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ORCHIDACEAE NOVAE GUINEAE I¹

BY

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THE ORCHIDS described and discussed here were collected in New Guinea either by Mr. L. J. Brass on the third Archbold Expedition in 1936-1937² or by Mrs. Mary Strong Clemens in 1940-1941.

The material collected by Mr. Brass is well prepared; in most cases there are duplicates which will be distributed by the Arnold Arboretum. The types of all new species described are in the Oakes Ames Orchid Herbarium, Harvard University, Cambridge, Massachusetts.

***Paphiopedilum papuanum* (Ridl.) L. O. Williams**
comb. nov.

Cypripedium papuanum Ridley in Gard. Chron. ser. 3, 58 (1915) 131, fig. 43.

Paphiopedilum papuanum is closely allied to *P. violascens* Schltr., which also comes from New Guinea.

***Pterostylis caulescens* L. O. Williams sp. nov.**

Herbae graciles, terrestres, usque ad ca. 20 cm. altae. Caules flexuosi, foliosi. Folia basalia ignota. Folia caulium longe petiolata; lamina elliptica vel elliptico-lanceolata, acuta, membranacea. Inflorescentia uniflora.

¹ Botanical Results of the Archbold Expeditions.

² For an account of this expedition see A. L. Rand and L. J. Brass in Bull. Am. Mus. Nat. Hist. 77 (1940) 341-380, tt. 21-42.

Sepalum dorsale lanceolatum, acuminatum. Sepala lateralia lanceolata, acuminata, basi connata. Petala elliptico-lanceolata, acuta, leviter arcuata. Labellum anguste oblongo-ellipticum, basi appendice penicillata ornatum. Columna generis.

Slender terrestrial herbs up to about 20 cm. tall. Stems flexuose, foliose. Basal leaves unknown. Cauline leaves long-petiolate; lamina 5.5–7.5 cm. long, 1.4–1.8 cm. broad, elliptic or elliptic-lanceolate, acute, membranaceous, tapering to the petiole at the base; petiole 2–5 cm. long and 0.2–0.3 cm. broad, canaliculate, semiamplexicaul at the base. Flower terminal, solitary. Dorsal sepal about 3 cm. long and 1 cm. broad, lanceolate, acuminate, about 9-nerved, puberulent dorsally. Lateral sepals about 3 cm. long and 0.4–0.5 cm. broad, lanceolate, acuminate, puberulent dorsally, connate at the base for about one third of their length or less. Petals about 3 cm. long and 0.5 cm. broad, elliptic or elliptic-lanceolate, acute, somewhat arcuate, 7- to 9-nerved, puberulent dorsally. Lip about 13 mm. long and 4 mm. broad, narrowly oblong-elliptic, with a conduplicate ridge down the center, papilliferous, originating from the apex of the column-foot, with a recurved flattened appendage at the base which is about 4 mm. long and penicillate at the apex. Column of the genus, about 13 mm. long; column-foot about 4 mm. long.

BRITISH NEW GUINEA: alpine, bush margin, Rawlinson Range, Morobe District, alt. 10,000–12,000 ft., flowers flesh pink, September 22, 1941, *Clemens s.n.* (TYPE in Herb. Ames No. 61211).

Pterostylis caulescens is easily distinguished from the other two known species of the genus in New Guinea by its large cauline leaves. The material from which this species is described is not very good.

***Pterostylis papuana* Rolfe** in Kew Bull. (1899)

112—J.J. Smith in *Nova Guinea* 12, pt. 3 (1915) 185, t. 61, fig. 99.

NETHERLANDS NEW GUINEA: vicinity of Lake Habbema, *Brass* 9214, 9215, 9598, 10810, 10880; about 5 km. northeast of Wilhelmina-top, *Brass & Myer-Drees* 9406.

The six collections cited constitute an excellent series of this uncommon species, from young to mature examples.

***Calochilus caeruleus* L. O. Williams sp. nov.**

Herbae terrestres, graciles, efoliosae vel subefoliosae, usque ad 7 dm. altae. Caules stricti. Folia caulium bracteiformia, acuta vel acuminata, scariosa vel subscariosa. Inflorescentia racemosa, laxa, pauciflora; bractae ovato-lanceolatae, acuminatae. Sepalum dorsale suborbiculari-ovatum, acutum, cucullatum. Sepala lateralia ovata, acuta, leviter obliqua, basi connata. Petala oblonga, leviter arcuata, obtusa. Labellum obovato-cuneatum; discus callis digitiformibus elongatis acutis ornatus. Columna generis.

Slender, terrestrial, leafless or nearly leafless herbs up to 7 dm. tall. Stems up to 3 mm. in diameter, strict, with about three short, bract-like leaves or bracts. The cauline leaves or bracts 1–4 cm. long, sheathing, acute or acuminate, scarious or subscarious. Inflorescence a lax few-flowered raceme; bracts up to 1 cm. long, ovate-lanceolate, acuminate. Flowers smaller than usual in the genus. Dorsal sepal about 7 mm. long and about 6 mm. broad when expanded, suborbicular-ovate, acute, strongly cucullate. Lateral sepals about 7 mm. long and 4 mm. broad, ovate, acute, slightly oblique, connate for a short distance at the base. Petals about 6 mm. long and 3 mm. broad, oblong, somewhat arcuate, obtuse, minutely verrucose dorsally. Lip about 14 mm. long and 8 mm. broad near the apex, obovate-cuneate, gradually

narrowed to the base, the proximal margins fimbriated; the disc with the proximal two thirds densely adorned with elongated, acute, finger-like calli and with two inconspicuous parallel, sublamellate calli at the base, the distal third calvous or essentially so. Column of the genus, about 4 mm. long, auriculate winged at the base; anther about 2.5 mm. long.

BRITISH NEW GUINEA: sporadic on poorly drained soils, savannah forests, Tarara, Wassi Kussa River, Western District, stems green, erect from an ovoid tuber, flowers green densely mottled and shaded with red, beard of the labellum a deep metallic blue at the base, distal two thirds maroon-red, January 1937, *Brass* 8600 (TYPE in Herb. Ames No. 61165).

Calochilus is a small genus of some ten or twelve species which has its center of distribution in Australia. It belongs to a group that is essentially Australian. The genus is also represented in Tasmania, New Zealand and New Caledonia. The species described here extends the range of the genus to New Guinea.

