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PERIODICAL SHELVES

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ERRATA

page 11, line 13
for 1815 read 1816

page 35, line 16
for *pumilum* read *pusillum*

page 38, line 16
for ovati read ovoidei

page 111, line 10
for that read than

page 176, line 26
for vermillion read vermilion

page 188, line 26
for lineas latas read lineis latis

page 219, line 8
delete August 6, 1940

page 219, line 9
after cliffs insert August 6, 1940

page 231, line 1
transpose to bottom of page

page 249, plate VI
for C. pumila C. Scweinf. read C. pumila C. Schweinf.

BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, DECEMBER 6, 1940 VOL. 9, NO. 1

ORCHID STUDIES, XIII

BY

LOUIS O. WILLIAMS

NEW OR INTERESTING ORCHIDS FROM ECUADOR AND COLOMBIA

DURING 1939, C. William Penland and Robert H. Summers of Colorado College undertook botanical exploration in Ecuador. The orchids collected consisted of 136 numbers, mostly in duplicate. Among these there were a few apparently undescribed species. Several collections, other than those of Penland and Summers, have been included in this paper because of their relation to the Penland and Summers specimens.

Lepanthes echinocarpa *L. O. Williams sp. nov.*

Herbae epiphyticae, repentes, usque ad 1.5 dm. longae. Folia oblanceolata, ovato-oblanceolata vel elliptico-ovalia, obtusa, carnosa, glabra. Inflorescentia pauciflora, laxa, quam folia longior. Sepalum dorsale orbiculari-ovatum, aristato-apiculatum, cucullatum, trinervium. Sepala lateralia oblongo-ovata, aristato-apiculata, margine exteriore apicem versus serrulata. Petala lineari-lanceolata, obtusa, uninervia. Labellum trilobatum; lobi laterales explanati, lati; lobus medius parvus et carnosus, cucullatus; discus callo mammillato ornatus. Columna sectionis. Ovarium echinato-pubescens.

Repent epiphytic herbs up to about 1.5 dm. long.

Secondary stems about 5 mm. long, very slender and inconspicuous, covered with scarious sheaths. Leaves 10–20 mm. long, 4–8 mm. broad, oblanceolate, ovate-oblanceolate or elliptic-oval, obtuse, fleshy, glabrous. Inflorescence few-flowered, lax, much exceeding the subtending leaf; bracts 1–2 mm. long, chartaceous, surrounding the rachis and the pedicel, apiculate, about half as long as the pedicel. Dorsal sepal about 4.5 mm. long including the aristate apicule, orbicular-ovate, aristate-apiculate, serrulate (at least above), 3-nerved, cucullate. Lateral sepals about 4.5 mm. long and 2 mm. broad, oblong-ovate, aristate-apiculate, serrulate toward the apex along the outer margins only, 3-nerved, the inner margins connate for about 2 mm. Petals about 1.2 mm. long and 0.3 mm. broad, linear-lanceolate, obtuse, 1-nerved. Lip about 2 mm. long and 3 mm. broad when expanded, 3-lobed; lateral lobes explanate, about 1.5 mm. long and 1.25 mm. broad; mid-lobe very small and fleshy, about 0.4 mm. long and 0.25 mm. broad, cucullate; disc somewhat fleshy, with a small mammillate callus near the junction of the mid-lobe with the lateral lobes. Column 2–2.5 mm. long, slender. Ovary echinate-pubescent.

ECUADOR: epiphyte in moss at base of tree, Hacienda Talahua, Province of Bolivar, leaves thick and fleshy, dull green above, paler below, flowers brownish yellow, column and lip reddish brown, capsule hairy, at 2600 meters altitude, May 2, 1939, *Penland & Summers 611* (TYPE in Herb. Ames No. 57860).

Lepanthes echinocarpa is allied to *L. pensilis* Schltr., from which it is distinguished by the aristate-apiculate sepals, the much smaller mid-lobe of the lip and the generally broader leaves. *Lepanthes lancipetala* L. Wms. is allied to the present species, from which it is also distinguished by the small mid-lobe of the lip and by other characters.

Lepanthes lancipetala *L. O. Williams sp. nov.*

Herbae epiphyticae, repentes, usque ad 4 dm. longae. Folia lanceolata, oblanceolata vel elliptica, obtusa vel acuta, carnosissima. Inflorescentia laxe pauci-vel pluriflora, secunda, quam folia longior. Sepalum dorsale ovale, apiculatum, paene usque ad basim serrulatum, cucullatum. Sepala lateralia ovato-lanceolata, apiculata, margine exteriore ciliata, trinervia. Petala lanceolata, acuta, carnosa. Labellum trilobatum; lobi laterales subovales, obtusi; lobus medius suborbicularis, obtusus; discus carnosus, callo mammillato ornatus. Columna sectionis. Ovarium echinato-pubescens.

Repent, epiphytic herbs up to 4 dm. long. Secondary stems up to 6 mm. long, very slender and inconspicuous, covered with the chartaceous sheaths of the primary stem. Leaves 15–35 mm. long, 3–7 mm. broad, lanceolate, oblanceolate or elliptic, obtuse or acute, very fleshy, glabrous. Inflorescence few- to several-flowered, lax, secund, exceeding the subtending leaf; bracts about 1 mm. long, chartaceous, apiculate, surrounding the rachis and pedicel, subequal to or a little shorter than the pedicel. Dorsal sepal 3.5–4 mm. long, 2.5–3 mm. broad, oval, apiculate, serrulate nearly to the base, cucullate, carinate along the mid-nerve dorsally. Lateral sepals about 4.5 mm. long and 2 mm. broad, ovate-lanceolate, apiculate, coarsely glandular-ciliate along the outer margins with the inner margins smooth or nearly so, 3-nerved, with the mid-nerve lamellate dorsally. Petals 0.8–1 mm. long, about 0.2 mm. broad, lanceolate, acute, fleshy. Lip about 2 mm. long and 3–3.5 mm. broad when expanded, with the surface more or less glandular-papilliferous, 3-lobed; lateral lobes suboval, obtuse, about 1.5 mm. long from the apex to the point of attachment and 1 mm. broad; mid-lobe 1 mm. long and about 1 mm. broad, suborbicular, obtuse; disc fleshy, with a mammillate callus near

the junction of the mid-lobe with the lateral lobes. Column 2–2.5 mm. long. Ovary pubescent with coarse hairs.

Ecuador: epiphyte, Lake Cuicocha, Province of Imbabura, at 3300 meters altitude, leaves thick, fleshy, pale green, sepals transparent light brown, the dorsal with three purple-red stripes, sides of the lip arched around the column, capsule prickly, June 2, 1939, *Penland & Summers 835* (Type in Herb. Ames No. 57873).

Lepanthes lancipetala is closely allied to *L. pensilis* Schltr. from which it is distinguished by the lobes of the lip, when expanded, being at right angles to the axis, and by the callus on the disc of the lip. *Lepanthes echinocarpa* L. Wms. is also an allied species.

Lepanthes micropetala *L. O. Williams sp. nov.*

Herbae epiphyticae, repentes, pensiles, usque ad 4.5 dm. longae. Folia plusminusve ovalia, obtusa, glabra vel leviter hispido-ciliata. Inflorescentia uni-vel pauciflora, quam folia brevior. Sepala in tubum brevem connata. Sepalum dorsale orbiculari-ovatum, obtusum, trinervium. Sepala lateralia late ovata, acuta, binervia, sparse ciliata. Petala suborbicularia, abortiva. Labellum expansum reniformi-cordatum, obtusum, trinervium. Columna sectionis.

Pendent or repent epiphytic herbs up to about 4.5 dm. long. Primary stems closely sheathed with scarious, hispid bracts, which are expanded at their apex. Secondary stems minute, about 0.5–1 mm. long. Leaves 4–8 mm. long, 1.5–5 mm. broad, commonly oval in outline (rarely broader or narrower), obtuse, essentially glabrous or somewhat hispid-ciliate. Inflorescence one- or at most few-flowered, shorter than the subtending leaf; bracts about 1 mm. long, hispid. Sepals connate into a short tube at the base. Dorsal sepal about 2.5 mm. long and 2.5 mm. broad, orbicular-ovate, obtuse, 3-nerved, pu-

berulous within. Lateral sepals 2.5–3 mm. long, about 2 mm. broad, broadly ovate, acute, 2-nerved, sparsely ciliate, glabrous within. Petals about 0.13 mm. long and 0.12 mm. broad, suborbicular, abortive. Lip about 1 mm. long and 2 mm. broad when expanded, reniform-cordate, obtuse, 3-nerved with the lateral portions (in natural position) surrounding the column. Column about 1 mm. long, slender. Ovary echinulate on the angles when immature, becoming smooth with age.

COLOMBIA: pendent epiphytic herbs, wet glen in forest, "San José," San Antonio, Department of El Cauca, Cordillera Occidental, at 2400-2700 meters altitude, perianth brown, June 28, 1922, *Pennell & Killip 7331* (TYPE in Herb. Ames No. 47021); same data, *Pennell & Killip 7332*.

Lepanthes micropetala is without close allies, but is perhaps nearest to *L. polygonoides* Smith & Harris in floral structure, and to *L. pseudocaulescens* Smith & Harris in vegetative structure.

Lepanthes pseudocaulescens *Smith & Harris* in Bot. Mus. Leafl. Harv. Univ. 2 (1934) 33, t.

COLOMBIA: epiphytic herb, open trail, La Cumbre, Cordillera Occidental, Department of El Valle, perianth deep purple, September 19, 1922, *Killip 11417*.

The drawing of the petals in the figure cited should be corrected so as to show the lobe next to the lateral sepals shorter than the lobe next to the dorsal sepal, the apex more pronounced and rounded, and the margins obscurely ciliate.

Masdevallia (§ Rhombopetalae) **Summersii** *L. O. Williams sp. nov.*

Herbae parvae, caespitosae, epiphyticae, usque ad 6 cm. altae. Caules secundarii graciles, cylindracei, unifo-

liati. Folia anguste lineari-oblanceolata, acuta vel obtusa. Inflorescentia uniflora, quam folia brevior. Sepala in tubum connata. Sepalum dorsale expansum late ovatum, aristato-caudatum, cucullatum, trinervium. Sepala lateralia lanceolata, aristato-caudata, trinervia, prope basim callo ornata. Petala subquadrata, pandurata, apice bilobulata. Labellum unguiculatum; lamina obovato-sagittata, obtusa; unguis linearis, canaliculatus, basi biauriculatus. Columna generis.

Small, caespitose, epiphytic herbs up to 6 cm. tall. Secondary stems up to 1.5 cm. long, very slender, cylindric, unifoliate, covered with scarious bracts. Leaves 2.5–4.5 cm. long, 2–3 mm. broad, narrowly linear-oblanceolate, acute or obtuse, marginate or obscurely so. Inflorescence 1-flowered, much shorter than the subtending leaf. Sepals connate into a short tube at the base. Dorsal sepal broadly ovate (when expanded), aristate-caudate, strongly cucullate; lamina about 4 mm. long and 3.5 mm. broad, 3-nerved; aristate cauda 2–2.5 mm. long. Lateral sepals lanceolate, aristate-caudate; lamina about 4 mm. long and 1.5 mm. broad, 3-nerved, with a conspicuous callus near the base; aristate cauda 3–4 mm. long. Petals about 1.75 mm. long and 1.5 mm. broad, subquadrate, pandurate, bilobulate at the apex. Lip unguiculate; lamina about 2 mm. long and 1.7 mm. broad, obovate-sagittate, obtuse; claw about 1 mm. long, linear, canaliculate, biauriculate at the base. Column about 2.5 mm. long, arcuate, with a lanceolate pendent tooth about 0.5 mm. long on each side toward the apex; column-foot about 1.5 mm. long.

Ecuador: epiphytic, Lake Cuicocha, Province of Imbabura, at 3300 meters altitude, sepals translucent with brilliant violet-purple markings, lip slightly deeper purple, June 2, 1939, *Penland & Summers 837* (Type in Herb. Ames No. 57872).

Masdevallia Summersii is allied to *M. simula* Reichb. f. and to *M. popayanensis* Lehm. & Kränzl., from both of which it is distinguished by the pendent teeth on the column and by the shape of the lip.

Diothonaea angustifolia *Schlechter* in Fedde Repert. Beihefte 8 (1921) 65—Schlechter ex Mansfeld in Fedde Repert. Beihefte 57 (1929) t. 85, Nr. 331.

Ecuador: island in Lake Cuicocha, Province of Imbabura, at 3100 meters altitude, May 29, 1939, *Penland & Summers 757*.

Diothonaea angustifolia is allied to *D. lloensis* Lindl. and perhaps should not be segregated. Among the few specimens of *D. angustifolia* available, it seems that this species may be separated by the petals which have three nerves, by the broad wing of the column and by the mid-lobe of the lip which is much larger than the lateral lobes and is cordate at the base instead of cuneate.

Diothonaea heterothonaea *Reichenbach filius & Warscewicz* in Bonplandia 2 (1854) 112.

Colombia: on trees in dense forests on the highlands of Popayan, at 1600-2000 meters altitude, November, *Lehmann 8371*.

Diothonaea heterothonaea is a rare species which was discovered by Warscewicz in Peru. There is a drawing and an analysis of this species (made by Reichenbach) in the Ames Herbarium. There can be no doubt that the plants collected by Lehmann represent the same species as those of Warscewicz.

Epidendrum catillus *Reichenbach filius & Warscewicz* in Bonplandia 2 (1854) 112.

Ecuador: terrestrial, along Pastaza River below Machay, Province of Tunguragua, at 1350 meters altitude, March 18, 1939, *Penland & Summers 114*.

Epidendrum catillus is a rare species which was known previously only from Colombia. The specimen cited is in the Herbarium of Colorado College in Colorado Springs.

We have not seen specimens of *Epidendrum vinosum* Schltr. from Peru, but from the description and a plate it seems quite possible that it is the same species as *E. catillus*.

A drawing of *E. catillus* from Reichenbach's herbarium indicates that the sepals and petals are acute. Those on the plant cited are obtuse.

Epidendrum (§Euepidendrum) **nitidum** *L. O. Williams sp. nov.*

Herbae epiphyticae, parvae, usque ad 2 dm. altae. Caules ramosi. Folia linearia, obtusa vel acuta, apiculata. Inflorescentia fractiflexa. Sepalum dorsale oblanceolatum vel elliptico-oblanceolatum, obtusum vel acutum, quinquenervium, columnae adnatum. Sepala lateralia ovato-lanceolata, obtusa vel acuta, quinquenervia, columnae adnata. Petala oblanceolata, obtusa, supra crenata. Labellum columnae valde adnatum; lamina late cordata, auriculata, obtusa, emarginata, sub apice paulo constricta, sublacerato-crenata, callo V- vel U-formi ornata; unguis longus. Columna sectionis.

Small epiphytic herbs up to 2 dm. tall. Stems branched, becoming somewhat indurated and subfusiform, foliate only at the apex, naked below or the old leaf-sheaths soon disintegrating. Leaves 4.5–9 cm. long, 1.5–4 mm. broad, linear, obtuse or acute, apiculate, with two leaves borne at the summit of each year's growth. Inflorescence up to 8 cm. long, strongly fractiflex and apparently spiral; bracts up to 5 mm. long, lanceolate to ovate-lanceolate, acuminate or acute. Dorsal sepal 6–8 mm. long, 2–3.5 mm. broad, oblanceolate to elliptic-oblanceolate, obtuse

or acutish, 5-nerved. Lateral sepals 6.5–8 mm. long, 3–4.5 mm. broad, ovate-lanceolate, obtuse or acute, 5-nerved, adnate to the column along the mid-nerve for about 2 mm. at the base. Petals 6–7.5 mm. long, 1.8–2.5 mm. broad, oblanceolate, obtuse, with the apical half crenate. Lip strongly adnate to the column; lamina 5.5–7 mm. long and 5.5–7 mm. broad, broadly cordate in outline, with prominent basal auricles, obtuse, emarginate, slightly constricted below the apex, with sublacerate-crenate margins; disc with a prominent V- or U-shaped callus 3–4 mm. long; claw 2.5–3 mm. long, mostly adnate to the column but with the terminal part free. Column of the section, 4.5–5 mm. long.

ECUADOR: epiphyte, mountain side above Loja, Province of Loja, at 2600 meters altitude, "inflorescence zig-zag, sepals and petals lead colored with white margins, labellum dull green within, margins thin, column green at the base, then white" July 28, 1939, *Penland & Summers 1141* (TYPE in Herb. Ames No. 55404).

A most distinctive species with no close ally. Although the base of the stem is suggestive of the section Encyclium, it belongs to the section Euepidendrum.

Epidendrum (§ Euepidendrum) **Penlandii** *L. O. Williams sp. nov.*

Herbae parvae, epiphyticae, usque ad 1.5 dm. altae. Caules usque ad 2 cm. longi, apice bifoliati. Folia lanceolata, acuta, carnosa, quam caules longiora. Sepalum dorsale oblanceolatum, obtusum vel leviter acutum, trinervium. Sepala lateralia oblongo-lanceolata vel oblonga, falcata, trinervia. Petala clavellato-filiformia, obtusa. Labellum columnae valde adnatum; lamina subreniformis, trilobata; lobi laterales explanati, crenati; lobus medius parvus, emarginatus, subcrenatus; discus carnosus, callis tribus vel quinque ornatus. Columna generis.

Small caespitose, epiphytic herbs up to 1.5 dm. tall.

Stems up to about 2 cm. long, usually bifoliate at the apex, covered with scarious sheaths. Leaves 4.5–8.5 cm. long, 0.6–1.5 cm. broad, lanceolate, acute, fleshy, much exceeding the stems in length. Inflorescence erect, surpassing the leaves, lax, few-flowered; bracts up to 6 mm. long, lanceolate, acuminate, much shorter than the pedicels. Dorsal sepal about 6.5 mm. long and 2–2.5 mm. broad, oblanceolate, obtuse or acutish, 3-nerved. Lateral sepals about 5.5 mm. long and 2–2.5 mm. broad, oblong-oblanceolate to oblong, strongly falcate, 3-nerved. Petals 5.5–6 mm. long and about 1 mm. broad, clavellate-filiform, obtuse. Lip strongly adnate to the column; lamina about 4 mm. long and 7 mm. broad, subreniform, 3-lobed; lateral lobes broad, explanate, crenate, thin; mid-lobe small, emarginate, subcrenate, thin; disc very fleshy, with 3 (or 5) callus-like thickenings; claw about 5 mm. long, basal portion adnate to the column. Column about 5–6 mm. long, straight or only slightly arcuate.

ECUADOR: epiphyte, island in Lake Cuicocha, Province of Imbabura, at 3100 meters altitude, "leaves thick, dark green above, bronze beneath, sepals pinkish white, petals narrow and white, labellum white with yellowish center, slightly fringed, column pale pastel green," May 29, 1939, *Penland & Summers 756* (TYPE in Herb. Ames No. 57881).

Epidendrum Penlandii is closely allied to *E. conopseum* R. Br., a species which occurs in the southern United States, with a variety in Mexico, but differs in the calli of the lip, in having smaller flowers and larger leaves. The outline of the segments of the flowers is almost identical in the two species. It is interesting to find a species in Ecuador which is so similar to a species of the southern United States and Mexico.

Epidendrum piperinum *Lindley* in Ann. & Mag. Nat. Hist. 15 (1845) 256.

?Epidendrum peperomioides Schlechter in Fedde Repert. Beihefte 8 (1921) 79—Schlechter ex Mansfeld in Fedde Repert. Beihefte 57 (1929) t. 91, Nr. 354.

Ecuador: Lake Cuicocha, Province of Imbabura, at 3300 meters altitude, June 2, 1939, *Penland & Summers 836*.

In the Ames Herbarium there is a drawing of *Epidendrum piperinum* from Lindley's Herbarium, as well as the Schlechter plate and description of *E. peperomioides*. There seems to be only a slight difference in the size of the labellum between the species proposed by Lindley and Schlechter. The species is quite rare.

Epidendrum polystachyum *Humboldt, Bonpland & Kunth* Nov. Gen. & Sp. Pl. 1 (1815) 352.

Ecuador: near Chinche, between San Pedro and Zaruma, Province of Loja, at 1900 meters altitude, August 1, 1939, *Penland & Summers 1204*.

Epidendrum polystachyum is a very interesting species. The stems are similar to those of the section Encyclium, also the leaves are borne at the apex of the stem or pseudobulb. However, the flowers are exactly those of the section Euepidendrum and there can be little doubt that it belongs to this section, although it seems to be somewhat intermediate between the two sections. Mr. Summers has written that the plant grew in a nest of vicious ants, that the relationship between the orchid and the ants interested him, but that because of the ants he could not study the plant closely. The association of the ants with the hollow pseudobulbs is similar to that found in some species of Schomburgkia.

Epidendrum (§ Euepidendrum) **rhombochilum** *L. O. Williams sp. nov.*

Herbae caespitosae, epiphyticae vel terrestres, usque ad 4.5 dm. altae. Caules ramosi. Folia linearia vel lan-

ceolata, obtusa et apiculata vel rare acuta. Inflorescentia pauciflora, nutans. Sepalum dorsale ellipticum vel oblanceolatum, obtusum, trinervium, carnosum. Sepala lateralia lanceolata vel ovato-lanceolata, obtusa vel acuta, obliqua, tri-vel obscure quinquenervia, carnosa, apiculata. Petala anguste linearia vel filiformia, obtusa, uninervia, leviter obliqua. Labellum columnae adnatum; lamina rhombica vel transverse rhombica, acuta, carnosissima, ecallosa, cochleata. Columna sectionis.

Caespitose, epiphytic or terrestrial herbs up to 4.5 dm. tall. Stems slender, profusely branched. Leaves 15–40 mm. long, 2.5 mm. broad, linear to lanceolate, obtuse and apiculate or rarely acute; leaf-sheaths verrucose. Inflorescence few-flowered, nodding; bracts up to 6 mm. long, ovate-lanceolate, acute or acuminate, cucullate. Dorsal sepal 7–8 mm. long, 2.5–3 mm. broad, elliptic to oblanceolate, obtuse, 3-nerved, fleshy. Lateral sepals 6.5–7.5 mm. long, 3–3.5 mm. broad, lanceolate to ovate-lanceolate, obtuse or acute, oblique, 3- or obscurely 5-nerved, fleshy, with a dorsal apicule near the apex. Petals about 6.5 mm. long and 0.5-0.8 mm. broad, narrowly linear or filiform, obtuse, 1-nerved, slightly oblique. Lip adnate to the column; lamina 4.6 mm. long and 4–6.5 mm. broad, rhombic to transversely rhombic, acute, very fleshy, without conspicuous calli, cochleate, with the sides erect and enfolding the apex of the column; claw about 2 mm. long, adnate to the column. Column of the section, about 4 mm. long.

Ecuador: terrestrial, Paramo of Minza, Province of Tunguragua, at 3800 meters altitude, "flowers greenish-yellow, becoming yellower with age," labellum distinctly fleshy, April 9, 1939, *Penland & Summers 376* (Type in Herb. Ames No. 57926).

Epidendrum rhombochilum does not seem to be closely allied to any species, although there are many species which are similar in habit.

The specimen was terrestrial, but the type of root-system indicates that it is at least a facultative epiphyte and that the terrestrial habit was due to chance.

Epidendrum (§ Euepidendrum) **vesicicaule** *L. O. Williams sp. nov.*

Herbae caespitosae, epiphyticae, multo ramosae, usque ad 2.5 dm. altae. Folia lineari-lanceolata vel lanceolata, acuminata vel acuta, falcata, carnosa; vaginae vesiculatae, plusminusve hyalinae. Inflorescentia uni- vel pauciflora et umbellata. Sepalum dorsale elliptico-lanceolatum, obtusum vel acutum, trinervium. Sepala lateralia ovato-lanceolata, acuta, trinervia, leviter obliqua. Petala linearia, uninervia. Labellum columnae valde adnatum; lamina late cordata, bicallosa. Columna generis.

Caespitose, profusely branched, epiphytic herbs up to 2.5 dm. tall. Stems slender, much branched below, invested with the bladder-like sheaths of the leaves. Leaves 3.5–6 cm. long, 4–8 mm. broad, linear-lanceolate to lanceolate, acuminate or acute, falcate, very fleshy; sheaths somewhat bladder-like and more or less hyaline. Inflorescence one- to few-flowered, umbellate, subtended by a large chartaceous bract. Dorsal sepal about 13 mm. long and 3.5 mm. broad, elliptic-lanceolate, obtuse or acute, 3-nerved. Lateral sepals about 12 mm. long and 4.5 mm. broad, ovate-lanceolate, acute, 3-nerved, slightly oblique. Petals about 13 mm. long and 1.5 mm. broad, linear, 1-nerved. Lip strongly adnate to the column; lamina about 7.5 mm. long and 8 mm. broad, broadly cordate, with two mammillate calli at the base; very fleshy above the calli; claw about 6 mm. long, adnate to the column. Column about 7 mm. long. Summit of the ovary with a vesiculate swelling just below the base of the lip.

Ecuador: epiphyte, edge of forest between Paramos Minza Chica and Minza Grande, Province of Tunguragua, at 3800 meters altitude, "flower pale transparent green, central part of the lip thick and whitish," April 5, 1939, *Penland & Summers 333* (Type in Herb. Ames No. 57891).

Epidendrum vesicicaule is allied to *E. piperinum* Lindl., *E. Peperomia* Reichb.f. and *E. peperomioides* Schltr. (all of which are very similar), but differs in its larger size, in the shape of the leaves, and in the structure of the flowers.

The specimen (*Lehmann 8338*) cited by Kränzlin in Engler's Bot. Jahrb. 26 (1899) 462, as *Epidendrum Peperomia* Reichb.f. may belong here, but the flowers of the specimen of that number in the Ames Herbarium are not in condition to warrant a sure diagnosis.

The specific name is in allusion to the bladder-like leaf-sheaths which cover the stem.

Scaphyglottis Summersii *L. O. Williams sp. nov.*

Herbae terrestres vel epiphyticae, ramosae, usque ad 4.5 dm. longae. Caules graciles, ramosi. Folia linearia vel lineari-lanceolata, obtusa, emarginata. Inflorescentiae uniflorae, singulae vel fasciculatae. Sepalum dorsale ovato-lanceolatum, acutum, cymbiforme, septemnervium. Sepala lateralia oblongo-lanceolata, acuta, leviter obliqua, quinque- vel septemnervia. Petala oblongo-lanceolata, acuta vel obtusa, repanda, tri-vel obscure quinquenervia. Labellum cuneatum, truncatum, retusum, geniculatum; discus carnosus, tuberculatus. Columna apice auriculato-alata; pollinia quatuor.

Terrestrial or epiphytic, fasciculately branched herbs up to 4.5 dm. long. Stems slender, smooth, covered with leaf-sheaths which soon disintegrate, with one or more groups of fascicled branches. Leaves 2–9 cm. long and 2–5 mm. broad, linear or linear-lanceolate, obtuse, emar-

ginate. Inflorescences 1-flowered, single or fascicled. Dorsal sepal 7–8 mm. long, 3.5–4 mm. broad, ovate-lanceolate, acute, cymbiform, 7-nerved. Lateral sepals 7–8 mm. long and about 3–5 mm. broad, oblong-lanceolate, acute, slightly oblique, 5- or 7-nerved. Petals 6–7 mm. long, 2.5–3 mm. broad, oblong-lanceolate, acute or obtuse, repand, 3- or obscurely 5-nerved. Lip 6–7.5 mm. long and 4–5.5 mm. broad near the apex, cuneate, truncate, retuse, somewhat constricted just above the base, geniculate; disc thickened and fleshy, tuberculate. Column about 4 mm. long, auriculate-winged at the apex; pollinia four.

ECUADOR: terrestrial among rocks, Pastaza River at Baños, Province of Tunguragua, "flowers brownish-tan," at 1750 meters altitude, March 15, 1939, *Penland & Summers 81* (TYPE in Herb. Ames No. 57816).

Scaphyglottis Summersii is not closely allied to any South American species. The closest ally apparently is *Scaphyglottis bilobulata* Schltr., from Central America.

Maxillaria dichotoma *(Schltr.) L. O. Williams comb. nov.*

Camaridium dichotomum Schlechter in Fedde Repert. Beihefte 7 (1921) 98—Schlechter ex Mansfeld in Fedde Repert. Beihefte 57 (1929) t. 98, Nr. 382.

ECUADOR: just east of Río Topo bridge, Province of Napo-Pastaza, at 1226 meters altitude, March 23, 1939, *Penland & Summers 254*.

This is a rare species. The determination was made from the characters and the plate.

Maxillaria luteorubra *(Lindl.) Reichenbach filius* in Walp. Ann. 6 (1863) 539.

Camaridium luteorubrum Lindley Orch. Lind. (1846) 22.

Maxillaria cassapensis Reichenbach filius in Walp. Ann. 6 (1863) 539.

VENEZUELA: Province of Mérida, April 1842, *Linden 633*.

ECUADOR: on rocks, just west of Río Topo Bridge, Province of Napo-Pastaza, at 1226 meters altitude, March 23, 1939, *Penland & Summers 243*.

PERU: in rupium fissuris prope Cuchero, September 1829, *Poeppig 1387*.

Maxillaria luteorubra is new to the flora of Ecuador.

Maxillaria cassapensis does not seem to be distinct, although the leaves of the type are narrower than those of ***M.*** *luteorubra*.

EXPLANATION OF THE ILLUSTRATIONS

PLATE I. LEPANTHES LANCIPETALA *L. O. Williams.* 1, plant, natural size. 2, flower, enlarged five times. —LEPANTHES ECHINOCARPA *L. O. Williams.* 3, plant, natural size. 4, flower, enlarged five times.—LEPANTHES MICROPETALA *L. O. Williams.* 5, plant, natural size. 6, flower, enlarged seven and one half times.—MASDEVALLIA SUMMERSII *L. O. Williams.* 7, plant, natural size. 8, flower, enlarged three times. 9, petal, enlarged five times. 10, lateral sepals, enlarged three times. 11, lip, enlarged five times. 12, column and column-foot, enlarged five times.

Drawn by G. W. DILLON

PLATE II. EPIDENDRUM NITIDUM *L. O. Williams.* 1, plant, natural size. 2, flower, enlarged four times. 3, lip, enlarged eight times.

