunculus* cum racemo 3.5 cm longus. *Bracteae* minutae, acutae, 1 mm longae. *Flores* minuti, flavi. *Sepala* 3 mm longa, connata, tubum formantia, partes terminales 1.5 mm longae, liberae, subacutae. *Petala* uninervia, dolabriformia, vel triangula breviter unguiculata, 3.5 mm longa. *Labellum* cordatum ad basim sagittatum breviter unguiculatum, 3-nervium, 2.5 mm longum, 2.25 mm latum.

LUZON, Camarines Province, Maagnas, *Bur. Sci. 6371 C. B. Robinson*, August 27, 1908, altitude above sea 200–400 meters. Here also I refer material collected on Canlaon Volcano, Island of Negros, by *C. S. Banks* in June, 1906, *Bur. Sci. 1137*.

In general aspect this species resembles *P. strictus* Ames and *P. scalpelliformis* Bl. It is easily distinguished from these by its broader leaves, longer racemes and very different petals. The sepals are connate as in *P. scalpelliformis*. The rigid bracts give to the raceme a pectinate aspect. In dried specimens the leaves appear to have been twisted slightly.

176. AGROSTOPHYLLUM Bl.

Agrostophyllum malindangense sp. nov.

Caules usque ad 2.5 dm longi, ad basim 2 mm in crassitudine, fasciculati, teretes, exiles inferne, superne sensim dilatati vaginis foliorum tecti: vaginae foliorum imbricatae, persistentes, nitidae, flavidae, prope apicem caulis inflatae, (in sicco ?) marginibus nigricantes. *Folia* usque ad 1 dm longa, prope basim 4 mm lata, linearia, acuminata, acuta, coriacea, ad basim rotundata, nervo intermedio prominente praedita. *Inflorescentia* terminalis dense capitata globosa, multiflora, 1.5 cm in diametro. *Bracteae* exteriores rigidae, lanceolatae, floribus longiores; bracteae interiores obtusae, floribus breviores, glumaceae. *Pedicelli* cum ovario 5.5 mm longi. *Flores* flavidi, conferti. *Sepala lateralia* oblongi-lanceolata, acuta, uninervia, 3 mm longa, ad basim 2 mm lata. *Sepalum dorsale* simile. *Petala* valde linearia, uninervia, 3 mm longa. *Labellum* carnosum, 3-lobatum, hypochilio obtuso, valde scrotiforme, lamella transversa integra ab epichilio separato. *Epichilium* cupulam formans. *Lobi laterales* minuti, paene obsoleti. *Columna* crassa, 3.5 mm longa.

Mindanao, Province of Misamis, Mount Malindang, *For. Bur. 4610 Mearns & Hutchinson*, May 25, 1906, altitude 1,700 m.

178. CERATOSTYLIS Bl.

Ceratostylis philippinensis Rolfe ex Ames Orch. 1: 79, with fig.

Among the orchids collected on Mount Mariveles by Elmer D. Merrill and sent alive in 1905 to North Easton was this interesting species which has grown luxuriantly in my collection, forming dense tuffs of semiterete leaves from the axils of which the sweet-scented, snow-white flowers emerge in August and September. The margin of the lip is slightly revolute near the middle and on the disk beyond the middle are two inconspicuous papillose calli.

This species has also been collected recently by *R. C. McGregor, Bur. Sci. 8447*, near Pauai, Benguet Subprovince, Luzon, at an altitude of 2,100 m.

218. PHAIUS Lour.

Phaius flavus Lindl. Gen. Sp. Orch. Pl. 128.

The material which I refer here may be conspecific with *P. philippinensis* N. E. Brown, a species which I have not seen. There are several details, however, in Mr. Brown's description which do not agree with my specimens. The entire lip of my plant suggests *P. philippinensis*, also the thin keels on the disk. On the other hand *P. flavus* is a very variable species and *P. philippinensis* may be one of its variants. Mr. Brown's description refers to the fugaceous floral bracts. In my material the bracts are persistent.

Luzon, Lepanto-Bontoc region, *Bur. Sci. 5616 Dean C. Worcester*, July 8, 1907, flowers with a rather rank odor, yellow, fringe of lip brown-purple.

230. ACANTHOPHIPPIUM Bl.

Acanthophippium Mantinianum L. Lind. & Cogn. Journ. des Orch. 7: 138.

Roots fleshy, elongated. Stems 12 cm long, gradually tapering upward from a broad base, jointed. Leaves 2, plicate, ovate-oblong, petiolate, up

to 3 dm long, 9 cm wide. Raceme 5-flowered, bracts cymbiform up to 3 cm long. Sepals about 3 cm long. Petals rhomboidal, obtuse. Labellum 3-lobed, lateral lobes dolabriform, about 5 mm long, 5 mm wide, middle lobe obtuse, about 7 mm long. Disk lamellate, lamellae 5, fleshy, prominent.

This peculiar species, which was originally introduced from the Philippine Islands, and described by Linden and Cogniaux in "Le Journal des Orchidées" in 1896, has just come to hand from Luzon, where it was collected by Father M. Vanoverbergh. The flowers are yellowish with dark spots and the labellum is nearly white. My knowledge of the species, unfortunately, is based on the original description and not on an examination of the type material. I have seen no other specimen of *Acanthophippium* from the Philippines.

232. PACHYSTOMA Bl.

Pachystoma pubescens Bl. Bijdr. 376.

Pachychilus pubescens Bl. Mus. Bot. Lugd. Bat. 2: 173.

I refer to this species several specimens recently collected in Luzon. They agree with the material figured in detail by Blume and with a Javan plant preserved in the herbarium of the British Museum of Natural History, collected by Horsfield.

Luzon, Cagayan Province, *Bur. Sci. 7969 Maximo Ramos*, April 3, 1909, flowers "dark-purplish:" Lepanto Subprovince, *Bur. Sci. 7050 Ramos*, January 24, 1909, flowers "violet:" Benguet Subprovince, *For. Bur. 10942 H. M. Curran*, January 14, 1909, in grass lands, pine-covered hills, flowers "pink," altitude 1,500 m: Rizal Province, *Bur. Sci. 6774 C. B. Robinson*, May 18, 1909, flowers "lilac, lip golden-yellow except on margin in front."

235. EULOPHIA R. Br.

Eulophia dentata sp. nov.

Mea sententia E. venosae Reichb. f. affinis. *Radices ?* *Caulis* erectus usque ad 5.5 dm longus, bracteis scariosis vaginantibus instructus; foliis carens. *Bracteae* tubulares, supra dilatatae, acuminatae, setaceae, imbricatae inferne, superne distantes, 2–4 cm longae. Bracteae inflorescentiae scariosae, lineares, setaceae, usque ad 2 cm longae, flore longiores. *Racemus* sublaxiflorus, 7–10 cm longus, circiter 4 cm in diametro. *Flores* albi et purpurei, 12 mm longi, nutantes. *Pedicelli* pergraciles, 5–9 mm longi. Ovarium 5–7 mm longum. *Sepala lateralia* oblonga, 5-nervia, 1.5 cm longa, 3 mm lata, acuta. *Sepalum dorsale* simile, basi leviter attenuatum. *Petala* oblongi-lanceolata, 3-nervia, 12 mm longa, 3 mm lata. *Labellum* ovatum, 3-lobatum, inferne in calcar productum. *Lobi laterales* rotundati, leviter crenulati, circiter 2 mm longi, 2 mm lati, sparsim papillosi; *lobus medius* suborbicularis, margine valde dentatus; discus ad basim leviter tricarinatus, ad medium et prope apicem papillis et processibus numerosis. Papillae et processus inaequales. Processus complanati, usque ad 2 mm longi. *Calcar* obtusum, 3.5 mm longum. *Columna* 4 mm longa, ad apicem dilatata.

Luzon, Bontoc Subprovince, *For. Bur. 17035 H. M. Curran*, January 26, 1909, very common in open grass lands.

From the specimens at hand *Eulophia dentata* appears to be a leafless species closely allied to *Eulophia venosa* Reichb. f.

276. DENDROBIUM Sw.

Dendrobium (§ **Aporum**) **indivisum** Miquel Fl. Ind. Bat. 3: 630.

D. lunatum Lindl. in Journ. Linn. Soc. Bot. 3: 4.

This is apparently a common species in the Philippine Islands where it is found growing on trees along the coast and inland. The flattened, erect stems, triangular distichous leaves and terminal inflorescence are quite characteristic. According to the field notes of collectors the small flowers are pale-yellow marked with purple. The lunate labellum and conspicuous callus serve to distinguish this species from its congeners in the Philippines.

In Lindley's Herbarium the Cuming plant, which I take to be the type of *D. lunatum* Lindl., appears to be conspecific with *D. indivisum*. Lindley's sketch of the flower agrees very well with the figure on *Plate XIII* of Presl's "Reliquiae Haenkeanae," although the general habit of the Cuming specimen is not exactly like that of the majority of the specimens recently collected in the Philippines.

Sulu Archipelago, *Merrill 3003*, plants growing on low rocky bluffs along the seashore, 1907. Luzon, Province of Bataan, Lamao, Mount Mariveles, *For. Bur. 2753 T. E. Borden*, March, 1905, on tree trunks in mossy forest, 900 m above sea level: Province of Zambales, Mount Pinatubo, *Bur. Sci. 2616 Foxworthy*, April 25, 1907, on trees on very dry mesa, 700 m above sea level.

Dendrobium platycaulon Rolfe in Kew Bull. (1892) 139.

This species bloomed in the orchid collection of the Bureau of Science in November, 1909. According to notes which accompany the specimens submitted for identification the exact locality from which they were obtained and the name of the collector who discovered them are unknown. They certainly were Philippine. As Mr. Rolfe states, this species resembles *Dendrobium lamellatum*. The pseudobulbs, however, are longer and narrower in relation to their length and the flowers are larger than in that species. In the notes which are appended to the original description of *D. platycaulon* the flowers are said to exceed an inch in length. In the specimens I have examined the flowers are scarcely an inch long, but in other details they agree very well with Mr. Rolfe's description. *D. platycaulon* is a curious species with flattened pseudobulbs, which are about 11 cm long, 2.5 cm wide and only a few millimeters thick; they are contracted into a slender terete base; the leaves are oblong-lanceolate, larger than the pseudobulbs and somewhat similar to them in outline. The specimens examined were apparently 3- or 4-leaved. The flowers are nearly white, and fragrant when fresh. They close in a short time and turn yellow. They are few in number and borne near the apex of the leafless pseudobulbs.

Dendrobium scopa Lindl. Bot. Reg. (1842) Misc. 55.

What I take to be specimens of this species have been received from Mr. W. S. Lyon who collected them in Tarlac Province. Mr. Lyon in his field notes describes the plants as terrestrial, growing among rocks. The flowers, which were open in June, were white, cinnamon-scented, the finely fringed lip being straw-yellow. The flowers are not showy but on account of the peculiarly fringed lip are of exceptional interest and very curious. The sepals and petals are similar, linear-oblong, about 15 mm long. The labellum is oblong, the apex

broken up into a delicate spreading fringe the filaments of which are about 5 mm long.

Lindley's type specimen, for an excellent sketch of which I am indebted to Doctor Prain, is perhaps stouter than my plants, but in other respects matches them perfectly. The labellum of *D. scopa* is well illustrated in Lindley's herbarium by a colored drawing. In outline and in general aspect this drawing agrees very well with the labellum of the plants collected by Mr. Lyon.

Dendrobium scopa is referred to in J. J. Smith's "Die Orchideen von Java" as probably related to *D. comatum* Lindl. From the specimens at hand it would seem to be more nearly allied to *D. angulatum* in the form of the lip, but differs from that species in detail.

Luzon, Tarlac Province, *W. S. Lyon 110.*

276. SARCOPODIUM Lindl.

In the "Orchid Review" for August, 1910 (**18**: 237) Mr. R. A. Rolfe gives a list of twenty-one species, usually referred to *Dendrobium,* which he regards as constituents of a distinct genus, namely *Sarcopodium.* This genus was originally proposed by Lindley for the inclusion of a small group of species which Reichenbach f. referred to *Bulbophyllum.* At present only three Philippine species of *Sarcopodium* are known. All of these have recently been described. *S. acuminatum* Kränzl. was the first to be discovered, *S. Lyonii* Rolfe (*S. acuminatum* var. *Lyonii* Kränzl.) the second, and *S. stella silvae* Kränzl. & Loher, a species which I have not seen, the third.

In its brief history *Sarcopodium Lyonii* has accumulated an interesting synonymy as follows:

Sarcopodium Lyonii R. A. Rolfe in Orch. Rev. **18**: 240.
Dendrobium Lyonii Ames Orch. **2**: 177.
D. acuminatum Kränzl. Orchis **2**: 73, not Rolfe.
Sarcopodium acuminatum var. *Lyonii* Kränzl. in Fedde Rep. **7**: 40.

In view of Doctor Kränzlin's treatment of *S. Lyonii,* Mr. Rolfe's opinion in the "Orchid Review" is of interest. He says *S. Lyonii* is allied to *S. acuminatum,* but has larger rosy-carmine flowers with a darker lip. "It has been confused with the preceding,[7] and I believe includes all the plants which have been recently exhibited under the name *D. acuminatum,* also the figure in Gard. Chron. 1907, ii, p. 210, *fig. 88;* 1909, ii. p. 150, *fig. 64;* Gard. Mag. 1909, pp. 649, 660, with fig.; Journ. Hort., 1902, ii, p. 291, with fig.; Orchis ii, p. 73, *t. 16.*"

280. PHREATIA Lindl.

Phreatia prorepens Reichb. f. Otia Bot. Hamb. (1878) 54.

Up to the present I had seen only the material in the Gray Herbarium identified by Reichenbach and the specimens collected by Merrill on Mount Halcon. The collection under consideration was made by McGregor and is of unusual interest as it is composed of numerous specimens which exhibit a wide range of variation, some of the scapes approximating 2 dm in length. The variation in the leaves is also notable, ranging from the ligulate form char-

[7] *Sarcopodium acuminatum.*

acteristic of the type to broadly lanceolate. As a rule the scapes exceed the leaves considerably and bear spikes of white flowers which appear to be more rigid than in the other material I have examined. The structure of the flowers is very similar in the plants from Mount Halcon and in those collected by McGregor, so that variation seems to be purely vegetative. *P. prorepens* is closely related to *P. acuminata* J. J. Smith, from which it appears to differ chiefly in the size of the floral parts. In Lindley's herbarium at Kew there are two Javan species of *Phreatia* mounted on the same sheet. One of these, a plant collected by Junghuhn (no. 207), belongs to § *Ebulbosae*. The other, a plant collected by Lobb, belongs to § *Bulbosae* and is probably conspecific with *P. acuminata*. In habit it closely resembles *P. prorepens* and may be a form of that species. From my material it is quite impossible to distinguish *P. acuminata* from *P. prorepens*. In "Die Orchideen von Java," J. J. Smith distinguishes *P. acuminata* by the floral bracts being shorter than the ovaries. In my material I find some of the bracts conspicuously shorter than the ovaries, and some longer.

Luzon, Benguet Subprovince, Pauai, *Bur. Sci. 8363 R. C. McGregor*, June, 1909.

383. CLEISOSTOMA Bl.

Cleisostoma Kunstleri Hook. f. Icon. Pl. IV 4: *pl. 2335*.

I refer to this species, which was originally collected at Perak by Kunstler, material from the Island of Polillo. Leaves coriaceous, oblong, at the apex unequally bilobed, 2 dm long, 3–4.4 cm wide. *Scape* terete, 2.5 mm in diameter. *Bracts* few, obtuse, 5 mm long. *Inflorescence* laxly paniculate, many-flowered. *Floral bracts* minute, acute, much shorter than the pedicels of the purplish flowers. *Lateral sepals* oblong, obtuse, 3.5 mm long, 1.25 mm wide. *Upper sepal* oblong or oblanceolate, obtuse, 5 mm long, 1.5 mm wide. *Petals* linear-oblong, obtuse, 4.5–5 mm long, 1 mm wide. *Labellum* saccate, 3-lobed. Sac scrotiform, 3 mm long, with a posterior scale within, the scale oblong, membranaceous, bifid at the tip, each division obscurely emarginate. Lateral lobes minute, triangular, less than 1 mm long, middle lobe suborbicular, 1.5 mm long.

Polillo, *Bur. Sci. 10444 R. C. McGregor*, September 25, 1909, on tree trunks.

286. BULBOPHYLLUM Thou. (§ *Cirrhopetalum*).

Bulbophyllum chryseum comb. nov.

Cirrhopetalum chryscum Kränzl. in Fedde Rep. 8: 97.

This is a member of the section *Cirrhopetalum*, characterized by a solitary flower at the summit of the scape. The only other described species from the Philippines which are thus characterized are the ones very briefly described by Lindley, namely *B. antenniferum* and *B. maxillare*, which are remarkable on account of their very large flowers.

I have not seen the type of *B. chryseum* but my material agrees almost in detail with Kränzlin's description. Furthermore the collections in the Bureau of Science Herbarium contain no other species of the small, single flowered type which belongs to § *Cirrhopetalum* that would indicate *B. chryseum* to be one of a group. Consequently I am morally sure that my identification is correct. The only other described species of § *Cirrhopetalum* from the Philippines, characterized by a solitary flower, are the two mentioned above, and these are sharply distinguished by the extraordinary size of their flowers, these being among the largest in the section.

I have seen no material from the Philippines which agrees with *B. antenniferum* and *B. maxillare*. In the Herbarium of the Bureau of Science there are two plants which approach them in aspect but which represent very different species. My knowledge of *B. antenniferum* and *B. maxillare* is based on sketches of the types kindly given to me by Doctor Prain.

LUZON, Rizal Province, *Bur. Sci. 3076 Maximo Ramos*, flowers yellow. (Specimen flowering in Manila, January 21, 1908).

Bulbophyllum Cumingii Reichb. f. in Walp. Ann. 6: 261.

Cirrhopetalum Cumingii Lindl. Bot. Reg. 1843 sub *t. 49;* Bot. Mag. *t. 4996.*

This species which Lindley described from specimens collected in the Philippines by Cuming is apparently a rarity. The tetragonal pseudobulbs, oblong, coriaceous leaves, elongated scape and umbel of purplish flowers are characteristic.

NEGROS, Cadiz, *Bur. Sci. 7334 A. Celestino*, March, 1909, *For. Bur. 5227 Danao & Aspillera*, June, 1906.

Bulbophyllum Makoyanum Reichb. f. in Gard. Chron. 1879, 1: 234 in note.

Cirrhopetalum Makoyanum Reichb. f. in Gard. Chron. 1879, 1: 234; Bot. Mag. *t. 7259.*

This interesting species, which differs chiefly in color and minor details from *B. Cumingii*, has been discovered in the Philippines. The umbels of yellow flowers spotted with purple, which, according to the collector's notes, give the plant the aspect of a sun-flower, are very distinctive. The elongated, narrowly linear lateral sepals radiate from the center of the umbel. The petals and upper sepal are fringed with yellow hairs. The labellum is fleshy and smooth.

B. fimbriatum, which is a closely allied species, has two conspicuous teeth at the summit of the column.

POLILLO, *Bur. Sci. 10438 R. C. McGregor*, September 28, 1909, flowers pale-yellow speckled with burnt-carmine. MINDANAO, *Rev. R. F. Black s. n.*

299. DIPODIUM R. Br.

Dipodium paludosum Reichb. f. Xenia 2: 15.

There are two specimens in the Herbarium of the Bureau of Science which according to materials at hand appear to be referable to this species, one from Negros, the other from Mindanao. The details of the labellum agree with the figure in the "Botanical Magazine" (*t. 7464*), although the lateral lobes or teeth are rather longer, measuring 4 mm in length. Unfortunately I possess no authentic material of *D. paludosum*, consequently my identification is not so sure as I could wish. The identity of the genus, however, is beyond doubt and its addition to the Philippine flora through the specimens under consideration is of importance.

MINDANAO, Province of Surigao, *F. H. Bolster*, September, 1906. NEGROS, Himugaan, River, *For. Bur. 7313 H. D. Everett*, April 10, 1907, 20 m altitude above the sea.

376. LUISIA Gaudich.

Luisia Ramosii sp. nov.

Planta ±3 dm alta. *Caulis* plus minus 4 mm in crassitudine, vaginis foliorum tectus. *Folia* teretia, obtusa, in sicco valde rugosa, plus minus 1 dm longa, in sicco usque ad 3 mm in crassitudine, erecta vel adscendentia. *Vaginae* tubulosae, substriatae, persistentes. *Flores* flavidi, labello purpureo. *Pedunculi* breves, crassi, ? cm longi. *Bracteae inflo-*

rescentiae rigidae, obtusae. *Sepala lateralia* cymbiformia, oblonga, carinata, 6 mm longa, 3 mm lata; carina in apiculum uncinatum producta. *Sepalum dorsale* elliptico-lanceolatum, 3-nervium, obtusum, 6 mm longum, 3.5 mm latum, breviter apiculatum. *Petala* falcato-ovata, obtusa, 3-nervia, 6 mm longa, 4 mm lata, nervis lateralibus ramosis. *Labellum* trilobum, 6 mm longum; *lobus medius* triangulari-ovatus, 4 mm longus, 5 mm latus; *lobi laterales* erecti columnam amplectentes, rotundati, 2 mm longi, 2 mm lati. *Columna* crassa.

Luzon, Cagayan Province, *Bur. Sci. 7970 Maximo Ramos*, April 20, 1909.

Luisia Ramosii is a stout plant, in habit similar to *L. teretifolia*. The lateral sepals are strongly keeled near the apex, the keel passing into an elongated, uncinate apicula.

Three species of *Luisia* are now known to be natives of the Philippine Islands: *L. valida* Reichb. f., *L. Foxworthyi* Ames and the present one. Of these *L. valida* is not known to me. The description does not agree with any of the Philippine material I have examined, still its brevity leaves much to be desired.

402. TAENIOPHYLLUM Bl.

Taeniophyllum Merrillii sp. nov.

Radices crassae, numerosae, plus minus 4 mm in crassitudine. *Folia* 0. *Scapus* filiformis, usque ad 1.7 cm longus, hispidulus, nudus. *Flores* albi. *Racemus* brevis, 3–4 mm longus. *Bracteae* minutae 0.5 mm longae. *Pedicelli* plus minus 1 mm longi. *Sepala lateralia* oblongi-lanceolata, 1-nervia, 1.25–1.5 mm longa, 0.75 mm lata. *Sepalum dorsale* lineari-oblongum. *Petala* lanceolata, 1 mm longa. *Sepala lateralia petalaque* prope basim connata. *Labellum* saccatum, integerrimum, 3 mm longum, ad apicem rotundatum.

Luzon, Province of Bataan, Mount Mariveles, *Merrill 3878*, August, 1904, altitude above sea level about 800 m.

This is a curious species composed of fleshy yellow-green roots 3–7 cm long. and filiform scapes. The minute flowers appear to open in succession. The lateral sepals appear to arise wholly from the lip and look like lateral lobes as their middle nerve continues from the base into the sac.

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NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTION OF NEW SPECIES, IV

By Oakes Ames, M. A., F. L. S.
(*From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.*)

Reprinted from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government,
Manila, P. I.
Vol. VII, No. 1, Section C, Botany, May, 1912

MANILA
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THE PHILIPPINE
JOURNAL OF SCIENCE
C. BOTANY

VOL. VII APRIL, 1912 No. 1

NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, IV.

By OAKES AMES.
(From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.)

The following paper contains descriptions of twenty-seven new species from the Philippine Islands, one genus, heretofore unrecorded as a native of the Philippines, and one species, namely *Dendrobium angustifolium* Blume, a native of Java, Sumatra, and the Malay Peninsula, which is an addition to the list of Philippine plants.

Cestichis Cumingii (Ridley) Ames is here included as a distinct species. In Orchidaceae 1:13, doubts were expressed as to its distinctness from *C. compressa*. From careful studies of *C. compressa*, as represented by Javan material, and of *C. Cumingii*, as represented by the specimens collected by Weber on Mount Mariveles, I am convinced that two species are before us. What is true of *C. Cumingii* is true of numerous other Philippine orchids which have close allies in Java and the Malay Peninsula. A general similarity undoubtedly exists, but comparative studies of each individual case show differences, the sum of which indicate clearly that there are constant differentiating traits of specific value. This fact becomes more and more apparent with each case studied and makes it seem highly probable that many Philippine plants which have been referred to extra-limital species will be found, after critical examination, to be distinct

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and endemic. An interesting example of this is offered by the genus *Dendrochilum* in the Philippines, which is composed entirely of endemic species, if we exclude one or two which have been ascribed to the Philippines conjecturally on evidence too slight for recognition.

HABENARIA Willd.

Habenaria Curranii sp. nov.

Planta 6 dm alta, foliis paulum infra medium partem caulis congestis, lanceolatis, acuminatis. *Sepala lateralia* lanceolata, vel lineari-lanceolata, aristata, *sepalum superius* simile, lanceolatum, acuminatum, cucullatum. *Petala* bipartita, *lacinia* posterior linearia, *lacinia anterior* posteriori similis sed longior, 4.5 cm longa. *Labellum* usque ad basim tripartitum; *laciniae laterales* media longiores, filiformes; *lacinia media* 1.7 cm longa. *Calcar* prope apicem subdilatatum, *processus stigmatis* prominentes.

Plant tall, slender throughout, *leaves* five or more, narrowly lanceolate, acuminate, acute, 7.5 to 11 cm long, 1 to 2 cm wide, clustered near the middle of the stem or lower, about 2 dm above the roots. *Bracts* of the stem sheathing, those above the leaves acuminate, aristate, about 2 cm long. *Raceme* slender, elongated, smooth, many-flowered (about 20), flowers greenish. *Bracts of the inflorescence* aristate, about equaling the flowers, ovary and pedicel about 2 cm long, smooth. *Lateral sepals* spreading, narrowly lanceolate, 3-nerved, acuminate, aristate, about 1 cm long, 2 mm wide. *Upper sepal* similar to but shorter than the laterals, 7.5 mm long. *Petals* bipartite, *posterior division* (free from the dorsal sepal?) linear, 1 cm long, *anterior division* filiform, 4.5 cm long. *Labellum* tripartite, *lateral divisions* much longer than the middle one, filiform, about *4 cm long* (!), *middle division* broader than the laterals, about 0.5 mm wide, 1.7 cm long. *Stigmatic processes* elongated, tapering, longer than the anther-canals. *Spur* stout, somewhat inflated near the tip, about 2.4 cm long.

LUZON, Province of Cagayan, Lalloc, H. M. Curran, *For. Bur. 17138*, February 22, 1909: Benguet Subprovince, Sablan, E. Fénix, *Bur. Sci. 12578*, December 6, 1910.

Similar in habit to *H. ponerostachys* Reichb. f., but unlike that species in the size and structure of the flowers. It is also like *H. aristulifera* Reichb. f., but the floral divisions are conspicuously longer in *H. Curranii*.

Habenaria Delessertiana Kränzl. Gen. et Sp. Orch. 1: 233.

Kränzlin cites Cuming's 2086 as the type of this species, but under *Habenaria muricata* Vidal (*H. hystrix* Ames) he also cites this number of

the same collection without any allusion to a mixture having been made in the distribution of Cuming's specimens. In my studies of the material collected for the Bureau of Science I have examined two series of specimens which are clearly referable to *H. Delessertiana,* being chiefly characterized by the linear petals, protuberant in part at the base, by the aristate sepals, and by the middle lobe of the labellum being about one-fourth longer than the lateral lobes. Another characteristic is the crowding of the oblong-lanceolate leaves near the middle of the stem.

All of the material distributed as 2086 of Cuming's collections which I have examined is referable to *Habenaria hystrix,* and as *H. muricata* Vidal this number is listed in "Phanerogamae Cumingianae Philippinarum." (*H. muricata* is a synonym of *H. hystrix*).

Kränzlin cites "Calananz?" as the habitat of *H. Delessertiana.* The material from Luzon which I have examined was collected at Calauan (written on the field label as Calauang). May not the localities in question be identical, Kränzlin's "Calananz?" being the same as Calauang?[1]

LUZON, Province of Laguna, Calauan, R. C. McGregor, *Bur. Sci. 12407,* November 30, 1910. MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens 865,* November, 1906.

Habenaria Mearnsii sp. nov.

Habitu *H. clavellatae* (Michx.) Spreng. haud dissimilis. *Folia* oblongi-elliptica et lineari-lanceolata. *Bracteae inflorescentiae* ovariis longiores, excedentes flores infimos. *Sepala lateralia* lanceolata vel ovato-lanceolata, subfalcata. *Sepalum superius* ellipticum, obtusum. *Petala* simplicia, oblonga, obtusa. *Labellum* simplex, linearis; prope basim labelli *tuberculum. Calcar* ovario brevius.

Tuberoids fleshy (3 ?). *Plants* 1.4 to 3.6 dm tall, strict, few-leaved, in leafage somewhat resembling *H. clavellata* (Michx.) Spreng. *Lowermost leaf* elliptic-oblong, obtuse, 4 to 7 cm long, 1.3 to 2 cm wide, much longer than those above it, which are bract-like and about 4 in number. *Upper leaves* linear, acute, the uppermost one about 1 cm long, linear, acute. *Floral bracts* linear-lanceolate, acute, lower ones exceeding the flowers. *Raceme* 4.7 cm long, many-flowered, flowers pale-green. *Lateral sepals* lanceolate or ovate-lanceolate, subfalcate, obtuse, 3.5 mm long, about 2 mm wide near the base. *Upper sepal* elliptic, obtuse, 3 mm long. *Petals* simple, oblong, obtuse, 3 mm long, 1.25 mm wide. *Labellum* 4 mm long, 1 mm wide, simple, fleshy, linear, tapering toward the tip, with a fleshy retrorse callus or

[1] "Calananz" is unquestionably a misprint for Calauan, or Calauang as it is frequently spelled. Cuming collected in Calauan from the end of September to the 15th of December, 1836, according to a letter written by him from Manila Dec. 24, 1836, to Sir W. J. Hooker, now preserved in Hooker's correspondence at Kew. There is no town by the name of Calananz in the Philippines. E. D. M.

protuberance near the base. *Spur* 5 to 6 mm long, slender, not at all inflated. *Stigmatic processes* wanting or very much reduced.

LUZON, Subprovince of Benguet, Pauai, Major E. A. Mearns, *Bur. Sci. 4313*, July, 1907; Mount Pulog, R. C. McGregor, *Bur. Sci. 8815, 8835*, in grass lands near the summit, July 3 and 4, 1909. *H. Mearnsii* is similar in its leafage and general appearance to *H. clavellata* (Michx.) Spreng., although totally dissimilar in the details of the inflorescence. The gynostemium of the flowers examined was so pressed out of shape that it was impossible to describe it with fullness.

Habenaria ponerostachys Reichb. f. in Bonplandia 3: 213; Kränzlin in Engler's Jahrb. 16: 179; Gen. et Sp. Orch. 1: 385.

This species was described by Reichenbach in 1855 from material collected in the Philippines by Hugh Cuming (*no. 2095*). The next reference to the species was made by Kränzlin in Engler's "Jahrbücher" and subsequently in "Genera et Species Orchidacearum." In the Herbarium of the British Museum of Natural History there is one of Cuming's specimens from the Philippines (*no. 2095*) which it is reasonable to suppose represents *H. ponerostachys*, but in several details it is not in agreement with Reichenbach's description. Kränzlin's description, on the other hand, is quite satisfactory. In Engler's "Jahrbücher," Kränzlin states that Reichenbach drew up his description from a depauperate specimen preserved in the Boissier Herbarium. In April, 1910, Mr. Merrill secured specimens from the Island of Negros which are almost a perfect match for the specimen of *Cuming 2095*, preserved in the British Museum of Natural History. These, I believe, are clearly referable to *H. ponerostachys*.

DESCRIPTION: *Plant* 2 to 5 dm tall, very slender, with several sheathing, obtuse or acute bracts below the leaves. *Leaves* clustered 7 to 14 cm above the stout fleshy roots, lanceolate to ovate-lanceolate, acute, shortly aristate, 3 to 9 cm long, 1.6 to 2.7 cm wide. *Spicate raceme* 6 to 25 cm long, very slender, many-flowered. *Bracts* lanceolate, erect, acute, 5 to 10 mm long, about equaling the matured capsules. *Lateral sepals* elliptic, 2.5 to 3 mm long, about 1.5 mm wide. *Upper sepal* ovate, about equal to the laterals. *Petals* asymmetrically ovate, blunt, 1–nerved, 3 mm long, 2 mm wide, simple. *Labellum* 3-lobed, similar to that of *Peristylus tentaculatus* J. J. Smith, 3 mm long to tip of middle lobe. *Lateral lobes* linear, longer than the middle one, abruptly curved at the tip, 2 mm long. *Middle lobe* gradually tapering to the obtuse tip, 1.5 mm long, about 1 mm wide. *Spur* longer than the lip, slender at base, dilated toward the tip, about 5 mm long.

NEGROS, Canlaon Volcano, *Elmer D. Merrill 7022*, April, 1910. Terrestrial, on forested ridges, about 1500 m above sea level, flowers greenish-white.

Habenaria Robinsonii sp. nov.

Folia linearia, acuta. *Bracteae* aristatae. *Pedunculus* glabratus. *Flores* albi, 1 ad 4. *Bracteae inflorescentiae* aristatae. *Sepala lateralia* oblongi-ovata, subacuta, 3-nervia. *Sepalum superius* cucullatum, obtusum. *Petala* spathulata, obtusa, 1-nervia. *Labellum* 4-lobatum; lobi laterales cuneati, truncati, lobi terminales rotundati. *Calcar* 4.7 cm longum.

Whole plant from 10 to 27 cm high (including the inflorescence). *Bulbs* elongated, roots fleshy. *Leaves* linear, acuminate, 5 to 13 cm long, 4 to 9 mm wide (average about 6 mm), slightly contracted at the base, sheathing, passing rather abruptly into the sheathing, aristate bracts. *Bracts* 3 or more, 2 to 3.5 cm long, long-aristate. *Raceme* glabrous, slender, flowers 1 to 4 (rarely 4). *Floral bracts* 2 to 3 cm long, aristate, sheathing. *Pedicel,* together with the *ovary,* about 2 cm long, glabrous. *Flowers* large, white (in general aspect recalling *H. militaris*). *Lateral sepals* deflexed, oblong-ovate, subacute, 3-nerved, about 7 mm long, 4 mm wide. *Upper sepal* cucullate, obtuse, about 8 mm long. *Petals* simple, spathulate, rounded at the apex, 1-nerved, 8 mm long, 2 mm wide near tip. *Labellum* very large in comparison with the other perianth-organs, about 2 cm long, 2.5 cm wide, four-lobed, *basal lobes* cuneate, the free end obliquely truncated, 12 mm long, 9 mm wide at the tip, many-nerved. *Front lobes* separated from the basal ones by a narrow isthmus 3 mm long, 2.5 mm wide, semi-rotund, margin slightly crenulate. (The front lobes might be more properly designated as the bifid or cleft middle lobe of the lip.) *Stigmatic processes* prominent, tapering, somewhat decurved, 2.5 mm long. *Spur* slender, longer than the ovary, 4.7 cm long.

Luzon, Province of Laguna, Molauin River, C. B. Robinson, *Bur. Sci. 9666,* Feb. 2, 1910, on rocks in the river, 50 to 150 m above sea level; *Elmer D. Merrill 6306,* Feb. 9, on mossy boulders in stream bed.