Calochilus caeruleus is easily distinguished from all other species of the genus by the obovate-cuneate lip, as well as by other details of the perianth. The leafless or nearly leafless stem is unusual in the genus.

***Drakaea irritabilis* (Mueller) Reichenbach filius** Beitrage Syst. Pflanzenk. (1871) 68; *Xenia Orch.* 2 (1874) 203, t. 189—Bentham Fl. Austral. 6 (1873) 368.

Arthrochilus irratabilis Mueller Fragm. 1 (1854) 43.

PAPUA: savannah forest, occasional on wet flats, Tarara, Wassi Kussa River, Western Division, flowers green, January 1937, *Brass* 8722.

Drakaea is a small genus of about seven species previously known only in Australia. Six of the seven species seem to be limited in their distribution to West Australia. One species, *Drakaea irritabilis*, is known from the eastern coast of Australia, in Queensland, and now from the region of the Fly River in Papua.

We have seen only Reichenbach's figure, cited above, and the various descriptions. Although our specimens differ somewhat from Reichenbach's plate and were collected some 1600 kilometers distant from previously recorded localities, they will probably be found to be identical when they are compared with authentic material in London.

Erythroides adscendens *L. O. Williams sp. nov.*

Herbae parvae, adscendentes, terrestres, usque ad 35 cm. longae. Folia breviter petiolata; lamina lanceolata vel lanceolato-ovata, obtusa vel acuta; petiolus brevis. Sepalum dorsale late ellipticum, cucullatum, apice clavellatum, carnosum. Sepala lateralibus elliptico-oblonga, obtusa, leviter obliqua, apice clavellata. Petala late elliptico-oblonga, obtusa, apice carnosum. Labellum calcaratum; lamina oblonga, obtusa, emarginata, apice carnosum, puberula, callo V-formi ornata.

Small ascending, terrestrial herbs up to 35 cm. long. Rhizome decumbent, stem-like. Stems repent or ascending, slender, leaf-bearing to the middle or beyond. Leaves short-petiolate; lamina 2–6.5 cm. long and 0.6–1.5 cm. broad, lanceolate to lanceolate-ovate, obtuse or acute; petiole short, up to 5 mm. long, from an amplexicaul, membranaceous sheath. Inflorescence a lax, few-flowered spike or raceme; the rachis pubescent above; bracts 5–10 mm. long, lanceolate, acuminate, membranaceous, usually exceeding the ovary. Dorsal sepal about 4 mm. long and 1.5–2 mm. broad, broadly elliptic, cucullate; the apex clavellate, fleshy and obtuse. Lateral sepals about 4 mm. long and 1.5–2.2 mm. broad, elliptic-oblong, obtuse, slightly oblique, the apex fleshy-thickened. Petals about 4 mm. long and 1.5 mm. broad, elliptic-oblong, obtuse, the apex fleshy-thickened. Lip spurred; the lamina 3–3.5 mm. long and 1.5–2 mm. broad, oblong, ob-

tuse, emarginate, the apex fleshy-thickened and obscurely pubescent, disc with a V-shaped callus; spur 3.5–5 mm. long and 1.5–2 mm. in diameter, straight, the tip simple, acute or obtuse, with two stipitate glands near the middle inside. Column of the genus.

BRITISH NEW GUINEA: forming open ground cover in forest on flood plains, Fairfax Islands, Lower Fly River, flowers white, October 1936, *Brass* 8193 (TYPE in Herb. Ames); Matap, Morobe District, alt. 5000–6000 ft., flowers white, February 6–April 6, 1940, *Clemens* 11252.

Erythroides adscendens and *E. sutricalcar*, the species described below, are unique among the species of *Erythroides* in New Guinea (if not in all of Oceania) in having a spur that is not bilobed or didymous. These species add further strength to Ames' contention (*Orch.* 7 (1922) 63–66) that *Physurus* (neotropic) and *Erythroides* (paleotropic) are synonymous.

There are apparently no near allies of *Erythroides adscendens* in the immediate area of Oceania, except *E. sutricalcar*. Superficially the species somewhat resembles *Erythroides platensis* (Haum.) L. Wms. from South America.

It is with some hesitation that we unite the two collections cited above as one species. The Clemens specimen is the smaller of the two, with smaller leaves and shorter stems, but has slightly larger flowers. The flower parts seem to be essentially the same as those in the Brass collection. The Brass collection comes from near sea-level, while Mrs. Clemens found the plants at 5000–6000 feet altitude.

***Erythroides sutricalcar* L. O. Williams sp. nov.**

Herbae parvae, adscendentes, terrestres, usque ad 25 cm. longae. Folia petiolata; lamina elliptica vel ovato-lanceolata, acuta. Inflorescentia racemosa, conferta, pauciflora; bracteae lineares vel lineari-lanceolatae, acutae

vel acuminatae. Sepalum dorsale late lanceolatum, obtusum, cucullatum. Sepala lateralibus anguste oblonga, obtusa, cucullata. Petala elliptico-oblonga, obtusa. Labellum calcaratum; lamina late oblonga vel subquadrata, obscure trilobata, emarginata; discus carnosus et callosus; calcar simplex, intus bicallosum, callo sutriforme ornatum.

Small erect or ascending, terrestrial herbs up to about 25 cm. long. Stems slender, leafy up to about the middle. Leaves petiolate; lamina 2.5–4.5 cm. long and 1–2 cm. broad, elliptic to (usually) ovate-lanceolate, acute; petiole 1–1.5 cm. long, constricted below the lamina but expanded at the base and amplexicaul or semiamplexicaul. Inflorescence a dense, few-flowered raceme; rachis and stem immediately below the inflorescence pubescent; bracts up to 8 mm. long, linear to linear-lanceolate, acute or acuminate, cucullate. Flowers green. Dorsal sepal about 4 mm. long and 2 mm. broad, broadly lanceolate, obtuse, cucullate, 1-nerved, the apex callose-thickened. Lateral sepals about 4 mm. long and 2–2.5 mm. broad, narrowly oblong, obtuse, 1-nerved, cucullate, the apex callose-thickened. Petals 3.5–4 mm. long and 1.5–2 mm. broad, elliptic-oblong, obtuse, 1-nerved, the apex callose-thickened, rapidly constricted at the base, lightly adnate to the dorsal sepal. Lip spurred; lamina about 3 mm. long and 2.5–3 mm. broad, broadly oblong or subquadrata, three-lobed with the lateral lobes small, basal and inconspicuous, the margins membranaceous and strongly involute, the apex emarginate, the disc thickened and with a longitudinal fleshy callus which is more or less divided at the base; spur about 5–6 mm. long and 2.5–3 mm. in greatest diameter, constricted at the throat, becoming broad and inflated in the middle but again constricted at the simple tip, with a suture-like callus-thickening on the posterior side and with two re-

trorse, stipitate glands on the anterior wall within. Column of the genus, 2–2.5 mm. long.