Drawn by G. W. DILLON

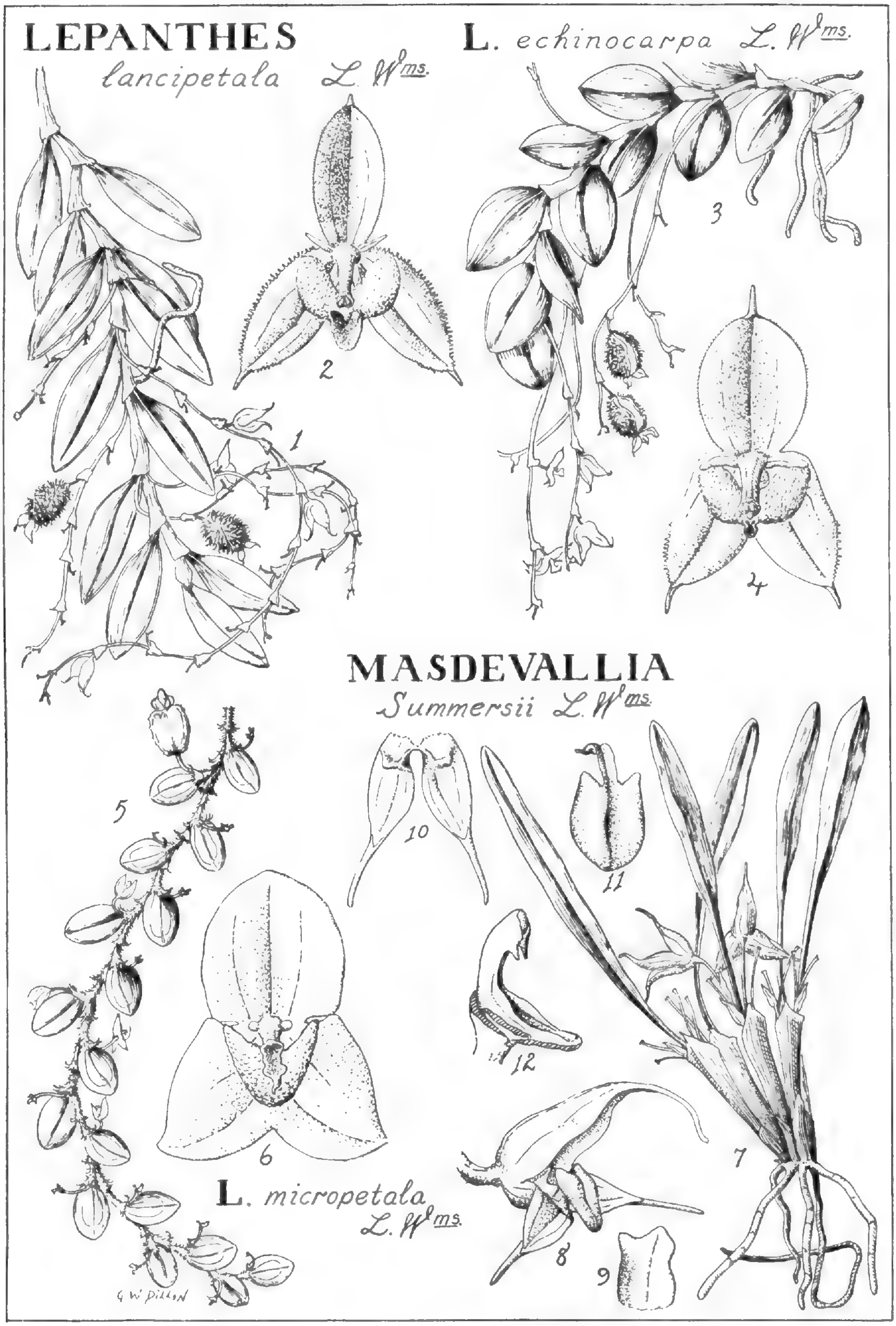
PLATE III. EPIDENDRUM PENLANDII *L. O. Williams.* 1, plant, natural size. 2, flower, enlarged three times. 3, lip and column from the side, enlarged three times.—EPIDENDRUM RHOMBOCHILUM *L. O. Williams.* 4, plant, natural size. 5, flower seen from above, enlarged three times. 6, lip, enlarged five times. 7, flower seen from the side, enlarged three times.

Drawn by G. W. DILLON

PLATE IV. EPIDENDRUM VESICICAULE *L. O. Williams.* 1, plant, natural size. 2, flower, enlarged one and one half times. 3, lip, enlarged two and one half times.—SCAPHYGLOTTIS SUMMERSII *L. O. Williams.* 4, plant, natural size. 5, flower, enlarged one and one half times. 6, lip, enlarged three times. 7, lip and column from the side, enlarged one and one half times.

Drawn by G. W. DILLON

PLATE I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L. echinocarpa L. Wms.
MASDEVALLIA
Summersii L. Wms.
L. micropetala
L. Wms.
G. W. DILLON
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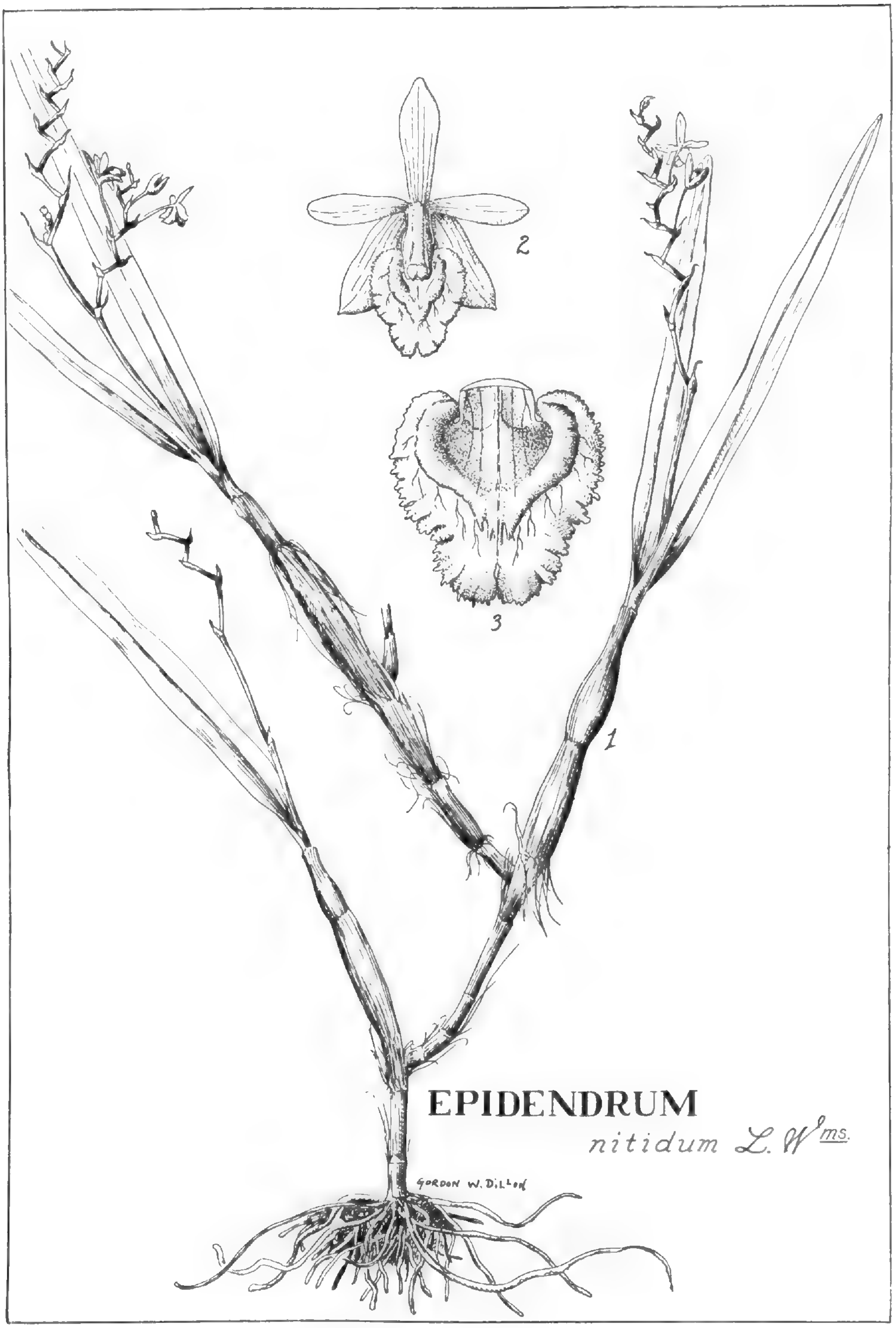
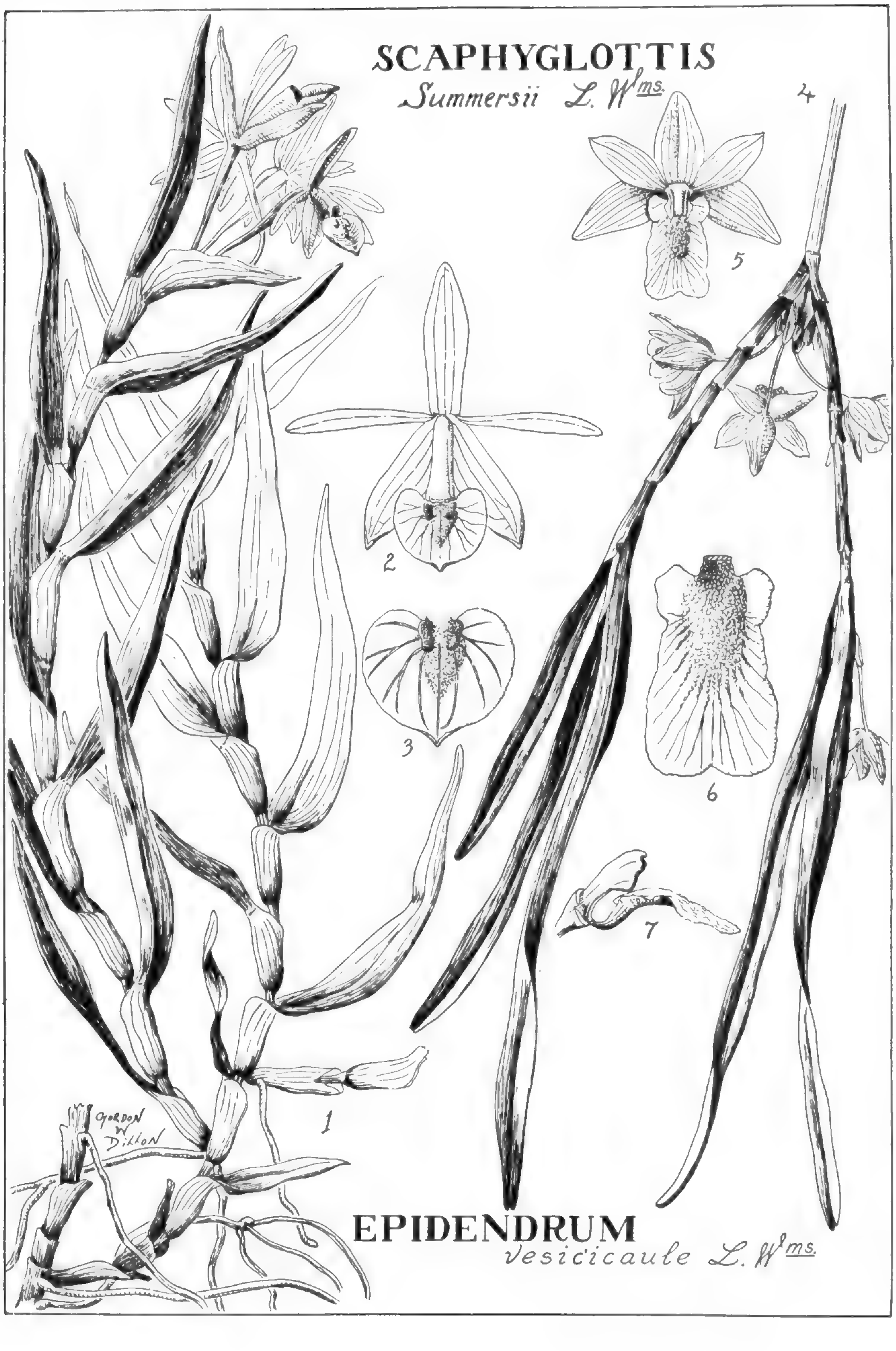
Plate II




SCAPHYGLOTTIS
Summersii L. Wms.
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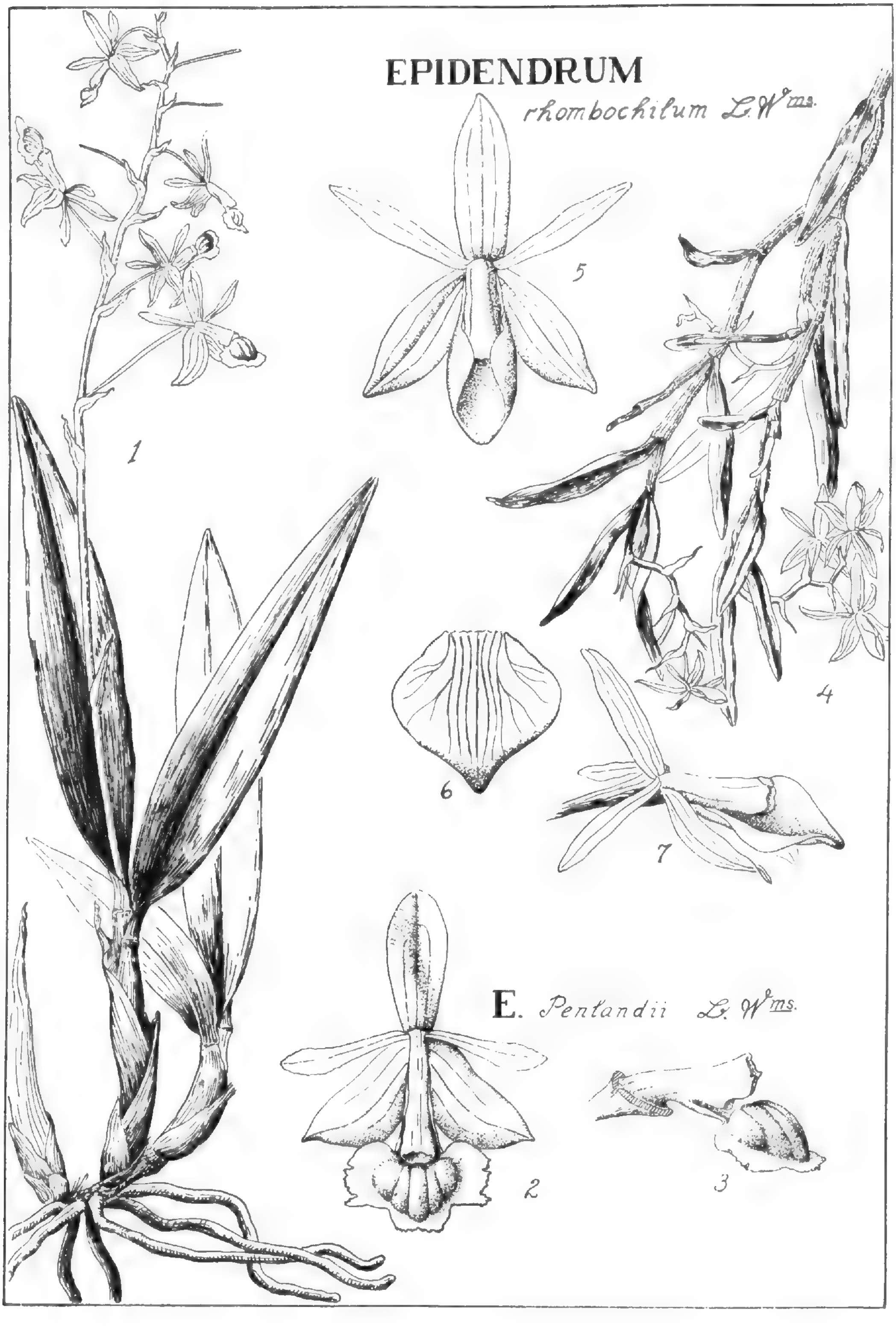
6
7
GORDON W DILLON
EPIDENDRUM
vesicicaule L. Wms.

Plate IV



PLANTAE MEXICANAE VII

BY

RICHARD EVANS SCHULTES

TWO RARE ENDEMICS FROM NORTHEASTERN OAXACA

AMONG other plants recently collected in northeastern Oaxaca, Mexico, were two interesting endemics.

Oreopanax platyphyllum *Marchal* in Bull. Acad. Bruxelles, ser. 2, 47 (1879) 88.

MEXICO: Oaxaca, District of Choapam, Santiago Choapam, long. 95°55′, lat. 17°20′, alt. 1000 m., May 13, 1939, *Schultes & Reko 907* (Econ. Herb. Oakes Ames No. 5833; Herb. Gray).

Known apparently from only two other collections, *Oreopanax platyphyllum*, a member of the Araliaceae, is endemic to the District of Choapam in Oaxaca. In the original description, Marchal referred to the two collections which were known at that time as follows: "Mexico, ad Jocatepec et Lobcoba, Liebmann nos. 17 et 18 in hb. Haun." No state was designated in the description, but these localities are in the District of Choapam very near the locality of *Schultes & Reko 907*. The Liebmann localities are often omitted from standard maps; it may, therefore, be helpful to note that they are situated as follows: Santiago Jocotepec, longitude 95 degrees 56 minutes, latitude 17 degrees 33 minutes; and San Juan Lacova, longitude 95 degrees 55 minutes, latitude 17 degrees 29 minutes.

Besleria glabra *(Oersted) Hanstein* in Linnaea 34 (1865) 325.

MEXICO: Oaxaca, District of Choapam, San Juan Lalana, long. 95°45′, lat. 17°25′, alt. 350 m., May 6, 1939, *Schultes & Reko 784* (Econ. Herb. Oakes Ames No. 7120; U.S. Nat. Herb.).

Besleria glabra, a member of the Gesneriaceae, is also a very local endemic, known only from the District of

Choapam in Oaxaca. In discussing the local distribution of species of *Besleria*, Morton (*Revision of Besleria* in Contrib. U.S. Nat. Herb. 26 (1939) 403) stated: "The actual rarity of the species is well shown by a consideration of those known from Mexico. Four were described from Mexico by Oersted in 1858. These are *B. glabra*, *B. deflexa*, *B. cyrtanthemum*, and *B. hirsuta*, none of which have since been collected in Mexico or found elsewhere, except perhaps *B. hirsuta*." *Besleria glabra* has been known from one Liebmann and one Galeotti collection. *Schultes & Reko 784*, apparently the third collection, does not extend the range of the plant but supports Morton's statement concerning the endemism of the species.

Besleria glabra has been assigned to the State of Puebla by Morton who cited the locality of the Liebmann specimen as "Lacoba, Chinantla, State of Puebla, Mexico". This should be corrected to read, "...State of *Oaxaca* ..." *Chinantla* is a local name referring to the District of Choapam and does not appear on maps of Oaxaca. It has often been confused with *Chinautla*, the name of a town which does appear on maps of Puebla. Oersted (*Gesneraceae centro-americanae* (1858) 55) in the original description of *Besleria glabra*, stated that the type plants "funden af Liebmann i Mexico i Departementet Oajaca ved Lacoba og Chinantla." Hanstein (Linnaea 34 (1865) 325) cited the specimen as "Mexico, Oajaca, Chinantla, Liebmann." The exact locality of San Juan Lacova is longitude 95 degrees 55 minutes, latitude 17 degrees 29 minutes.

Galeotti 1921, which has been referred to *Besleria glabra*, is labelled simply "Oaxaca." Since Galeotti made extensive collections in the Liebmann localities in northeastern Oaxaca, it seems very probable that his collection was made in this part of the state.

BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JANUARY 2, 1941 VOL. 9, NO. 2

PLANTAE MEXICANAE VIII

BY

RICHARD EVANS SCHULTES

NEW AND SIGNIFICANT SPECIES OF PLEUROTHALLIS FROM OAXACA

THE following species of *Pleurothallis* were collected by the writer in the northeastern part of Oaxaca, Mexico. Specimens of the collections are preserved in the Ames Herbarium. The following notes are presented in view of the fact that the collections represent undescribed or rare orchids which add to our knowledge of distribution.

Pleurothallis Grobyi *Bateman ex Lindley* in Bot. Reg. 21 (1836) t. 1797.

MEXICO: Oaxaca, District of Cuicatlán, Cerro Machin, San Juan Zautla, long. 96°40′, lat. 17°58′, altitude 450 m., June 29, 1939, *Schultes 739*.

The range of *Pleurothallis Grobyi* is very wide, including Central America, South America as far south as Brazil, and the West Indies. It has been known from Mexico by collections made in Vera Cruz and in Chiapas. It is especially well represented in the Ames Herbarium from Chiapas. *Schultes 739* is the first collection reported from Oaxaca and extends the range of the species considerably northwestward.

Pleurothallis Halbingeriana *R. E. Schultes sp. nov.*

Herba epiphytica, minima, repens. Radices fibrosae, glabrae. Caules primarii breves, repentes. Caules secundarii plusminusve erecti, apice unifoliati. Folium sessile, ellipticum, apice mucronatum, leviter coriaceum. Pedunculi folium superantes. Flores pauci, succedanei, in racemis brevibus. Sepala lateralia late obovata, acuminata, fere usque ad basim libera, uninervia. Sepalum dorsale simile. Petala elliptica, aliquid obtusa, sepalis crassiora. Labellum lanceolato-acuminatum, carnosum, carnoso cum apice inflexo. Columna supra dilatata, grandibus cum stelidiis lateralibus. Stigmata in columnae brachiis lateralibus infra rostellum confluentia. Flos omnino subviridi-flavidus.

Plant epiphytic, very small, repent. Roots fibrous, smooth. Primary stems abbreviated, repent. Secondary stems more or less erect, 2 mm. or less in length, each loosely invested by two hyaline sheaths, monophyllous at their apex. Leaf sessile, 6–9 mm. long, 2.5–3.5 mm. wide at the middle, elliptic, strongly mucronate at the apex, somewhat coriaceous. Peduncles conspicuously overtopping the leaves, up to 15 mm. long, with several closely appressed tubular bracts, one at the base, one near the middle. Flowers borne in succession on an abbreviated raceme. Raceme up to 5-flowered. Rachis 1–3 mm. long. Bracts of raceme subequal to or shorter than the pedicels, scarious. Pedicels (without ovary) less than 1 mm. long. Lateral sepals broadly obovate, long-acuminate, 1 mm. long, 0.75 mm. wide, free almost to the base, 1-nerved. Dorsal sepal similar, 1 mm. long, 0.75 mm. wide or less. Petals elliptical, somewhat obtuse, 1 mm. long, 0.5 mm. wide, fleshy, with an inflexed tip. Lip lanceolate-acuminate, fleshy, with an inflexed tip, about 1 mm. long, 0.5 mm. wide. Column dilated up-

wards, about 0.8 mm. long, with prominent lateral arms. Stigmas on the lateral arms confluent below the rostellum. All parts of the flower pale greenish yellow.

MEXICO: San Juan Lalana (near Santiago Choapam), long. 95°45′, lat. 17°25′, District of Choapam, Oaxaca, at about 1900 feet (about 600 meters) altitude, May 7, 1939, *Richard Evans Schultes & Blas Pablo Reko 805* (TYPE in Herb. Ames No. 57280; ISOTYPES in Herb. Inst. Biología (Chapultepec, Mexico), in Herb. Field Museum, in Herb. Halbinger and in Herb. Schultes).

I take great pleasure in naming this new species of *Pleurothallis* in honor of Mr. Christian Halbinger, in recognition of his interest in the furtherance of the study of Mexican Orchidaceae and in grateful appreciation of the help which he has given me during my botanical trips in Mexico.

Pleurothallis Halbingeriana is closely allied to *P. propinqua* Ames of Costa Rica and to *P. lancilabris* (Reichb.f.) Schltr. of Costa Rica and southern Mexico.

Pleurothallis Halbingeriana agrees with *P. propinqua* in general floral structure, but the latter is much larger than the former in all its parts. Furthermore, *P. propinqua* has oblanceolate or spatulate leaves which are bilobulate at the apex and peduncles which only slightly overtop the leaves, whereas *P. Halbingeriana* has elliptical leaves which are strongly mucronate at the apex and peduncles which conspicuously overtop the leaves. Minor floral differences further separate these two species. The relationship between them, however, is extremely close.

Pleurothallis lancilabris, which Ames regards as a close ally of *P. propinqua*, is related to *P. Halbingeriana*; but the relationship is more remote than that between *P. propinqua* and *P. Halbingeriana*. Although vegetatively rather similar to *P. Halbingeriana*, *P. lancilabris* differs in having linear (not lanceolate) petals and very long-acuminate (not short-acuminate) sepals. Furthermore, the

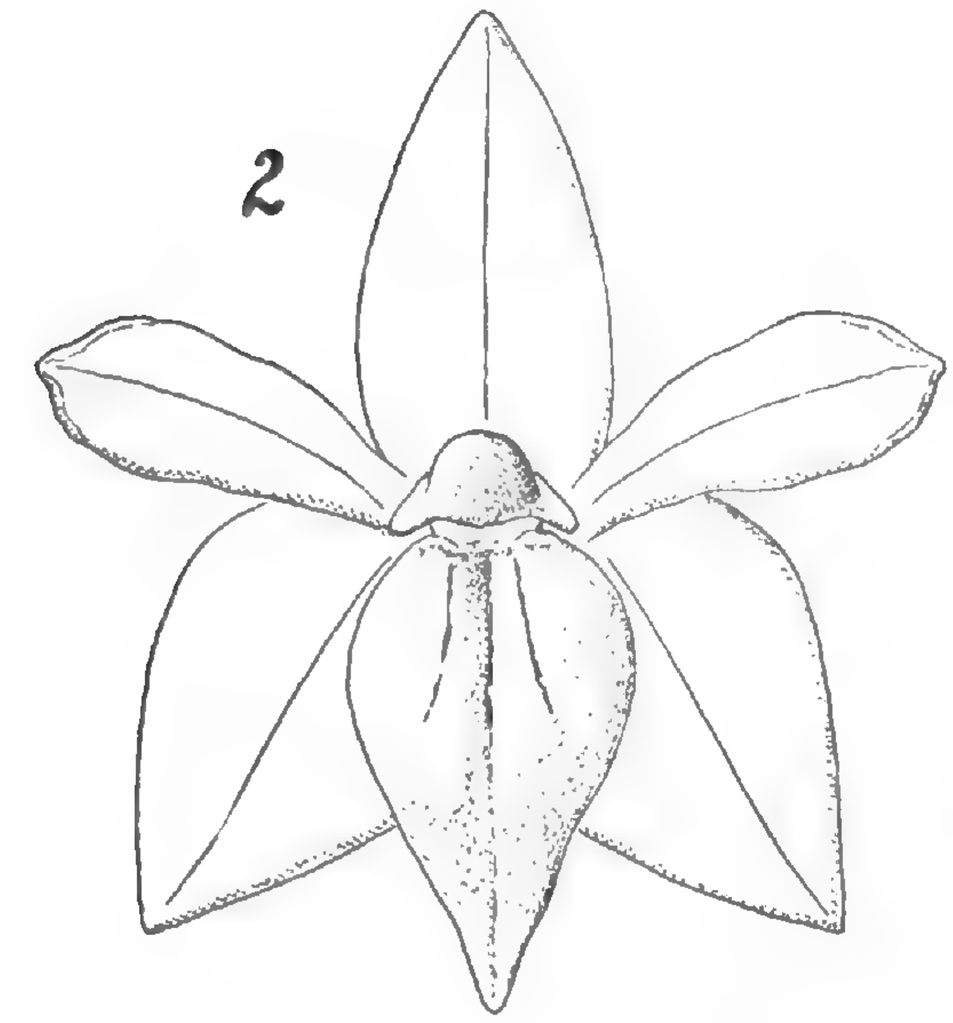
EXPLANATION OF THE ILLUSTRATION

PLEUROTHALLIS HALBINGERIANA *R. E. Schultes.* 1, plant about two and one half times natural size. 2, flower, magnified about twenty-five times. 3, column, magnified about twenty-five times. 4, lip and column, seen from the side, magnified about twenty-five times. 5, leaf and inflorescence, magnified about six times.