This very beautiful species bears a striking similarity to *H. militaris* from which it is readily distinguished by its very different leaves, long-aristate bracts, and white flowers.

Habenaria rosulata sp. nov.

Folia rosulata, linearia, acuta. *Bracteae* aristatae. *Flores* 3 vel 4, albi. *Bracteae inflorescentiae* acutae, ovariis breviores. *Sepala lateralia* ovata vel ovato-lanceolata, subacuta. *Sepalum superius* ovatum. *Petala* linearia, 1-nervia, obtusa, simplicia. *Labellum tripartitum,* laciniae laterales media longiores. *Calcar* inflatum, processus stigmatis hippocrepiformes.

Plant 1 to 2 dm tall, slender. *Roots* fleshy. *Leaves* rosulate, about 5, linear, acute, suberect or spreading, 2 to 4.5 cm long,

2 to 5 mm wide, acuminate, acute. *Bracts* sheathing, 3 or 4, aristate, 5 to 10 mm long. *Flowers* few, 2 to 4, white. *Floral bracts* about 5 mm long, about one-third as long as the pedicel and ovary, aristate. *Lateral sepals* narrowly ovate, subacute, larger than the dorsal one, about 7 mm long, by 3 mm wide. *Upper sepal* ovate, cucullate, about 5 mm long. *Petals* simple, linear, 1-nerved, obtuse, 6 mm long, 1 mm wide. *Labellum* tripartite nearly to the base, *divisions* filiform, about equally wide, the laterals longer than the middle one, laterals about 1.3 cm long, middle division 7 mm long, 0.5 mm wide. *Spur* about 13 mm long, slender near the opening, dilated from about the middle, resembling the abdomen of an ichneumon fly. *Anther canals* about equaling the stigmatic processes. *Stigmatic processes* cylindric, hippocrepiform.

LUZON, Province of Tayabas, Quinatacutan, Foxworthy & Ramos, *Bur. Sci. 13203*, on rocks at the edge of the stream, 75 m above sea level. Described in collector's note as "tuber-bearing or with fleshy roots."

This species, which I have been unable to refer to any described *Habenaria*, belongs, in my opinion, to the § *Diphyllae*. The flowers resemble those of *H. falcigera*, *H. diphylla*, etc., but the foliage is quite characteristic.

GASTRODIA R. Br.

Gastrodia javanica (Bl.) Lindl.

PALAWAN, Napsahan, on the west coast, *Elmer D. Merrill 7233*, Sptember 19, 1910. "About rotten stumps along trail in dense forest. Petals yellowish, whole plant brownish, with purplish tinge; a very brittle, succulent, leafless saprophyte."

The genus *Gastrodia* has not, heretofore, been recorded as a native of the Philippines.

KUHLHASSELTIA J. J. Smith.

Kuhlhasseltia Merrillii Schlechter in Fedde Repert. 9 (1911) 437.

Haemaria Merrillii Ames in Philip. Journ. Sci. 2 (1907) Bot. 315; Orchidaceae 3 (1908) 21, *pl. 30*.

Doctor Schlechter, *loc. cit.*, refers to J. J. Smith's recently established genus *Kuhlhasseltia* (1910) the species which, with hesitation, I described under the genus *Haemaria*, in my paper on the orchids collected on Mount Halcon. As stated in "Orchidaceae"[2] the genera which constitute the group to which *Haemaria* belongs are differentiated by means of characters which are not only of questionable value, in my opinion, but which are extremely perplexing when it is attempted to place in its proper position a new species of the *Neottiinae-Physureae*. As defined by J. J. Smith the genus *Kuhlhasseltia* includes *Haemaria Merrillii* and Doctor Schlechter is undoubtedly correct in his views expressed in Fedde's "Repertorium." But what do we gain at the present time by multiplying the genera of this puzzling section of the Orchidaceae ? It would seem that an exhaustive monograph of the *Neottiinae-Physureae* should be produced before the number of genera is inordinately increased.

[2] 3: 21.

TROPIDIA Lindl.

Tropidia calcarata sp. nov.

Folia 1 (-2), ovato-lanceolata, acuminata, acuta. *Bracteae inflorescentiae* lineares. *Flores* albi in racemo laxo. *Sepala lateralia* connata, scrotum conspicuum efficientia, basim labelli includens, partes terminales liberae, 3 mm longae, acutae. *Sepalum superius* anguste lineari-lanceolatum. *Petala* lanceolata, subacuta vel obtusa. *Labellum* integerrimum, lanceolatum, carinatum, calcar breve ad apicem obtusum.

Related to *T. angulosa* Bl. *Terrestrial,* 2 to 3 dm high. *Stems* slender, about 2 mm thick, sheathed with obtuse, tubular bracts, 1.5 to 3.4 cm long. *Leaves* 1 or 2 (only one bifoliate specimen among the three examined) sheathing at the base, ovate-lanceolate, acuminate, acute, many-nerved, when mature about 1 dm long, about 5 cm wide. *Peduncles* terminal, shorter than the leaves, erect, 5 to 9 cm long, slender; *floral bracts* linear about 1 cm long. *Racemes* 3 to 5 cm long. *Flowers* white, 1.3 to 1.8 cm long. *Lateral sepals* connate beyond the middle, at the base forming a conical spur 3 mm long which encloses the spur of the labellum, free portion about 3 mm long, acute. *Upper sepal* linear, acute, about 1 cm long. *Petals* lanceolate, subacute or obtuse, 1 cm long, 2.5 mm wide near the base, mid-nerve prominent. *Labellum* slightly sigmoid, *calcarate,* lamina lanceolate, the apex very slightly cucullate. Just below the middle, near the margin, two inconspicuous longitudinally extended keels are situated. Main nerves three in number, slightly prominent. *Spur* obtuse, about 2 mm long, curving slightly toward the ovary, blunt. *Gynostemium* 7 mm long, *rostellum* bifid, exceeding the acuminate anther.

Luzon, Province of Laguna, Mount Maquiling, *Elmer D. Merrill 7144,* September 2, 1910. "Rare, only three plants seen."

Tropidia calcarata is very near *T. angulosa* Blume, but distinguishable from it by the leafage and by the carinae of the lip.

Unfortunately I have seen very little material of *T. angulosa* and my knowledge of it is chiefly based on descriptions and plates. The material from which the above description was taken consists of three specimens. The unifoliate character appears to be normal. In the single case where two leaves terminate the stem, one of them is very small and bract-like.

CESTICHIS Pfitzer.

Cestichis Cumingii (Ridley) Ames Orchidaceae 1: 13.

Liparis Cumingii Ridley Journ. Linn. Soc. Bot. 22: 292.

What I blieve to be this species is well represented by specimens from Mount Mariveles, recently collected by C. M. Weber. The suborbicular lip with a minute tooth at the obscurely retuse tip, the very characteristic inflorescence, and the broad, somewhat oblanceolate leaves, agree very well

with the specimen collected by Cuming (*no. 2141*) preserved in the Herbarium of the British Museum of Natural History. This species should not be confused with *Cestichis compressa* which is a much larger plant with a larger lip. That *C. compressa* is very closely allied to *C. Cumingii* can not be denied, but for the present it seems wise to regard them specifically distinct.

LUZON, Province of Bataan, Mount Mariveles, *C. M. Weber 26*, February 9, 1911. On trees in mossy forest, about 800 m above sea level.

OBERONIA Lindl.

Oberonia benguetensis sp. nov.

Folia ensiformia, acuta, ad basim imbricata. *Pedunculus* elongatus, multo folia excedens, multibracteatus. *Bracteae* circiter 2 mm longae, setaceae. *Racemus* gracilis. *Flores* flavidi, minuti, circiter 1 mm longi. *Sepala lateralia* ovato-lanceolata. *Sepalum superius* triangulum. *Petala* linearia, attenuata. *Labellum* ad basim rotundatum, oblongum, ad apicem bilobum; lobi minuti, valde separati.

Roots fibrous. *Plants* diminutive, about 4 cm high to the tip of the tallest leaf, stem very short. *Leaves* ensiform or somewhat falcate, acute, the largest about 3 cm long and 4 mm across from edge to edge, fleshy. *Peduncle* up to 1 dm long, much longer than the leaves, beset with numerous, spreading, setaceous bracts 2 mm long. *Raceme* somewhat drooping, about 5 cm long, 5 mm in diameter at the base when in flower. *Flowers* yellowish, irregularly verticellate, minute, exceeding the bracts. *Floral bracts* linear-acute, about 2 mm long, margin minutely denticulate. *Pedicel* and *ovary* 2 mm long, smooth. *Lateral sepals* ovate-lanceolate, concave, about 1 mm long. *Upper sepal* triangular, subacute (half lanceolate). *Petals* linear-lanceolate, tapering gradually from the base to the subacute tip. *Labellum* rounded at the base, 1 mm long, from about the middle to the tip oblong, each distal angle produced into a diminutive blunt lobe, recalling, although vaguely, *Oberonia similis* Lindl. (which is, however, lobed at the base), lobes about 0.5 mm apart. *Column* minute.

LUZON, Benguet Subprovince, Suyoc to Pauai, *Elmer D. Merrill 4855*, November 7, 1905. Epiphytic in mossy forest about 2,200 m above sea level.

Oberonia hispidula sp. nov.

Aff. *O. mindorensi* speciei quam habitu et structura haec species conspicus simulat. *Folia* imbricata, ensiformia. *Pedunculus* elongatus, gracilis. *Racemus* densiflorus. *Bracteae* aristatae. *Sepala lateralia* ovata. *Sepalum superius* simile. *Petala* ovata,

integerrima. *Labellum* pandurata, ad apicem bilobum, lobi rotundi. *Ovarium* hispidulum.

Plants caulescent, similar to *Oberonia mindorensis* Ames, but different in the lobing of the lip, different petals and shorter pedicels. From base to tip of uppermost leaf, between 1 and 2 dm tall. *Leaves* imbricating, ensiform, about 4 cm long, free portion spreading, somewhat recurved, 1 to 4 cm long, about 1 cm deep where it forms an angle with the stem. *Peduncle* long, slender, about 1 dm long, about 4 mm through when the flowers are expanding. *Bracts* linear-lanceolate, aristate, equaling or slightly exceeding the flowers. *Flowers* greenish, approximate. *Lateral sepals* ovate, 0.75 mm long. *Upper sepal* similar to the laterals and about equal to them in size. *Petals* entire, ovate, obtuse, about 0.5 mm long. *Labellum* pandurate, 1 mm long, nearly 1 mm wide across the tip, margin entire, deeply retuse at the apex, or cleft into two, rounded, terminal, slightly divaricate lobes. *Pedicel* and *ovary* 1.5 mm long. *Ovary* hispidulous.

Luzon, Benguet Subprovince, H. M. Curran, *For. Bur. 5124*, August 20, 1906.

Oberonia Merrillii sp. nov.

Planta parvula. *Folia* ensiformia, acuta. *Pedunculus* gracilis. *Racemus* elongatus. *Flores* verticellati. *Bracteae* angustatae, acutae. *Bracteae inflorescentiae* lanceolatae prope apicem, 2-dentatae. *Sepala lateralia* rotundata. *Sepalum superius* ovato-oblongum. *Petala* orbiculata, denticulata. *Labellum* 3-lobatum. *Lobi laterales* minuti, rotundati, *lobus medius* subquadratus. *Columna* minuta.

Plant up to 9 cm tall from copious fibrous roots, acaulescent or with the stem very short, less than one quarter as long as the leaves. *Leaves* fleshy, equitant, ensiform, acute, 2.5 to 7 cm long, about 5 mm wide seen from the side, shorter than the inflorescence. *Peduncle* slender, 7 to 12 cm long, spike 4 to 9 cm long, about 4 mm in diameter when the flowers are fully expanded, below the spike beset with numerous, linear, spreading bracts 2 mm long; *floral bracts* lanceolate, acute, near the tip angled or 1-toothed on each side. *Flowers* minute, reddish, verticellate, or subverticellate, verticels 2 to 3 mm apart. *Pedicel* and ovary about 1.5 mm long, slender. *Lateral sepals* rotundate or round-ovate, obtuse, 0.75 mm long. *Upper sepal* ovate-oblong, obtuse, about 1 mm long. *Petals* rotund, 0.75 mm long, 0.75 mm wide, margin minutely denticulate. *Labellum* 3-lobed, 0.75 mm long. *Lateral lobes* minute, smaller than the middle lobe,

roundish, margin irregular; *middle lobe* subquadrate, 0.75 mm long, 0.75 mm wide. *Column* minute, clinandrium entire (?).

LUZON, Manila and vicinity (Masambong), *Elmer D. Merrill 7348*, November 6, 1910, on trees, 6 to 8 m above sea level: Province of Nueva Ecija, Cabanatuan, R. C. McGregor, *Bur. Sci. 5298*, September, 1908.

Oberonia setigera sp. nov.

Planta parvula. *Folia* ensiformia vel subfalcata, obtusa vel acuta. *Pedunculus* elongatus. *Bracteae* setiformes. *Sepala lateralia* ovato-lanceolata. *Sepalum superius* lanceolatum, acuminatum. *Petala* serrulata. *Labellum* 3-lobatum; *lobi laterales* majores valde dentati; *lobus medius* subquadratus, integer.

Roots fibrous. *Plants* caulescent, 6 cm tall to tip of uppermost leaf. *Leaves* equitant, ensiform or somewhat falcate, obtuse or acute, 2 to 4.5 cm long, 5 to 7 mm wide. *Peduncle* 12 cm long, thickly beset below the raceme with *setiform bracts* nearly 1 cm long. *Raceme* densely many-flowered, about 7 mm in diameter when in fruit. *Floral* bracts very long, setiform, longer than the flowers, clustered at intervals. *Flowers* lavender, minute, clustered at intervals, but the clusters approximate. *Lateral sepals* ovate-lanceolate, about 1 mm long, 0.5 mm wide. *Upper sepal* lanceolate, acuminate, slightly exceeding 1 mm in width. *Petals* fimbriate, oblanceolate, obtuse, 1 mm long. *Labellum* about 1 mm long, 3-lobed, *lateral lobes* much larger than the middle one, each with the margin broken up into about 7 finger-like divisions. *Middle lobe* minute, subquadrate. *Column* minute, clinandrium entire.

LUZON, Province of Bataan, Lamao River, Mount Mariveles, *H. N. Whitford 1122*, March 3, 1905.

The flowers of *Oberonia setigera* are similar to those of *O. Griffithiana* Lindl., but the middle lobe of the labellum is quite distinct and the setiform bracts constitute an unmistakable differentiating character.

PHAIUS Lour.

Phaius linearifolius sp. nov.

Folia 5, linearia, elongata, acuta. *Scapus* erectus, bracteis tubularibus vestitus. *Bracteae inflorescentiae* persistentes. *Flores* flavi. *Sepala lateralia* oblonga, falcata. *Sepalum superius* oblongi-lanceolatum, obtusum. *Petala* ovato-lanceolata. *Labellum* 3-lobatum; *lobi laterales* rotundati, obtusi, *lobus medius* crenulatus, retusus. *Discus* tricarinatus. *Gynostemium* arcuato-ascendens, clavatum, antice canaliculatum, dorso gibbum, facie anteriore concaviusculum et dense villosum.

Stem thickened at the base, somewhat rounded, tapering upward. *Leaves* about 5 in number, the lowermost one about 2

dm above the ground, sheathing at the base, about 55 cm long, 1.5 to 3 cm wide, linear, acuminate, acute, prominently 5-nerved. *Scape* erect, smooth, about 6 dm long, with four, closely appressed, sheathing, acute bracts about 4 cm long. *Floral bracts* persistent, smooth, lanceolate, acute, 1.5 to 2.5 cm long. *Flowers* 5.5 cm in diameter when spread out, 6 to 15 in a loose raceme, the lowermost 4 cm apart. *Pedicel* and *ovary* 3 cm long, slender. *Lateral sepals* oblong, subacute, broadly falcate, 3 cm long, 1 to 2 cm wide. *Upper sepal* lanceolate-oblong, obtuse, 3.5 cm long, 11 mm wide. *Petals* ovate-lanceolate, subfalcate, obtuse, 3.2 cm long, 1.4 cm wide. *Labellum* obscurely three-lobed, excluding the short spur, about 2.5 cm long. *Lateral lobes* slightly shorter than the middle lobe, rounded, obtuse, obscurely crenulate, smooth. *Middle lobe* irregularly dentate, the margin crumpled or ruffled, deeply retuse at the rounded tip. *Disk* smooth, the three central nerves carinate above the middle, somewhat wavy, diminishing as they approach the tip. *Spur* cylindric, round-pointed, 7 mm long. *Column* comparatively stout, 1.5 cm long, hairy on the anterior surface. *Pollinia* 8. *Flowers* yellow, the ruffled margin of the middle lobe brownish.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1288*, June 28, 1911, growing in brooks, 1,650 m above sea level.

Phaius linearifolius belongs to the groups of which *Phaius flavus* is the best known species. I have refrained from identifying it with *P. flavus* as I find many points of dissimilarity between my material and the specimens of *P. flavus* examined, and also as none of the numerous diagnoses in literature describe my plants adequately, and as the illustrations of *P. flavus* fall far short of depicting them.

CALANTHE R. Br.

Calanthe lacerata sp. nov.

Radices lanatae. *Caules* abbreviati. *Folia* anguste lanceolata, acuminata, acuta, plicata. *Petiolus* ad basim vaginans. *Scapus* foliis longior, gracilis, erectus, elongatus, tomentosus, *bracteis* bene appressis, vaginantibus. *Bracteae inflorescentiae* lanceolatae, pedicellis breviores. *Sepala lateralia* elliptico-lanceolata vel elliptica, acuta. *Sepalum superius* simile. *Petala* oblonga ad medium satis dilatata, ad apicem truncatum, apiculatum. *Labellum* 4-lobatum, *lobi inferiores* oblongi, subfalcati, obtusi. *Lobi anteriores* divaricati, cuneati, flabellati, lacerati, papillosi. In disco ultra columnam utroque *calli* complanati. *Calcar* gracilis.

Roots stout, lanate. *Stem* very short. *Leaves* about 4, about 2 dm long, up to 2 cm wide, narrowly lanceolate, acute, plicate,

shorter than the scape, sheathing at base. *Petiole* narrow, sulcate. *Scape* slender, tomentose, up to 4 dm long. *Bracts* closely appressed, sheathing, 1 to 2 cm long, acute, the lower ones subacute or rounded at the tip, sparsely pubescent. *Raceme* 4 to 9 cm long, densely many-flowered, bracts of the raceme lanceolate, 6 to 10 mm long. *Pedicel* and *ovary* about 1.5 cm long, slender, exceeding the bracts. *Flowers* 1 to 1.5 cm across, odorless, white, labellum purplish. *Lateral sepals* elliptic-lanceolate, acute, 6 to 8 mm long, 3 to 5 mm wide. *Petals* oblong, slightly dilated near the middle, truncate, apiculate, 3-nerved, 5 to 8 mm long, 2.5 to 3.5 mm wide. *Labellum* 1 cm long, 4-lobed. *Basal lobes* oblong, subfalcate, rounded at the tip, 4 mm long, about 2 mm wide, toothed in front, or almost entire, apical lobes 3 mm long, 3 mm wide across the tip, divaricate, cuneate, flabellate, margin lacerate-dentate, papillate. In front of the column on the disk two rows of flattened, elongated *calli* are situated. *Column* about 3 mm long, fleshy; *ovary* pubescent. *Spur* cylindric, or subscrotiform, 4 to 5 mm long. *Pollinia* 8 (4 large, 4 small).

LUZON, Benguet Subprovince, Pauai, *Elmer D. Merrill 4756*, November 8, 1905, terrestrial in mossy forest along the trail, about 2,050 m above sea level: Province of Tayabas, Mount Banahao, *H. N. Whitford 960*, at 1,700 m above sea level: Lepanto Subprovince, Mount Data, *Elmer D. Merrill 4582*, November 4, 1905, in damp shaded ravine, mossy forest, about 2,100 m above sea level.

The specimen collected on Mount Banahao, by Whitford, has broader leaves than the type (5 cm), but appears to be similar in the details of the flower.

Calanthe Ramosii sp. nov.

Planta foliosa. *Folia* oblongi-lanceolata, acuminata, acuta, nervosa, in petiolum vaginantem angustata. *Scapus* tomentosus, elongatus, *bracteis* bene appressis, obtusis, vaginantibus, tubularibus. *Bracteae inflorescentiae* deciduae. *Racemus* laxus, *pedicellus* cum *ovario* pubescens. *Sepala lateralia* extus pubescentia, anguste lanceolata, acuminata. *Sepalum dorsale* simile. *Petala* lineari-lanceolata, acuta. *Labellum* 3-lobatum. *Lobi laterales* acuti. *Lobus medius* valde emarginatus, apiculatus, crenulatus. In disco ultra columna utroque *callus* carinatus. *Calcar* o.

Plant leafy, from stout elongated roots. *Stem* thickened at base, attenuated, about 15 cm long, terminated by 3 to 5 leaves. *Leaves* oblong-lanceolate, acuminate, acute, about 2 dm long, up to 3 cm wide, plicate, sheathing, conspicuously 5-nerved, with numerous less conspicuous nerves. *Scape* longer than the leaves,

finely pubescent above, with several, tubular, obtuse, sheathing, closely appressed bracts about 2 cm long. *Raceme* loosely flowered, *bracts* deciduous. *Pedicels* slender, finely pubescent, 1 cm long. *Ovary* pubescent, about 8 mm long. *Color* of the flowers not noted. *Lateral sepals* 11 mm long, 3 mm wide, narrowly lanceolate, acuminate, pubescent. *Upper sepal* similar to the laterals and about equal to them. *Petals* 8 mm long, 2 mm wide, linear-lanceolate, acute, smooth. *Labellum* 7 mm long, 3-lobed. *Lateral lobes* directed forward, 3 mm long, acuminate, acute, margin slightly crenulate. *Middle lobe* flabellate, deeply emarginate, apiculate, margin crenulate or blunt-toothed. Disk smooth with two semi-elliptic *carinae* one on each lateral nerve in front of the column, fleshy, pubescent. *Spur* none.

Luzon, Province of Zambales, Maximo Ramos, *Bur. Sci. 4987*, December 14, 1907.

EULOPHIA R. Br.

Eulophia Vanoverberghii sp. nov.

Planta gracilis. *Folia* ? *Racemus* laxus, *bracteae* lineares. *Pedicelli* graciles. *Sepala lateralia* ligulato-oblonga, obtusa. *Sepalum* superius simile. *Petala* anguste elliptica. *Labellum* 3-lobatum; *lobi laterales* haud conspicui, minuti, obtusi, *lobus medius* oblongus, obtusus. *Discus* papillosus, ultra columnam utroque callus carinatus.

Plants slender, 2 to 4 dm tall from a large corm. *Scape* sheathed at the base by several, nervose, tubular, imbricating *bracts*, near the middle 1- or 2-bracteate. (*Leaves* absent at flowering time, not seen.) *Raceme* loosely flowered, 10 to 15 cm long. *Bracts of the raceme* linear, about 1 cm long, about equaling the pedicellate ovary, erect or slightly spreading. *Pedicels* slender, smooth, about 7 mm long; *ovary* smooth, about 5 mm long at the period of anthesis. *Flowers* about 1 cm long, erect. *Lateral sepals* 1.4 cm long, 3.5 mm wide, ligulate-oblong, obtuse, green. *Upper sepal* similar to the laterals, slightly shorter. *Petals* 1 cm long, about 5 mm wide, narrowly elliptic, rounded at the tip, green. *Labellum* 1.3 cm long, 7 mm wide at the tip, oblong, very obscurely 3-lobed, the lateral lobes minute and inconspicuous, margin wavy or fluted, nerves *papillose, disk* bilamellate at base. *Sac* obtuse, 1 mm long. *Column* about 11 mm long. *Pollinia* 2. The labellum is described by the collector as being yellow and all the perianth organs as being marked with red lines.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 336*, April 2, 1910. "Root edible;" found 1,350 meters above sea level on hillocks.

DENDROBIUM Sw.

Dendrobium albayense sp. nov. (§ *Aporum, Hemiphylla*).

Cum *D. cuneato* Schltr. comparandum videtur, a quo tamen foliis differt. *Caulis* ad basim teres, foliosus, compressus, anceps. *Folia* disticha, lanceolata a latere visa. *Sepala lateralia* triangulari-ovata, obtusa. *Sepalum superius* oblongum obtusum, subquadratum. *Petala* ligulata, obtusa. *Labellum* cuneatum ad apicem 3-lobatum. *Lobi laterales* divaricati, obtusi. *Lobus medius* obtusus. Prope apicem labelli *callus* bilobus. *Mentum* brevem, obtusum, rotundatum.

Plants up to 3 dm in length, simple or with a few branches, *leafy* to about the middle, floriferous portion of the stem leafless. *Leaves* distichous, lanceolate, acute, when viewed from the side, 1.5 to 3 cm long from tip to point of insertion; at the middle of the leafy part of the stem 1.5 cm long from tip to inner angle formed with the stem; free portion up to 1 cm wide. *Lateral sepals* fleshy, broad, triangular-ovate, subacute or obtuse, about 3.5 mm long, 2.5 mm wide. *Upper sepal* fleshy, 3 mm long, 2.5 mm wide, rounded at the tip. *Petals* ligulate, obtuse, 3 mm long, 1.5 mm wide. *Labellum* equaling the lateral sepals, 3.5 mm wide at the tip, obscurely 3-lobed in front, *lateral lobes* divaricate, obtuse, about 1 mm long to the angle formed with middle lobe, *middle lobe* shorter than the laterals, obtuse, forming with the cuneate-bilobed callus above it a shallow pocket. *Mentum* rounded, about 1.5 mm long. *Column* 1 mm long.

LUZON, Province of Albay, *A. Loher 6018*, June 26, 1905, plant flowering in Manila. "Flowers odorless, petals with purple lines."

Dendrobium angustifolium (Blume) Lindl. Gen. et Sp. Orch. 76.
Desmotrichum angustifolium Blume Bijdr. 330; Kränzlin in Engl. Pflanzenreich 45 (1910) 350.

The material which I refer to this species exhibits several slight variations from authentic specimens of *D. angustifolium*. These slight variations seem to me unimportant. I have examined living material collected by Elmer D. Merrill on Mount Mariveles in 1905.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 708, 709*, July 23, 1910: Province of Bataan, Lamao River, Mount Mariveles, *R. S. Williams 674*: Province of Rizal, San Isidro, M. Ramos, *Bur. Sci. 12123*, June 24, 1910.

Dendrobium basilanense sp. nov.

Caulis compressus, anceps. *Folia* disticha, lanceolata, acuta. *Flores* albi, terminales. *Sepala lateralia*, oblonga, acuta. *Sep-*

alum superius lanceolatum. *Petala* lineari-lanceolata. *Labellum* lineari-oblongum, ad apicem *bilobum*.

In *leafage* and in the bilobed tip of the *labellum* similar to *Dendrobium aloifolium* Reichb. f. *Stems* simple or branching, 1 to 4 dm tall or even taller. *Leaves* distichous, extending along the stem from the base to the summit, gradually diminishing in size, from the point of insertion of the sheathing base to the tip 1 to 2 cm long (average somewhat exceeding 1.5 cm), free portion of the leaf lanceolate, acute, about 1 cm long from inner angle to tip. *Inflorescence* terminal, floriferous part of the stem up to 2 cm long. *Pedicels* arising from small heads of minute bracts. Pedicel and ovary 3 mm long. *Lateral sepals* 3 mm long, oblong, acute. *Upper sepal* 2.75 mm long, lanceolate. *Petals* linear-lanceolate, 3-nerved, obtuse or subacute, 2.25 mm long, slightly less than 1 mm wide. Labellum 3 mm long, 1 mm wide at base, linear-oblong, slightly dilated below the middle, above the middle contracted, the tip deeply retuse, or cleft, the lobes 1 mm long, obtuse. At the point where the lip is contracted, a transversely situated fleshy *callus* occurs. *Mentum* obtuse, about 2 mm long. *Column* 1 mm long.

BASILAN, W. I. Hutchinson, *For. Bur. 3968*, January 23, 1906.

Dendrobium basilanense is nearly allied to *D. aloifolium*, from which it is to be distinguished by the linear-oblong labellum, scarcely, if at all, broader near the middle than at the tip.

In his monograph of the *Dendrobiinae*[3] Doctor Kränzlin cites *D. Merrillii* Ames Orch. 2: 181, as a synonym of *D. aloifolium*. I believe this is clearly the result of an error in judgment. *D. Merrillii* is unlike *D. aloifolium* in leafage and has an entire or obscurely retuse middle lobe of the labellum. With the original description of *D. Merrillii* mention was made of two collections, one *Merrill 3357*, and one *Loher 6017*. On the sheet of Loher's specimen in my herbarium I find in A. A. Eaton's handwriting "Not *aloifolium*." This note was made when Eaton and I were comparing the Philippine species of § *Aporum* with the specimens preserved at the British Museum of Natural History and at Kew. Doctor Kränzlin refers to *Merrill 3357* in the geographical notes under *D. aloifolium* and from the exclamation mark after the number it would seem that he had examined the type. Yet, he makes no revision in the description of *D. aloifolium* which accounts for the inclusion of material which has a three-lobed labellum with the apical lobe oblong, and inconspicuously, if at all, retuse at the tip. *D. merrillii* Ames is also given by Kränzlin[4] under his "Species *Dendrobii* imperfecte notae."

Dendrobium Brongniartii Kränzl. in Engl. Pflanzenreich 45 (1910) 210.

This is a robust species of § *Aporum*. The flowers are described by collectors some as white, some as yellow, others as

[3] Engl. Pflanzenreich 45 (1910) 206. [4] l. c. 299.

reddish, but these differences are very likely the result of difference in age of the flower; the color turning from white to brown as it matures. In all cases I have been unable to identify the material at hand by an analysis of a flower, but where an examination has been possible the perianth organs agree with Kränzlin's description. In a specimen collected by W. S. Lyon I was able to find perfect pollen masses. These are *four* in number.

LUZON, Province of Zambales, Mount Pinatubo, F. W. Foxworthy, *Bur. Sci. 3029*, June 13, 1907, on stunted trees in small rocky desert, flowers white and fragrant, bracts yellow; *Bur. Sci. 2617*, April 26, 1907, on plain of coarse sand on trees: Province of Rizal, Ahern's collector, *For. Bur. 3304*, September, 1905; Bosoboso, M. Ramos, *Bur. Sci. 5639*, November 30, 1909, fls. pure white, bracts yellow; Montalban, W. Schultze, *Bur. Sci. 5620*, May 25, 1908, flower white, fragrant, basal bracts yellow: Province of Cagayan, H. M. Curran, *For. Bur. 16844*, March 9, 1909: Province of Tayabas, H. M. Curran, *For. Bur. 9651*, March 22, 1908: Province of Camarines, H. M. Curran, *For. Bur. 11345*, May 10, 1908. MINDANAO, Province of Surigao, *F. H. Bolster 378*, August 15, 1906, epiphyte on trees, flowers yellow: District of Davao, Malalag, *E. B. Copeland 692*, March 28, 1904, ephiphyte, and on rocks over the sea: District of Zamboanga, H. N. Whitford and W. I. Hutchinson, *For. Bur. 9207*, January, 1908, altitude above the sea 150 meters, flowers white. BASILAN, W. I. Hutchinson, *For. Bur. 4018*, February 10, 1906, growing on tree near beach, flower brownish-yellow.

Dendrobium Clemensiae sp. nov.

Caules uniarticulati, monophylli. *Folium* oblongum. *Sepala petalaque* ad basim triangularia in caudas longas producta. *Labellum* 3-lobatum costis 2 usque ad basim lobi medii percurrentibus. *Lobi laterales* obtusi, parvi. *Lobus medius* linearis ad apicem dilatatus, acutus, medio papillosus.

Stem uniarticulate, somewhat stouter at the base than at the tip, rugose when dry, 7 to 14 cm long, monophyllous. Leaf narrowly oblong, fleshy, rigid, unequally bilobed at the tip, 11 to 15 cm long, 11 to 14 mm wide. *Peduncle* slender, weak, about 5 cm long, 1-flowered, from the summit of the stem, terminal, sheathed by an elongated spathe 3.5 to 4 cm long. *Lateral sepals* about 5 cm long, triangular at the base, prolonged into a long, slender, filiform tail. *Upper sepal* similar to the laterals, about 5 cm long. *Petals* similar to the sepals, but shorter and more slender, about 4.5 cm long. *Labellum* up to 1.8 cm long, 3-lobed, suborbicular at base, abruptly continued from between the small, obtuse, lateral lobes into a linear, papillose limb which terminates in a lanceolate, membranaceous

lamina; orbicular base about 5 mm long, 6 to 7 mm wide, with a membranaceous, sulcate lamina on each side of the middle nerve which extends beyond the lateral lobes, the linear papillose portion about 1 cm long, lamina about 4 mm long, 1.5 mm wide. Foot of the *column* 4 mm long.

MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens 508*, April, 1906: NEGROS, *W. S. Lyon 40*, December, 1907, "epiphyte, pedicel green, base of perianth pure white, prolongations of sepals and petals lemon-yellow."

This species, which is closely allied to *Dendrobium filiforme* J. J. Smith, belongs to the section which, in his recent monograph, Doctor Kränzlin has established as the genus *Diplocaulobium*, characterized by a uniarticulate stem, 3-lobed crested labellum, and ephemeral flowers. *Dendrobium longicolle* Lindl., another species of this section, has been reported from the Philippines, but without sufficient authority.

Dendrobium lunatum Lindl. in Journ. Linn. Soc. Bot. 3 (1859) 4.

In my preceding paper,[5] I referred *Dendrobium lunatum* Lindl. to the synonymy of *D. indivisum* Miquel. Further studies have convinced me that this proceeding was a matter of mistaken judgment. From the material referred by me to *D. indivisum*, *D. lunatum* differs slightly in foliage and also slightly in the labellum. The leaves are not so spreading as in *D. indivisum*, their tips pointing more exactly in the same direction as the stem. The labellum of *D. lunatum* is not 3-lobed, although in my specimens it is hardly so reniform or lunate as shown in the sketch preserved with the Cuming specimen from the Philippines in Lindley's Herbarium. The flowers of both species are whitish or yellowish with purple streaks.

According to Kränzlin's recent monograph *Dendrobium indivisum* Miquel (not Bl.) and *D. distichum* (Presl) Reichb. f., are conspecific. The specimens previously referred by me to *D. indivisum* Miquel belong to *D. distichum* (Presl) Reichb. f.

The specimens of *D. lunatum* which I have examined come from Palawan, F. W. Foxworthy, *Bur. Sci. 907*, May 6, 1906.

Dendrobium MacGregorii sp. nov. (§ *Aporum, Hemiphylla*).

Caulis ad basim teres, foliosus, compressus, anceps. *Folia* disticha, lanceolata, a latere visa lanceolata. *Sepala lateralia* triangulari-lanceolata, subacuta. *Sepalum superius* oblongi-ovatum, obtusum. *Petala* lineari-oblonga, obtusa. *Labellum* cuneato-spathulatum, ad apicem trilobatum, *lobi* rotundati, obtusi, laterales obscuri, medius obtusus. *Mentum* obtusum.