BRITISH NEW GUINEA: abundant around small stagnant pools in flood-plain forest, Palmer River 2 miles below junction with Black River (long. ca. $141^{\circ}30'$ E., lat. ca. $5^{\circ}55'$ S.), alt. 100 meters, pale fleshy ascending herbs ca. 25 cm. high, flowers green, July 1936, *Brass* 7199 (TYPE in Herb. Ames).

Erythroides sutricalcar is most closely allied to *E. ascendens* L. Wms., but is easily distinguished by the differently shaped leaves, by the inflated spur, and by the details of the lip, petals and sepals.

The specific name is in allusion to the suture-like callos-thickening on the posterior wall of the spur.

Malaxis seleniglossa (*Schltr.*) *L. O. Williams* comb. nov.

Microstylis seleniglossa Schlechter in Fedde Repert. Beihefte 1 (1911) 115; in Fedde Repert. Beihefte 21 (1923) t. 44, fig. 152.

BRITISH NEW GUINEA: Amieng on Yaneng River, a tributary of the Buso River, above mouth of Tosapik Creek, Morobe District, elevation 5000–6000 ft., buds green, April 3, 1941, *Clemens* 12095a.

The determination was made from the description and floral analysis cited.

Dendrobium cyananthum *L. O. Williams* sp. nov.

Herbae parvae, epiphyticae, caespitosae, usque ad 10 cm. longae. Folia lineari-filiformia, coriacea vel subteretia. Inflorescentia brevis, uni- usque ad triflora. Sepalum dorsale lanceolatum, acutum vel acuminatum, leviter cucullatum. Sepala lateralibus basi mentum formantia; lamina lanceolato-triangularis, acuta vel acuminata, leviter obliqua. Petala lineari-oblongeolata, acuta vel acuminata. Labellum oblongo-oblongeolatum, acutum, prope apicem subtrilobulatum, leviter carnosum, ecallosum.

Small caespitose, epiphytic herbs up to about 10 cm.

long. Stems 1–3 cm. long and about 2–3 mm. in diameter, cylindric to subfusiform, with several nodes, branched or simple, one- to several-leaved, the leaves borne terminally and from the uppermost nodes. Leaves 3–6 cm. long and 1.2 mm. broad, linear-filiform, coriaceous or subterete. Inflorescence terminal, short, one- to three-flowered; bracts oval to suborbicular, chartaceous, subaristate, shorter than the ovary. Flowers large for the section, pale slate blue with the lip deep red. Ovary strongly three-winged. Dorsal sepal 8–10 mm. long and 3–4 mm. broad, lanceolate, acute or acuminate, five-nerved, slightly cucullate. Lateral sepals adnate to the column-foot and elongated at the base into a mentum; lamina free, 8–10 mm. long and 4–5 mm. broad, lanceolate-triangular, acute or acuminate, somewhat oblique, base forming a mentum 16–20 mm. long which is saccate-cylindric and closed for about 8–9 mm. Petals about 7–9 mm. long and 1.5–2 mm. broad, linear-oblongate, acute or acuminate, two- (three-) nerved. Lip (free portion) about 12 mm. long and 3.5–4 mm. broad, oblong-oblongate, acute, subtrilobulate toward the tip, seven-nerved, somewhat fleshy but ecallose. Column short, about 3 mm. long, but the column-foot much elongated and about 16–20 mm. or more long.

BRITISH NEW GUINEA: Amieng, on Yaneng River, a tributary of the Buso River, above mouth of Tosapik Creek, Morobe District, elevation 5000–6000 ft., flowers pale slate blue, lip deep red, tube purplish pink, March 26, 1941, *Clemens 12089b* (TYPE in Herb. Ames).

Dendrobium cyananthum belongs to the subgenus *Eudendrobium*, section *Oxyglossum* of Schlechter's treatment of the "Deutsch-Neu-Guinea" species of the genus in *Fedde Repert.* 1 (1912) 440 et seq. It is most closely allied to *D. cyanocentrum* Schltr., but is a larger plant with flowers twice or more as large, narrower petals, larger leaves and other distinguishing details.

It is quite impossible to say from macroscopic examination just where the column-foot ends and where the sepal tissue starts in the mentum. Likewise the lip is completely fused with the sepals below the point where the sepals are connate and the tissue is impossible to differentiate.

Dendrobium dischorens (*Schltr.*) *L.O. Williams*
comb. nov.

Cadetia dischorens Schlechter in Fedde Repert. Beihefte 1 (1912) 429.

BRITISH NEW GUINEA: mountain bush, Matap Station, Morobe District, alt. 4000–6000 ft., March 1, 1940, *Clemens 11216* (in Herb. Univ. Michigan; fragment in Herb. Ames).

There are three isotypes of this species in the Ames Herbarium.

Dendrobium fantasticum *L.O. Williams* *sp. nov.*

Herbae epiphyticae, graciles, usque ad 40 cm. altae. Folia elliptica vel late lanceolata, acuta vel acuminata, coriacea, breviter petiolata, erecta vel suberecta. Inflorescentia foliis subaequalis, tri- usque ad decem-flora. Sepalum dorsale oblongo-ellipticum, obtusum, prope apicem constrictum. Sepala lateralalia ovato-lanceolata, basi mentum subsaccatum formantia. Petala linearia vel lineari-spathulata, obtusa vel truncata, falcata. Labellum breviter unguiculatum; unguis compressus, carnosus, arcuatus; lamina trilobulata, lobus medius emarginatus. Columna sectionis.

Slender, epiphytic herbs up to 40 cm. tall. Stems cylindrical or slightly swollen at the apex, indurated, sulcate when dry, with several joints, up to 5 mm. in diameter, bifoliate at the apex. Leaves 8–12 cm. long and 2–2.8 cm. broad, elliptic to broadly lanceolate, acute or acuminate, coriaceous, short-petiolate, erect or suberect.

