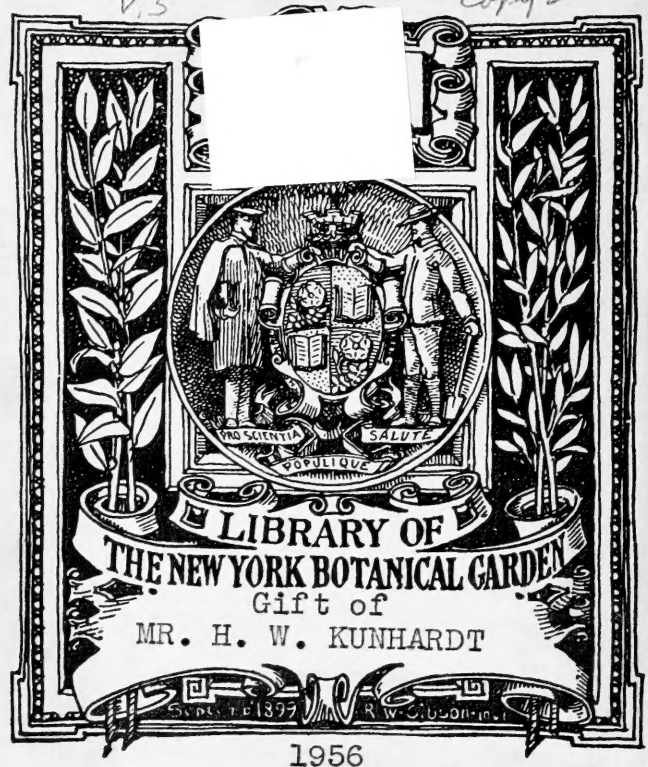


STUDIES IN THE FAMILY ORCHIDACEÆ

OAKES AMES A. M.

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ORCHIDACEÆ

III

UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

PHYSICS 350

1990

ORCHIDACEÆ

ILLUSTRATIONS AND STUDIES OF
THE FAMILY ORCHIDACEÆ
ISSUED FROM THE AMES BOTANICAL LABORATORY
NORTH EASTON, MASSACHUSETTS

BY
OAKES AMES

A. M., F. L. S.



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To A. C. A.



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OBSERVATIONS ON THE GENUS
DENDROCHILUMIN WHICH A NEW SECTION IS PROPOSED AND FOUR NEW
SPECIES ARE DESCRIBED

THE division of the genus *Dendrochilum* into five subgenera by Pfitzer and Kränzlin* is based primarily on peculiarities of the vegetative structure and secondarily on characters of the gynostemium and labellum. The spirit of this treatment is in full accord with the views clearly expressed by Pfitzer in his *Entwurf einer natürlichen Anordnung der Orchideen* (1887), where he says that the vegetative parts of the Orchidaceæ are the most reliable for a natural classification of the genera, and that the floral parts, being of a less stable nature, are not to be relied on to any great extent, if we except the larger divisions of the family.

A profound knowledge of the morphology of the Orchidaceæ is, of course, indispensable in all critical work tending toward a rational classification. Without it, serious blunders must of necessity creep in and vitiate results. The vegetative parts of orchids, however, are frequently the most puzzling to interpret correctly in a system of classification based in the main upon them, and have led to unfortunate errors in judgment where the genus *Dendrochilum* is concerned. In 1888, when Pfitzer's arrangement of orchid genera appeared in Engler and Prantl's *Die*

* *Das Pflanzenreich*, 32 Heft (iv. 50. II. B. 7).

natürlichen Pflanzenfamilien, *Dendrochilum* proper (§ *Eudendrochilum*), distinguished from *Platyclinis* by a lateral inflorescence and leaves duplicative in the bud, was placed in the *Bolbophyllinæ*, fifty-two pages distant from the *Cœlogyninæ*, in which *Platyclinis* was placed. In 1907 Pfitzer and Kränzlin, in accordance with the views of J. J. Smith, combined *Dendrochilum* and *Platyclinis*, making *Platyclinis* a subgenus of the former. This radical change proves conclusively that vegetative variations may arise which disturb materially a system of classification based almost exclusively upon vegetative parts. Furthermore, the results are annoying if morphological exceptions occur when vegetative characteristics are employed in casting large groups.

Notwithstanding the opinions held by Pfitzer regarding the advisableness of placing more reliance on vegetative than on floral structures in the classification and arrangement of the *Orchidaceæ*, the genus *Dendrochilum*, in my judgment, may be more naturally subdivided if the species are grouped into subgenera, or sections, according to the peculiarities of the gynostemium. This system has one difficulty, namely, the necessity of examining minute details, which may be thought too great for convenience; but as a knowledge of the species of *Dendrochilum* is only to be had after careful analysis of the flowers, this inconvenience is not so great as at first it may seem to be.

§ *Acoridium* is clearly set off from § *Platyclinis* and § *Eudendrochilum* by the absence from the gynostemium of stelidia. § *Eudendrochilum* is distinguished from the other sections, or subgenera, by its laterally produced flower shoot (which arises from the base of a pseudobulb), although agreeing with § *Platyclinis* in possessing stelidia. These three sections include without undue violence to affinities all known species of *Dendrochilum*, if we except the Philippine species described as *D. Woodi-*

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anum, a plant which has all the distinctive floral characteristics of §*Acoridium* and the lateral flower-shoot characteristic of §*Eudendrochilum*. *D. Woodianum* bears the same relationship to §*Acoridium* which §*Eudendrochilum* bears to §*Platyclinis*; consequently I have assigned it to a new section in the following conspectus, where it stands as a transitional section between §*Acoridium* and §*Eudendrochilum*.

CONSPECTUS SECTIONUM GENERIS DENDROCHILI

A. *Stelidia columnæ nulla*

1. Pedunculus terminalis
2. Scapus lateralis

- I. *Acoridium*
- II. *Pseudacoridium*

B. *Stelidia columnæ conspicua vel rarissime rudimentaria*

1. Scapus lateralis
2. Pedunculus terminalis

- III. *Eudendrochilum*
- IV. *Platyclinis*

NOTE. The stelidia of the column in §*Platyclinis* may be rudimentary, and either basal or terminal. In the latter case they may have the appearance of being segments of the terminal wing which surrounds the androclinium. Examples of this are to be found in *D. Mearnsii*, *D. bicallosum*, *D. Copelandii* and *D. graciliscapum*, species which approach in aspect those of §*Acoridium* and form, perhaps, a connecting group between §*Platyclinis* and §*Acoridium* (cf. plates 21–24, ORCHIDACEÆ, Fasc. II). *Dendrochilum* (§*Acoridium*) *Foxworthyi*, which resembles *D.* (§*Platyclinis*) *graciliscapum* Pfitz. in general aspect and is unique among the species of §*Acoridium* because of its simple labellum, does not possess stelidia.

In §*Platyclinis* there is much similarity in the floral structure of many species, which is extremely confusing and conducive to the belief that specific distinctions have been too finely drawn. As examples of this similarity, *D. uncatum* Reichb. f., *D. gracile*

Hook. f., *D. longispicatum* Ames, *D. Clemensiae* Ames, and *D. latifolium* Lindl. may be cited. All of these species, however, differ from each other in their vegetative development and in the position of the stelidia on the gynostemium. The whole section is readily separated into three groups distinguished by having an entire, or obscurely 3-lobed, or conspicuously 3-lobed, labellum.

Dendrochilum pumilum Reichb. f. This species was originally described by H. G. Reichenbach f. in *Bonplandia* on page 222 of the third volume (1855). The description was drawn from material gathered by H. Cuming in the Philippine Islands and distributed as herbarium specimens under the number 2102. In 1861 Reichenbach, in accordance with other sweeping changes, referred *D. pumilum* to the genus *Cœlogyne* in Walpers's *Annales Botanices Systematicæ* (6: 236).

Until very recently nothing had been done to clear away the seemingly unavoidable obscurity under which this species has remained. In his review of the genus *Dendrochilum*, J. J. Smith doubtfully referred *D. pumilum* to the section *Eudendrochilum*.* In the Pfitzer-Kränzlin treatment of the *Cœlogyne* it is placed among the dubious species as insufficiently known. In my studies of the orchid flora of the Philippine Islands for the second fascicle of this work, I searched for specimens representative of Cuming's no. 2102, and discovered one in the herbarium of the British Museum. I have compared this specimen carefully with the description published by Reichenbach, and with specimens from the Philippines which I had provisionally determined to be *D. pumilum*. Reichenbach's description in *Bonplandia* is not all that one might desire to elucidate an am-

* In Walpers's *Annales Botanices Systematicæ* 6: 927 Reichenbach refers this species to §*Eudendrochilum*. It is presumable, however, that he did so through a misinterpretation of Cuming's material.

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biguous species, but taken in conjunction with the material in the herbarium of the British Museum it is reasonably serviceable. At least it is conclusive, in my opinion, in determining that Reichenbach's plant was a *Dendrochilum*, and to make that point sure is to advance toward a comprehension of what he described as *D. pumilum*. The semifusiform pseudobulbs, about 1 inch long, the linear-lanceolate leaves, 3 inches long, the maculate sheaths, the large floral bracts, subequalling the ovaries, the lanceolate sepals and broader cuneate-ovate petals, and the very short labellum and gynostemium, described by Reichenbach, are descriptive of the material in the British Museum, and are furthermore characteristic of a small group of Philippine species which belong to §*Acoridium*. These facts, taken together with the Cuming specimen and the number under which it was distributed, leave very slight doubt in my mind regarding *D. pumilum*. Reichenbach's description of the labellum is, it is true, quite inadequate, but not wholly without value when interpreted by the Cuming plant in the British Museum.

To establish absolute certainty regarding *D. pumilum*, nothing but the type specimen, which is presumably deposited in Reichenbach's sealed herbarium, will suffice; but in the absence of that, there appears to be no well founded reason for disregarding the specimens distributed by Cuming under no. 2102. It was on this evidence that I included *D. pumilum* in my list of Philippine orchids in the second fascicle of this series, and published a camera-lucida drawing of a flower taken from the specimen in the British Museum.

Dendrochilum rhombophorum (Reichb. f.) *comb. nov.* In connection with *D. pumilum*, mention should be made of *Cœlogyne* (*Pholidota*) *rhombophora*, a Philippine species described by

Reichenbach f. in *Linnaea* 41:116, which, he states, is allied with "*Cœlogyne pumila* (*Dendrochilum?* *pumilum*)." From the description it is quite impossible to ascertain what Reichenbach's species may have been. That it includes *Dendrochilum affine*, *D. simulacrum*, *D. anfractum* or *D. cinnabarinum* is highly probable, but in the absence of types with which to make comparisons, I have deemed it best not to attempt to identify *Cœlogyne rhombophora* by purely conjectural methods. Pfitzer and Kränzlin refer *C. rhombophora* to the genus *Pholidota* in their treatment of the Cœlogyninæ, but merely on presumption, guided by Reichenbach's suggestion. Neither author had been able to discover authentic material. It is a significant fact, however, that Reichenbach should have alluded to *Dendrochilum pumilum* as a near affinity of *Cœlogyne rhombophora*. In view of the foregoing discussion regarding *D. pumilum*, I prefer to place *Cœlogyne rhombophora* in the genus *Dendrochilum*, being fully convinced that Reichenbach's description in *Linnaea* and his reference to *Dendrochilum pumilum* warrant such a proceeding.

Dendrochilum (§ *Acoridium*) **Foxworthyi** *sp. nov.* *Herbæ* habitu cæspitosæ. *Pseudobulbi* fusiformes, dense aggregati, graciles, 1–2 cm. longi, monophylli, *bracteis* elongatis maculatis vaginati. *Folia* lineari-oblonga, obtusa vel subacuta, apiculata, 6–14 cm. longa, 5 mm. lata, paulatim in *petiohum* gracilem angustata. *Pedunculus* gracilis, foliis æquilongus vel subbrevior. *Spica* cum pedunculo 1.5–2 dm. longa, densa. *Bracteæ* glumaceæ, ovaria superantes, 2 mm. longæ. *Sepala lateralialia* oblongi-lanceolata, acuta, 3-nervia, 2 mm. longa, 1 mm. lata. *Sepalum dorsale* 3-nervium, 2 mm. longum, lateralibus angustius. *Petala* rhombico-ovata, vel obovata, acuta, 3-nervia, circa 2 mm. longa, 1.5 mm. lata. *Labelium* simplex, oblongum, apiculatum, ecallosum, ad basim cor-

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datum vel auriculatum, 3-nervium, 1.5 mm. longum, 1 mm. latum. *Columna* minuta, columnæ *D. tenelli* similis.

PHILIPPINE ISLANDS: Epiphyte on mountain tops; flowers yellow. At 1800 m. alt. on Mt. Pinalubo, Province of Zambales, Luzon, April, 1907, *F. W. Foxworthy* (no. 2542). Specimens in herb. Bureau of Science, Manila, and in herb. AMES. COLLECTOR'S NOTE: "*The most prominent thing on top of the mountain. It covers the mossy tree trunks very densely. The leaves are a dark rather shiny green.*" (The mountain is also called *Pinalobo* and *Pinatubo*.)

The column being destitute of stelidia, this species is referred to the section *Acoridium*. It is clearly distinguished from all other known species of this section by its simple oblong labellum. In habit *D. Foxworthyi* resembles *D. tenuifolium*, from which species it differs in its flowers. Above, the labellum is described as ecallose. In the dried condition, at least, no calli are perceptible under the high-power lens of the dissecting microscope. If calli are present they must be extremely minute or evanescent. The graceful racemes are about 5 cm. long, bearing as many as thirty flowers, 2 mm. apart on pedicels 2 mm. long. A wide range of variation is noticeable in the material gathered by Foxworthy on Mt. Pinalubo, some of the specimens being twice as tall as others, but no corresponding variation that I have been able to discover occurs in the flowers of the extremes.

According to the classification of *Dendrochilum* species adopted by Pfitzer and Kränzlin in *Das Pflanzenreich*, *D. Foxworthyi* would seem to belong to the subgenus *Aphanostelidion*, which is in part characterized by the absence of stelidia from the column. It does not seem to me advisable, however, to recognize *Aphanostelidion*, as it necessitates confusing artificiality in the disposition of the species in the genus.* Had Pfitzer been acquainted with the numerous species which have been recently discovered in the Philippine Islands it is probable that he would

* Cf. *Orchidaceæ*, Fasc. II, pp. vii and viii.

have refrained from establishing a subgenus which passes so easily into § *Acoridium*. When Pfitzer prepared his monograph, less than half a dozen species of the *Acoridium* section were known to him. *D. Foxworthyi* is the twenty-fourth species to be added to § *Acoridium*, collected for the Bureau of Science at Manila, since 1905.

Dendrochilum* (§ *Acoridium*) *cinnabarinum Pfitzer in *Das Pflanzenreich* IV. 50. II. B. 7, *Orch.-Monandracæ-Cælogyninæ* 104 (1907); Ames ORCHIDACEÆ, Fasc. II. p. viii (1908). “*Pseudobulbi* anguste conico-ovati, juniores vaginis mox in fibras solutis inclusi, in rhizomate repente dense seriatim, monophylli, 1 cm longi, 4 cm [*sic*] crassi. Folium in petiolum pseudobulbo duplo longiorem sensim angustatum, lineari-lanceolatum, gramineum, 12 cm longum, 5 mm latum acutum, 3-nerviū, nervo medio subtus magis prominente. Scapus gracilis, erectus, hysternanthus, folium superans; racemus brevis, pluriflorus; bracteæ ovatæ, acutæ, convolutæ, scariosæ, ovarium pedicellatum superantes, bracteæ infimæ steriles erectæ. Sepalum dorsale rhombeum, subacutum; lateralialia multo latiora obliqua. Petala rhombeo-orbicularia, longe acuminata. Labelli nani trilobi lobi laterales breves dentiformes antrorsum curvati, medius cuneato-obovatus, apiculatus, carinis obsoletis.—Flores cinnabarinæ. . . Monsungebiet, Provinz der Philippinen: Benguet (Loher n. 461!).—Herb. Kew.”—Pfitzer, *loc. cit.*

REDESCRIPTION

Pseudobulbs 1–1.3 cm. long, 3–4 mm. thick near the base, gradually tapering upwards, corrugated when dry. *Leaves* subcoriaceous; *lamina* up to 8 cm. long, 4–6 mm. wide, many-nerved, prominently 3-nerved beneath; *petiole* slender, 2–3 cm. long,

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0.5 mm. in diameter, together with the pseudobulbs clothed with tubular acute or obtuse *bracts*, which, when dry, are conspicuously many-nerved. *Peduncle* wiry, shorter than the leaves or exceeding them, 1–1.5 dm. long, persistent on the mature and leafless pseudobulbs. *Raceme* erect, loosely flowered, \pm 4 cm. long. *Floral bracts* 4 mm. long, cymbiform, acute, the lowermost one empty, embracing the foot of the rhachis, dilated, truncate-aristate. *Flowers* 6 mm. across, orange-red when dry, cinnabar when fresh, according to the collector's observations. *Lateral sepals* oblique, 3–3.5 mm. long, 3 mm. wide, broadly ovate, obtuse, 3-nerved. *Upper sepal* about 4 mm. long, 2.5 mm. wide, rhombic-lanceolate to ovate-lanceolate. *Petals* rhombic-cuneate, at the rounded apex acuminate or subcaudate, 2.5 mm. long, 2.75 mm. wide, 3-nerved. *Labellum* 3-lobed; *middle lobe* hastate, acute, somewhat fleshy, 2 mm. long, concave and bicallose at base; *calli* nipple-like, inflexed; *lateral lobes* diaphanous, oblong, obtuse or subacute, relatively small, 1 mm. long. *Column* typical of the section.