Drawn by G. W. DILLON

PLEUROTHALLIS

Stalbingeriana R.E.Schultes



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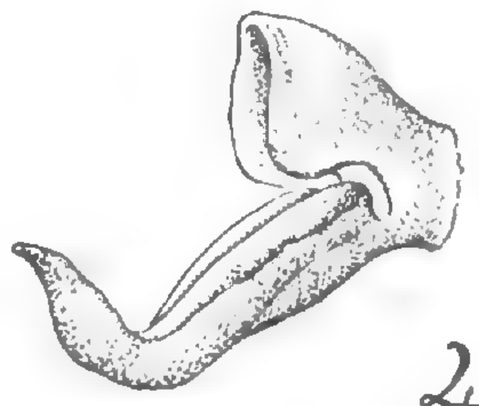

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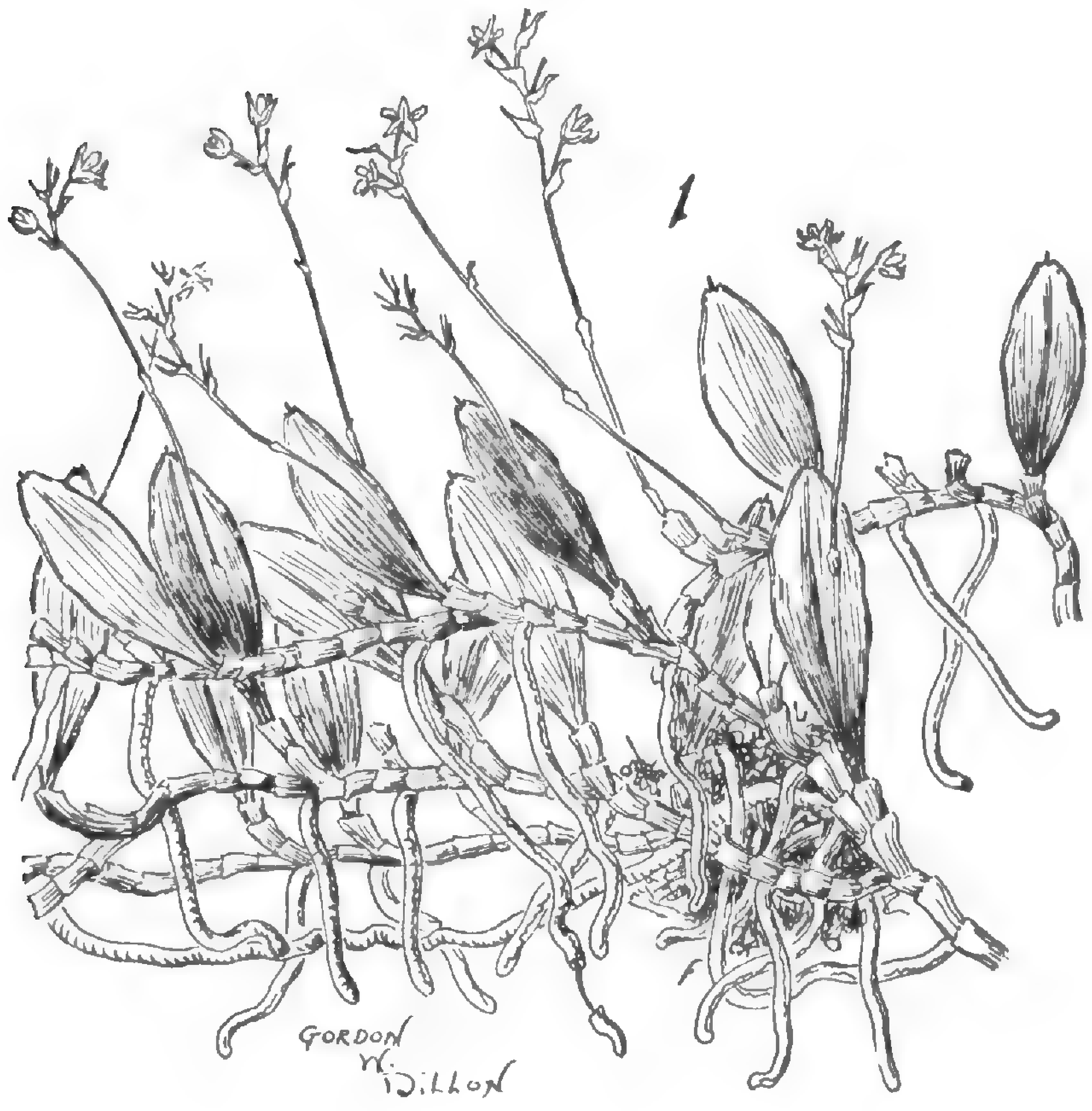

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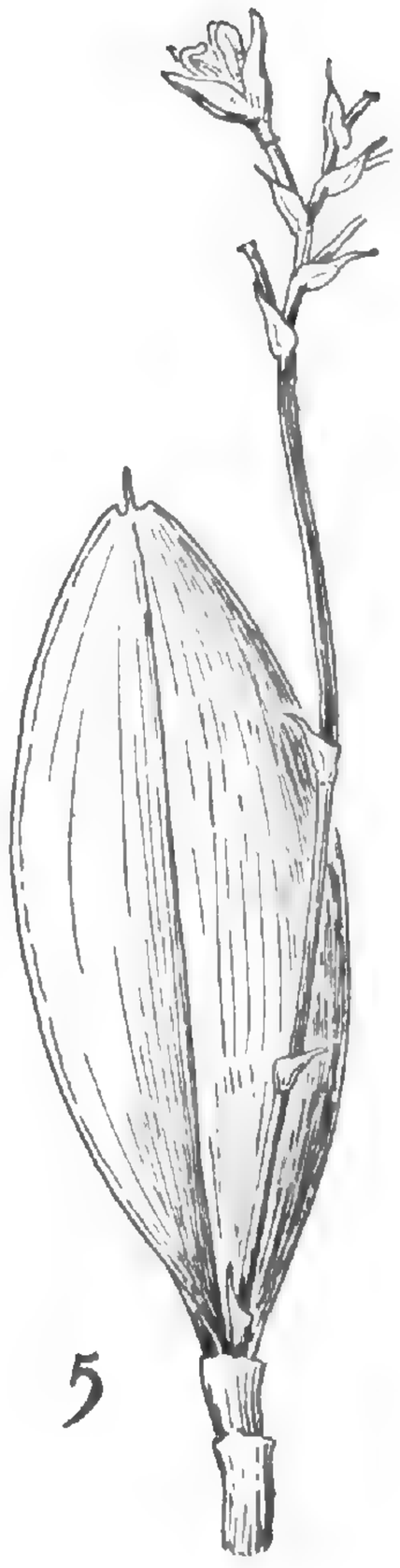

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GORDON W. DILLON

inflorescence of *P. lancilabris* is extremely lax, whereas that of *P. Halbingeriana* is very congested. The habit of *P. Halbingeriana* is much more obviously repent than that of either *P. propinqua* or *P. lancilabris.*

Pleurothallis Halbingeriana is a very small inconspicuous epiphyte growing deeply imbedded in moss on coffee trees in a partly cleared forest near the town of San Juan Lalana in the District of Choapam. The type of this orchid was found on a large coffee tree growing beneath a robust *Talauma mexicana* (DC.) Don *(cacaloxochitl)* on the forest trail which leads southeast from the town. I did not find *Pleurothallis Halbingeriana* on any tree other than *Coffea arabica* L., although almost all the trees in the vicinity supported epiphytic orchids, ferns and mosses. It occurred in the type locality in association with *Oncidium pumilum* Lindl.

The flowers of *Pleurothallis Halbingeriana* are pale yellowish green in all their parts and are not easily noticed, although in May the little plant flowers in great profusion. The Chinantec Indians of San Juan Lalana refer to this species, and to other small epiphytic orchids, as *dzu.*

Pleurothallis lancilabris *(Reichb.f.) Schlechter* in Fedde Repert. 12 (1913) 205.

MEXICO: Oaxaca, District of Cuicatlán, Cerro Machin, San Juan Zautla, long. 96°40′, lat. 17°58′, altitude 450 m., June 29, 1939, *Schultes 738.*

Hitherto, *Pleurothallis lancilabris* has been considered endemic to Costa Rica where it is very abundant. The extension of the range of this orchid to the northeastern part of Oaxaca is very significant because it indicates the possibility that subsequent work may extend to southern Mexico a complex of species which is not represented in herbaria by Mexican collections. It is one of the closest allies of *Pleurothallis Halbingeriana* of Oaxaca.

Pleurothallis Schiedei *Reichenbach filius* in Linnaea 22 (1849) 826.

Mexico: Oaxaca, District of Cuicatlán, Río de Dormilones, Santa María de las Nieves, long. 96°29′, lat. 17°47′, altitude 1710 m., June 26, 1939, *Schultes 709*; District of Villa Alta, Cerro Zempoaltepetl, south of Ayutla, long. 96°04′, lat. 16°59′, April 5, 1934, altitude 2400 m., *Nagel 3792*.

Pleurothallis Schiedei is easily recognized by its reddish brown or maroon sepals which bear white, clavellate pubescence. It is a very rare orchid and is unknown outside of Mexico. The Ames Herbarium has one collection from Chiapas and two (cited above) from Oaxaca. The Oaxacan collections, while from the northeastern part of the state, are not from neighboring localities, but are separated by many miles and by several mountain chains. It is apparent that, although *Pleurothallis Schiedei* is a rare plant, it is distributed over a rather large area in southern Mexico. The type was collected in Mexico, but the precise locality is not known.

Pleurothallis sertularioides *(Sw.) Sprengel* Syst. Veg. 3 (1826) 721.

Mexico: Oaxaca, District of Cuicatlán, Finca Unión Francesa, long. 96°39′, lat. 17°55′, altitude 350-450 m., June 28, 1939, *Schultes 725*.

Predominantly a West Indian species, *Pleurothallis sertularioides* has been collected in Honduras; it has been reported from Mexico (as *Pleurothallis tenuissima* Reichb.f.) on the basis of one previous collection. It is a rare plant in Oaxaca and is not abundant in the locality where it was collected.

ORCHID STUDIES, XIV

BY

LOUIS O. WILLIAMS

A NEW GENUS OF THE ORCHIDACEAE FROM BURMA

In a collection of orchids sent for determination by Mr. F. G. Dickason, the following new genus was noted.

Dickasonia *L. O. Williams gen. nov.* Tribus Kerosphaereae, subtribus Coelogyneae, Orchidacearum.

Herbae epiphyticae. Pseudobulbi perennes, unifoliati (rare bifoliati). Folia lanceolata vel elliptica, petiolata, cum nervis quinque ad novem prominentibus, vernatione convoluta. Inflorescentia lateralis; racemus pauciflorus, plusminusve unilateralis. Sepala similia, libera, dorso carinata. Petala sepalis similia vel leviter minora. Labellum columnae adnatum, immobile, integrum, basi valdissime gibbosum vel leviter saccatum, ecallosum. Columna brevis, apoda; anthera operculata, incumbens, antherae loculi biloculares; pollinia quatuor, cerea; rostellum integrum; stigma semiorbiculare, margine prominenti.

Epiphytic herbs. Pseudobulbs perennial, unifoliate (rarely bifoliate), vernicose. Leaves lanceolate or elliptic, petiolate, with five to nine prominent nerves, vernation convolute. Inflorescence lateral, from the base of a pseudobulb; raceme few-flowered, usually unilateral. Sepals similar, free, carinate dorsally especially along the mid-nerve. Petals similar to the sepals but usually a little smaller. Lip adnate to the column, immobile, entire, strongly gibbous or somewhat saccate at base, ecallose. Column short, about one third as long as the petals, footless; anther operculate, incumbent, enclosed in the clinandrium, loculi of the anther bilocular; pollinia four,

ceraceous; rostellum entire; stigma semiorbicular, with raised and prominent margins.

Dickasonia is similar in habit to *Panisia* Lindl., but is easily distinguished from it by the lip which is adnate to the column, and also by the short column.

There are but two genera in the subtribe Coelogyneae which have the lip adnate to the column, *Gynoglottis* J.J.Smith and the present genus. *Dickasonia*, however, is more closely allied to *Panisia* and should be placed next to it in the classification proposed by Schlechter.

The genus is named for Mr. F. G. Dickason of Judson College, Rangoon, Burma, who has contributed to the orchid knowledge of that country through his collections.

Dickasonia vernicosa *L.O.Williams sp. nov.*

Herbae parvae, epiphyticae, repentes vel caespitosae. Pseudobulbi subcylindracei vel ovati, unifoliati (rare bifoliati). Folia lanceolata vel elliptico-lanceolata, acuta vel acuminata. Sepalum dorsale ellipticum, acutum. Sepala lateralia lanceolata, acuta. Petala oblanceolata, obtusa. Labellum obovatum apiculatum, ecallosum; unguis columnae adnatus, valdissime gibbosus vel subsaccatus. Columna generis.

Small epiphytic, repent or caespitose herbs up to 15 cm. high. Pseudobulbs 2–3 cm. long, subcylindric to ovoid, prominently ridged or winged, unifoliate (rarely bifoliate). Leaves 3–12 cm. long, 0.5–2.5 cm. broad, lanceolate to elliptic-lanceolate, acute or acuminate, petiolate. Inflorescence of the genus. Dorsal sepal 10–14 mm. long, 3–3.5 mm. broad, elliptic, acute, 3- to 5-nerved. Lateral sepals 11–14.5 mm. long, 2.5–4.5 mm. broad, lanceolate, acute, 3- to 5-nerved, with the middle nerve thickened dorsally. Petals 10–11 mm. long, 2.5–4 mm. broad, oblanceolate, obtuse, 3-nerved. Lip entire; lamina 8–10 mm. long, 2.5–4 mm. broad, obovate, obtuse, api-

culate, entire or somewhat crenulate, ecallose; claw 2.5–4 mm. long, adnate to the column, strongly gibbous or subsaccate at the base. Column 2.5–4 mm. long.

BURMA: on trees, Haka, at 5500 feet altitude, flowers white, odorless, April 5, 1937, *Dickason 7377*; epiphytic in deep shade, mossy forest, Haka, at 7625 feet altitude, flowers pure white, odorless, April 20, 1938, *Dickason 7524*; on trees, rare, Kyanksit Chaung, Chin Hill district, at 6500 feet altitude, flowers small, white, fragrant, April 1939, *Dickason 8576* (TYPE in Herb. Ames No. 57363).

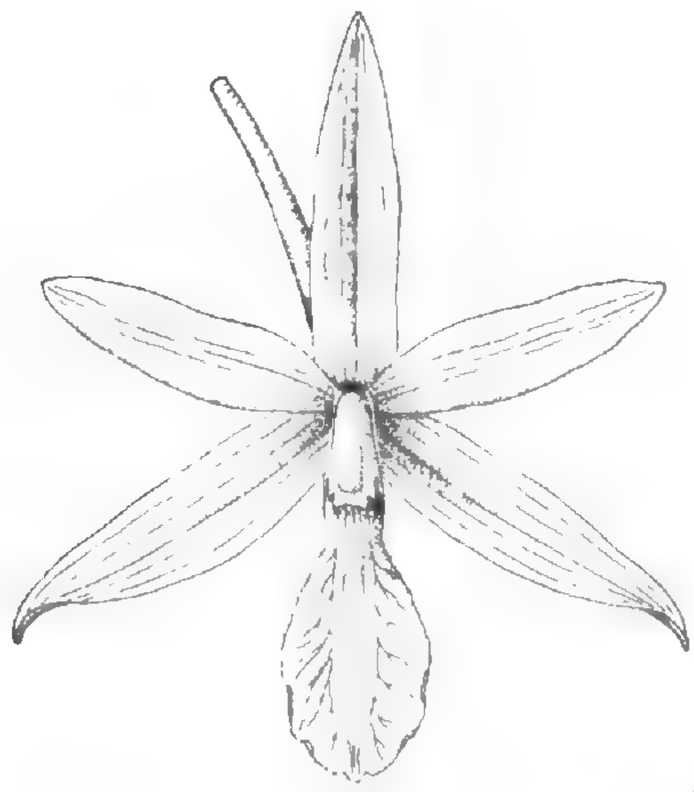
EXPLANATION OF THE ILLUSTRATION

DICKASONIA VERNICOSA *L. O. Williams.* 1, plant, natural size. 2, flower, opened out, magnified one and one half times. 3, lip and column, from the side, magnified three times. 4, lip and column, from above, magnified three times.

Drawn by G. W. DILLON

DICKASONIA

vernicosa L. W^ms.



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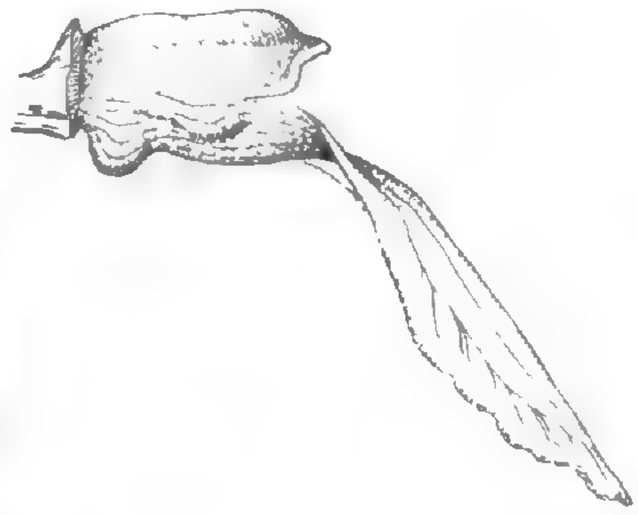

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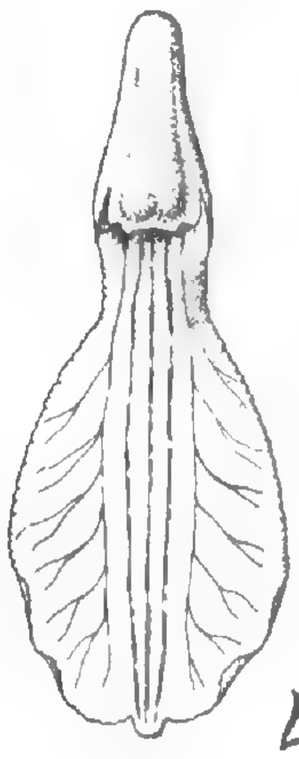

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GORDON W. DILLON

A NEW SPECIES OF OCTOMERIA FROM MT. RORAIMA

BY
CHARLES SCHWEINFURTH

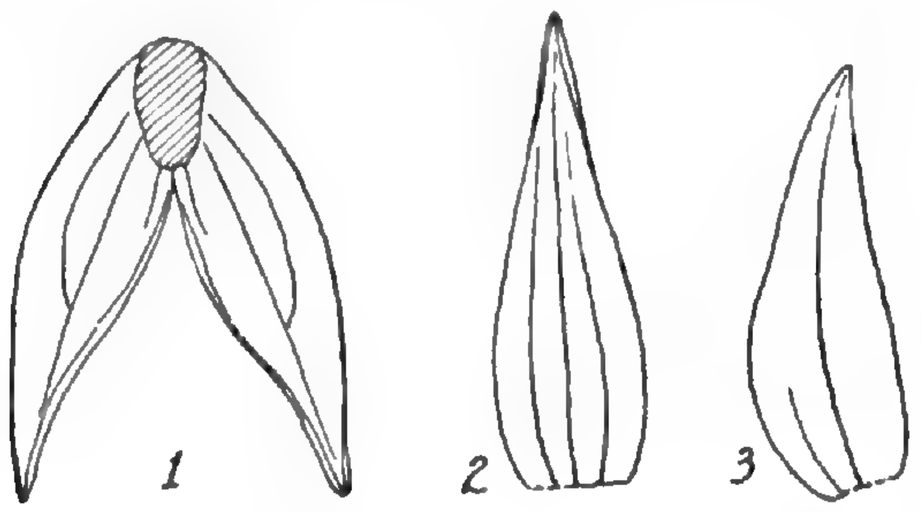
THE orchid collection made by G. H. H. Tate on Mount Roraima in 1927 contained, among several unusual plants, the following new species of Octomeria.

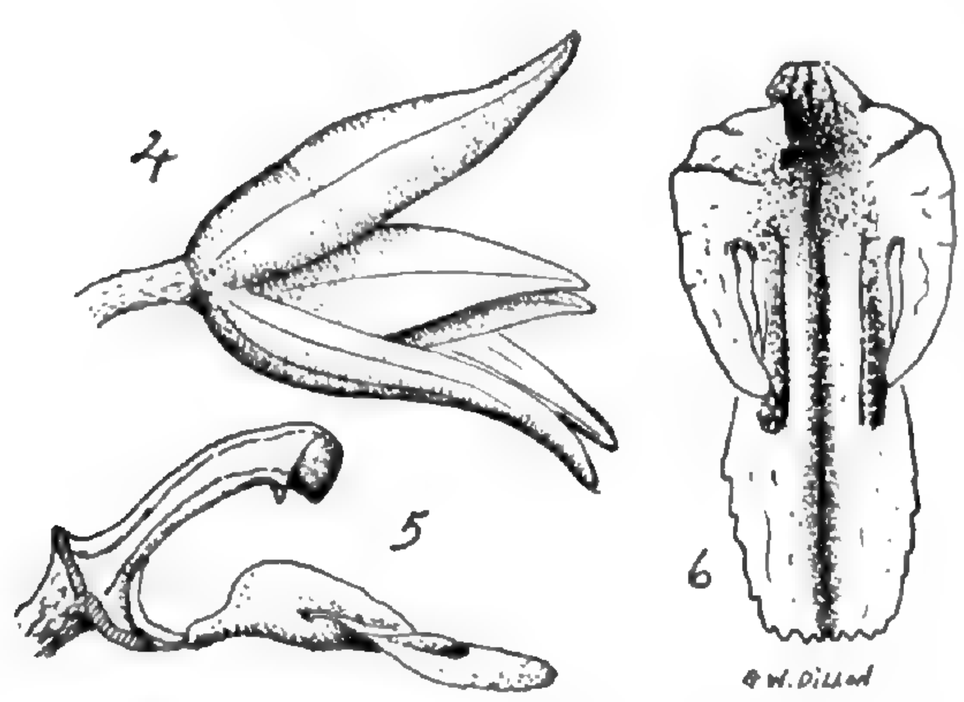
Octomeria monticola *C. Schweinfurth sp. nov.*

Herba parvula, caespitosa. Radices fibrosae, glabrae. Caules dense caespitosi, pluriarticulati, apice monophylli. Folium erectum, ovato-lanceolatum vel lineari-lanceolatum, sessile, valde coriaceum. Inflorescentiae caulis apice fasciculatae, pauciflorae. Flores parvi, campanulati, membranacei. Sepala lanceolata vel ovato-lanceolata, acuminata, trinervia. Petala oblique lanceolata, acuminata. Labellum multo minus, trilobatum cum lobis lateralibus erectis, in circuitu oblongo-ovatum; lobi laterales porrecti, falcato-oblongi, apice rotundati; lobus medius ovato-quadratus, apice truncato pluridentatus, marginibus dentatis. Columna basi incrassata.

Plant small, caespitose, up to about 15 cm. tall to the tip of the erect leaf. Roots fibrous, glabrous, numerous. Secondary stems congested, up to about 10.5 cm. high, about 3- to 5-jointed, with the lower joints approximate and the uppermost internode the largest, mostly concealed by close tubular sheaths; the joints are marked by conspicuous dark bands. Leaf apical, erect, ovate-lanceolate to lanceolate or linear-lanceolate, minutely tridenticulate at the obtuse apex, sessile with a cuneate base, up to 5.4 cm. long and about 1.1 cm. wide, rigid and coriaceous in the dried specimen with sulcate mid-nerve and revolute margins. Inflorescences fascicled at the apex of the stem, each one apparently several-flowered with the abbreviated 1-flowered peduncle mostly concealed by scarious imbricating sheaths. Flowers small, membrana-

ceous. Sepals lanceolate or ovate-lanceolate, acuminate, 3-nerved. Dorsal sepal up to about 6 mm. long and 2 mm. wide, concave. Lateral sepals up to about 5.8 mm. long and 1.6 mm. wide, lightly oblique, concave. Petals obliquely lanceolate, acuminate, 2- to 3-nerved at the base, up to about 5.1 mm. long and 1.8 mm. wide. Lip much smaller, 3-lobed near the base with the lateral lobes erect and parallel in natural position, about 2.6 mm. long; when expanded the lamina is oblong-ovate with a broadly cuneate base; lateral lobes falcate-oblong, lightly incurved, rounded at the apex; mid-lobe ovate-quadrate, about 1.7 mm. long, broadly truncate with a pluridentate apex, coarsely dentate on each side; disc with a thickened mid-nerve and a pair of low keels extending from the base of the lateral lobes almost to the middle of the mid-lobe. Column lightly arcuate, dilated below, up to about 2 mm. long. Anther hemispherical, incumbent, opercular, 2-celled.





1, lateral sepals, magnified about 5 times. 2, dorsal sepal, magnified about 5 times. 3, petal, magnified 5 times. 4, flower from the side, magnified about 5 times. 5, column and lip, magnified about 10 times. 6, lip, magnified about 15 times.

There appear to be no near allies of this species. Distinctive features are the small sessile leaves and the small flowers with the relatively long porrect lateral lobes and dentate mid-lobe of the lip.

British Guiana and northern Brazil, summit of Mt. Roraima, flowers pinkish, November 28, 1927, *G. H. H. Tate 425* (Type in Herb. N.Y. Bot. Gard.; Duplicate type in Herb. Ames No. 58323).

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ORCHIDACEAE PERUVIANAE I

BY
CHARLES SCHWEINFURTH

THE following article is the first of a series resulting from a critical study of the orchids of Peru. The present paper treats seven species and one variety that appear to represent undescribed concepts.

Habenaria avicula *Schlechter* var. **peruviana** *C. Schweinfurth var. nov.*

Haec varietas herbae majore altitudine et caulis parte basali nuda longiore et labelli calcari longiore a planta typica differt.

Plant up to 10.5 dm. tall. Stem leafy, but the basal portion (up to about 22 cm. long) provided only with sheaths. Leaves elliptic-lanceolate or lanceolate-ligulate (the upper and lower blades much smaller), acute or acuminate, clasping by a narrowed base. Raceme 22 cm. or more long, loosely many-flowered. Floral bracts ovate. Flowers greenish-white. Dorsal sepal deeply concave, rounded. Lateral sepals much larger, very obliquely semiorbicular. Petals small, divaricately bilobed with the posterior lobe linear-ligulate and the anterior lobe narrowly triangular. Lip 3-lobed with the lateral lobes reduced to short spreading triangular or linear-triangular teeth, up to 11.5 mm. long. Spur considerably more than twice longer than the lip, up to 28.5 mm. long, narrowly clavate-cylindric.

The single Peruvian collection referred to this variety differs from the typical (Panamanian) form in its much greater height, its longer naked basal portion of the stem, its shorter floral bracts and its longer spur. Its leaves are in a very imperfect condition.

LORETO: Mishuyacu near Iquitos, at about 100 meters altitude, in dense forest, September 24-28, 1929, *E.P.Killip & A.C.Smith 29880*. (TYPE in Herb. Ames No. 43511).

Habenaria dentifera *C.Schweinfurth sp. nov.*

Herba terrestris, elata. Caulis inferne vaginis tubulatis solum obtectus, supra foliosus. Folia lanceolata vel elliptico-lanceolata, acuminata. Racemus longus, laxe multiflorus. Sepalum dorsale comparate parvum, suborbiculare ut videtur, valde cucullatum. Sepala lateralia falcato-semiorbicularia, valde obtusa. Petala bilobata; lobus posterior subquadratus, apice dilatato inaequaliter tridentatus; lobus anterior minor, lanceolato-dentiformis. Labellum lineare, basi utrinque unidentatum. Calcar tenuiter cylindraceum, labello multo longius.

Plant terrestrial, about 79–85 cm. or more tall. Roots fibrous, lanuginose. Stem leafy from below the middle up to the raceme, lower portion (for about 11–27 cm.) provided only with 3 close tubular sheaths. Leaves lanceolate or elliptic-lanceolate, up to 21.5 cm. long and 5 cm. wide, (much shorter on the lower part of the stem and gradually diminishing toward the raceme), acuminate, clasping. Raceme about 22–29.5 cm. long, very loosely many-flowered. Floral bracts lanceolate, spreading, up to 2.7 cm. long, acuminate, 3-nerved. Dorsal sepal relatively small, strongly cucullate, apparently suborbicular in outline, 6 mm. long, broadly obtuse at the recurved tip, 3-nerved. Lateral sepals falcate-semiorbicular, very oblique, about 8.5 mm. long and 5.8–6.5 mm. wide in the middle, strongly obtuse, reflexed, with three

conspicuous nerves and two or three outer less prominent ones. Petals deeply bilobed; posterior lobe subquadrate, about 5 mm. long and 3–3.5 mm. wide, unequally 3-toothed at the slightly dilated apex, 2- to 3-nerved; anterior lobe smaller, at right angles to the posterior lobe, triangular-ovate, oblong-ovate or lanceolate, more or less oblique, about 3.1 mm. long, obtuse. Lip linear, fleshy, more or less recurved (occasionally geniculate), strongly longitudinally convex, 3-lobed at the base (rarely merely angled on each side at base); lateral lobes minute, dentiform, reflexed, occasionally uncinate, about 1.2 mm. long; mid-lobe about 10–11.5 mm. long, rounded at the apex. Spur very slenderly cylindric, 2.7–3.1 cm. long. Anther canals long and slender. Stigmatic processes short, stout.

Habenaria dentifera has several superficially close allies, among which are *H. autumnalis* Poepp. & Endl., *H. avicula* Schltr. var. *peruviana* C. Schweinf., *H. odontopetala* Reichb. f., and *H. pleiophylla* Hoehne & Schltr. It differs from all these concepts, however, in the form and lobing of the petals. From *H. pleiophylla* it further differs in having broader leaves and relatively shorter floral bracts.

JUNIN: East of Quimirí Bridge, near La Merced, at 800-1300 meters altitude, in dense forest, perianth segments light green, June 1–3, 1929, *E. P. Killip & A. C. Smith 23841.* (TYPE in Herb. Field Museum No. 622198; DUPLICATE TYPE in Herb. Ames No. 38278.)—LORETO: Mishuyacu, near Iquitos, at 100 meters altitude, in forest, flowers light green, April 1930, *G. Klug 1217* (plant immature).—SAN MARTIN: Zepelacio, near Moyobamba, at 1100 meters altitude, terrestrial, in mountain forest, flowers yellow-green, June 1934, *G. Klug 3691.*

Habenaria ligulata *C. Schweinfurth sp. nov.*

Herba terrestris, elata. Caulis robustus, foliosus. Folia oblongo-lanceolata vel elliptica, adscendentia. Racemus longus, dense multiflorus. Flores mediocres. Sepalum

dorsale late ovatum, valde cucullatum. Sepala lateralia oblongo-lanceolata. Petala simplicia, anguste triangulari-lanceolata, leviter falcata. Labellum simplex, lineare vel lineari-lanceolatum, crassum. Ovarium exalatum.

Plant terrestrial, up to about 9 dm. tall from a decumbent base. Stem stout, leafy, at base concealed by tubular leaf-bearing sheaths. Leaves elliptic-lanceolate to oblong-lanceolate, acute or acuminate, amplexicaul, ascending, up to about 13 cm. long and 2.6 cm. wide, the largest blade near the middle of the stem. Raceme densely many-flowered, about 22.7 cm. long to the tip of the uppermost flower, about 3.5–5 cm. wide in the dried specimen. Floral bracts ovate-lanceolate, the lowest (and largest) 3.9 cm. long, acuminate, clasping. Flowers medium-sized, perianth ringent. Dorsal sepal broadly ovate, strongly cucullate, about 14 mm. long, 9–10.2 mm. wide when forcibly expanded, rounded or minutely retuse and apiculate at the tip, conspicuously 3- (or inconspicuously 5-) nerved with the mid-nerve prominently carinate on the outer surface. Lateral sepals oblong-lanceolate, about 14–16 mm. long, 5 mm. wide, obtuse and more or less apiculate with a concave tip, 4- to 5-nerved with the mid-nerve prominently carinate on the lower half of the outer surface. Petals narrowly triangular-lanceolate, slightly falcate, about 11 mm. long, 4 mm. wide near the base, acute, 3-nerved, thickened through the anterior longitudinal part, rounded at the anterior basal part. Lip simple, linear or linear-lanceolate, very slightly dilated at base, about 15 mm. long, fleshy, obtuse. Spur slender-cylindric below, prominently clavate and laterally flattened above, about 18 mm. long. Anther canals slender, much surpassing the fleshy semiovoid stigmatic processes. Ovary longitudinally ribbed but not winged.

Habenaria ligulata suggests *H. hexaptera* Lindl., but differs in the densely flowered raceme, in the dissimilar

lanceolate petals and in the absence of crisped wings on the ovary.

A Bolivian specimen collected by Miguel Bang, in the Columbia University Herbarium, and identified as *Habenaria hexaptera*, appears to represent this species.

Habenaria ligulata was described from a single dried specimen in which the leaf-blades are rather imperfect.

AYACUCHO: Ccarrapa, between Huanta and Río Apurimac, at 1500 meters altitude, terrestrial, on open hillside, perianth green, May 5-6, 1929, *E. P. Killip & A. C. Smith 22341*. (TYPE in Herb. Ames No. 42082).