Inflorescences one or more from the axils of the leaves or from the nodes of the stem, about as long as the leaves, 3- to 10-flowered, peduncle slender, with one or more semiamplexicaul bracts below; bracts of the inflorescence 3–5 mm. long, ovate-lanceolate, acute, cucullate. Flowers dull purple with greenish white and yellow markings. Dorsal sepal 10–12 mm. long and 5–6 mm. broad, oblong-elliptic, obtuse, constricted near the apex, 5-nerved. Lateral sepals about 8 mm. long and 6–8 mm. broad, 5-nerved, ovate-lanceolate, prolonged at the base and with the column-foot forming a subsaccate mentum; the mentum laterally compressed, about 5 mm. deep and 6–7 mm. across the mouth. Petals 10–12 mm. long and 2 mm. broad, linear to linear-spatulate, obtuse or truncate, the apex sometimes obscurely lobulate, falcate, 2- to 3-nerved. Lip short-unguiculate; claw about 4–5 mm. long, laterally compressed and fleshy, about 2 mm. thick, arcuate, with two longitudinal calli which become three in front; lamina 14–18 mm. broad and about 10 mm. long, 3-lobed, subcochleate, with a single subumbonate or 3-ridged callus at the base; lateral lobes spreading, about 3 mm. broad, obtuse; mid-lobe emarginate almost to its base, about 4 mm. long with each segment about 1.5 mm. broad, acute. Column of the section, 3.5–4.5 mm. long.

NETHERLANDS NEW GUINEA: common low epiphyte on ridges, rain forest, 6 km. southwest of Bernhard Camp, Idenberg River, flowers a pale brownish purple, alt. 1200 m., February 1939, *Brass 12844* (TYPE in Herb. Ames).

BRITISH NEW GUINEA: Amieng, on Yaneng River, a tributary of the Buso River, above mouth of Tosapik Creek, Morobe District, flowers dull purple with greenish white and purple markings, alt. 5000–6000 ft., May 22, 1941, *Clemens 12213*.

Dendrobium fantasticum belongs to the subgenus *Athecebum*, section *Latourea* of Schlechter's treatment of the orchids of "Deutsch-Neu-Guinea" in Fedde Re-

pert. Beihefte 1 (1912) 440 et seq. Specifically it is most closely allied to *Dendrobium aberrans* Schltr., from which it is easily distinguished by the larger leaves, longer stems which are not much swollen, by the entire, obtuse or truncate petals, by the lamina of the lip which has quite different calli, as well as by the general shape of the mentum and by other details of the flower.

***Dendrobium palustre* L. O. Williams sp. nov.**

Herbae epiphyticae, parvae, erectae vel adscendentes. Folia petiolata; lamina elliptica, acuta vel obtusa, coriacea; petiolus canaliculatus. Inflorescentia racemosa, brevis, tri- usque ad quinqueflora. Sepalum dorsale ovato-lanceolatum, acuminatum. Sepala lateraliam mentum formantia; lamina ovato-lanceolata, acuminata. Petala subrhombico-ob lanceolata, acuta vel acuminata. Labellum oblongo-ob lanceolatum, apice trilobulatum, acuminatum, basi sepalis lateralibus adnatum. Columna sectionis.

Small caespitose, epiphytic, erect or ascending herbs up to about 20 cm. long. Pseudobulbs up to 8 cm. long and 0.5 cm. in diameter, unifoliate. Leaves 11–13 cm. long and 1.3–2.3 cm. broad, petiolate; lamina 7–10 cm. long, elliptic, acute or obtuse, coriaceous; petiole up to 5 cm. long, canaliculate. Inflorescence a short 3- to 5-flowered raceme borne in the axil of the leaf or at a node. Flowers large for the section, green with purple lines, the lip white. Dorsal sepal 9–11 mm. long and about 4 mm. broad, ovate-lanceolate, acuminate, 5-nerved. Lateral sepals elongated at the base and forming a mentum with the column-foot; lamina 9–11 mm. long and 4–5 mm. broad, ovate-lanceolate, acuminate, 5-nerved; bases 15–18 mm. long, adnate to the column-foot and forming a mentum which is spur-like for 8–10 mm. at the tip. Petals 7–9 mm. long and 3–3.5 mm. broad, obliquely

subrhombic-oblongate, acute to acuminate, 3-nerved, very obscurely denticulate toward the apex. Lip (free portion) 13–15 mm. long and about 5 mm. broad near the apex, oblong-oblongate, trilobulate at the apex, acuminate, adnate to the lateral sepals at the base, ecallose. Column of the section.

BRITISH NEW GUINEA: in tufted clumps, boggy margin of Conifer Pond in mosses near the ground, Amieng on Yaneng River, a tributary of the Buso River, above mouth of Tosapik Creek, Morobe District, flowers green with purple lines, lip white, alt. 5000–6000 ft., March 25, 1941, *Clemens 12056c* (TYPE in Herb. Univ. Michigan; fragment in Herb. Ames).

Dendrobium palustre belongs to the subgenus Eudendrobium, section Oxyglossum and is most closely allied to *D. petiolatum* Schltr. and to *D. undatialatum* Schltr. It is easily distinguished from both of these species in being a larger plant with larger flowers and in having several differences in floral detail.

***Calanthe fissa* L. O. Williams sp. nov.**

Herbae graciles, erectae, usque ad ca. 6 dm. altae. Inflorescentia multiflora, conferta. Sepala late oblongate vel elliptica, acuta, cucullata. Petala oblongate, obtusa, basi columnae adnata. Labellum trilobatum, calcaratum; lobi laterales explanati, lineares, obtusi; lobus medius linearis, emarginatus. Columna generis.

Slender, erect, terrestrial herbs up to about 6 dm. tall. Stems short, indurated. Leaves narrowed to a petiole at the base; lamina 25–40 cm. long and 2.5–4 cm. broad, linear-elliptic, acute or acuminate, with seven to nine main nerves; petiole 20–35 cm. long, indurated. Inflorescence up to about 8 dm. long, scapose, slender, many-flowered above, glabrous; bracts 1–2 cm. long, linear to linear-lanceolate, acute; raceme compact, 10–20 cm. long, up to fifty-flowered. Sepals about 10–12 mm. long

and 5–6 mm. broad, broadly oblanceolate to elliptic, acute, 5-nerved, cucullate. Petals 10–12 mm. long and 3–4 mm. broad, oblanceolate, obtuse, 3-nerved, adnate to the column at the base for about 4 mm. by their anterior margins. Labellum digitately 3-lobed, spurred; lateral lobes somewhat explanate, 8–10 mm. long and 2–3 mm. broad, linear, obtuse; mid-lobe about 10 mm. long and 2.5 mm. broad, linear, emarginate to about the middle, the lobules parallel and acute; disc at the tip of the column with several small calli in three lines; spur 8–10 mm. long, slender, obtuse. Column of the genus.