My description is based on a specimen in the United States National Herbarium, numbered 461, which A. Loher collected in Benguet, Luzon. This specimen is a duplicate of the one on which Pfitzer established *Dendrochilum cinnabarinum*. In Fascicle II of ORCHIDACEÆ it was stated that neither the description nor the figure published by Pfitzer and Kränzlin is reliable, both conveying an erroneous and a misleading impression. The position assigned to the species is quite anomalous and is explicable only on the assumption that Pfitzer mistook the lateral lobes of the labellum for stielidia arising from the base of the minute column. In his figure prepared to illustrate *D. cinnabarinum* the lateral lobes of the labellum are not shown, nor is the

column more than vaguely indicated. The position of the species in the subgenus *Platyclinis* (which, according to Pfitzer and Kränzlin, is characterized in part by the presence of steldia on the column and by the comparative size of the middle lobe and of the lateral lobes of the labellum) is therefore significant and indicates either an oversight or an absolute misinterpretation of structural details. If the conspectus of the genus *Dendrochilum* in the *Cœlogyninæ* is followed, *D. cinnabarinum* on every count would be placed in the subgenus *Aphanostelidion* and by no means in the subgenus *Platyclinis*. Therefore it is supposable that Pfitzer overlooked the characteristic structure of the labellum and column in the material on which he based his conception of the new species.

It is much to be regretted that error is so difficult to avoid in the study of minute flowers of complex structure, as the consequences of such error are far reaching and likely to lead to duplication of names and, in the absence of types, to constant confusion.

Dendrochilum (§ *Acoridium*) **Loheri** *sp. nov.* Aff. *D. venustulosum* in floribus major. *Pseudobulbi* subglobosi vel subfusiformes, juniores vaginis subacutis mox in fibras solutis inclusi, ± 8 mm. longi. *Folium* lineari-oblongum, acutum, 4–6 cm. longum, 3–3.5 mm. latum, 9–11-nervium, nervo medio subtus magis prominente; *petiolus* ± 1 cm. longus. *Pedunculus* folia superans vel illis æquilongus, gracilis, 4–8 cm. longus. *Inflorescentia* laxiflora. *Bracteæ* glumaceæ, ovaria superantes. *Sepala* *lateralia* ovato-lanceolata, uninervia, acuta, 5 mm. longa, 2.5 mm. lata. *Sepalum dorsale* lanceolatum, acutum, 1-nervium. *Petala* lanceolata, acuta, 1-nervia, 4.5 mm. longa, 1.5 mm. lata. *Labellum* 3-lobatum; *lobi laterales* ovato-falcati, obtusi, 1.5 mm. longi, 1 mm.

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lati; *lobus medius* transverso-reniformis, apiculatus, circa 1.25 mm. latus; prope basim lobi utriusque lateralis et in depressione disci *callus* vel *papilla*. *Columna* sectionis.

PHILIPPINE ISLANDS: Benguet, Luzon, A. Loher (no. 461 A). Type specimen in U. S. National Herb.

Dendrochilum Loheri, as indicated above, is a near ally of *D. venustum* (Ames) Pfitz. It is also closely allied with *D. strictiforme* (Ames) Pfitz., from which it is readily distinguishable by means of its very dissimilar labellum. The flowers are much larger than those of *D. venustum* and are borne in loose racemes, and the narrow leaves and different habit are quite distinctive, while the reniform apical lobe of the labellum overlaps the lateral lobes, — a characteristic which I have not noted in *D. venustum*. The specimens on which my description is based were collected by A. Loher. I found them mounted on the same sheet with *D. cinnabarinum* in the United States National Herbarium. I have marked the specimen on which *D. Loheri* is based no. 461 A (*D. cinnabarinum* was distributed by Loher under the number 461).

Though additional material from the Philippines may break down the distinctions between *D. venustum* and *D. Loheri*, which I now regard as specific, the specimens thus far studied do not make such a result seem probable.

Dendrochilum (§ *Acoridium*) ***anfractoides*** *sp. nov.* Aff. *D. anfracto*. *Pseudobulbi* aggregati, subfusiformes, 2.5 cm. longi, juniores vaginis mox in fibras solutis inclusi. *Folium* oblongi-lanceolatum, acutum, 6–8 cm. longum, 8–13 mm. latum; *petiolus* 1.5 cm. longus. *Pedunculus* gracilis, erectus, folium vix superans. *Racemus* subnutans, distichus, multiflorus; *rhachis* vix flexuosa. *Bractea* duplo longiores quam pedicellus ovariumque, 6 mm.

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longæ, 4 mm. latæ, ovatæ, obtusæ, conduplicatæ. *Sepala lateralia* lanceolata, acuta, 3-nervia, 5 mm. longa, 3 mm. lata. *Sepalum dorsale* oblongi-lanceolatum, vel oblongi-ellipticum, acutum, 3-nervium, 6 mm. longum, 2.75 mm. latum. *Petala* elliptica, vel suborbiculata, marginem versus erosula, 4.5 mm. longa, 3 mm. lata. *Labellum* 3-lobatum, 5.5 mm. latum; *lobi laterales*, 2.5 mm. longi, valde reflexi, acuti; *lobus intermedius* tridentatus, dens medius lateralibus major, 0.75 mm. longus; *calli* in basi labelli. *Columna* crassa, cucullo circa androclinium crenulato, columnæ *D. anfracti* similis.

PHILIPPINE ISLANDS: At 4000 ft. altitude, Province of Benguet, Luzon, July, 1907, *Major E. A. Mearns* (no. 4311). Type in herb. Bureau of Science, Manila.

Dendrochilum anfractoides is clearly allied to *D. anfractum* (Ames) Pfitz., as the specific name implies. It differs considerably, however, from *D. anfractum* in habit, especially in the relative length of the peduncle and leaves, and in the rhachis, which is less conspicuously zigzag. It also differs from *D. anfractum* in the labellum, which is less rounded at the base and distinctly tridentate at the apex of the middle lobe. Near the base of the labellum are two fleshy calli transversely situated, which are linear in conformation rather than papilla-like as in *D. anfractum*; between these calli in the sac or depression of the labellum are other calli or wart-like excrescences which vary in size and in number. Regarding these supernumerary calli, it must be said that they are not present in all of the flowers examined and are not of diacritical worth. The column of *D. anfractoides* is fleshy, very thick, 2.5 mm. long, with the base of the anther concealed by the crenate or crenulate terminal wing, and with the rostellar protuberance conspicuous and projecting in front.

It is unfortunate that both *D. anfractum* and *D. anfractoides*

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are based on scanty material. The former species is represented by two specimens, one in the herbarium of the Bureau of Science at Manila, and the other in my own collection of *Dendrochilum* species. These specimens, however, are in an excellent state of preservation, and are apparently fully developed. *D. anfractoides*, on the other hand, is known only through a single plant bearing six leaves and two mature racemes. In aspect it is wholly unlike *D. anfractum*, although the floral segments, with the exception of the labellum, are similar to the floral segments of the older species. Notwithstanding the peculiarities of distribution exhibited by many orchids, which preclude large representative collections being made, the plants often occurring scattered in small colonies or as single individuals over wide areas, collectors are too frequently inclined to secure single specimens, merely as records, forgetful of the necessities of the science they are attempting to aid. Often it is not desirable to let material lie unnamed for years, in the hope that more extensive collections will throw light upon it, nor does this procedure seem necessary when the specimens are well developed and apparently normal. When, however, lack of material renders impossible a thorough study of extreme forms, errors in judgment are likely to be frequent and unavoidable. A comparison of *D. anfractoides* with *D. anfractum* may be made by means of the plate published herewith and plate 21 in the second fascicle of ORCHIDACEÆ.

Dendrochilum (§ *Acoridium*) **Curranii** *sp. nov.* Aff. *D. tenui*, speciei quam habitu et structura hæc species conspicue simulat. *Pseudobulbi* fusiformes, graciles, a basi fastigati, 2–2.5 cm. longi. *Folium* petiolatum, lineari-lanceolatum, obtusum, conspicue 3-nerviū, 5–10.5 cm. longum, 7–12 mm. latum; *petiolus* circa 2 cm. longus. *Pedunculus* flexuosus, ± 10 cm. longus, gracilis.

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Racemus gracilis, 5–7.5 cm. longus, apicem folii superans. *Bractea* inflorescentiæ ± 2 mm. longæ, pedicellum brevem et ovarium multo excedentes. *Sepala lateralia* lanceolata, acuminata, acuta, subcaudata vel incrassata ad apicem, 2.5 mm. longa. *Sepalum dorsale* simile, lanceolatum, acuminatum, 1-nerviū. *Petala* lineari-lanceolata, acuminata, acuta, 1-nerviā, 2 mm. longa. *Labellum* 3-lobatum; *lobi laterales* membranacei, semicrescentiformes, rotundati ad apicem, obtusi; *lobus medius* sagittatus, acutus, 0.75 mm. longus; *calli* 3, unus ad basim lobi lateralis utriusque, unus in medio partis saccatæ labelli. *Columna* minuta, columnæ *Dendrochili tenelli* similis.

PHILIPPINE ISLANDS: Type from Mt. Maquiling, Prov. Laguna, Luzon, January, 1908, *H. M. Curran* (no. 3077). Specimens in herb. Bureau of Science, Manila, and in herb. Ames.

Dendrochilum Curranii suggests in general habit *D. tenue* (Ames) Pfitz., although the leaves are much broader in proportion to their length and the structure of the flowers is very different. The sepals and petals are strongly involuted near the tips and in the dried state have the appearance of being caudate. When dry, the perianth is whitish, with the tips of the sepals and petals yellow or orange.

If the inflorescence of *D. tenue* were to be transferred to the foliage of *D. venustum*, the result would in aspect approach the general appearance of *D. Curranii*.



DENDROCHILUM *Toxworthyi* Ames



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PLATE 26: *Dendrochilum Foxworthyi*

I. Plant, natural size. II. Plant, reduced by one half. I and II exhibit extremes of variation in height. A, flower; a, labellum. Both flower and labellum drawn, enlarged, with the aid of the camera lucida.

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PLATE 27: *Dendrochilum Loheri*

I, drawn, natural size, from a specimen deposited in the United States National Herbarium at Washington, D. C., collected in Luzon, Philippine Islands, by *A. Loher*, and distributed by him under the number 461. A, flower; a, labellum drawn, enlarged, with the aid of the camera lucida.

PLATE 27: *Dendrochilum cinnabarinum*

II, drawn from a specimen deposited in the United States National Herbarium at Washington, D. C., collected in Luzon, Philippine Islands, by *A. Loher*, and distributed by him under the number 461. B, flower; b, labellum drawn, enlarged, with the aid of the camera lucida.

DENDROCHILUM

Pl 27







DENDROCHILUM

Pl. 28

anfractoides Ames



ORCHIDACEÆ

PLATE 28: *Dendrochilum anfractoides*

Plant, natural size, drawn from the type in the herbarium of the Bureau of Science, Manila, Philippine Islands. 1, flower; 2, labellum; 3, column; 4, pollinia. All parts drawn, enlarged, with the aid of the camera lucida.

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PLATE 29: *Dendrochilum Curranii*

Plant, natural size. 1, flower; 2, labellum. Flower and labellum drawn with the aid of the camera lucida from a co-type.



DENDROCHILUM
Curranii Ames

HÆMARIA MERRILLII

Hæmaria Merrillii Ames in *Philipp. Journ. Sci. (Bot.)* 2: 315 (1907).

Plant erect or ascending, up to 3 dm. high, leafy at the base. *Rhizome* creeping. *Leaves* 5-7, ovate-lanceolate, shortly acuminate, acute, 1-3 cm. long, 7-15 mm. wide, chartaceous when dry, 7-nerved, shortly petiolate; *petioles* expanded at base into short, inflated *sheaths* which surround the stem. *Peduncle* comparatively slender, smooth or sparsely pubescent below, pubescent above, with four or five acuminate acute *bracts*, the lowermost sheathing. *Raceme* somewhat cylindrical, 7-12-flowered, 2-3 cm. long. *Flowers* whitish, smooth. *Floral bracts* lanceolate, acuminate, acute, from a broad base, exceeding the ovaries, margins ciliate or denticulate. *Lateral sepals* oblong-lanceolate, acute, 1-nerved, 5-6 mm. long, about 2 mm. wide. *Upper sepal* lightly adherent to the petals, narrowly oblong-lanceolate, subacute, 1-nerved, about 6 mm. long. *Petals* asymmetrical, lanceolate, obtuse, 1-nerved, 6 mm. long, 2 mm. wide above the middle. *Labellum* 5 mm. long, complex, with 2 fleshy protuberances, warts, or rotund *calli* within, somewhat saccate at the base, thickened on each side, expanded at the apex into a membranaceous crenulate-margined transversely oblong retuse mucronate *lamina*; lamina 4 mm. wide, about 2 mm. long. *Column* short, about 4 mm. long to the tip of the anther; *anther* large, exceeding the bifid *rostellum*, 3 mm. long.

PHILIPPINE ISLANDS: Terrestrial in mossy forest at 4300 ft. alt. on Mt. Halcon, Mindoro, flowers white, odorless, calyx greenish, November 13, 1906, *E. D. Merrill* (nos. 5840 *type* & 5819). The description was made from a *co-type* in herb. Ames.

The *Neottiinæ-Physureæ* group, according to Pfitzer's treat-

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ment of the Orchidaceæ, is made up of twenty-four genera, which, with few exceptions, are difficult to interpret and are separated on characters which must appear trivial to one endeavoring to apply them. In my paper on the Mt. Halcon orchids, I assigned the present species, not without misgiving, to the genus *Hæmaria*. Undoubtedly close scrutiny of the species which make up the genera allied to *Hæmaria* will bring about a much broader conception of generic limitations than is now admitted. It would seem that many of the genera in the *Physureæ* were originally based on a few species, and then perpetuated notwithstanding contradictory evidence brought in by later acquisitions. Obstinate adherence to the present conception of generic limitations, in my judgment, must lead to perplexity in the case of the *Physureæ*. Natural affinities, at least, are obscured by the tendency to maintain, as distinct, genera which pass into one another by almost imperceptible gradations.

Date	Description	Debit	Credit	Balance
1880				
Jan 1	Balance forward			
Jan 15	...			
Jan 30	...			
Feb 15	...			
Feb 28	...			
Mar 15	...			
Mar 31	...			
Apr 15	...			
Apr 30	...			
May 15	...			
May 31	...			
Jun 15	...			
Jun 30	...			
Jul 15	...			
Jul 31	...			
Aug 15	...			
Aug 31	...			
Sep 15	...			
Sep 30	...			
Oct 15	...			
Oct 31	...			
Nov 15	...			
Nov 30	...			
Dec 15	...			
Dec 31	...			

HÆMARIA *Merrillii* Ames



PLATE 30: *Hæmaria Merrillii*

Plant, natural size. 1, flower; 2, labellum, one of the warts at base represented in full view, the other partly concealed by the margin of the sac; 3, petal; 4, pollen-mass; 5, column, somewhat diagrammatically represented; 6, floral bract. All parts drawn, enlarged, with the aid of the camera lucida from a co-type.

PLEUROTHALLIS REPENS

Pleurothallis (§*Apodæ prorepentes*) **repens** Ames ORCHIDACEÆ, Fasc. II. p. 271 (1908).—*P. hians* Ames ex J. D. Smith *Enum. Pl. Guatemal.* pt. VIII (Index), not *P. hians* Lindl.

Rhizome slender, creeping. *Secondary stems* ascending, 4–5 mm. apart, 5–10 mm. long, very slender, jointed, clothed with tubular *sheaths*, which are acuminate at the apex. *Leaves* linear-spathulate or narrowly oblanceolate, attenuated at base into a slender *petiole*; *lamina* 2.5–4.5 cm. long, 3 mm. wide near the apex; *petiole* ± 1 cm. long. *Peduncle* filiform, 7–15 mm. long, with several scarious, aristate *bracts* about 2 mm. long. *Flowers* about four in number, apparently produced in succession, only one at a time being fully expanded. *Bracts* subtending the slender *pedicels*, dilated above, obliquely truncate, acute. *Lateral sepals* free to the base, lanceolate, acute, 1-nerved, 3 mm. long, 1.5 mm. wide. *Upper sepal* somewhat broader than the laterals, otherwise similar to them. *Petals* ovate-acute, 2–2.5 mm. long, 1.5 mm. wide, conspicuously 1-nerved, similar to the sepals in outline and texture. *Labellum* fleshy, narrowly lingulate, sub-acute, 3 mm. long, 1 mm. wide, margins strongly revolute, surface minutely papillose. *Column* minute, stout, with rounded membranaceous lateral wings or lobes at the summit.