Plants (somewhat resembling *D. teloense* J. J. Smith, but with very different leaves) leafy to about the middle, slender and nearly terete at the base, about 5 dm tall. Leaves about 3.5 cm long from the tip to point of insertion, 1.5 to 2 cm long from tip to angle formed by the inner edge of the leaf and

[5] This Journal 6 (1911) Bot. 52.

the stem, free portion lanceolate, acute, about 1 cm wide measured perpendicularly. At about the middle of the stem the leaves suddenly decrease in size and give place to bract-like leaves 5 to 10 mm long, where they are free, which are closely appressed, their tips erect and nearly touching the stem. From the bases of these bracts, at intervals, the flowers break through. *Flowers* pale-yellowish-white with two lines of dark-carmine on the lip. *Lateral sepals* 3 mm long, triangular-lanceolate, subacute. *Upper sepal* oblong-ovate, obtuse, 3 mm long. *Petals* linear-oblong, obtuse, about 3 mm long, slightly less than 1 mm wide. *Labellum* cuneate-spathulate, 3-lobed in front, the side lobes rounded, the middle lobe half-elliptic, obtuse, rounded (in dried specimens the margin of each lateral lobe appears to have been stained with carmine). In general outline the lip resembles that of *D. Merrillii*, and appears to be minutely *papillose* on the disk near the base of the middle lobe. *Mentum* obtuse, 2 mm long. *Column* 2 mm long.

POLILLO, R. C. McGregor, *Bur. Sci. 10457*, epiphytic in mangrove swamp, October 12, 1909.

Dendrobium parciflorum Reichb. f. ex Lindl. in Journ. Linn. Soc. Bot. 3 (1859) 4.

D. Jenkensii Griff. in Calcutta Journ. Nat. Hist. (1854) 367, *t 25.*

D. kentrophyllum Hook. f. Fl. Brit. Ind. 5 (1890) 725; Icon. Plant. *t. 2021.*

D. marivelense Ames Orchidaceae 2 (1908) 180.

The above is the bibliographical history of the species which in my second volume of "Orchidaceae" I described as a novelty under the name *D. marivelense.* In his monograph of the "*Dendrobiinae*" Doctor Kränzlin concluded that *D. parciflorum* and *D. marivelense* should be regarded as conspecific.

In addition to the locality given in Orchidaceae 2: 180, the following is of interest: MINDANAO, Lake Lanao, Camp Keithley, *Mary Strong Clemens 611*, June, 1906.

Dendrobium Ramosii sp. nov.

Caules gracilis, gerentes folia circiter 13. *Folia* linearia, acuta in anthesi decidua. *Flores* pallide rosei vel purpurei, in pedunculis brevibus. *Sepala lateralia* oblonga, obtusa, ad apicem cucullata. *Sepalum superius* oblongum, obtusum. *Petala* ovato-oblonga, denticulata. *Labellum* cuneato-obovatum, unguiculatum, prope basin callus hippocrepiformis. *Caules* foliosi et florigeri simul exstant.

Plant very slender, about 3 dm tall, leafy, about 2 mm thick near the base. *Leaves* distichous, linear, acute, about 7 cm

long, about 6 mm wide, base sheathing. Sheathing bases of the leaves tubular, in dried specimens tinged with purple, about 1 cm long. *Flowers* pale-purplish, in short lateral racemes. *Peduncle* 1 cm long. *Bracts* lanceolate, purplish, 2 mm long. *Pedicellate ovary* about 1 cm long, pedicel very slender. *Flowers* about 5, about 1 cm long, with a sharply curved mentum. *Lateral sepals* oblong, obtuse, somewhat cucullate at the tip, 3 mm wide. *Upper sepal* cucullate, lanceolate, 6 mm long. *Petals* ovate-oblong, rounded at the tip, 6 mm long, 3 mm wide, margin minutely denticulate. *Labellum* 12 mm long, 6 mm wide near the tip, simple, cuneate-obovate, sharply bent at the base to conform to the curved (genuflected) mentum, finely denticulate along the margin of the rounded, broad tip. In front of the column-foot the lip is dilated (nearly orbicular), then contracted at the point where a hippocrepiform membranaceous callus is situated, beyond the callus the limb is cuneate obovate, with three prominent longitudinal central nerves. In some flowers the mentum is so much curved that the blunt apex points in the same direction as the sepals and petals.

LUZON, Lepanto Subprovince, Maximo Ramos, *Bur. Sci. 7049*, January, 1909.

Dendrobium Ramosii belongs in the same section with *D. O'Brienianum* Kränzl., and *D. Epidendropsis* Kränzl., two Philippine species which are characterized by the sharply bent mentum. From both it is very distinct in foliage and in the color and size of the flowers.

I have seen two other collections from the Philippines which appear to be referable to this species. The leaves and stems are longer than in the specimens gathered by Ramos, but the flowers are very similar, the lip varying slightly in outline.

LUZON, Bontoc Subprovince, Bauco, *Father M. Vanoverbergh 9*, 1,300 meters above sea level, January 8, 1910: Benguet Subprovince, Bugias, *Elmer D. Merrill 4682*, October 28, 1905.

Dendrobium ventricosum Kränzl. in Engl. Pflanzenreich 45 (1910) 209.

LUZON, Province of Zambales, *A. Loher 6004*, June 11, 1905, flowers greenish-yellow, with purple lines. MINDANAO, Butuan Subprovince, Agusan River, Talacogon, *C. M. Weber 176*, epiphyte, flower light-green, July 20, 1911: District of Davao, *Rev. R. F. Black*, August, 1906, "flowers white, blue-veined inside;" from same locality, *Black*, 1909

Apparently a very variable species. The material which I have examined would seem to indicate that the labellum varies considerably in the condition of the anterior margin which may be minutely and inconspicuously denticulate or almost fringed. In the specimen collected by Rev. R. F. Black the margin of the lateral and middle lobes is lacerate-denticulate.

My understanding of Doctor Kränzlin's *D. ventricosum* is based on his original description; I have not seen the type.

ERIA Lindl.

Eria (Mycaranthes) Vanoverberghii sp. nov.

Planta robusta, erecta, foliosa. *Folia* ligulata, coriacea, acuta, disticha. *Pedunculi* terminale, circiter 6 bracteae imbricatae. *Bracteae inflorescentiae* lineari-lanceolatae, acutae, circiter 1.5 cm longae. *Pedunculus* rhachisque sericeo-pubescens. *Pedicellus* et *ovarium* pubescentia. *Sepala* externe pubescentia. *Sepala lateralia* oblonga, 5-nervia. *Sepalum dorsale* oblongi-lanceolatum. *Petala* oblonga, obtusa. *Labellum* 3-lobatum. *Lobi laterales* obtusi; *lobus medius* quadratus, apiculatus, callus parvus ad basim labelli; prope apicem labelli *tuberculum* permagnum; utroque in disco *callus* carinatus lobis lateralibus parallelus.

Plant robust, erect, probably 10 dm high (only upper part seen), leafy. *Leaves* ligulate, coriaceous, acute, sheathing, distichous, about 20 cm long, up to 22 mm wide. *Inflorescences* several (as many as 6) sheathed by large, imbricating bracts. *Peduncles* rather stout, about 2 dm long, whitish-pubescent. *Floral bracts* linear-lanceolate, acute, crowded, reflexed, the lowermost exceeding 2 cm in length, about 5 mm wide, longer than the densely pubescent flowers. *Lateral sepals* oblong, acute, 5-nerved, densely pubescent on the exterior surface, 7 mm long, 3.5 mm wide. *Upper sepal* oblong-lanceolate, 7 mm long, 3 mm wide, 5-nerved. *Petals* oblong, or nearly elliptical, obtuse, 5 mm long, about 2 mm wide. *Labellum* 3-lobed, 6 mm long. *Lateral* lobes triangular, obtuse, from the tip to base of sinus formed with middle lobe 1.5 mm long, *middle lobe* subquadrate, apiculate, 3 mm long, 4.5 mm wide. *Calli* 4, one in the middle of the base, one on each side near the sinus formed by the middle and lateral lobes, each continued from the free forward protruding apex to near the base of the lip, passing into a gradually diminishing keel, one at the apex, a large triangular, obtuse, erect tooth-like callus, 2 mm high, laterally flattened with the apex slightly reflexed. *Column* very short, free portion almost none.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 789*, August 27, 1910, 1,550 meters above sea level.

Eria Vanoverberghii is near *Eria longibracteata* Leavitt, but is unlike it in the dense inflorescence, large flowers, and very different calli.

PHREATIA Lindl.

Phreatia (§ Euphreatia) infundibuliformis sp. nov.

Folia linearia. *Pedunculus* valde elongatus, prope basim fractiflexus, *bracteae* infundibuliformes, magnae. *Racemus* elongatus, gracilis. *Bracteae inflorescentiae* lineari-lanceolatae, acutae, *ovarium pedicellum* aequantes. *Sepala lateralia* ovato-

lanceolata. *Sepalum superius* oblongi-lanceolatum. *Petala* oblonga, angustata, obtusa. *Labellum* breviter unguiculatum; lamina *cordatum*, breviter apiculata. *Columna* minuta.

Leaves linear, much shorter than the peduncle, about 9 cm long, 5 to 7 mm wide, asymmetrical at the tip. *Peduncles* elongated, somewhat zig-zag below the raceme, the angles marked by the large infundibuliform bracts, 4 or 5 in number. *Bracts* about 1 cm long. *Peduncle* 14 to 27 cm long. *Raceme* 8 to 14 cm long, 5 to 7 mm through in fruiting specimens. *Bracts* of the raceme linear-lanceolate, 3 to 7 mm long, the lowermost ones equaling or exceeding the flowers on fruiting specimens. *Flowers* diminutive, white. *Lateral sepals* ovate-lanceolate, 1 mm long. *Upper sepal* oblong-lanceolate, about 1 mm long *Petals* narrowly oblong, obtuse, 1 mm long, 0.5 mm wide. *Labellum* 0.75 mm long, cordate, shortly apiculate, 3-nerved, very shortly and inconspicuously unguiculate. *Mentum* minute. *Column* diminutive.

MINDANAO, Province of Misamis Mount Malindang, Major E. A. Mearns & W. I. Hutchinson, *For. Bur. 4611*, May, 1906. Plants abundant at an altitude of 1,700 meters above sea level.

From nearly related Philippine species readily distinguished by the large infundibuliform bracts below the raceme. In habit closely resembling *P. myosurus* (Forst.) Ames.

Phreatia (§ Euphreatia) Mearnsii sp. nov.

Habitu *P. densiflorae* haud dissimilis. *Folia* ligulata. *Racemus* densiflorus. *Bracteae inflorescentiae* lanceolatae, acuminatae. *Sepala lateralia* triangulari-ovata. *Sepalum superius* simile. *Petala* oblongi-ovata, obtusa. *Labellum* trapezoideum.

In habit similar to *P. Vanoverberghii* and *P. densiflora*. *Leaves* ligulate, asymmetrical at the tip, up to 25 cm long, 1.6 to 2.5 cm wide, coriaceous. *Peduncle* up to 4 dm long, exceeding the leaves, with several lanceolate sheathing bracts below the raceme. *Bracts* about 2 cm long, the upper ones about 1 cm long. Raceme about 1 dm long (1 cm through when the capsules are nearly ripe). *Floral bracts* lanceolate, long-acuminate, 3.5 cm long, spreading, subrigid. *Flowers* yellow, numerous, crowded. *Lateral sepals* triangular-ovate, 1.5 mm long, subacute. *Mentum* 0.5 mm long. *Upper sepal* 1 mm long. *Petals* oblong-ovate, obtuse, 1.5 to 2 mm long, 1.5 mm wide at about the middle. *Capsule* ellipsoid, 3 mm long. *Pedicel* and *ovary* in fruiting specimens about 5 mm long.

MINDANAO, Province of Misamis, Mount Malindang, E. A. Mearns & W. I. Hutchinson, *For. Bur. 4592*, May, 1906. LUZON, Province of Pampanga, H. M. Curran, *For. Bur. 19313*, March, 1910.

Phreatia Mearnsii is nearly related to *P. aristulifera* Ames and *P. Vanoverberghii* Ames, but differs from them in details of the flowers. The petals of *P. Mearnsii* are not unguiculate nor in any sense rhombic in outline.

Phreatia (§ Euphreatia) Ramosii sp. nov.

Planta parvula. *Folia* linearia. *Pedunculus* folio longitudine fere aequalis vel longior. *Flores* albi. *Sepala lateralia* triangulari-lanceolata, obtusa. *Sepalum superius* ovatum, obtusum. *Petala* ovata, ad apicem rotundata. *Labellum* oblanceolatum vel obovatum. *Mentum* obtusum.

In habit similar to *Phreatia myosurus* (Forst.) Ames. *Plants* about 1 dm tall. *Leaves* linear, asymmetrical at the tip, 4 to 9 cm long, up to 5 mm wide, spreading, equaling the peduncle or slightly shorter. *Peduncle* slender, 5 to 10 cm long, bracts sheathing, about 5 mm long, acuminate, aristate. *Raceme* 2 to 4 cm long, about 7 mm through when the flowers are open. *Flowers* white, diminutive, about 1 mm apart. *Floral bracts* rounded, prolonged at the tip, aristate, 3 mm long, aristate tip 1.5 mm long. *Pedicel* and ovary 3 mm long. *Lateral sepals* about 2 mm long (forming a blunt *mentum* 0.5 mm long), triangular-lanceolate, obtuse. *Upper sepal* 1.75 mm long, broadly ovate, obtuse. *Petals* ovate, rounded at the tip, 1.5 mm long, about 1 mm wide. *Labellum* 2.5 mm long, oblanceolate or obovate, about 1 mm wide at the middle. *Column* simple.

Luzon, Province of Abra, Maximo Ramos, *Bur. Sci. 7140*, February 8, 1909. Epiphyte, found on small trees in forests.

Phreatia sulcata J. J. Smith.

In a preceding paper[6] I described a new species from the Philippines as *P. bracteata*. An examination of additional material from Luzon convinces me that the specimens cited under *P. bracteata* are conspecific with *P. sulcata* J. J. Smith. A series of specimens from Bontoc Subprovince, Luzon, collected in June, 1911, by Father M. Vanoverbergh, *No. 1289*, are most certainly referable to *Phreatia sulcata* and compare well with specimens from Sumatra.

Phreatia (§ Euphreatia) Vanoverberghii sp. nov.

Habitu *P. densiflorae* (Bl.) Lindl. haud dissimilis sed in foliis angustior et in racemo gracilior. *Folia* linearia. *Racemus* densiflorus. *Bracteae inflorescentiae* aristatae. *Sepala lateralia* ovata. *Sepalum superius* ovatum, obtusum, concavum. *Petala* unguiculata, rhombico-spathulata. *Labellum* unguiculatum, ad basim cuneatum, super medium dilatatum, ad apicem in laminam subrhombicum dilatatum.

[6] This Journal 4 (1909) Bot. 674.

Leaves linear, asymmetrical at the tip, 20 to 26 cm long, 1.5 to 1.7 mm wide. *Peduncle* up to 24 cm long, with several closely appressed bracts below the inflorescence. *Raceme* slender, about 1 cm long, very densely flowered, about 6 mm through prior to development of the capsules. *Floral bracts* equaling the flowers, 2.5 mm long, cuneate at the base, rounded, prolonged into a conspicuous aristate tip (cf. *P. aristulifera* Ames). *Pedicel* and ovary of expanding flowers 2 mm long. *Lateral sepals* about 1 mm long, ovate, forming a *mentum* 0.5 mm long. *Upper sepal* ovate from a broad base, 1 mm long, obtuse, about 1 mm wide. *Petals* cuneate at the base, roundish, obtuse, or rhombic above the base, 1.5 mm long, 0.75 mm wide near the tip. *Labellum* slightly less than 2 mm long, unguiculate, cuneate, dilated, above the middle elliptical or subrhombic, rounded, margin entire, about 1 mm wide near the tip. *Column* 1 mm long. *Pollinia* 8.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1115*, on trees, altitude 1,650 meters, February 21, 1911.

Here also belongs a series of specimens with leaves 3 dm long by 13 mm wide collected in Luzon, Province of Abra, by Maximo Ramos, *Bur. Sci. 7145*, altitude about 600 m, February 8, 1909.

In habit similar, in a very general way, to *P. densiflora* (Bl.) Lindl., from which it differs in the aristate floral bracts and very slender raceme.

BULBOPHYLLUM Thou.

Bulbophyllum lancipetalum sp. nov.

Pseudobulbi minuti. *Folia* elliptico-lanceolata, coriacea, acuta, prominente 1-nervia. *Scapus* foliis brevior. *Racemus* strictus. *Bracteae inflorescentiae* ovariis longiores lanceolatae, acuminatae, acutae. *Sepala lateralia* triangulari-lanceolata, ad apicem aristata. *Sepalum dorsale* simile, cymbiforme, acuminatum, acutum. *Petala* lineari-lanceolata, obtusa, pubescentia in margine. *Labellum* lingulatum ciliolatum. *Columna* stelidiis 2.

Rhizome stout, about 5 mm in diameter. *Pseudobulbs* small, about 1 cm long, pyriform. *Leaf* elliptic-lanceolate, 12 cm long, about 2.5 cm wide, coriaceous, acute, prominently nerved along the middle, tapering at base into an elongated petiole. *Petiole* 5 to 10 cm long, sulcate, rigid. *Scape* shorter than the leaves, up to 17 cm tall, sheathed by about five, loose, acute bracts 9 to 13 mm long. *Raceme* strict, spicate, 6 to 7 cm long, about 20-flowered. *Bracts* of the raceme surpassing the ovaries, lanceolate, acuminate, acute, the largest one about 5 mm long.

Lateral sepals triangular-lanceolate from a broad base, 7 mm long, tapering into a slender bristle-like tip, at base, in front protuberant, forming a rounded *mentum*. *Upper sepal* shorter than the laterals, about 6 mm long, cymbiform, acuminate, acute. *Petals* linear-lanceolate, obtuse, 4 mm long, 1-nerved, somewhat thickened at the tip, very finely pubescent. *Labellum* lingulate, about 4 mm long, margin ciliolate, strongly deflexed near the middle, base rotund when spread flat. *Column* minute with two erect stelidia.

MINDANAO, Province of Misamis, Mount Malindang, Major E. A. Mearns & W. I. Hutchinson, *For. Bur. 4608*, flower yellow-white, 2,400 m above sea level, June 4, 1906.

In general habit similar to *B. dasypetalum*, but very distinct from that species in the details of the inflorescence.

The specimen from Mindanao, Mearns & Hutchinson, *For. Bur. 4601*, referred tentatively to *B. adenopetalum* Lindl.[1] appears to belong here. From *B. adenopetalum* it differs in its larger leaves and in the absence of caudate tips to the lateral sepals. According to the brief description of *B. braccatum* given by Reichenbach f. in "Linnaea," *B. lancipetalum* appears to be distinct from that species. In the Philippines there is a puzzling group of Bulbophyllums, all so closely allied that for proper interpretation a careful study of many specimens will be necessary. To this group belong *B. adenopetalum* and *B. Ramosii* characterized by caudate-tipped lateral sepals, *B. dasypetalum* and *B. lancipetalum* characterized by triangular-lanceolate lateral sepals, shortly if at all caudate, and *B. braccatum* which is said to have apiculate petals. At the present time, from material at hand, a thorough study of this group is being made which will be published in the near future.

Bulbophyllum nutans (Lindl.) Reichb. f. in Walper's Ann. 6: 260; Lindley in Bot. Reg. (1839) Misc. 118; Bot. Mag. *t. 4418*.

This interesting species of the § *Cirrhopetalum* has come to hand from the Island of Polillo. The leaves are very thick, elliptic or nearly orbicular, 3 cm long by 17 mm wide or thereabouts, very shortly petioled, arising from diminutive, rugose, pyriform pseudobulbs, 1 cm long. Scape 1.5 to 2 dm tall, slender, with several minute, closely appressed, acute bracts. Umbel many-flowered, nodding. Bracts of the umbel linear, about 3 mm long, crowded. Pedicel slender, together with the ovary 5 mm long. Lateral sepals ligulate, 2 cm long. Upper sepal 5 mm long, lanceolate, prolonged into a slender, bristle-like tip, 3-nerved. Petals lanceolate, acuminate, acute, 3-nerved, about 3.5 mm long, margin of the upper half entire, margin of

[1] Orchidaceae 2: 206.

the lower half ciliated or serrulated. Labellum diminutive, lingulate, about 2 mm long, obtuse, fleshy, bicristate.

Polillo, C. B. Robinson, *Bur. Sci. 9077*, August 9, 1909, growing on *Heritiera littoralis*, buds deep-yellow, flowers somewhat paler.

The plants figured in the "Botanical Magazine" have longer leaves, and larger pseudobulbs than the specimens from Polillo.

Bulbophyllum Ramosii sp. nov.

Folia oblonga, ad apicem rotundata. *Scapus* gracilis, *bracteis* tubularibus. *Flores* albi. *Bracteae inflorescentiae* lineares. *Sepala lateralia* triangularia, caudata. *Sepalum superius* concavum, lanceolatum, caudatum. *Petala* lineari-lanceolata, acuta, 1-nervia. *Labellum* lingulatum, ciliatum. *Columna* bifurcata.

Plant small, to the tip of the leaf not exceeding 1 dm. Rhizome comparatively slender, rooting freely. *Pseudobulbs* wanting, the leaves arising directly from the creeping rhizome. *Leaves* rigid, leathery, oblong, rounded at the tip, tapering gradually at the base, *lamina* up to 7 cm long, 11 mm wide, with a prominent mid-nerve. *Scape* weak, slender, longer than the leaves, up to 8 cm long, with several tubular bracts about 5 mm long below the raceme. *Raceme* lax, about 7-flowered. *Flowers* white. *Bracts* of the raceme linear, exceeding the pedicellate ovary, about 4 mm long. *Lateral sepals* triangular, prolonged into a slender caudate tip, triangular base about 3 mm long, caudate tip 5 mm long. *Upper sepal* shorter than the laterals, concave, lanceolate, caudate-tipped, 7 mm long. *Petals* linear-lanceolate, acute, 1-nerved, about 3 mm long. *Labellum* lingulate, strongly bent at the middle, apical half nearly 2 mm long, oblong, rounded at the tip, margin coarsely hairy, basal half sulcate, when spread out orbicular. *Column* at the tip bifurcate.

Luzon, Province of Laguna, San Antonio, Maximo Ramos, *Bur. Sci. 12091*, August 26, 1910.

This is a smaller species than *Bulbophyllum adenopetalum* Lindl., to which it is closely allied. The flowers resemble the sketch of *B. adenopetalum*, by Lindley, preserved at Kew. The leaves are much shorter than in Lindley's material and much broader in relation to their length. Both species are different from *B. dasypetalum* Rolfe, in their caudate-tipped lateral sepals, and ciliolate lips. *B. braccatum*, a Philippine species described by Reichenbach f., belongs in the same group. Of this species, unfortunately, I have seen no material; no type is designated by its author. The description is vague, no details regarding the foliage being given, and, in view of the fact that there is a group of species in the Philippines closely allied with *B. adenopetalum* and *B. dasypetalum*, wholly inadequate for purpose of identification and useless for comparative studies.

DENDROCHILUM Blume.

Dendrochilum (§ Acoridium) longibulbum sp. nov.

Pseudobulbi graciles, fusiformes, elongati. *Folia* linearia, obtusa. *Pedunculus* gracilis, filiformis, folio longior. *Racemus* 4 ad 5 cm longus. *Bracteae inflorescentiae* distichae. *Sepala lateralia* lanceolata, acuta. *Sepalum superius* lateralibus simile. *Petala* cuneato-ovata. *Labellum* crassum, 3-lobatum; *lobi* laterales semicrescentiformes; *lobus medius* subquadratus, apiculatus, prope basim *bicallosus*, et callo medio vel mammilla instructus.

Pseudobulbs densely clustered, elongated, cylindric, rugose, 2.5 to 4 cm long, 2 to 4 mm in diameter when dry. *Leaf* shortly petioled, linear, obtuse, 7 to 14 cm long, 5 to 7 mm wide, midnerve prominent. *Peduncle* filiform, slightly exceeding the leaf, up to 1 dm long. *Raceme* 4 to 5 cm long, loosely many-flowered (fls. about 15), subtended by 2 or 3, glumaceous, scarious, imbricating, *empty bracts;* flowers white, 2 to 3 mm apart, distichous, *floral bracts* exceeding and concealing the ovary. *Lateral sepals* lanceolate, acute, about 3.5 mm long, 1.5 mm wide, 3-nerved. *Upper sepal* similar, 3.5 mm long. *Petals* cuneate-ovate, acute, 3 mm long, about 1.5 mm wide, 3-nerved. *Labellum* fleshy, 3-lobed, 1.5 mm long; *lateral lobes* half crescent form, obtuse, shorter than the middle lobe; middle lobe 0.75 mm long, subquadrate with a triangular tooth in front. On the disk of the lip there are three *calli*, one in the middle at the bottom of the depressed or subsaccate base and one on each side near the base of each lateral lobe. *Column* typical of the section.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 782*, altitude 1,550 m, August 23, 1910.

Dendrochilum longibulbum might readily be mistaken for a narrow-leaved form of *D. pumilum*, but its smaller flowers and very different petals are differentiating characters.

Of the sixty or more species of this genus which have been described from Philippine material all are endemic; I have been unable to discover a single exception. Of the described Philippine species I have examined every one except *D. convallariaeforme* Schauer (which is supposed to include *D. Copelandii* Ames) and *D. maleolens* Kränzl., the latter a recently described species which is said to be close to *D. oliganthum* (Ames) Pfitzer.

Dendrochilum microchilum (Schlechter) Ames Orchidaceae 2 (1908) 87.

Platyclinis microchila Schlechter in Bull. Herb. Boiss. II 6 (March, 1906) 302.

Acoridium venustulum Ames in Proc. Biol. Soc. Wash. 19 (Sept., 1906) 147.

Dendrochilum venustulum (Ames) Pfitzer in Engl. Pflanzenreich 32 (1907) 116.

In my second volume of "Orchidaceae," having no material and judging wholly from the original description, I referred to *Platyclinis microchila* as a near affinity of *Dendrochilum tenue* Pfitzer. In a letter dated November 7, 1910, Doctor Schlechter states that *Dendrochilum microchilum* and *D. venustulum* Pfitzer are identical.

Dendrochilum (§ Acoridium) Vanoverberghii sp. nov.

Pseudobulbi pyriformes in sicco rugosi. *Folia* linearia, acuta. *Pedunculus* folio longior. *Inflorescentia* laxiflora. *Bracteae* glumaceae, ovario longiores. *Sepala lateralia* ovato-lanceolata, acuta. *Sepalum superius* oblongi-lanceolatum, acutum. *Petala* lanceolata, acuta. *Labellum* crassum, 3-lobatum, *lobi laterales* obtusi, *lobus medius* apiculatus.

Whole plant, including the peduncle, up to 24.5 cm high, as shown by the type. Pseudobulbs elongated pyriform, 1.5 cm long, about 5 mm in diameter at the base, rugose in dried specimens, clothed with the fibrous remains of sheathing bracts. *Leaves* linear, acute, 4.5 to 7.5 cm long, about 2.5 mm wide, grass-like when dry. *Peduncle* free, from the summit of the pseudobulb, slender, graceful, about twice longer than the leaf, about 1 dm high, not exceeding 13.5 cm in the type. *Inflorescence* loosely flowered, subtended by two imbricating, scarious bracts; flowers about 3 mm apart, distichously arranged. *Pedicel* and *ovary* 2 mm long, concealed by a glumaceous bract. When fresh the flowers are white with a "red" lip, in dried specimens they are brownish. *Lateral sepals* ovate-lanceolate, acute, 3-nerved, 2.5 mm long, 2 mm wide near the base. *Upper sepal* oblong-lanceolate, acute, 2.5 mm long, 1 mm wide, middle nerve conspicuous (in dried specimens). *Petals* lanceolate, acute, 3-nerved, 2 mm long, 1 mm wide. *Labellum* fleshy, 1.5 mm long, somewhat saccate near the base, 3-lobed; lobes subequal, *laterals* rounded, obtuse in front; *middle lobe* longer than the laterals, subquadrate, apiculate, broader than long. *Column* minute, characteristic of the Section *Acoridium*.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh*, November–December, 1910.

Dendrochilum Vanoverberghii appears to be a near relative of *D. exile*,[1] but differs from it in the details of the flower, and in general habit, the leaves and peduncle of *D. exile* being about subequal, while in *D. Vanoverberghii* the peduncle exceeds the leaf to a conspicuous extent. *D. MacGregorii* is also a near relative but the lip-characters of that species and the dense inflorescence are conspicuous differentiating peculiarities.

[1] Orchidaceae 2: 85 *fig.*

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NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES. V: THE GENUS BULBOPHYLLUM IN THE PHILIPPINE ISLANDS

By Oakes Ames, M. A., F. L. S.

(Director of the Botanical Garden, Harvard University, Cambridge, Mass., U. S. A.)

Reprinted from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science of the Philippine Government,
Manila, P. I.
Vol. VII, No. 3, Sec. C, Botany,
September 2, 1912

MANILA
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THE PHILIPPINE
JOURNAL OF SCIENCE
C. BOTANY

VOL. VII AUGUST, 1912 No. 3

NOTES ON PHILIPPINE ORCHIDS WITH DESCRIPTIONS OF NEW SPECIES, V: THE GENUS BULBOPHYLLUM IN THE PHILIPPINE ISLANDS.[1]

By OAKES AMES.
(*From the Ames Botanical Laboratory, North Easton, Mass., U. S. A.*)

The following paper contains descriptions of nineteen new species of the genus *Bulbophyllum* together with a list of the species heretofore ascribed to the Philippine Islands. Those which belong to the § *Racemosae* are closely related to one another, although distinguishable by characters which I have set forth in a provisional key. I am convinced that we have in the Philippines a puzzling group of species, closely allied to *Bulbophyllum adenopetalum* Lindl., and to *B. dasypetalum* Rolfe, which cannot be rightly understood until a great deal more material than I have seen has been assembled and thoroughly studied. In this group we find plants which bear flowers so similar in detail that they seem to belong to the same species, although they are easily distinguishable and specifically unlike in their foliage. Around *Bulbophyllum dasypetalum* there is grouped a number of species which have triangular-lanceolate lateral sepals, and around *B. adenopetalum* there is grouped

[1] Proof read by E. D. Merrill.

a number of species which have caudate-tipped lateral sepals. Aside from this conspicuous floral distinction, one easily recognized, the species of each group are perplexingly similar. Often the points of dissimilarity are difficult to make clear in a description and stand out distinctly only when actual comparisons are made.

The general habit and the characteristic flowers of this group may be seen in *Bulbophyllum dasypetalum* Rolfe, which is figured in Orchidaceae 1:99. The flowers of the species with caudate-tipped sepals are for the most part similar to those of *Bulbophyllum flavescens* Lindl. A figure of this species is given by J. J. Smith in his "Orchideen von Java," Atlas, *fig. CCCIV.*

A LIST OF THE PHILIPPINE SPECIES OF BULBOPHYLLUM.

The following species of *Bulbophyllum* have been reported as natives of the Philippine Islands. Those species marked with an asterisk have been verified by an examination of material from the Archipelago; those marked with a double asterisk are doubtfully natives of the Philippines.

*1. **Bulbophyllum adenopetalum** Lindl. Bot. Reg. 28 (1842) Misc. 85.

*2. **B. alagense** Ames in Philip. Journ. Sci. 2 (1907) Bot. 233, Orchidaceae 3 (1908) 54.

*3. **B. antenniferum** Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 248.
Cirrhopetalum antenniferum Lindl. Bot. Reg. 29 (1843) sub *t. 49.*
In Lindley's herbarium at Kew this species is represented by a single flower collected in the Philippines by Cuming.

*4. **B. auratum** Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 261.
Cirrhopetalum auratum Lindl. Bot. Reg. 26 (1840) Misc. 50.

5. **B. balaeniceps Reichb. f. in Hamb. Gartenz. 19 (1863) 280.
In "Index Kewensis" this species is given as an equivalent of *B. Napelli* Lindl., a native of Brazil. The original description of *B. balaeniceps* appears to have been drawn entirely from a flower. It was not stated positively by Reichenbach that *B. balaeniceps* came from the Philippines; its origin was obscure. Pfitzer[3] gives *Balaenoidea* as a section of the genus and refers to it a single species, "*B. balaeniceps* Rchb. f. von den Philippinen."

*6. **B. bataanense** Ames Orchidaceae 1 (1905) 96.
Probably conspecific with *B. Cheiri* Lindl.

*7. **B. Bolsteri** Ames. See below.

*8. **B. bontocense** Ames. See below.

9. **B. braccatum** Reichb. f. in Linnaea 41 (1877) 117.

*10. **B. canlaonense** Ames. See below.

11. **B. careyanum Spreng. Syst. Veg. 3 (1826) 732.

*12. **B. carinatum** Ames. See below.

[3] Engl. & Prantl, Nat. Pflanzenfam. 2[6] (1889) 179.

*13. **B. Cheiri** Lindl. Bot. Reg. 30 (1844) Misc. 44.

14. **B. chryseum** (Kränzl.) Ames in Philip. Journ. Sci. 6 (1911) Bot. 54.
Cirrhopetalum chryseum Kränzl. in Fedde Repert. 8 (1910) 97.

*15. **B. Clemensiae** Ames. See below.

*16. **B. Copelandii** Ames Orchidaceae 1 (1905) 97.

*17. **B. Cumingii** Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 261.
Cirrhopetalum Cumingii Lindl. Bot. Reg. 29 (1843) sub. *t. 49.*
For a colored plate see Bot. Mag. *t. 4996.*

*18. **B. cuneatum** Rolfe in Ames Orchidaceae 1 (1905) 98.

*19. **B. Curranii** Ames. See below.

20. **B. Blumei J. J. Smith Orch. Jav. (1905) 459.
B. cuspidilingue Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 264.
Philippines given as a habitat in Index Kewensis. Java, Singapore, New Guinea.

*21. **B. dasypetalum** Rolfe in Ames Orchidaceae 1 (1905) 98, *fig.*

*22. **B. Dearei** Reichb. f. in Flora 71 (1888) 156.
Sarcopodium Dearei Reichb. f. in Gard. Chron. (1883) 108, *fig. 17.*

*23. **B. Elmeri** Ames. See below.

*24. **B. exile** Ames Orchidaceae 2 (1908) 208, *fig.*

*25. **B. gimagaanense** Ames. See below.

*26. **B. gnomoniferum** Ames Orchidaceae 2 (1908) 209, *fig.*

*27. **B. halconense** Ames in Philip. Journ. Sci. 2 (1907) Bot. 334.

*28. **B. lancipetalum** Ames supra 23.

29. **B. lasianthum Lindl. in Gard. Chron. (1855) 53.
"The first knowledge we had of this remarkable plant was from a coloured drawing, from Sumatra, shown us by our learned friend Prof. de Vriese. It has now been examined in a living state, a specimen said to have come from Manila having flowered with Messrs. Loddiges." etc., Lindley l. c.

*30. **B. lasioglossum** Rolfe in Ames Orchidaceae 1 (1905) 100, 2 (1908) 3, *pl. 18.*

*31. **B. lepantense** Ames. See below.