Habenaria parvicalcarata *C. Schweinfurth sp. nov.*

Herba terrestris, mediocris. Caulis omnino foliosus. Folia elliptico-lanceolata, vel ovato-lanceolata, basi imbricantia, acuminata. Racemus pauciflorus, bracteis magnis foliaceis. Sepalum dorsale ovatum, cucullatum, valde mucronatum. Sepala lateralia lanceolata, obliqua, concava, valde mucronata. Petala bipartita; lobus posterior falcatus, lanceolato-linearis; lobus anterior angustior, longior, antice valde incurvatus. Labellum tripartitum, lobis parallelis perangustis; lobo intermedio latiore et paulo breviore. Calcar minimum.

Plant terrestrial, about 25 cm. high, with a central tuberous swelling terminating the base of the stem. Roots fibrous. Stem leafy, concealed at base by several tubular imbricating sheaths which soon produce blades. Leaves strict or slightly spreading, lanceolate-elliptic to ovate-lanceolate, sheathing by loose infundibuliform bases, acute or acuminate, membranaceous, free portion of the largest blade nearly 7 cm. long and 2.5 cm. wide, the upper blades gradually much smaller. Inflorescence about 7 cm. long, few- (about 9-) flowered, rather dense. Floral bracts relatively large, foliaceous, lanceolate to ovate-lanceolate, acuminate, the largest (basal) one 2.3 cm. long. Perianth green. Sepals obtuse with a prominent conical dorsal mucro. Dorsal sepal ovate, strongly cucul-

EXPLANATION OF THE ILLUSTRATION

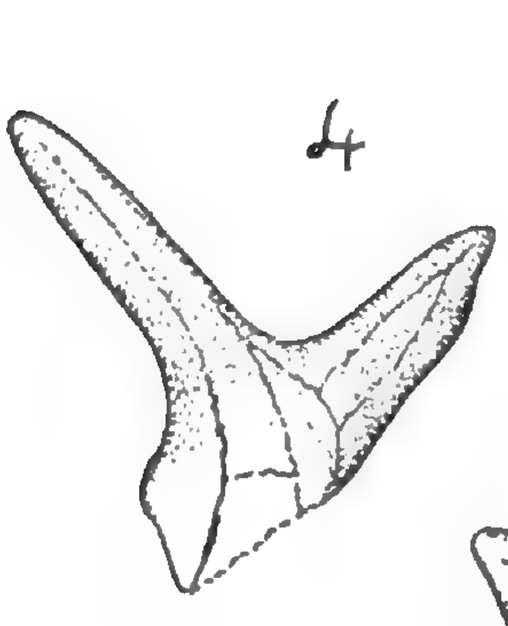
HABENARIA PARVICALCARATA *C.Schweinf.* 1, flower with pedicellate ovary, from side, six times natural size. 2, petal, six times natural size.

HABENARIA PUMILOIDES *C.Schweinf.* 3, petal, six times natural size.

HABENARIA AVICULA *Schltr.* VAR. PERUVIANA *C. Schweinf.* 4, petal, six times natural size.

HABENARIA DENTIFERA *C. Schweinf.* 5 and 6, petals from different flowers, six times natural size.

Drawn December 1940 by G. W. DILLON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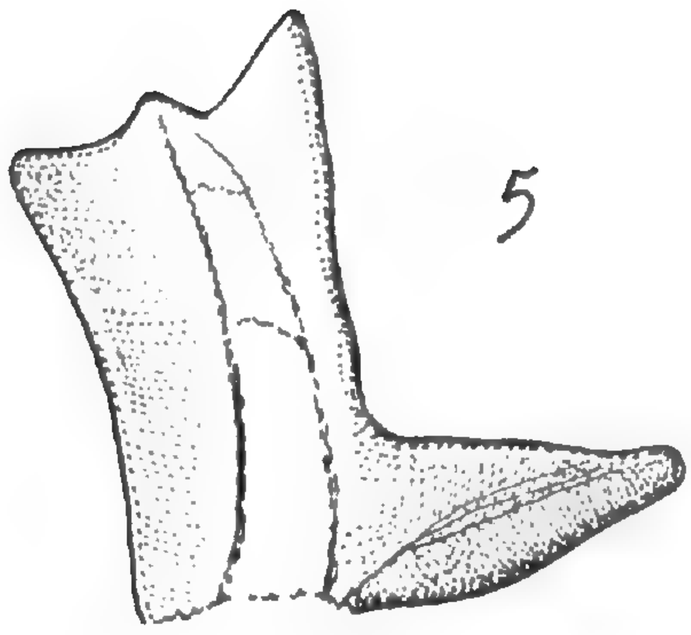
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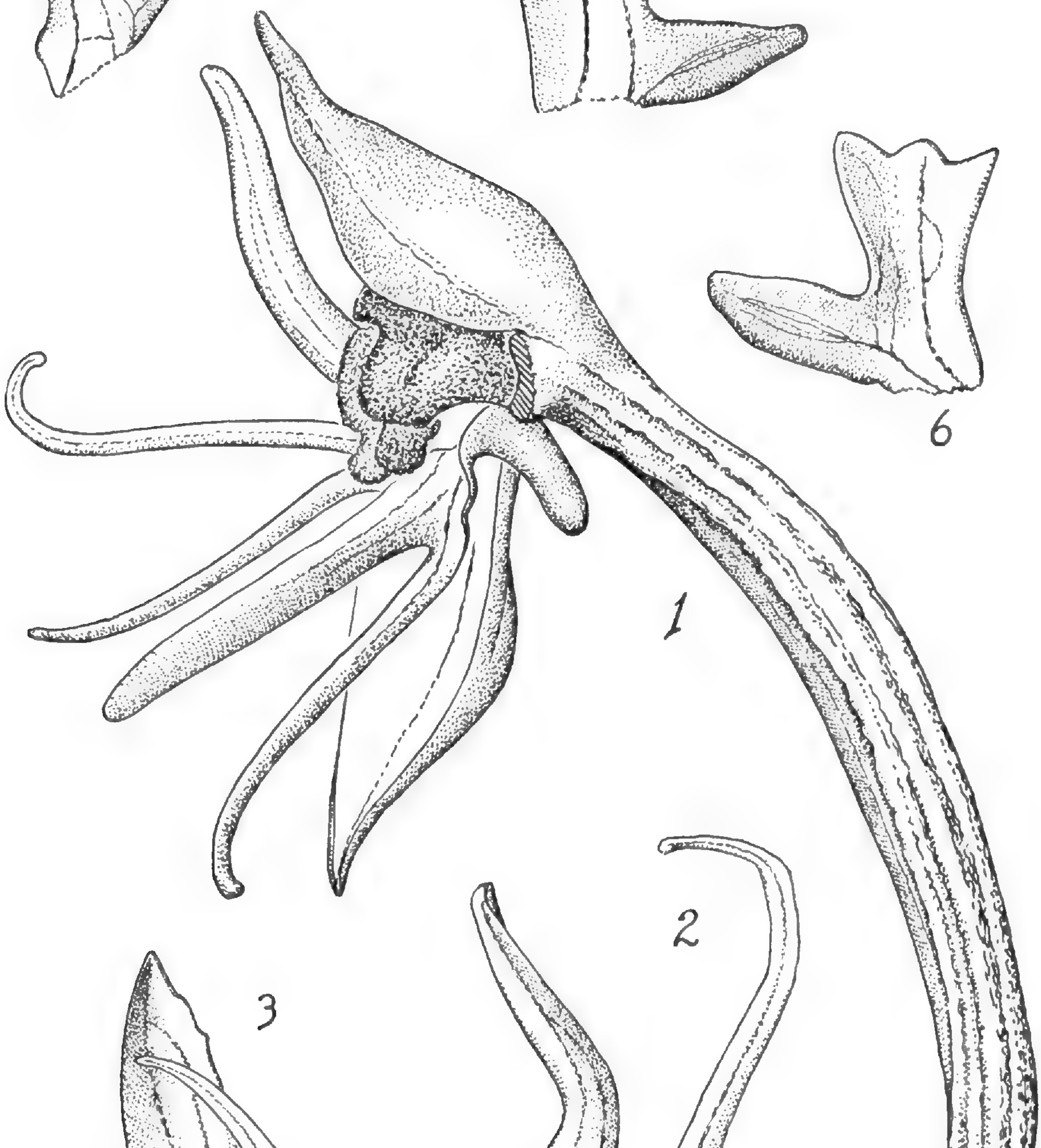
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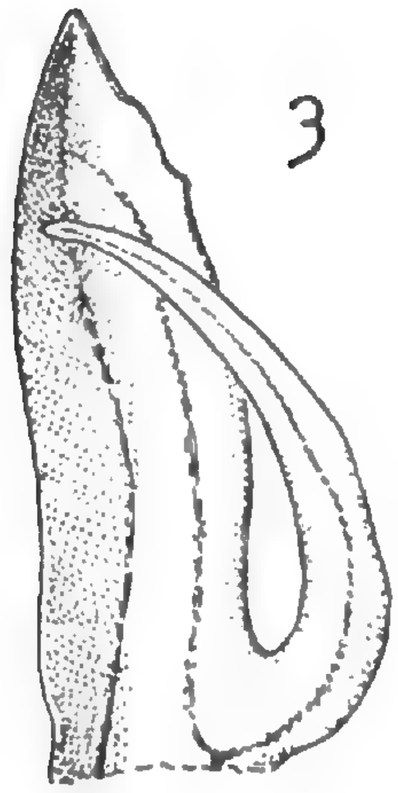
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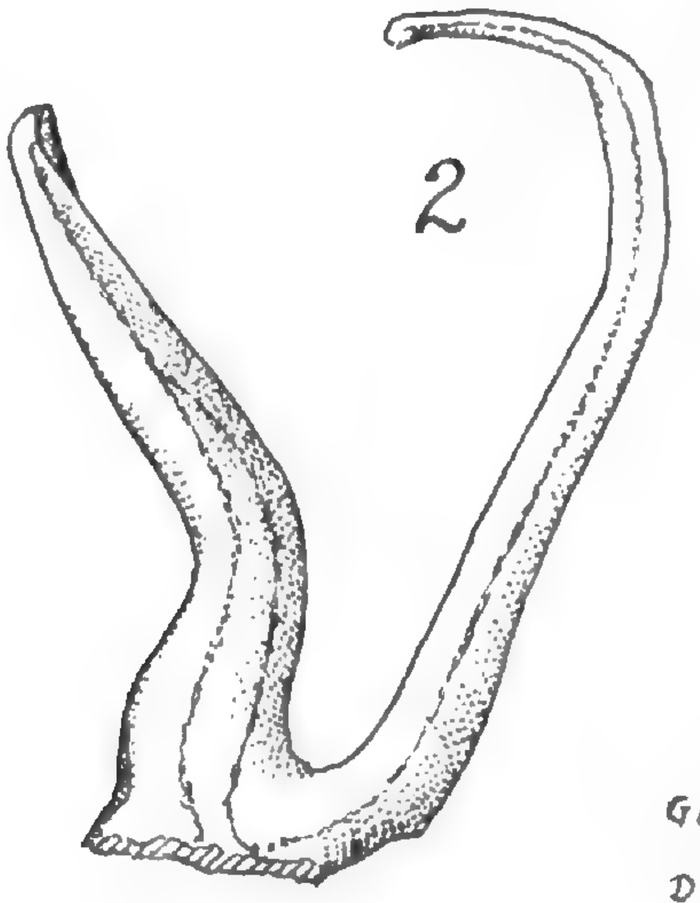
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late, about 7.5 mm. long and 4 mm. wide, 3-nerved, dorsally carinate toward the base. Lateral sepals obliquely lanceolate, spreading but not reflexed, 8.2–9 mm. long, about 3.2–4 mm. wide, strongly concave, 3-nerved. Petals bipartite; posterior lobe falcate, lanceolate-linear, 5.9 6.3 mm. long, about 1.65 mm. wide near the slightly dilated base, obliquely obtuse, 2-nerved; anterior lobe linear, longer than the posterior lobe and subparallel to it, strongly incurved toward the apex, about 8.5–9.5 mm. long from the sinus of the lobes to the apex when expanded, 1-nerved. Lip tripartite; lobes parallel; lateral lobes narrowly linear, about 8.2 mm. long, 1-nerved; middle lobe stouter but somewhat shorter, linear, 7 mm. long, obliquely obtuse, fleshy, 3-nerved. Spur very small, cylindric, rounded at the apex, 2.2 mm. long, about 1 mm. wide across the slightly dilated base. Stigmatic processes very short. Ovary slender, 6-sulcate.

Habenaria parvicalcarata is remarkable for its abbreviated spur, and appears to lack close allies. It was described from a single dried plant.

Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc, at 3800-3900 meters altitude, open grassy paramo, May 3, 1925, *Francis W. Pennell 13888*. (Type in Herb. Ames No. 38279).

Habenaria pumiloides *C. Schweinfurth sp. nov.*

Herba terrestris, humilis. Radices tuberosae. Caulis foliis paucis approximatis patentibus, basi vaginis solum ornatus. Racemus brevis, densus vel subdensus, usque ad tredecimflorus. Sepalum dorsale late ovatum, cucullatum. Sepala lateralia oblique ovato-lanceolata, reflexa. Petala bipartita; lobus posterior major, lanceolato-oblongus; lobus anterior linearis, incurvatus. Labellum tripartitum, lobis parallelis vel lateralibus divergentibus; lobi laterales filiformes; lobus intermedius major, linearis.

Plant low, up to about 19 cm. high (excluding rooting portion), terminating in a stout tuberoid, erect. Roots

tuberous. Stem up to the raceme 7–10 cm. high, entirely or mostly invested by the leaves, at base provided only with sheaths. Leaves four or five, distichous, mostly imbricating, apparently convolute or conduplicate, ovate, ovate-lanceolate or lanceolate-elliptic, up to 4.5 cm. long and about 1.8 cm. wide (the upper and lower blades often smaller), acute or acuminate, erect-spreading. Raceme up to 10.5 cm. long and about 3 cm. in diameter, densely flowered (at least above). Floral bracts lanceolate, long-acuminate, up to 3.2 cm. long. Flowers yellowish green. Sepals minutely crenulate near the apical margins. Dorsal sepal broadly ovate, cucullate, concave, 7.5–8 mm. long, about 5.8 mm. wide, obtuse or acute, 3- to 5-nerved, prominently carinate near the base on the outer surface. Lateral sepals obliquely ovate-lanceolate, 9 mm. long, about 3.7 mm. wide, reflexed, acute or obtuse, subapically mucronate on the back, 3- to 4-nerved. Petals bipartite; posterior lobe much the larger, lanceolate-oblong, about 7 mm. long and 2 mm. wide, obliquely obtuse or acute, 2-nerved; anterior lobe shorter, linear, incurved and overlapping the posterior lobe, about 5.4 mm. long, obtuse, 1-nerved. Lip tripartite near the base, parallel to the reflexed lateral sepals, 9–9.5 mm. long; lateral lobes shorter than the mid-lobe, filiform, 6.4–7 mm. long, parallel to the mid-lobe or diverging, obtuse, slightly incurved at the apex, 1-nerved; mid-lobe linear-ligulate, about 7.5 mm. long and up to 1.75 mm. wide, obtuse, longitudinally convex, 3-nerved. Spur longer than the lip, clavate, about 1.4 cm. long, obtuse, more or less curved near the apex. Anther canals and stigmatic processes short, thick.

Habenaria pumiloides is allied to *H. pumila* Poepp. & Endl., but differs in having shorter broader leaves and much larger flowers. It varies from *H. Ernstii* Schltr. in having a dense raceme of much larger flowers, in having a longer anterior lobe of the petals, in having a dissim-

ilar lip and in having an apically much thickened spur.

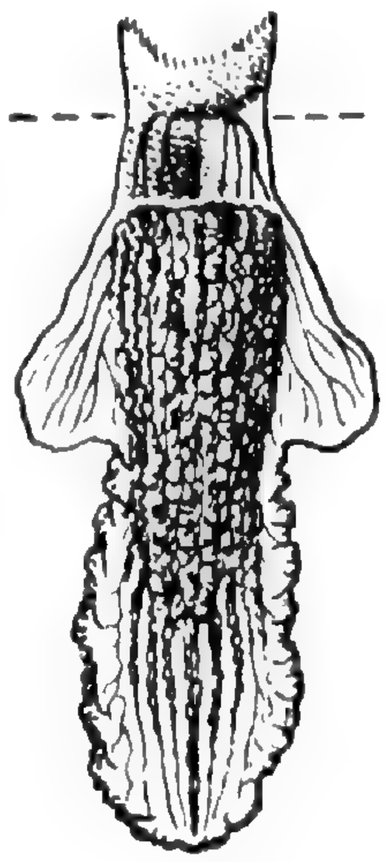
APURIMAC: Prov. Abancay, upper Río Marino, at 3000 meters altitude, in humus, in grassy area between shrubs, flowers pale yellowish green throughout, February 15, 1939, *H.E.Stork, O.B.Horton & C. Vargas 10645*.—CUZCO: Ollantaytambo, at about 3000 meters altitude, May 13, 1915, *O.F.Cook & G.B.Gilbert 709*. (TYPE in U.S. Nat. Herb. No. 603897).

Chloraea densipapillosa *C.Schweinfurth sp. nov.*

Herba robusta, terrestris. Caulis crassus, teres, foliosus, foliorum vaginis maxima pro parte celatus. Folia ovata, elliptico-ovata vel lanceolato-elliptica, amplexicaulia, acuta, in vaginas foliaceas supra decrescentia. Inflorescentia brevis ut videtur, dense vel laxe pluriflora. Flores pro genere mediocres. Perianthii segmenta reticulata. Sepalum dorsale ovato-lanceolatum, acutum. Sepala lateralia similia, obliqua, acuminata. Petala ovalia, apice late obtusa vel rotundata. Labellum unguiculatum; lamina oblongo-ovata, pandurata, leviter trilobata, lineis papillosis congestis maxima pro parte obtecta; lobi laterales parvi, semiobovati; lobus medius ovatus vel oblongo-ovatus. Columna utrinque alata.

Plant robust, terrestrial, up to about 54 cm. tall. Stem stout, terete, leafy, entirely or mostly concealed by the leaf-sheaths, about 1 cm. in diameter at the base. Leaves numerous, ovate, elliptic-ovate or lanceolate-elliptic, amplexicaul and sessile, extended at base into a closely clasping sheath; lamina up to about 9.4 cm. long and 4.7 cm. wide (often much smaller toward the base), gradually diminishing above into strict foliaceous sheaths, acute or acuminate, membranaceous in the dried specimens, many-nerved. Inflorescence loose to rather dense, up to about 19-flowered, up to about 21.5 cm. long and 10 cm. in diameter in the dried specimens. Floral bracts ovate-lanceolate, acuminate, nervose, surpassing the pedicellate ovary at the base of the raceme. Flowers medium-

sized for the genus, membranaceous in the dried specimens; perianth segments closely reticulate-nerved. Dorsal sepal ovate-lanceolate, acute, up to 2.63 cm. long and 1.2 cm. wide below the middle, with seven main nerves. Lateral sepals similar, asymmetric, acuminate, up to about 2.8 cm. long and 1.3 cm. wide, with six to eight prominent nerves near the base. Petals oval, slightly asymmetric, broadly obtuse or rounded at the apex, up to about 1.9 cm. long and 1.2 cm. wide, with seven prominent nerves. Lip clawed, lightly 3-lobed just below the middle, cuneate at the base; claw short and broad, about 5.6 mm. long, fleshy below, membranaceous above, slightly dilated and gradually passing into the lamina; lamina ovate-oblong in outline, pandurate, up to about 2.1 cm. long and 1.1 cm. wide across the lateral lobes; lateral lobes small, semiobovate, with rounded apex and irregular obscurely thickened margins; mid-lobe ovate or oblong-ovate, up to about 1.2 cm. long and 1 cm. wide near the middle, irregularly lobulate-apiculate, with irregularly crenulate and papillose-thickened margins; the basal and central part of the disc on the upper surface entirely covered by a dense mass of about ten lines of crowded fleshy pustulose ridges, the outer one or two on each side diverging onto the lateral lobes where they are usually supplemented by several irregular masses of papillae; toward the apical portion of the lip the pustulose ridges become more separated and diminish into indistinct papillae near the apex; the under surface of the lip near the apex is slightly pustulose. Column more or less broadly winged on each side, arcuate, dilated above, up to about 1.3 cm. long with the anterior basal surface deeply concave.



Lip, twice natural size.

Chloraea densipapillosa appears to lack any close allies. It differs from *C. robusta* Rolfe in having broader leaves, and in having ovate-lanceolate unthickened sepals. This is the third species of its genus to be recorded from Peru.

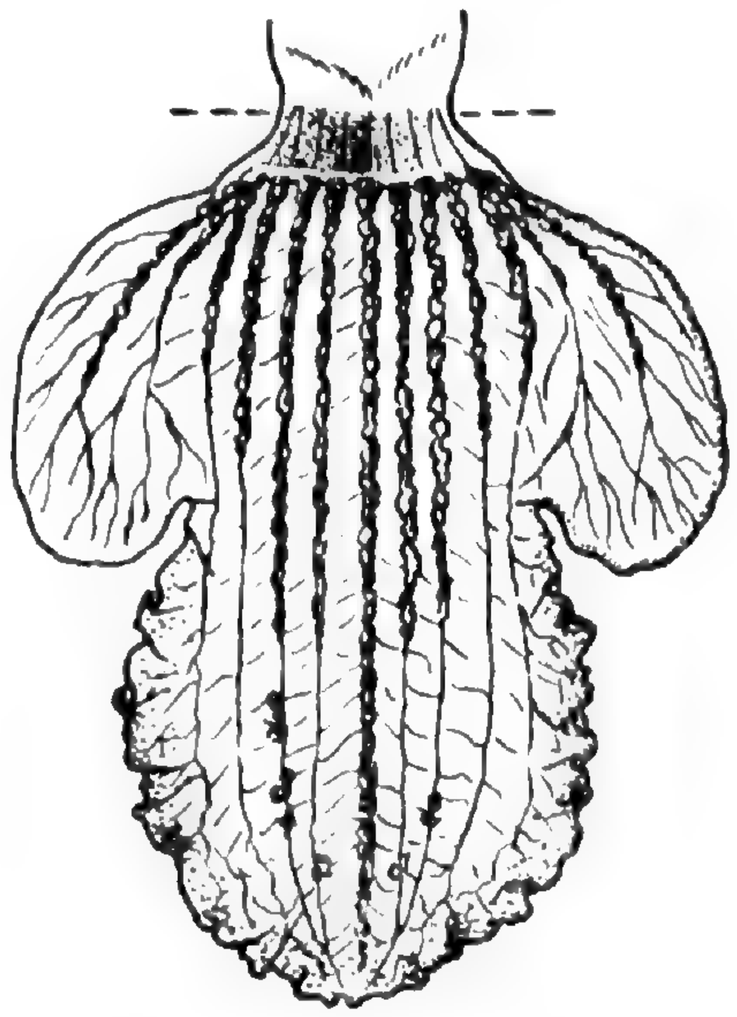
Apurimac: Prov. Abancay, "laderas cerca de Tsancapata", at 2700 meters altitude, January 1938, *C. Vargas 754*. (Type in Gray Herb. No. 7442; fragment of type in Herb. Ames No. 55411). Prov. Abancay, upper Marino Valley, at 3000 meters altitude, gravelly soil in open shrubland, *H. E. Stork, O. B. Horton & C. Vargas 10636*.—Cuzco: Prov. Urubamba, environs of Urubamba, at 2880 meters altitude, on rocky slopes, *Vargas 11086*.

Chloraea multilineolata *C. Schweinfurth sp. nov.*

Herba terrestris. Caulis robustus, leviter flexuosus, foliosus. Folia ovata, patentia, in vaginas supra decrescentia. Racemus laxe pluriflorus. Flores magni, membranacei. Sepalum dorsale late lanceolatum, acutum. Sepala lateralia anguste oblongo-lanceolata, acuta. Petala oblongo-ovalia, apice rotundato minute retusa. Labellum in circuitu late ovatum, trilobatum; lobi laterales semi-obcordati; lobus medius suborbiculari-ovatus, apice rotundatus; lamina lineis verrucosis pluribus ornata. Columna gracilis.

Plant terrestrial, stout, lightly flexuous, leafy, exceeding 3 dm. in height (lowermost portion lacking and upper part of raceme broken and imperfect). Leaves ovate with sheathing bases, gradually diminishing into sheaths above; lamina membranaceous, up to about 6.5 cm. long and 4 cm. wide, subacute to short-acuminate, spreading. Raceme about 11-flowered, loose. Floral bracts lanceolate, acuminate, membranaceous with prominent veins, up to 3.7 cm. long. Flowers large with spreading membranaceous segments which are lightly net-veined, pale yellow. Dorsal sepal broadly lanceolate, about 2.8 cm. long and 1.25 cm. wide, acute with three longitudinal nerves. Lateral sepals narrowly oblong-lanceolate, asym-

metric, about 3 cm. long and 9.5 mm. wide, acute, 4-nerved. Petals oblong-oval, about 2.4 cm. long and 1.22 cm. wide, rounded above with a retuse tip, 7-nerved, adnate to the base of the column. Lip broadly ovate in outline, deeply 3-lobed, very shortly and broadly clawed, about 2.3 cm. long and 1.94 cm. wide across the lateral lobes when expanded; lamina subcordate at base, provided with about thirteen approximate verrucose ridges of which the lateral ones on each side are sometimes broken into irregular series of warts; lateral lobes semi-obcordate with rounded apex, about 1.15 cm. long; mid-lobe suborbicular-ovate, rounded at the apex, with undulate irregularly papillose margins, about 1.4 cm. long and 1.3 cm. wide. Column slender, about 1.9 cm. long, abruptly dilated at the apex, narrowly winged on each side with the wing lightly dilated below forming a concave base.



Lip, twice natural size.

This species appears to be distinct by reason of the sharply 3-lobed lip with the distinct verrucose lines on the disc.

APURIMAC: Prov. Grau, Trapiche Canyon, Oropeza Valley, at 2500-2800 meters altitude, terrestrial, in stony clay soil, January 22, 1939, *C. Vargas 9793* (TYPE in Herb. Field Museum No. 1051164).

Gomphichis Macbridei *C. Schweinfurth sp. nov.*

Herba elata, terrestris. Folia basalia, rosulata, oblongo-linearia, acuta vel breviter acuminata. Caulis robustus, supra tomentosus. Spica elongata, laxe multiflora. Perianthium inversum. Sepalum dorsale elliptico-lanceola-

tum, valde concavum. Sepala lateralia similia, paulo majora. Petala anguste rhombico-lanceolata, dense fimbriata. Labellum leviter trilobatum, per medium incrassatum, in positu naturali tubulari-involutum, apice late rotundatum. Columna generis.

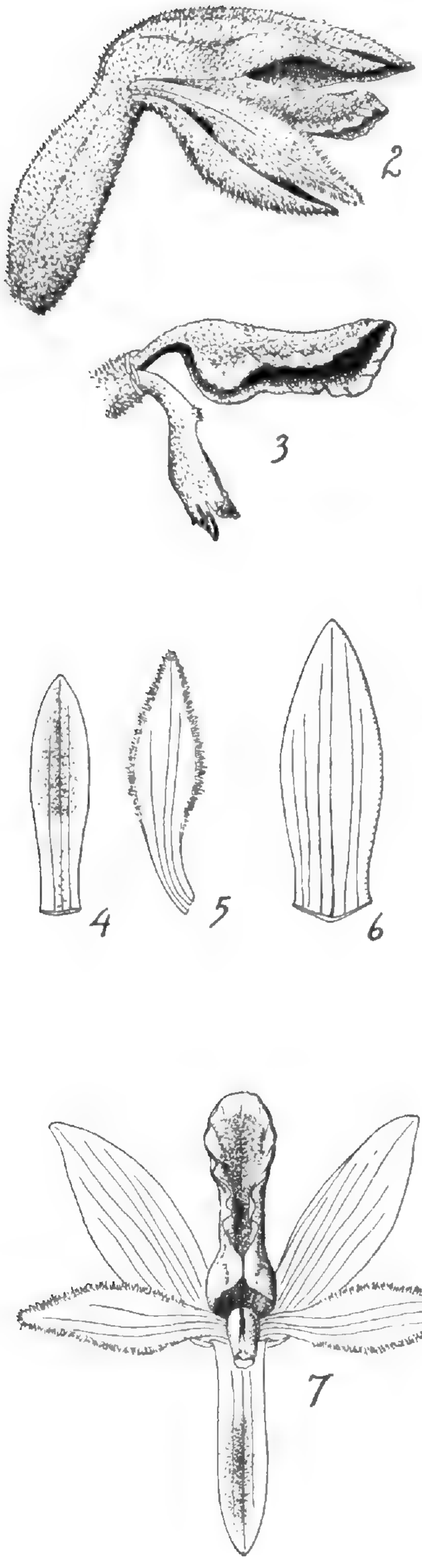
Plant tall, stout, terrestrial, about 8.8 dm. high. Roots a fascicle of stout tuberoids. Stem stout, mostly concealed by strict linear-lanceolate sheaths with long tubular sheathing bases, glabrous below, densely tomentose above. Leaves basal, rosulate, 5 to 6, suberect, oblong-linear, acute or shortly acuminate, sheathing and imbricated at the base, up to about 26 cm. long and 1.8 cm. wide, membranaceous in the dried specimens with the mid-nerve prominently carinate beneath. Spike lax, cylindric, elongate, 18–19 cm. long (with the upper portion immature in our specimens), many-flowered; rachis densely tomentose. Floral bracts triangular-lanceolate, long-acuminate, 5-nerved, densely tomentose without, about equaling the mature flowers. Perianth inverted, as in the genus, ringent. Sepals and petals densely pubescent on the outer surface. Dorsal sepal oblong-oblanceolate or elliptic-lanceolate, deeply concave, about 11 mm. long and 4.4 mm. wide, subacute or obtuse, 3-nerved, forming a galea with the petals. Lateral sepals elliptic-lanceolate, deeply concave at base, about 13.5–14 mm. long and 5 mm. wide, acute, 4- or 5-nerved, slightly oblique. Petals narrowly rhombic-lanceolate, obtuse, densely fimbriate except at the apex and near the base, about 12 mm. long and 4 mm. wide, 3-nerved, arcuate-oblique at the base. Lip lightly 3-lobed, in natural position tubular-involute and arcuate-recurved with the lateral lobes embracing the column, about 11.5 mm. long including the short claw, fleshy-thickened through the center, ovate-oblong in outline, broadly rounded or subtruncate at the concave apex; lateral lobes shallowly semiorbicular; mid-lobe

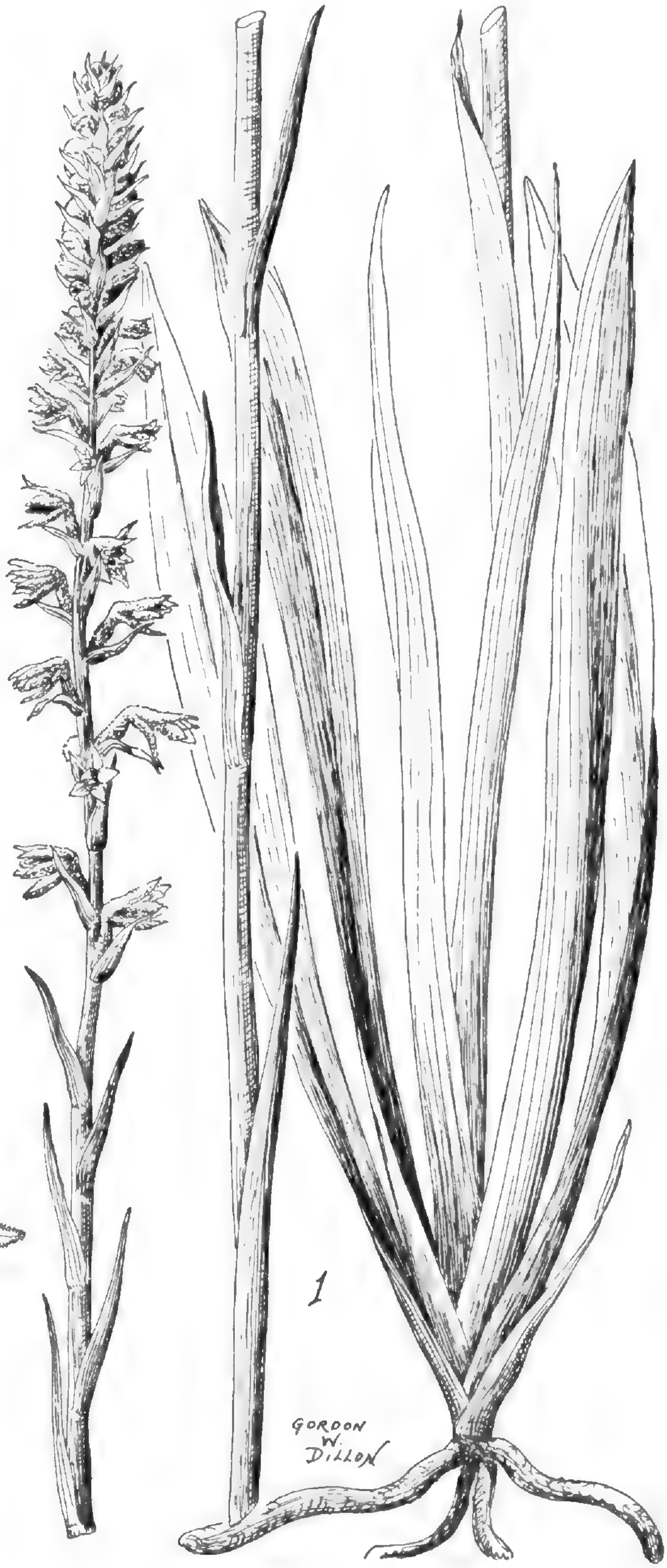
EXPLANATION OF THE ILLUSTRATION

GOMPHICHIS MACBRIDEI *C.Schweinf.* 1, plant, one half natural size. 2, flower with ovary, from side, natural position, twice natural size. 3, lip and column, from side, twice natural size. 4, dorsal sepal, twice natural size. 5, petal, twice natural size. 6, lateral sepal, twice natural size. 7, flower, expanded, twice natural size.