In general habit *Pleurothallis repens* resembles the West Indian *P. Sertularioides* Spreng, although it is distinct from it in detail. The floral parts are very dissimilar, especially the fleshy undivided papillose labellum. From the slender creeping rhizome the secondary stems arise alternately, and lateral branches originate at comparatively long intervals. The younger leaves vary somewhat in outline from the mature ones in being rela-

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tively broader in comparison with their length and in possessing very short petioles. The roots are produced in pairs on the rhizome near the point of origin of the secondary stems.

In my herbarium there is a single specimen of *P. repens* communicated by John Donnell Smith, which constitutes the type of the species. This specimen was collected at Cubilquitz, Department of Alta Verapaz, Guatemala, at an altitude of three hundred and fifty metres, by H. von Tuerckheim. The label bears two numbers, namely, 8305, which apparently designates the number under which J. D. Smith distributed his specimens, and 496, which is probably the field-number used by von Tuerckheim.

In his *Enumeratio Plantarum Guatemalensium*, unfortunately, Smith has used my name *Pleurothallis hians* to distinguish this species. *P. hians* is a homonym. This fact was discovered too late for correction in Smith's *Enumeratio*.

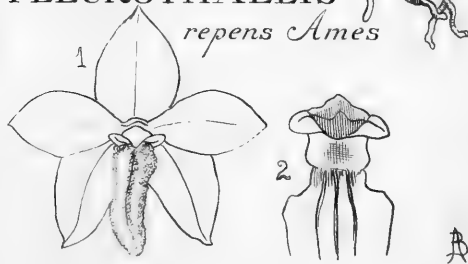
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PLATE 31: *Pleurothallis repens*

Plant, natural size, reproduced from the type specimen. 1, flower; 2, column and base of labellum. Parts drawn, enlarged, with the aid of the camera lucida.



PLEUROTHALLIS
repens Ames



PLEUROTHALLIS JOHNSTONII

P. Johnstonii Ames ORCHIDACEÆ, Fasc. II. p. 271 (1908).

Rhizome creeping, slender, clothed with tubular scarious *sheaths*. *Secondary stems* erect or ascending, about 1.75 mm. long, or shorter. *Sheaths* membranaceous, scarious, lax, truncate. *Leaf* oblong-elliptic, retuse-apiculate at the apex or slightly tridentate, coriaceous, ± 5 mm. long, ± 3 mm. wide. *Peduncle* erect or ascending, filamentous, graceful, few-flowered (with only one flower expanded at a time?), 6–10 mm. long. *Floral bracts* minute, pellucid, 1 mm. long. *Lateral sepals* lanceolate-acute, 1-nerved, free to the base, ± 2.5 mm. long. *Upper sepal* lanceolate, prolonged into a slender filamentous tail, 1 cm. long including the tail; dilated part lanceolate, 2 mm. long. *Petals* linear-lanceolate, 1-nerved, shorter than the sepals. *Labellum* about 1 mm. long, ovate or oblong, obtuse, 3-nerved, fleshy, with a fleshy *callus* at the base. *Column* 0.5 mm. long, margin of the clinandrium entire.

VENEZUELA: Alt. 600 m., Mt. San Juan, Island of Margarita, July 16, 1903, J. R. Johnston (no. 238).

The examination of another flower taken from the type specimen has made necessary several important alterations in the original description, in which the dorsal sepal was inadvertently confused with one of the lateral sepals.

PLATE 32: *Pleurothallis Johnstonii*

The drawing is a restoration from the type in the author's herbarium. I. Part of a plant, natural size. II. Part of the plant enlarged and drawn with the aid of the camera lucida. 1, flower; 2, labellum; 3, lateral sepal; 4, petal. Parts drawn, enlarged, with the aid of the camera lucida.

PLEUROTHALLIS

Johnstonii
Ames





PLEUROTHALLIS HIRSUTA

Pleurothallis hirsuta Ames ORCHIDACEÆ, Fasc. II. p. 270 (1908) with fig.

Plants densely cæspitose. *Secondary stems* 2–2.5 cm. long, semi-terete, grooved in front, clothed near the base with an elongated tubular *sheath* which is green when the leaves are immature and scarious when they approach maturity. *Leaf* elliptic-oblong, tridentate or retuse-apiculate at the apex, 3–5.5 cm. long, 1–2 cm. wide, rigid, coriaceous, with a conspicuous median groove. *Raceme* exceeding the leaves. *Floral bracts* tubular, obliquely truncate, acuminate, acute at the apex, 2.5–3 mm. long, much shorter than the pedicels. *Pedicels* 6 mm. long, slender, minutely spotted with madder-purple. *Flowers* 4–10, green in the bud, when mature, greenish yellow, densely and irregularly spotted with madder-purple, partly covered by purplish hairs. *Lateral sepals* apiculate, semi-elliptical, cohering to about the middle, 4–6 mm. long, 2.5 mm. wide, together forming a somewhat orbicular *plate*; outer half of each sepal yellow, spotted with purple and rather densely hairy, inner half almost uniform brown-purple. *Upper sepal* 6–8 mm. long, colored similarly to the outer half of the lateral sepals, somewhat winged dorsally along the median nerve, convex above, concave near the base, margin hirsute, with purplish hairs. *Petals* spatulate, obtuse, 3 mm. long, 1.5 mm. wide near the tip, yellowish with brown-purple spots. Apical half of the *labellum* 2 mm. long, oblong, obtuse, bicarinate or bilamellate; basal half, or *claw*, linear, about 2 mm. long. *Column* 3 mm. long, slender, erect, purple-spotted, irregularly and deeply toothed or fringed at the apex.

MEXICO: 1905, C. G. Pringle (nos. 8095, 10158 in herb. Ames).

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Pleurothallis hirsuta belongs to the section *Elongatæ*, characterized by having comparatively long upright secondary stems and elongated racemes which exceed the leaves.

PLEUROTHALLIS

hirsuta Ames



ORCHIDACEÆ

PLATE 33: *Pleurothallis hirsuta*

Plant, natural size. Separate flower enlarged.
Drawn from the living plant which furnished
the material on which the original description
was based.

PHYSURUS SECUNDUS

Physurus secundus AMES ORCHIDACEÆ, Fasc. II. p. 260 (1908).

Rhizome comparatively stout, creeping, rooting at intervals. *Leaves* about five in number, basal, short-petioled, the basal part of the petioles forming inflated *sheaths* which become scarious; *lamina* ovate-lanceolate, subcordate, acute, 2–3 cm. long, 1.6 cm. wide. *Scape* erect, smooth below or only sparsely hairy, pubescent above, about 1 dm. long, with about three tubular sheathing acuminate acute *bracts*. *Raceme* about 6 cm. long. *Flowers* secund, about 16 in number. *Floral bracts* smooth, lanceolate, acuminate, acute, about equalling the sessile *ovary*, 5–7 mm. long. *Ovaries* ellipsoidal, smooth. *Perianth* white(?). *Lateral sepals* lanceolate, acute, 1-nerved, 4–5 mm. long, 2 mm. wide. *Upper sepal* adherent to the petals, oblong-lanceolate, 1-nerved, concave, about 4 mm. long. *Petals* somewhat spatulate, 1-nerved, minutely denticulate on the free margin, 4–5 mm. long. *Labelium* produced at base into a blunt scrotiform *spur*; *lamina* oval, 3-nerved, entire, about 3 mm. long, somewhat contracted at the blunt apex into a minutely fringed or denticulate *plate*; *spur*, or *sac*, 3–3.5 mm. long, about 2 mm. in diameter, blunt and grooved at the tip; within, near the tip are several minute, rather fleshy, subclavate *hairs*, or elongated *papillæ*. *Column* slender, about 3.5 mm. long.

MEXICO: Sierra de Reyes, at 9000 ft. alt., State of Oaxaca, November 9, 1894, C. G. Pringle (no. 5837). Type, consisting of a single plant, in herb. Gray.

The description given above has been made anew from the type. As more material comes to light variations from the measurements noted in the description may be expected. The species of the genus *Physurus* are often variable in the vegeta-

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tive parts, as may be noted in *Physurus querceticola* Lindl., a species found in Florida, the extreme forms of which might be mistaken at first glance for distinct species.

Physurus secundus is in habit very similar to *Epipactis repens*, although generically unlike it.

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PLATE 34: *Physurus secundus*

The drawing is a restoration from the type in the Gray Herbarium. The plant is represented natural size. 1, flower; 2, labellum. Parts drawn, enlarged, with the aid of the camera lucida.

PHYSURUS

secundus
Ames



Pl. 34



PHYSURUS POLYGONATUS

Physurus polygonatus Ames in J. D. Smith *Enum. Pl. Guatemal.* pt. VII. p. 50, no. 7678 (1905), *nomen*; ORCHIDACEÆ, Fasc. II. p. 259 (1908).

Plant 26.3 cm. high from a creeping *rhizome*. *Stem* rather stout, below the leaves smooth. *Leaves* smooth, asymmetrically ovate-lanceolate to elliptic-oblong, abruptly acuminate, acute, conspicuously 3-nerved, 3–7 cm. long, 1.6–3 cm. wide; *petioles* slender, dilated at base into scarious *sheaths*. Above the leaves the stem is pubescent and sheathed by 3 lanceolate, acute *bracts*. *Raceme* ±6 cm. long, rather loosely many-flowered. *Rhachis* finely pubescent. *Floral bracts* lanceolate, acuminate, acute, sparsely pubescent, exceeding the sparsely pubescent *ovaries*, 5–8 mm. long. *Flowers* small. *Lateral sepals* sparsely pubescent, oblong-lanceolate, obtuse, 1-nerved, 4 mm. long, about 2 mm. wide. *Upper sepal* linear-lanceolate, 1-nerved, sparsely pubescent, narrower than the laterals. *Petals* narrowly spathulate, 1-nerved, 4 mm. long. *Labellum* from the tip of the spur to the apex of the subreniform *plate*, 5 mm. long; *plate* mucronate, 2 mm. long, 3 mm. wide.

The single specimen which constitutes the type was collected at Cubilquitz in Guatemala, by H. von Tuerckheim. The specific name alludes to the resemblance of the foliage to that of some species of the genus *Polygonum*. *P. polygonatus* appears to be closely allied with *P. repens* Lindl. and *P. hyphæmaticus* Reichb. f. I have been unable to identify my material satisfactorily with any of the species contained in the herbarium of the British Museum of Natural History or of the Royal Gardens at Kew, or in any of the large collections which I have consulted.

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PLATE 35: *Physurus polygonatus*

Plant, natural size. 1, labellum; 2, petal; 3, lateral sepal. All of the parts were drawn with the aid of the camera lucida from the type.

N. 35



PHYSURUS

polygonatus
Ames



PHYSURUS PURPUREUS

Physurus purpureus Ames in J. D. Smith *Enum. Pl. Guatemal.* pt. VII. p. 50, nos. 8000 and 8759 (1905), *nomen*; ORCHIDACEÆ, Fasc. II. p. 259 (1908).

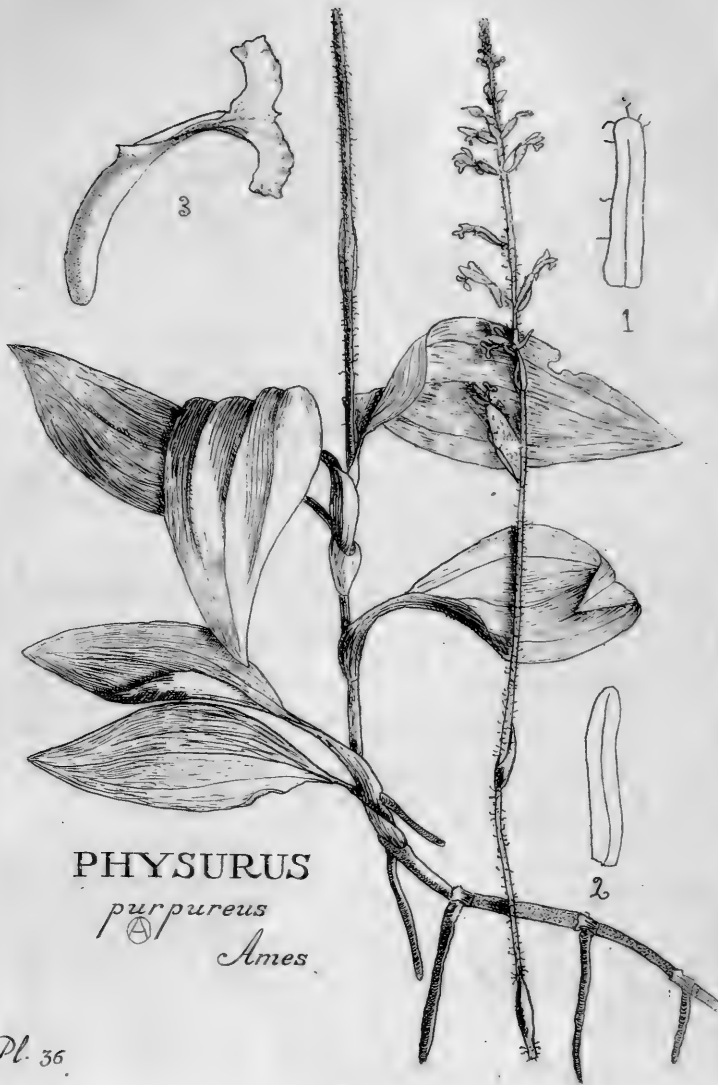
Plant leafy near the base, slender, from an elongated creeping *rhizome*. *Leaves* dark red-violet in color, about 6 in number, membranaceous, conspicuously 3-nerved when dry, lanceolate, acute, tapering at the base, 4–5 cm. long, 1.5–2 cm. wide; *petiole* slender above, dilated into loose nervose *sheaths* which embrace the slender stem. *Stem* above the leaves 14 cm. long, silky-pubescent, clothed at intervals by linear-lanceolate acute *bracts*. *Raceme* 6.5 cm. long, rather loosely many-flowered. *Floral bracts* about equalling the ovaries, exceeded by the fruit. *Ovaries* sparsely hairy. *Lateral sepals* sparsely pubescent, linear-oblong, obtuse, 1-nerved, 4 mm. long, 1 mm. wide. *Upper sepal* similar to the laterals. *Petals* similar to the lateral sepals, smooth. *Labellum* prolonged into a cylindrical *spur* at base, narrowed above the spur into a grooved *mesochil*; *epichil* a lunate or bifalcate minutely denticulate mucronate *plate*, 4 mm. wide; *spur* 3.5 mm. long.

The specific name of the plant alludes to the color of the leaves, which in life, according to the collector's observations, were dark red-violet. *P. purpureus* was collected by H. von Tuerckheim in Cubilquitz, Guatemala, in June, 1904. The type specimen (in herb. Ames) bears the number 8759.

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PLATE 36: *Physurus purpureus*

Plant, natural size, reproduced from the type.
1, lateral sepal; 2, petal; 3, labellum. All analytical parts drawn, enlarged, with the aid of the camera lucida.



PHYSURUS
purpureus
Ames

Pl. 36.



PHYSURUS VENUSTULUS

Physurus venustus Ames in J. D. Smith *Enum. Pl. Guatemal.* pt. VII. p. 50, no. 8591 (1905), *nomen*; ORCHIDACEÆ, Fasc. II. p. 261 (1908).

Plants among the smallest of the genus, 6–10 cm. high, erect or ascending from an elongated fleshy creeping *rhizome*. *Leaves* membranaceous, nervose, lanceolate, acute, 1–3 cm. long, 5–10 mm. wide; *petiole* slender, forming a sheath at base, which loosely clothes the stem. *Stem* glabrous, succulent. *Raceme* few- or many-flowered; *rhachis* smooth. *Floral bracts* foliose, lanceolate, acute, equalling or exceeding the ovaries. *Flowers* subglobose, white, about 3 mm. long. *Lateral sepals* oblong-lanceolate, 1-nerved, obtuse, 3.5 mm. long, 1.5 mm. wide. *Dorsal sepal* lanceolate, obtuse, 1-nerved. *Petals* linear-lanceolate, 1-nerved, asymmetrical, 3.5 mm. long, 1 mm. wide. *Labellum* globular-saccate at base, dilated into a suborbicular or subreniform apiculate *plate* above the concave *mesochil*; *sac* 3-nerved, 2 mm. long, at base 2 mm. wide; *mesochil* 2 mm. long; *plate* or *epichil* 1.5 mm. long, 2 mm. wide, with a transverse membranous ridge between it and the *mesochil*.

The type was collected by H. von Tuerckheim (no. 8591) at Cubilquitz, Guatemala, at an altitude of three hundred and fifty metres, in December, 1903. My material appears to be conspecific with an unnamed specimen in the herbarium at Kew, collected by R. Tate (no. 464) in Nicaragua, in 1867–8. In habit the plants resemble depauperate specimens of *Physurus querceticola* Lindl. They appear to have been flaccid when alive, and somewhat succulent. I have been unable to discover that this species has been heretofore described.

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PLATE 37: *Physurus venustus*

Two plants, natural size. 1, flower enlarged;
2, labellum showing sac, mesochil and epichil,
enlarged. All parts drawn from the type speci-
men with the aid of the camera lucida.