32. **B. longiflorum** Thouars Orch. Afr. (1822) *t. 97.*
Cirrhopetalum Thouarsii Lindl. Gen. and Sp. Orch. (1830) 58.
This species has been referred to the Philippines by Lindley and by other authors (cf. Bot. Mag. sub. *t. 7214;* Gard. Chron. 2 (1891) 69). I have not seen *B. longiflorum* from the Philippines and probably the species referred by various authors to the Archipelago under this name is *B. Weberi* Ames, described below.

*33. **B. luzonense** Ames. See below.

*34. **B. Makoyanum** Reichb. f. in Gard. Chron. 1 (1879) 234, in note; Ames in Philip. Journ. Sci. 6 (1911) Bot. 55.

*35. **B. marivelense** Ames. See below.

*36. **B. maxillare** Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 248.
Cirrhopetalum maxillare Lindl. Bot. Reg. 29 (1843) sub. *t. 49.*
In Lindley's herbarium at Kew this species is represented by a flower and leaf collected in the Philippines by Cuming.

*37. **B. MacGregorii** Ames. See below.

*38. **B. Merrittii** Ames in Philip. Journ. Sci. 2 (1907) Bot. 334.

*39. **B. mindorense** Ames l. c. 334, Orchidaceae 3 (1908) 56, *pl. 45.*

*40. **B. nutans** Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 260; Ames Supra 24.

Cirrhopetalum nutans Lindl. Bot. Reg. 25 (1839) Misc. 71; Bot. Mag. *t. 4418.*

41. **B. orthoglossum Wendl. & Kränzl. in Gard. Chron. (1896) 326.

This species was collected by W. Micholitz in "Sarangui insula," according to its authors. If by "Sarangui insula" Sarangani Island is intended, then *B. orthoglossum* is a native of the Philippines.[1]

*42. **B. pauciflorum** Ames. See below.

43. **B. penicillium** Par. & Reichb. f. in Trans. Linn. Soc. 30 (1874) 151; King & Pantl. Orch. Sikkim Himalaya *t. 108.*

Rolfe in both Vidal's Phanerogamae Cumingianae Philippinarum (1885) 80, 149, and in the Journal of Botany 23: 215 cites *Cuming 2076*, from the Philippines, as *Bulbophyllum penicillium* Par. & Reichb. f.

*44. **B. pleurothallioides** Ames in Philip. Journ. Sci. 2 (1907) Bot. 335, Orchidaceae 3 (1908) 55, *pl. 44.*

*45. **B. profusum** Ames. See below.

*46. **B. Ramosii** Ames supra 25.

47. **B. saurocephalum** Reichb. f. in Gard. Chron. 2 (1886) 262.

*48. **B. stellatum** Ames. See below.

*49. **B. trisetum** Ames. See below.

*50. **B. vagans** Ames & Rolfe in Orchidaceae 2 (1908) 210, *fig.* *Var. **angustum** Ames in Philip. Journ. Sci. 2 (1907) Bot. 335.

*51. **B. Vanoverberghii** Ames. See below.

*52. **B. Weberi** Ames. See below.

*53. **B. Whitfordii** Rolfe in Ames Orchidaceae 1 (1905) 100.

*54. **B. zambalense** Ames. See below.

BULBOPHYLLUM Thouars.

The following key represents a provisional effort to differentiate the group of the racemose Bulbophyllums which are closely allied to *B. adenopetalum* and *B. dasypetalum.* In order to make it more serviceable several other racemose species, clearly separable from all other Philippine species of the genus, are included. The key is based on characters which may exhibit a wide range of variation when more material is available for comparison. Unfortunately very few duplicates of the new species described in this paper have been received so that it has been impossible to arrive at a clear conception of those characters which will, in a key, make positive identification possible.

Bulbophyllum lasianthum Lindl. has been ascribed to the Philippines from whence it was supposed to have been imported into England by Loddiges, but I have seen no material referable

[1] Sarangani Island is known to several professional orchid collectors, Micholitz and others, as the home of certain species of commercial value, and has been visited at various times by different collectors. It is a small island off the south coast of Mindanao.

E. D. M.

to *B. lasianthum* among the Philippine specimens I have examined.

A. Raceme sharply decurved ..... *B. cuneatum*
B. Raceme erect or simply flexuose.
  a. Labellum or sepals hairy.
    b. Labellum hairy ..... *B. lasioglossum*
    (*b.* Sepals hairy ..... *B. lasianthum*)
  a. Labellum ciliolate; sepals smooth.
    b. Lateral sepals caudate-tipped.
      c. Leaves 7.5 to 15 cm long..... *B. adenopetalum*
      c. Leaves 5 to 6 cm long..... *B. Ramosii*
    b. Lateral sepals triangular-lanceolate, not caudate-tipped.
      c. Leaves about 15 cm long..... *B. lancipetalum*
      c. Leaves 3.5 to 5.5 cm long..... *B. gimagaanense*
      c. Leaves 8 to 10 cm long..... *B. Clemensiae*
  a. Labellum smooth on the margin.
    b. Plants caespitose.
      c. Pseudobulbs 1 cm long; flowers several..... *B. Merrittii*
      c. Pseudobulbs wanting or minute.
        d. Flowers several ..... *B. lepantense*
        d. Flowers two ..... *B. pauciflorum*
    b. Rhizome creeping; leaves distant.
      c. Flowers 7 mm long..... *B. vagans*
      c. Flowers less than 7 mm long.
        d. Raceme erect, many-flowered, longer than the leaves.
          e. Petioles 3 to 10 cm long.
            f. Leaves elliptic-oblong ..... *B. Vanoverberghii*
            f. Leaves narrowly lanceolate ..... *B. dasypetalum*
          e. Petioles about 1 cm long..... *B. zambalense*
        d. Raceme weak, few-flowered, shorter than the leaves; petals spathulate ..... *B. marivelense*
        d. Raceme 2-flowered ..... *B. Curranii*
        (Insufficiently known) ..... *B. braccatum*

§ RACEMOSAE.

Bulbophyllum Clemensiae sp. nov.

Aff. *B. adenopetalo* et *B. dasypetalo. Rhizoma crassum. Pseudobulbi* 0. *Folia* oblanceolata, coriacea, petiolata. Scapus gracilis flexuosus, bracteis tubularibus prope basim. *Racemus* elongatus, bracteis inflorescentiae glabris, lanceolatis, ovarium aequantibus. *Sepala lateralia* triangulari-lanceolata, acuminata. *Sepalum superius* lineari-lanceolatum, acutum, concavum. *Petala* linearia, acuta, 1-nervia, margine cellulari-ciliato. *Labellum* ad basim rotundatum, lingulatum ab medio, vel lingulatum, pars inferior explanata suborbicularis; ad basim bicallosum. *Columna* brevis, ad apicem bifurcata.

Rhizome comparatively stout, copiously rooted. Pseudobulbs 0. Leaves long petiolate, oblanceolate, coriaceous, tapering abruptly

at the tip, lamina 8 to 10 cm long, 1.6 to 2.3 cm wide. Petiole 2 to 4 cm long. Scape weak, flexuouse, sheathed at the base with several tubular bracts, shorter than the leaves or equaling them. Raceme loose, 10- to 20-flowered. Bracts subtending the flowers about equaling the pedicellate ovary, scarious, lanceolate, concave, acute. Flowers in dried specimens appear to have been yellowish or whitish when fresh. Lateral sepals triangular-lanceolate, acute, broadly caudate-tipped, 5 mm long, 2 mm wide. Upper sepal linear-lanceolate, concave, acute, 4.5 mm long. Labellum 3.75 mm long, lingulate, margin of the apical half minutely ciliate, somewhat deflexed, margin of the basal half erect; basal half rotundate when spread out; bicallose. Column bifurcate at the tip.

MINDANAO, Lake Lanao, Camp Keithley, March, 1906, *Mary Strong Clemens 440.*

Bulbophyllum Curranii sp. nov.

Rhizoma gracile, ad nodos radicans. *Pseudobulbi* nulli. *Folia* oblongi-lanceolata vel oblonga, coriacea, acuta, in sicco rugosa, erecta, distantes, vix petiolata. *Scapus* brevis, biflorus, bracteis tubularibus obtectus, prope apicem bractea tubulari adornatus. *Bracteae inflorescentiae* flores subtendentes, pedicellis longiores, lanceolatae, acutae, in sicco scariosae. *Flores* flavidi. *Sepala lateralia* triangulari-lanceolata, acuminata, acuta, 3-nervia. *Sepalum superius* simile, lanceolatum, acutum, 3-nervium. *Petala* lineari-oblonga, 1-nervia, acuta. *Labellum* subhastatum vel subquadratum, ad apicem rotundatum, obtusum, 3-nervium. *Columna* breviter bicuspidata.

Rhizome elongated, very slender, in dried specimens less than 1 mm thick. Pseudobulbs, scarcely if at all developed, mere thickenings of the rhizome at the base of each leaf. Leaves 2 to 3 cm distant, elliptic-oblong, or oblong-lanceolate, acute, coriaceous, 1 to 2 cm long, up to 5 mm wide. Scape very short, scarcely exceeding 6 mm in length, concealed by sheathing bracts. Flowers in pairs, yellow, small, subtended by lanceolate bracts 2 to 3 mm long. Lateral sepals triangular-lanceolate, 5 mm long, 2 mm wide. Upper sepal 4.5 mm long. Petals much shorter than the sepals, about 2 mm long, less than 1 mm wide, 1-nerved. Labellum 2 mm long, about 1 mm wide, smooth.

LUZON, Benguet Subprovince, summit of Mount Tonglon, August 8, 1906, H. M. Curran, *For. Bur. 4953.* "Epiphytic vine."

Bulbophyllum gimagaanense sp. nov.

Aff. *B. adenopetalo* sed foliis minor et sepalis lateralibus non caudatis. *Rhizoma* elongatum, repens, gracile. *Pseudobulbi* 0.

Folia lineari-oblonga, obtusa, coriacea, in petalos graciles contracta. *Scapus* flexuosus, folio longitudine fere aequalis, vel brevior, bracteis 2, laxe vaginantibus, acutis. *Racemus* laxiflorus, pauciflorus (flores ± 3). *Bracteae* lanceolatae. *Sepala lateralia* triangulari-lanceolata, acuta. *Sepalum superius* oblongi-lanceolatum, acutum, concavum. *Petala* spathulata, 1-nervia, margine papilloso vel cellulari-ciliato. *Labellum* lingulatum, ad basim bituberculatum, 3-nervium, margine ciliato. *Columna* bifurcata.

Rhizome slender, elongated, creeping, copiously rooted. Pseudobulbs 0. Leaves coriaceous, linear-oblong, 3.5 to 5 cm long, 5 to 8 mm wide, contracted into slender petioles. Scape very slender, sheathed at the base by several, tubular, acute bracts. Raceme loose, few-flowered, flowers 5 to 10 mm apart. Bracts about 2 mm long, lanceolate, acute, exceeding the ovaries. From dried specimens the flowers appear to have been yellowish or whitish when fresh. Lateral sepals triangular or triangular-lanceolate, acute, hardly caudate-tipped, 5 mm long, about 2.5 mm wide. Upper sepal oblong-lanceolate, acute, about 4.5 mm long, concave. Petals spathulate, 3 mm long, ciliolate on the margin, 1-nerved. Labellum 3.5 mm long, lingulate, obtuse, margin ciliate, base bituberculate. Column minute.

NEGROS, Province of Occidental Negros, May 26, 1906, *H. N. Whitford 1610*. On tall trees, 65 m above sea-level.

B. gimagaanense differs from *B. adenopetalum* Lindl. and *B. Ramosii* Ames in the form of the lateral sepals. In habit it resembles *B. Ramosii* rather closely but is readily distinguishable from that species by means of its elongated rhizome and widely separated leaves. It is also similar to *B. vermiculare* Hook. f. but in the details of the flowers is quite distinct.

Bulbophyllum lepantense sp. nov.

Pseudobulbi minuti, caespitosi, globosi, rugosi, 3.5 mm alti. *Folia* crassa, in sicco rugosa, oblongi-elliptica, subacuta, breviter petiolata. *Scapus* foliis longior, bracteis carinatis tubularibus infra medium. *Racemus* sublaxiflorus. *Bracteae* ovato-lanceolatae, acutae. *Sepala lateralia* triangulari-lanceolata, 3-nervia, acuta. *Sepalum superius* ligulatum, acutum, concavum, 3-nervium. *Petala* rhombica vel rhombico-spathulata, obtusa, 1-nervia. *Labellum* lingulatum, obtusum, ad basim bituberculatum.

Pseudobulbs minute, approximate, rugose, globose, about 3.5 mm in diameter. Leaves fleshy, 3.5 to 5.5 cm long, 1 to 1.6 cm wide, deeply wrinkled in the dried state. Petals comparatively short, stout, 3.5 mm long. Scape at least twice longer than the leaves, ±10 cm tall, sheathed below the raceme with

about three, carinate, tubular bracts 1 to 1.5 cm long. Raceme loosely flowered. Bracts subtending the flowers ovate-lanceolate, about 3 mm long. Perianth about 5 mm long, the divisions scarcely spreading, yellowish-white. Lateral sepals triangular-lanceolate, acute, not caudate-tipped, 3-nerved, about 5 mm long. Upper sepal 5 mm long, ligulate, acute, 3-nerved, concave. Petals rhombic or rhombic-spathulate, obtuse, 1-nerved, about 3 mm long, the margin minutely cellular-ciliate. Labellum lingulate, about 3 mm long, fleshy, bituberculate at the base. Column minute, bifurcate at the tip.

LUZON, Lepanto Subprovince, October 29, 1905, *Elmer D. Merrill 4586.* Epiphyte in mossy forests, 2,200 m above sea-level.

Bulbophyllum marivelense sp. nov.

Aff. *B dasypetalo*, a quo tamen foliis differt. *Rhizoma* repens. *Pseudobulbi* nulli. *Folia* oblongi-lanceolata, obtusa, coriacea, petiolata. *Scapus* folio brevior, flexuosus, pauciflorus. *Flores* flavidi. *Sepala lateralia* triangulari-lanceolata, 3-nervia, acuta. *Sepalum superius* oblongum, acutum. *Petala* spathulata, 1-nervia. *Labellum* lingulatum, ad basim bicarinatum. *Columna* breviter bicuspidata.

Rhizome creeping, 2 mm thick. Pseudobulbs wanting. Leaves 1 cm apart, petiolate, coriaceous, oblong-lanceolate, obtuse, lamina 10 to 12 cm long, 12 to 13 mm wide, in general outline similar to that of *B. adenopetalum.* Petioles 3 to 4 cm long, slender, shorter in relation to the length of the lamina than those of *B. dasypetalum* to which species this one bears a close resemblance in the details of the flowers. Scape erect, bracteate, shorter than the leaves, 8.5 to 10 cm tall. Bracts subtending the flowers ovate-lanceolate, acute, about 1 mm long, equaling the ovaries, hyaline in dried specimens. Raceme loosely flowered, flowers about 10, yellow. Lateral sepals triangular-lanceolate, acute, 3-nerved, 4.5 mm long. Upper sepal oblong or oblong-lanceolate, acute, concave, 4 mm long. Petals spathulate, 1-nerved, obtuse, 2.5 mm long. Labellum lingulate, margin smooth, about 2.5 mm long, bicarinate at the base. Column minute, bicuspidate.

LUZON, Province of Bataan, Mount Mariveles, January 1, 1904, *Elmer D. Merrill 3738.* On exposed ridges, epiphytic, at 1,100 meters above the sea.

Bulbophyllum pauciflorum sp. nov.

Planta parvula, caespitosa, pseudobulbi minuti vel nulli. *Folia* conferta, coriacea, elliptica vel oblanceolata, breviter petiolata. *Scapus* foliis breviores, flores duos gerentes. *Flores* flavidi.

Sepala lateralia, triangulari-lanceolata, 3-nervia. *Sepalum* superius concavum, oblongi-lanceolatum, 3-nervium. *Petala* spathulata, 1-nervia. *Labellum* ovato-lanceolatum, 3-nervium, acutum. *Columna* breviter bicuspidata.

Plants small, copiously rooted, caespitose, leaves crowded. Pseudobulbs practically wanting. Leaves fleshy, coriaceous, rugose when dry, elliptic or oblanceolate, rounded at the retuse tip, 1 to 2 cm long, 6 to 8 mm wide. Petiole very short, causing the leaves to appear sessile. Scape shorter than the leaves or barely equaling them, up to 2 cm long, bearing, in the specimens studied, only two yellowish flowers. Bracts of the inflorescence about half as long as the shortly pedicellate ovary. Lateral sepals triangular-lanceolate, acute, 4.5 mm long. Upper sepal about 4 mm long, concave, oblong-lanceolate, acute. Petals much smaller than the sepals, about 2 mm long, spathulate, 1-nerved. Labellum comparatively large, ovate-lanceolate, acute, 3-nerved, 3 mm long, 2 mm wide. Column minute, bicuspidate.

LUZON, Bontoc Subprovince, August 17, 1911, *Father M. Vanoverbergh 1381*. Epiphytic, altitude 1,650 meters above sea level.

Bulbophyllum Vanoverberghii sp. nov.

Pseudobulbi 0. *Folia* petiolata, coriacea, oblongi-elliptica. *Scapus* gracilis, erectus, folio longior, bracteis tubularibus prope basim. *Racemus* gracilis, multiflorus. *Bracteae* ovariis longiores, anguste lanceolatae. *Sepala* lateralia triangulari-lanceolata, acuminata, acuta, subcaudata. *Sepalum* superius lanceolatum, acutum ad basim concavum. *Petala* lineari-oblonga, obtusa, 1-nervia. *Labellum* crassum, 3-nervium, lingulatum, obtusum, ad basim bituberculatum, bicarinatum prope medium. *Columna* bifurcata.

Rhizome creeping, about 5 mm in diameter, copiously rooted. Pseudobulbs 0. Leaves petiolate, very thick, coriaceous, yellowish when dry, rugose. Petiole 2.5 to 5 cm long, sulcate, about 3 mm thick, rigid. Lamina elliptic-oblong, obtuse, bilobed at the tip, abruptly or gradually contracted at the base, margin revolute, average length about 15 cm, average width 4 cm. Scape erect, sheathed up to the lowermost flower by about four, loose, acute, vaginate bracts. Raceme slender, many-flowered, 12 to 22 cm long. Bracts exceeding the ovaries, linear-lanceolate, acuminate, acute, diaphanous in dried specimens, about 7 mm long. Flowers yellowish or whitish, up to 8 mm long, segments of the perianth hardly spreading. Lateral sepals triangular-lanceolate, acuminate, subcaudate-tipped, acute, smooth,

6 to 8 mm long. Upper sepal lanceolate, acute, about 5 mm long. Petals linear-oblong, obtuse, 1-nerved, 3 mm long, about 1 mm wide. Labellum 4.5 mm long, lingulate, obtuse, fleshy, 3-nerved, bituberculate at the base, bicarinate or furnished with two fleshy marginal ridges on the apical half below the middle, strongly deflexed at about the middle, obscurely if at all 3-lobed, margin of the basal half erect, margin of the apical half deflexed, slightly revolute. Column bifurcate.

LUZON, Bontoc Subprovince, July-August, 1911, *Father M. Vanoverbergh 1367.*

To this species I refer the following collections:

LUZON, Province of Nueva Vizcaya, December 22, 1908, M. L. Merritt, *For. Bur. 15861,* altitude above sea-level 1,600 meters: Benguet Subprovince, August 8, 1906, H. M. Curran, *For. Bur. 5062;* Subaan trail, January, 1909, W. Schultze, *Bur. Sci. 5629:* Bontoc Subprovince, July 23, 1910, *Father M. Vanoverbergh 712:* Province of Tayabas, November 3, 1907, Curran and Merritt, *For. Bur. 7835:* Province of Zambales, December 10, 1907, Maximo Ramos, *Bur. Sci. 4995:* Province of Rizal, Bosoboso (San Isidro), January, 1909, Maximo Ramos, *Bur. Sci. 2025:* Province of Laguna, Mount Banajao, November, 1907, Curran and Merritt, *For. Bur. 8025.*

Bulbophyllum Vanoverberghii belongs to a small group of Philippine species of which *B. dasypetalum* Rolfe and *B. adenopetalum* Lindley are representatives. It appears to be closely allied to *B. braccatum* Reichb. f. a species which is known to me only through the brief and incomplete description published by Reichenbach f.[4] Up to the present time I have been unable to assign with certainty any Philippine specimens to *B. braccatum. B. Vanoverberghii* is distinguishable from *B. dasypetalum* Rolfe chiefly by the very dissimilar foliage. The flowers of these species are very similar in detail.

Bulbophyllum zambalense sp. nov.

Rhizoma elongatum. *Pseudobulbi* nulli vel minuti. *Folia* oblanceolata, coriacea, petiolata. *Scapus* folio longitudine fere aequalis vel longior, ad basim bracteis imbricatis. *Racemus* laxus. *Flores* flavidi. *Sepala lateralia* triangulari-lanceolata, subcaudata, acuta. *Sepalum superius* lanceolatum, acutum, concavum. *Petala* spathulata, obtusa, 1-nervia. *Labellum* lingulatum, 3-nervium. *Columna* breviter bicuspidata.

Rhizome creeping, elongated, bearing at intervals of 3 to 5 cm, coriaceous, oblanceolate leaves. Pseudobulbs reduced to small thickenings on the rhizome. Leaves petiolate, lamina about 5 cm long, 6 mm wide. Petiole about 1 cm long. Scape equaling or somewhat longer than the leaves, clothed at the base by several, scarious, imbricating bracts. Raceme loosely few-flowered, bracts 2 mm long, linear-lanceolate, acute. Flowers

[4] Linnaea 41: 117.

yellow. Lateral sepals triangular-lanceolate, subcaudate, 7 mm long. Upper sepal lanceolate, about 5 mm long, concave. Petals spathulate, obtuse, 1-nerved, 2.5 mm long. Labellum lingulate, 3-nerved, 2.5 mm long. Column minute, shortly bicuspidate.

LUZON, Province of Zambales, December 13, 1907, Maximo Ramos, *Bur. Sci. 4996.*

The type of this species is composed of a single specimen in the Herbarium of the Bureau of Science and of a fragment preserved in my own herbarium. The elongated rhizome is very characteristic. The labellum of the flowers examined lacked the conspicuous tubercles or callosities at the base, which are usual in flowers of this group.

§ MONANTHAPARVA.

Bulbophyllum bontocense sp. nov.

Rhizoma elongatum, repens, gracile, ad nodos radicans. *Radices* crassae. *Pseudobulbi* pyriformi, rugosi, parvi. *Folia* brevissime petiolata, coriacea, elliptica vel ovata, ad apicem aristata. *Scapus* foliis longior ortus a basi pseudobulbi vel a rhizomate; ad basim vaginis tubularibus bracteiformibus; sub *florem* solitarium bractea tubularis. *Sepala lateralia* triangulari-lanceolata, longe caudata, 3-nervia. *Sepalum superius* simile. *Petala* variabilis, 1-nervia, oblonga, ad apicem irregulariter retusa, mucronata vel marginibus inaequaliter dentatis. *Labellum* 3-lobatum, unguiculatum, 3-nervium, lobis lateralibus erectis, lanceolatum ab medio, obtusum vel subacutum, pars inferior explanata orbicularis, pars anterior crassa.

Rhizome creeping, elongated, slender. Pseudobulbs 2 to 3 cm apart, pyriform, rugose, monophyllous, 4 to 6 mm long. Leaves coriaceous, elliptic or ovate, setigerous at the tip, 7 to 12 mm long, 5 to 7 mm wide. Scape slender, longer than the leaves, 1 to 3 cm long, arising from the base of the pseudobulbs and from the rhizome about midway between the pseudobulbs, bracteate at base, unibracteate at the base of the solitary white flower, persistent. Lateral sepals triangular-lanceolate, acuminate, caudate-tipped, 3-nerved, up to 8 mm long. Upper sepal similar to the laterals. Petals variable, 1-nerved, 3 mm long, 1 mm wide, oblong, somewhat cuneate at the base, apex mucronate or irregularly dentate, the apex exhibiting both conditions in the same flower. Labellum 3-lobed, 2 mm long. Lateral lobes semiorbicular, erect, when spread out giving to the basal portion of the labellum an orbicular aspect, middle lobe lanceolate, fleshy, acute, 1.5 mm long. Column 1.5 mm long.

LUZON, Bontoc Subprovince, August 17, 1911, *Father M. Vanoverbergh 1382.* Growing on trees, altitude 1,650 meters above sea-level.

Bulbophyllum canlaonense sp. nov.

Cum *B. halconensi* comparandum videtur, a quo tamen sepalis differt. *Rhizoma* longe repens, gracile, elongatum, ad nodos radicans. *Pseudobulbi* pyriformi, 3 mm alti, in sicco rugosi, distantes. *Folia* 1 ad 3 cm longa, 4 ad 9 mm lata, elliptico-oblonga, acuta, coriacea, petiolata. *Scapus* usque ad 4.5 cm longus, foliis longior, 1-florus, a basi pseudobulbi vel a rhizomate in medio inter pseudobulbos ortus. *Flores* atropurpurei, usque ad 12 mm longi. *Sepala lateralis* ovato-lanceolata, acuta. *Sepalum superius* simile. *Petala* 6 mm longa, 3 mm lata, elliptica, ad apicem rotundata, acuta. *Labellum* 4.5 mm longum, cordato-lanceolatum, acutum. *Columna* brevis, in medio columnae dens vel papilla.

NEGROS, Canlaon Volcano, April 10, 1910, *Elmer D. Merrill 7015.* Epiphyte, rather abundant, altitude above sea-level 1,200 to 1,700 m, flower dull-purple.

A near ally of *Bulbophyllum halconense* from which it differs mainly in the entire absence of caudate tips to the sepals (cf. Orchidaceae 3: 54, *pl. 44, fig. 3 C. c.*)

Bulbophyllum Elmeri sp. nov.

Rhizoma repens, gracile, elongatum. *Pseudobulbi* pyriformes, rugosi, distantes, monophylli. *Folia* vix petiolata, lanceolata, acuta, breviter apiculata. *Scapi* filiformes, ad basim bractea tubulari vaginati, a basi pseudobulbi vel a rhizomate in medio inter pseudobulbos ortus, interdum scapi orti a pseudobulbo uno. *Sepala lateralia* triangulari-linearia, acuminata, valde acuta, 3-nervia. *Sepalum superius* simile. *Petala* elongata sepalis vix breviora, linearia, acuminata, longe aristata, 1-nervia. *Labellum* 3-lobum, lobi laterales parvi, rotundati, lobus medius subcordatus, crassus, apex erectus vel recurvatus, incrassatus, ad basim labellum carina brevis, gnomoni solari similis. *Columna* brevis, antice utroque ad apicem processus setiformis.

Rhizome about 1 mm thick. Pseudobulbs about 1 mm apart, 5 mm tall. Leaves 1 to 2.5 cm long, up to 5 mm wide. Scape equaling the leaves in length or shorter. Lateral sepals about 4 mm long, about 1 mm wide; upper sepal similar to the laterals. Petals very slender, prolonged into a thread-like or aristate tip, 4 mm long. Labellum 1.5 cm long, 3-lobed, cuneate at the base, middle lobe 0.5 mm long.

LUZON, Benguet Subprovince, Baguio, March 8, 1904, *A. D. E. Elmer 6618.*

Bulbophyllum MacGregorii sp. nov.

Aff. *B. mindorensi*, specei quam habitu et structora haec species conspicue simulat. In cortice arborum depressum, decumbens. *Rhizoma* elongatum omnino pseudobulbis obtectum. *Pseudobulbi* cylindracei, depressi, rugosi, 1-foliati. *Folia* elliptica vel oblanceolata, coriacea, breviter petiolata, erecta. *Scapus* 1-florus, a basi pseudobulbi ortus. Ovarium hystricosum vel papillosum. *Flos* flavidus in sicco [5] a bractea tubulari subtensus. *Sepala lateralia* oblonga, acuta, 3-nervia, margine prope apicem cellulari-dentato. *Sepalum* superius oblongi-lanceolatum, 3-nervium. *Petala* abbreviata, 1-nervia, spathulata, ad apicem incrassata. *Labellum* crassum, oblongum, obtusum, integerrimum, ad apice valde incrassatum, ad basim concaviusculum; apex saepe deflexus. *Columna* gracilis, bicuspidata. *Petalis* brevior.

Pseudobulbs 6 mm long. Leaves shortly petiolate, 8 to 13 mm long, 2 to 3.5 mm wide. Scape slender, filiform, about 1 cm tall. Bract subtending the flower up to 2 mm long. Lateral sepals 4 to 7 mm long, up to 2 mm wide, conspicuously 3-nerved when dry. Upper sepal similar to the laterals. Petals 2 to 2.5 mm long, about 0.75 mm wide, thickened at the tip. Labellum 3 mm long, 1 mm wide. Column 2 mm long.

LUZON, Benguet Subprovince, Pauai, June, 1909, R. C. McGregor, *Bur. Sci. 8322*, altitude above sea-level about 2,100 meters; same locality, *Elmer D. Merrill 6624*, May, 1909, epiphyte in mossy forest, "flowers dull-red," altitude 2,250 m above sea-level.

B. MacGregorii is nearly allied to *B. mindorense* and to the Bornean species, *B. corticicola*, recently described by Doctor Schlechter. From the former it differs in the sepals, petals and lip, and from the latter it is readily distinguishable by its 3-nerved sepals, *B. corticicola* having 5-nerved sepals in the specimens I have examined.

Bulbophyllum profusum sp. nov.

Rhizoma ramosum, elongatum, diffusum, bracteis imbricatis, arcte vaginantibus, dense vestitum; *scapis* e vaginis rhizomatis a pseudobulbis longe remotis erumpentibus. *Pseudobulbi* parvuli, cylindracei, in sicco rugosi. *Folium* coriaceum, elliptico-oblongum, breviter petiolatum. *Scapus* abbreviatus, uniflorus. *Flores* flavidi, sub florum solitarium bractea infundibuliformis. *Sepala lateralia* elongata, caudata, lineari-triangularia, 3-nervia, glabra. *Sepalum* dorsale simile. *Petala* elliptica vel ovata,

[5] In dried specimens the flowers are yellowish or orange-yellow. McGregor made no remarks regarding the flowers of his specimens. Merrill describes the flowers of his specimen as dull-red.

obtusa, 1-nervia. *Labellum* lanceolatum, obtusum, 3-nervium. *Columna* minuta.

Rhizome much branched, clothed with imbricating, scarious bracts from among which the numerous 1-flowered scapes arise, crowding the space between the widely separated pseudobulbs. Pseudobulbs about 2 cm apart, 5 mm long, 2 mm thick, closely appressed to the rhizome, rugose and angled when dry, cylindraceous, truncate, bearing at the summit a solitary, fleshy, elliptic-oblong leaf. Leaves shortly petiolate, 2.2 to 5 cm long, about 1 cm wide, yellowish-green in dried specimens, retuse at the rounded tip. Flowers about 6 mm long, yellowish, borne singly on very short, slender scapes, the scapes almost entirely concealed by the bracts of the rhizome. Subtending each flower there is an infundibuliform, acuminate-tipped, hyaline bract which partly conceals the ovary. Lateral sepals linear-triangular, caudate-tipped, 6 mm long. Upper sepal similar to the laterals. Petals elliptic or ovate, obtuse, much shorter than the sepals, 1.75 to 2 mm long, 0.75 mm wide. Labellum lanceolate, more fleshy than the other perianth divisions, about 1.5 mm long, 3-nerved, smooth.

LUZON, Province of Rizal, Mount Canumay, October 15, 1911, Maximo Ramos, *Bur. Sci. 13785*, epiphytic: Province of Cagayan, April 20, 1909, Ramos, *Bur. Sci. 7971*.

B. profusum resembles the Celebesian *B. myrianthum* Schltr. so closely that the slight differences between them, observable when specimens are laid side by side, may be considered too trivial for recognition as valid specific characters. In *B. myrianthum* the leaves are ovate or suborbicular and, in the specimens I have examined, do not exceed 2.5 cm in length. In *B. profusum*, however, the leaves average more than 2.5 cm in length and are rather oblong-elliptic than ovate or suborbicular. In *B. profusum* the labellum is broader than in *B. myrianthum*, very obtuse, and broader in proportion to its length. The sepals of *B. profusum* are narrower in proportion to their length than those of *B. myrianthum*. Both species are near relatives of the Javan *B. sessile* J. J. Smith (*B. clandestinum* Lindl.) which is rather widely distributed, having been reported from Borneo, the Malay Peninsula, Singapore, and Tenasserim. An examination of additional material may show that *B. myrianthum* and *B. profusum* are referable to *B. sessile* and that the differences now relied on for differentiation are of slight importance.

§ CIRRHOPETALUM.

Bulbophyllum antenniferum (Lindl.) Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 245.

Cirrhopetalum antenniferum Lindl. Bot. Reg. 29 (1843) sub. *t. 49*.

The type specimen of *Cirrhopetalum antenniferum* in Lindley's Herbarium at Kew consists of a solitary flower. There are no leaves and no pseudobulbs. Lindley's description of the flower is incomplete, no

reference being made to the labellum. The nearest approach to Lindley's type, among the Philippine specimens I have examined, is a *Bulbophyllum* from Mindanao collected at Camp Keithley on Lake Lanao by Mary Strong Clemens, *no. 445*. The leaves of this specimen are about 10 cm long by 2.5 cm wide, from pseudobulbs 2 cm long. The lateral sepals are 5 cm long, about equaling the upper sepal. The petals are minute, prolonged into setiform tips. The lip is missing.

Bulbophyllum auratum (Lindl.) Reichb. f. in Walp. Ann. Bot. Syst. 6 (1860) 261.

Cirrhopetalum auratum Lindl. Bot. Reg. 26 (1840) Misc. 107; 29 (1843) *t. 61*.

To this species I refer two series of specimens from Mindanao. The flowers suggest those of *B. Cumingii*, but are considerably smaller with a much broader upper sepal, abruptly terminating in a filiform appendage, and with the yellow-fringed petals broader in relation to their length. The foliage of the two species is very similar but in *B. auratum* the pseudobulbs are much smaller than in *B. Cumingii*. *Plate 61* in the "Botanical Register" represents, with reasonable closeness to details, the specimens here referred to *B. auratum*. In *B. Cumingii* the lateral sepals are about 2.6 cm long. In *B. auratum* they are 1.6 cm long. *B. Cumingii* the upper sepal is 7 mm long including the filiform appendage, and in *B. auratum* it is about 4 mm long.

MINDANAO, Butuan Subprovince, San Vicente, Agusan River, *C. M. Weber 137*, June 2, 1911, epiphyte, flowers pink; near Butuan, A. Celestino, *Bur. Sci. 12128*, October, 1910.

Bulbophyllum Bolsteri sp. nov.

Aff. *B. chryseo* sed in floribus major. *Rhizoma* repens. *Internodia* 2.3 cm longa. *Pseudobulbi* 1.5 ad 2 cm longi, cylindracei, ad apicem fastigiati, in sicco rugosi, monophylli. *Folia* breviter petiolata, elliptico-lanceolata, acuta, coriacea, 3.3 ad 5.2 cm longa, usque ad 1.7 cm lata. *Petiolus* 2 mm longus, sulcatus. *Scapus* filiformis, 8 ad 12 cm longus, uniflorus, bracteis tubularibus 2. Bractea 1 in basi pedicelli unici. *Pedicellus* cum ovariis 1.5 cm longus, filiformis. *Sepala lateralia* leviter conglutinata, lineari-lanceolata, acuta, 1.6 cm longa, 3.5 mm lata prope basim. *Sepalum superius* simile valde concavum. *Petala* lanceolata, 1-nervia, 6.5 mm longa, 2.5 lata, diaphana, glabra. *Labellum* petalis longior, lineari-lanceolatum, obtusum, 9 mm longum, 1.5 mm latum, ad basim biauriculatum, auriculi rotundati, erecti. Columna minuta, stelidia subulata, gracilia, 1 mm longa, glabra.