BRITISH NEW GUINEA: Amieng on the Yaneng River, a tributary of the Buso River, above mouth of Tosapik Creek, Morobe District, at 5000–6000 ft. alt., flowers pale green, lip white, April 3, 1941, *Clemens 12093* (TYPE in Herb. Ames).

Calanthe fissa is allied to *C. finisterrae* Schltr. from which it is distinguished by the lobing of the lip and its proportions, and by the much narrower and more deeply divided mid-lobe.

***Pedilochilus Clemensiae* L.O. Williams sp. nov.**

Herbae parvae, epiphyticae. Pseudobulbi fusiformes vel anguste ovoidei, unifoliati. Folia lineari-elliptica, acuta, coriacea, petiolata. Inflorescentia lateralis, uniflora, folia excedens. Sepalum dorsale ellipticum vel oblanceolatum, acutum, trinervium. Sepala lateralia oblongo-obovata, leviter obliqua, apiculata. Petala oblongo-subsigmoidea, apiculata. Labellum unguiculatum, cymbiforme et apice saccatum. Columna generis.

Small epiphytic herbs from a repent rhizome. Pseudobulbs 1–2 cm. long and 2–4 mm. in diameter, aggregated, fusiform to narrowly ovoid, unifoliate. Leaves (only two seen) 5–5.5 cm. long including the petiole and about 6 mm. broad, linear-elliptic, acute, coriaceous, petiolate, the petiole about 1 cm. long. Inflorescence about

7–9 cm. long, one-flowered, exceeding the leaf, lateral, with two small apiculate bracts about 4 mm. long on the rachis. Flowers large for the genus. Dorsal sepal 10–11 mm. long and 4 mm. broad, elliptic or oblanceolate, acute, with three main nerves, margins minutely undulate. Lateral sepals about 14 mm. long and 6 mm. broad, oblong-ovate, slightly oblique, apiculate, 3- to 5-nerved, decurrent on the column-foot. Petals 5–6 mm. long and about 2.5 mm. broad, oblong-subsigmoid, apiculate, 1-nerved, strongly winged dorsally along the nerve. Lip about 10 mm. long and 5 mm. deep, unguiculate, cymbiform and saccate especially toward the apex, apex with a short recurved apicule, base of the sac with two lamellate calli 3–4 mm. long, with two small erect lanceolate auricles about 1.5 mm. long and a small lamellate callus about 1 mm. long at the apex of the small claw (or at the base of the lip). Column about 1 mm. long, with two terminal, erect, subulate stelidia; column-foot about 2 mm. long; anther about 1.25 mm. long, apparently erect; pollinia two deeply sulcate ellipsoid masses.

BRITISH NEW GUINEA: base of mossy trunk, conifer bush by pond, at 5000–6000 ft. alt., Amieng, Morobe, flowers golden with wine labellum, March 13, 1941, *Clemens 12008* (TYPE in Herb. Ames No. 60625).

Pedilochilus Clemensiae seems to be most closely allied to *P. terrestre* J. J. Sm., described from Netherlands New Guinea. *Pedilochilus Clemensiae* is distinguished by the longer leaves, shorter peduncle, eciliate dorsal sepal and by the shape of the floral parts.

Pedilochilus is a small genus of about twenty-four species. With the exception of one species in Celebes and an undescribed one in the New Hebrides, the genus is limited to New Guinea. *Pedilochilus* is closely allied to *Bulbophyllum*, of which it may eventually prove to be but a section.

Bulbophyllum schizopetalum *L.O. Williams sp. nov.*

Herbae epiphyticae, usque ad ultra 20 cm. longae. Folia elliptica, breviter acuminata, coriacea. Inflorescentiae fasciculatae, uni- vel pauciflorae. Sepalum dorsale lanceolatum vel lineari-lanceolatum, acutum, trinervium. Sepala lateralia lanceolata vel elliptico-lanceolata, acuta, leviter obliqua, trinervia. Petala bi- vel trilobata, quam sepala breviora. Labellum lineari-oblongum, semiteres, obtusum, muriculatum. Columna sectionis.

Epiphytic, repent herbs up to more than 20 cm. long. Rhizome stem-like, covered with semiamplexicaul, cucullate, ovate, short-acuminate bracts which are 7–15 mm. long. Pseudobulbs 1.5–2 cm. long and about 0.4–0.8 cm. in diameter, ellipsoid to ovoid, unifoliate. Leaves 6–10 cm. long and 1.5–3 cm. broad, straight or arcuate, short-acuminate, coriaceous. Inflorescences 1- to few-flowered fascicles borne from the base of the pseudobulbs and from the axils of all of the bracts at each of the nodes of the rhizome, about equaling the subtending bracts. Dorsal sepal 6–7 mm. long and 1.5–2 mm. broad, lanceolate to linear-lanceolate, acute, 3-nerved. Lateral sepals 6–7.5 mm. long and 2.5–3 mm. broad, lanceolate to elliptic-lanceolate, acute, slightly oblique, 3-nerved, the margins somewhat involute, free. Petals about 1.5 mm. long and 1.25 mm. broad, strongly 2- to 3-lobed, the posterior and middle lobes largest, the anterior lobe small or almost wanting, so the petals appear to be about equally divided in most cases; the posterior lobe round, the terminal lobe acute. Lip about 4 mm. long, 1 mm. broad and 0.75 mm. deep, linear-oblong, apical two thirds densely muriculate, the basal third much less so and with a smooth, subcanaliculate area above on the basal half. Column of the section, about 2 mm. long.

BRITISH NEW GUINEA: Amieng on Yaneng River, a tributary of the

Buso River, above the mouth of Tosapik Creek, Morobe District, elevation 5000–6000 ft., flowers wine red, March 14, 1941, *Clemens 12018* (TYPE in Herb. Ames).