PHYSURUS

venustus

Ames



SAB

Pl. 37

EPIPACTIS CLAUSA

Epipactis clausa A. A. Eaton in *MS.*

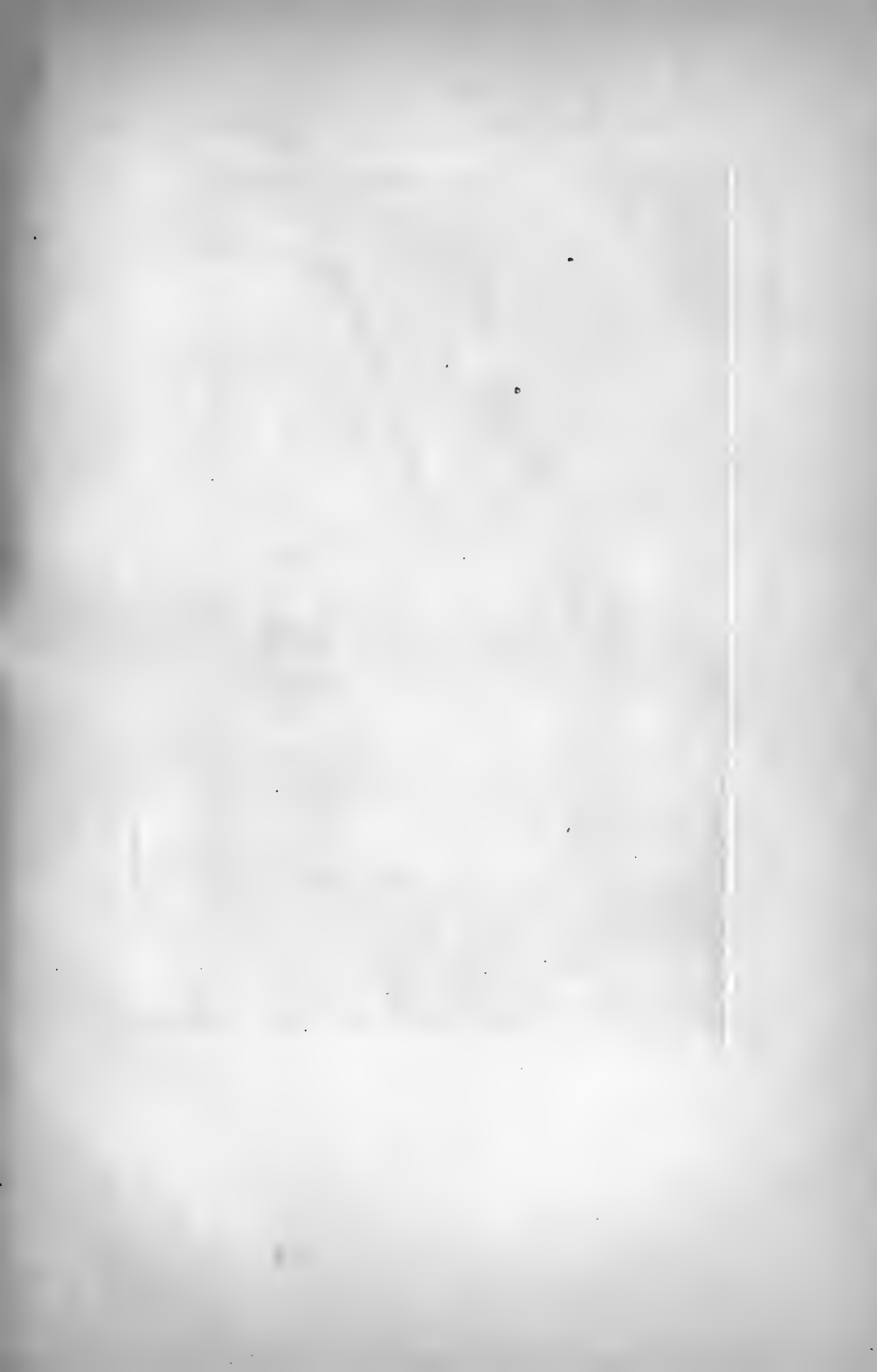
The solitary *plant* which composes the type specimen is about 2 dm. tall, ascending or erect from an elongated creeping *rhizome*. *Leaves* three, 2–3 cm. apart, dark green with whitish or yellowish veins, ovate-lanceolate, acuminate, acute, the margin minutely crenulate (when dry?); *lamina* of the largest leaf 3.5 cm. long, 1.8 cm. wide above the middle; uppermost leaf bract-like; *petiole* very short, or none, consequently the lamina of each leaf has the appearance of being sessile on an inflated *sheath*, which is about 1 cm. long and which clothes the thickened *stem*. *Raceme* rather dense, about 4 cm. long, with a slender pubescent *rhachis* and lanceolate acute *bracts* subtending the somewhat globular *flowers*. *Lateral sepals* coherent at base, ovate, 1-nerved, obtuse, the apical margin involute. *Petals* asymmetrical, 1-nerved, obtuse, above the claw dilated into a subrhombic irregularly lanceolate or subdolabriform *plate*. *Labellum* lightly saccate at the base, very broadly ovate when flattened out, contracted at the apex into a blunt point; margin irregularly crenulate, with scattered minute almost invisible *papillæ*; within the sac are several clavate hairs, and near its middle, arising from the median nerve, two relatively large clavate *processes*. *Anther* exceeding the rostellum.

PHILIPPINE ISLANDS: Canlaón Volcano, Negros Occidental, March, 1902, C. S. Banks (without number, marked as type, in the herbarium of the Philippine Bureau of Science).

The specimen on which the description is based has minute globular flowers which have the appearance of being partially closed owing to their immature condition. Whether or not these flowers exhibit the normal and characteristic tendencies of the

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inflorescence, the material at hand does not warrant an expression of opinion.





EPIPACTIS
clausa
A.A. Eaton

ORCHIDACEÆ

PLATE 38: *Epipactis clausa*

Plant, natural size, drawn from the type specimen, the leaves represented as without crenulate margins. 1, lateral sepal; 2, labellum; 3, pollinia; 4, petal. All the parts much enlarged, and drawn with the aid of the camera lucida.

EPIPACTIS DOLABRIPETALA

Epipactis dolabripetala Ames ORCHIDACEÆ, Fasc. II. p. 262 (1908).

Related to *E. striata* (Reichb. f.) A. A. Eaton. *Plant* erect or ascending, 3 dm. high from an elongated creeping thickened *rhizome*. *Leaves* about 4 in number, approximate near the base of the stem; *lamina* lanceolate, acute, 3–5 cm. long, 1.4–2 cm. wide; *petiole* slender at the base of the lamina, scarios, dilated and sheathing where it joins the stem, 7–14 mm. long. *Peduncle* slender, finely pubescent, clothed with 4 oblong acute *bracts*, the lowermost of which are sheathing at base. *Raceme* somewhat cylindraceous, rather loosely flowered, 7 cm. long; *rhachis* finely pubescent. *Floral bracts* lanceolate, acuminate, acute, sparsely hairy, equalling the sparsely hairy *ovaries*, or shorter than the ovaries of the uppermost flowers. *Lateral sepals* 4.5 mm. long, 1-nerved, lanceolate. *Upper sepal* narrower than the laterals, 1-nerved, 4.5 mm. long. *Petals* dolabriform, 1-nerved, about 5 mm. long. *Labellum* 4.5 mm. long, ovate-lanceolate, slightly saccate at base, with several minute, thickened *hairs* within the sac.

MEXICO: Collected near San Cristobal in Chiapas, at an altitude ranging between 7000 and 8800 ft., September 18, 1895, by *E. W. Nelson* (no. 3211). Type in U. S. National Herb.

The type is composed of a single specimen preserved in the United States National Herbarium, from which the accompanying illustration was prepared. In accordance with the view held by A. A. Eaton,* I have adopted the generic name *Epipactis* of Boehmer for those species which have been heretofore improperly placed in the genus *Goodyera* of R. Brown.

* *Proceedings of the Biological Society of Washington* 21: 63 (1908).



Pl. 39



EPIPACTIS
dolabripetala
Ames

ORCHIDACEÆ

PLATE 39: *Epipactis dolabripetala*

Plant, natural size. 1, petal; 2, labellum; 3, lateral sepal. All the parts enlarged and drawn from the type-specimen with the aid of the camera lucida.

CHEIROSTYLIS OCTODACTYLA

Cheirostylis octodactyla Ames in *Philipp. Journ. Sci. (Bot.)* 2: 314 (1907).

“Related to *C. Griffithii* Lindl. *Plants* rather stout in relation to their height, 4–8 cm. tall, few-flowered. *Leaves* ovate-lanceolate, acute, 0.7–2 cm. long, 5–11 mm. wide, 5–6 mm. apart on the stem. *Petioles* short, sheathing at base. *Flowers* one or two, white, 1 cm. long, standing at right angles to the erect *stem*. *Lateral sepals* united nearly to the apex, lanceolate, subacute, 8 mm. long. *Upper sepal* oblong-lanceolate, acute, somewhat dilated near the base, 8 mm. long. *Petals* lightly adhering to the upper sepal, linear spathulate, about 8 mm. long, 2 mm. wide near the tip. *Labellum* linear-oblong, about 9 mm. long to the tip of the slightly dilated 8-fingered apex, 2.5 mm. wide at base; on each side a row of 7–8 setæ. Digitate divisions of the apex 3 mm. long.” —Ames, *loc. cit.*

At the base the lip is concave or lightly saccate, with a row of blunt setæ on each side. The column is short, with two erect processes at the summit in addition to the rostellar arms.

PHILIPPINE ISLANDS: *C. octodactyla* was collected at an altitude of 8200 ft. on Mt. Halcon, Mindoro, on November 22, 1906, by *E. D. Merrill* (no. 5834).

CHEIROSTYLIS

Pl. 40

octodactyla
Ames



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PLATE 40: *Cheirostylis octodactyla*

Two plants, natural size. 1, petal; 2, labellum; 3, column. All the parts drawn, enlarged, from a co-type with the aid of the camera lucida.

MASDEVALLIA TUBULIFLORA

Masdevallia tubuliflora Ames ORCHIDACEÆ, Fasc. II. p. 265 (1908).

Allied with *M. floribunda* Lindl. *Secondary stems* erect or obliquely ascending, 1 cm. long. *Leaf* oblanceolate, obtuse, minutely bidentate, coriaceous, 3–10 cm. long, 9–11 mm. wide above the middle. *Scape* very slender, about 7 cm. long. *Calyx* about 12 mm. long to the tip of the dorsal lobe, 8 mm. long to the base of the dorsal lobe; *lateral lobes* 6–7 mm. long, 3-nerved, falcate-lanceolate; *dorsal lobe* linear, fleshy, 4–5 mm. long. *Petals* linear-lanceolate, with a small curved apicule or tooth on the anterior margin, 1-nerved, 4 mm. long. *Labellum* 4 mm. long, linear, subacute or obtuse, cordate and somewhat thickened at the base, lamellate above the middle, the lamellæ rounded, short and thin. *Column* 3.5 mm. long.

GUATEMALA: At an alt. of 350 m., Depart. Alta Verapaz, *H. von Tuerckheim* (no. 512). Type in herb. Ames (no. 7339).

In John Donnell Smith's distribution of Guatemalan plants *Masdevallia tubuliflora* bears the number 8296. Up to the present time I have been unable to identify my material with any known species of the genus, although I have made careful comparisons with the specimens in the herbaria at the Royal Gardens, Kew, and the British Museum of Natural History.





MASDEVALLIA *tubuliflora* Ames

ORCHIDACEÆ

PLATE 41: *Masdevallia tubuliflora*

Plant, natural size, drawn from the type.
1, petal; 2, labellum. These parts much enlarged and drawn with the aid of the camera lucida.

MASDEVALLIA TUERCKHEIMII

Masdevallia Tuerckheimii Ames ORCHIDACEÆ, Fasc. II. p. 265 (1908).

Allied with *M. Rolfeana* Kränzl. *Secondary stems* erect, sheathed by tubular scarious *bracts* when young. *Leaf* coriaceous, 6–10 cm. long, oblanceolate or spatulate, attenuated below into a slender *petiole*, obtuse, minutely tridentate with a conspicuous median nerve. *Peduncle* ascending, subfiliform, up to 5 cm. long, bearing two rather large *flowers*, only one of which is open at a time. *Bracts* erect, scarious, tubular. *Calyx* about 1.5 cm. long, subcoriaceous, tubular below, 3-lobed above, the *lobes* terminating in slender filamentous tails. *Lateral lobes* ovate, 3-nerved, 1.7 cm. long, the tails 3 mm. long. *Dorsal lobe* subrotundate, 3-nerved, 19 mm. long, the tail longer than that of each lateral lobe. *Petals* linear-oblong, 5 mm. long, 1.5 mm. wide, truncate at the apex, apiculate or retuse and minutely unidentate, with a protuberance at the middle on the anterior margin. *Labellum* linear-oblong, cordate at base, obtuse, bilamellate. *Column* fleshy, about as long as the petals.

GUATEMALA: Alt. 350 m., Cubilquitz, Depart. Alta Verapaz, August, 1903, *H. von Tuerckheim* (no. II 464). Type no. 5832 in herb. Ames.

The type of *M. Tuerckheimii* is represented by a single specimen, from which the accompanying plate has been prepared.



N. 42

MASDEVALLIA
Tuerckheimii Ames



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PLATE 42: *Masdevallia Tuerckheimii*

1, petal; 2, labellum. Both petal and labellum drawn, enlarged, with the aid of the camera lucida.

PHREATIA PROREPENS

Phreatia prorepens Reichb. f. *Otia bot. Hamb.* 54 (1878) in syn. and *Xen. Orch.* 3: 31, in syn.; Ames in *Philipp. Journ. Sci. (Bot.)* 2: 332 (1907); ORCHIDACEÆ, Fasc. II. p. 205 (1908).—*Eria prorepens* Reichb. f. *Otia bot. Hamb. loc. cit.* and *Xen. Orch. loc. cit.*

The specimen in the Gray Herbarium, determined by Reichenbach, has *leaves* 5.5–6.7 cm. long, 7–8 mm. wide. The *scape* is longer than the leaves, very slender, with about 5 sheathing aristate-pointed *bracts*, 5–7 mm. long. *Perianth* about 2 mm. long. These measurements agree almost perfectly with the specimen collected on Mt. Halcon, Mindoro, Philippine Islands, from which the accompanying etching was prepared. The Gray Herbarium specimen, which was collected in the Philippines by the Wilkes Expedition, was among the novelties which Reichenbach described in *Otia botanica Hamburgensia*, in 1878. As many of these are known to botanists only through the original descriptions, the accompanying plate should prove a welcome addition to the illustrations of obscure or little known orchid species.



PHREATIA prorepens Reichb. f.



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PLATE 43: *Phreatia prorepens*

The plate has been prepared from material collected on Mt. Halcon, Mindoro, Philippine Islands. Plant, natural size. 1, flower; 2, labelum; 3, lateral sepal; 4, petal; 5, upper sepal. All parts drawn enlarged with the aid of the camera lucida.

BULBOPHYLLUM ALAGENSE, B. HALCONENSE,
B. PLEUROTHALLOIDES

Bulbophyllum (§ Monanthaparva) **alagense** Ames in *Philipp. Journ. Sci. (Bot.)* 2: 333 (1907).

Rhizome slender, creeping. *Pseudobulbs* approximate to each other or sometimes 2 cm. apart, pyriform, 4–6 mm. long, narrowed above, at base 3–4 mm. in diameter. *Leaves* ovate, apiculate, 1.2–2 cm. long, 4–9 mm. wide; *apicule* 0.75 mm. long, awn-like. *Scape* very slender, filiform, exceeding the pseudobulbs, 8–11 mm. long, sheathed at base by a tubular truncate 1–2 mm. long *bract*. *Flower* solitary, pale yellow, nearly white. *Pedice* slender, graceful, subtended by a loose tubular obliquely truncate apiculate 2 mm. long *bract*, which is dilated above. *Sepals* triangular-lanceolate, 5–7 mm. long, caudate-tipped, the tails about 4 mm. long. *Petals* minute, about 2 mm. long, spatulate, acute. *Labellum* about 1.5 mm. long, strongly curved, 3-lobed; *lateral lobes* erect, half-round, when spread out forming an orbicular *plate*, 1 mm. long, 1 mm. wide; *middle lobe* fleshy, oblong, obtuse, about 1 mm. long. *Column* minute with blunt wings.

PHILIPPINE ISLANDS: On mossy branches overhanging the water along the Alag River, Mindoro, at 1250 ft. alt., November 12, 1906, *E. D. Merrill* (no. 5494).

Bulbophyllum (§ Monanthaparva) **halconense** Ames in *Philipp. Journ. Sci. (Bot.)* 2: 334 (1907).