MINDANAO, Province of Surigao, *F. H. Bolster 349*, May, June, 1906. Epiphyte, flowers yellowish with purple markings. Here should be referred *Bur. Sci. 3076 Ramos*, collected in Rizal Province, Luzon, a plant previously confused with *B. chryseum*.[6]

[6] This Journal 6 (1911) Bot. 54.

B. Bolsteri and *B. chryseum* (Kränzl.) Ames are very near allies, differing mainly in the more rambling habit of *B. Bolsteri* and in the proportions of the flowers, *B. Bolsteri* being a larger flowered species with smooth petals, the median nerve unbranched. Unfortunately, I have not seen the type of *B. chryseum*, but among the Philippine plants in my herbarium there is one collected by *W. S. Lyon 152*, which answers so closely to Kränzlin's description in Fedde's "Repertorium" that I feel sure it must be that species.

B. Bolsteri is suffused with purple in dried specimens, conspicuously so at the base, while *B. chryseum* is light-yellow.

Bulbophyllum carinatum sp. nov.

Pseudobulbi cylindracei, rugosi, 3 cm longi, juniores vaginis mox in fibras solutis inclusi, monophylli. *Folia* permagna, petiolata, oblongi-elliptica, coriacea, in petiolum attenuata, in sicco rugosa. *Scapus* elongatus, bracteis tubularibus vestitus, univel pauciflorus. *Flores* aurantiaci. *Pedicellus* gracilis. *Sepala lateralia* elongata, subfalcata, sulcata, valdi carinata, ad basim connata et pedi columnae adnata, mentum breve formantia, superne libera. *Sepalum superius* sepalis lateralibus multo brevior, ovato-lanceolatum, acuminatum, valde acutum. *Petala* ovato-lanceolata, acuta. *Labellum* crassum, inferne sulcatum, margo partis dimidiae basilaris erectus; pars dimidia superior, conduplicata, margine copiosi pilis instructis. Columna bipartita, laciniae bipartitae.

Leaves, including the sulcate petiole, 21 to 30 cm long, 3.5 to 5.5 cm wide. Petiole about 5 cm long. Scape 17 to 26 cm long. Bracts about 1 cm long, infundibuliform. Pedicel and ovary 2 cm long. Flowers 1 or 2, mottled, yellow-red. Lateral sepals 4 cm long, 5 mm wide, conspicuously carinate, sulcate above, triquetrous. Upper sepal 3 cm long, about 1 cm wide. Petals strongly reflexed, 1.5 cm long, 6 to 7 mm wide. Labellum 1.4 cm long, conduplicate for the most part, the basal portion cordate when spread out, with setiform, marginal teeth near the point of insertion, the margin otherwise, to about the middle of the lip, irregularly and shortly dentate. The lip, just beyond the middle is conduplicate, the upper margin long-papillose, papillae fleshy; on the under side it is longitudinally sulcate. Column about 1 cm long, divided at about the middle into two spreading lateral arms or wings, each wing deeply unequally cleft, the anterior division terminating in a setiform tip.

MINDANAO, Province of Misamis, Mount Malindang, Mearns and Hutchinson, *For. Bur. 4593*, May, 1906, found at an altitude of about 900 m above sea-level.

B. carinatum suggests *B. Leysianum* Burbidge Journ. Roy. Hort. Soc.

134 (1894) *fig. 19*, from which, in detail, it is clearly distinct. The carinate lateral sepals, the fleshy labellum, sulcate beneath, with its papillose apex, are marked peculiarities which distinguish *B. carinatum* from all other Philippine species of the genus heretofore described.

Bulbophyllum luzonense sp. nov.

Rhizoma repens. *Pseudobulbi* approximati, cylindracei. *Folia* oblonga, coriacea, ad apicem attenuata, breviter petiolata. *Petiolus* sulcata. *Scapus* folia brevior, bracteatus, suberectus. *Bracteae inflorescentiae* numerosae, confertae. *Pedicelli* graciles, divaricata. *Flores* albidi, racemo in umbellam constricto. *Sepala lateralia* longe triangulari-lanceolata, acuta, 3-nervia, libera, patentia. *Sepalum* superius simile. *Petala* triangulari-lanceolata, angustata, acuminata, acuta, glabra, 1-nervia. *Labellum* minutum, lingulatum, glabrum, obtusum. *Columna* parvula.

Pseudobulbs 2 to 2.7 cm long. Leaves about 8 cm long, 1.2 to 1.8 cm wide. Petiole 3 mm long. Scape about 8 cm long, in fruiting specimens 10 cm long. Bracts subtending the umbel linear, about 5 mm long. Pedicel and ovary about 1.5 cm long. Flowers about 8 in each umbel. Lateral sepals 7 to 9 mm long, about 1.5 mm wide near the base. Petals about 4 mm long, less than 1 mm wide near the base. Labellum about 2 mm long, obtuse.

LUZON, Province of Cagayan, H. M. Curran, *For. Bur. 16787*, March, 1909.

This is an interesting species of § *Cirrhopetalum* easily distinguished from all other Philippine species of the same section by its loose umbels and long, narrowly triangular petals which are smooth and similar in form to the sepals. The upper sepal is remarkable because of its similarity to the lateral sepals.

Bulbophyllum stellatum sp. nov.

Rhizoma repens, crassum. *Pseudobulbi* cylindracei, ad basim tumidi, prope apicem paulatim fastigati, rugosi, 2.5 ad 3 cm longi in sicco, ad basim 8 mm in diametro, monophylli. *Folia* coriacea, oblongi-elliptica, breviter petolata, 8.5 ad 9 cm longa, usque ad 3 cm lata. *Petiolus* 5 mm longus, sulcatus, rigidus. *Scapus* folio brevior, usque ad 11 cm longus, bracteis 3 vaginantibus. *Bracteae inflorescentiae* confertae, circiter 2 mm longae, lineari-lanceolatae. *Pedicellus* cum *ovario* 1 cm longus, gracilis. *Flores* albidi et rubidi, racemo in umbellam constricto. *Sepala lateralia* subpatentia, 5 mm longa, prope basim 2 mm lata, 3-nervia, lanceolata, acuta. *Sepalum superius* valde concavum, 6 mm longum. *Petala* lanceolata, acuminata, acuta, prope basim

3-nervia, 5 mm longa, 1.5 mm lata prope basim. *Labellum* parvulum circiter 2 mm longum, anguste lingulatum, obtusum. *Columna* brevis, stelidia longe aristata, filiformia.

LUZON, Bontoc Subprovince, *Father M. Vanoverbergh 1360*, August 3, 1911. Found on trees, altitude 1,650 m above sea-level. The flowers are described by the collector as yellowish-white and red.

Among the Philippine species of § *Cirrhopetalum*, *B. stellatum* is most closely allied to *B. luzonense* Ames, from which it differs in its larger leaves, shorter pedicels and smaller flowers.

Bulbophyllum trisetum sp. nov.

Aff. *B. longifloro* Thou. *Rhizoma* crassum, repens. *Pseudobulbi* pyriformes, plus minus tetragoni, remoti. *Folia* coriacea, petiolata. *Lamina* elliptico-oblonga. *Petiolus* sulcatus. *Scapus* elongatus, erectus, bracteatus, gracilis. *Flores* albi et purpurei, racemo in umbellam contracto. *Bracteae inflorescentiae* lanceolatae, acutae. *Pedicelli* graciles. *Sepala lateralia* supra basim fere ad apicem cohaerentia, glabra, oblonga vel ligulata. *Sepalum superius* cucullatum, in caudam filiformem, constrictum, ad apicem dilatatum, margo dentatus. *Petala* triangularia, purpurea, in caudam elongatam, integerrimam, abrupte attenuata, ciliata. *Labellum* crassum, lingulatum, glabrum, obtusum, convexum. *Columna* erecta, basi in pedem producta, superne 2-alata, alis utrinque in brachium erectum productis.

Pseudobulbs 3 to 4 cm long, about 1.5 cm thick. Leaves about 12 cm long, up to 3.5 cm wide. Petiole 1.6 cm long. Scape about 15 cm long. Umbels few-flowered. Lateral sepals 2.7 cm long, each one about 3 mm wide. Upper sepal from base to end of setiform or filiform tip 2.3 cm long, filiform tip 1.5 cm long, slightly dilatated at the end. Petals 1.2 cm long to end of the setiform tip, setiform tip 5 to 6 mm long. Labellum 7 mm long. Column wings 4-toothed at the tip; anterior tooth prolonged into a setiform appendage 2 mm long.

LUZON, Benguet Suprovince, Itogan to Baguio, E. S. Bacani, *For. Bur. 15899*, December 24, 1908, found on trees.

Bulbophyllum trisetum is closely allied to *B. longiflorum* Thou., from which it differs in the color of the flowers, the longer appendages of the sepals, and in the different toothing of the wings of the column. It is also near *Cirrhopetalum Koordersii* Rolfe, a Celebes species. The collector described the flowers as being white, but in dried specimens the petals and upper sepal are of a rich deep-madder color.

Bulbophyllum Weberi sp. nov.

Pseudobulbi plus minus tetragoni, 2 ad 3 cm longi, paulatim fastigiati ad apicem, juniores vaginis mox in fibras solutis inclusi. *Folium* late oblongi-ellipticum, coriaceum, petiolatum, 9.5 ad 13.5

cm longum, 2.5 ad 4.4 cm latum. *Petiolus* circiter 2 cm longus, sulcatus, rigidus. *Scapus* folio longior, gracilis, bracteis circa 3 vaginantibus. *Bracteae inflorescentiae* lineari-lanceolatae, 3 mm longae, valde acutae. Flores circiter 8, flavidi et rubidi, 2.5 cm longi, speciosi, racemo in umbellam contracto. *Pedicelli* graciles, bracteas excedentes. *Pedicellus* cum ovario 1.5 cm longus. *Sepala* lateralia 2.7 cm longa, supra basim fere ad apicem connata in lamina cohaerentia; *lamina* oblongi-elliptica, 11 mm lata, flavida. *Sepalum superius*, 6 mm longum, valde concavum, suborbiculare, non ciliatum, ad apicem in caudam filiformem constrictum; cauda 4 mm longa. Petala 5 mm longa, ciliata, 3-nervia, in caudam filiformem, 1.5 mm longam, constricta. *Labellum* valde arcuatum, circiter 5 mm longum, lingulatum, obtusum, glabrum. *Columna* superne 2-alata, alis in brachium erectum producta. *Anthera* denticulata.

Luzon, Province of Rizal, Mount Canumay, *C. M. Weber 8*, found on mossy trees, 700 m above sea-level.

The affinity of this species seems to be with *B. Cumingii* Reichb. f. and with *B. longiflorum* Thouars. From the former it is readily separated by the color of the flowers, the smooth margin of the dorsal sepal, and by the arms of the column. The column-arms are similar to those of *B. longiflorum* as shown in the figure of *Cirrhopetalum Thouarsii* in the "Botanical Magazine" *plate 7214*. The denticulate margin of the anthers is another distinguishing character in the comparison of *B. Weberi* and *B. Cumingii*. From *B. longiflorum* it is not so easy to distinguish *B. Weberi*. Here we have a striking similarity in the structure of the column, the erect wings and the denticulate anther-cap in both species. The plate formed by the union of the lateral sepals is rather more elliptic in *B. Weberi* than in *B. longiflorum*, and the leaves are broader in relation to their length. From the *Cirrhopetalum Thouarsii* of the Botanical Register (1838) *t. 11* and of the Botanical Magazine, *t. 4239*, a plant which appears to be different from the *C. Thouarsii* of Lindley, *B. Weberi* is hardly distinct.

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NEW OR NOTEWORTHY PHILIPPINE ORCHIDS, VI

By Oakes Ames
Professor of Botany, Harvard University
and
Eduardo Quisumbing
Curator, Philippine National Herbarium, Bureau of Science, Manila

Separate from
THE PHILIPPINE JOURNAL OF SCIENCE
Published by the Bureau of Science, Department of Agriculture and Commerce, Manila, P. I.
Volume 59, No. 1, January, 1936

MANILA
BUREAU OF PRINTING
1936

297394

BOTANICAL GARDEN

THE PHILIPPINE JOURNAL OF SCIENCE

VOL. 59 JANUARY, 1936 NO. 1

NEW OR NOTEWORTHY PHILIPPINE ORCHIDS, VI

By OAKES AMES

Professor of Botany, Harvard University

and

EDUARDO QUISUMBING

Curator, Philippine National Herbarium, Bureau of Science, Manila

NINE PLATES

The present paper is essentially similar to its predecessors.[1] It consists of descriptions of four new species. The genera *Bromheadia* and *Ascoglossum* are new to the Philippines. *Nephelaphyllum pulchrum* Blume and *Ascoglossum calopterum* (Reichb. f.) Schltr. are for the first time credited to the Philippines. Illustrations of two Philippine species, *Nephelaphyllum mindorense* Ames and *Plocoglottis lucbanensis* Ames, are also included.

All descriptions in the text have been prepared from living specimens, and all colored illustrations were made by Mr. Pedro Ramos, draftsman of the National Museum Division, Bureau of Science. All line drawings were prepared by Messrs. Marasigan, Aguilar, and Castelo, and Miss Ico, artists of the National Museum Division. All the types of the new species have been deposited in the Philippine National Herbarium, Bureau of Science, and the isotypes in the herbarium of the senior author. Available types will be distributed to American and European

[1] Philip. Journ. Sci. 44 (1931) 369–383, 16 pls.; 47 (1932) 197–220, 29 pls.; 49 (1932) 483–504, 28 pls.; 52 (1933) 443–473, 17 pls.; 56 (1935) 453–469, 10 pls.

herbaria. The color terms used are mostly from Ridgway's Color Standards and Color Nomenclature (1912).

Genus MALAXIS Solander ex Swartz

MALAXIS PURPUREIFLORA Ames and Quis. sp. nov. Plate 1, fig. 9; Plate 2, figs. 1 to 8; Plate 7.

Radices numerosae, fibrosae. Herba terrestris, prope basim foliosa, circiter 25 cm alta. Caulis brevis, crassus, 3.5 ad 5 cm longus, vaginis tubuliformibus inflatis membranaceis imbricantibus omnino obtectus. Folia 3 ad 8; lamina lanceolato-elliptica ad late elliptica, acuminata, acuta, 7 ad 20 cm longa, 2.5 ad 8 cm lata, nervosa, paulatim in petiolum latum basi dilatatum vaginantem transiens. Pedunculus gracilis, cum racemo 45 ad 46 cm longus. Bractei scariosae, triangulari-lanceolatae, acutae, 4 ad 6 mm longae. Flores juveniles approximati ut videtur, sed tardius remotiores. Sepala petalaque margine valde revoluta. Sepala lateralia suborbicularia, apice late rotundata, circiter 4 mm longa, 3.2 mm lata, 4- ad 5-nervia. Sepalum dorsale oblongo-ellipticum, obtusum, circiter 5.4 mm longum, 2.4 mm latum, 3- ad 5-nervium. Petala anguste oblongo-elliptica, obtusa, 4.75 ad 5 mm longa, 1.4 ad 1.7 mm lata, 3-nervia. Labellum in circuitu suborbiculare, valde auriculatum, circiter 6 mm longum, 5.5 ad 6 mm latum, antice acute pluridentatum cum callo semicirculari lobulato circa gynostemium ornatum, postice in auriculae triangulari-ovatas retrorsas obtusas extensum. Gynostemium per breve, bialatum. Anthera oblata. Pollinia 4, pyriformia, per paria cohaerentia.

Roots numerous, fibrous. Terrestrial herb, about 25 cm tall, leafy at the base. Stems short, stout, 3.5 to 5 cm long, concealed by the swollen, infundibuliform membranaceous leaf-sheaths. Leaves 3 to 8, with petioles imbricating below; lamina lanceolate-elliptic to very broadly elliptic, acuminate, acute, 7 to 20 cm long, 2.5 to 8 cm wide, 5-nerved. Peduncles slender, including the racemes 45 to 46 cm long, provided with triangular-lanceolate, acute, scarious bracts, 4 to 6 mm long. The buds and young flowers at the apex of the racemes crowded, older flowers remote. Sepals and petals with strongly revolute margins. Lateral sepals suborbicular, broadly rounded at the apex, about 4 mm long, 3.2 mm wide, 4- to 5-nerved. Dorsal sepal oblong-elliptic, obtuse, about 5.4 mm long, 2.4 mm wide, 3- to 5-nerved. Petals narrowly oblong-elliptic, obtuse, 4.75 to 5 mm long, 1.4 to 1.7 mm wide, 3-nerved. Labellum suborbicular in

outline, prominently auriculate, about 6 mm long, 5.5 to 6 mm wide, 8- to 10-dentate on the anterior margin, extended at base into a pair of retrorse triangular-ovate rounded auricles. Disc in front of the column, with a semicircular lobulate callus. Gynostemium very short, 2-winged. Pollinia 4, pyriform, in pairs.

LUZON, Benguet Subprovince, near Baguio, on rocks on the Naguilian Trail, *Phil. Nat. Herb. 79 Mrs. K. B. Day,* June 29, 1934.

The species is especially characterized by the purple color on the lower surface of the leaves, the purple flowers and the 8- to 10-sharp-toothed labellum. It differs from all its nearest allies—*M. atrosanguinea* Ames, *M. bulusanensis* Ames, and *M. Taylori* Ames—in its much broader petals and in the teeth on the anterior margin of the lip.

Genus NEPHELAPHYLLUM Blume

NEPHELAPHYLLUM MINDORENSE Ames. Plate 1, figs. 3 and 4; Plate 2, figs. 21 to 31; Plate 8.

Nephelaphyllum mindorense AMES in Philip. Journ. Sci. 2 (1907) Bot. 316, Orch. 3 (1908) 83, *t. 55,* 5 (1915) 48, in Merr. Enum. Philip. Fl. Pl. 1 (1924) 280.

"Closely allied to *N. pulchrum* Blume. Plants about 2 dm. tall. Rhizome creeping, slender, rooting at intervals. Stems purple. Leaves with the under surface uniformly dark purple, upper surface mottled, ovate-lanceolate, acuminate, acute, 8–10 cm. long, 3–5.5 cm. wide near the base. Petioles relatively slender, about 3 cm. long. Peduncles exceeding the leaves, clothed with several scarious, tubular, acute sheaths. Inflorescence loosely few-flowered. Bracts about 1 cm. long, linear, acute, scarious, somewhat shorter than the pedicels of the white flowers. Lateral sepals linear-acute, 1-nerved, 9 mm. long, 1.5 mm. wide. Upper sepal similar and equal to the laterals. Petals oblong, acute, slightly broader above than below the middle, 1-nerved, about 8 mm. long, 3 mm. wide. Labellum suborbicular, entire, 9–10 mm. long, 9–10 mm. wide, with 3 prominent converging lamellae near the apex, which pass basally into the main nerves of the hairy disc. Spur blunt, inflated, 4–5 mm. long."—AMES, loc. cit.

LUZON, Benguet Subprovince, Baguio, *Phil. Nat. Herb. 80 Mrs. K. B. Day,* June 29, 1934: Nueva Ecija Province, Mount Umingan, *Bur. Sci. 26319, 26494, 29652 Ramos and Edaño,* August and September, 1916. MINDORO, along Binabay River, *Merrill 5623* (type in Phil. Nat. Herb.), November 2, 1906.

The peduncles are purple; sepals and petals pale grass green flushed with light brownish olive and lined with purple-drab; labellum white except the lamellæ orange-chrome; anther orange

chrome. Terrestrial orchids on dry slopes and in humid forests at 200 to 1,700 meters altitude.

NEPHELAPHYLLUM PULCHRUM Blume.

Nephelaphyllum pulchrum BLUME Bijdr. (1825) 373, *f. 22*, Fl. Jav. Orch. (1858) 144, *t. 61, f. 1, t. 54 F;* LINDL. Gen. & Sp. Orch. (1830) 24; REICHB. F. Xenia Orch. 1 (1856) 216, *t. 88, f. 1;* MIQ. Fl. Ind. Bat. 3 (1859) 675; Bot. Mag. 88 (1862) *t. 5332;* HOOK. F. Fl. Br. Ind. 5 (1890) 818; J. J. SM. Fl. Buitenz. 6 (Orch. Java) (1905) 178, Fig.-Atlas (1909) *fig. 135;* SCHLTR. Die Orchideen (1927) 127.

The original description reads as follows:

"N: floribus dense spicatis, labelli limbo lineis tribus muricatis.
"*Crescit:* in locis humidioribus sylvarum Salak.
"*Floret:* Januario–Aprili."—BLUME.

Plants ascending, 10 to 15 cm high; rhizome creeping, slender, rooting at intervals. Leaves three in our plant, submembranaceous, ovate or triangular-ovate, subcordate at the base, acuminate-acute at apex, 8.4 to 9 cm long, 4 to 4.2 cm wide near the base, uniformly dark purple beneath, silvery green with dark green reticulations above; petioles 1.3 to 1.8 cm long. Inflorescence terminal, few-flowered; the peduncle clothed with several scarious tubular sheaths, erect, about 4 cm or more long. Flowers about 2.8 cm across. Sepals and petals reflexed. Sepals linear, acute, about 12.7 mm long, 1.8 to 2 mm wide. Petals oblong-linear, acute, about 13 mm long, 3 mm wide. Labellum large, oblong-obovate when expanded, cuneate at the base, slightly retuse, about 10.5 mm long, 11 mm wide when stretched out, with three elevated dentate or lacerate lamellæ near the apex; base of the labellum extended into a short didymous spur about 5 mm long. Column stout in proportion to the size of the flower, semiterete, the margin expanded into a wing along each side. Anther two-horned. Pollinia 8, unequal, in pairs.

PALAWAN, on rocks along the bank of Iwahig River, *Bur. Sci. 81158 E. H. Taylor*, September 18, 1923.

The single collection here cited appears to be referable to *Nephelaphyllum pulchrum* Blume, although the long acuminate leaves seem aberrant from those of the typical form.

This species differs from *N. mindorense* Ames in having much larger flowers and dentate (not subentire) keels on the lip.

Besides the Philippines, it occurs in Borneo, Java, Sumatra, and the Straits Settlements.

Genus PLOCOGLOTTIS Blume

PLOCOGLOTTIS LUCBANENSIS Ames. Plate 1, figs. 7 and 8; Plate 2, figs. 9 to 20.

Plocoglottis lucbanensis AMES in Elm. Leafl. Philip. Bot. 5 (1912) 1572, Orch. 5 (1915) 100, in Merr. Enum. Philip. Fl. Pl. 1 (1924) 338.

"Herba terestris. Caules subcaespitosi, purpurei, ad basim incrassati, fibris elongatis ornati, monophylli. Folium oblongi-lanceolatum, acutum, acuminatum ad basim attenuatum, circiter 3.8 dm. longum, usque ad 3.5 cm. latum in petiolum gracilem elongatum contractum distincte 3-nervium. Scapi aphylli a basi caulium laterales, longi, erecti, circiter 6 dm. longi, vaginati, pubescentes. Racemi abbreviati. Bracteae inflorescentiae lanceolatae, acutae, pubescentes, ± 5 mm. longae. Pedicellus cum ovario circiter 1.2 cm. longus, pubescens. Flores atro-flavidi, purpureo-maculati, pubescentes. Sepala lateralia crassa 12 mm. longa, acuta, ad apicem subcucullata, oblongi-lanceolata, extus pubescentia, 5-nervia. Sepalum posticum oblongum, obtusum. Petala 11 mm. longa, linearia, falcata, ad apicem sensim dilatata et incrassata. Labellum crassum 8 mm. longum, circiter 4 mm. latum, ad apicem in apiculo productum. Apiculus valde deflexus, recurvatus. Columna scabrata.

"Aside from a slight thickening of the nerves the labellum appears to be ecallose.

"LUZON, Province of Tayabas, Lucban, May, 1907, *A. D. E. Elmer*, 7707.

"Small tufted terrestrial herbs in damp soil of wooded ravines at 2,750 feet altitude. Pseudobulbs and stems conspicuously purple; leaves submembranaceous; buds whitish; flower dull yellow, spotted with purple. Rare!"—AMES in Elm. Leafl. Philip. Bot. 5 (1912) 1572.

BABUYAN ISLANDS (CAMIGUIN ISLAND), *Bur. Sci. 4147 Fenix*, July 16, 1907. LUZON, Benguet Subprovince, Baguio, *Phil. Nat. Herb. 50 Mrs. K. B. Day*, May 21, 1934: Laguna Province, *For. Bur. 28939 Willie and Salvoza:* Tayabas Province, Lucban, *Elmer 7707* (type), May, 1907: Sorsogon Province, Irosin, Mount Bulusan, *Elmer 17123*, September, 1916.

The peduncles are purplish; sepals and petals light cadmium and spotted with nopal red; labellum pinard yellow; column pinard yellow at apex and white at base; pedicellate ovary white.

Genus DENDROBIUM Swartz

DENDROBIUM BUKIDNONENSE Ames and Quis. sp. nov. Plate 1, figs. 5 and 6; Plate 3, figs. 1 to 7; Plate 9, fig. 1.

Caules aggregati, 23.5 ad 50 cm longi, basi ovoideo-incrassati, supra attenuati. Folia disticha, linearia, obtusa, 4 ad 7 cm longa, 3 ad 4 mm lata. Racemi breves; flores singuli succedanei, circiter 1.4 cm dimetiente. Sepala lateralia late triangularia, apice rotundato subacuta, 6.5 ad 8 mm longa, circiter 15.6 mm secundum columnae pedem lata, 6- to 7-nervia. Sepalum

dorsale oblongo-ovatum, subacutum, 6 ad 7 mm longum, circiter 3.5 mm latum, 5- to 7-nervium. Petala oblongo-elliptica, obtusa, 5.5 ad 7 mm longa, 2.9 ad 3.5 mm lata, 1-nervia. Labellum cuneato-obovatum, simplex obscurrissime trilobatum, crenulatum, 15.7 ad 18 mm longum, 9 ad 11 mm latum. Columna breve, in pedem perlongum extensa.

Stems aggregated, similar in habit to those of *Dendrobium crumenatum* Sw., 23.5 to 50 cm long. Pseudobulbs or ovoid thickenings at the base of the stems, 2 to 4 cm long, 1.3 to 1.5 cm in diameter, conspicuously many-ridged with rounded angles. Leaves distichous, linear, obtuse, 4 to 7 cm long, 3 to 4 mm wide. Racemes short; the flowers appearing singly, about 1.4 cm across. Lateral sepals broadly triangular, subacute, 6.5 to 8 mm long, about 15.6 mm broad along the column-foot, 6- to 7-nerved. Dorsal sepal oblong-ovate, subacute, 6 to 7 mm long, about 3.5 mm wide, 5- to 7-nerved. Petals oblong-elliptic, obtuse, 5.5 to 7 mm long, 2.9 to 3.5 mm wide, 1-nerved. Spur or mentum conical with elongated apex. Labellum simple, cuneate-obovate, crenulate on the anterior margins, 15.7 to 18 mm long, 9 to 11 mm wide when expanded at the broadest portion. Disc with slightly thickened veins—especially the central one—and with scattering papillæ at the center near the apex. Column very short, extended into a very long foot.

LUZON, Manila, Bureau of Science orchid house, *Bur. Sci. 85617 E. Quisumbing,* December 14, 1932. Living specimens were presented to the junior author by Mr. L. H. Phillips, formerly of Bukidnon, Mindanao, who collected them from the hills of Bukidnon. The plants have flowered several times in the Bureau of Science orchid house during the months of July, August, and December. The flowers are not fugacious (remaining fresh for two days) and are slightly fragrant. The sepals are marguerite yellow. The petals almost white with a slight tinge of primrose yellow at the tips, and the spur slightly cream-colored; the ridge at the middle of the labellum apricot yellow.

This species is allied to *Dendrobium gracile* (Bl.) Lindl., but differs in not having subulate leaves, in its oblong-ovate dorsal sepal, and in the color of the flowers.

Genus BROMHEADIA Lindley

BROMHEADIA PHILIPPINENSIS sp. nov. Plate 1, figs. 1 and 2; Plate 4; Plate 9, fig. 2.

Herba epiphytica. Caules e rhizomate ramoso exorti, complanati, erecti, 26 ad 54 cm alti, vaginis foliorum omnino obtecti;

internodia 2 ad 3 cm longa. Folia disticha, patentia, ligulata, subcoriacea, 10.5 ad 17.5 cm longa, 1.1 ad 1.6 cm lata, apice valde bilobata, lobis inaequilateralibus. Inflorescentia terminalis, 4 ad 6 cm longa, simplex, fere sessilis; bracteae distichae, rigidae, imbricantes, cymbiformes, acutae, 6 ad 8 mm longae. Flores singuli apparentes, albi, odorati, 2.5 ad 2.6 cm longi, 2.2 ad 2.4 cm dimetiente. Pedicellus cum ovario gracilis, circiter 1.4 cm longus. Sepala lateralia lanceolata, paulo obliqua, carinata, acuta, circiter, 2.3 cm longa, 7 mm lata. Sepalum dorsale oblanceolato-oblongum, acutum, circiter 2.5 cm longum, 7 mm latum. Petala anguste lanceolata vel anguste oblanceolata, obliqua, acuta, circiter 2.2 cm longa, 5.75 mm lata. Labellum in circuitu late oblongum, brevissime unguiculatum, supra medium trilobatum, circiter 1.7 cm longum et 9.5 mm latum; lobi laterales parvi, ovato-triangulares, obtusi, 2 ad 2.5 mm longi; lobus medius subquadratus, antice truncatus et minute apiculatus, 6 ad 6.5 mm latus, medio calloso-elevato et flavo. Discus cum parte longitudinali centrali calloso-elevata pubescenti in callum distinctum terminanti. Columna crassiuscula, recta, vel paulo incurvata, antice excavata, circiter 14 mm longa. Clinandrium parvum; anthera late ovoidea, apice obtusa, margine anteriore profunde emarginato. Pollinia 2, triangulari-ovoidea, dorso excavata.

Plants growing ascendingly on tree trunks. Roots fibrous, flexuous, stout, glabrous. Stems flattened, 26 to 54 cm long, arising from terete, branching rhizomes; internodes shortest at base, 2 to 3 cm long, entirely or almost entirely concealed by the flattened leaf-sheaths. Leaves distichous, ligulate, subcoriaceous when dry, 10.5 to 17.5 cm long, 1.1 to 1.6 cm wide, strongly bilobed at the apex with the lobes inequilateral. Inflorescence terminal, simple, almost sessile, 4 to 6 cm long; bracts distichous, rigid, imbricated, cymbiform, acute, 6 to 8 mm long. Flowers appear singly, rather fleshy, white, fragrant, 2.5 to 2.6 cm long, 2.2 to 2.4 cm across. Pedicellate ovary slender, about 1.4 cm long. Lateral sepals lanceolate, oblique, carinate near the apex, acute, about 2.3 cm long, 7 mm wide. Dorsal sepal oblanceolate-oblong, acute, about 2.5 cm long, 7 mm wide. Petals narrowly lanceolate or narrowly oblanceolate, oblique, acute, about 2.2 cm long, 5.75 mm wide. Labellum very slightly unguiculate, broadly oblong, trilobed in outline above the middle, about 1.7 cm long and 9.5 mm wide; lateral lobes very small, ovate-triangular, obtuse, 2 to 2.5 mm long; middle lobe subquadrate, truncate and minutely apiculate, 6 to 6.5 mm wide, with the center callose-elevated and yellow.

Disc with a central longitudinal fleshy pubescent zone ending in a distinct callus. Column thick, straight or slightly incurved, concave in front, with winged margins, about 14 mm long. Clinandrium small; anther broadly ovoid, obtuse at the apex, cucullate. Pollinia 2, triangular-ovoid, the dorsal side excavated, about 1.5 mm long.

MINDANAO, Zamboanga Province, Mount Silingan, *Phil. Nat. Herb. 3000 Mrs. K. B. Day*, November, 1934.

The description was based on living specimens given to the junior author by Mrs. Day and now cultivated in the Bureau of Science orchid house. The flowers have the general appearance and habit of opening of *Sarcochilus pallidus*. Pedicellate ovary chalcedony yellow; sepals and petals white with naphthalene yellow tips; labellum white with the callus on the front lobe apricot yellow; column naphthalene yellow.

The genus *Bromheadia* is new to the Philippines. *Bromheadia philippinensis* is apparently closely allied to *B. alticola* Ridl., but differs in its apparently dissimilar habit of growth and the obtuse outward-pointing side lobes of the lip.

Genus ASCOGLOSSUM Schlechter

ASCOGLOSSUM CALOPTERUM (Reichb. f.) Schltr. Plate 1, figs. 12 and 13; Plate 5, figs. 1 to 10.

Ascoglossum calopterum (Reichb. f.) SCHLTR. in Fedde Repert. Beihefte 1 (Orchidaceen von Deutsch-Neu Guinea) (1914) 975; 21 (Fig. Atlas) (1923) *t. 343*, No. 1324.

Saccolabium calopterum REICHB. F. in Gard. Chron. (1882) 2: 520.

Cleisostoma cryptochilum F. v. MUELL. in Wing South Sci. Rec. n. 5 1 (1885).

Saccolabium Schleinitzianum KRANZL. in Engl. Bot. Jahrb. 7 (1886) 440.

Caules erecti vel curvati, rigidi, teretes, 20 ad 30 cm longi, vix 1 cm dimetiente. Folia disticha, rigida, ligulata, approximata, valde coriacea, apice rotundato inaequaliter obtuse bilobata, 11 ad 18.5 cm longa, 2 ad 3 cm lata. Inflorescentiae laterales paniculatae, multiflorae, 20 ad 35 cm longae; pedunculus erectus, rigidus, 12 ad 15 cm longus, vaginis brevibus tubularibus, 4 ad 5 mm longis ornatus. Pedicellus cum ovario gracilis, 11 ad 15 mm longus. Flores inodori feri, purpurei, 15 ad 17 mm longi, 6 ad 8 mm dimetiente; perianthii parte valde reflexae. Sepala lateralia unguiculata, acuta vel obtusa, 9 ad 12 mm longa, 4.5 ad 5 mm lata, ad basim vix 1.25 mm lata, supra medium lobulo ovato-triangulari plus minusve distincto ornata. Sepalum dorsale oblongo-oblanceolatum, acutum vel

subacutum, 9 ad 10.5 mm longum, 3 ad 3.25 mm latum. Petala elliptico-lanceolata, apice attenuata, acuta, 8.5 ad 9.5 mm longa, 2.75 ad 3 mm lata. Labellum calcaratum, trilobatum; lobi laterales erecti, apice oblique truncati, postice ad columnam attingentes; lobus medius e calcaris medio exoriente, minutus, reflexus, lineari-lanceolatus, apice obtusus, 2.5 ad 3 mm longus, 0.75 ad 0.9 mm latus. Calcar cylindricum, leviter curvatum, apice lateraliter abrupte inflatum et rotundatum, 10.25 ad 11 mm longum. Columna rigida, perbrevis, crassa, 4.5 ad 5 mm alta. Anthera obovoidea, 1.7 ad 1.8 mm longa. Pollinia oblonga.