Bulbophyllum schizopetalum belongs in the subgenus *Hapalochilus*, section *Trachychilus* of Schlechter's treatment in *Die Orchideen von Deutsch Neu-Guinea* (Fedde Repert. 1 (1912) 693 et seq.). The species is apparently closely allied to *B. xanthophaeum* Schltr., but differs in the narrower sepals, in the more deeply lobed petals, in the smaller lip (which also differs in its muriculations and in not being sulcate below) and in the larger leaves.

***Chitonanthera Brassii* L. O. Williams sp. nov.**

Herbae parvae, epiphyticae, pendentes, usque ad ca. 20 cm. longae. Folia linearia vel oblongo-linearia, recta vel falcata. Inflorescentia quam folia brevior. Sepalum dorsale ovato-lanceolatum, acutum, naviculare. Sepala lateralibus ovata, leviter obliqua. Petala linearia, obtusa. Labellum lineare, obtusum. Columna generis, pollinia quatuor.

Small, pendent, flexuose, epiphytic herbs up to about 20 cm. long. Stems slender, fractiflex, covered with the bases of the leaves or exposed in age, internodes 4–5 mm. long. Leaves 6–10 mm. long and 1–2 mm. broad, linear to oblong-linear, straight or falcate, acute or subulate, erect-spreading, laterally compressed, articulate; leaf-sheaths covering the stem, decurrent, extended above into a petiole which is about 2 mm. long and similar to the lamina. Inflorescence 1- to 3-flowered, shorter than the subtending leaf. Sepals united into a short tube at the base. Dorsal sepal about 2 mm. long and 1–1.3 mm. broad, ovate-lanceolate, acute, navicular. Lateral sepals 2–2.5 mm. long and about 1.5 mm. broad, ovate, slightly oblique. Petals about 0.6–1 mm. long and 0.1 mm. broad, linear, obtuse, puberulent. Lip about 1.5 mm.

long and 0.3 mm. broad, linear, obtuse, puberulent above and laterally but glabrous beneath, attached near the base of the column. Column of the genus, about 0.7 mm. long; pollinia four.

BRITISH NEW GUINEA: epiphyte in ridge crest forest, Mt. Tafa, Central Division, alt. 2400 m., May–September 1933, *Brass* 4902; amongst moss on tree trunks of ridge forest trees, stems pendent, single or in tufts, flat fleshy leaves, Mt. Tafa, Central Division, alt. 2400 m., May–September 1933, *Brass* 5036 (TYPE in Herb. Ames No. 57612).

Chitonanthera Brassii is allied to *C. angustifolia* Schltr., but differs in its narrower petals and leaves.

***Chitonanthera filiformis* L. O. Williams sp. nov.**

Herbae epiphyticae, parvae, usque ad 10 cm. longae. Folia filiformia, teretia, articulata. Inflorescentia foliis aequalis. Sepalum dorsale ovatum, obtusum, uninervium. Sepala lateralibus ovata, obtusa, leviter obliqua. Petala rhombico-reniformia vel rhombico-orbicularia, obtusa, uninervia. Labellum oblongo-lanceolatum, obtusum, cymbiforme, bicallosum. Columna generis.

Small, matted, epiphytic herbs up to 10 cm. long. Stems slender, flexuose, fractiflex; internodes 4–10 mm. long. Leaves 5–20 mm. long (mostly 10–15 mm. long) and 0.25–0.5 mm. in diameter, filiform, terete, articulate; leaf-sheaths covering the stem, the apex extending out 1–2 mm. from the stem to the articulation with the lamina. Inflorescence short, about equal to the subtending leaf or shorter, few-flowered; rachis filiform, fractiflex; bracts about 1 mm. long, ovate-triangular, acuminate, verrucose dorsally. Sepals united for a short distance at the base, fleshy; dorsal sepal 1.5–2 mm. long and 1.2–1.5 mm. broad, ovate, obtuse, 1-nerved; lateral sepals about 1.2–1.5 mm. long and 0.8–1.2 mm. broad, broadly ovate, obtuse, somewhat oblique, 1-nerved. Petals about 0.5 mm. long and 0.7 mm. broad, rhombic-

reniform to rhombic-orbicular, obtuse, 1-nerved. Lip about 0.75 mm. long and 0.3 mm. broad, oblong-lanceolate, obtuse, cymbiform, with two parallel fleshy costae covering the basal half. Column about 0.5 mm. long, reflexed, with two fleshy stelidia opposite the pouch-like stigma. Ovary verrucose.

NETHERLANDS NEW GUINEA: tufted in moss on trees of closed forest, common, Lake Habbema, flowers very small and orange-colored, alt. 3225 m., August 1938, *Brass* 9360 (TYPE in Herb. Ames No. 61584); epiphyte in moss, subalpine forest, Lake Habbema, alt. 3225 m., August 1938, *Brass* 9369A.

Chitonanthera filiformis is most closely allied to *C. tenuis* (J.J.Sm.) L.Wms. (cf. below), but is easily distinguished by its filiform leaves, slender stems and the details of the flower and column.

***Chitonanthera filiformis* L. Wms. var. *brachyphylla* L.O. Williams var. nov.**

Folia 1.5–3 mm. longa. Internodia caulium 2–4 mm. longa.

NETHERLANDS NEW GUINEA: common epiphyte in open mossy thickets, Lake Habbema, alt. 3225 m., flowers orange-colored, August 1938, *Brass* 9437 (TYPE in Herb. Ames).

Variety *brachyphylla*, at first glance, appears to be amply distinct, but closer study shows it to have flowers identical with those of the species and to differ mainly in the short leaves and in the short internodes of the stem.

***Chitonanthera gracilis* L. O. Williams sp. nov.**

Herbae epiphyticae, flexuosae, usque ad ca. 15 cm. longae. Folia linearia vel elliptico-linearia, acuta, falcata vel recta. Sepala basi in tubo connata. Sepalum dorsale ovatum vel ovato-orbiculare, obtusum vel acutum, carnosum. Sepala lateralibus late ovato-orbicularibus vel subtriangularibus, obtusa vel acuta, carnosae. Petala obovata vel

oblanceolata, obtusa vel subtruncata. Labellum cupulatum et carnosissimum, apice sagittatum, obtusum, puberulum.