Drawn April 1940 by G.W.DILLON

GOMPHICHIS *Macbridei* *C. Schweinf.*





spatulate-oblong; lamina laterally undulate (especially near the middle), with a pair of small fleshy papillose calli near the basal margins, and a broad central lightly sulcate fleshy thickening. Column abruptly retrorse-arcuate or geniculate below the middle, about 7.5 mm. long, very densely tomentose in front around the stigmatic cavity; clinandrium membranaceous, lacerate; anther dorsal, erect.

Gomphichis Macbridei appears to lack close allies; the petals and lip are very characteristic.

HUANUCO: Yanano, at about 6000 feet altitude, on grassy slopes, "Two upper parts w. lower green. Central green and brown lined. Lip white-tipt", *J. Francis Macbride 3839*. (TYPE in Herb. Field Museum No. 534902; DUPLICATE TYPE in Herb. Ames No. 39051).

NOMENCLATORIAL NOTES XII

BY

CHARLES SCHWEINFURTH

Pleurothallis setosa *C. Schweinfurth nom. nov.*

Masdevallia fimbriata A. & S. in Sched. Orch. 10 (1930) 18.

A careful examination of the floral parts of this species convinces me that it should be referred to the genus Pleurothallis; but the combination *P. fimbriata* has previously been used by Lindley for a Brazilian species, thus necessitating a new specific epithet.

This species appears to be allied to *Pleurothallis samacensis* Ames, but has much narrower leaves, setose peduncles and larger flowers with dissimilar lateral sepals and lip. It was described from Costa Rica.

Recently this concept has been recorded from British Honduras. In this collection the peduncle appears to be even more conspicuously setose-pubescent than in the type.

BRITISH HONDURAS: Stann Creek District, Middlesex, on tree on high ridge, flowers mauve, October 20, 1939, *Percy H. Gentle 3044.*

BOTANICAL MUSEUM LEAFLETS

HARVARD UNIVERSITY

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A SYNOPSIS OF THE GENUS UROSKINNERA

BY

RICHARD EVANS SCHULTES

FOR a number of years, the genus *Uroskinnera*, a member of the Scrophulariaceae, has commanded the attention and interest of horticulturists because of its beauty and its rarity.

Lindley described *Uroskinnera* in 1857, basing the genus on the Guatemalan *U. spectabilis*. For twenty-two years thereafter the genus was considered to be monotypic.

In 1879, however, Hemsley described a second species from southern Mexico, naming it *Uroskinnera hirtiflora*. Since that time *Uroskinnera* has been represented only by these two species, neither of which had been collected again until very recently. Since herbarium material was scanty, and there was but little information concerning the habit of the plants, the genus remained imperfectly understood.

Several collections of *Uroskinnera* were made by the author in northeastern Oaxaca in 1939. These are referable to *U. hirtiflora* and apparently represent the first collections of this plant that have been made in a century, and appear to constitute the only material of the species in American herbaria.

In 1939, Mr. Eizi Matuda collected an interesting

Uroskinnera in Tabasco which represents a hitherto undescribed species. Its diagnosis is presented in this paper by Dr. C. L. Lundell.

Recently, an unidentified specimen of *Uroskinnera*, collected in Guatemala in 1885 by Sereno Watson, was brought to my attention by Dr. Lyman B. Smith of the Gray Herbarium. This proves to be a second new species, the description of which is given below. In 1940, Dr. Julian Steyermark collected in Guatemala what proves to be this same species, together with additional material of *Uroskinnera spectabilis*.

In view of the fact that the last few years have seen not only the rediscovery of the two older species, but also the discovery of two new species, the time seems appropriate for a revision of the genus.

Uroskinnera *Lindley* in Gard. Chron. (1857) 36—Hooker in Bot. Mag. 83 (1857) t. 5009—Bentham & Hooker filius Gen. Pl. 2 (1876) 942—Baillon Hist. Pl. 9 (1888) 437—Wettstein in Engler Pflanzenfam. IV. 3b, (1891) 63, 67—Baillon Dict. Bot. 4 (1892) 240—Hallier filius in Bull. Herb. Boiss. 3 (1903) 194, 206—Lemée Dict. Genr. Pl. Phan. 6 (1935) 804.

ORIGINAL DESCRIPTION: "Aestivatio imbricato-bilabiata. Calyx cyathiformis 4-dentatus. Corolla et stamina Penstemonis. Stylus planus stigmate furcato. Capsula calyce arctissime vestita, loculucide dehiscens. Semina scrobiculata, membrana cincta. Herba facie Gesnerae, floribus spicatis violaceis."

A more extended generic description of *Uroskinnera* is given in Bentham & Hooker filius Gen. Pl. 2 (1876) 942. The following diagnosis is a translation of that of Bentham and Hooker with the addition of minor changes necessitated by the discovery of the new species and the

acquisition of more accurate knowledge in regard to the habit of the older ones.

Calyx tubular-campanulate, with four or five short, setaceous or puberulent teeth. Corolla tube elongate, enlarged above; limb spreading, 5-parted, with broad, flat, slightly unequal lobes, the two outer posterior. Stamens four, didynamous, included, with filiform filaments; locules of the anthers divergent, confluent apically. Staminodium posterior, linear-clavate, shorter or longer than the stamens. Style elongate, apically stigmatose, shallowly or deeply bifid; ovules numerous in the locules. Capsules globose, almost included by the calyx, loculicidally dehiscent; valves entire, septate at the middle with connate placentae. Seeds numerous, small, scrobiculate, enclosed by a thin membrane, or naked. Shrubs, softly villous or puberulent-hirtellous. Leaves opposite, petiolate, velutinous or hirtellous, crenate or dentate. Spike or raceme terminal, dense or rather lax, secund. Flowers rather large, rose-purple or yellow, declinate, subsessile or short-pedicellate, with two setaceous or puberulent bracts at the base.

TYPE SPECIES: *Uroskinnera spectabilis* Lindley.

Uroskinnera consists of four species endemic to southern Mexico and adjacent Guatemala. One species occurs in Oaxaca, one in Tabasco, and two in Guatemala.

KEY TO THE SPECIES OF UROSKINNERA

A. Flowers yellow; leaves membranaceous, pubescent and hirtellous beneath; calyx and floral bracts puberulent; staminodium longer than fertile stamens
flavida

AA. Flowers rose-purple; leaves chartaceous, sericeous (usually densely so) beneath; calyx and floral bracts villous-hirsute; staminodium shorter than fertile stamens

B. Calyx 5-dentate, its teeth 5–6 mm. long; inflorescence long, lax; floral bracts 3.5–5 mm. long; corolla externally hirsute; staminodium eglandular, 3 mm. long

hirtiflora

BB. Calyx 4-dentate, its teeth 1.5–2 mm. long; inflorescence short, compact; floral bracts not exceeding 3 mm. in length; corolla externally glabrous; staminodium glandular-lepidote, 6–12 mm. long

C. Leaves elliptic-ovate, 6–16 cm. long, 4–10 cm. wide; corolla 3.5–4 cm. long; fertile stamens 12 and 17 mm. long; staminodium 12 mm. long

spectabilis

CC. Leaves elliptic-lanceolate, 4–8 cm. long, 2.5–3.5 cm. wide; corolla 2.5–3 cm. long; fertile stamens 9-14 and 15 mm. long; staminodium 6–8 mm. long

Watsonii

Uroskinnera flavida *Lundell sp. nov.*

Frutex, ramulis puberulis. Petioli usque ad 6.8 cm. longi. Lamina membranacea, crenato-dentata, ovata vel ovato-elliptica, apice obtusa vel acutiuscula, basi subcordata vel rotundata, utrinque puberula et parce hirtella. Inflorescentiae subspicatae, usque ad 13.5 cm. longae. Pedicelli circa 1.3 mm. longi. Calyx 2.8–4 mm. longus, quattuor-dentatus. Corolla flavida, usque ad 3.8 cm. longa, parce glanduloso-pilosa, quinquelobata. Stamina quattuor.

A shrub; branchlets slender, densely short-hirtellous or puberulent. Petioles slender, canaliculate, puberulent and sparsely hirtellous, striate, up to 6.8 cm. long. Leaf-blades membranaceous, conspicuously crenate-dentate, the teeth minutely apiculate, ovate or ovate-elliptic, 5–13.5 cm. long, 3–9.5 cm. wide, apex obtuse or acutish, base subcordate or rounded, both surfaces puberulent and sparsely hirtellous, the hairs denser along the midrib and veins, dark green above, paler beneath, costa and veins slightly raised above, conspicuous beneath, primary veins five or seven on each side. Inflorescence terminal, subspicate, long, slender, densely puberulent,

up to 13.5 cm. long. Pedicels about 1.3 mm. long. Calyx 2.8–4 mm. long, accrescent, puberulent and sparsely glandular-pilose outside, glabrous within, shallowly 4-dentate, the teeth apiculate, 1 mm. or less in length. Corolla yellowish, up to 3.8 cm. long, ampliate above, 5-lobed, sparsely glandular-pilose outside, sparsely glandular within with sessile or short-stipitate glands. Stamens four, didymous, included, the two shorter ones about 1.3 cm. long, the two longer ones about 1.7 cm. long; filaments glabrous; staminodium linear-clavate, glandular-lepidote. Ovary glabrous, 2-celled, with axillary placentae and numerous ovules. Style filiform, about 2.6 cm. long, glabrous, shallowly bifid, the stigmatic lobes unequal, the shortest one erect.

SPECIMENS EXAMINED:

MEXICO: Tabasco, on limestone rocks at Retiro, near Tenosique, June 19-25, 1939, *Eizi Matuda 3425* (TYPE in Herb. Univ. Michigan; ISOTYPE in Econ. Herb. Oakes Ames No. 7113).

Uroskinnera flavida is easily distinguished from the other known species of the genus by its yellow rather than rose-purple flowers, by its membranaceous rather than chartaceous leaves, and by its puberulent, not sericeous, indument. Florally, *U. flavida* differs strikingly from the other species in having a staminodium which is longer than the fertile stamens.

The long and lax inflorescence of *Uroskinnera flavida* resembles somewhat that of *U. hirtiflora*, but it is entirely unlike the short, crowded inflorescences of the two Guatemalan species. In *U. flavida*, the calyx and floral bracts are puberulent, while in the other species these structures are densely hirsute. The glandular-lepidote corolla of *U. flavida*, which resembles the hirsute corolla of *U. hirtiflora*, is unlike the glabrous corollas of *U. spectabilis* and *U. Watsonii*.

While *Uroskinnera flavida* is obviously closely related

to *U. hirtiflora*, it possesses a number of characters which indicate a relationship with *U. spectabilis* and *U. Watsonii* as well. *U. flavida* resembles both the Guatemalan species in having a 4-dentate calyx. A corresponding resemblance is to be found in the glandular-lepidote staminodium of *U. flavida*, *U. spectabilis* and *U. Watsonii*, as opposed to the glabrous staminodium of *U. hirtiflora*.

An evaluation of the important characters of *Uroskinnera flavida* indicates that this species, which is geographically intermediate between the Oaxacan and the Guatemalan species, is also taxonomically intermediate between *U. hirtiflora* on the one hand, and *U. spectabilis* and *U. Watsonii* on the other. A closer affinity exists between *U. flavida* and the Oaxacan *U. hirtiflora*, than between *U. flavida* and the Guatemalan species, *U. spectabilis* and *U. Watsonii*.

Uroskinnera hirtiflora *Hemsley* Diagn. Pl. Nov. . . . Mex. et Centr.- Am., pt. 2 (1879) 34—Hemsley in Godman & Salvin Biol. Centr.-Am., Bot. 2 (1881-82) 447—ibid 5(1882) t. 64—Conzatti & Smith Fl. Sin. Mex., ed. 2 (1910) 150, 161.

Zapotec name: *yet-le*

On the basis of the four collections cited below, and the field notes which accompany them, the following amplified description of *Uroskinnera hirtiflora* is presented.

A stout shrub 6–8 feet in height. Leaves long-petiolate, oblong-elliptic or ovate-elliptic, serrate, rather obtuse at the apex, rounded or slightly cordate at the base, thick-chartaceous, velvety villous-sericeous above and below, 7–12 cm. long, 4.5–7.5 cm. wide (the members of a pair often unequal), yellow-green above, grey-green below. Petioles densely villous-hirsute, 1.5–5 (usually 4–5) cm. long. Inflorescence a long, dense, many-flowered raceme. Pedicels up to 5 mm. long, but usually much shorter,

very densely villous-hirsute. Bracts linear, very hairy, 3–5 mm. long. Flower 2.5–3 cm. long, 1–1.3 cm. wide at the tip when expanded. Calyx 5-dentate, cup-shaped, the cup 5–6 mm. long, densely white-hirsute, the hairs up to 1 mm. long, the teeth linear, 5–6 mm. long. Corolla purple, narrowly infundibuliform, 5-lobate with rounded, subequal lobes, 2-lipped, densely hirsute externally and internally at the insertion of the stamens. Fertile stamens four, glabrous, the shorter two about 1.1–1.5 cm. long, the longer two 1.7–1.9 cm. long; staminodium linear-clavate, about 3 mm. long, not glandular. Style elongate, glabrous, 2.2 cm. long; stigma shallowly bifid. Ovary subglobose, about 2–3 mm. in diameter. Seeds very numerous, small, scrobiculate. Flowering season: June and July.

SPECIMENS EXAMINED:

MEXICO: Oaxaca, District of Choapam, Santa María Yahuivé, long. 95°50′, lat. 17°19′, alt. 1200 m., May 15, 1939, *Schultes & Reko 918*; District of Choapam, between San Juan Teotalcingo and Santiago Choapam, long. 95°57′, lat. 17°18′, alt. 1300 m., June 1, 1939, *Schultes 566*; ibid, alt. 1400 m., June 1, 1939, *Schultes 566a*; District of Choapam, between Santiago Choapam and San Juan Comaltepec, long. 95°58′, lat. 17°24′, alt. 1000 m., June 3, 1939, *Schultes 571*.

This striking endemic is very local in occurrence. It has been collected only in the mountains of the Districts of Villa Alta and Choapam in the northeastern part of the state of Oaxaca. Galeotti (*Galeotti 1040*) collected it a century ago, "in rupibus montium orientalium Oaxacae, alt. 2,500 ped". It was found shortly thereafter by Jürgensen (*Jürgensen 642, 842, 936*) on San Pedro Nolasco, a mountain near the boundary of the Districts of Villa Alta and Ixtlán. These collections were cited by Hemsley in the original description, but they are at present unavailable for examination. However, Hemsley's excellent plate of *Uroskinnera hirtiflora* (in Godman &

Salvin Biol. Centr.-Am. 5 (1882) t.64) leaves no doubt that the collections which I have been able to examine are referable to this species.

Inasmuch as no description of the habit of *Uroskinnera hirtiflora* in the wild state has been published, the following notes may be of interest. Unlike the two Guatemalan species, *U. hirtiflora* is a silvicolous shrub, inhabiting the deepest, darkest parts of the rain-forests on steep mountains. The plant, standing six to eight feet high, is completely sheltered by the tall trees so that little direct sunlight reaches it. Nevertheless, its leaves are very heavily villous-sericeous above and below. It exhibits a predilection for well-drained, calcareous terrain which is not overgrown with the usual tangle of vines and herbaceous elements. It is usually not present in abundance.

The flowers of *Uroskinnera hirtiflora* are rose-purple in all their parts. There is no white on the corolla as reported for *U. spectabilis* and *U. Watsonii.*

In the original description of *Uroskinnera hirtiflora*, Hemsley did not comment upon the habit of the plant, but in an extended description (Biol. Centr.-Am., l.c.), he stated that the genus *Uroskinnera* consisted of "two herbaceous species". This is erroneous. The plants from which my four collections of *U. hirtiflora* were taken were large, rather woody shrubs ranging in height from six to eight feet. Furthermore, Hemsley's figure of *U. hirtiflora* indicates by the thickness of the terminal branches and the stoutness of the petioles and size of the leaves that the specimens which he studied were portions of a shrub.

Probably because of Hemsley's statement that the plant was herbaceous, Standley did not include *Uroskinnera hirtiflora* in his *Trees and shrubs of Mexico* (Contrib. U.S. Nat. Herb. 23 (1920-1926)). Furthermore, in their *Flora sinóptica Mexicana* (ed. 2 (1910) 161),

Conzatti and Smith made the statement that *Uroskinnera* consists of two stout herbs ("hierbas gruessas"). This error is probably also due to the earlier statement by Hemsley, for Professor Conzatti has informed me that he has never had an opportunity of seeing *Uroskinnera hirtiflora* in its natural state.

Specimens of *Uroskinnera hirtiflora*, collected in 1939, have been distributed among several institutions in North America and apparently represent the only material of this species in American herbaria. Specimens are to be found in the Econ. Herb. Oakes Ames; Herb. Gray; U.S. Nat. Herb.; Herb. Field Mus. Nat. Hist.; Herb. Phil. Acad. Nat. Sci.; and Herb. Inst. Biología (Mexico). A sample of the wood of *Uroskinnera hirtiflora* has been deposited in the Wood Collection of the Biological Laboratories of Harvard University.

Uroskinnera hirtiflora appears to be related to the Tabascan *U. flavida* more closely than to the Guatemalan *U. spectabilis* and *U. Watsonii*, even though the relationship with the Tabascan species is not close. In habit, *Uroskinnera hirtiflora* is similar to *U. spectabilis*; both are stout shrubs, five to six feet high, with large, elliptic-ovate, chartaceous, sericeous leaves, large rose-purple flowers with hirsute calyces, and staminodia which are shorter than the fertile stamens. However, *Uroskinnera hirtiflora* is more like *U. Watsonii* in the density of the indument of the leaves. *Uroskinnera hirtiflora* differs from the other species of the genus in having a 5-dentate (instead of a 4-dentate) calyx. It has the shortest staminodium of the genus. Its staminodium is one half the size of that of *U. Watsonii*, one fourth that of *U. spectabilis*, and one seventh that of *U. flavida*. A striking and unique characteristic of *U. hirtiflora* is the densely hirsute condition of the interior of the corolla tube at the insertion of the stamens.

Uroskinnera spectabilis *Lindley* in Gard. Chron. (1857) 36—Hooker in Bot. Mag. 83 (1857) t. 5009—Morren Belg. Hort. 7 (1857) 238—Lemaire Ill. Hort. 5 (1858) 3—Galeotti in Journ. Hort. Prat., n.s. 1 (1857) 77, 244—Lemaire in Rev. Hort. (1858) 35—Lemaire in Fl. Serres, ser. 2, 4 (1861) t. 1433—Bois Dict. Hort. 2 (1893-99) 1182—Nieuwenhuis in Ann. Jard. Bot. Buitenzorg 21 (1907) t. 29, f. 75.

Stout shrub up to five feet in height. Leaves long-petiolate, elliptic-ovate, dentate, the teeth not apiculate, subacute, cuneate at the base, chartaceous, hispidulous and dark green above, sericeous and grey-green beneath, 6–16 (mostly 12–16) cm. long, 4–10 (mostly 6–10) cm. wide. Petioles densely hirsute, 1.5–5 (mostly 3–5) cm. long. Inflorescence a short, dense, many-flowered raceme about 6 cm. long. Pedicels 1–2 mm. long, very densely white villous-hirsute. Bracts linear, very hairy, 1–3 mm. long. Flowers up to 4 cm. long, 1.5–2 cm. wide at the tip when expanded. Calyx 4-dentate, cup-shaped; the cup 4.5 mm. long, densely white-hirsute, the hairs about 0.8 mm. long; the teeth linear, 1.8–2 mm. long. Corolla violet-purple, infundibuliform, glabrous externally, 5-lobate, 2-lipped; the lobes triangular, subacute, subequal, sparsely glandular-lepidote within. Fertile stamens four, glabrous; the longer two about 1.7 cm. in length, inserted 15 mm. from the base of the corolla tube; the shorter two about 1.2 cm. long; locules of the anthers divergent; staminodium terete, clavate, glandular-lepidote, 1.2 cm. long, inserted 9 mm. from the base of the corolla tube, not equaling the stamens. Style elongate, flattened, linear-clavate in outline, abruptly rounded at the apex, glabrous, 2.6 cm. long, persisting in fruit; stigma deeply bifid, the two lobes horn-like, strongly divergent. Ovary glabrous, subglobose, measuring about 1.5

and 2 mm. in its diameters. Seeds numerous, small, scrobiculate.

SPECIMENS EXAMINED:

(Cultivated) BRITISH GUIANA: Botanic Gardens, Georgetown, *L. H. Bailey s.n.*, 1922 (Bailey Hort.); ibid, *E. B. Martyn*, May, 1940 (Econ. Herb. Oakes Ames No. 1577; Herb. Field Mus.); ibid, *coll. unknown*, summer, 1940 (Econ. Herb. Oakes Ames. No. 8473; Herb. Gray; Herb. Univ. Michigan).

(Wild) GUATEMALA: dry pine slope, Dept. Izabál, between Milla 49.5 and ridge 6 miles from Izabál, Montaña del Mico, alt. 65–600 m., April 1, 1940, *Julian A. Steyermark 38571* (Herb. Field Mus. Nos. 1035324 and 1035325).

Uroskinnera spectabilis was described from two collections from Guatemala (*Skinner s.n.* and *Wendland s.n.*), the exact localities of which were not given. These collections are preserved in the Herbarium at Kew. According to Hemsley (in Godman & Salvin, Biol. Centr.-Am., Bot. 2 (1881-82) 447), who presumably examined the Skinner and Wendland material when he drew up the description of *Uroskinnera hirtiflora*, *U. spectabilis* is "not uncommon near Quirigua in the valley of the Montagua, Guatemala." This locality is in the east-central part of Guatemala where Steyermark rediscovered and collected the plant in 1940; Steyermark's collection was made in the Departamento de Izabál. Apparently *Uroskinnera spectabilis* is a localized endemic of this part of Guatemala.

According to the field notes which accompany *Steyermark 38571*, *Uroskinnera spectabilis* inhabits "dry, pine slopes" and is a "shrub 5 feet tall." These notes indicate a different habitat than that of *Uroskinnera hirtiflora* which exhibits a predilection for the damp, shady rainforests of Oaxaca. *Uroskinnera Watsonii* grows together with *U. spectabilis* in dry situations; thus, there appears to be a fundamental ecological difference between the

Oaxacan and the Guatemalan species. Concerning the flower of *U. spectabilis*, Steyermark states: "Corolla whitish at base, lavender-orchid in upper half."

Introduced into the horticultural world in 1857, *Uroskinnera spectabilis* immediately attracted wide interest in Europe. The plant was grown in a number of horticultural centres, if we are to judge from the numerous references to it and the illustrations in horticultural publications of the latter half of the 19th Century. It is probable that collections from cultivated material have been preserved in various European herbaria, but the present European hostilities have precluded the possibility of studying them.

Through the kindness of Mr. Charles A. Weatherby and Professor L. H. Bailey, I learned that *Uroskinnera spectabilis* is still cultivated in the Botanic Gardens at Georgetown, British Guiana. In 1922, Professor Bailey collected a specimen from these Gardens; I was fortunate in being able to examine this specimen which is preserved in the Bailey Hortorium. Through the kindness of Dr. E. B. Martyn, Director of the Georgetown Gardens, a number of additional specimens of *Uroskinnera spectabilis* have recently been procured for study.

An examination of these specimens and a comparison of them with the type description and with Steyermark's wild material of this species from Guatemala indicates that the leaves tend to become smaller and thinner in cultivation. Aberrations in the flowers of the cultivated plants are also frequent. A flower taken from one of the Georgetown specimens (Econ. Herb. Oakes Ames No. 8473) had a six-toothed instead of four-toothed calyx, a trifid instead of a bifid stigma, and five fertile stamens without a staminodium instead of four fertile stamens with one staminodium.

Uroskinnera spectabilis is most closely allied to *U.*

Watsonii, although it superficially resembles *U. hirtiflora* in habit. A consideration of the relationship of *U. spectabilis* and *U. Watsonii* will be deferred until after the description of *U. Watsonii*.

Uroskinnera Watsonii *R. E. Schultes sp. nov.*

Frutex. Folia elliptico-lanceolata, serrata, basi cuneata, chartacea, supra densissime hispidulosa, infra dense villoso-sericea, 4–8 cm. longa, 2.5–3.5 cm. lata. Inflorescentia racemosa, densissima, brevis. Pedicelli brevissimi, densissime villoso-hirsuti. Calyx quattuor-dentatus, accrescens. Corolla purpurea, infundibuliformis, usque ad 3 cm. longa, quinquelobata, lobis rotundatis, extus glabris, intus glanduloso-lepidotis. Stamina quattuor, glabra; staminodium lineari-clavatum, glanduloso-lepidotum, quam stamina brevius. Stylus elongatus; stigma profunde bifidum, lobis vix divergentibus. Ovarium glabrum.

Shrub about 3 feet tall. Young branches densely sericeous, in age glabrescent, grey-brown. Leaves elliptic-lanceolate, serrate, acute at the tip, cuneate at the base, chartaceous, densely hispidulous and dark green above, densely velvety villous-sericeous and grey-green beneath, 4–8 cm. long, 2.5–3.5 cm. wide. Petioles densely villous-hirsute, 1 to rarely 2 cm. long. Inflorescence a short, very dense, many-flowered raceme, 3–3.5 cm. long. Pedicels up to 2 mm. long but usually much shorter so that the flowers appear subsessile, very densely villous-hirsute. Bracts filiform-linear, very hairy, about 2.5–3 mm. long. Calyx 4-dentate, cup-shaped, accrescent; the cup 2 mm. long, densely white-hirsute, the hairs nearly 1 mm. long; the teeth linear, 4–4.5 mm. long. Corolla violet-purple, very narrowly infundibuliform, glabrous without, 2.2–3 cm. long, 5-lobate, 2-lipped; the lobes rounded, subequal, glandular-lepidote within. Stamens four, glabrous; the shorter two 9–14 mm. long; the longer two about

EXPLANATION OF THE ILLUSTRATION

UROSKINNERA WATSONII *R. E. Schultes.* 1, habit, one half natural size. 2, flower (spread open), natural size. 3, dissected calyx and pistillate organs, natural size.

UROSKINNERA FLAVIDA *Lundell.* 4, habit, one half natural size. 5, flower (spread open), natural size. 6, dissected calyx and pistillate organs, natural size.

UROSKINNERA SPECTABILIS *Lindley.* 7, flower (spread open), natural size.