Roots dark gray, elongate, 3.5 to 4 mm in diameter. Stems erect or curved, rigid, terete, 20 to 30 cm long, about 1 cm in diameter. Leaves distichous, rigid, ligulate, approximate, very leathery, unequally bilobed at the rounded apex with obtuse lobules, 11 to 18.5 cm long, 2 to 3 cm wide. Panicles lateral, many-flowered, 20 to 35 cm long; peduncles erect, rigid, 12 to 15 cm long; sheaths short, tubular, 4 to 5 mm long. Pedicellate ovary slender, 11 to 15 mm long. Flowers odorless, 15 to 17 mm long, 6 to 8 mm wide. Lateral sepals unguiculate, parallel, oblanceolate, acute or obtuse, 9 to 12 mm long, 4.5 to 5 mm wide, the very base about 1.25 mm wide, above the middle provided with a more or less distinct triangular-ovate lobule. Dorsal sepal oblong-oblanceolate, acute or subacute, 9 to 10.5 mm long, 3 to 3.25 mm wide. Petals parallel, elliptic-lanceolate, narrowed to the acute apex, 8.5 to 9.5 mm long, 2.75 to 3 mm wide. Labellum spurred, trilobed; lateral lobes erect, obliquely truncate at the apex, attached to the column at the base; middle lobe very small, linear-lanceolate, reflexed, obtuse at the tip, 2.5 to 3 mm long, 0.75 to 0.9 mm wide. Spur cylindric, elongate, curved, laterally abruptly dilated and rounded at the apex, 10.25 to 11 mm long, 3 to 3.5 mm in diameter at the very apex, when viewed from the front. Column rigid, very short and thick, 4.5 to 5 mm high. Anther obovoid, 1.7 to 1.8 mm long. Pollinia oblong.

DINAGAT ISLAND, Osmeña, Dinagat, *Phil. Nat. Herb. 387 L. E. Hachero*, October, 1933. Growing on tree trunks in the coastal forests on Dinagat Island, northeast of Mindanao. Living plants were sent to the junior author through Dr. E. B. Copeland, formerly of the Economic Garden, Bureau of Plant Industry, and have flowered in the Bureau of Science orchid house twice—May 12, 1934, and March 6, 1935. The flowers remain fresh on the plant for two weeks.

Sepals and petals rosolane purple dotted with true purple; pedicellate ovary aster purple; middle lobe of the labellum and throat onion skin pink; spur pomegranate purple.

A very interesting species with very leathery dark green leaves and conspicuous purple flowers, of which the lateral sepals and petals are reflexed and parallel. It differs from any typical *Renanthera* in its long clavate spur and minute narrow middle lobe of the labellum.

This species belongs to the genus *Ascoglossum* Schltr., a new genus for the Philippines. The genus is closely allied to *Renanthera* but differs in that the lateral lobes reach much higher than the mid-lobe.

Genus TRICHOGLOTTIS Blume

TRICHOGLOTTIS AGUSANENSIS Ames and Quis. sp. nov. Plate 1, figs. 10 and 11; Plate 6, figs. 1 to 10.

Herba epiphytica, erecta, rigida, 22 ad 35 cm alta. Caules foliosi, internodiis 2 ad 3 cm longis. Foliorum vaginae cylindricae, internodiis vix aequilongae. Folia disticha, ligulata, coriacea, in sicco rugosa, 14 ad 15.5 cm longa, 1.7 ad 2 cm lata, apice inaequaliter rotundato-bilobata. Inflorescentiae oppositifoliae, paniculatae, 12 ad 13 cm longae, 10- ad 12-florae. Bracteae inflorescentiae rigidae, squamiformes, 1.5 ad 2 mm longae. Flores carnosi, 16 ad 17 mm dimetiente. Sepala lateralia ovato-elliptica, acuta vel subacuta, 8.5 ad 9.5 mm longa, 6 ad 6.5 mm lata. Sepalum dorsale obovato-ellipticum, apice late rotundatum, 9 ad 10 mm longum, 6 ad 6.5 mm latum. Petala elliptico-obovata, apice rotundata, 8.5 ad 9 mm longa, 4.5 ad 5.5 lata. Labellum basi breviter saccatum, 3-lobatum, 8 ad 9 mm longum; lobi laterales breves, erecti, indistincti, 1 ad 1.25 mm alti; lobus medius lanceolatus, antice attenuatus, supra medium abrupte inflexus, apice ipso truncato-dilatatus. Discus valde calloso-incrassatus et pubescens.

Epiphytes with elongated roots. Stems rigid, foliose, erect or more or less arcuate, 22 to 35 cm high; internodes 2 to 3 cm long. Leaf sheaths cylindric, almost as long as the internodes. Leaves distichous, ligulate, coriaceous, rugose when dry, 14 to 15.5 cm long, 1.7 to 2 cm wide, unequally bilobed at the apex with rounded lobules. Inflorescences opposite the leaves, shorter than the leaves, paniculate, 12 to 13 cm long, 10- to 12-flowered. Bracts of the fractiflex inflorescence rigid, squamiform, concave, 1.5 to 2 mm long. Flowers fleshy, odorless, 16 to 17 cm across. Pedicellate ovary, 10 to 11 mm long. Lateral sepals ovate-

elliptic, acute or subacute, 8.5 to 9.5 mm long, 6 to 6.5 mm wide. Dorsal sepal obovate-elliptic, broadly rounded at the apex, 9 to 10 mm long, 6 to 6.5 mm wide. Petals elliptic-obovate, rounded at the apex, 8.5 to 9 mm long, 4.5 to 5.5 mm wide. Labellum 3-lobed, shallowly saccate at base, 8 to 9 mm long; lateral lobes short, erect, indistinct, with free portion 1 to 1.25 mm high; middle lobe lanceolate, attenuate toward the apex, above the middle abruptly inflexed, truncate dilated at the very tip. Disc strongly callose-thickened and pubescent through the center. Between the basal lobes there is a ligulate, pubescent upcurved appendage which is about 2.5 mm long. Gynostemium very short and stout, pubescent, with a pair of falcate, narrow, elongate, pubescent auricles which are 2.5 to 3 mm long.

LUZON, Rizal Province, Mariquina, Mrs. M. L. Quezon's gardens, *Phil. Nat. Herb. 3005 E. Quisumbing*, January 16, 1935.

The living plants were sent from Agusan by Attorney José Rodriguez. Pedicellate ovary lumiere green. Sepals and petals bright chalcedony yellow lined with vinaceous rufous. Lateral lobes of the lip white; the middle lobe white with two eugenia red lines above, apex and base between the lateral lobes cadmium yellow, callus white.

This species is allied to *Trichoglottis ionosma* (Lindl.) J. J. Sm., but is a much smaller plant throughout with less prominent spurred base to the lip.

ILLUSTRATIONS

Plate 1

Fig. 1. *Bromheadia philippinensis* Ames and Quis. sp. nov., front view of flower, × 1.

2. *Bromheadia philippinensis* Ames and Quis. sp. nov., side view of flower, × 1.

3. *Nephelaphyllum mindorense* Ames, front view of flower, × 2.

4. *Nephelaphyllum mindorense* Ames, side view of flower, × 2.

5. *Dendrobium bukidnonense* Ames and Quis. sp. nov., front view of flower, × 2 (circa).

6. *Dendrobium bukidnonense* Ames and Quis. sp. nov., side view of flower, × 2 (circa).

7. *Plocoglottis lucbanensis* Ames, front view of flower, × 1.

8. *Plocoglottis lucbanensis* Ames, side view of flower, × 1.

9. *Malaxis purpureiflora* Ames and Quis. sp. nov., front view of flower (natural position), × 3 (circa).

10. *Trichoglottis agusanensis* Ames and Quis. sp. nov., front view of flower, × 2.

11. *Trichoglottis agusanensis* Ames and Quis. sp. nov., side view of flower, × 2.

12. *Ascoglossum calopterum* (Reichb. f.) Schltr., front view of flower, × 1.

13. *Ascoglossum calopterum* (Reichb. f.) Schltr., side view of flower, × 1.

Plate 2

Malaxis purpureiflora Ames and Quis. sp. nov.: *1*, dorsal sepal, × 5.5; *2*, petal, × 5.5; *3*, lateral sepal, × 5.5; *4*, front view of column and labellum (natural position), × 5.5; *5*, side view of ovary, column, and labellum (natural position) × 5.5; *6*, anther from above, × 14; *7*, anther from below, × 14; *8*, pollinia, very much enlarged. (All figures drawn with aid of camera lucida.)

Plocoglottis lucbanensis Ames: *9*, dorsal sepal, from back, × 2; *10*, side view of dorsal sepal, × 2; *11*, petal (flattened), × 2; *12*, exterior view of lateral sepal, × 2; *13*, side view of lateral sepal, × 2; *14*, side view of ovary, column, and labellum (natural position), × 4; *15*, front view of column, × 4; *16*, column and labellum (natural position) from above, × 4; *17*, labellum from above (natural position), × 4; *18*, labellum from above (stretched out), × 4; *19*, anther from above, × 7; *20*, anther from below, × 7. (Figs. 19 and 20 were drawn with the aid of a camera lucida.)

Nephelaphyllum mindorense Ames: *21*, dorsal sepal, × 3; *22*, petal, × 3; *23*, lateral sepal, × 3; *24*, side view of ovary, column, and labellum (natural position), × 3; *25*, labellum from above (natural position), × 3; *26*, labellum from above (stretched out), × 3; *27*, front view of spur, × 4; *28*, front view of column, × 3; *29*, side view of column, × 3; *30*, anther from above, × 5.5; *31*, anther from below, × 5.5. (Figs. 30 and 31 were drawn with the aid of a camera lucida.)

PLATE 3

Dendrobium bukidnonense Ames and Quis. sp. nov.: *1*, dorsal sepal, × 7; *2*, petal, × 7; *3*, lateral sepal, × 7; *4*, labellum from above (somewhat expanded), × 4; *5*, side view of ovary and column, × 7; *6*, front view of column, × 7; *7*, anther, × 11.

PLATE 4

Bromheadia philippinensis sp. nov.: *1*, dorsal sepal, × 2; *2*, petal, × 2; *3*, lateral sepal, × 2; *4*, labellum from above (natural position), × 4; *5*, labellum from above, (stretched out), × 4; *6*, front view of column, × 4; *7*, side view of column, × 4; *8*, pollinia, × 12.

PLATE 5

Ascoglossum calopterum (Reichb. f.) Schltr.: *1*, habit, one-third natural size; *2*, dorsal sepal, × 2.66 (circa); *3*, petal, × 2.66 (circa); *4*, lateral sepal, × 2.66 (circa); *5*, front view of flower, × 2; *6*, side view of flower, × 2; *7*, longitudinal section of the labellum and spur, × 2; *8*, anther from above, × 4.66 (circa); *9*, anther from above, × 4.66 (circa); *10*, pollinia, × 4.66 (circa). (Figs. 8 to 10 drawn with aid of camera lucida.)

PLATE 6

Trichoglottis agusanensis Ames and Quis. sp. nov.: *1*, habit, one-third natural size; *2*, dorsal sepal, × 1.33 (circa); *3*, petal, × 1.33 (circa); *4*, lateral sepal, × 1.33 (circa); *5*, side view of ovary, column, and labellum (natural position), × 2; *6*, front view of column and labellum (natural position), × 2; *7*, column and labellum from above (natural position), × 2; *8*, anther from above, × 4; *9*, anther from below, × 4; *10*, pollinia, × 4.

PLATE 7

Malaxis purpureiflora Ames and Quis. sp. nov.: habit, much reduced.

PLATE 8

Nephelaphyllum mindorense Ames: habit, slightly larger than natural size.

PLATE 9

FIG. 1. *Dendrobium bukidnonense* Ames and Quis. sp. nov.: habit, very much reduced.

2. *Bromheadia philippinensis* Ames and Quis. sp. nov.: habit, very much reduced.

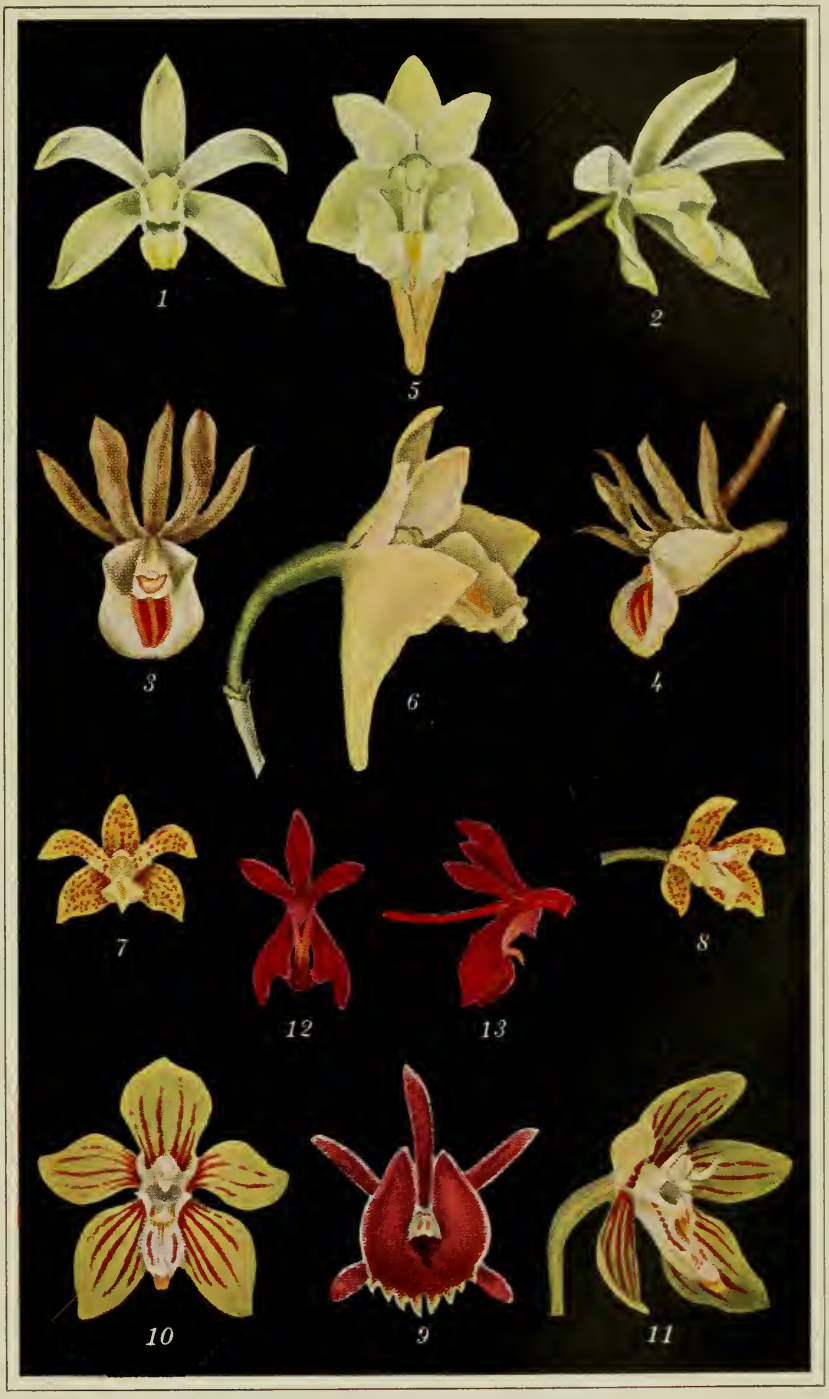


PLATE 1.

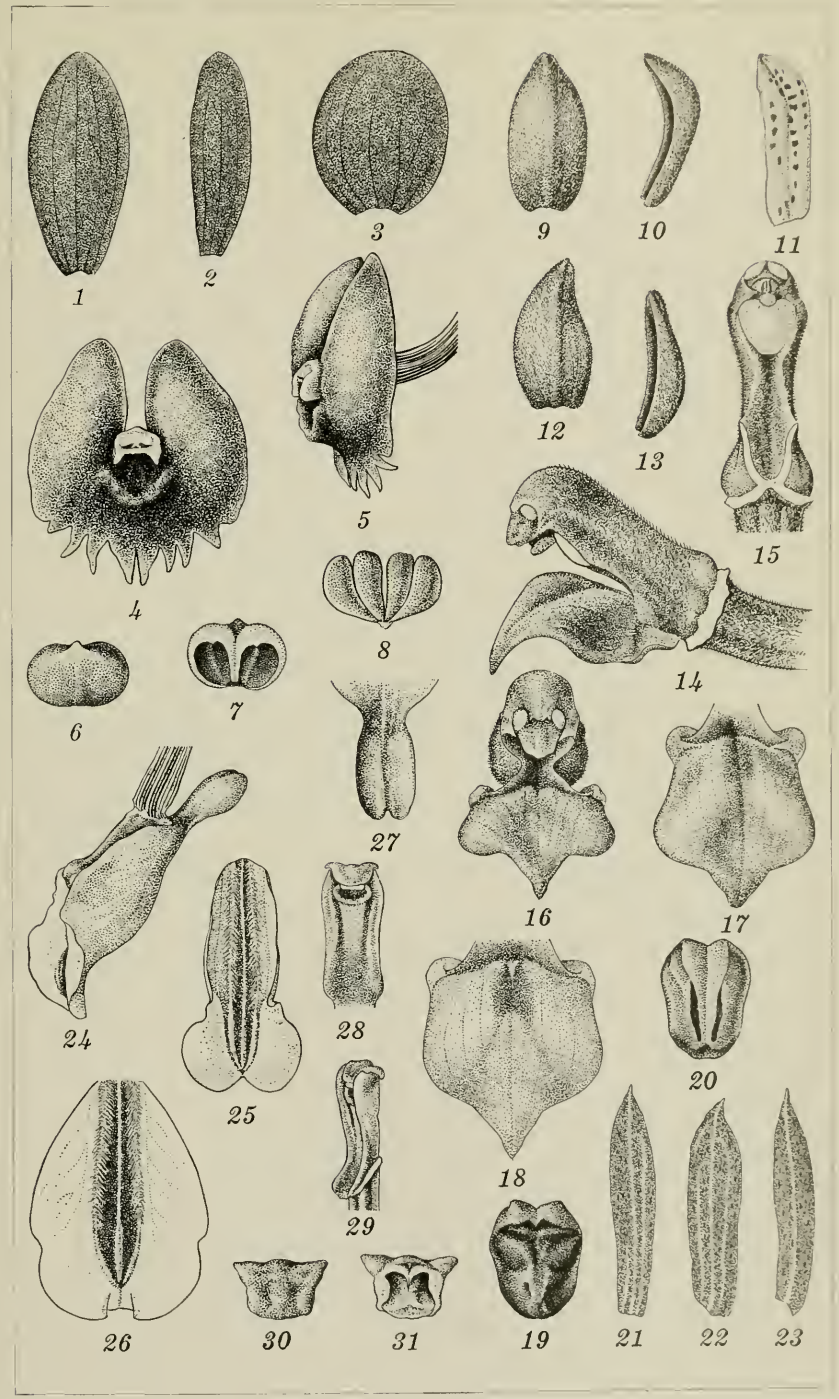

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PLATE 2.

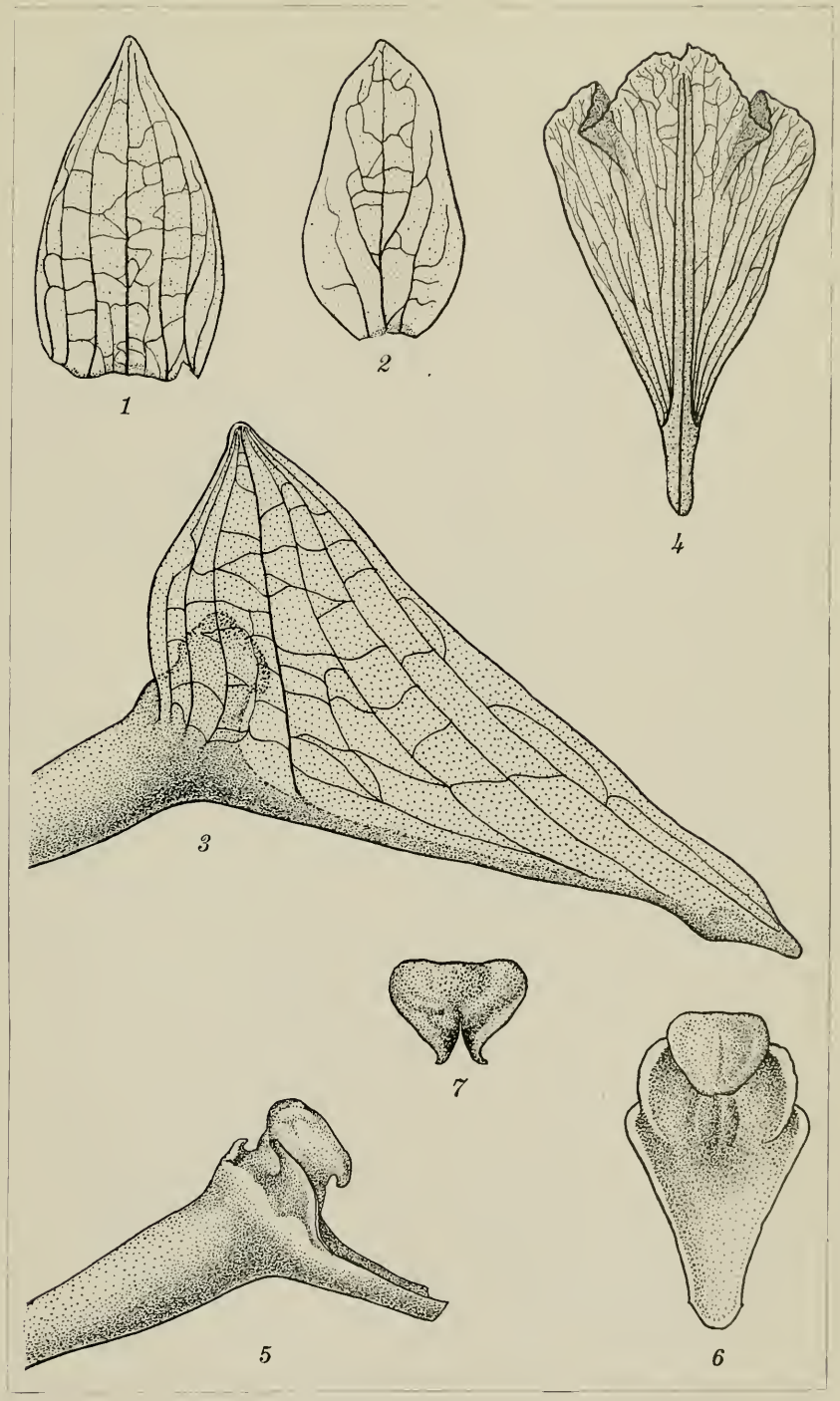


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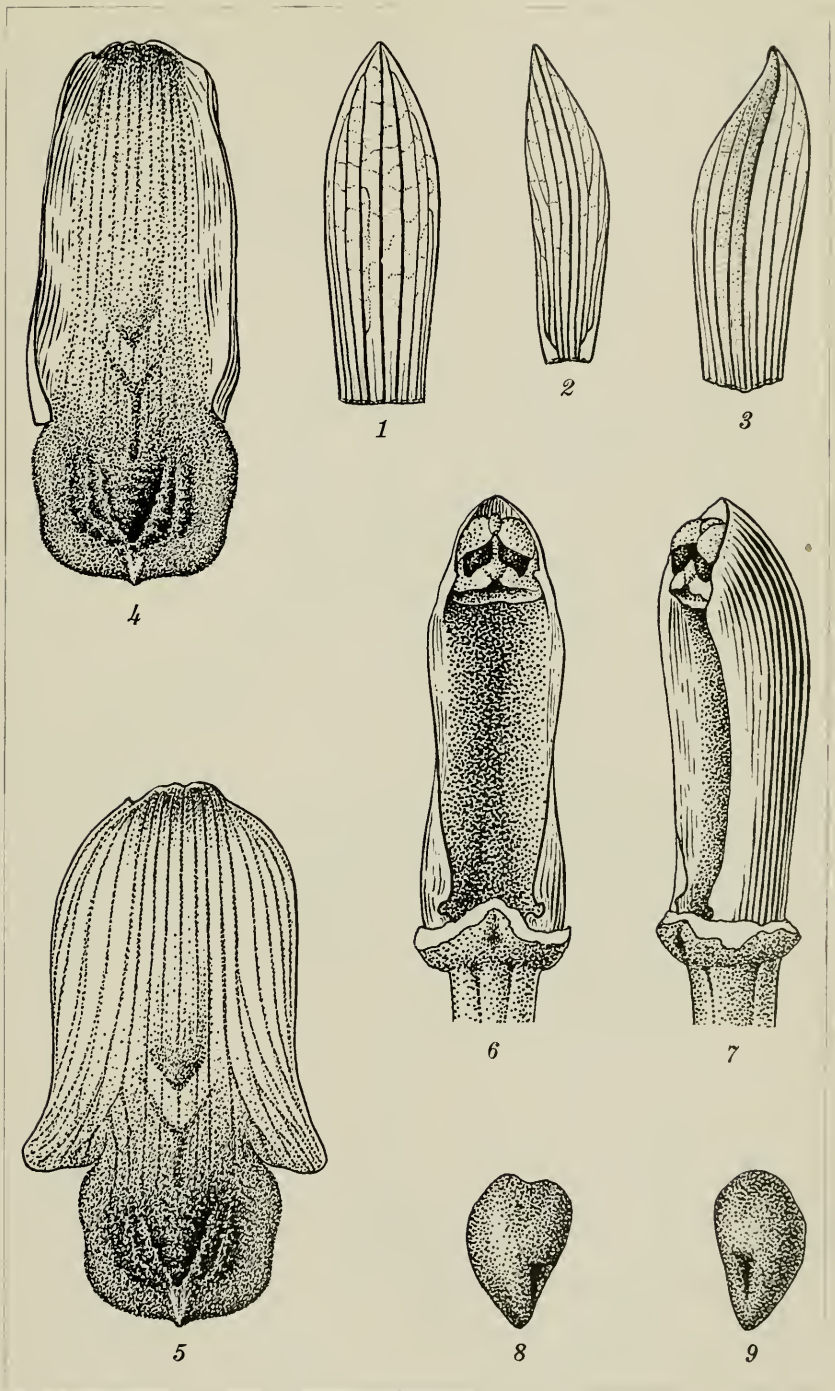


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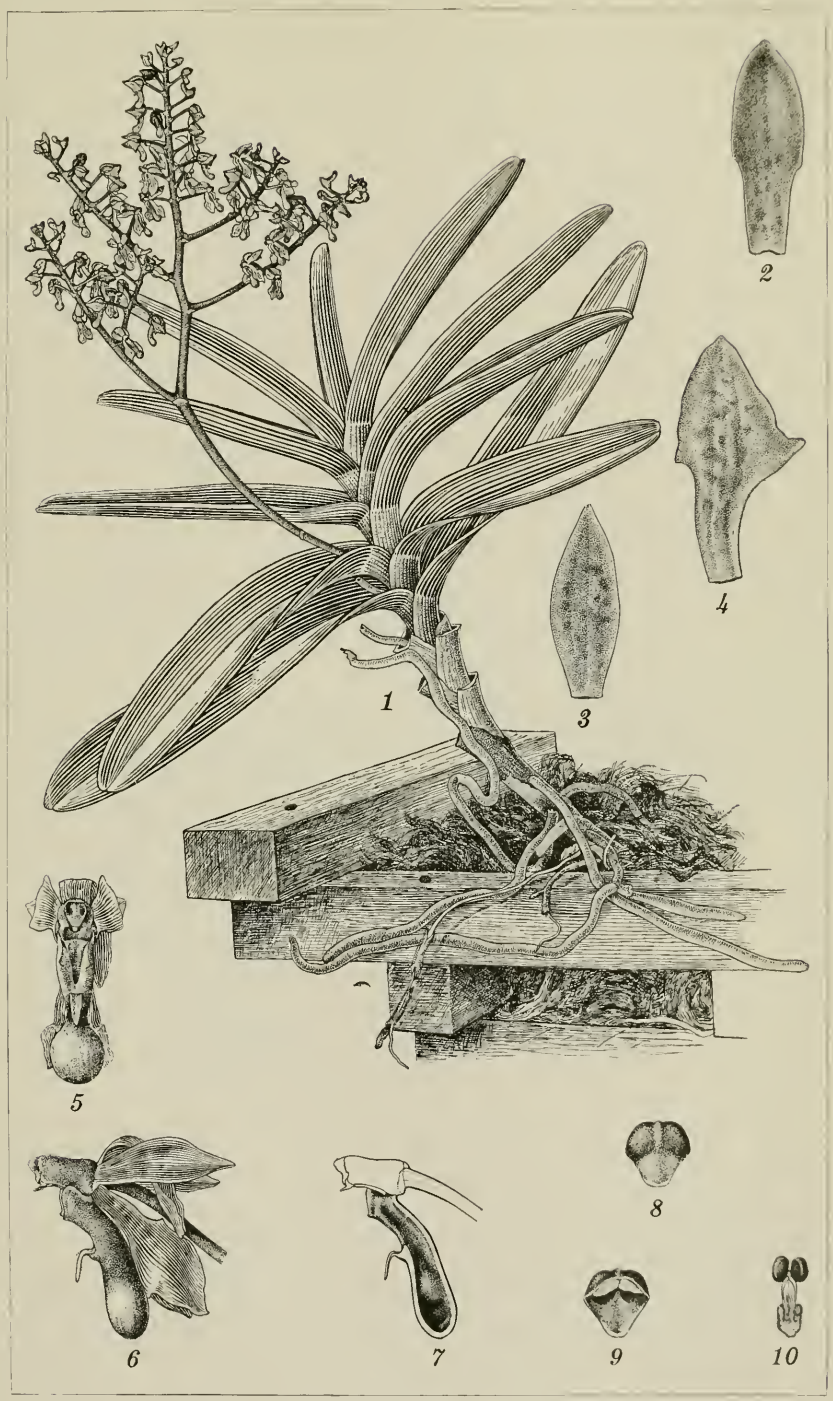


PLATE 5.



PLATE 6.



PLATE 7.



PLATE 8.



PLATE 9.

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TES ON PHILIPPINE ORCHIDS VII

BY OAKES AMES

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By

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WITH FOUR ETCHINGS BY BLANCHE AMES



[*Reprinted from Orchidaceæ, Fascicle VI*]

BOSTON

THE MERRYMOUNT PRESS

1920

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NOTES ON PHILIPPINE ORCHIDS

WITH DESCRIPTION OF NEW SPECIES, VII

SINCE the publication of my enumeration of the genera and species of Philippine orchids in the fifth fascicle of the present work numerous collections have been received, both from the Bureau of Science and from private collectors, that have contained new or noteworthy species. Although it has been impossible on account of the war to make a detailed study of the material that has accumulated, I have set aside from time to time, specimens that seem to be obviously new to the Philippine flora. Such of these as proved to be undescribed or worthy of attention are included in the following list.

It has become apparent that numerous genera of Philippine orchids need to be thoroughly reworked if we are to profit from the material that has been referred, often tentatively, to various species that were originally described from a limited number of specimens or from a single plant. This is true especially of Bulbophyllum, Dendrobium, Dendrochilum, Eria, Liparis and Malaxis. In these genera there are many species that may be too laxly defined or too closely circumscribed. Critical work in the field may be necessary, together with a careful study of Malayan types, to solve some of the problems suggested by Malaxis. This genus constitutes a very puzzling group which, when studied from herbarium material, presents an exasperating number of perplexities. Dendrochilum needs to be examined very thoroughly from the point of view of distribution. It would seem that many species of the section Acoridium are localized or restricted in their range to the higher altitudes of isolated mountains. Here we have an opportunity for investigations that may conclusively prove that

many species of Dendrochilum are characterized by a remarkable tendency toward montane endemism. Of course it is quite probable that the apparent isolation of *Dendrochilum irigense* Ames on Mount Iriga, of *D. ocellatum* Pfitz. on Mount Data and of *D. sphacelatum* Pfitz. on Mount Santo Tomas, to mention only a few of many examples, may be the result of incomplete knowledge of their actual distribution. If it were not for the repeated discovery of some of these species in their original stations, and for their absence from collections made elsewhere, the suggestion that deductions as to restricted distribution are premature at this time might be seriously entertained. At least until there is evidence to the contrary, it will be well to act on the hypothesis that the alpine species of Dendrochilum are often endemic on isolated mountains.

Although the evidence obtained from an examination of recent collections indicates that we have made substantial progress toward a comprehensive survey of the Philippine orchid flora, it is highly probable that unexplored and lightly touched regions, especially the mountainous regions of Mindanao and Mindoro, will bring to light many new species. It is very desirable that Mount Halcon should be ascended again for botanical purposes. Some of the species obtained on this mountain by Merrill in 1906 have not since appeared in collections from other sources, and many of them are represented in herbaria by very scanty material. Mount Data would seem to have an exceptionally interesting orchid flora, and an effort to assemble it would be distinctly worth while. Some of the species described from specimens collected on Mount Data should again be sought for. I have in mind especially *Dendrochilum oliganthum* Pfitz. and *D. ocellatum* Pfitz., two very remarkable species that are poorly represented by the material obtained in 1905 by Merrill. Even though the

botanical activities of the Bureau of Science and of private collectors have been pretty constant during the last fifteen years, there are numerous orchids that are represented in herbaria by the specimens of a single collection. This is in part accounted for by the tendency of orchids to occur sporadically, but is largely due to the fact that there are regions in which botanical exploration has been limited to a single effort or to a cursory examination.

From time to time the relationship of the Philippine flora to that of the other Malayan islands has been discussed. In the fifth fascicle of this work I referred to the subject very briefly and indicated that the alliance between the orchid floras of the Philippines, Celebes and Java was somewhat close. Recently I have had an opportunity to study the Bornean collections of Chaplain Joseph Clemens. Although these were confined to Mount Kinabalu in British North Borneo, they tend to show that the relationship between the orchid flora of the Philippines and that of Borneo is not so close as geographical considerations would seem to indicate. In my studies I was deeply impressed by the absence of species from the Bornean collections that are common to the higher altitudes of the Philippines. Under Dendrochilum in the enumeration of the orchids of Mount Kinabalu I have discussed this point at some length, and the remarks made therein are applicable in general to the other Bornean orchid genera.

Until we know more about the floras of Borneo and Sumatra it will be impossible to arrive at satisfactory conclusions regarding the distribution of orchids in the Malayan tropics. It is becoming clear that endemism is more pronounced than we had believed, and that many of those species now supposed to extend over a wide range may prove to be made up of several different species, each one restricted to a well-defined area. Of course there are dominant species, such for example, as *Spiranthes sinensis* (Pers.)

Ames and *Eulophia squalida* Lindl. that extend over a wide range, but the majority of orchids, if conclusions based on present knowledge are to be relied on, are held within comparatively small geographical areas and are restrained in their distribution by influences of which we have little or no understanding. This lesson is easily learned from a study of those Philippine species that seem to be localized on an island or within a province.

In the following list the genera are arranged, with a few exceptions, in the sequence adopted in the fifth fascicle of Orchidaceae. This arrangement follows closely the system proposed by Engler and Prantl.