Small epiphytic, flexuose herbs up to about 15 cm. long. Stems slender, flexuose, obscurely fractiflex; internodes about 5 mm. long. Leaves 8–15 mm. long and 1–2 mm. broad, linear to elliptic-linear, acute, falcate or straight, spreading, laterally compressed, articulate; leaf-sheaths covering the stem, usually ancipitous. Inflorescence elongated, much exceeding the subtending leaf, 3–9 cm. long, borne in the axils of the leaves, a several-to many-flowered spike or raceme; bracts 1.5–3 mm. long, lanceolate-triangular, acute or aristate, cucullate, decurrent on the rachis, smooth or verrucose externally, glabrous. Sepals united into a tube for a short distance at the base. Dorsal sepal about 2–2.5 mm. long and 1.5–2 mm. broad, ovate to ovate-orbicular, obtuse or acute, fleshy, 1-nerved. Lateral sepals 2–2.5 mm. long and 1.5–2 mm. broad, ovate-orbicular to subtriangular, obtuse or acute, fleshy, 1-nerved. Petals about 1 mm. long and 0.5 mm. broad, obovate to oblanceolate, obtuse to subtruncate, sometimes obscurely unguiculate, 1-nerved, puberulent. Lip 2–2.5 mm. long and 1–1.5 mm. broad, adnate to the column; the basal portion cupulate and very fleshy, 1–1.5 mm. in diameter, puberulent; terminal part about 1–1.5 mm. long and 0.75–1 mm. broad, sagittate, obtuse, the basal angles sharp, not fleshy, puberulent, attached to the under side of the basal part. Column about 0.5 mm. long and as broad or broader; pollinia eight, of two sizes, the larger subreniform about 0.25 mm. long and 0.12 mm. broad, the smaller broadly reniform 0.1–0.15 mm. long and 0.08–0.1 mm. broad.

BRITISH NEW GUINEA: Ulap trail, Matap, Morobe District, flowers vivid brick red, April 6, 1940, *Clemens 11341* (TYPE in Herb. Ames).

Chitonanthera gracilis is allied to *C. calceiformis* J. J.

Sm. from which it is distinguished by the larger leaves, by the different form of the basal part of the lip, by the dorsal sepal being smaller than the lateral sepals (not vice versa), as well as by less prominent details of the flowers and vegetative parts.

***Chitonanthera tenuis* (J. J. Sm.) L. O. Williams**
comb. nov.

Vonrömeria tenuis J. J. Smith in Bull. Dép. Agric. Ind. néerl. No. 39 (1910) 22; in Nova Guinea 8, pt. 3 (1912) 598, t. 108B; in Nova Guinea 12, pt. 1 (1913) 96.

Octarrhena tenuis J. J. Smith in Fedde Repert. 12 (1913) 25; in Nova Guinea 14, pt. 3 (1929) 487.

NETHERLANDS NEW GUINEA: epiphyte in a low thicket, Lake Habbema, alt. 3225 m., August 1938, *Brass* 9273; massed on logs in forest opening, 9 km. NE. of Lake Habbema, alt. 2800 m., October 1938, *Brass* 10790 and 10884; at the foot of Doorman-top, alt. 2250 m., October 17, 1920, *Lam* 1609.

BRITISH NEW GUINEA: common on forest trees, Murray Pass, Wharton Range, Central Division, alt. 2840 m., June–September 1933, *Brass* 4509.

Dissections and study of the several collections of this species which are available seem to indicate that it should be referred to *Chitonanthera* rather than to *Octarrhena*. If the present specimens were to be referred to *Octarrhena*, probably the entire genus *Chitonanthera* should be placed there. This course does not seem justified at the present time.

Smith describes and illustrates the lateral sepals of this species as being connate nearly to their apices. This is not the case, for several dissections show that they are merely overlapping and coherent above. The sepals are connate at the base as in other species of the genus. The column is described and illustrated as having a column-foot. However, if present, the column-foot is very ob-

scure, and it is probable that the lip is attached to the very short broad column as in other species of *Chitonanthera*.

Chitonanthera Lorentzii *J. J. Smith* in Nova Guinea 14, pt. 3 (1929) 483.

I have determined *Brass* 9040 and *Brass & Myer-Drees* 9669 as this species. The stems are long, and consequently the plants appear tall. One of these specimens has the rachis broadly winged while in the other the wing is less prominent.

Chitonanthera suborbicularis *J. J. Smith* in Nova Guinea 14, pt. 3 (1929) 485, t. 80.

I have determined three specimens, *Brass & Myer-Drees* 9670, 9924 and 10384, as this species. These specimens seem to differ from those mentioned under the foregoing species mainly in having shorter stems. The flowers in *C. Lorentzii* and *C. suborbicularis* seem to be identical or practically so, and it is probable that the two species will prove to be the same.

Phreatia phreatioides (*J. J. Sm.*) *L. O. Williams* comb. nov.

Thelasis phreatioides *J. J. Smith* in Bull. Dép. Agric. Ind. néerl. 45 (1911) 11; in Nova Guinea 8, pt. 3 (1912) 602, t. 110 B.

Phreatia digulana Schlechter in Fedde Repert. Beihefte 1 (1913) 911; in Fedde Repert. Beihefte 21 (1923) t. 308, fig. 1222.

The combination *Phreatia phreatioides* must be used. It is not a tautonym as treated by Schlechter.

Arachnis Muelleri (*Kränzl.*) *J. J. Smith* in Bull. Jard. Bot. Buit. ser. 3, 13 (1914) 47.

Vanda Muelleri Kränzlin in Oesterr. Bot. Zeitschr. 44 (1894) 461.

Vandopsis Muelleri Schlechter in Fedde Repert. 10 (1911) 196; in Fedde Repert. Beihefte 1 (1914) 972.

Stauropsis Imthurnii Rolfe in Bot. Mag. 143 (1917) t. 8714; in Orch. Rev. 26 (1918) 149, 167.

Arachnis Imthurnii L.O. Williams in Bot. Mus. Leaflet. Harv. Univ. 5 (1937) 58.

Solomon Islands and British New Guinea.

BRITISH NEW GUINEA: common on tops of rocks in Eucalyptus savannah, forests, Roma, Central Division, alt. 650 meters, February 14, 1936, Brass 6205.

Material of this species from the Solomon Islands, received in 1937 was thought to be the same as Rolfe's *Stauropsis Imthurnii*. Excellent specimens are now at hand from New Guinea. It is probable that all of these are referable to Kränzlin's rather poorly described *Vanda Muelleri* which J. J. Smith has transferred to *Arachnis*.