“*Rhizome* thread-like, less than 1 mm. thick. *Pseudobulbs* 1–3 cm. apart, round-pyriform when mature, rugose when dry, about 5 mm. long, about 4 mm. in diameter at base. *Leaves* narrowly

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elliptic-oblong, very fleshy (not apiculate), 1.5–2.5 cm. long, 4–6 mm. wide, acute, contracted into a very slender *petiole*. *Scape* exceeding the pseudobulbs, filiform, 1.5–3 cm. long, sheathed at base. *Flower* solitary, relatively large. *Pedicel* filiform, subtended by a tubular obliquely truncate apiculate *bract* dilated at its mouth. *Lateral sepals* narrowly lanceolate, caudate-tipped, 12–14 mm. long, about 3 mm. wide near the base. *Upper sepal* similar to the laterals, 12–14 mm. long, caudate-tipped. *Petals* ovate, acute, 5 mm. long, 2.5 mm. wide. *Labellum* lanceolate from a cordate base, acute, dilated at the middle, 3.5–4 mm. long, 2 mm. wide. (From dried specimens it appears to have been strongly convex in life.) *Column* short with a minute tooth in front at about the middle.”—Ames, *loc. cit.*

PHILIPPINE ISLANDS: On trees in ridge forest, flowers dark purple, at 4500–6800 ft. alt. on Mt. Halcon, Mindoro, November 16, 1906, *E. D. Merrill* (no. 5832). On the same sheet with the type is a small species of the *Monanthaparva* section with much smaller flowers and shorter scapes.

Bulbophyllum (§*Monanthaparva*) **Pleurothalloides** Ames in *Philipp. Journ. Sci. (Bot.)* 2: 335 (1907).

“*Rhizome* obscure. *Pseudobulbs* 3 mm. long, much depressed, forming a chain. *Leaves* about 1 cm. long, 2–4 mm. wide, oblanceolate to spatulate, obtuse, minutely apiculate, contracted below into a slender *petiole*. *Scapes* filiform, elongated, exceeding the leaves, 3 cm. long, with scarious *sheaths* at base, and with a tubular obliquely truncate *bract* subtending the solitary, minute, brownish yellow *flower*. *Lateral sepals* lanceolate, acute, about 4 mm. long, 2.5 mm. wide, 3-nerved. *Upper sepal* similar and equal to the laterals. *Petals* lanceolate, 2 mm. long, 0.75 mm. wide. *Labellum* lanceolate-cordate, obtuse or subsagittate, 2 mm.

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long, 1 mm. wide at base, about 0.5 mm. wide near the tip. *Column* 1 mm. long."—Ames, *loc. cit.*

PHILIPPINE ISLANDS: On mossy trunks of trees at 4500 ft. alt. on Mt. Halcon, Mindoro, November 14, 1906, *E. D. Merrill* (no. 6128).

In habit *B. Pleurothalloides* is allied to *B. cernuum* (Blume) Lindl., but has very different leaves. The general aspect of the plant when in flower recalls some species of *Pleurothallis*.

The three *Bulbophyllum* species which are illustrated in the accompanying plate were collected by Elmer D. Merrill, in November, 1906, during the ascent of Mt. Halcon, one of the loftiest summits in the Philippine Islands. While making this ascent more than one hundred orchid species were discovered by Merrill, many of them novelties. These were dealt with in my paper entitled *Orchidaceæ Halconenses*, which appeared in July, 1907, in the second volume of the *Philippine Journal of Science*. Among the *Bulbophyllums* collected, the three here figured I have been unable to identify with any known species. They belong to the interesting, rather large and puzzling section which Ridley designated by the name *Monanthaparva*, in allusion to the smallness of the vegetative parts and the relatively small solitary flower on a slender scape. In the habital illustration of *B. Pleurothalloides* (II) the contiguous bulbs, which form a rhizome-like chain, are well shown.

BULBOPHYLLUM



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PLATE 44: *Bulbophyllum* species

I. *B. alagense*, natural size. A, flower; a, labellum. II. *B. Pleurothalloides*, natural size. B, flower; b, labellum. III. *B. halconense*, natural size. C, labellum and column; c, labellum. All the analytical parts, as well as the separated flowers, have been drawn, enlarged, with the aid of the camera lucida, from co-types.

BULBOPHYLLUM MINDORENSE

Bulbophyllum (§*Monanthaparva*) *mindorense* Ames in *Philipp. Journ. Sci. (Bot.)* 2: 334 (1907).

Rhizome inconspicuous, concealed by the depressed 3–4 mm. long *pseudobulbs*, which form a continuous sometimes branching chain closely appressed to the bark of trees on which the species is epiphytic. *Leaves* lanceolate, acute, 6–8 mm. long, up to 3 mm. wide, shortly petiolate. *Scapes* filiform, up to 4 cm. long. *Flower* straw-yellow, relatively large, with a very long *pedicel*, apparently without a subtending bract, the *pedicel* being fully 5 mm. long. *Floral bract* tubular, obliquely truncate. *Lateral sepals* narrowly lanceolate, acute, 3-nerved, 8 mm. long, 2 mm. wide below the middle, margin minutely ciliate. *Upper sepal* similar to the laterals, about equally long. *Petals* linear-oblong, subspathulate, acute, 1-nerved, 3 mm. long, about 0.75 mm. wide. *Labellum* linear-lanceolate, 3.5 mm. long, about 1 mm. wide. *Column* 1 mm. long, with a tooth or protuberance in front near the base or below the middle.

PHILIPPINE ISLANDS: Epiphyte in deep shaded ravine, at 3000 ft. alt., on Mt. Halcon, Mindoro, November 27, 1906, *E. D. Merrill* (no. 5796).

In the description the lateral sepals are said to be ciliate on the margin. This statement refers to the minute papillose cells which are visible under the high powers of the dissecting microscope. The labellum, as shown in the drawing, is somewhat roundish at the base, and lightly concave, in general outline linear-lanceolate, and 3-nerved, each of the lateral nerves giving off a branch which runs nearly to the apex of the labellum. The pseudobulbs are as in *Bulbophyllum cernuum* (Blume) Lindl.



BULBOPHYLLUM
mindorense Ames



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PLATE 45: *Bulbophyllum mindorense*

Plant, natural size, drawn from a co-type.
1, lateral sepal; 2, labellum; 3, upper sepal;
4, petal. All parts drawn, enlarged, with the
aid of the camera lucida.

DENDROBIUM ORNITHOFLORUM

Dendrobium (§*Grastidium*) *ornithoflorum* *sp. nov.* *Herba* multum ramosa. *Caules* teretes, ± 6 dm. longi, ascendentes vel erecti, graciles. *Folia* lineari-lanceolata, acuminata, acuta, 2.5–10 cm. longa, 4–5 mm. lata. *Pedunculus* 10–12 mm. longus. *Pedicelli* 14 mm. longi. *Flores* geminati. *Sepala* *lateralia* triangulari-lanceolata, acuta, subcaudata, circa 1.6 cm. longa. *Sepalum dorsale* lineari-lanceolatum, circa 1.6 cm. longum, 3 mm. latum. *Petala* similia, angustiora, 3-nervia. *Labellum* ± 1.5 cm. longum, 3-lobatum; *lobi laterales* subacuti, subfalcati; *lobus terminalis* 8 mm. longus, 6 mm. latus, acuminatus, acutus, margine serrulato; *discus* 3-carinatus.

PHILIPPINE ISLANDS: Flowers yellowish white, at 5700 ft. alt. on Mt. Bliss, Province of Misamis, Mindanao, May 25, 1906, *Major E. A. Mearns & W. I. Hutchinson* (no. 4727). Specimens in herb. Bureau of Science, Manila, and in herb. Ames.

D. ornithoflorum is a graceful, profusely branched epiphyte of the *Grastidium* section of the genus *Dendrobium*, allied with *D. acuminatissimum* Lindl. The younger branches are clothed with the closely appressed tubular sheaths formed by the leaves; the older ones are naked except for the fibrous remains of the withered sheaths at the internodes, are polished yellow, and are rather rigid. From the younger branches the flowers arise in pairs. The peduncle is sheathed at base by a compressed bract. On none of the specimens observed were the flowers open, and it is quite probable that they never widely expand. The median keel on the disc of the labellum extends to the tip of the column foot; near its apex two shorter keels arise, one on each side. All of the keels are somewhat toothed or crenulate near the distal end. Scattered over the upper surface of the labellum minute

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papillæ appear, mainly along the nerves. The specific name alludes to the bird-like aspect of the flowers.

PLATE 46: *Dendrobium ornithoctorum*

Part of a plant, much reduced. In the lower right-hand corner the bract subtending the peduncle is shown, enlarged; in the lower left-hand corner a flower and the pollen masses are represented, enlarged. Behind the labellum of the enlarged flower, a petal and lateral sepal are shown, adherent.

Pl. 46



DENDROBIUM *ornithoflorum* Ames

CESTICHIS HALCONENSIS

Cestichis (§*Laxifloræ*) *halconensis* Ames in *Philipp. Journ. Sci. (Bot.)* 2: 321 (1907).

“A very distinct bifoliate species, about 3 dm. high. *Pseudobulbs* about 1.5 cm. long, somewhat cylindrical, covered by 4 or 5 distichous, acute *sheaths* when immature. *Leaves* oblong-lanceolate, very acute, 15–20 cm. or more long, about 3 cm. wide, contracted into a winged *petiole*. *Peduncle* graceful, strongly bialate, exceeding the leaves. *Lowermost bracts* elongated, linear-acute, 1–1.5 cm. long, those of the inflorescence about half as long as the slender pedicels. *Pedicels* of the lowermost flowers 1.5 cm. long. *Inflorescence* loosely many-flowered. *Flowers* grass-green, turning yellow with age. *Lateral sepals* oblong, very obtuse, 5 mm. long, 2 mm. wide. *Upper sepal* similar to the laterals. *Petals* linear, 5 mm. long, about 1 mm. wide. *Labellum* 5.5 mm. long, suborbicular from an oblong-cuneate base; distal margin crenulate and obscurely blunt-mucronate; in the middle of the claw is a fleshy subcucullate *callus*. *Column* 3 mm. long, rather slender, strongly arcuate near the summit.”—Ames, *loc. cit.*

PHILIPPINE ISLANDS: Terrestrial in ridge forest at 1200–2200 ft. alt. on Mt. Halcon, Mindoro, November 8, 1906, *E. D. Merrill* (no. 5799).

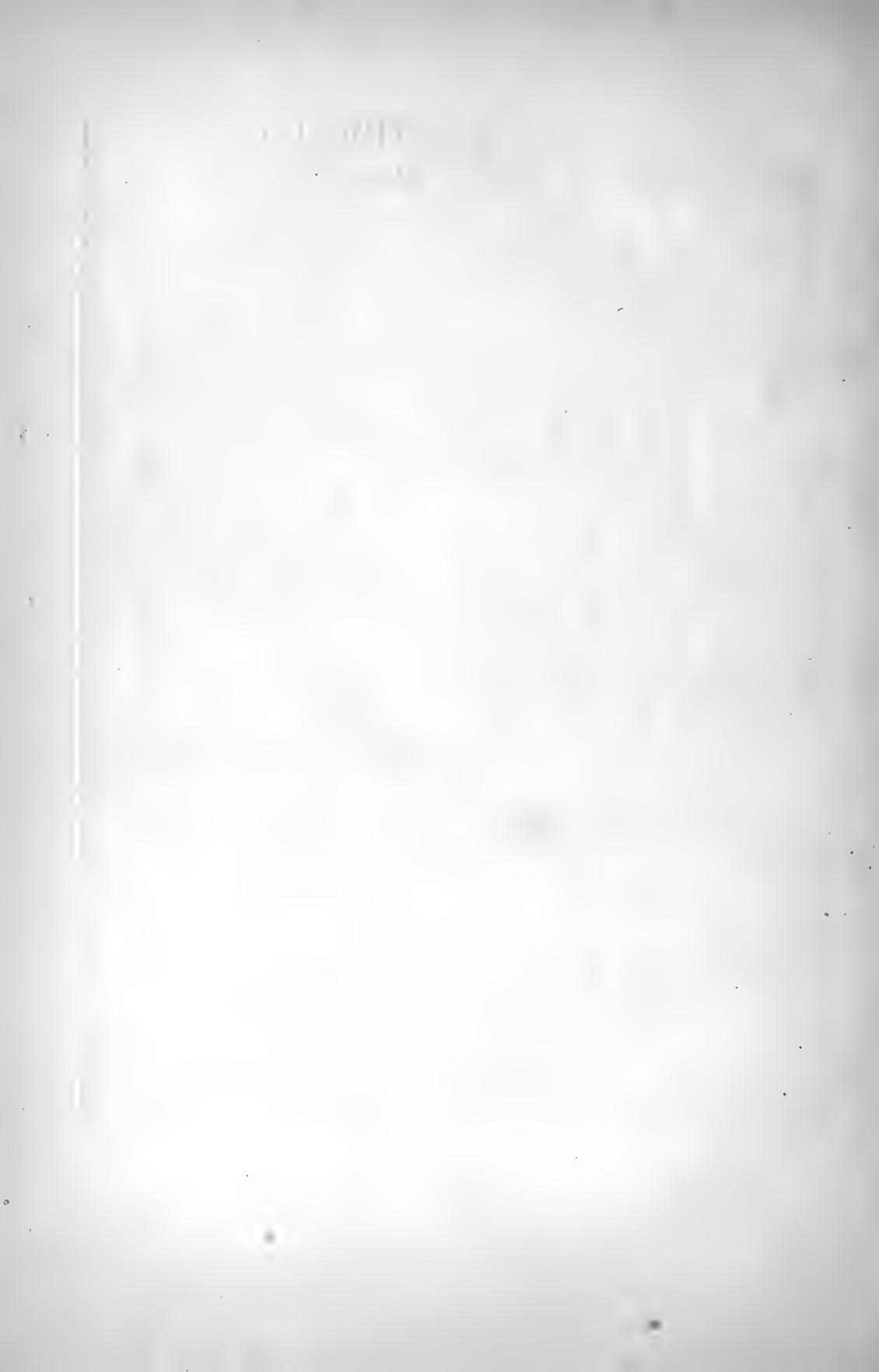
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PLATE 47: *Cestichis halconensis*

1, labellum; 2, petal; 3, upper sepal; 4, lateral sepal; 5, floral bract; 6, flower. Flower and parts enlarged, drawn from a co-type with the aid of the camera lucida.

CESTICHIS
halconensis Ames





OBERONIA MCGREGORII

Oberonia McGregorii Ames in *Philipp. Journ. Sci. (Bot.)* 2: 321 (1907).

“Closely allied with *O. ciliolata* Hook. f. *Plants* caulescent, when in flower about 12 cm. high from base of stem to tip of the densely flowered cylindrical *spike*. *Leaves* distichous, obliquely spreading from below the middle, ensiform, about 4 cm. long, acute. *Peduncle* relatively stout, bracteate, minutely scurfy-pubescent. *Bracts* linear-lanceolate, acuminate, acute, ciliate-pubescent, about 2 mm. long, exceeding the pedicels of the flowers. *Ovaries* finely pubescent. *Lateral sepals* ovate-lanceolate, or triangular-lanceolate, acute, ciliate, 0.75 mm. long. *Upper sepal* nearly elliptical, subobtuse, 0.75 mm. long, ciliate. *Petals* linear-oblong, rounded at the tip, much shorter and narrower than the sepals, minutely ciliate. *Labellum* pandurate (or oblong, constricted at the middle), coarsely several-toothed at the dilated tip, 0.75 mm. long, slightly auriculate at base.” — Ames, *loc. cit.*

PHILIPPINE ISLANDS: Only one specimen seen, found on a prostrate tree, Balete, Baco River, Mindoro, April 23, 1905, *R. C. McGregor* (no. 291).

The accompanying illustration is reproduced from a fragment of the type preserved in my herbarium.

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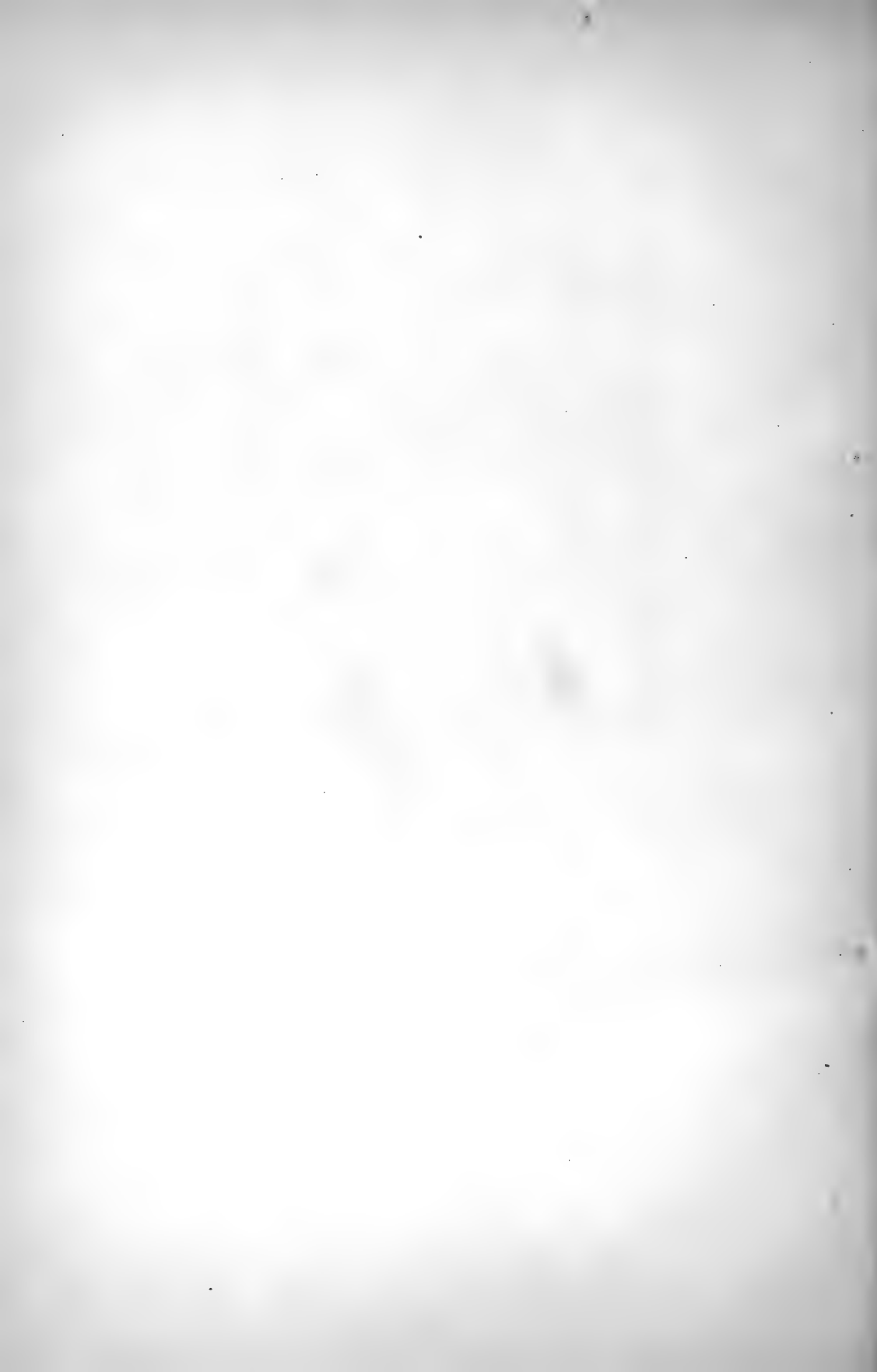
PLATE 48: *Oberonia McGregorii*

1, flower; 2, lateral sepal; 3, petal; 4, floral bract; 5, bud. All parts drawn, enlarged, with the aid of the camera lucida.