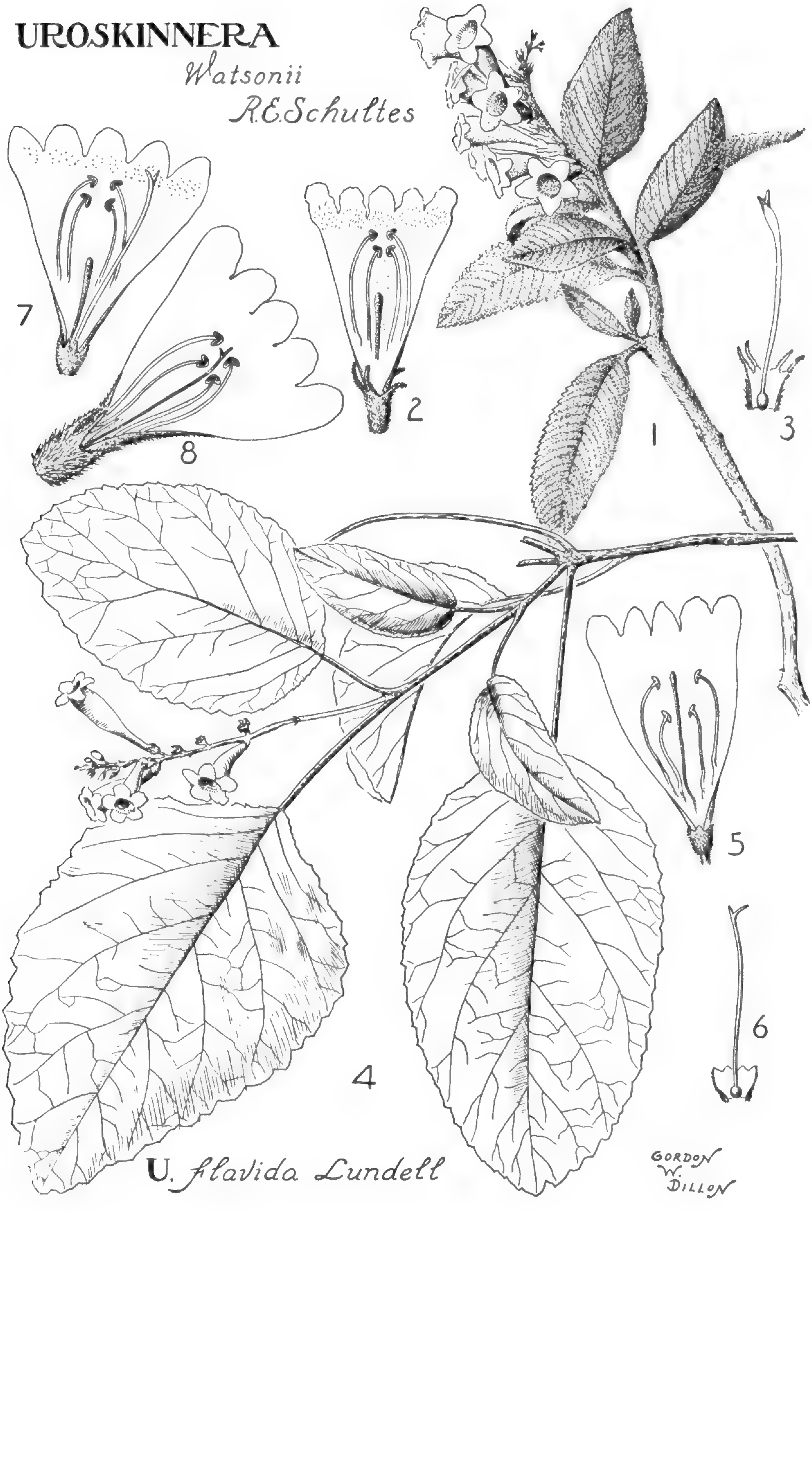
UROSKINNERA HIRTIFLORA *Hemsley.* 8, flower (spread open), natural size.

Drawn by G. W. DILLON

UROSKINNERA

Watsonii

R.E.Schultes



U. *flavida Lundell*

GORDON W. DILLON

15 mm. long; staminodium linear-clavate, glandular-lepidote, 6–8 mm. long. Style elongate, about 2.8 cm. long; stigma deeply bifid, the lobes unequal, strongly diverging. Ovary subglobose, glabrous. Ovules numerous, very small.

SPECIMENS EXAMINED:

GUATEMALA: Eastern portion of Vera Paz and Chiquimula, 1885, *Sereno Watson 474c* (TYPE in Herb. Gray); "Dept. Izabál, between Milla 49.5 and ridge 6 miles from Izabál, Montaña del Mico, alt. 65-600 m.," April 1, 1940, *Julian R. Steyermark 38541* (COTYPES in Herb. Field Mus. No. 1035330; Econ. Herb. Oakes Ames No. 1581).

Uroskinnera Watsonii, according to field notes accompanying *Steyermark 38541*, grows in "grassy places on dry slopes". It inhabits the same kind of land as *Uroskinnera spectabilis* with which it is often found.

Steyermark's field notes further state of *Uroskinnera Watsonii* that it is a "shrub 2–3 ft. tall. Leaves thickish, soft, membranaceous, rich light green above, pale greenish-white beneath. Corolla lilac to deep-orchid, the ventral half white."

There is a very striking agreement in size and in diagnostic characters between Watson's type collection (from the eastern part of Vera Paz or Chiquimula) and Steyermark's cotype collection (from Izabál).

On account of its smaller size and its narrower leaves, *Uroskinnera Watsonii* is vegetatively the most distinctive species of the genus.

Uroskinnera Watsonii is most closely related to *U. spectabilis*. These two species are similar in having chartaceous leaves which are hispidulous above and sericeous below, in having a short crowded inflorescence of rose-purple flowers, the corollas of which are externally glabrous and internally glandular-lepidote on the lobes; in having a 4-dentate, hirsute calyx; in having a glandular-lepidote staminodium and in having a deeply bifid stigma.

Uroskinnera Watsonii differs from *U. spectabilis* in possessing small elliptic-lanceolate (instead of large elliptic-ovate) leaves, smaller flowers, a staminodium of 6–8 mm. (instead of 12 mm.) in length, and a subterete (instead of conspicuously flattened) style.

COMPARATIVE SUMMARY OF THE CRITICAL CHARACTERS OF THE SPECIES OF UROSKINNERA

	U. spectabilis	U. Watsonii	U. flavida	U. hirtiflora
Habit	shrub	shrub	shrub	shrub
Leaf	elliptic-ovate 6–16 × 4–10 cm. chartaceous hispidulose above sericeous beneath	elliptic-lanceolate 4–8 × 2.5–3.5 cm. chartaceous densely hispidulose above densely villous-sericeous beneath	elliptic-ovate 5–13.5 × 3–9.5 cm. membranaceous sparsely pubescent above pubescent beneath	elliptic-ovate 7–12 × 4.5–7.5 cm. chartaceous densely villous-sericeous above densely villous-sericeous beneath
Inflorescence	short, compact	short, compact	long, lax	long, lax
Flowers	rose-purple (with a white stripe)	rose-purple (with a white stripe)	yellow	rose-purple (with no white stripe)
Bracts	1–3 mm. villous-hirsute	2.5–3 mm. villous-hirsute	1.3 mm. puberulent	up to 5 mm. villous-hirsute
Corolla	up to 4 cm. externally glabrous internally glandular-lepidote on lobes	2.2–3 cm. externally glabrous internally glandular-lepidote on lobes	up to 3.8 cm. ext. sparsely glandular-lepidote internally sparsely glandular	2.5–3 cm. externally hirsute internally hirsute at insertion of stamens
Calyx	4-dentate hirsute teeth 1.8–2 mm.	4-dentate hirsute teeth 4–4.5 mm.	4-dentate puberulent and glandular-pilose teeth 1 mm. or less	5-dentate hirsute teeth 5–6 mm.
Fertile Stamens	glabrous about 1.2 cm. about 1.7 cm.	glabrous 0.9–1.4 cm. about 1.5 cm.	glabrous about 1.3 cm. about 1.7 cm.	glabrous 1.1–1.5 cm. 1.7–1.9 cm.
Staminodium	1.2 cm. glandular-lepidote	0.6–0.8 cm. glandular-lepidote	about 2.1 cm. glandular-lepidote	about 0.3 cm. not glandular
Style	somewhat flattened 2.6 cm.	somewhat flattened 2.8 cm.	subterete 2.6 cm.	subterete 2.2 cm.

A RANGE EXTENSION FOR THE DROSERACEAE

BY

RICHARD EVANS SCHULTES

A collection from Oaxaca is apparently the first occurrence of the family Droseraceae in Mexico.

Drosera sp.

MEXICO: Oaxaca, District of Choapam, on clay bank along the road to El Arenal, San Juan Lalana, long. 95°45′, lat. 17°25′, alt. 550 m., May 9, 1939, *Schultes & Reko 836a* (Herb. Gray).

Although species of *Drosera* occur in nearly all parts of the world, the genus has not been reported from Mexico. It has apparently been represented in Central America by only two species, both from British Honduras: *Drosera brevifolia* Pursh and *Drosera capillaris* Poiret. *Schultes & Reko 836a* is a sterile collection but when keyed out on vegetative characters (Diels in Engler Pflanzenr. IV. 112 (Heft 26) (1906) 62), it is clearly referable to the subgenus *Rorella* DC.

Because this collection extends the *Droseraceae* to Mexico, and for purposes of comparison with collections which may later be made, the vegetative characters of *Schultes & Reko 836a* are described.

Plant a minute, scapose herb with a very short rootstock. Leaves more than twenty-five in number, prostrate, tufted at the base in a rosette 8–10 mm. across, spatulate, 3–5 mm. long, 2–2.5 mm. wide (0.5 mm. wide at the base), heavily clothed with reddish glandular pubescence, in life exuding glandular liquid. Scape slender, straight, glabrous, naked, at least 2 cm. long (broken in specimens at hand).

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THE FOSSIL FLORA OF IOWA COAL BALLS
IV. LEPIDOCARPON

BY
WILLIAM C. DARRAH

Seeds and seed-like bodies have been observed in all of the coal ball floras of the world. Krick (7), Reed (10), Schopf (11), and Darrah (2) have recorded numerous forms from various American localities. Recently in the progress of our investigation of Iowa coal balls, large numbers of smooth seeds or seed-like structures without any prominent scars or markings were isolated from the matrix by mechanical means. These rather large organs are somewhat flattened and elongate. A typical specimen is approximately 12 mm. long, 8.5 mm. wide, and 7 mm. thick in a median plane. Many, however, are considerably larger. Serial sections were prepared from four specimens for routine examination, and it appears that these seed-like structures are really sporangia similar to those characteristic of the extinct arborescent lycopods, particularly the so-called *Lepidocarpon* alliance.

The best preserved of the seed-bearing Lepidodendrids constitute the genus *Lepidocarpon*, which has been known for nearly a century, although for a long time its true relationship was not understood. In all of the species attributed to this group, the megaspore, which produces its gametophyte endosporally, is retained within integumentary tissues formed from the sporophyll. Even when

the specimens are isolated from the strobili which bear them, they always have this combination of structures. Thus there is a point of distinction between these seed-like organs and a typical seed, that is to say, in *Lepidocarpon* the sporophyll forms an integument and is shed as part of the "seed."

A considerable number of species attributed to *Lepidocarpon* have been described (7, 11, 13), all of which have been collected in rocks of Carboniferous age. They have proved to be of considerable abundance both in Europe and America. A closely related genus was described by Schopf (11) under the name *Illiniocarpon*, but the degree of difference between this form and that of *Lepidocarpon* is not great. The two best known species of *Lepidocarpon* are *L. lomaxi* Scott and *L. wildianum* Scott. The strobili of both of these resemble closely the usual *Lepidostrobus* type, but each megasporangium contains only one mature megaspore. Some of the species also contain three abortive spores. The sporophyll or "bract" forms an integument around the megasporangium, but a micropylar slit remains unclosed. The sporangium has a heavy wall and contains a tough megaspore membrane. The seeds became detached after attaining great size and an advanced degree of tissue differentiation. It is interesting to observe that the seeds of *Lepidocarpon lomaxi* were considered by paleobotanists for many years to be those of a gymnosperm (*Cordaicarpon anomalum* Williamson). Among living pteridophytes no equivalent structures have been observed, although in *Selaginella* the gametophyte develops within the megaspore, forming a living multicellular body, but it usually thrusts through the triradiate crest in the spore wall. No intimate relationship between the spore and the sporangium exists. On the other hand, among many extinct lycopods the sporangium produces one functional megaspore which

develops within the sporangium and fills the sporangium nearly completely, although a central cavity sometimes remains.

In 1914, Kidston (6) described a small strobilus of *Lepidocarpon westfalicum* from the upper Carboniferous of Staffordshire. This is a particularly instructive specimen because the strobilus is said to contain a large number of "ripened" seeds borne spirally upon an axis. The seeds are quite small attaining a length of only 2 to 3 mm. and a thickness of slightly less. We have found in Iowa a single strobilus of *Lepidocarpon lomaxi* in which the seeds are much larger, as a matter of fact attaining a length of nearly 4.5 mm. A comparison of isolated specimens of *L. lomaxi* with those attached in the strobilus has shown clearly that those not yet shed from the cone are immature rather than ripened. The average length of those which have been shed is nearly 6 mm. The histological detail preserved in the megaspores which are still enclosed in their sporangia and sporophyll never demonstrates the advanced degree of differentiation encountered in the isolated specimens. The diameter of the strobilus of *Lepidocarpon westfalicum* Kidston is approximately 1.5 cm. On the individual seeds there is a smooth pit at the basal end which marks the place where the sporangium was attached distally upon the sporophyll.

In 1936, Miss Reed (10) reported on the nature of isolated specimens of *Lepidocarpon*. A single vascular strand traverses the full length of the sporophyll. The sporangial wall is described as having two layers, each averaging three cells in thickness. Both layers, however, are composed of thick-walled isodiametric cells and at first appearance look much alike, the epidermis being only slightly differentiated from the hypodermis. According to her description the sporangium does not have a hypodermis with the distinct palisade appearance of

Lepidocarpon lomaxi Scott. There is an inner layer of thin-walled elongated cells. The megaspore grows to great size and is the single functional member of a tetrad of four spores. In one of her specimens Miss Reed recognized three aborting megaspores, and shows conclusively that they did not disintegrate immediately following inception, but that there was a relatively short growth period for all four megaspores, the proximal spore soon gaining ascendency over the others. In time, the larger of the spores seems to fill the whole cavity. Often, the megaspore membrane is collapsed. Miss Reed notes that never in her experience has she found gametophytic tissue; fragments of tissue which occur occasionally inside the membrane are intruded. She has developed this idea further and argues that the conventional opinion that *Selaginella* foreshadows seed structure is erroneous. She concludes that *Lepidocarpon* is a sporangium containing a living dependent gametophyte.

Several years ago Schopf (11) described impressions of *Lepidocarpon mazonense* from Mazon Creek in northern Illinois. It appears that this interesting species is very abundant, for he was able to collect forty specimens in a few visits to the locality. Prior to this discovery little was known of the variability or the gross form of the sporangium and its associated sporophyll in *Lepidocarpon*. In a more recent contribution Schopf (in Janssen (5), pp. 39–45) added still more information on these structures. He described *Lepidocarpon corticosum* (Lesquereux) Schopf as "a seed structure 11 mm. long and 7.5 mm. tall" borne upon a sporophyll of medium size, with the integumentary structures of the seed attached along a ventral extension of the pedicel enclosing the seed. The proximal end of the pedicel merges with a "splinter" of the former cone axis. The functional or seed-megaspore is 7 mm. long and 3.75 mm. broad; the broader end of

the asymmetrical spore is toward the anterior end of the seed. The megaspore membrane has a characteristic fibrous texture.

Schopf compared *Lepidocarpon corticosum* with *Cantheliophorus* Bassler (Bot. Gaz. Vol. 68, pp. 73–108, 1919) and concluded that most, if not all, of the fertile sporophylls attributed to *Cantheliophorus* should be transferred to *Lepidocarpon*. However, inasmuch as a number of sporophylls of the *Cantheliophorus* type as well as sporangia of the *Lepidocystis* type (White 14) bear many megaspores of the familiar "Triletes" type, it is not possible to accept these transfers until a critical revision of all of the species has been made.

The seed megaspore of *Lepidocarpon* has been named *Cystosporites* by Schopf (12) and he finds it to be a very persistent and abundant form among the microfossils of certain coals of Illinois. The spore is always rather ovoid, elongate and sac-like, varying in its greatest length up to nearly 10 mm. The spore membrane has a characteristic fibrous construction which is densely matted and is thicker and more dense at the distal end. Frequently there are abortive spores which for a time remain attached to the apex of the fertile member and are appressed to the triradiate crest of the functional spore. These abortive spores become detached as the seed megaspore enlarges. They vary greatly in size and when still small are nearly spherical in shape.

One may question the propriety of bestowing a generic name upon isolated spores which are referable to some plant already possessing a generic name. There is no convincing reply to this question. From a botanical and nomenclatorial point of view there would seem to be no justification for a new generic name, but on the other hand, in investigations on the microfossil content of coals, one is dealing exclusively with isolated objects for which

EXPLANATION OF THE ILLUSTRATIONS

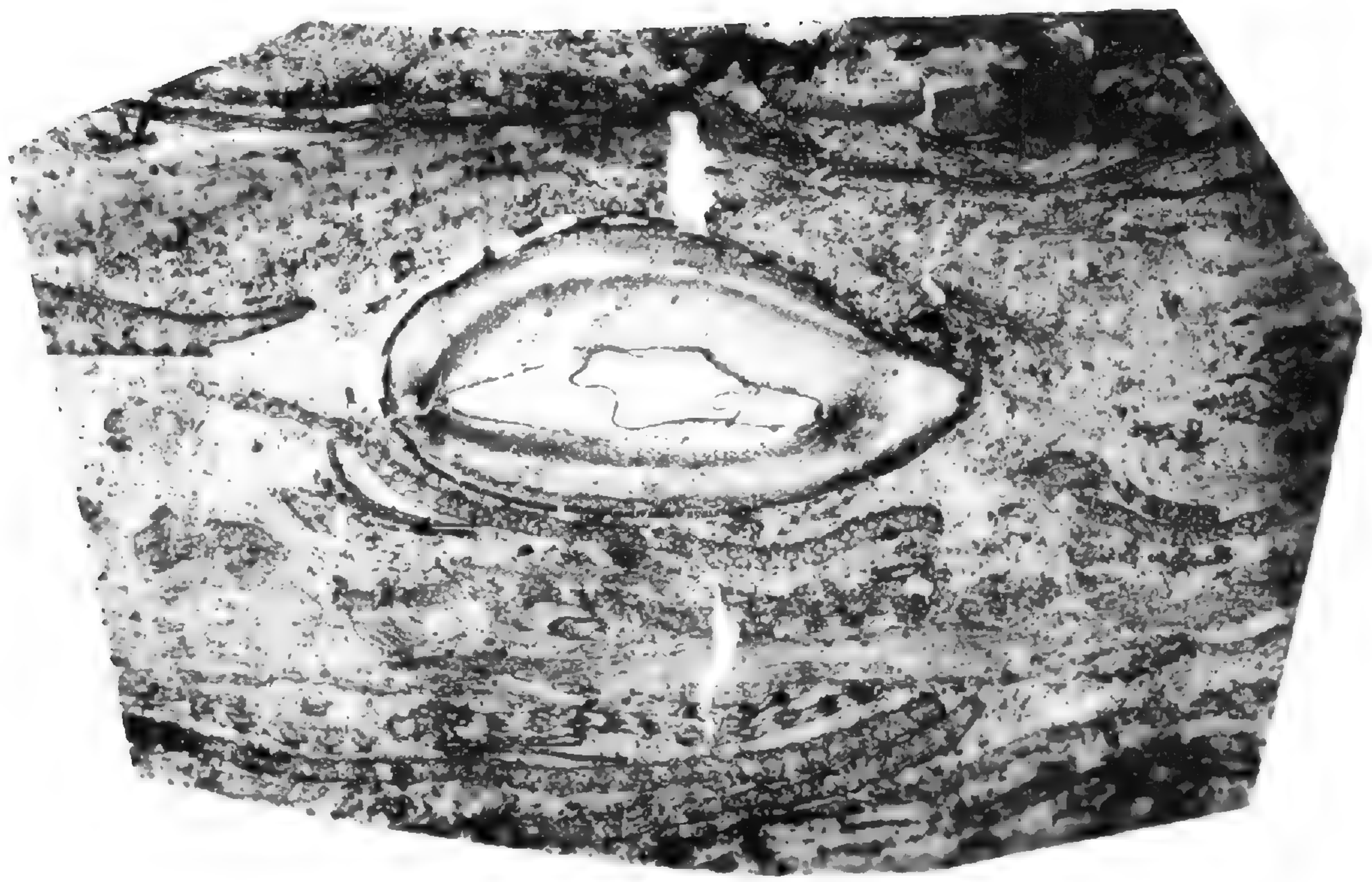
PLATE I. LEPIDOCARPON GLABRUM *Darrah sp. nov.* A single seed, embedded in a coal ball, showing the lustrous smooth wall of the sporangium. Shuler Mine, Waukee, Dallas County, Iowa. Specimen 44106. Five times natural size.

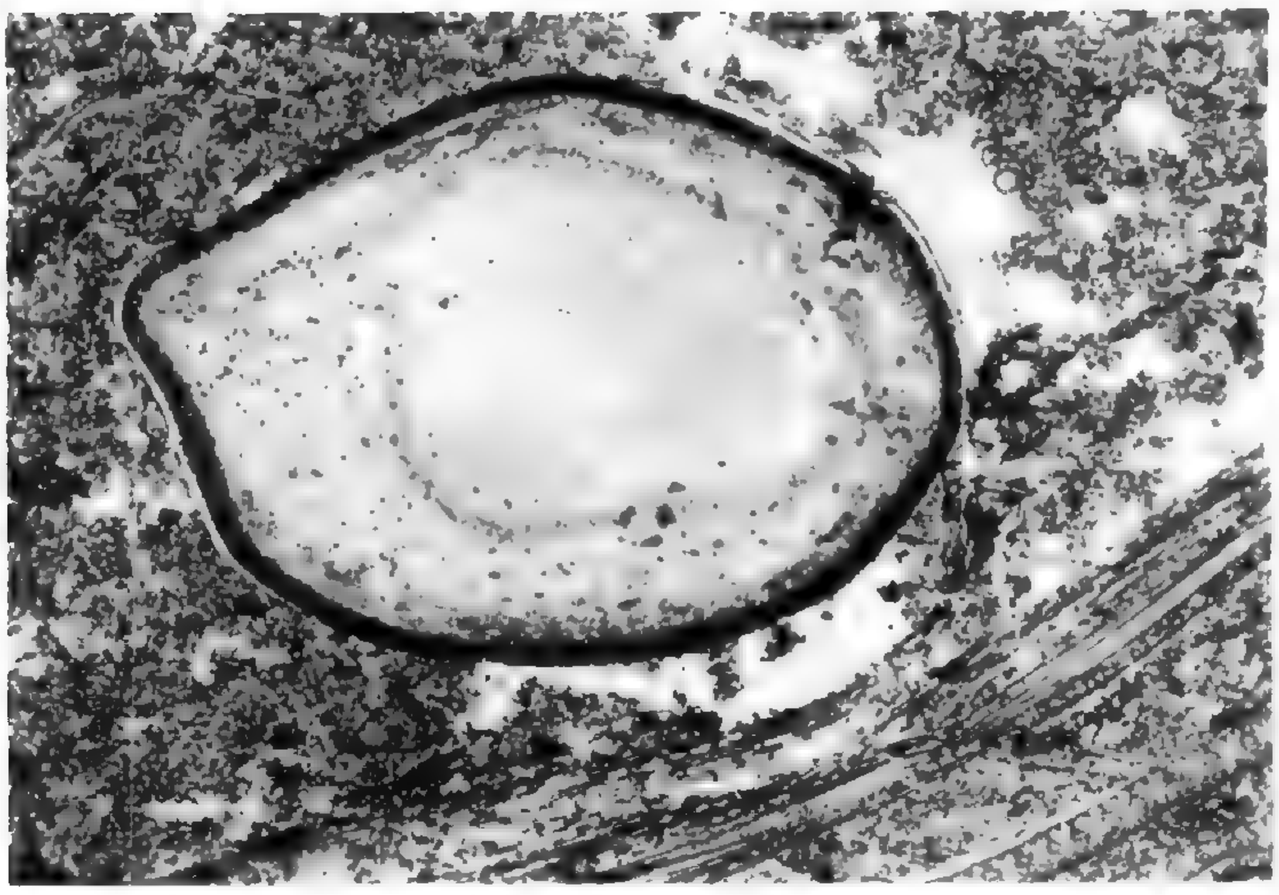
PLATE II. LEPIDOCARPON GLABRUM *Darrah sp. nov.* Figure at top. A lateral section through a seed showing the sporangial wall, the dense "nutritive" tissue, the seed megaspore, and the central cavity. Shuler Mine, Waukee, Dallas County, Iowa. Specimen 44103.

Figure at bottom. A sagittal longitudinal section through an immature seed showing the hard sporangial wall and the gametophyte. The tissues surrounding the central cavity not fully differentiated, although the nature of the "nutritive" layer is suggested. Shuler Mine, Waukee, Dallas County, Iowa. Specimen 44107. Both photographed from cellulose nitrate peels, magnified five times natural size.

Plate I

Plate II





the degree of variation in each form is unknown, and it is convenient to have a purely artificial method of classification. In this manner one may identify with reasonable accuracy a great number of objects without entering into the difficult morphological problem of determining botanical relationships. No attempt is made here to reduce the name *Cystosporites* to a synonymous position.

In 1879, Lesquereux (8) described, under the name of *Lepidocystis*, sporangia which were either isolated or attached to axes of unknown character. He himself said, "The limitations of this genus are vague and uncertain." However, he astutely referred the majority of these peculiar fructifications to the lycopods. The capsules are cylindrical or ellipsoidal and are smooth or angular. I have studied the type series of Lesquereux's species and have recognized two major groups. Sometimes, as in *Lepidocystis fraxiniformis* Lesquereux, many spores are to be found within the sporangium. In other cases, with a single spore, the bladder-like sporangia, which were originally inflated, have been flattened during preservation. In *Lepidocystis vesicularis* Lesquereux, an example of the latter group, the large sporangia are oval or nearly square in outline. The average diameter of this type is 1 cm. The occurrence of impressions of such large sporangial organs in rocks of Upper Carboniferous age, and of a few forms probably related to them in rocks of the Lower Carboniferous age, suggests that some characteristic feature, probably the presence of protective tissues in the sporangial wall, made preservation possible. It should be observed that the sporangial wall of *Lepidocarpon* has such construction.

The recent discovery of a new *Lepidocarpon* has shown an unexpected relationship between *Lepidocystis* and *Lepidocarpon*. Moreover, it is the first case of a *Lepidocarpon* in which the sporangium is shed free from the

sporophyll. The seeds obtained from the Iowa and Kansas coal balls are smooth and lustrous and are protected merely by the thickened cells of the sporangial wall. In other words the isolated "seed" is a sporangium and its contents. There is no suture nor other mechanism for dehiscence. Many thin sections have revealed the presence of a gametophytic body, in which no archegonia have been preserved. The different tissues produced within the sporangium will be discussed in the description of the species given later.

A number of seeds were macerated with dilute hydrochloric acid and the large seed megaspores were recovered. These are ovoid or ellipsoid bodies nearly as large as the sporangium with the megaspore wall thicker at its distal end. They are undoubtedly the same type of spore as that termed *Cystosporites* by Schopf. However, the differences in size between his species (*Cystosporites brereton sis* Schopf) and the isolated spores in coal make it impossible to attribute both forms to a single species. The recognition of the megaspore of our seeds confirms their reference to *Lepidocarpon*.

However, the external form and gross anatomy of these seeds apparently conform in all particulars to the isolated seed-like or sporangium-like bodies described by Lesquereux under the name *Lepidocystis*. A number of the species of *Lepidocystis* are nothing more than the sporangia of *Lepidocarpon* and their contained structures, hitherto only recognized with certainty in examples showing the sporangium associated with its sporophyll. Thus the *Lepidocarpon* ("*Lepidocystis*") from Iowa coal balls illustrates a more mature condition of the seed body than usually observed in the familiar *Lepidocarpon*.

It is therefore consistent with the evidence to refer these fossils to *Lepidocarpon* without amplifying the generic concept. A reference of this form to *Lepidocystis*

would be inappropriate inasmuch as this "genus" includes a variety of unrelated fructifications, some of which are megasporangia filled with large numbers of spores.

The sporangium is similar in its construction to *Lepidocarpon lomaxi* Scott, but the tissues developed within the sporangium show much more detail than in this species. At the proximal end of this seed-like sporangium there is a vascular trace which forks twice, but the four branches quickly exhaust themselves. The bifurcations are at right angles to each other, and by serial sections it has been observed that the two forkings take place one above the other. The individual elements in the vascular trace are spiral tracheids. It is somewhat difficult to identify each of the tissues within this seed. The hard integument is the sporangial wall. It is only one cell in thickness and the palisade-like cells are columnar in longitudinal section with a length two to three times the diameter. In transverse section the cells of the integument are roughly hexagonal, sometimes quadragonal. The cells are usually filled with a dense material, which is sometimes limited to the peripheries of the cell cavities. The functional or "seed" megaspore of typical species of *Lepidocarpon* is frequently accompanied by three abortive spores which are appressed to the triradiate crest of the functional spore. In only a few of our preparations have abortive spores been observed and all of the evidence points to the fact that in life the degeneration of the abortive spores was usually complete. Schopf (11) and Arnold (1) have both observed isolated spores of this type. Schopf correctly identified his spores with *Lepidocarpon* and *Illiniocarpon*. Arnold isolated his specimens from a poorly preserved cone from Mazon Creek, Illinois. In the case of Arnold's specimen (*Lepidostrobus braidwoodensis* Arnold), the spores probably were not those of a *Lepidocarpon*. In the seeds from the Iowa coal balls

only the smaller and more immature forms are recognized as typical *Lepidocarpon*, that is specimens still within an integument. All of the seeds attaining the maximal or near maximal size are found isolated.

LEPIDOCARPON Scott, Phil. Trans. Roy. Soc. Lond. B. vol. 194, 1901.

Lepidocarpon (Lepidocystis) **glabrum** *Darrah sp. nov.*

The seeds are large, 10–16 mm. in length, 8–10 mm. in width and 3.5–4.5 mm. in thickness. The seed body is smooth and lustrous with no ornamentation present. There is a small pit or interruption in the cells of the integument at the base of the seed where the vascular traces have entered. The protective integument is the massive sporangial wall, which is composed of columnar cells, usually filled with a dense substance. Within this integument, towards the center, are four tissues which are conspicuously different from one another. The outer of these is a closely packed tissue composed of rounded, nearly isodiametric cells with rather thick walls, larger in diameter than the columnar cells on the periphery. This tissue is several cells deep. The next tissue is a loose network of rounded parenchymatous cells which are, at maturity, somewhat larger than the preceding. They have thin walls and are frequently irregular in shape. Within this tissue is a closely packed mass of smaller, isodiametric and thin-walled cells, which line the cavity and completely surround the fourth tissue (the gametophyte). The seed megaspore is always present. The megaspore is of the *Cystosporites* type; abortive spores occasionally can be distinguished. In the basal portion of the seed there is a dense pad composed of the second parenchymatous tissue, into which runs a vascular strand that divides twice to form four short strands which soon exhaust them-

selves. This pad of tissue has four club-shaped masses of cells of unknown significance. Presumably from one of these, perhaps from all, megaspores could be developed. I assume that this may be homologous with an archesporial pad. The gametophyte is extensive, nearly filling the whole cavity.