HABENARIA *Willd.*

Habenaria malintana (*Blanco*) *Merrill* Sp. Blancoanae (1918) 112. Thelymitra malintana *Blanco* Flora de Filipinas (1837) 642. Habenaria pelorioides *Par. & Reichb. f.* in Trans. Linn. Soc. 30 (1874) 135, 139, t. 27, f. A, 1–3. Habenaria trinervis *Naves* Novis. App. (1880) 250 non Wight.

If Professor Elmer D. Merrill's conclusions are adopted, the synonymy given above would seem to be correct for the Philippine plant that has been referred to *Habenaria pelorioides* Par. & Reichb. f. in my previous lists of Philippine orchids. Merrill, with exceptional opportunities for exactitude and finality, has given concentrated attention to the task of clarifying obscure species described by Blanco, so that his conclusions must be regarded as authoritative. Aside from the very rambling description published in Flora de Filipinas, there are references that, once the clue to the species is given, seem to leave little, if any, room for doubt as to the plant Blanco wished to characterize. In the Novissima Appendix Naves referred *Thelymitra malintana* to the synonymy of *Habenaria trinervia* Wight, but on

what assumption I do not know. In the Philippines *Habenaria malintana* appears to be common in Luzon.

VANILLA *Juss.*

Vanilla calopogon *Reichb. f.* Otia Bot. Hamb. Fasc. 1 (1878) 40.

This appears to be a very rare species. Among the collections examined I have seen only three sets of specimens. *Vanilla calopogon* Reichb. f. is readily distinguished from *V. ovalis* Blanco, the only other species of the genus heretofore reported from the Philippine Islands, by its leafless stems and white flowers. Up to the present time this species has been found only in Luzon. The following collection is worthy of a record.

Luzon, Ilicos Norte Province, Burgos, *M. Ramos Bur. Sci. 32928*, July 20, 1918. In dry thickets. Flowers white.

LECANORCHIS *Bl.*

Lecanorchis javanica *Bl.* Mus. Bot. Lugd.-Bat. 2 (1856) 188. L. triloba *J. J. Sm.* in Bull. Dépt. Agric. Ind. Néerl. 19 (1908) 26.

In Fascicle V of this work, I adopted for this species the name proposed by J. J. Smith in Bull. Dépt. Agric. Ind. Néerl. Smith is now of the opinion that *L. triloba* should be added to the synonymy of *L. javanica* Bl., on the assumption that Blume must have described his species from a peloric form in which the labellum was entire instead of being normal and three-lobed. The type of *L. javanica* at Leiden is in poor condition and insufficient to establish beyond doubt that Smith is correct. Smith has examined material from western Java that is characterized by a three-lobed lip, and his studies have convinced him that *L. triloba* is not a distinct species, but simply the normal state of *L. javanica.*

PHILIPPINAEA *Schltr. & Ames gen. nov.*

Sepala lateralia lanceolata, extus glanduloso-pubescentia, saccum labelli occludentia. Sepalum dorsale petalis adhaerens, extus glanduloso-pubescens, concavum. Petala membranacea, oblongo-lanceolata, sepalum dorsale aequantia. Labellum gynostemio adnatum, basi saccato-gibbosa; saccus scrotiformis, intus utrinque squamis clavatis ornatus; lamina labelli in partes duas divisa, pars basalis orbicularis antice pectinato-dentata, pars apicalis unguiculata, dilatata, obtuse triangularis. Discus labelli bicarinatus. Gynostemium valde elongatum, sepalum dorsale aequans; stigma indivisum; rostellum profunde bifidum, divisionibus inaequaliter bilobatis, lobis exterioribus obtusis, lobis interioribus elongatis, lineari-triangularibus, acutis. Clinandrium tubulare. Anthera elongata, navicularis. Pollinia sectilia, sessilia in disco rostelli. Ovarium glanduloso-pubescens. Herba terrestris, succulenta, caulescens, inferne repens; foliis alternis, congestis, in petiolum latum vaginantem angustatis; scapo laxe vaginato, elongato; floribus in racemo elongato dispositis.

Philippinaea Wenzelii (*Ames*) *Schltr. & Ames comb. nov.*

Adenostylis Wenzelii *Ames* Orchidaceae 5 (1915) 41.

The genus Philippinaea differs from Adenostylis in the details of the gynostemium and labellum. From the African members of Platylepis it is separable generically by the lip characters, although in the elongated column and in the rostellar divisions it shows close relationship with Platylepis through *P. goodyeroides* A. Rich.

Philippinaea is endemic in the Philippines. It is monotypic and from evidence based on collections is only known from Leyte, Mindanao and Luzon. The material on which the genus is founded was originally referred to Adenostylis and published in Fascicle V of Orchidaceae as *A. Wenzelii.* Before publication I invited the

opinion of Dr. Rudolf Schlechter as to its generic characters. He agreed with me that the species was new and probably referable to the section Monochilus of Adenostylis. Later Dr. Schlechter revised his opinion and we agreed that a new genus should be recognized to receive the Philippine species. Further studies indicated relationship to the genus Platylepis which has representatives in Africa, Mascarene Islands, New Guinea, etc. It would seem to indicate affinity to Platylepis through Papuan and Pacific types of which the relationship to African species of Platylepis is not yet wholly clear.

Present records prove that Philippinaea is the only endemic orchid genus of the Philippine Islands. If it should remain so, it would be within reason to assume that the majority of the orchid species of the Philippines have originated in the archipelago and that their phylogeny may be traced to the species of Celebes, Java, Borneo and Sumatra. (PLATE 100.)

LEYTE, Dagami, *C. A. Wenzel 0210* (Type), July 21, 1913. 60 meters altitude. Flowers white; Ormoc, *Wenzel 0119*, April 28, 1913. Terrestrial in forest. 200 meters altitude. Flowers white; Jaro, *Wenzel 0510*, July 25, 1914. 500 meters altitude. Terrestrial in forest. Sepals and petals green, labellum white and pink. MINDANAO, Province of Agusan, Mount Urdaneta, *A. D. E. Elmer 13884*, September 1912. Erect, succulent, terrestrial herb in good soil of deep humus in forest, along the side of the Catangan Creek, at 3000 feet altitude. LUZON, Province of Sorsogón, Mount Balusan, *Elmer 16668*, July 1916.

COELOGYNE *Lindl.*

Coelogyne Loheri *Rolfe* in Kew Bull. (1908) 414.

The labellum of this species was originally described as five-carinate. I find that the number of carinae is variable. In material that I have referred to this species, three carinae seem to constitute the average. A specimen in the United States National Herbarium, *Loher 549*, that I regard as a duplicate type of *C. Loheri*, has a tricarinate labellum. In comparison with its Philippine allies,

the narrow leaves constitute the most conspicuous differentiating character in the recognition of this species.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 1197*, March–May 1911; *Vanoverbergh 2867*, April 4, 1913. 1700 meters altitude; *Vanoverbergh 3906*, June–July 1914. 1700 meters altitude. Flowers white and yellowish-brown; *Vanoverbergh 4041*, 1916.

Coelogyne quinquelamellata *Ames sp. nov.* Radices fibratae, ramosae; pseudobulbi diphylli, 4–9 cm. longi, anguste pyriformes vel ampullacei, subtetragoni, prope basim ±1.5 cm. in crassitudine, valde rugosi, juniores vaginis coriaceis acutis tecti. Vaginae distichae, in sicco rigidae, ±5 cm. longae. Folia 10–30 cm. longa, 1.5–4.5 cm. lata, oblongo-elliptica, utrinque attenuata, acuta, valde coriacea, in sicco nervosa, erecta, scapo longiora, breviter petiolata. Scapus erectus, rigidus, ±3 dm. longus, initio foliis juvenilibus synanthus, versus antheseos finem hysteranthus, folia demum superans, basi nudus, multiflorus, compressus. Flores rubri, succedanei. Rachis flexuosa. Bracteae inflorescentiae elongatae, 2.5 cm. longae, glumaceae, lanceolatae, acutae, ovaria pedicellata superantes, cum floribus deciduae, super flores arctissime imbricatae. Sepala lateralia 11 mm. longa, ±4 mm. lata, lanceolata, acuta. Sepalum dorsale 12 mm. longum, circa 7 mm. latum, ovato-lanceolatum, acutum, valde concavum, suberectum. Petala linearia, 9 mm. longa, 1 mm. lata, prope apicem attenuata. Labellum simplex, 7 mm. longum, circa 1 cm. latum, transverse ellipticum, minute apiculatum, prope basim lamellis quinque, obtuse triangularibus, erectis, 1–2 mm. longis, abbreviatis praeditum. Gynostemium arcuatum, apice late alatum.

This very distinct species belongs to the section Longifoliae. It is at once distinguishable from all other members of the genus, heretofore reported from the Philippine Islands, by means of the five abbreviated lamellae at the base of the labellum. In

general habit the plant resembles *Coelogyne longifolia* Lindl. Wenzel describes the flowers as red in all specimens except the one collected on August 30, 1917. In this specimen the sepals and petals are orange, while the labellum is orange and white.

MINDANAO, Surigao Province, *C. A. Wenzel 01206* (Type), September 22, 1917. Epiphyte in forest. 150 meters altitude. Flowers red; *Wenzel 01175*, August 23, 1917; *Wenzel 01179*, August 20, 1917; *Wenzel 01182*, August 30, 1917.

DENDROCHILUM *Bl.*

Dendrochilum (§ Acoridium) **binuangense** *Ames sp. nov.* Radices fibratae. Pseudobulbi ±1 cm. longi, semifusiformes, in sicco plurisulcati, monophylli, juniores vaginis inclusi. Folium 4–8 cm. longum, 6–11 mm. latum, anguste oblongo-ellipticum, utrinque attenuatum, obtusum, coriaceum, in sicco prominenter trinervium, nervis lateralibus submarginatis. Petiolus abbreviatus. Pedunculus cum racemo ±1 dm. longus, folio multo longior, infra inflorescentiam bracteis infundibuliformibus ornatus. Racemus ±8 cm. longus, gracilis, elongatus, arcuatus, multiflorus. Flores distichi, albidi, circa 1 mm. distantes. Bracteae inflorescentiae circa 4 mm. longae, glumaceae, semiovatae, acuminatae, valde acutae, ovaria pedicellata superantes. Sepala lateralia 3.75–4 mm. longa, circa 1 mm. lata, oblongo-lanceolata, acuminata, valde acuta, uninervia. Sepalum dorsale circa 4 mm. longum, 1 mm. latum, anguste oblongo-lanceolatum, acuminatum, acutum, uninervium. Petala 3 mm. longa, anguste oblongo-lanceolata, acuta, uninervia. Labellum minutum, trilobatum, lobis lateralibus columnam excedentibus; lobi laterales vix 1 mm. longi, circa 1 mm. lati ad apicem, subcuneati, truncato-obtusi, lobum medium multo excedentes; lobus medius tridentatus, carnosus, vix .5 mm. longus, dentibus triangularibus subaequalibus; discus valde concavus, callo minuto lineari ornatus. Calli

duo, complanati, unus prope basim lobi lateralis utriusque. Columna minuta, rostellum prominens.

Dendrochilum binuangense at first glance resembles *D. microchilum* (Schltr.) Ames so closely that it might readily be mistaken for it. The floral bracts are acuminate and end in a sharp triangular point, and the lateral lobes of the labellum are conspicuously longer than the middle lobe, exceeding the column when erect. In *D. microchilum*, on the other hand, the floral bracts are obtuse and the lateral lobes of the labellum are not much longer than the middle lobe.

Luzon, Province of Tayabas, Mount Binuang, *Ramos & Edaño Bur. Sci. 28620*, May 27, 1917. 500 meters altitude. Found on the summit of the mountain on a tree. Flowers white.

Dendrochilum (§ Acoridium) **cinnabarinum** *Pfitz.* in Engl. Pflanzenreich IV, 50. II. B. 7 (1907) 104.

This very distinct species, of which a detailed account was given in Orchidaceae 3 (1908) 10, t. 27, was originally reported from Benguet Province, Luzon, without precise data. Since its discovery by A. Loher it has been collected several times, but always on Mount Pulog, and would seem to be restricted in its distribution.

Luzon, Benguet Province, Mount Pulog, *Elmer D. Merrill 6475*, May 1909. In mossy forest. 7500 feet altitude; *R. C. McGregor Bur. Sci. 8844*, July 1909; *Curran, Merritt & Zschokke For. Bur. 16348*, January 1909. In hard wood forest on tree. 8800 feet altitude. Flowers coral red; *George Boettcher*, June 1918. Flowers blood red.

Dendrochilum (§ Platyclinis) **ecallosum** *Ames sp. nov.* Radices fibratae, elongatae. Pseudobulbi caespitosi, 12–20 mm. longi, pyriformes, in sicco valde rugosi, longitudinaliter sulcati, flavescentes, usque ad apicem attenuati, monophylli. Folium petiolatum, cum petiolo 6–10 cm. longum, 1.3–2 cm. latum, oblongo-ellipticum, subacutum, in sicco nervosum, nervo marginali

utrinque addito, coriaceum, in petiolum subito contractum. Petiolus ±1.5 cm. longus, superne sulcatus. Pedunculus cum racemo folio fere explanato synanthus eoque fere duplo longior, nutans, gracilis, 1.5–2 dm. longus. Racemus 7 cm. longus, subdensiflorus. Bracteae inflorescentiae 3 mm. longae, glumaceae, convolutae, ovaria pedicellata superantes, subacutae. Flores distichi, 2 mm. distantes in racemo, in sicco flavescentes. Pedicellus cum ovario 2 mm. longus. Sepala lateralia 3.5 mm. longa, 1 mm. lata, oblongo-lanceolata, acuta, trinervia, subpatentia. Sepalum dorsale 3.5 mm. longum, 1.5 mm. latum, oblongo-lanceolatum, acutum, trinervium. Petala circa 3 mm. longa, 1 mm. lata, oblongo-elliptica, acuta, trinervia. Labellum circa 3 mm. longum, super medium 1.5 mm. latum, oblanceolatum, acutum, trinervium, ecallosum. Columna crassa, 1 mm. longa, columnae *Dendrochili bicallosi* similis, lacinia utraque reducta in dentem truncatum alae terminali adsistentem, cujus illa pars fieri videtur; ala terminalis truncata, denticulata.

Dendrochilum ecallosum is very closely related to *D. propinquum* Ames, but differs from it in the much smaller dimensions of all its parts. The ecallose labellum and marginate leaves serve to distinguish it from *D. bicallosum* Ames.

Catanduanes Island, Mount Mariquidon, *M. Ramos Bur. Sci. 30240*, November 30, 1917. 140 meters altitude. On tree in forest. Flowers salmon colored.

Dendrochilum (§ Acoridium) **Loheri** *Ames* Orchidaceae 3 (1908) 12, t. 27.

This rare species which is represented by material recently collected on Mount Santo Tomas by Boettcher was originally found in Benguet Province, Luzon, by A. Loher and distributed without being localized. On the evidence of herbarium material it would seem to be confined to Mount Santo Tomas and Mount Pulog.

Luzon, Benguet Province, Mount Pulog, *Elmer D. Merrill 6476*, May 1909; Mount Santo Tomas, *George Boettcher*, May 1918. Flowers rose colored.

Dendrochilum (§ Platyclinis) **niveum** *Ames sp. nov.* Radices validae, glabrae. Pseudobulbi caespitosi, statu juvenili vaginis tubulatis tecti. Vaginae usque ad 4 cm. longae, obtusae. Folium ligulatum, circa 1 dm. longum, 2 cm. latum, utrinque attenuatum, in sicco nervosum, nervo medio subtus magis prominenti. Pedunculus cum racemo 21 cm. longus, gracilis, infra inflorescentiam bractea singula ornatus. Racemus gracilis, 12 cm. longus, laxiflorus. Bracteae inflorescentiae glumaceae, ±3.5 mm. longae, convolutae, ovaria pedicellata superantes. Pedicellus cum ovario circa 3 mm. longus. Flores distichi, nivei, circa 3 mm. distantes. Sepala lateralia 5–6 mm. longa, circa 1.5 mm. lata infra medium, triangulari-lanceolata, acuminata, valde acuta, trinervia. Sepalum dorsale 5–6 mm. longum, vix 2 mm. latum, anguste oblongo-lanceolatum, acuminatum, acutum, trinervium. Petala 5 mm. longa, circa 1 mm. lata, oblongo-lanceolata, minutissime denticulata, acuminata, valde acuta, trinervia. Labellum usque ad 3 mm. longum, trilobatum, callo parvo in nervo utroque paulo infra medium; lobi laterales tertiam partem labelli aequantes, rotundati, obtusi, minutissime denticulati; lobus medius suborbicularis, 2 mm. longus, vix 2 mm. latus, subito acutus vel obtusus. Columna circa 2 mm. longa; stelidia lateralia prope medium columnae exserta, longe lineari-triangularia, acuta, alam apicalem haud aequantia; ala terminalis variabilis, minutissime lobulata vel retusa.

The nearest affinity of *Dendrochilum niveum* appears to be *D. filiforme* Lindl., which has smaller flowers in denser racemes and a very different labellum. The type consists of a single plant in which the pseudobulb is immature and still clothed by the

elongated tubular sheath that conceals the petiole of the leaf and the base of the peduncle.

LUZON, Kalinga Province, *George Boettcher*, March 19, 1918. 1000 meters altitude. Flowers white.

Dendrochilum (§ Platyclinis) **propinquum** *Ames sp. nov.* Radices fibratae, elongatae. Rhizoma repens. Pseudobulbi 2.5–3.3 cm. longi, anguste pyriformes, approximati, superne attenuati, monophylli, juniores vaginis tubulatis acutis pseudobulbum superantibus inclusi, in sicco valde rugosi. Folium petiolatum, 17–20 cm. longum, circa 3 cm. latum, oblongo-lanceolatum, utrinque attenuatum, nervosum, subacutum, nervo marginali utrinque addito, medio subtus multo magis prominenti, lamina folii coriacea. Petiolus sulcatus. Pedunculus folio fere explanato synanthus eoque fere duplo longior, nutans, subdensiflorus. Racemus gracilis, 12–16 cm. longus. Bracteae inflorescentiae circa 5 mm. longae, convolutae, glumaceae, ovaria pedicellata superantes, obtusae, persistentes. Flores distichi, flavidi. Sepala lateralia 4.5–5 mm. longa, 2 mm. lata, ovato-lanceolata, subacuta, trinervia, ecarinata, nervo medio solo subtus prominenti. Sepalum dorsale 5 mm. longum, oblongum, obtusum, trinervium. Petala 4 mm. longa, 2.5 mm. lata, cuneato-ovata, obtusa, trinervia. Labellum simile, simplex, 4 mm. longum, 2.5 mm. latum, breviter unguiculatum, prope basim incrassatum, ad apicem subacutum; discus ecallosus, trinervius, nervis incrassatis. Columna crassa, 1.75 mm. longa, columnae *Dendrochili bicallosi* similis, lacinia utraque reducta in dentem obtusum alae terminali adsistentem, cujus illa pars fieri videtur; ala terminalis paucidentata.

Dendrochilum propinquum is a near ally of *D. bicallosum* Ames. From this species it differs conspicuously in the ecallose lip which is similar to the petals.

The structure of the column brings *D. propinquum* into that

small group of Philippine Dendrochilum species which appears to be transitional between § Platyclinis and § Acoridium. The lateral arms or stelidia are apical, but have the aspect of being lobes of the terminal wing.

The flowers are reddish-brown in dried specimens. The collector's notes describe them as having been yellow in living plants.

In fruiting specimens, surely referable to this species, the mature capsules are spherical and about 8 mm. in diameter.

The prominent marginal veins of the leaf are a conspicuous differentiating character between this species and *D. bicallosum.*

LEYTE, Jaro, *C. A. Wenzel 0805* (Type), December 27, 1914. Epiphyte in forest. 700 meters altitude. Flowers yellow; *Wenzel 0809*, December 27, 1914. Epiphyte in forest. 700 meters altitude. Flowers yellow.

Dendrochilum (§ Acoridium) **purpureum** *Ames sp. nov.* Radices fibratae, validae, elongatae. Pseudobulbi ±2 cm. longi, anguste pyriformes, in sicco rugosi, longitudinaliter et irregulariter sulcati, statu juvenili vaginis arcte adpressis vestiti, monophylli. Bracteae vel vaginae longe tubulatae, usque ad 7 cm. longae, in sicco brunneae, petiolum folii occludentes. Folium cum petiolo ±1.5 dm. longum, 1–2 cm. latum, ligulatum, utrinque attenuatum, acutum, in sicco prominenter quinquenervium. Pedunculus cum racemo usque ad 2.5 dm. longus, gracilis, folio longior, infra inflorescentiam bracteis sterilibus imbricatis vestitus. Racemus ±8 cm. longus. Flores purpurei, distichi, in racemo subdenso dispositi, circa 2 mm. distantes, valde carnosi. Bracteae inflorescentiae circa 2 mm. longae, glumaceae, ovaria pedicellata superantes, obtusae. Pedicellus cum ovario vix 2 mm. longus. Sepala petalaque valde carnosa. Sepala lateralia circa 4 mm. longa, 2 mm. lata, lanceolata, acuta, trinervia. Sepalum dorsale 5 mm. longum, 2 mm. latum, anguste oblongo-ellipticum, acutum, trinervium.

Petala circa 4 mm. longa, 3 mm. lata, cuneato-ovata vel sagittata, variabilia, acuminata, acuta, trinervia. Labellum simplex, integrum, valde carnosum, 2 mm. longum, 1 mm. latum, trulliforme, obtusum, sessile, subcordatum, prope basim in foveam excavatum, ecallosum. Gynostemium breve.

In general aspect this species resembles *Dendrochilum philippinense* Pfitz., but is distinguishable from it by the simple trowel-shaped labellum. When immature the pseudobulbs are concealed by tubular bracts the lowermost of which are much reduced. The uppermost bract conceals the petiole of the leaf and the base of the peduncle. As the plants mature these bracts gradually disintegrate and are finally represented only by fibrous remains.

Luzon, Apayo Province, Mount Pasoan, *George Boettcher*, January 1, 1918. 2000 meters altitude. Flowers purple.

Dendrochilum (§ Acoridium) **sphacelatum** (*Ames*) ***Pfitz.*** in Engl. Pflanzenreich IV, 50. II. B. 7 (1907) 112.

The absence of this species from the wealth of material received from the Philippines since 1905 had led me to believe that it represented, perhaps, an aberrant form of the more common and widely distributed *D. tenellum* Ames. Very recently George Boettcher visited the type station and secured an abundance of specimens that correspond in detail with the type. A reexamination of the material in my herbarium substantiates the conclusions presented in Orchidaceae 1 (1905) 2, t. 1. *D. sphacelatum* in its distribution confirms my belief that those species of Dendrochilum that are alpestrine in their requirements are very often confined to particular mountains or mountain ranges. This is a subject on which the attention of collectors should be concentrated.

Luzon, Benguet Province, Mount Santo Tomas, *George Boettcher*, May 1918.

MALAXIS *Soland.* ex Sw.

Malaxis cuneipetala *Ames sp. nov.* Radices fibratae. Caules abbreviati, ±3 cm. alti, vaginis foliorum obtecti. Folia conferta, petiolata; lamina ±1 dm. longa, usque ad 4.5 cm. lata, lanceolata vel ovato-lanceolata, acuminata, acuta, chartacea, prominenter septemnervia. Petiolus late sulcatus, ±6 cm. longus, circa 6 mm. latus, ad basim imbricatus. Pedunculus gracilis, elongatus, cum racemo usque ad 2 dm. longus, multiflorus. Flores aurantiaci, succedanei, in racemo subdenso dispositi. Bracteae inflorescentiae demum dependentes, 3–10 mm. longae, in sicco chartaceae, lineari-lanceolatae, valde acutae. Pedicellus cum ovario circa 5 mm. longus. Sepala lateralia 4 mm. longa, 3 mm. lata, orbicularia, valde obtusa. Sepalum dorsale 5 mm. longum, 2.5 mm. latum, oblongum, obtusum, trinervium, prope basim sensim attenuatum. Petala cuneiformia, usque ad 4.5 mm. longa, 3.5–4 mm. lata, ad basim valde attenuata, unguiculata. Labellum cum auriculis circa 4.5 mm. longum, 2.5 mm. latum, ambitu ellipticum, antice utrinque unilobulatum, lobo intermedio semirotundato, bifido, .75 mm. longo, 1 mm. lato, auriculis 1.75 mm. longis, circa 1 mm. latis, falcatis, obtusis, convergentibus. Gynostemium breve.

Malaxis cuneipetala is remarkable because of its extraordinarily wide cuneiform or cuneate-rhombic petals which are wider than the sepals. The front part of the labellum is trilobed at the tip, the lateral lobes or rather lobules being much shorter and narrower than the bifid middle lobe.

LEYTE, *C. A. Wenzel 0724*, November 24, 1914. Terrestrial in forest. 800 meters altitude. Flowers orange.

Malaxis negrosiana *Ames* in Elmer Leaf. Phil. Bot. 5 (1912) 1561.

Several specimens from Leyte referable to this species exhibit

slight differences from the type. The stems are shorter, about 2 cm. in length, tumid at the base. The plants are much smaller with the lanceolate leaves 1 dm. long, 1.5–3 cm. wide, prominently five-nerved. The peduncle including the raceme is about 1 dm. long. The auricles of the labellum are 1 mm. long.

LEYTE, *C. A. Wenzel 0641*, November 12, 1914. Epiphyte. Flowers lilac. 600 meters altitude.

Malaxis propinqua *Ames sp. nov.* Herba parvula, terrestris, 8–15 cm. alta cum racemo, di- vel trifoliata. Caulis aliquid crassus, 2–3 cm. longus, ad basim tumidus vel bulbosus, bracteis tubulatis scariosis vestitus. Folia succulenta, conferta, inaequalia, 1.5–4 cm. longa, 7–33 mm. lata, lanceolata et valde ovata, subacuta, subcordata, amplexicaulia, conspicue quinque- ad septemnervia in sicco. Scapus cum racemo 5.5–12 cm. longus, longitudinaliter sulcatus, infra racemum paucibracteatus. Bracteae inflorescentiae ±3 mm. longae, anguste lanceolatae, acuminatae, in sicco scariosae, dependentes. Racemus 2–7 cm. longus. Pedicellus cum ovario circa 1 mm. longus, bracteis multo brevior. Sepala lateralia 2.5 mm. longa, elliptica, obtusa. Sepalum dorsale circa 3 mm. longum, ellipticum, obtusum. Petala linearia, ±3 mm. longa. Labellum crassum, 5 mm. longum, obscure trilobulatum infra columnam, subpanduriformi-sagittatum, apice profunde bifido, basi auriculata; auriculae falcatae, subacutae, circa 1 mm. longae. Callus in disco crescentiformis. Columna generis.

The nearest ally of *Malaxis propinqua* seems to be M. Mackinnonii (*Duthie*) *Ames comb. nov.* (*Microstylis Mackinnonii* Duthie in Journ. As. Soc. Beng. 71, pt. 2 (1902) 37). In general aspect there is a striking similarity between these two species, although *M. propinqua* appears to be normally smaller in its vegetative parts. The callus on the disc of the labellum in *M. propinqua* is a raised fleshy rim which divides the blade into basal and

apical parts. This fleshy rim crosses the disc in a circular line at the point where the margin is indented to give the subpanduriform aspect described above. The labellum of *M. Mackinnonii*, as it appears in specimens of the type number preserved in my herbarium, is more strongly trilobed in front of the column than the labellum of *M. propinqua*. This trilobed condition is clearly shown in the analytical drawings on plate 95 of Duthie's Orchids of the Northwestern Himalayas (Ann. Roy. Bot. Gard. Calc. 9, pt. 2 (1906)). From the tips of the falcate basal lobes of the labellum to the tips of the terminal lobules *M. Mackinnonii*, in specimens before me, measures 4 mm. in length. The labellum of *M. propinqua* measured similarly is 5 mm. long. From the material I have examined, *M. Mackinnonii*, while it sometimes bears three leaves, is usually bifoliate. All of the specimens in my herbarium, in fact, are bifoliate. *M. propinqua*, on the other hand, usually has a well-developed third leaf, and from the material examined would seem to be rarely bifoliate. These differences coupled with the widely separated habitats of the specimens may be taken as safe guides to specific differentiation.

Luzon, Bontoc Subprovince, *Vanoverbergh 3916*, July 19, 1914. On hills. 1200 meters altitude. Flowers pinkish violet.

Malaxis Taylorii *Ames sp. nov.* Aff. *M. Wenzelio.* Caules 4.5 cm. longi, vaginis foliorum tecti, quadrifoliati. Folia cum petiolo usque ad 1.5 dm. longa, ±4 cm. lata, in sicco prominenter quinquenervia, chartacea, ovato-lanceolata, acuminata, valde acuta. Petioli usque ad 6 cm. longi, canaliculati. Pedunculus 2.8 cm. longus, gracilis, multiflorus. Flores subdensi, in racemo elongato ±1.5 dm. longo dispositi. Bracteae inflorescentiae lineares, usque ad 7 mm. longae. Pedicelli graciles, cum ovario 5 mm. longi. Sepala lateralia 4.5–5 mm. longa, ±2 mm. lata, oblique

ovalia, obtusa, trinervia. Sepalum dorsale 5 mm. longum, circa 2 mm. latum, valde convexum, oblongo-ellipticum, obtusum. Petala 5 mm. longa, linearia, uninervia. Labellum cum auriculis 7 mm. longum, 4 mm. latum, antice utrinque in dentes duos fissum; lobus terminalis bifidus vel tridentatus dentibus lateralibus longioribus; auriculae 3.5 mm. longae, acutae vel obtusae, triangulares, elongatae; fovea margine superiore leviter semilunato-incrassata. Gynostemium breve.

The type consists of a single plant preserved in the Herbarium of the Bureau of Science at Manila. The leaves may be more or less than four. The labellum indicates a wide range of variation in the shape, length and position of the teeth. The two lateral teeth on each side of the tridentate or simply bifid middle lobe are narrowly triangular in shape, about 1 mm. long. The middle lobe is variable, sometimes being deeply bifid. When it is tridentate the lateral teeth are much longer than the middle one. In the type the dried flowers are yellowish. The color of fresh flowers is not described in the collector's notes.

Mindanao, Agusan Province, *E. H. Taylor*, April 10, 1913.

OBERONIA *Lindl.*

Oberonia leytensis *Ames sp. nov.* Herba tenella, epiphytica, caulibus circa 3 cm. longis, dense 6–8-foliatis, basibus foliorum omnino absconditis. Folia ensiformia, usque ad 3 cm. longa, 3–4 mm. lata a latere visa, incrassata, adscendentia, equitantia. Pedunculus cum racemo usque ad 7 cm. longus, valde arcuatus, gracilis, circa 4 mm. in diametro. Bracteae inflorescentiae pedicellis longiores, circa 1 mm. longae, triangulari-lanceolatae, acutae, irregulariter denticulatae vel crenulatae. Flores subverticillati, minuti, in racemo laxo dispositi, rubri (in sicco flavidi). Pedicelli glabri, 1 mm. longi. Sepala lateralia 1 mm. longa,

ovata, acuta. Sepalum dorsale simile. Petala oblonga vel subspathulata, 1 mm. longa, valde obtusa. Labellum circa 1 mm. longum, ad basim auriculato-cordatum, ad apicem rotundatum bilobatum, prope medium leviter constrictum vel angustatum. Columna simplex.

In habit *Oberonia leytensis* suggests *O. brevifolia* Lindl. The sinus formed by the lobes of the lip is distinctly triangular. Five or more flowers make up the whorls of the arching or drooping raceme. *O. mindorensis* Ames has a very similar lip, but the habit of the plant is much more robust and the petals are linear. (Plate 98.)

Leyte, *C. A. Wenzel 0945*, June 4, 1915. Epiphyte at sea level.

Oberonia surigaensis *Ames sp. nov.* Planta *O. Wenzelio* habitu omnino congruens. Radices valde elongatae, fibratae. Caules abbreviati, ±8 mm. longi, complanati. Folia usque ad 1.5 dm. longa, 7–10 mm. lata a latere visa, falcata, prope basim equitantia, quam inflorescentia longiora, super medium attenuata. Scapus cum racemo circa 1 dm. longus, pergracilis, densiflorus, floribus rubris. Racemus 9 cm. longus, 4 mm. in diametro. Flores verticillati, minuti. Rachis costatus, glaber. Bracteae inflorescentiae minutae, paucidenticulatae, triangulares, acutae. Sepala lateralia circa 1 mm. longa, triangulari-ovata, subacuta. Sepalum dorsale simile. Petala anguste oblonga, vix .5 mm. lata, prope apicem leviter dilatata et paucidenticulata. Labellum 1 mm. longum, circa 1 mm. latum prope basim, concavum, profunde retusum, ovatum, margine valde denticulatum, dentibus simplicibus vel bifurcatis. Columna generis.

Oberonia surigaensis is closely related to *O. Wenzelii* Ames, from which species it differs in part in the denticulation of the labellum. The teeth on the labellum of *O. Wenzelii* are confined to the margin of the basal half and are inconspicuously, if at all,

bifurcated. In *O. surigaensis* the margin of the labellum is denticulate up to the deeply retuse tip, some of the teeth being conspicuously bifurcated. In dried specimens the labellum is pale orange, the sepals and petals nearly white.

MINDANAO, Surigao Province, *C. A. Wenzel 01159*, June 4, 1917. 150 meters altitude. Epiphyte in forest. Flowers red.

LIPARIS *L. C. Rich.*

Liparis jarensis *Ames sp. nov.* Aff. *L. Glossulae* Reichb. f., sed in habitu satis dissimilis. Herba epiphytica. Rhizoma repens. Radices elongatae, patentes, albidae. Folium 2.5–4.5 dm. longum, 2.3–5 cm. latum, in sicco prominenter nervosum, petiolatum; lamina oblongo-lanceolata, acuminata, acuta, in sicco chartacea, in petiolum elongatum sulcatum 4–6 cm. longum contracta. Scapus cum racemo usque ad 3 dm. longus, quam folium brevior, infra racemum paucibracteatus, bracteis acutis 3–4 cm. distantibus. Flores virides, in racemo laxo dispositi, bracteis subtendentibus anguste lanceolatis, circa 1 cm. longis, in sicco scariosis. Pedicelli graciles, elongati, cum ovario usque ad 17 mm. longi, vix adscendentes. Sepala lateralia 1 cm. longa, 2 mm. lata, anguste oblonga, acuta. Sepalum dorsale angustius, 11 mm. longum, 1.5 mm. latum, acutum. Petala linearia, 13 mm. longa, 1 mm. lata, uninervia. Labellum suborbiculare, 9 mm. longum, 7.5 mm. latum, apiculatum, denticulatum, basim versus cuneatum, prope basim columnae callus late crescentiformis stat. Columna valde arcuata, super medium alata.

The flower indicates affinity with *Liparis Glossula* Reichb. f., but the leaves are much narrower than in that species. In several specimens examined the leaf and flower shoot arise from between two erect, rigid, ensiform foliaceous sheaths. By the time the leaf has reached its normal size the flowers produced on the subtending scape begin to expand.

LEYTE, Jaro, *C. A. Wenzel 0799* (Type), December 1, 1914. Epiphyte in forest. 700 meters altitude. Flower green; *Wenzel 0813*, December 1, 1914. In forest. 700 meters altitude; *Wenzel 0708*, December 2, 1914. Epiphyte. 600 meters altitude. Flower flesh color.