OBERONIA
McGregorii Ames



Pl. 48



OBERONIA MINDORENSIS

Oberonia mindorensis Ames in *Philipp. Journ. Sci. (Bot.)* 2: 322 (1907).

“Allied to *O. Aporophylla* Reichb. f. *Plant* caulescent, 1.5–4 dm. or more tall from base of stem to tip of elongated, slender, densely flowered *spike*. *Leaves* distichous, 5–10 cm. or more long, acute or subobtuse, obliquely ascending, upper half or two-thirds free. *Spike* 1–2.5 dm. long, about 5 mm. in diameter, somewhat scurfy-pubescent. *Bracts* linear, about 2 mm. long. *Flowers* minute, greenish. *Lateral sepals* elliptic-ovate or ovate, 1 mm. long. *Upper sepal* similar to the laterals. *Petals* linear, obtuse, 0.75 mm. long. *Labellum* 1 mm. long, 3-lobed; *middle lobe* emarginate, about 1 mm. wide; *lateral lobes* not very conspicuous, prolonged slightly behind the column. In general outline the *labellum* is subpanduriform, emarginate, or equally 4-lobed.”—Ames, *loc. cit.*

PHILIPPINE ISLANDS: Epiphyte, at 1200 ft. alt., along the Alag River, Mindoro, November, 1906, *E. D. Merrill* (no. 5613).

The illustration is a restoration from a co-type preserved in my herbarium. The flowering plant is representative of one of the smallest of the specimens collected by Merrill, while the leaves in the background exhibit one of the largest.

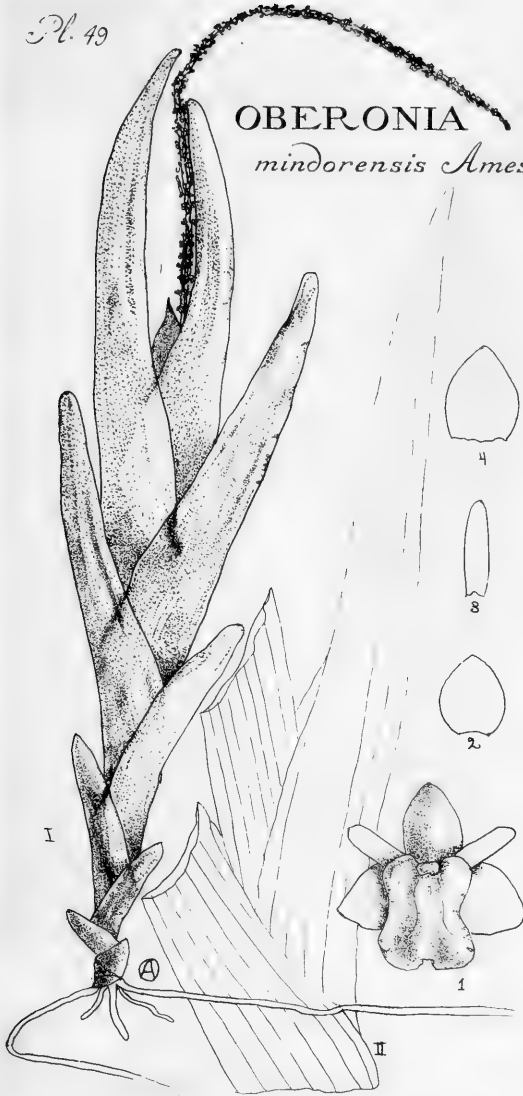
ORCHIDACEÆ

PLATE 49: *Oberonia mindorensis*

I. Flowering plant, natural size. II. Fragment of a plant to exhibit range of variation in size. 1, flower; 2, upper sepal; 3, petal; 4, lateral sepal. All parts drawn, enlarged, with the aid of the camera lucida.

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OBERONIA
mindorensis Ames





ANGRÆCUM PHILIPPINENSE

Angræcum philippinense Ames in *Philipp. Journ. Sci. (Bot.)* 2: 336 (1907); ORCHIDACEÆ, Fasc. II. p. 246 (1908).

Plant 3–6 cm. high. *Roots* very fleshy. *Leaves* elliptic-oblong, obtuse, 2–5.5 cm. long, 0.6–1.4 cm. wide, on contracted *stems*. *Peduncle* fleshy, stout, conspicuously winged, few-flowered, 1.5–4 cm. long. *Bracts* rigid, fleshy, 5 mm. long, conduplicate, triangular, acute. *Pedicels* elongated, about 2.5 cm. long, including the ovary. *Flowers* large, white, odorless. *Lateral sepals* elliptic, rounded and very obtuse at the apex, about 2.2 cm. long, about 1.5 cm. wide. *Upper sepal* similar to the petals, cuneate at base, about 2.2 cm. long, 1.4–1.5 cm. wide. *Petals* broadly spatulate, about 2.2 cm. long, 1.5 cm. wide, very obtuse. *Labellum* 3-lobed; *middle lobe* oblong, rounded at the tip, 9 mm. long, about 7.5 mm. wide; *lateral lobes* somewhat similar to the middle lobe, but shorter, 4–5 mm. long, 6.5 mm. wide at base. *Spur* slender, 3.5 cm. long. *Column* about 7 mm. long, rather stout. *Pollinia* globose with a single *stipe*.

PHILIPPINE ISLANDS: Epiphyte at about 2500 ft. alt. on forested slopes of Mt. Halcon, Mindoro, November 28, 1906, *E. D. Merrill* (no. 5698).

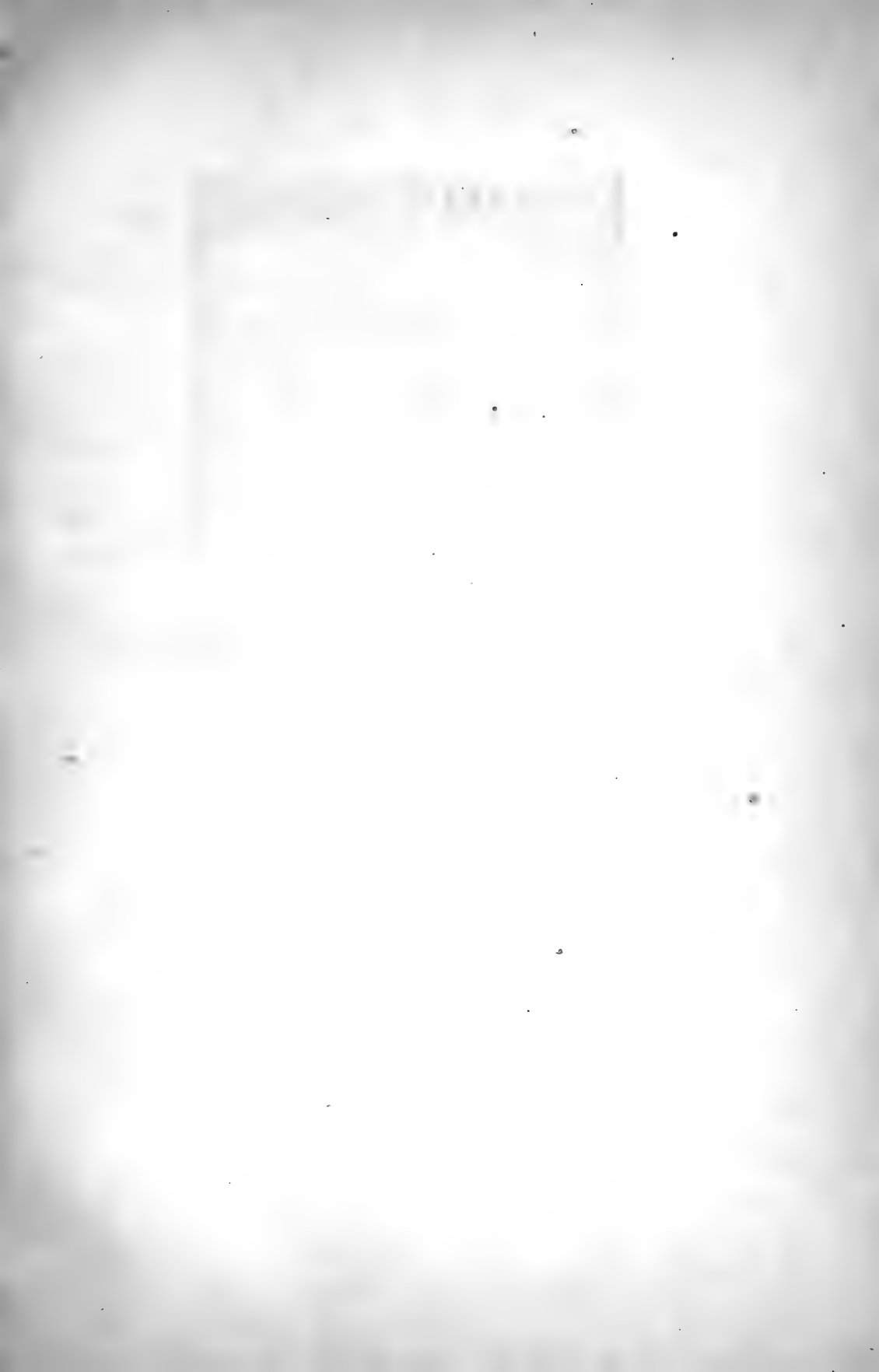
The description given above is, with the exception of several minor changes, taken from the *Philippine Journal of Science*.

Angræcum philippinense is the first species of the genus *Angræcum* recorded as a native of the Philippine Islands. The flowers are white with a yellow stripe on the labellum, and in relation to the size of the plant which bears them extraordinarily large. When dry they retain their white color and become somewhat translucent. The leaves when dry retain the coriaceous texture characteristic of their fresh state and become extremely rugose. Each of the specimens which constitute the co-type, from

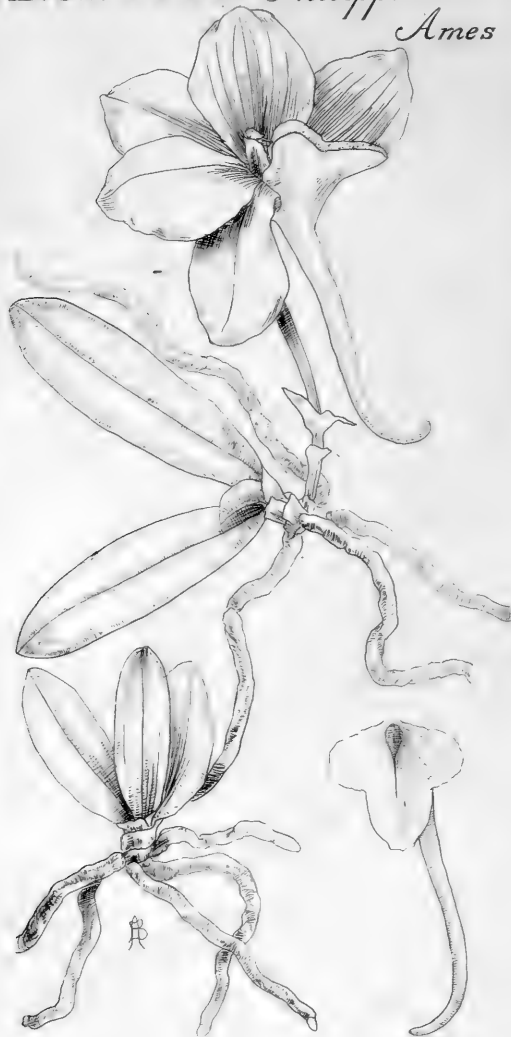
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which the accompanying plate was prepared, bears about three distichous leaves. In the illustration the vegetative parts were prepared from a co-type in my herbarium and the flower from the type specimen deposited in the herbarium of the Bureau of Science at Manila.

The genus *Angræcum* of Thouars, as at present understood, is confined to those species which have a single stipe to the pollinia, a character which, according to R. A. Rolfe in *Dyer's Flora of Tropical Africa* (7: 133), is the only absolute one by which *Angræcum* can be separated from the genera allied to it. In *Listrostachys* Reichb. f., the globose pollinia are situated upon a pair of slender stipes distinct from each other or only united at base, while in *Mystacidium* Lindl., the pollinia are situated upon a pair of slender stipes which are attached to separate oblong or squamiform glands.



ANGRÆCUM *Philippinense*
Ames



ORCHIDACEÆ

PLATE 50: *Angræcum philippinense*

Plant, natural size. In the right-hand lower corner the labellum and spur are shown.

SPIRANTHES SALTENSIS

Spiranthes saltensis Ames ORCHIDACEÆ, Fasc. II. p. 258 (1908).

The type specimen is destitute of foliage and appears to be hysteranthous. *Plant* about 32 cm. tall, clothed by 6 or more tubular acute rather loosely appressed *bracts*. *Stem* pubescent. *Flowers* 8, large, nodding. *Floral bracts* exceeding the ovary, ovate-lanceolate, acuminate, acute, when dry conspicuously striate-nerved, 1.1–1.8 cm. long. *Ovary* turbinate, pubescent, suberect. *Perianth* strongly deflexed. *Lateral sepals* linear-oblong, acute, 3-nerved, 1.7 cm. long, about 2.5 mm. wide. *Upper sepal* linear-oblong, 3-nerved, 1.8–1.9 cm. long, broader at the base than the lateral sepals. *Petals* falciform, acute, 1.7 cm. long. *Labellum* panduriform, *ecallose*, shortly clawed, somewhat apiculate, 3-nerved, with the lateral nerves branched, 1.7 cm. long.

MEXICO: Collected near El Salto, State of Durango, at 8000–8700 ft. alt., on July 12, 1898, by *E. W. Nelson* (no. 4545).

This very distinct species is nearly allied with *Spiranthes Llaveana* Lindl. It belongs to a puzzling group of plants which appear to form a connecting series between the genera *Spiranthes* L. C. Rich. and *Sauroglossum* Lindl. The species of this series are rarely found complete in herbaria on account of the usual absence, during anthesis, of basal leaves, consequently descriptions of the foliage are likely to be wanting. The accompanying plate was prepared from the type specimen in the United States National Herbarium.

S. eriophora Robinson & Greenman, another Mexican species, which is a near ally of *S. saltensis*, is characterized by elongated tubular sheaths which entirely conceal the stem, and by exceptionally long floral bracts which exceed the flowers.



SPIRANTHES

Saltensis Ames

Pl. 51



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PLATE 51: *Spiranthes saltensis*

1, labellum; 2, petal; 3, lateral sepal; 4, upper sepal. All the parts natural size, the sepals, petal, and labellum having been traced through transparent paper on the stage of a dissecting-microscope.

STELIS GRACILIS

Stelis gracilis Ames ORCHIDACEÆ, Fasc. II. p. 266 (1908).

Secondary stems erect or ascending, 2–4 cm. long, clothed by elongated ancipitous obliquely truncate acute *sheaths*, which are conspicuously nervose when dry. *Leaves* coriaceous, linear-oblong, bidentate at the tip, 6–10 cm. long, 7–10 mm. wide above the middle, tapering at base into slender canaliculate *petioles*. *Peduncle* longer than the leaf, 10 cm. long, filiform, graceful, clothed at intervals with tubular obliquely truncate aristate-apiculate *bracts*, about 1 mm. long. *Pedicels* graceful, slender, exceeding the scale-like *floral bracts*. *Flowers* minute. *Sepals* similar, ovate, 3-nerved, 2 mm. long, 1.5 mm. wide. *Petals* cuneate, fleshy, thickened at the apex, about 0.5 mm. long, 1 mm. wide near the tip, 1-nerved. *Labellum* unguiculate, subequal to the petals, at about the middle obscurely bicallose, the *calli* approximate or confluent. *Column* short, the margin dentate.