IOWA: Dallas County, Waukee, Shuler Mine. F.O.Thompson Coll.
: Polk County, Walnut Township, Urbandale Mine. F.O. Thompson Coll.
: Lucas County, Williamson Mines 3 and 5. F.O.Thompson Coll.

KANSAS: Crawford County, Frontenac. F.O.Thompson and W.C. Darrah Coll.

CARBONIFEROUS: Pennsylvanian: Des Moines Series

Summary

The following new observations are believed to offer significant information concerning the Carboniferous lepidodendrids:

1. A portion of the genus *Lepidocystis* Lesquereux comprises isolated seeds of *Lepidocarpon*.

2. The mature *Lepidocarpon* sporangium is shed from the strobilus.

3. In at least one species of *Lepidocarpon* the sporangia are shed free from the sporophyll.

4. *Lepidocarpon glabrum* Darrah is described as a new species, demonstrating these observations.

The knowledge that the lepidodendrids include seed-like forms of remarkable diversity, some of which are shed completely from the parent sporophyll, modifies considerably our concepts relating to those Carboniferous pteridophytic plants which produced the homologues of true seeds. They agree far more closely with the gymnosperm seed, than has been hitherto recognized.

I wish to express sincere appreciation to the Milton Fund of Harvard University and the Marsh Fund of the National Academy of Sciences, for aid given toward our investigations of American coal balls.

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THE MEANING AND USAGE OF THE MEXICAN PLACE-NAME "CHINANTLA"

BY

RICHARD EVANS SCHULTES

I. INTRODUCTION

THERE are probably few geographical names more important to the historical botany of southeastern Mexico than *Chinantla*. Yet this name has very often been misunderstood and has been used in a variety of senses. In view of this misunderstanding and of the importance to botanists of an exact definition of *Chinantla*, and in response to several queries from botanical workers, it has seemed advisable to present the following notes.

About a century ago, a number of enthusiastic European botanical explorers penetrated the rain-forested mountains of northeastern Oaxaca and brought out thousands of specimens of plants. Several of these botanists carried on extensive explorations in that part of Oaxaca known locally as *La Chinantla*, a region which can be stated roughly to comprise the northern half of the District of Choapam, the northeastern edge of the adjacent District of Villa Alta, and the southernmost edge of the District of Tuxtepec.

The Chinantla is unquestionably the richest part of northeastern Oaxaca as it is the northernmost limit of the luxuriant Central American rain-forest flora. As a consequence, the collections of the early explorers of the

Chinantla proved to be exceedingly rich in new and rare plants, many of which have never been collected again. Some of these collections represent local endemics which have never been collected elsewhere, while others have since been found to be widespread tropical American species.

A large number of species have been based on types from the Chinantla. Some of these plants bear as a specific epithet an adjectival form of *Chinantla* (e.g. *Desmoncus chinantlensis* Liebm. ex Mart. and *Clidemia chinantlana* (Naud.) Triana). A few species which were first collected in the Chinantla have since become important economic or horticultural plants (e.g. *Monstera deliciosa* Liebm.).

The majority of these early collections are preserved in European herbaria, although duplicates of some of them are in American institutions, especially in the Gray Herbarium, the Herbarium of the Field Museum of Natural History, and the United States National Herbarium. With the growing interest among American botanists in the flora of Central America, it is becoming increasingly evident that these early collections from northeastern Oaxaca (including those from the Chinantla) must be consulted. Since the historical material in European herbaria is periodically unavailable to American students, it is desirable that the localities of the early collectors be revisited and that topotypical material be collected.

Recently, in a number of floristic and monographic publications, critical specimens from Oaxaca labelled "Chinantla" have been erroneously assigned to other parts of Mexico. For example, very frequently botanists allocate such specimens to the State of Puebla instead of to the State of Oaxaca. The reason for this error is probably due to the fact that the term *Chinantla* is not

to be found on standard maps of Oaxaca, while recent maps of Puebla bear conspicuously the name of the town of Chinautla. *Chinantla* refers to a rain-forested mountainous region, whereas *Chinautla* refers apparently to a dry, plateau region. The resulting errors in floristic studies are often grave.

Further uncertainty is occasioned by the variety of meanings which the convenient term *Chinantla* has assumed at the hands of botanical, anthropological and historical writers.

Although in several papers (27, 29, 30) incidental reference has been made to the meaning of *Chinantla*, a more complete review of the history of the term with special reference to its botanical usage and significance may be helpful in clarifying the problem.

II. Use by Historians and Anthropologists

The word *Chinantla* has its etymological origin in the Aztec word *chinamitl*, signifying "an enclosed space". It is believed that the name *Chinantla* originally referred to a single settlement or town probably slightly south of the present village of San Juan Valle Nacional (long. 96°20′, lat. 17°48′) in the District of Tuxtepec. At the time of the Conquest, however, the name was used to designate an area which included a town called *Chinantla* and a number of dependent hamlets as well. Recent attempts have been made to identify the town of Chinantla with ruins of a *pueblo viejo* which have been found on the southern side of the Río Valle Nacional between San Mateo Yetla (long. 96°24′, lat. 17°45′) and San Juan Valle Nacional (15).

The *Relación de Chinantla* (12), an excellent English translation of which has been prepared by Bevan (2), was written in the town of Chinantla in November 1579. It is clearly set forth in the *Relación* that *Chinantla* referred

to four distinct entities in 1579: 1) an abandoned town: 2) a newer town nearby; 3) the area and villages surrounding this newer town; and 4) the river passing through the area (Río Valle Nacional).

In defining the *Chinantla,* the *Relación* stated: "The town of Chinantla is situated in a valley formed between two ranges of mountains . . . . in such manner that one of these ranges extends along the northern side and the other along the southern side. The town lies on the banks of a swiftflowing river which they call Chinantla because it flows from a hill eleven leagues from here past a formerly inhabited village called Chinantla . . . . Into this river empty four other large rivers, three of them above Chinantla and the other more than three leagues below the town. . . . It, (the town of Chinantla), has twenty-four villages surrounding it and possessing churches. It has four other settlements or hamlets which have no churches. . . . It is a very damp region and equally so is the cabecera and town of Chinantla; hot, humid, and unhealthy, so much so that at present it is abandoned, and there live in it only three Indians".

The *Relación* enumerated the villages comprising the region of which the new or second town of Chinantla was the capital. Many of these villages do not have recognizable names and may correspond to towns which (like Chinantla) are no longer in existence or to towns which are at present known by newer names. The following names are maintained: Cuasimulco, Santa María Jacatepec, San Pedro Ozumazín, San Juan Palantla, and San Mateo Yetla.

In summarizing the four original meanings of *Chinantla,* we may again quote from the *Relación.* "The town of Chinantla is called Chinantla because it is surrounded by towns and by mountains, and the natives call any kind of enclosed space chinamitl . . . . as well as because it lies

on the banks of a swift-flowing river named Chinantla, rising eleven leagues from the town in a hill where was formerly situated a village named Chinantla, abandoned as the results of wars, and (finally) because the site was similar they called it, (the new town), Chinantla.'' Each village of the region comprising the Chinantla had a lord who in turn ''recognized the authority of the lord of the cabeçera of Chinantla, and to him they paid tribute . . . . and this lord recognized Moteçuma . . . .'', who kept a garrison at the nearby town of San Juan Bautista Tuxtepec (long. 96°07′, lat. 18°06′).

The *Relación de Chinantla* was a governmental report, and its statements, though sometimes vague, are usually reliable. The *Relación* makes it clear that, in 1579, the term Chinantla referred in its widest sense to a region of northeastern Oaxaca which now comprises the southern edge of the District of Tuxtepec, the northern part of the District of Choapam, and the northeastern edge of the District of Villa Alta. This region is shaded on the map accompanying the present article. The *Relación* does not specify the southern limit of this area, but later usage seems to indicate that it was delimited by the southernmost Chinantec towns —San Juan Teotalcingo (long. 95°58′, lat. 17°25′) and Santo Domingo Latani (long. 95°52′, lat. 17°23′). We may assume that the Chinantla did not extend west beyond Cuasimulco because, in 1579, simultaneously with the *Relación de Chinantla*, a *Relación de Uçila* (26) was compiled. This *Relación de Uçila* pertained to the vicinity surrounding San Felipe Usila (long. 96°34′, lat. 17°55′) in the southwestern part of the District of Tuxtepec and immediately west of the Chinantla.

That Chinantla was a settlement of some importance in the early years after the Conquest is indicated by an old map which was published as a frontispiece in several

editions of Clavigero's *Historia* . . . . (7). This map, entitled *Anahuac or the Empire of Mexico, the Kingdom of Acolhuacan & Michuacan &c as they were in the year 1521*, has designated only a few towns in what is now the State of Oaxaca; one of these is Chinantla. The town is located in the "province" of Chinantla. Very near the town of Chinantla, the map designates a town called *Achiotlán* ("place of achiote"); this town either bears another name now or does not exist. It is of interest, however, to point out that in the vicinity of San Juan Valle Nacional, where the town of Chinantla probably existed, *achiote* (*Bixa Orellana* L.) abounds, whereas in the higher mountains to the south, this plant is less frequent.

We find a number of other writers referring incidentally to the Chinantla and using the name in its correct historical sense. In 1864, Orozco y Berra (25) stated that "La Chinantla, con su cabeçera del mismo nombre, era une provincia mexicana . . . . " and Brinton (5, 24), in 1892, wrote that "The Chinantecs inhabited Chinantla, which is a part of the State of Oaxaca, situated in the Sierra Madre, on the frontier of the Province of Vera Cruz."

Unfortunately, the term *Chinantla* has not always retained its original and historically correct meaning. In recent years, it has been applied to other parts of Oaxaca. It has been used among historical and anthropological writers to refer to the entire area which the Chinantec Indians inhabit. This area includes most of the District of Tuxtepec, the northern half of the District of Choapam, a small part of the District of Villa Alta, the northeastern section of the District of Ixtlán, and most of the eastern third of the District of Cuicatlán, and so comprises the greater part of northeastern Oaxaca. Among the writers who have used *Chinantla* in this broad sense, the following may be cited.

In 1881, Gay referred many times to the Chinantla in his *Historia de Oaxaca* (13). He used the term in a very broad sense, stating that "La Chinantla es una provincia situada al norte de la ciudad de Oaxaca," and he intimated that it was synonymous with the territory of the Chinantecs.

Belmar (4) wrote: "The Chinantecs occupy chiefly the Chinantla, comprising the Districts of Ixtlán, Choapam, Cuicatlán, Teotitlán, Villa Alta, and Tuxtepec", and elsewhere (3) he used *Chinantla* similarly.

Burgoa (in 2) suggested that the *Chinantla* was a synonym of the area inhabited by the Chinantecs and stated that it lay "beyond Villa Alta."

Although Bevan (2) carefully discussed the meaning of the name *Chinantla* and pointed out that it has been used in four different senses, he stated that in his opinion "the name La Chinantla is, . . . a synonym for the region where any dialect of Chinantec is spoken."

In his writings on southern Mexico, Starr (31) has used *Chinantla* to refer exclusively to the eastern third of the District of Cuicatlán, which is Chinantec territory, especially to the region around San Pedro Sochiapam (long. 96°41′, lat. 17°53′) and San Juan Zautla (long. 96°40′, lat. 17°58′).

III. Use by Botanists

In reviewing the use of *Chinantla* in the writings of botanical explorers who knew the region personally, it is interesting to discover that the term was consistently employed in its historically correct sense.

Among the early botanical explorers who travelled in Oaxaca, Galeotti, Hartweg and Liebmann penetrated into the Chinantla, carrying on their explorations almost simultaneously. Galeotti and Hartweg worked in the

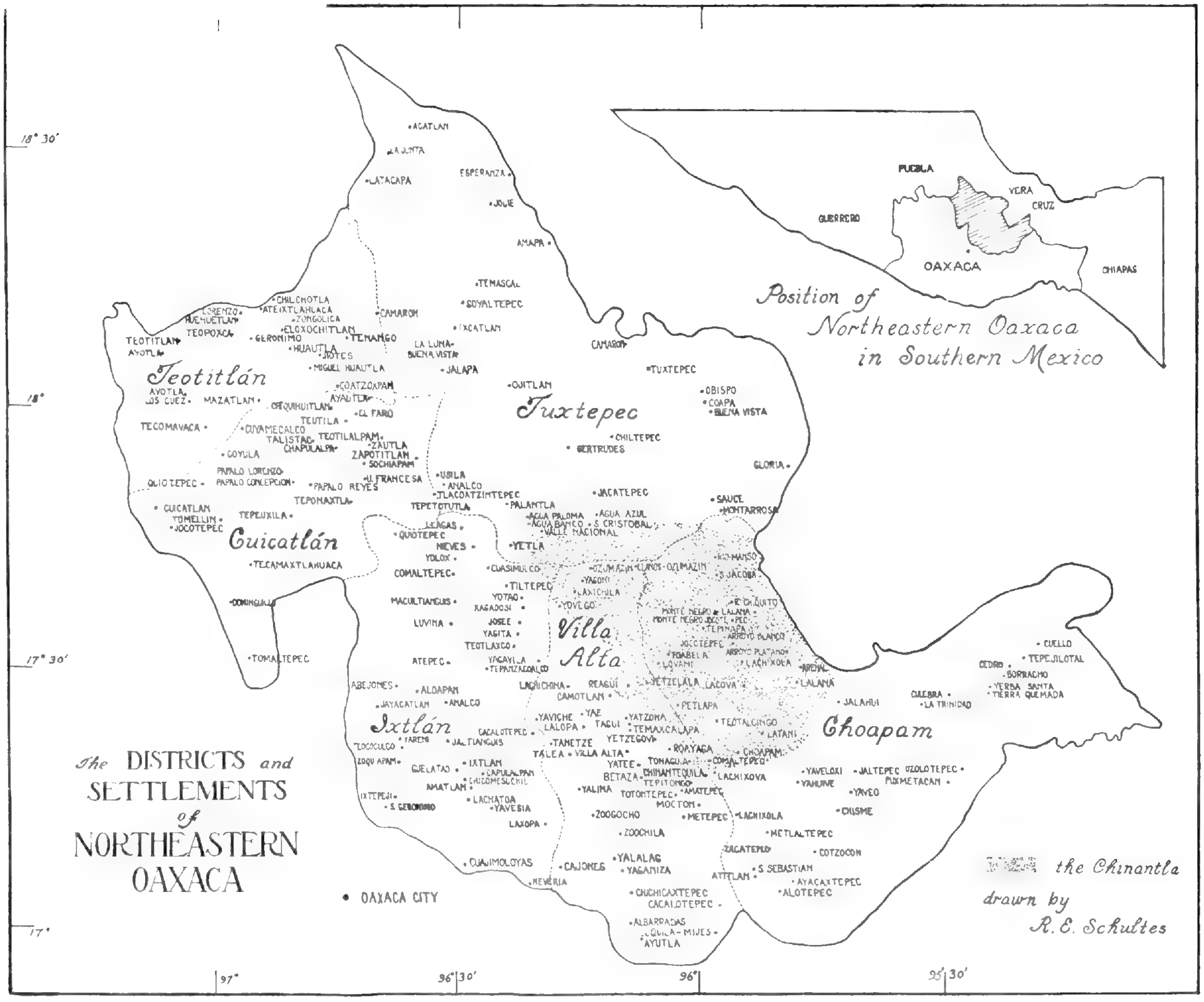
EXPLANATION OF THE MAP

This map is based upon a study of several old manuscript maps; Conzatti's *Mapa biologico y minerologico del Estado de Oaxaca* (1918), scale 1:500,000; the 1937 edition of the map of *Oaxaca* of the Departamento de Geográfico (Mexico), scale 1:1,000,000; the map of *North America*, section E-14, of the American Geographical Society of New York (1938), scale 1:1,000,000; the maps in Bevan (2); and upon field observations made by the writer in 1938 and 1939.

Many places which are of historical interest to botanists have been indicated on the map. The localities visited by the early botanical explorers (Galeotti, Hartweg, Jürgensen, Karwinski, Liebmann, Nelson, etc.) are included.

Scale: approximately 1:1,670,000

The DISTRICTS and SETTLEMENTS of NORTHEASTERN OAXACA



region during the spring and early summer of 1839, and Liebmann followed in 1842.

These early European collectors used the name *Chinantla* freely in their field notes, and the name has appeared in their own taxonomic papers, as well as in later monographs and in biographies and itineraries of the explorers. Since the Galeotti and Liebmann collections are represented by a number of specimens in North American herbaria and since their collections seem to have been more extensive and important that those of Hartweg, the following discussion and examples of the use of the name *Chinantla* are based on the work of these two men.

In several publications (1, 6, 14, 16, 18, 22), general discussions of the itineraries of Galeotti and Liebmann in Mexico have appeared. In most of these, *Chinantla* is used to refer to a district, but Alston (1) has stated that Liebmann collected in ". . . Chinantla, a village on the slopes of Mt. Sempoaltepec . . .". A clear discussion is found in Oersted's introduction to Liebmann's *Chênes de l' Amérique tropicale* (22) and in Liebmann's *Mexicos Bregner* . . . (18). The former stated that: "Dans la contrée montagneuse peu connue et peu habitée de Chinantla, Liebmann fit un riche moisson de plantes nouvelles . . . "; the latter briefly reported that Liebmann had travelled through "det saakaldte Sierra de Oajaca med Indbefättelse af Districterne Ixtlán, Chuapam, Villa alta og Chinantla . . .".

A study of the actual collection-data of these two explorers is more instructive. From an examination of Galeotti and Liebmann collections and from a study of the citations in numerous taxonomic publications (17, 18, 19, 20, 21, 22, 23), it has been possible to work out the itineraries of these collectors in northeastern Oaxaca (still to be published) and to ascertain the exact region which they meant to designate by the word *Chinantla*.

From this study, it is clear that both Galeotti and Liebmann used the term in its historically accurate sense to denote the region which is shaded on the map which accompanies this article. Usually, Galeotti and Liebmann cited actual towns in the Chinantla, but, in some cases, especially in the Galeotti collections, the specimens are labelled simply "Chinantla", sometimes even without the designation of the state. It is this, primarily, which has confused taxonomists who believed Chinantla to be a town but who were unable to find such a town on the maps of Oaxaca.

A few examples selected from the hundreds of collections of Galeotti and Liebmann will indicate the clarity with which they used the name *Chinantla*.

Galeotti:

Piper chinantlensis Mart. & Gal. "On trouve cette espèce dans les belles forêts de la Chinantla, région située sur le versant oriental de la cordillère orientale d'Oaxaca, a 3,000 pieds."
Quercus acutifolia Née "On trouve cette belle espèce dans les forêts si riches et si variées de la Chinantla, a Tonaguia (parte orientale de la cordillère orientale d'Oaxaca)."
Smilacina paniculata Mart. & Gal. "Chinantla, région fertile et humide, située sur la déclivité océanique de la cordillère orientale d' Oaxaca."
Smilax multiflora Mart. & Gal. "Ce Smilax entoure les arbres des forêts de la Chinantla près du bourg indien de Lalana (département d'Oaxaca) a 8,000 pieds d'élévation."

Liebmann:

Begonia pustulata Liebm. "I skyggefulde fugtige Bjergskove ved Lacoba i Districtet Chinantla i Dep. Oajaca . . ."
Begonia reptans Benth. "Hartweg fandt det ved S. Pedro Tepinapa i Chinantla i Dep. Oajaca."
Dieffenbachia Seguine Schott " . . . bjergige Landskab Chinantla i östlige Oaxaca."
Hydnostachyon brevirostra Liebm. "Cuesta de Teotalcingo imellem Chuapam og Teotalcingo (Districtet Chinantla, 4–5000′) . . ."

Liebmann also visited Chinautla in the State of Puebla, the locality which has been confused with the Oaxacan Chinantla. There is no possibility of ambiguity in Liebmann's notes, for, as the following examples indicate, he carefully denoted the state and, in several cases, actually contrasted the two names.

> *Acrostichum Schiedei* Ktze. "Byen Tiuzutlán og Indierlandsbyen Chinautla i Dep. Puebla 7–8000′."
>
> *Polypodium angustum* (Willd.) Liebm. ". . . i Chinantla S. Pedro Tepinapa (2,500′), paa Ege Tiuzutlán og Chinautla."

The towns and villages of the Chinantla in which Galeotti and Liebmann collected include the following in the District of Choapam: San Juan Comaltepec, Santiago Choapam, Santiago Jocotepec, San Juan Lacova, San Juan Lalana, Santa María Lovani, San Juan Petlapa, San Juan Teotalcingo, San Juan Toabela, San Pedro Tepinapa; and Santa María Tonaguía in the District of Villa Alta.

In his writings (8, 9, 10, 11), Professor Conzatti, the contemporary authority on the flora of Oaxaca, has consistently used the term *Chinantla* in its historical sense. He has also used the modification *Chinantla-cuicateca* to refer to the eastern third of the District of Cuicatlán where he collected in 1898 and in 1909. Although this term has been misunderstood, there should be no ambiguity in Conzatti's use of the word in this heterodox manner because of the clarity and fullness of the localities cited on Conzatti collections (28).

In conclusion, it should be pointed out that the early botanical collectors used *Chinantla* in its historically accurate sense. At the present time, however, there is a tendency to misapply the word to designate the entire area of northeastern Oaxaca inhabited by the Chinantec Indians. It is unfortunate that such a broad use of the

word *Chinantla* has occurred, even though it may be, for ethnologists at least, a more convenient term than others which might have been coined for the Chinantec-area. In all botanical work, however, it is necessary to restrict the word to its original meaning and to use it only for the area which is shaded on the map. The use in botanical work of any extended application of the name will result in floristic and ecological errors; inasmuch as the area occupied by the Chinantecs comprises many types of country, while the Chinantla is almost completely rain forested.

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PLANTAE MEXICANAE IX

BY

RICHARD EVANS SCHULTES

AECHMEA MAGDALENAE AND ITS UTILIZATION AS A FIBRE PLANT

Aechmea magdalenae (*André*) *André ex Baker*, a fibre plant of southeastern Mexico, Central America and northwestern South America, is the basis of one of the most important native industries of the Chinantec and Zapotec Indians of Oaxaca. Since this industry is very ancient, yet relatively little known, the following notes on the plant and its utilization may be of interest to anthropologists and to those economic botanists who are engaged in fibre investigations.

Aechmea magdalenae is known throughout its range by the vernacular names *pita* and *pitafloja*. These are inclusive terms for many fibre plants of the Amaryllidaceae and Bromeliaceae, but in this paper they are restricted to *Aechmea magdalenae*.

Aechmea magdalenae *(André) André ex Baker* Handb. Bromel. (1889) 65.

Chevalliera Magdalenae André Enum. Bromel. (Dec. 13, 1888) 3; in Rev. Hort. 60 (Dec. 16, 1888) 563.

Bromelia Magdalenae (André) C. H. Wright in Kew Bull. 1923 (1923) 267.

Ananas magdalenae (André) Standley in Standley & Calderón Lista Prel. Pl. Salvador (1925) 45.

VERNACULAR NAMES IN OAXACA:

Chinantec: *guh-to-oh*
Spanish: *clavel; ishte; iste; ixtle; pita; pitafloja; vitaya*
Zapotec: *la-ga-ge-chi; ye-tsi-ro-tee*

Aechmea magdalenae occurs in forested areas in southeastern Mexico, Guatemala, Honduras, Salvador, Costa Rica, Panama, Colombia and Ecuador. The type was collected in Colombia.

This large terrestrial species resembles the pineapple in many respects, and consists of a rosette of leaves and a stalked inflorescence. The leaves which are frequently six feet long (they have been reported as long as ten feet) are narrow, linear, very flexible and armed along the margins with prominent, recurved teeth. The red inflorescences are large and capitate; the fruits are enlarged and juicy. The plants tend to form extensive and impenetrable thickets on the forest floor. These thickets are so characteristic an ecological formation in some parts of Central America that they have been called *pitales* from the vernacular name of the plant. In the Districts of Villa Alta and Choapam—the Chinantla of Oaxaca—the northeastern limits of its range, *Aechmea magdalenae* is very abundant at altitudes of between 450 and 650 meters.

Aechmea magdalenae is the basis of the pita industry of the Chinantec Indians of the Chinantla. The extraction of the fibre was practised by the Chinantecs even in pre-hispanic times. The *Relación de Chinantla*[1], which was written in Chinantla in 1579, and which has recently been translated (Bevan, B. "The Chinantec: Report on the central and southeastern Chinantec region. Vol. 1—The Chinantec and their habitat" in Inst. Panam. Geogr.

[1]D'Esquibel, Diego "Relación de Chinantla" 1579; published in Pap. Nueva España 4 (1905).

Hist. Publ. 24 (1938) 135-144), states that the inhabitants "make a fibre like hemp".

The pita industry is believed to have been much more extensive in former times than it is now. Bevan further states: "It appears that formerly this cutting and dressing of pita formed quite an important industry in certain parts of the Chinantla, and that far away in Oaxaca, the pita-fibre of this region was greatly esteemed for its superior qualities."

At the present time, the industry is centered in San Pedro Tepinapa (long. 96°00′, lat. 17°29′) and to a lesser extent in Monte Negro de Lalana (long. 95°45′, lat. 17° 25′) and Río Chiquito (long. 95°53′, lat. 17°41′). Very little pita work is carried on in San Juan Teotalcingo, San Juan Petlapa and San Juan Toabela—the seats of the Chinantec basketry industry. This is due to the fact that *Aechmea magdalenae* is not abundant at the altitude of these towns and only scattered plants are to be found in the surrounding forests.

The work of procuring the fibre is accomplished chiefly by the Chinantec women who cut the leaves near the ground and remove the soft, flexible but strong fibres. The extraction process consists in rubbing the softer tissues of the leaf free from the fibres on a metate. The fibres are then thoroughly washed and freed from extraneous materials. When dry, the finished product is almost pure white in color.

Very little of the fibre is worked by the Chinantecs themselves. In San Juan Teotalcingo and neighboring villages, a small amount of the pita fibre is utilized in the manufacture of the pheasant- and falcon-feather fans so typical of the region, but, other than this, no use is made of the fibre locally by the Chinantecs not even in the manufacture of their baskets.

The greater part of the fibre which the Chinantecs

gather and prepare is sold to Zapotec carriers who take it to such large Zapotec centers as San Ildefonso Villa Alta, Yalalag, and Oaxaca City. In these centers the fibre is worked into hammocks, ropes, nets and many other articles. Some of the Chinantec pita fibre finds its way to Vera Cruz through the village of Monte Negro de Lalana and by way of the Río Monte Negro. In the Collection of Economic Plants of the Botanical Museum of Harvard University there is a large hank of fibre of *Aechmea magdalenae* which was purchased in San Ildefonso Villa Alta and which, according to the natives, had been traded in from the mountain village of San Pedro Tepinapa. In the Economic Herbarium of Oakes Ames there is a sheet (No. 8322) of this plant from the same region.

Pita fibre is also extensively used by the Zapotec Indians of the Isthmus of Tehuantepec, the southeasternmost part of Oaxaca, immediately adjacent to the Chinantla. On the Isthmus, *Aechmea magdalenae* is often referred to as *ixtle* (Llewelyn Williams "Arboles y arbustos del Istmo de Tehuantepec" in Lilloa 4 (1939) 162). This term, in its usual and general sense, is applied to desert species of fibre-plants which, because of the dense covering of wet tropical forest, do not occur on the Isthmus.

An early and detailed account of the industry is that given by J. J. Williams in J. G. Barnard "The Isthmus of Tehuantepec" published in 1852. Barnard's work, which includes a very complete account of the vegetable products of Tehuantepec, has unfortunately in the past been neglected or overlooked. Due to this fact, Williams' discussion of pita (p. 184-5) will be quoted in part:

"Among the spontaneous products is the *bromelia pita*, or ixtle of the Isthmus . . . . Of this prolific plant there are numerous varieties, all yielding fibres which

vary in quality from the coarsest hemp to the finest flax . . . . The simplicity of its cultivation and the facility of extracting and preparing its products render it of universal use. From it is fabricated thread and cordage, mats, bagging and clothing, and the hammocks in which the natives are born, repose and die. The fibres of the pita are sometimes employed in the manufacture of paper, it is used as a caustic for wounds, and its thorns serve the Indians for needles and pins. The point generally selected for its cultivation is a thick forest, from which the small undergrowth is removed by cutting and burning. The roots of the old plants are then set out, at a distance of five or six feet apart, and at the end of a year the leaves are cut and 'rasped'. When the pita is young its fibres are fine and white, but as it increases in age they become longer and coarser . . . . In a wild state the thorns are very numerous, but by cultivation they are diminished both in size and number, and in many instances there are none at all. Even with the imperfect instruments used in cleaning the leaves, four or five pounds of fibres per day is only a fair average for the labor of a man. . . . In 1831, . . . the ixtle plantations in the northern division numbered 1221."

Aechmea magdalenae is known to be utilized as the source of a fibre not only by the natives in Mexico, but also in Honduras (Standley in Field Mus. Nat. Hist. Publ. Bot. 10 (1931) 126), Costa Rica (Standley in ibid 18 (1937) 148), Panama and other parts of Central America (Standley, in Contrib. U. S. Nat. Herb. 27 (1928) 108), and Colombia (Wright in Kew Bull. 1923 (1923) 266-7; Archer in Scientific Monthly 44 (1937) 14).

Although it must be classed as one of the most desirable of Mexican fibre plants, *Aechmea magdalenae* has apparently only recently begun to attract the attention which it merits. It was not mentioned in Altamirano's

inclusive list of the fibres of Mexico (Altamirano, F. "Datos acerca de las plantas fibrosas de Mexico" in Anal. Inst. Med. Nac. 11 (1910) 9-54), nor is it included in the most recent treatment of Mexican economic plants (Martínez, M. "Las plantas mas utiles que existen en la República Mexicana" 1928). Furthermore, it is not one of the many plants considered in Dodge's catalogue (Dodge, C. R. "A descriptive catalogue of useful fiber plants of the world" U.S. Dept. Agr. Fiber Invest. Rept. 9(1897)). Neither is it enumerated in "Vegetable Fibres" (Kew Bull. Additional Series II (1912) 2-270).