Liparis monophylla *Ames sp. nov.* Herba epiphytica. Pseudobulbi approximati, 3–10 cm. longi, circa 1 cm. in diametro prope basim pseudobulborum, juniores vaginis foliaceis inclusi, complanati, monophylli. Folium subcoriaceum, variabile, 1.5–4.5 dm. longum, usque ad 7 cm. latum, prominenter nervosum, petiolatum; lamina elliptico-oblonga, acuta, utrinque attenuata, quam pedunculus longior. Petiolus latus, circa 3 cm. longus. Bracteae inflorescentiae ±6 mm. longae, lineares, scariosae, acutae, in sicco albidae, pedicellum aequantes vel excedentes. Pedunculus infra racemum paucibracteatus, brevis, cum racemo 14–22 cm. longus. Flores mediocres, numerosi, in racemo denso cylindraceo spicato dispositi. Racemus ±1.5 dm. longus, circa 1 cm. in diametro, erectus, floribus approximatis. Sepala lateralia oblonga, 3.5 mm. longa, utrinque angustata, subacuta, trinervia. Sepalum dorsale simile. Petala 3.5 mm. longa, linearia, obtusa, uninervia. Labellum crassum, 3 mm. longum, 1.5 mm. latum prope medium, subquadratum, truncatum, obtuse apiculatum, parte basali gynostemio subparallela, parte apicali reflexa. Callus prope columnam in disco labelli, minutus. Gynostemium circa 2 mm. longum, arcuatum.

Liparis monophylla is similar in habit to *L. serrulata* Schltr. It is separable from *L. parviflora* Lindl. by the form of the labellum and by the monophyllous pseudobulbs.

In the material examined the flower shoot was without exception much shorter than the leaf, even in fruiting specimens.

LEYTE, Jaro, *C. A. Wenzel 0673*, November 7, 1914. Epiphyte in forest. Flowers flesh color.

Liparis pallida *Lindl.* Gen. & Sp. Orch. (1830) 31; Miq. Fl. Ind. Bat. 3 (1859) 622; Ridl. in Journ. Linn. Soc. 22 (1886) 296. Malaxis pallida *Bl.* Bijdr. (1825) 391. Leptorchis pallida *O. K.* Rev. Gen. Pl. 2 (1891) 671.

LEYTE, Jaro, *C. A. Wenzel 0930*, January 30, 1915. In forest. 700 meters altitude. Flowers orange yellow; *Wenzel 0908*, March 1, 1915. In forest. 600 meters altitude; *Wenzel 0775*, November 28, 1914. In forest. 500 meters altitude. Sepals and petals brown, labellum green.

Liparis rizalensis *Ames sp. nov.* Pseudobulbi approximati, 3–4 cm. longi, lageniformes, complanati, in sicco valde rugosi, di- vel triphylli. Folia 6–15 cm. longa, ±2.5 cm. lata, articulata, nervosa, coriacea, oblongo-oblanceolata, valde obtusa, quam inflorescentia breviora. Pedunculus terminalis, cum racemo usque ad 3 dm. longus, exalatus. Racemus usque ad 20 cm. longus, sublaxus, multiflorus, arcuatus, cylindraceus, 2 cm. in diametro. Flores ±5 mm. distantes, in sicco flavescentes. Bracteae inflorescentiae scariosae, ±6 mm. longae, oblongo-lanceolatae, acuminatae, acutae, pedicellis longiores. Sepala lateralia 5 mm. longa, 1.75 mm. lata, anguste elliptica, obtusa, trinervia. Sepalum dorsale simile, valde convexum. Petala linearia, 5 mm. longa, .5 mm. lata, obtusa. Labellum 6 mm. longum, crassum, margine minute ciliolato; parte apicali usque ad medium bilobata, 3 mm. longa, 2.5 mm. lata, lobis irregulariter denticulatis; parte basali 3 mm. longa, canaliculata, incrassata, gynostemio subparallela, prope basim leviter bicarinata, cordata. Gynostemium incrassatum, prope medium constrictum, prope apicem utrinque alatum.

Liparis rizalensis is a near ally of *L. pallida* Lindl., *L. bicolor* J. J. Sm., and *L. latifolia* Lindl. The oblique carinate calli at the base of the lip in front of the column and the three-leaved pseudobulbs are distinguishing characters. It is a member of the large and perplexing section Blepharoglossum.

Luzon, Rizal Province, *M. Ramos Bur. Sci. 24070*, December 14, 1915. Epiphyte in river forest.

DENDROBIUM *Sw.*

Dendrobium (§ Ceratobium) **busuangense** *Ames sp. nov.* Caules elongati, 2 m. alti vel altiores, ±1 cm. in diametro, flavidi, foliosi. Folia ±7.5 cm. longa, ±4.5 cm. lata, elliptica, obtusa, valde coriacea, in sicco prominenter nervosa, inaequaliter bilobulata. Vaginae tubulatae, internodiis subaequilongae vel paulo breviores. Inflorescentiae laxe racemosae, plus minusve quindecimflorae, pedunculo tereti, ±5 dm. longo, nonnullis vaginulis tubulatis donato, rachide circa 2 dm. longa. Bracteae inflorescentiae triangulares, acutae, 3 mm. longae. Pedicellus cum ovario gracilis, 4–5 cm. longus. Sepala lateralia 2.5 cm. longa, triangularia, obtusa, apiculata, cum pede gynostemii mentum 1 cm. longum acutum formantia. Sepalum dorsale 2.5 cm. longum, 8 mm. latum, oblongo-lanceolatum, obtusum, septemnervium. Petala 3.5–3.8 cm. longa, 5 mm. lata, erecta, torta, haud undulata, oblonga, obtusa. Labellum 3.2 cm. longum, trilobulatum, subtus canaliculato-concavum, supra tricostatum costa intermedia apice aliformi-elevata; lobi laterales semiovati, margine undulati et irregulariter denticulati; lobus medius ±1 cm. longus, vix 1 cm. latus, oblongus, obtusus. Gynostemium bialatum. Clinandrium denticulatum.

Dendrobium busuangense is a near ally of *D. conanthum* Schltr. The general aspect and habit of the plant suggest *D. taurinum* Lindl., the only other representative of the section Ceratobium known to occur in the Philippine Islands, but it is easily distinguishable from that species by the very different labellum and by the color of the flowers. The sepals and mentum are very pale lavender-purple. The twisted petals and the labellum are green-

ish, tinged with lavender-purple. The carinae of the labellum extend onto the middle lobe, the lateral ones terminating in minute rounded wart-like protuberances. Toward the base and middle of the labellum the lateral carinae are much higher than elsewhere. The middle carina is represented by a thickening of the mid-nerve until it reaches the mid-lobe on which it terminates in an erect plate nearly 4 mm. high. In this respect the general appearance of the middle carina recalls *D. conanthum.* (PLATE 101.)

CALAMIANES ISLANDS, Busuanga, *E. H. Taylor*, October 1918. Type from a plant cultivated at Manila. (The flowers last about two months.)

Dendrobium (§ Rhopalanthe) **polytrichum** *Ames* in Phil. Journ. Sci. 2 (1907) 328; Orchidaceae 2 (1908) 183.

The use of the stems of this species in decorative work in weaving recalls the similar use of *Dendrobium utile* J. J. Sm. in the Moluccas where the stems enter into the fabrication of small articles such as cigar pouches.

LUZON, MINDORO.

ERIA *Lindl.*

Eria mindanaensis *Ames* in Elmer's Leaflets of Phil. Bot. 5 (1912) 1577.

The original specimens of this species were secured by A. D. E. Elmer on Mount Giting-giting on the island of Sibuyan. Why the specific name *mindanaensis* was given to it I am unable to explain. The only material I have seen, aside from specimens recently received from Panay, is that which constitutes the type in my herbarium. I have not received any specimens from Mindanao that are referable to the Sibuyan plants. In June 1919 A. Martelino and G. Edaño collected on Mount Salibongbong, Capiz Province, Panay, and among other orchids they se-

cured excellent material of *E. mindanaensis*. While working on this material for the Bureau of Science Herbarium I discovered the error herein noted.

Island of Panay, Capiz Province, Mount Salibongbong, *Martelino & Edaño Bur. Sci. 35633*, June 21, 1919. Summit of the mountain. 2000 feet altitude. Sepals and petals yellow, lip pink; Libacao, Capiz Province, *Martelino & Edaño Bur. Sci. 35379*, June 12, 1919. On tree at low altitude. Flowers white. Stems 1.5 dm. tall.

AGROSTOPHYLLUM *Bl.*

Agrostophyllum leytense *Ames sp. nov.* Herba gracilis. Caules elongati, vaginis foliorum obtecti, ±2 dm. longi, valde complanati. Folia disticha, ±2 cm. longa, ±4 mm. lata, obcuneato-oblonga, bilobata, breviter mucronata. Vaginae foliorum caulem obtegentes, bicuspidatae, circa 7 mm. longae, longitudinaliter rugosae. Flores in capitulis sublaxis circa 1 cm. longis dispositi, albidi. Pedunculi abbreviati, vaginulis paucis imbricantibus obtecti. Bracteae flores subtendentes glumaceae, oblongo-lanceolatae. Sepala lateralia circa 3.5 mm. longa, prope basim 2.5 mm. lata, late triangulari-ovata, acuta, mentum apertum formantia. Sepalum dorsale 3.5 mm. longum, oblongo-ovatum, valde concavum. Petala circa 3 mm. longa, subspathulata, acuta. Labellum circa 3.5 mm. longum, leviter saccatum vel valde concavum prope columnam, oblongo-ovatum, subacutum, ecallosum, marginibus involutis. Gynostemium breve, incrassatum.

Agrostophyllum leytense is allied to *A. celebicum* Schltr. and *A. stipulatum* Schltr.

Leyte, Jaro, *C. A. Wenzel 0597* (Type), October 13, 1914. In forest. 700 meters altitude. Sepals and petals white. Lip yellowish; *Wenzel 0632*, November 10, 1914. Epiphyte in forest. 600 meters altitude; *Wenzel 0654*, November 14, 1914. Epiphyte in forest. 600 meters altitude.

SPATHOGLOTTIS *Bl.*

Spathoglottis Vanoverberghii *Ames sp. nov.* S. tomentosa *Ames* Orch. 2 (1908) 163, non Lindl. (as to specimens from Luzon). Pseudobulbi breviter cylindracei, circa 3 cm. longi, 2.5 cm. in diametro prope basim, valde rugosi, vaginis tecti. Folia (non visa) in anthesi absunt. Pedunculus ±2 dm. altus, rigidus, erectus, superne minute tomentosus, infra racemum bracteis quattuor ±15 mm. longis tubularibus oblique truncatis acutis. Bracteae inflorescentiae ±1 cm. longae, cymbiformes, late ovatae, dense pubescentes, pedicellis breviores. Flores succedanei, in racemo usque ad 18 cm. longo dispositi; rachis sub anthesi abbreviata. Pedicelli cum ovario graciles, pubescentes, 2–3 cm. longi. Sepala lateralia ±2 cm. longa, 7–8 mm. lata, elliptico-lanceolata, acuta, pubescentia. Sepalum dorsale simile. Petala 2 cm. longa, 12–13 mm. lata, late ovata, obtusa. Labellum 1.3–1.4 cm. longum, trilobatum; lobi laterales 1–1.2 cm. longi, usque ad 6 mm. lati, oblongi, subdolabriformes; lobus medius 1.1 cm. longus, unguiculatus, prope basim bilobulatus lobulis pubescentibus, apice flabellatus, retusus; in disco, prope basim labelli, callo crescentiformi valde incrassato. Gynostemium circa 13 mm. longum, gracile, arcuatum, utrinque alatum.

Luzon, Bontoc Subprovince, *Father M. Vanoverbergh 163*, December 18, 1910.

BULBOPHYLLUM *Thou.*

Bulbophyllum (§Sestochilus) **costatum** *Ames sp. nov.* Radices fibratae, ramosae. Rhizoma repens, lignosum. Pseudobulbi 2–3 cm. longi, pyriformes, rugosi, circa 2 cm. inter se, monophylli. Folium cum petiolo ±1.3 dm. longum, 3–4 cm. latum, erectum, valde coriaceum, oblongo-ellipticum. Petiolus ±3 cm. longus, rigidus. Scapus ±7 cm. longus, a basi pseudobulbi ortus,

erectus, foliis brevior, uniflorus, paucibracteatus, bracteis tubularibus 1–1.5 cm. longis. Sepala lateralia 2.8 cm. longa, ±8 mm. lata, lanceolata, acuta, septemnervia, purpureo-striata. Sepalum dorsale 2.8 cm. longum, valde concavum, extus quinquecostatum costis valde pustulatis, purpureo-maculatum, acutum. Petala vix 3 cm. longa, prope basim 6 mm. lata, triangulari-falcata, usque ad apicem attenuata, acuta, purpureo-maculata, pustulata. Labellum vix 1 cm. longum, valde curvatum, linguiforme, disco bicarinato, retusum vel bilobulatum, extus et intus minute glanduloso-pubescens, prope apicem pustulatum. Stelidia gynostemii 3 mm. longa.

Allied to *Bulbophyllum maculosum* Ames, but distinct from that species in the elongated scapes and blunt-tipped leaves.

Leyte, *C. A. Wenzel 0665*, November 15, 1914. Epiphyte in forest. 600 meters altitude. Flowers yellow marked with six purple stripes on the lateral sepals and spotted with purple on the upper sepal and petals.

Bulbophyllum (§Racemosae) **hortensoides** *Ames sp. nov.* Radices numerosae, fibratae, elongatae. Rhizoma repens, pseudobulbis approximatis, more sectionis quam maxime subpressis, ±4 mm. altis, circa 6 mm. in diametro, unifoliatis. Folium coriaceum, cum petiolo 2.5–3.5 dm. longum; lamina 2 dm. longa, usque ad 4.5 cm. lata, anguste oblongo-elliptica, in sicco valde nervosa, nervis prominentibus. Petiolus circa 9 cm. longus, circa 4 mm. in diametro, sulcatus, rigidus, in sicco valde rugosus, subteres. Scapus ±20 cm. longus, a basi pseudobulbi ortus, cum racemo foliis brevior, infra racemum bracteis laxis ancipitibus imbricantibus. Racemus ±12 cm. longus, densiflorus, cylindraceus, ±1 cm. in diametro, bracteosus. Bracteae inflorescentiae 5–10 mm. longae, in sicco scariosae, lineari-triangulares, acuminatae, pedicello cum ovario longiores. Flores flavidi. Sepala lateralia triangularia, circa 1 cm. longa, prope basim vix 3 mm. lata,

trinervia, caudata. Sepalum dorsale 9 mm. longum, triangulari-lanceolatum, acutum. Petala minuta, 2 mm. longa, .75 mm. lata, oblonga, acuta, uninervia. Labellum vix 3 mm. longum, lingulatum, trilobatum; lobi laterales erecti, rotundati; lobus medius oblongus, obtusus, callo oblongo in disco, minute verruculosus. Gynostemium antice bicuspidatum.

Closely allied with *Bulbophyllum hortense* J.J. Sm. which has longer, looser racemes and very different flowers in which the lateral sepals are more caudate at the tip and less triangular. *B. odoratum* Lindl., another nearly related species, is in part distinguished by its triangular sepals that are hardly, if at all, caudate. Among Philippine species, *B. hortensoides* is most closely allied with *B. leytense* Ames, from which it differs in the structure of the labellum. As in *B. prianganense* J.J. Sm., *B. hortense* J. J. Sm. and *B. leytense* Ames, the scape is concealed from its base to the lowermost flower of the raceme by conspicuous, ancipitous, imbricating, foliaceous sheaths. The elongated callus, rounded in front, that reaches almost to the apex of the middle lobe of the labellum is of diacritical value in separating *B. hortensoides* from its Philippine allies. When highly magnified the sepals are pustulose.

LEYTE, Jaro, *C. A. Wenzel 0771* (Type), November 28, 1914. In forest. Epiphyte. 600 meters altitude. Flowers yellow; *Wenzel 0649*, November 13, 1914. In forest. 600 meters altitude.

Bulbophyllum (§ Racemosae) **jarense** *Ames sp. nov.* Radices fibratae, circa 2 mm. in crassitudine, numerosae. Pseudobulbi valde abbreviati, circa 6 mm. alti, ±5 mm. in diametro, longitudinaliter rugosi, vaginis mox in fibras solutis inclusi, monophylli. Folium longe petiolatum, cum petiolo ±3.5 dm. longum, valde coriaceum, rigidum; lamina anguste elliptica vel oblanceolata, circa 25 cm. longa, 7.5–10 cm. lata, obtusa, nervosa; peti-

olus circa 1 dm. longus, sulcatus, in sicco 3 mm. in diametro. Scapus elongatus, circa 3.5 dm. longus, gracilis, infra racemum bracteis 2.5–3.5 cm. longis, laxis ancipitibus approximatis vix imbricantibus vestitus. Racemus elongatus, usque ad 27 cm. longus, circa 2 cm. in diametro, subdensiflorus. Bracteae inflorescentiae 6–7 mm. longae, lineari-triangulares, in sicco scariosae, acutae, pedicellis longiores. Pedicellus cum ovario 3 mm. longus, glaber. Flores numerosi, circa 8 mm. longi, glabri. Sepala lateralia lineari-triangularia, circa 8 mm. longa, prope medium 1.5 mm. lata, prope apicem valde incrassata, sulcata, breviter caudata, mentum rotundatum formantia. Sepalum dorsale simile, marginibus involutis. Petala vix 7 mm. longa, .5 mm. lata, linearia, acuta, super medium usque ad apicem incrassata. Labellum 3 mm. longum, lingulatum, limbo anguste oblongo-lanceolato; lobi laterales rotundati, erecti; discus bicarinatus, carinis elongatis, flexuosis. Gynostemium crassum, antice bicuspidatum, cuspidibus elongatis, valde acutis.

Bulbophyllum jarense is a near relative of *B. hortensoides* from which species it is distinguishable through its longer petals, bicarinate lip and denser racemes of flesh colored flowers spotted with red.

Leyte, Jaro, *C. A. Wenzel 0761*, November 27, 1914. Epiphyte in forest. 500 meters altitude. Flowers flesh color and red.

Bulbophyllum (§ Racemosae) **masaganapense** *Ames sp. nov.* Rhizoma repens. Radices numerosae, ramosae, glabrae. Pseudobulbi abbreviati, 3–4 mm. alti, ±3 cm. distantes, monophylli. Folium cum petiolo 14–30 cm. longum, coriaceum, erectum, in sicco nervosum; lamina oblonga, 9–19 cm. longa, circa 3 cm. lata, utrinque attenuata, obtusa, petiolo rigido ±6 cm. longo sulcato. Scapus 10–21 cm. longus, adscendens, infra racemum bracteis tubulatis usque ad 2 cm. longis vestitus. Racemus

laxiflorus, ±1 dm. longus, ±1 cm. in diametro. Bracteae inflorescentiae lanceolatae, ±8 mm. longae. Flores albidi, circa 1 cm. longi, carnosi. Sepala lateralia circa 9 mm. longa, basi 4.5 mm. lata, triangularia, breviter caudata, prope apicem marginibus involutis, mentum apertum formantia. Sepalum dorsale oblongum, 8.5 mm. longum, 2.5 mm. latum, super medium attenuatum, acuminatum, acutum, trinervium, ad basim concavum. Petala quam sepala multo minora, 4.5 mm. longa, circa 2 mm. lata, subspathulata, obtusa, minute papillosa, carnosa, nervo medio conspicuo. Labellum 5.5 mm. longum, carnosum, lingulatum, lamina super lobos laterales anguste elliptica, obtusa; lobi laterales semiorbiculares; discus prope basim bicallosus, callis carnosis papilliformibus. Gynostemium breve, antice breviter bicuspidatum.

Bulbophyllum masaganapense is closely related to *B. leytense* Ames from which it differs in its greater size, looser raceme, larger flowers and longer floral bracts.

LEYTE, Jaro, Masaganap, *C. A. Wenzel 0681*, November 19, 1914. Epiphyte in forest. 600 meters altitude. Flower white.

Bulbophyllum (§ Pelma) **philippinense** *Ames sp. nov.* Rhizoma flexuosum, elongatum. Pseudobulbi arcte adpressi, 1.5–2 cm. longi, remoti, fusiformes, monophylli, in sicco valde longitudinaliter rugosi, flavidi, leviter arcuati. Folium 3–6 cm. longum, 5–13 mm. latum, oblongo-lanceolatum, utrinque attenuatum, acutum, breviter petiolatum, in sicco vix coriaceum, nervosum. Inflorescentiae ad nodos rhizomatis, brevissimae, racemosae, pauciflorae, circa 1 cm. longae. Bracteae inflorescentiae infundibuliformes, scariosae, circa 2 mm. longae. Flores parvi, sepala petalaque carnea, labello aurantiaco. Sepala lateralia 2.5 mm. longa, 1 mm. lata, lanceolata, ad apicem cucullato-conduplicata, apiculata, carinata. Sepalum dorsale simile, 2 mm. longum. Petala cuneato-oblonga, truncato-obtusa, circa 1.5 mm. longa,

uninervia. Labellum 1 mm. longum, circa 1 mm. latum, circa .5 mm. in crassitudine, quadrilaterum, cum pede columnae continuum, infra apicem insertum, postice excavatum. Pes columnae ad apicem liber, erectus, lamellam transversam simulans.

Bulbophyllum philippinense is a member of the group to which belong *B. colliferum* J. J. Sm., *B. fractiflexum* J. J. Sm., and *B. Pelma* J. J. Sm. From the nearly related *B. absconditum* J. J. Sm. and *B. neo-caledonicum* Schltr. it is distinguished by the several-flowered inflorescence. For the species of this alliance Schlechter has proposed the section Pelma based on the bitypic genus Pelma proposed by A. Finet. In Fedde's Repertorium 10 (1912) 488, J. J. Smith had previously suggested the advisability of uniting *B. absconditum* and *B. subcubicum* J. J. Sm. into a section for which the name Pelma might well be adopted. Schlechter includes in § Pelma a number of species that have more than one flower on the peduncle and thus differ from the species on which Finet relied for the characterization of his genus. The foot of the column is free and erect and at the tip appears like a transverse lamella. The labellum is inserted below the tip of the column-foot on its outer side. As at present limited the section Pelma includes no less than twenty-seven species, the greater part of which are natives of New Guinea.

LEYTE, Jaro, *C. A. Wenzel 0659*, November 13, 1914. Epiphyte in forest. 500 meters altitude. Sepals and petals flesh color, labellum orange.

Bulbophyllum (§ Racemosae) **sempiternum** *Ames sp. nov.* Rhizoma longe repens, radicibus flexuosis instructum. Pseudobulbi subapproximati vel 2 cm. distantes, parvi, cylindracei, 2–3 mm. alti, longitudinaliter rugosi, monophylli. Folium cum petiolo ±20 cm. longum, ±2 cm. latum, variabile, anguste oblongo-oblanceolatum, ad basim valde attenuatum, obtusum, valde coriaceum; petiolus ±5 cm. longus, rigidus, erectus, sulcatus; lamina

±15 cm. longa, nervosa, nervo intermedio prominenti. Scapus cum racemo ±3 dm. longus, gracilis, infra racemum bracteis tubulatis vestitus. Bracteae inflorescentiae 5–10 mm. longae, rigidae, triangulari-lanceolatae, valde acutae, ±5 mm. distantes, quam pedicellus cum ovario longiores. Racemus elongatus, ±15 cm. longus. Flores carnei et aurantiaci, numerosi, succedanei, eodem tempore perpauci aperti. Sepala lateralia 5 mm. longa, triangularia, acuta, carnosa, mentum apertum formantia. Sepalum dorsale 5 mm. longum, oblongo-lanceolatum, concavum. Petala 2 mm. longa, lanceolata. Labellum 2.5 mm. longum, linguiforme, carnosum, ecallosum. Gynostemium breve, antice bicuspidatum.

This species is represented in my herbarium by numerous specimens that exhibit a wide range of variation. The rigid bracts of the inflorescence, that in dried specimens have the appearance of thorns or spines; the elongated racemes, that sometimes have expanding flowers at the tip and ripe capsules at the base; the narrowly oblong-oblanceolate leaves, that in dried specimens take on a bronzy hue are characteristics that set this species apart from its Philippine allies. The flowering season must be a long one, as the flowers seem to open in succession, few being expanded at one time.

Leyte, *C. A. Wenzel 0595* (Type), October 12, 1914. Flowers flesh color, lip orange; *Wenzel 0893*, February 28, 1915. In forest. 700 meters altitude; *Wenzel 0589*, October 10, 1914; *Wenzel 0260*, February 11, 1914. 750 meters altitude; *Wenzel 0555*, October 1, 1914. 500 meters altitude; *Wenzel 0841*, February 10, 1915. 500 meters altitude; *Wenzel 0287*, March 4, 1914; *Wenzel 0849*, February 11, 1915. 600 meters altitude; *Wenzel 0607*, October 23, 1914; *Wenzel 0675*, November 17, 1914. 600 meters altitude; *Wenzel 0546*, September 27, 1914. 700 meters altitude; *Wenzel 0810*, December 31, 1914. 700 meters altitude; *Wenzel 0848*, February 11, 1915. 600 meters altitude; *Wenzel 0873*. 700 meters altitude; *Wenzel 0472*, June 26, 1914. 500 meters altitude; *Wenzel 0820*, December 15, 1914. 700 meters altitude; *Wenzel 0610*, November 7, 1914.

500 meters altitude; *Wenzel 0913*, February 2, 1915. 500 meters altitude; *Wenzel 0524*, September 9, 1914. 500 meters altitude; *Wenzel 0751*, November 25, 1914. 500 meters altitude; *Wenzel 0442*, June 10, 1914. 500 meters altitude.

GEODORUM *Jackson.*

Geodorum nutans (*Presl*) *Ames* Orchidaceae 2 (1908) 164.

Native names for this species are *Camaog*, *Lubi lubi* and *Cola* from the Spanish *cola* meaning glue. This plant is used for its adhesive properties. The rhizomes are split and the pulp rubbed on surfaces that are to be fastened together. It serves in the Philippines as a glue in the manufacture of musical instruments. The economic importance of the plant is indicated in Blanco's name, *Arethusa glutinosa*. The rhizomes contain about fourteen per cent of a water-soluble adhesive. Cf. Wells in Phil. Journ. Sci. 14 (1919) 4.

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

ACRIOPSIS *Reinw.* ex Bl.

Acriopsis floribunda *Ames sp. nov.* Planta *Acriopsi javanicae* habitu omnino congruens, pseudobulbis caespitosis, 4–7 cm. longis, ovatis, costatis et annulatis, foliis ternis, coriaceis, oblongo-ligulatis, erecto-patentibus, acutis vel subobtusis, ±1.5 dm. longis, 8–18 mm. latis. Scapus ±3 dm. longus, gracillimus, erectus, plus minusve flexuosus, vaginis nonnullis late ovatis amplectentibus. Flores numerosi, in panicula laxa dispositi. Bracteae inflorescentiae minutae, 1 mm. longae, acutae, in sicco scariosae, quam pedicellus multo breviores. Pedicellus cum ovario ±6 mm. longus, pergracilis, glaber. Sepala subpatentia, ligulata, obtusa, lateralia ad apicem inter se connata, 8 mm. longa, ±2 mm. lata, valde convexa vel cymbiformia. Sepalum dorsale 8 mm. longum, arcuatum, valde concavum, obtusum. Petala obovato-spathulata,

obtusissima, sepalis paulo breviora, quinquenervia, 3 mm. lata prope apicem. Labellum 6 mm. longum, trilobum, basi fere usque ad stigma columnae connatum, deinde liberum, porrectum, late et breviter unguiculatum; lobi laterales 1 mm. longi, subquadrati; lobus medius elongatus, anguste spathulatus, valde obtusus, ±4 mm. longus, 1 mm. latus prope apicem; discus inter lobos laterales longitudinaliter bilamellatus, lamellis membranaceis erectis, in appendices duas quadratas productus. Columna more generis elongata, basi antice ungue labelli connata, calcar gibbosum formans. Clinandrium more generis permagnum, cucullatum, marginibus crenulatum, antheram obtusam occludens. Rostellum triangulare. Stelidia (vel appendices stigmaticae) antice producta, rostello duplo longiora, obtusa, ad apicem callosa. Pollinia elongata, 1 mm. longa, utrinque attenuata.

Acriopsis floribunda is similar to *A. sumatrana* Schltr. in the crenulate margined clinandrium. It is at once separable from *A. javanica* Reinw. ex Bl. by means of the much larger flowers, the elongated linear-spatulate middle lobe of the labellum and the callosities of the stelidia tips of the column.

Bucas Grande Island, *Ramos & Pascasio Bur. Sci. 35112*, June 10, 1919. In dry forest on trunk of tree. Flowers greenish yellow.

Acriopsis indica *Wight* Icon. 5 (1852) t. 1748, f. 1.

This species has not heretofore been reported as a native of the Philippines. It is readily distinguished from *Acriopsis floribunda* and *A. javanica* by the simple labellum.

Luzon, Kalinga Subprovince, *George Boettcher*, 1918. Flowers yellow. India, Java, Borneo.

KINGIELLA *Rolfe.*

Kingiella philippinensis (*Ames*) *Rolfe* in Orch. Rev. 25 (1917) 197. Doritis philippinensis *Ames* Orch. 2 (1908) 235, fig.

The type of the genus *Doritis*, *D. pulcherrima* Lindl., proves

to be *Phalaenopsis Esmeralda* Reichb. f. Rolfe maintains this species as a true *Doritis* and for the species referred to *Doritis* proposes a new generic concept with the name *Kingiella*.

Luzon, Palawan.

VANDA *Jones.*

Vanda luzonica *Loher* ex Rolfe in Orch. Rev. 23 (1915) 137, f. 12, p. 371; Bot. Mag. (1917) t. 8709.

Pedicel and ovary white. Flowers odorless. Sepals white, irregularly splotched and stained near the apex with rose purple. Petals similar, but with the purplish markings extending in broken lines to the base. Labellum rose purple with six purple basal lines; lateral lobes white. Spur white. This description was taken from a fresh specimen which bloomed in the collection of Edwin S. Webster at Chestnut Hill, Massachusetts, in January 1920. This specimen differs from the one figured in the Botanical Magazine in that the purple markings on the sepals and petals are diffuse and not concentrated.

Vanda tricolor Lindl. is the nearest relative of the species.

Luzon.

EUANTHE *Schltr.*

Euanthe Sanderiana *Schltr.* Die Orchideen (1915) 567. Esmeralda Sanderiana *Reichb. f.* in Gard. Chron. n. s. 17 (1882) 588. Vanda Sanderiana *Reichb. f.* in Gard. Chron. n. s. 17 (1882) 588.

Mindanao.

SACCOLABIUM *Bl.*

Saccolabium tenellum *Ames sp. nov.* Herba epiphytica. Caulis brevis, vix 1 cm. altus, complanatus, vaginis foliorum obtectus. Folia 2–3 cm. longa, ±7 mm. lata, oblongo-lanceolata,

inaequaliter bilobata, quam pedunculus breviora. Pedunculus cum racemo 3–6 cm. longus, multiflorus, angulatus. Bracteae inflorescentiae ±1 mm. longae, pedicellis breviores, lineari-lanceolatae. Racemus usque ad 4 cm. longus. Flores minuti, virides, labello albido. Sepala petalaque uninervia. Sepala lateralia circa 2 mm. longa, prope apicem incrassata. Sepalum dorsale simile. Petala subspathulata, obtusa. Labellum circa 2 mm. longum, leviter trilobatum, basi gynostemii adfixum, profunde saccatum; lobi laterales vix distincti; lobus medius carnosus, semiovatus, obtusus. Gynostemium generis, apodum. (PLATE 99.)

LEYTE, *C. A. Wenzel 0988*, April 18, 1912. In forest at sea level.

POMATOCALPA *Breda.*

Pomatocalpa Merrillii *Schltr.* in Fedde Rep. Beihefte 1 (1913) 988. Cleisostoma Kunstleri *Ames* in Phil. Journ. Sci. C. Bot. 6 (1911) 54, not Hook. f.

NEGROS, POLILLO, PERAK.

MICROSACCUS *Bl.*

Microsaccus brevifolius *J. J. Sm.* in Ic. Bogor. 3 (1906) 63, t. 225.

Material that agrees satisfactorily with Smith's diagnosis of *M. brevifolius* has recently been received from Mindanao, District of Davao. It is the second representative of the genus to be reported from the Philippines. From *M. Wenzelii* Ames it is separable through the more slender habit, the distichous equitant leaves being only about 1 cm. long.

MINDANAO, District of Davao, Madaum, *C. A. Wenzel 010003*, December 20, 1915. Found at sea level. Epiphyte in forest.

TAENIOPHYLLUM *Bl.*

Taeniophyllum leytense *Ames sp. nov.* Herba epiphytica, polyrhiza, radicibus numerosissimis, filiformibus, elongatis, flexuosis, glabris, applanatis, patentibus, 2–10 cm. longis, 1–1.5 mm. latis. Caules vix distincti. Scapus gracilis, usque ad 4.5 cm. longus, vix .5 mm. in crassitudine. Racemus usque ad 2 cm. longus, fractiflexus, floribus 2 mm. longis, viridibus; sepalis circa 2 mm. longis, lineari-lanceolatis, acutis, usque ad medium fere cum petalis connatis, lateralibus margine anteriore liberis. Petala sepalis latiora. Labellum concavum, lanceolatum, acutum; lamina lanceolata, apice superne appendice subulata refracta donato. Saccus rotundatus, lateraliter compressus. Gynostemium incrassatum, minutum.

This species is closely allied to *Taeniophyllum usneoides* Schltr. from Celebes, but is smaller with much more slender and shorter scapes. Also closely allied to *T. glandulosum* Bl. from Java.

Leyte, *C. A. Wenzel 0998*, May 14, 1916. At sea level.

The preceding papers in this series were published in the Philippine Journal of Science: *I in vol. 4. C. Botany, pp. 593–600; II in vol. 4. C. Botany, pp. 663–676; III in vol. 6. C. Botany, pp. 35–56; IV in vol. 7. C. Botany, pp. 1–27; V in vol. 7. C. Botany, pp. 125–143; VI in vol. 8. C. Botany, pp. 407–440.*

PLATE 98

PLATE 98 : *Oberonia leytensis*
Plant, drawn natural size. Flower much enlarged.


Pl. 98
OBERONIA leytensis Ames

PLATE 99

PLATE 99: *Saccolabium tenellum*
Plant, drawn natural size. Flower much enlarged.



SACCOLABIUM *tenellum Ames*

PLATE 100

PLATE 100: *Philippinaea Wenzelii*

I. Plant reduced one half. II. Inflorescence natural size. 1, labellum and gynostemium, pollinia removed. 2, labellum and gynostemium, pollinia in position. 3, pollinia. 4, labellum sac open to show clavate processes on the lateral wall.


PHILIPPINAEA
Wenzelii
Schltr. & Ames
1
2
3
4
II
I
Pl. 100

PLATE 101

PLATE 101: *Dendrobium busuangense*
Plant and inflorescence, drawn natural size. Lip, drawn natural size. All drawn from the type.



DENDROBIUM *busuangense Ames*

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