GUATEMALA: Cubilquitz, Depart. Alta Verapaz, at 350 m. alt., June, 1900, H. von Tuerckheim (no. 7681).

In habit *Stelis gracilis* resembles *S. intermedia* Poepp. & Endl. The callus on the labellum appears to be variable and is so minute that its presence is not readily detected.

The genus *Stelis*, of Swartz, is systematically a most confusing one; consequently it is very inadequately understood and as a rule very poorly represented by carefully determined specimens in herbaria. Until an exhaustive comparative study of all available material has been made it must prove a fruitless task to identify with surety any but the better known and more common species of the genus.

STELIS *gracilis* Ames



ORCHIDACEÆ

PLATE 52: *Stelis gracilis*

Plant, natural size, reproduced from a part of the type. 1, flower; 2, upper sepal; 3, lateral sepal; 4, petal; 5, column; 6, labellum. All parts drawn, enlarged, with the aid of the camera lucida.

STELIS COMPACTA

Stelis compacta sp. nov. *Planta* pusilla, cæspitosa, ± 2 cm. alta. *Caules secundarii* graciles, ± 5 mm. longi, 1-foliati. *Folium* oblanceolatum, apiculatum, coriaceum, 1–2.7 cm. longum, ± 2 mm. latum, carina prominenti dorsali media. *Pedunculus* gracilis, filiformis, 3 cm. longus, foliis longior. *Bracteæ* tubulares, ad apicem dilatatae, oblique truncatae. *Bracteæ inflorescentiæ* squamiformes, pedicellis breviores, apiculatae. *Sepala lateralía* late ovata, 1 mm. longa, circa 1 mm. lata. *Sepalum dorsale* lateralibus simile sed angustius. *Petala* oblanceolata vel spatulata, obtusa, uninervia, circa 1 mm. longa. *Labellum* crassum, ovato-lanceolatum, acuminatum, obtusum vel subacutum, in alabastro acutum, 1 mm. longum. *Columna* erecta, crassiuscula, apoda, utroque ad apicem ala rotundata. *Pollinia* 2, subglobosa vel pyriformia, minutissima.

GUATEMALA: Cubilquitz, Depart. Alta Verapaz, at 350 m. alt., May, 1901, *H. von Tuerckheim* (no. 7991).

This compact little plant which, with some hesitation, is here referred to the genus *Stelis* Swartz, is most nearly allied with *Stelis lancilabris* Reichb. f. (*Beiträge zu einer Orchideenkunde Central-Amerika's*, 94, tab. 8, II. 3–5, 1866), which it closely resembles in habit and with which it agrees in having membranaceous petals devoid of thickening at the apical margin. According to Lindley's tentative classification of the genus in *Folia Orchidacea*, *Stelis compacta* belongs in the section *Monostachyæ brachypodæ*, although in its floral parts it resembles none of the well-known species of that extremely artificial group. The petals in outline bear no resemblance to the labellum, and in this respect are unusual for the genus. The floral bracts are obliquely truncate and clasp the slender rhachis. The apicules

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which terminate the narrow leathery leaves are bristle-like and about 0.5 mm. in length. The type specimen is made up of four well-developed plants and several fragments.

While the generic characters of this plant may have been incorrectly diagnosed on account of its unusual floral conformation, its affinities with the species of *Brachionidium* Lindl. (a nearly allied genus) are not clear, and its agreement with the generic characters of *Pleurothallis* R. Brown—a somewhat heterogeneous group—is equivocal. Except for the structure of the column, one might readily place the plant in *Brachionidium* on the strength of the brief characterization published by Lindley in *Folia Orchidacea*. For the present, at least, I prefer to place it in the genus *Stelis* because of its agreement with Reichenbach's *Stelis lancilabris* and its lack of agreement with any of the species known to me in the other genera mentioned. As R. A. Rolfe has stated (*Memoirs of the Torrey Botanical Club*, 4: 261), the groups designated by Lindley as the *Monostachyæ* and *Polystachyæ* cannot be retained, as the traits which distinguish them are not constant even for the same species.

ORCHIDACEÆ

PLATE 53: *Stelis compacta*

Plant, natural size, reconstructed from the type in herb. Ames. The single flower was drawn, enlarged, with the aid of the camera lucida.

STELIS *compacta* Ames



Pl. 53



ERYTHRODES MERRILLII

Erythroides Merrillii comb. nov.—*Herpysma Merrillii* Ames in *Philipp. Journ. Sci. (Bot.)* 2: 313 (1907).

Plant 1–3 dm. high. *Rhizome* creeping. *Leaves* about 5, ovate-lanceolate, shortly acuminate, acute, rounded at the base, 5–7 cm. long, about 3 cm. wide, passing into slender *petioles*. Base of the *petioles* scarios, sheathing the stem. *Peduncle* sparsely pubescent, with about 3 lanceolate scarios about 1 cm. long *bracts* below the loose racemose *inflorescence*. *Floral bracts* linear-lanceolate, acute, scarios, about 1 cm. long. *Flowers* white. *Lateral sepals* linear-oblong, about 1.2 cm. long, 2 mm. wide, concave, lightly carinate, cucullate with several hairs at the tip. *Upper sepal* similar to the laterals, broader, adhering lightly to the petals. *Petals* 1.2 cm. long, spatulate, obtuse, linear below the middle, free from each other at the base, cohering above the middle by their inner margins. *Labellum* adhering to the column, produced at base into a rather slender *spur*, which is bilobed at the tip and which protrudes between the lateral sepals; free portion narrow, a little dilated beyond the column, then 4-lobed; *proximal lobes* divaricate, oblong, obtuse, 1.5 mm. long, 1 mm. wide, separated from the distal lobes by a short 1 mm. long *claw* or isthmus; *distal lobes* divaricate, 1.5 mm. long, about 2 mm. wide, margin irregular; on the disc two thin longitudinal *lamellæ*, free at the obliquely truncate apex. Two wart-like *calli* are situated in the spur near its base, on the dorsal wall. From tip of spur to apex of labellum 1.5 cm.

PHILIPPINE ISLANDS: Terrestrial in damp ravine, by small stream on Mt. Halcon, Mindoro, November 9, 1906, *E. D. Merrill* (no. 5836).

Since the publication of the original description of this species further studies into its generic characters have convinced me

that it is more properly a species of *Erythrodes* Blume, than of *Herpysma* Lindl., differing from all the other species of the former genus, of which I have any knowledge, in the lamellæ of the labellum and in the two wart-like excrescences within the didymous sac or spur. *Herpysma*, it is true, has a bilamellate labellum, which, as in *Erythrodes*, is adherent to the gynostemium, but all the other characters of the species under consideration indicate clear affinity with the latter genus.

As now understood *Erythrodes* receives the Old World species placed by some authors in *Physurus* L. C. Rich. There is a marked difference between these genera, and it seems desirable to restrict *Physurus* to the western hemisphere (at least until a more decided agreement between it and *Erythrodes* is discovered), on the basis that geographical limits, when accompanied by strongly pronounced structural differences, are quite reliable in the differentiation of genera.

In *Nachträge zur Flora der deutschen Schutzgebiete in der Südsee* (Schumann & Lauterbach), Dr. Rudolf Schlechter discusses briefly the relationship between *Erythrodes* and *Physurus*, and in conformity with his views places in *Erythrodes* the following species: *Physurus bracteatus* Blume, *P. Blumei* Lindl., *P. viridiflorus* Lindl., and *P. Henryi* Rolfe; and he describes and figures two new species from Kaiser-Wilhelmsland, namely, *Erythrodes papuana* and *E. purpurascens*. J. J. Smith in *Bulletin du Département de l'Agriculture aux Indes Néerlandaises*, in his first supplement to *Die Orchideen von Java*, agrees with Schlechter's views and places the Javan *Physurus humilis* Blume in *Erythrodes*. The didymous sac or spur of the labellum of the Old World species is a constant differentiating character, according to Schlechter's studies never occurring in the species of *Physurus* of the New World. Furthermore, the gynostemium is supposed

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to offer important differentiating characters, although these are more or less relative in value and consequently of questionable worth in a systematic arrangement of species in such a puzzling group as the Physureæ. In both the Spiranthæ and Physureæ the dangers to a stable system of classification from excessive segregation of genera are very great. Even the most careful disposition of species in genera may be severely disturbed by morphological exceptions. Whether or not convenience is subserved by the multiplication of genera in such groups as the Spiranthæ and Physureæ, it is often quite evident that affinities are frequently neglected.

PLATE 54: *Erythrodes Merrillii*

Plant, natural size. 1, petals; 2, basal portion of the labellum showing the didymous tip of the spur; 3, apical portion of the labellum, showing the tips of the lamellæ; 4, lateral sepal; 5, column. All parts drawn, enlarged, from a co-type with the aid of the camera lucida.

NEPHELAPHYLLUM MINDORENSE

Nephelaphyllum mindorense Ames in *Philipp. Journ. Sci. (Bot.)* 2: 316 (1907).

“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 *lamellæ* near the apex, which pass basally into the main nerves of the hairy *disc*. *Spur* blunt, inflated, 4–5 mm. long.”—Ames, *loc. cit.*

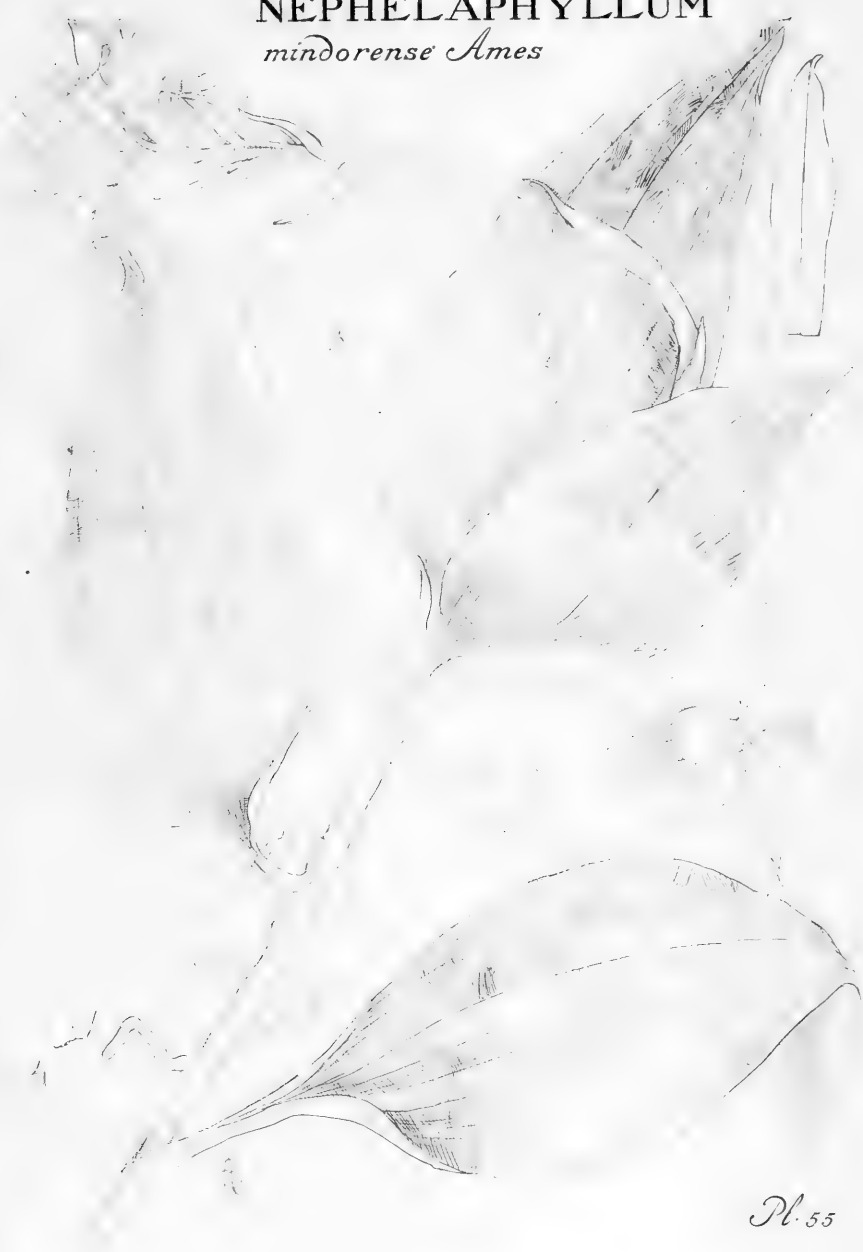
PHILIPPINE ISLANDS: Terrestrial in humid forest at about 900 ft. alt. along the Binabay River, Mindoro, November 2, 1906, *E. D. Merrill* (no. 5623).

PLATE 55: *Nephelaphyllum mindorense*

Plant, natural size, drawn from a co-type in herb. Ames. 1, flower; 2, upper sepal; 3, lateral sepal; 4, petal. In fig. 1 the labellum is shown with its converging lamellæ and blunt spur. All parts drawn, enlarged, with the aid of the camera lucida.

NEPHELAPHYLLUM

mindorense Ames



ERIA HALCONENSIS

Eria (§*Trichotosia*) *halconensis* Ames in *Philipp. Journ. Sci. (Bot.)* 2: 330 (1907).

“*Plant* comparatively slender, about 5 dm. tall. *Stems* about 7 mm. in diameter near the base, tapering gradually upwards. *Leaves* linear-lanceolate, acuminate, acute, pubescent, about 1 dm. long, 7–11 mm. wide. *Racemes* leaf-opposed, shorter than the leaves, about 5 cm. long, somewhat flexuose, densely covered with reddish yellow hairs. *Bracts* broadly ovate or sub-orbicular, 4–6 mm. long, hairy, abruptly acuminate. *Lateral sepals* triangular, externally hairy, subacute, 7 mm. long, about 4 mm. wide at base. *Upper sepal* oblong, externally hairy. *Petals* linear, subspathulate, tapering to a subacute or subobtuse apex, 6 mm. long, 1.5 mm. wide. *Labellum* 7 mm. long, linear-cuneate at the base, dilated above, then constricted within 2 mm. of the tip, 3-lobed; *lateral lobes* minute, obtuse, formed by the constriction; *middle lobe* subquadrate, apiculate, 3–4 mm. wide; *disc* with a prominent mid-nerve. *Mentum* about 3 mm. long.”—Ames, *loc. cit.*

PHILIPPINE ISLANDS: Epiphyte, flowers pink-purple, on exposed ridge at 4500 ft. alt. on Mt. Halcon, Mindoro, November 14, 1906, *E. D. Merrill* (no. 5742).—Terrestrial, flowers pink-purple, odorless, on banks in mossy forest at 6000 ft. alt. on Mt. Halcon, Mindoro, November 15, 1906, *E. D. Merrill* (no. 5510) type.

In addition to the type, which was collected on November 15, Merrill discovered a series of specimens which exhibit slight differences from *Eria halconensis*. This series was referred to *E. halconensis* in my paper on Merrill's Mt. Halcon orchids,* although the original description was drawn entirely from the type. The plants of the series in question are smaller through-

* *Philippine Journal of Science (Bot.)* 2: 330 (1907).

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out than typical *E. halconensis*, one specimen in my herbarium being only 23 cm. high, with narrow leaves 4.5 to 7.5 cm. long and with flowers 7 mm. long from the tip of the blunt mentum to the tips of the lateral sepals. The differences in the floral conformation between the two series are too slight to warrant specific or even varietal distinction, and as the variation in foliage, though great, is not uncommonly wide for species of the *Trichotosia* section of the genus *Eria*, I have refrained from placing upon it undue reliance.

Pl. 55



ERIA *halconensis* Ames

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PLATE 56: *Eria halconensis*

Plant, natural size, drawn from a co-type (*Merrill*, no. 5510). 1, flower; 2, petal; 3, labelum; 4, upper sepal. All parts drawn, enlarged, with the aid of the camera lucida.

ERIA GRACILISCAPA

Eria (§Hymeneria) *graciliscapa* Rolfe ex Ames ORCHIDACEÆ, Fasc. I. p. 93 (1905) and Fasc. II. p. 193 (1908).

Roots copiously branched, finely hairy. Stems slender, terete, 11.5–19 cm. long, sheathed by several tubular acute *bracts*. *Leaves* 3–4, terminal, oblong-lanceolate, acute, nervose, scarcely petiolate, 6–8.5 cm. long, 1.2–1.9 cm. wide. *Peduncles* axillary near the summit of the stem, slender, many-flowered, 6–7 cm. long. *Bracts* lanceolate, acute, scarious (in dried specimens), ±2 mm. long. *Flowers* white. *Lateral sepals* 5 mm. long, 1 mm. wide, linear-lanceolate to oblong-lanceolate, subacute or obtuse, 3-nerved. *Upper sepal* similar to the laterals. *Petals* linear-lanceolate, obtuse, subfalcate, about 3 mm. long. *Labellum* entire, about 2 mm. long, ovate-lanceolate to lanceolate, 3-nerved, the lateral nerves carinate. *Column* rather stout, about 1 mm. long.