Mr. L. J. Brass' field description of the plant in New Guinea is of interest: "Very conspicuous large plants, usually several grouped together; with about 20 long, leathery, drooping leaves arranged in two series on an erect stem about 15–20 cm. long below the leaves. Leaf nerves quite obscure, edges [of the leaves] thin and sharp. Panicles two or more, produced in leaf axils but lateral below leaves at time of opening of flowers, over 2 meters long. Flowers fragrant, spotted brown and yellow."

EXPLANATION OF THE ILLUSTRATIONS

PLATE XXI. *PTEROSTYLIS CAULESCENS* *L.O. Wms.* 1, plant drawn natural size. 2, dorsal sepal, three times natural size. 3, lateral sepals, three times natural size. 4, petal, three times natural size. 5, column from below, three times natural size. 6, column and lip from the side, three times natural size. 7, lip and column-foot from above, three times natural size. 8, cross section of the lip, three times natural size.

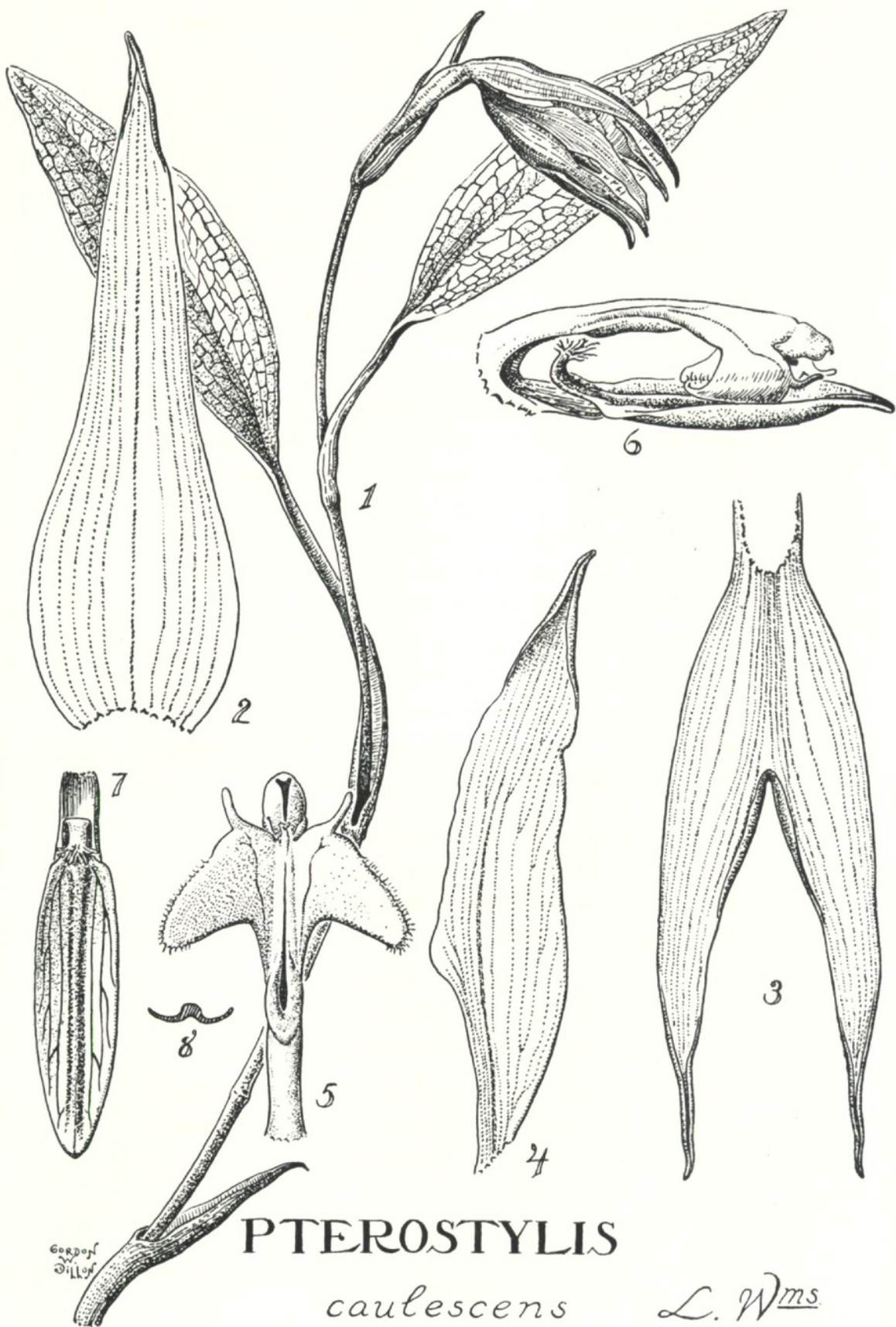
PLATE XXII. *CALOCHILUS CAERULEUS* *L. Wms.* 1, fruiting habit of plant, reduced to one half natural size. 2, inflorescence, natural size. 3, column and lip from the side, enlarged three times. 4, the lip spread out, enlarged two times. 5, petal, enlarged three times. 6, lateral sepal, enlarged three times. 7, dorsal sepal, enlarged three times.

PEDILOCHILUS CLEMENSIAE *L. Wms.* 8, habit, natural size. 9, column and lip from the side, enlarged three times. 10, petal, enlarged two times. 11, dorsal sepal, enlarged two times. 12, lateral sepal, enlarged two times.

PLATE XXIII. *CHITONANTHERA BRASSII* *L. Wms.* 1, habit, natural size. 2, flower from the front, enlarged five times. 3, flower from the side, enlarged five times.

CHITONANTHERA GRACILIS *L. Wms.* 4, habit, natural size. 5, flower from the front, enlarged five times. 6, lateral view of flower, enlarged five times.

CHITONANTHERA FILIFORMIS *L. Wms.* 7, habit, natural size. 8, flower from above, enlarged five times. 9, flower from the side, enlarged five times.



PTEROSTYLIS

caulescens

L. Wms

CALOCHILUS

caeruleus L. Wms.



PEDILOCHILUS

Clemensiae L. Wms.

PLATE XXIII



C. gracilis L. Wms

C. filiformis L. Wms

CHITONANTHERA *Brassii* L. Wms.



Williams, Louis O. 1946. "Orchidaceae novae guineae I." *Botanical Museum leaflets, Harvard University* 12(5), 149–177. <https://doi.org/10.5962/p.295167>.

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