PHILIPPINE ISLANDS: On Mt. Mariveles, Prov. of Bataan, Luzon, May, 1904, *H. N. Whitford* (no. 307).—Near the same locality it was collected on May 22, 1904, by *D. LeRoy Topping* (no. 474), and on May 25, 1904, by *Thomas E. Borden* (no. 795). Borden reports that his specimens bore white, fragrant flowers and were gathered on mountain ridges at 1150 m. above sea level.

In aspect *E. graciliscapa* recalls *E. tenuifolia* Ridley, a species which has narrower leaves and broader floral segments. Whitford says of the type that it was found both epiphytic and on the ground, 3000 feet above sea level.





ERIA
graciliscapa
Rolfe

Pl. 57

ORCHIDACEÆ

PLATE 57: *Eria graciliscapa*

Plant, natural size, drawn from the co-type in herb. Ames. 1, labellum; 2, petal; 3, upper sepal; 4, lateral sepal, the margin rolled in. All the parts, much enlarged, drawn with the aid of the camera lucida.

LIPARIS SAUNDERSIANA

Liparis Saundersiana Reichb. f. in *Gard. Chron.* July 27, 1872, p. 1003; Ridley in *Journ. Linn. Soc.* 22: 274 (1886).

“Minuta, similis *Liparidi Wendlandi*; pseudobulbo ovato; foliis carnosulis geminis supra vaginam cordato oblongis acutis; pedunculo longiori trigono; racemo paucifloro, bracteis triangularibus angustis herbaceis ovaria pedicellata non æquantibus; sepalis triangulo ligulatis, summo trinervi, lateralibus uninerviis; tepalis lineari-filiformibus uninerviis; labello basi juxta columnam sagittato oblongo apiculato seu obtuso, ciliato seu eciliato; columna apice ampliata.”—Reichenbach f., *loc. cit.*

Plant 5–8 cm. or more high, bifoliate, pseudobulbous. *Leaves* elliptic-oblong to ovate, one of the pair larger than the other; *lamina* ±1.5–2.5 cm. long, ±0.9–2 cm. wide; *petiole* about 1.5–2 cm. long. *Scape* winged, much exceeding the leaves, rather slender, naked below. *Racemes* rather loose, bearing from 6 to 10 or more flowers. *Floral bracts* lanceolate, acute, about 5 mm. long. *Pedicel* slender, exceeding the bracts, together with the ovary about 7 mm. long. *Lateral sepals* oblong, 1-nerved, about 5 mm. long. *Upper sepal* similar to the laterals. *Petals* linear, obtuse, 1-nerved, about 7 mm. long. *Labellum* ovate-cordate, about 7 mm. long, 5 mm. wide.

JAMAICA: Cinchona, at 4900 ft. alt., January 12, 1907, *Wm. Harris* (no. 9789).

In dried specimens the pedicels, labellum, and petals have the appearance of having been madder-purple and the sepals greenish when fresh. Reichenbach suggests that *Liparis Saundersiana* recalls in aspect some species of the Australian genus *Cyrtostylis* of R. Brown. It resembles distantly *Cyrtostylis reniformis* R. Brown.



LIPARIS
Saundersiana
Reichb.f.

Pl. 58

ORCHIDACEÆ

PLATE 58: *Liparis Saundersiana*

Plant, natural size, drawn from a specimen collected in January by William Harris. 1, petal; 2, upper sepal; 3, lateral sepal. On the right, a flower drawn natural size.

LIPARIS CARDIOPHYLLA

Liparis cardiophylla *sp. nov.* Aff. *L. neuroglossæ* Reichb. f. et *L. ramosæ* Poepp. & Endl. *Rhizoma* repens. *Pseudobulbi* cylindrati, 8 mm. longi. *Folium* erectum; *lamina* ovato-cordata vel suborbiculata, apiculata, membranacea, 2.5–3.9 cm. longa, 2.3–3.3 cm. lata, multinervia; *petiolus* ad basim vaginans, 2–2.5 cm. longus. *Pedunculus* alatus, ± 5 cm. longus, cum racemo folia excedens. *Bracteæ* lanceolatæ, acutæ, ± 2.5 mm. longæ. *Racemus* pauciflorus, laxiflorus. *Sepala* lateralia membranacea, 4 mm. longa, oblonga, uninervia. *Sepalum* dorsale simile. *Petala* linearia, membranacea, 4–5 mm. longa. *Labellum* 3.5 mm. longum, 3.5 mm. latum ad apicem, membranaceum, cuneato-flabellatum, retuso-apiculatum vel bilobatum; *lobi* truncati marginibus irregulariter dentatis; ad basim prope columnam *callus* incrassatus, cucullatus. *Columna* 2.5 mm. longa, ex comparatione crassa.

Plant small, monophyllous. *Pseudobulb* minute, sheathed by the petiole of the ovate-cordate or suborbicular apiculate *leaf*. *Peduncle* strongly winged, comparatively stout, bearing about ten flowers. The *flowers* appear to have been greenish when fresh, with five purple nerves in the *labellum*. *Liparis cardiophylla* is closely allied to *L. neuroglossa* Reichb. f., a Bolivian species, to *L. ramosa* Poepp. & Endl. as indicated above, and to *L. elegantula* Kränzl., a bifoliate species, native of Peru.

JAMAICA: John Crow Peak, at 6000 ft. alt., January 12, 1907, *Wm. Harris* (no. 9784). Type in herb. Ames (no. 10529).



LIPARIS
cardiophylla Ames

ORCHIDACEÆ

PLATE 59: *Liparis cardiophylla*

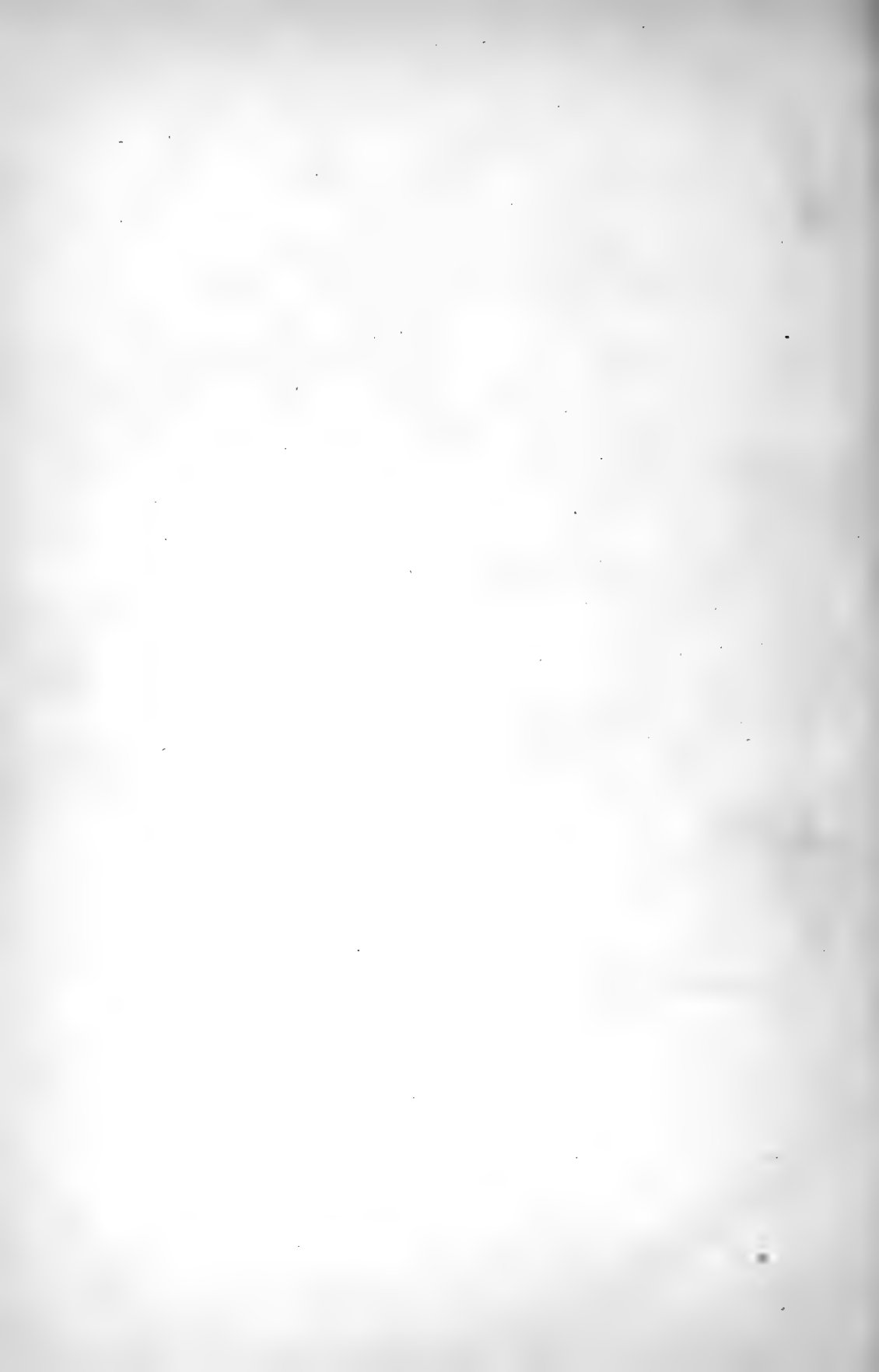
Plant, natural size, drawn from the type.
1, labellum; 2, petal; 3, lateral sepal; 4, upper
sepal. All parts drawn, enlarged, with the aid
of the camera lucida.



A SUMMARY OF NEW SPECIES AND
COMBINATIONS PROPOSED IN THIS FASCICLE

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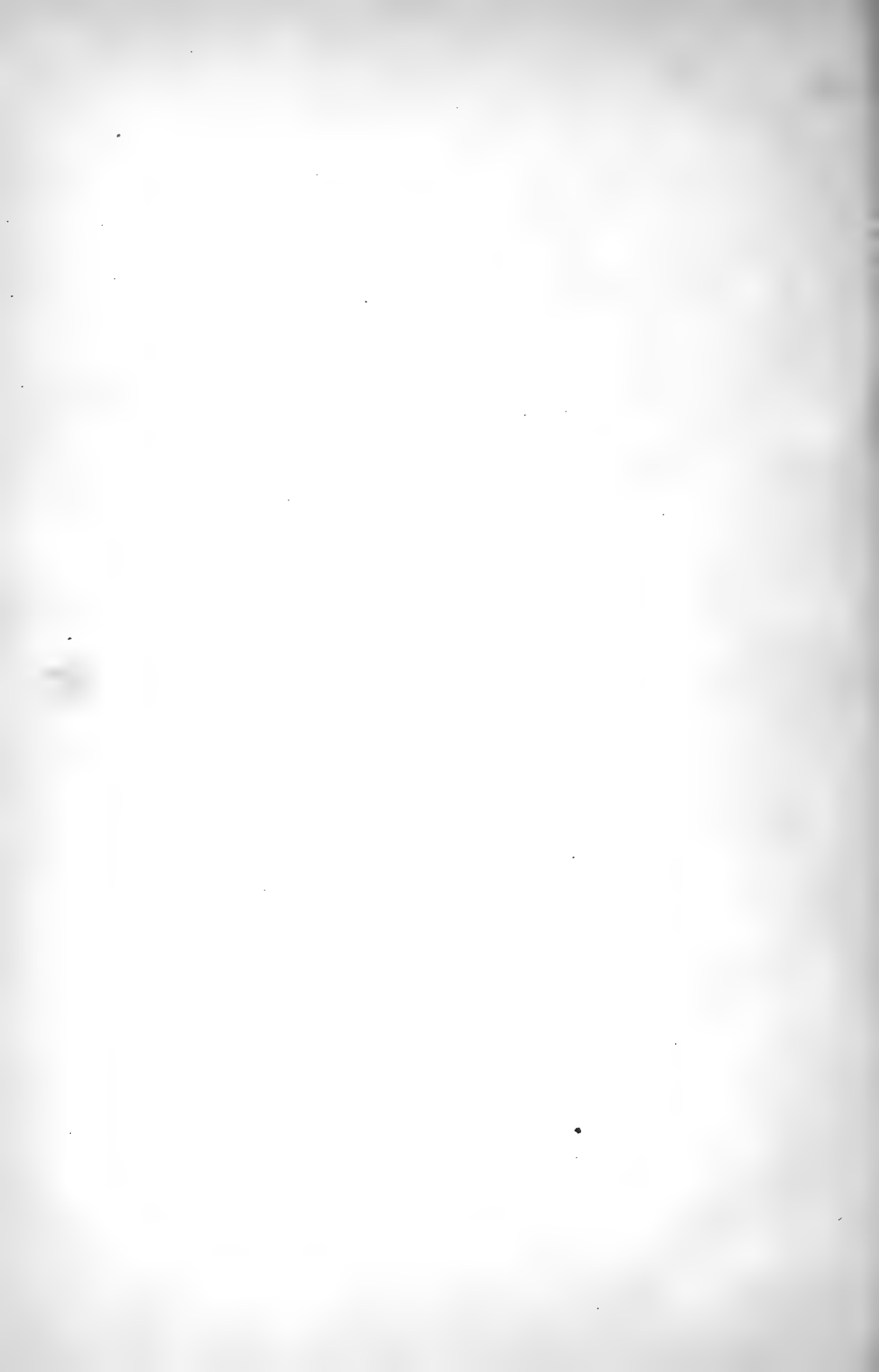
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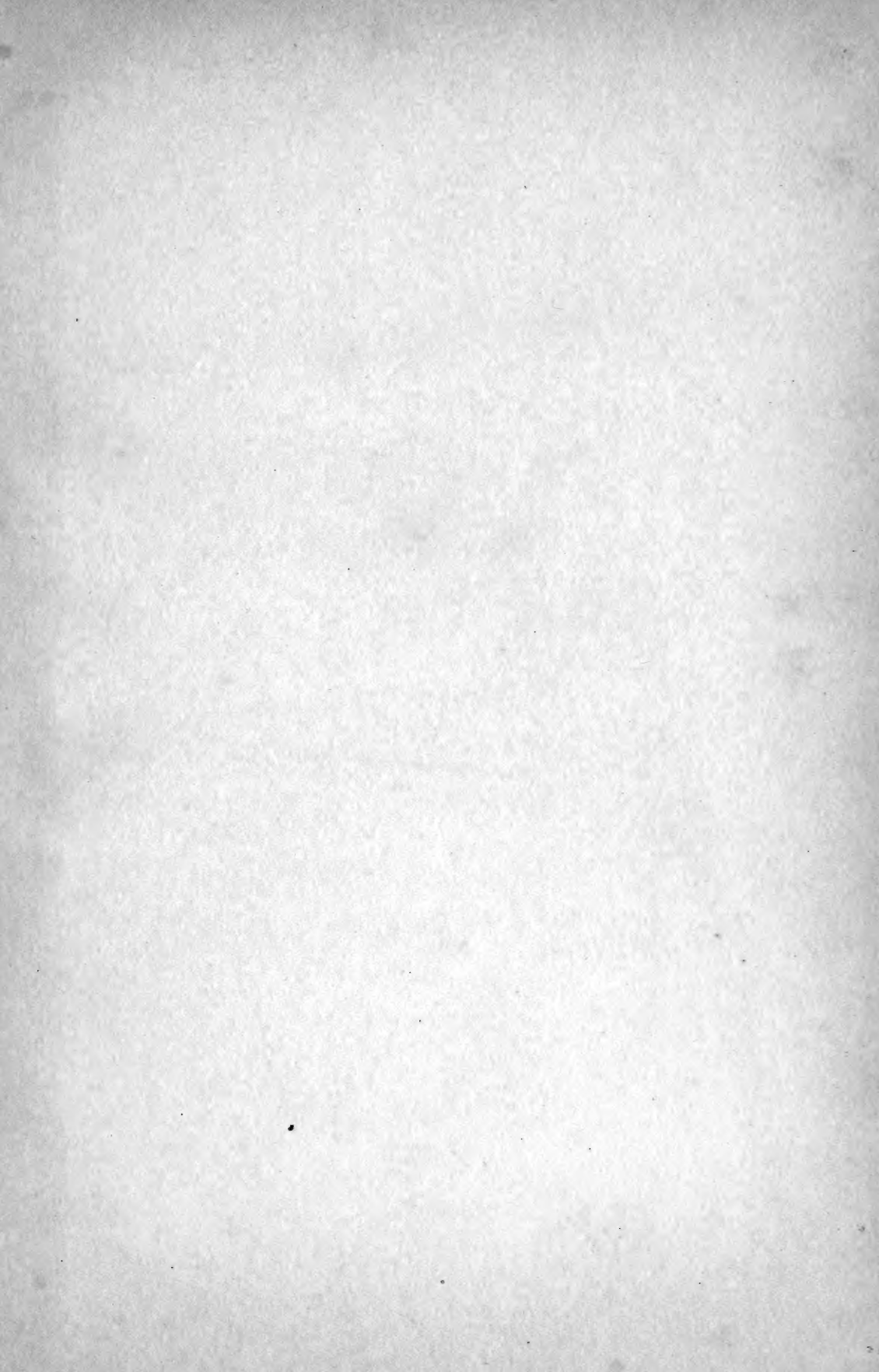
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