In 1901, Belmar (Belmar, F. "Breve reseña histórica y geográfica del Estado de Oaxaca" (1901) 119) mentioned the pita industry under the *Industrias indígenas*, stating that in Villa Alta beautiful hammocks as well as the type of slipper called *cacle* or *huarache* were manufactured from pita and ixtle.

In 1923, C.H. Wright (l.c.) obtained flowers of *Aechmea magdalenae* and published a brief note on the plant identifying it as the source of a Colombian fibre which had long been known simply as "pita". At about the same time, *Aechmea magdalenae* was introduced into southeastern Asia for experimentation (Chevalier, A. in Rev. Bot. App. & Agric. Colon. 3 (1923) 652-60).

Although the fibres of most of the Bromeliaceae have not, on the whole, been commercially promising, that of *Aechmea magdalenae* is of superior quality. It has been shown to possess great powers of resistance to the effects of salt water. Cross and Bevan (quoted in Burkill, I.H. "A dictionary of the economic products of the Malay Peninsula" 1 (1935) 367-8) report that "of the fibres of potential industrial importance it stands pre-eminent. The breaking-strain gives a number for weight / length unit superior to those of the staple textile fibres of all classes. The tenacity figures are quite remarkable. The resistance to alkaline hydrolysis (caustic soda) is good"

THE GENUS PAPPERITZIA

BY

LOUIS O. WILLIAMS

In 1844, H.G. Reichenbach described *Leochilus Leiboldi* from specimens received in liquid from Leibold. He realized that the species was different from Leochilus but at that time did not think that it was distinct enough to warrant the erection of a new genus. However, in 1852, Reichenbach described the genus Papperitzia to include this species. Later, in 1854, in his Xenia Orchidacea, he redescribed it and published a figure. The figure is so badly drawn that it is misleading.

The characters of Papperitzia were so obscure, however, that Bentham included it among his uncertain genera in the Genera Plantarum.

In Reichenbach's herbarium there are two specimens of Papperitzia, the original one which was collected by Leibold and a specimen collected by Kienast. Dr. Rudolph Schlechter had one specimen in his herbarium collected by H.Schenck. In the Ames Herbarium there are two specimens, one collected by Purpus and the other collected by Nagel & Juan G. [onzáles]. The latter specimen is also represented by flowers preserved in liquid.

The study of this more adequate material has made possible a fuller understanding of the genus, and consequently, it seems advisable to present an amplified description.

Papperitzia *Reichenbach filius* in Bot. Zeit. 10 (1852) 670; Xenia Orch. 1 (1858) 237, t. 100, figs. I, 1–5.

Small epiphytic herbs. Stems pseudobulbose. Pseudobulbs small, ancipitous, unifoliate. Leaves coriaceous, lateral under the pseudobulbs (usually one pair) and articulated, and also with a single leaf on the summit of

EXPLANATION OF THE ILLUSTRATION

PAPPERITZIA LEIBOLDII *Reichb.f.* 1, plant, natural size. 2, flower, oblique view, enlarged four times. 3, lip and column from the front, enlarged four times. 4, lip and column from the side, enlarged four times. 5, longitudinal section of lip and column to show sac.

Drawn from herbarium specimen and flowers preserved in liquid by GORDON W. DILLON.

PAPPERITZIA

Leiboldii Reichb. fil

the pseudobulb. Peduncles lateral, simple. Inflorescence racemose, few- to several-flowered; bracts small. Dorsal sepal free, hood-like, subcaudate. Lateral sepals connate to their apices, navicular, subcaudate. Petals free, similar to the dorsal sepal except flat, caudate. Lip fleshy, saccate at the base (but the sac ordinarily obscured by the sepals), with a trilobulate callus below partly enfolding the column and column-wings. Column short, auriculate-winged at the apex, footless; rostellum elongated; anther terminal, operculate, incumbent; pollinia two, ceraceous.

A rare monotypic genus.

1. **Papperitzia Leiboldii** *Reichenbach filius* in Bot. Zeit. 10 (1852) 670; Xenia Orch. 1 (1858) 237, t. 100, figs. I, 1–5, (very poor figures).

Leochilus Leiboldi Reichenbach filius in Linnaea 18 (1844) 404.

Range: Mexico (Vera Cruz and Oaxaca).

Mexico: *Kienast; Liebold; Nagel & Juan G[onzáles] 6050; Purpus 2125; Schenck.*

NOMENCLATORIAL NOTES XIII

BY

CHARLES SCHWEINFURTH

Erythrodes santensis *(Kränzl.) C. Schweinfurth comb. nov.*

Physurus santensis Kränzlin in Kungl. Svensk. Vet. Akad. Handl. 46 (1911) 39, t. 7, fig. 6.

Since *Physurus* L.C.Rich., a nomen nudum, is synonymous with *Erythrodes* Bl., the new combination is necessary.

It is evident that the artist's drawing (l.c.) represents the natural forcipate position of the apical arms of the lip, whereas in the forcibly expanded position these arms are reversed and assume a retrorsely lunate position.

A collection from Colombia appears to be referable to this species which was described from São Paulo, Brazil. These plants differ from the typical form in having broader leaves (up to about 20 mm. wide) and in having larger petals.

COLOMBIA: Intendencia El Chocó, in dense forest south of Río Condoto, between Quebrada Guarapo and Mandinga, at 120-180 meters altitude, April 22, 28, 1939, *E.P.Killip 35674.*

Malaxis liparidioides *(Finet) C. Schweinfurth comb. nov.*

Microstylis liparidioides Finet in Bull. Soc. Bot. France 55 (1908) 333, t. 10, figs. 1-10

As the concept *Microstylis* Nutt. ex Lindl. is synonymous with the earlier name *Malaxis* Soland. ex Sw., the new combination is required.

This species, which was described from Ecuador and Peru, is now recorded from Colombia.

COLOMBIA: Dept. El Valle, El Silencio, Yanaconas, at 1900-2200 meters altitude, terrestrial in dense forest, flowers green with white lip, February 28, 1939, *E.P.Killip & Hernando Garcia 33775.*

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THE GENUS PONERA

BY

DONOVAN S. CORRELL

IN 1831, John Lindley proposed the genus *Ponera* based on *P. juncifolia*, a Mexican plant. Later, in 1842, he described a second species of the genus, *P. striata*, and stated that this concept evidently belonged to the "... rare and little known genus Ponera, ..." The genus is still comparatively "little known," although the widespread *P. striata* is fairly common.

In 1838, Knowles and Westcott proposed the genus *Nemaconia* based on *N. graminifolia*. This species is apparently the same as *Ponera juncifolia*. Lindley recognized the genus *Nemaconia* as congeneric with *Ponera* and in 1839 he combined them. However, he retained the specific epithet, *graminifolia*, proposed by Knowles and Westcott.

In the present paper six species are recognized as components of the genus *Ponera: P. glomerata, P. juncifolia, P. longipetala, P. macroglossa, P. striata* and *P. subquadrilabia*. *Ponera striata* is widespread and rather common. It occurs from Mexico to Costa Rica, and also in Venezuela and Brazil. The other five species are apparently restricted to Mexico or Guatemala, or occur in both countries. All of the species seem to grow at high elevations, usually above one thousand meters altitude. One of the six species, *P. macroglossa*, is of doubtful status. Three

others, *P. glomerata*, *P. longipetala* and *P. subquadrilabia*, are here proposed as new. These three species have in the past been erroneously included in *P. striata*.

A number of species have been described in the genus *Ponera* which subsequently have been correctly referred to the genera *Scaphyglottis* and *Neo-Urbania*. To make the present study complete, all of the concepts correctly proposed for the genus *Ponera* and also those which have at one time or another been wrongly attributed to this genus have been included with full synonymy. In this connection, it was necessary to make several new combinations and to propose several reductions.

It was impossible to arrive at satisfactory conclusions concerning several of the concepts which have been proposed; namely *P. pellita*, *P. pleurostachys* and *P. inconspicua*. Consequently, these have been included at the end of the paper as doubtful species.

Ponera *Lindley* Gen. & Sp. Orch. Pl. (1831) 113; in Bot. Reg. 28 (1842) Misc. p. 19.

Nemaconia Knowles & Westcott Flor. Cab. 2 (1838) 127.

Epiphytic or rock-inhabiting plants with creeping rhizomes. Stems leafy on the upper part, slender or robust, terete, reed-like, never pseudobulbous, simple or sometimes branching. Leaves six or more, alternate, distichous, linear or narrowly lanceolate. Inflorescence or inflorescences composed of short or subsessile racemes or a solitary flower, sometimes glomerate or fasciculate, terminal or opposite the leaf axils at the nodes of the defoliated stem. Sepals about equal; dorsal sepal free; lateral sepals with the broad base adnate to the foot of the column to form a mentum under the lip. Petals longer than or about equal to the dorsal sepal, somewhat narrower, more or less decurrent on the column. Lip subarticulated

to the apex of the column-foot; lamina arcuate-recurved and spreading, nearly entire to deeply emarginate at the apex, simple or three-lobed. Column short, stout, wingless, produced into a foot at the base; anther terminal, operculate, incumbent; pollinia four, equal, waxy, laterally compressed. Capsule ellipsoidal.

The generic name is taken from the Greek, meaning "wretched, vile," in allusion to the starveling appearance of the type species—*Ponera juncifolia.*

KEY TO THE SPECIES

Plants small, grass-like; stem less than 2 mm. in diameter; leaves linear, less than 3 mm. broad; inflorescence a terminal 2-3-flowered raceme; lip distinctly 3-lobed

2. *P. juncifolia*

Plants rather large, reed-like; stem more than 2 mm. in diameter; leaves narrowly lanceolate, tapering to the apex, more than 4 mm. broad; inflorescences composed of solitary flowers or few-flowered subsessile racemes or glomerules, both terminal and lateral; lip simple, not distinctly 3-lobed

Inflorescences composed of dense, stalked glomerules; flowers nearly concealed by the densely imbricated bracts

1. *P. glomerata*

Inflorescences composed of a solitary flower or several clustered flowers; flowers completely exposed, not concealed by the bracts

Lip rhombic-ligulate, tapering to a narrow retuse apex

4. *P. macroglossa*

Lip cuneate or subquadrate, not tapering to a narrow apex

Petals much longer than the dorsal sepal; sepals and ovary densely verrucose; leaf-sheaths smooth; plants normally branching

3. *P. longipetala*

Petals about as long as the dorsal sepal; sepals and ovary smooth; leaf-sheaths densely verruculose; plants normally unbranched

Inflorescences subtended by several large clasping, imbricated bracts; flowers essentially sessile, clustered; lamina of the lip typically oblong-cuneate, thin

5. *P. striata*

Inflorescences subtended by inconspicuous bracts; flowers pedunculate; lamina of the lip subquadrate, fleshy-thickened

6. *P. subquadrilabia*

1. **Ponera glomerata** *Correll sp. nov.*

Herba caespitosa. Caulis robustus, arundinaceus, teres, supra foliosus, foliorum vaginis arcte adpressis omnino celatus. Folia disticha, lineari-lanceolata, membranacea vel subcoriacea, vaginis articulata; vaginae laeves, non verruculosae, cicatrix prominens, persistens. Inflorescentiae glomeratae, terminales vel in caulis parte inferiore defoliata oppositifoliae; glomeruli breviter pedunculati, in floribus pluribus sessilibus et bracteis numerosis dense imbricantibus consistentes; bracteae membranaceae, in fibras numerosas solutae. Flores inflorescentiae bracteis fere obtecti, perianthii segmenta carnosa. Sepalum dorsale ovato-ellipticum, concavum, obtusum. Sepala lateralia oblique triangularia, obtusa, concava, columnae pedi adnata et mentum conspicuum formantia. Petala oblongo-elliptica, apice late rotundata. Labellum columnae pedi leviter articulatum, in positu naturali late obovato-flabellatum, expansum obcordato-subquadratum, emarginatum cum lobulis rotundatis. Columna brevis, apice trilobulata, basi in pedem latum elongatum producta.

Plant caespitose, stout, coarse, up to 1.5 m. tall, with numerous coarse fibrous roots which are densely tomentose. Stem robust, reed-like, terete, 6–8 mm. in diameter, leafy above, concealed by closely appressed leaf-sheaths, vernicose when exposed. Leaves distichous, articulated to the leaf-sheaths, narrowly lanceolate, obliquely retuse at the apex, firmly membranaceous or subcoriaceous, grass-green above, paler beneath, 8–25 cm. long, 1–1.8 cm. wide; leaf-sheaths smooth, not verrucose; leaf scar prominent, persistent, about 1.5 mm. wide. Inflorescences composed of glomerules, terminal or opposite the leaf axils at the nodes along the defoliated lower part of the stem; glomerules short-stalked, up to 2.5 cm. long and 2 cm. in diameter, consisting of several sessile flowers

and numerous densely imbricated bracts; bracts of the glomerules fibrous-membranaceous, disintegrating into numerous fibres. Flowers small, with short stout ovaries which are nearly concealed by the bracts of the inflorescence, the floral segments very fleshy-thickened and connivent. Dorsal sepal broadly ovate-elliptic, obtuse, concave, about 8 mm. long and 5.5 mm. wide below the middle. Lateral sepals obliquely triangular, obtuse, concave, about 8 mm. long and 7 mm. wide across the base, adnate to the column-foot to form a prominent mentum. Petals oblong-elliptic, broadly rounded at the apex, slightly oblique, about 9 mm. long and 4.5 mm. wide. Lip densely covered with minute papillae, subarticulated to the column-foot, strongly arcuate-recurved in natural position with the lower half of the margins upturned to form a channel, broadly obovate-flabellate in natural position, deeply emarginate with the lobules rounded, obcordate-subquadrate when spread out, about 9 mm. long and 7 mm. wide near the apex. Column short, stout, less than 3.5 mm. long, 3-lobulate at the apex, with the middle lobule incurved over the anther, produced at the base into a broad elongated foot; column-foot as long as or longer than the column, strongly sulcate, about 3.5 mm. long, forming with the column a deep saddle. Capsule suborbicular-ellipsoidal, about 1 cm. long.

The large glomerules at once distinguish this species from *P. striata*, its nearest ally. The smooth, not verrucose, leaf-sheaths also distinguish it from that species. Although the lip is not unlike that of some forms of *P. striata*, the floral segments are much fleshy-thickened rather than thin. The leaves are usually larger than those of *P. striata*.

Ponera glomerata has been found only in Mexico and Guatemala.

Mexico: Chiapas, Hunkanal auf Eichbaümen, March 30, 1896,

Caec. et Ed. Seler 2604 (Herb. Ames); Chiapas, E. of Comitán, on old oak trees above Sta. María de los Arcos, in forest, 1500 meters alt., April 1, 1936, *Otto Nagel 5654* (TYPE in Herb. Ames No. 52257).

GUATEMALA: Chimaltenango, pine forest, Cerro de Tecpám, region of Santa Elena, 2400-2700 meters alt., December 26, 1938, *P. C. Standley 60925* (Herb. Field Museum); Quezaltenango, on trees along forested ravine, leaves stiff, firmly subcoriaceous, grass-green above, paler beneath, Volcán Santa María, between Santa María de Jesús, Los Mojadas, and summit of volcano, 1500-3000 meters alt., January 12, 1940, *J. A. Steyermark 33962* (Herb. Field Museum); Sacatepequez, origin near San Juan, about 1700 meters alt., 1933, *Margaret W. Lewis 85* (Herb. Ames).

2. **Ponera juncifolia** *Lindley* Gen. & Sp. Orch. Pl. (1831) 114.

Nemaconia graminifolia Knowles & Westcott Flor. Cab. 2 (1838) 127.

Ponera graminifolia Lindley in Bot. Reg. 25 (1839) Misc. p. 17.

This species is outwardly distinguishable from all other species of *Ponera* by its weak, slender stem, its narrowly linear, grass-like leaves and its distinctly 3-lobed lip.

Lindley, in comparing *P. graminifolia* with *P. juncifolia*, wrote: "Having received flowers of it from Mr. Barker, I find that it agrees in every essential particular with the structure of *P. juncifolia*; so nearly indeed that, if the leaves of the two were not very different, some doubt might be entertained of their being specifically different."

Lindley evidently did not see the leaves of *P. graminifolia* since he said that only the flowers were sent to him by Barker. He probably relied on the description of the species for his reference to the leaves. We have not found this supposed leaf difference to be of specific value.

The leaves of *P. juncifolia* were described as subulate, canaliculate and secund, whereas those of *P. graminifolia* were described as linear. The leaf-sheaths of both have been described by Reichenbach, Lindley and others as

being dusky papillose, minutely verrucose or "arpophyllaceo-punctulatae." An examination of a photograph of *P. juncifolia* from the Lindley Herbarium shows the leaves to be narrowly linear as described for *P. graminifolia.*

SPECIMENS EXAMINED:

MEXICO: Guerrero, near Santa Rosa, S. W. of Chilpancingo, on tree trunks, fls. pale salmon color, lip callus orange, 2200 meters alt., October 12, 1933, *Juan G. 1712* (Herb. Ames); District of Temascaltepec, near Cajones, 2480 meters alt., November 11, 1932, *G. B. Hinton 2346* (Herb. Ames); District of Temascaltepec, Cajones, 2480 meters alt., November 7, 1932, *G. B. Hinton 2369* (Determined by the staff at Kew) (Herb. Ames); Vera Cruz, region of Naolinco, toward Coacohuacintla, on tree trunk, fls. pale pinkish yellow, lip orange, 1800 meters alt., November 12, 1935, *Otto Nagel & Juan G. 4721* (Herb. Ames).

3. **Ponera longipetala** *Correll sp. nov.*

Herba multo ramosa. Caulis primarius et ei ramorum graciles, arundinacei, subteretes, supra foliosi, vaginis arcte adpressis obtecti. Folia disticha, lineari-lanceolata, membranacea, vaginis articulata; foliorum vaginae laeves, non verruculosae, vernicosae, leviter complanatae. Inflorescentia in ramis terminalis, sessilis, racemosa, dense pauciflora, bracteis pluribus imbricatis ornata. Flores sessiles, carnosi, cum ovariis brevibus dense verrucosis. Sepala carnosissima, extus dense verrucosa, apice obtuso multo incrassata. Sepalum dorsale oblongo-subquadratum. Sepala lateralia oblique triangulari-ovata, columnae pedi adnata et mentum conspicuum formantia. Petala sepalis multo longiora, oblongo-elliptica, apice late rotundata vel subtruncata. Labellum columnae pedi leviter articulatum, expansum oblongo-subquadratum, emarginatum. Columna crassa, basi in pedem latum elongatum producta.

Plant much branched, the branches up to 6 dm. long, with large coarse roots up to 1 cm. in diameter. Main stem and stems of the branches slender, reed-like, nearly

terete, 2–3 mm. in diameter, leafy above, concealed by closely appressed leaf-sheaths, somewhat vernicose when exposed. Leaves distichous, articulated to the leaf-sheath, narrowly lanceolate, obliquely bidentate at the apex, firmly membranaceous, 5–15 cm. long, 4–7 mm. wide; leaf-sheaths smooth, not verruculose, tan, vernicose, somewhat compressed. Inflorescence terminal on the branches, composed of a sessile compact few-flowered raceme, subtended by several dark brown membranaceous imbricated bracts. Flowers sessile, fleshy-thickened, with short densely verrucose ovaries. Sepals very fleshy-thickened, densely and coarsely verrucose on the outer surface. Dorsal sepal oblong-subquadrate, obtuse and much thickened at the apex, 7.5 mm. long, 5 mm. wide. Lateral sepals obliquely triangular-ovate, obtuse and much thickened at the apex, 8–9 mm. long, 6 mm. wide across the broad base, adnate to the elongated column-foot to form a prominent mentum. Petals oblong-elliptic, narrowed below the middle, subtruncate to broadly rounded at the apex, 7-nerved, 10 mm. long, 4.5 mm. wide. Lip subarticulated to the column-foot, strongly arcuate-recurved in natural position, oblong-subquadrate when spread out, broadest at the base of the lamina, emarginate, 1–1.1 cm. long including the short narrow claw, 7.2 mm. wide across the basal portion. Column stout, 4 mm. long, produced at the base into a broad elongated foot; column-foot 3.5 mm. long.

Ponera longipetala differs from *P. subquadrilabia*, its nearest ally, in the larger, sessile (not pedunculate) flowers, the longer petals which exceed the sepals, and in the densely verrucose sepals and ovaries. The plants of *P. subquadrilabia* are unbranched, whereas *P. longipetala* is much branched. The two species also differ in their leaf-sheaths. The leaf-sheaths of *P. longipetala* are smooth while those of *P. subquadrilabia* are densely verruculose.

Ponera longipetala is the only *Ponera* which is normally branched. We have seen a collection of *P.striata* (*Lundell 1102* from Mexico in Herb. Ames Nos. 4369, 38055) with a branched stem which was due to an injury.

Mexico: Guerrero, pine-oak forest near Jaleaca, epiphyte, 2000 meters alt., April 9, 1936, *Otto Nagel & Juan G. 3252* (Type in Herb. Ames No. 52256).

4. **Ponera macroglossa** *Reichenbach filius* in Bot. Zeit. 10 (1852) 639.

Scaphyglottis macroglossa Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 457.

Reichenbach stated that this species is allied to and resembles in habit *P. striata.* The flowers, which were said to be borne solitary or in fascicles along the stem, have a lip which was described as: ". . . rhombeo ligulato apice bilobulo." Reichenbach's illustration (Xen. Orch. 1 (1854) t. 19, fig. 12) shows a lip which approaches being rhombic-lanceolate with a tapering apical portion. In keying out the species of *Ponera* in Walp. Ann. 6 (1862) 450–454, Reichenbach placed *P. macroglossa* in the "Ebulbes distichifoliae" section. However, in spite of this, Schlechter later transferred this species to the genus *Scaphyglottis*, which, if this transfer were correct, would place the species in Reichenbach's "Pseudobulbosae" section.

It is reasonable to suppose that if it were possible to examine the type of *P. macroglossa*, it might prove to be a variety of *P. striata.* However, for the time being, it seems best to recognize *P. macroglossa* with some doubt as to its true status. It has been collected only in Guatemala.

5. **Ponera striata** *Lindley* in Bot. Reg. 28 (1842) Misc. p. 18-19.

?*Ponera punctulata* Reichenbach filius in Walp. Ann. 6 (1862) 451.

Ponera australis Cogniaux in Martius Fl. Bras. 3, pt. 5 (1898) 9, t. 5.

Ponera geraensis Rodrigues in Contr. Jard. Bot. Rio de Janeiro 4 (1907) 103, t. 23, fig. C.

Sobralia polyphylla Kränzlin in Vidensk. Medd. fra Dansk. Naturh. Foren. 71 (1920) 173.

This species is easily distinguished by the large bracts which subtend the sessile inflorescences, both terminal and lateral. The flowers, which are variable in size, are rather thin in texture and are usually marked with bright purple, light reddish brown or violet stripes. The lip is provided with a short claw and is typically cuneate-oblong and deeply emarginate. However, the lip may vary somewhat in shape, often being pandurate-cuneate with the lateral margins sigmoid, or may even appear to be shallowly 3-lobed when the upcurved margins of the basal portion are spread out.

Lindley, in describing *P. striata*, wrote: "When old the stems become leafless, are closely covered with rugged sheaths, and produce here and there from their axils clusters of two or three sessile flowers, . . . both sepals and petals being striped with bright reddish-brown. . . . The labellum is wedge-shaped, slightly downy, curved downwards in the middle, and two-lobed at the apex."

Ponera punctulata would seem to be referable to this concept. Reichenbach said that the flowers were about equal to those of *P. striata* but were greenish white with many dark violet spots instead of being striped with reddish brown. Reichenbach further stated that the lip of *P. punctulata* was cuneate, dilated and retuse at the apex, and obscurely 3-lobed in front of the base. As pointed out above, it is possible to produce a 3-lobed effect with the lip of some specimens of *P. striata* if the basal margins are spread out.

Cogniaux's plate showing *P. australis* is what we con-

sider to be an excellent illustration of typical *P. striata*. He described and illustrated the lip of the flowers of *P. australis* as being ligulate-spatulate, deeply emarginate at the apex, and slightly constricted about the middle. The habit of the plant as shown in the illustration is more or less typical of all the species of Ponera, except *P. juncifolia*, and shows along the naked stem lateral clusters of sessile flowers subtended by large bracts.

Rodrigues wrote as follows concerning *P. geraensis*: "Les feuilles et les fleurs sont plus petites que le *P. australis*, et sont blanches, ayant les divisions lignées et veinées de violet." As is evident from his illustration the flowers of *P. geraensis* resemble rather closely those of *P. striata*. The lip, as he stated, is oblong, narrowed at the base and deeply emarginate at the apex. He also stated that the lip was about 3 mm. wide at the base and about 6 mm. wide at the apex, measurements which would seem to indicate a cuneate shape. Except for the statement that the flowers were fleshy and pedicellate, the description he gives of the plant proves that it is vegetatively similar to *P. striata*.

Rodrigues' measurements are palpably erroneous in part. For example, he gives the leaf measurements as 12–13 mm. long and 8 mm. wide and the lip measurements as 11 mm. long and 6 mm. wide at the apex and 3 mm. wide at the base. According to these measurements, the lip of the flowers and the leaves of his plant are about equal in length. His illustration, however, disproves this. The leaf illustrated is as long as those of typical *P. striata*.

Kränzlin described *Sobralia polyphylla* from very poor and inadequate material, with the result that he placed the plant in an entirely different subtribe, the Sobralieae, instead of in the Ponereae where it properly belongs. He wrote: "Labellum e basi cuneata dilatatum, oblon-

gum, basi lineis subparallelis percursum. . . . " It would seem from this description that the lip is comparable to that of *P. striata*. Williams (in Bot. Mus. Leafl. Harvard Univ. 7 (1939) 184), who has seen the type specimen of *Sobralia polyphylla*, says that it is unquestionably *Ponera striata*.

This species is widespread and rather common in Mexico, Guatemala, British Honduras, Honduras, Salvador, Costa Rica, Venezuela and Brazil. It has been found from 790 to 1300 meters altitude.

SPECIMENS EXAMINED:

MEXICO: Vallée de Cordova, January 10, 1866, *M. Bourgeau 1766* (in part) (Herb. Ames); Yucatan, Tuxpeña, Campeche, December 20, 1931, *C. L. Lundell 1102* (Herb. Ames, Gray Herb., Herb. N.Y. Bot. Gard., U.S. Nat. Herb.).

GUATEMALA: Amatitlán, February 11, 1905, *W. A. Kellerman 4556* (U.S. Nat. Herb.); Guatemala, near Guatemala City, purchased from an Indian, flowers small, greenish yellow with red nerves, February 12, 1933, *Margaret W. Lewis 71* (Herb. Ames); Guatemala, Laguna del Naranjo, February 1923, 1490 m. alt., *G. Salas 201* (U. S. Nat. Herb.); Petén, epiphyte, Vaxactun, March 22, 1931, *H. H. Bartlett 12277* (Herb. Ames); San Marcos, pendent epiphyte, stems obliquely descending or pendent, leaves firmly chartaceous, shining and grass-green above, pale green beneath, Finca El Porvenir, along Río Cabus above Potrero Matasán, Volcán Tajumulco, 1000-1300 meters alt., March 2, 1940, *J. A. Steyermark 37607* (Herb. Field Museum); San Martín-Jilotepeque, greenish flowers, two lateral petals with purple stripes, January 29, 1939, *J. R. Johnston 1416* (Herb. Ames); Zacapa, epiphyte on tree, rich forested slopes in deep ravine along Río Lima, Sierra de las Minas, between Río Hondo and summit of mountain at Finca Alejandria, 1500-1700 meters alt., October 11, 1939, *J. A. Steyermark 29609* (Herb. Field Museum).

BRITISH HONDURAS: El Cayo District, bank of Belize River, epiphyte, February 13, 1938, *P. H. Gentle 2233* (Herb. Ames); Maskall Pine Ridge, January 1934, *P. H. Gentle 1097* (Herb. Ames, Gray Herb., N.Y. Bot. Gard.); Stann Creek Valley, Mountain Cow Ridge, in high ridge on hill top, on tree, March 2, 1940, *P. H. Gentle 3243* (Herb. Ames).

SALVADOR: Dept. de La Libertad, on tree trunk, vicinity of Santa Tecla, 790-950 meters alt., April 10, 1922, *P. C. Standley 23007* (Herb. Ames, Herb. N. Y. Bot. Gard., U. S. Nat. Herb.); Dept. de La

Libertad, Santa Tecla, March 1923, *S. Calderón 1538* (Herb. Gray, U.S. Nat. Herb.).

Honduras: Dept. of Comayagua, Siguatepeque, epiphyte, dense tropical forest, sepals light green with lavender stripes running vertically, petals and lip white with very few lavender stripes, column white, March 29, 1933, *J.B. Edwards 394* (Herb. Ames).

Costa Rica: Peralta (in cultivation at Las Cóncavas), flowers hyaline, streaked with pink-purple, November 9, 1924, *C. H. Lankester 955* (Herb. Ames); Peralta, on upper branches of Anacardium, stems more than 1 meter tall seen, *C.H. Lankester 916* (Herb. Ames).

Venezuela: prope coloniam *Tovar*, 1854-5, *A. Fendler 1456* (Herb. Gray).

Brazil: Serra Negra, Sao Paulo, cult. particular, January 2, 1928, *F.C. Hoehne 22261* (Herb. N. Y. Bot. Gard.); *Sellow 5342* [Det. as *P. australis* by Cogniaux] (Herb. Ames); Minas Geraes, 1861, *A. F. Regnell III 1193* (U.S. Nat. Herb.).

6. **Ponera subquadrilabia** *Correll sp. nov.*

Herba caespitosa. Caulis gracilis, arundinaceus, teres, supra foliosus, foliorum vaginis arcte adpressis obtectus. Folia disticha, lineari-lanceolata, membranacea, vaginis articulata; foliorum vaginae dense verruculosae. Inflorescentia vel panicula brevis pauciflora terminalis vel flores singuli aut bini in caulis parte inferiore defoliata oppositifolii; flores bracteis pluribus inconspicuis membranaceis infra ornati; bracteae amplexicaules, verruculosae. Sepala carnosa, concava, obtusa vel acuta; sepalum dorsale ovali-ellipticum vel suborbiculari-ovale; sepala lateralia oblique triangularia vel suborbiculari-ovata, columnae pedi adnata et mentum conspicuum formantia. Petala oblongo-elliptica vel ovalia, apice rotundata. Labellum columnae pedi leviter articulatum, pulvillo carnoso ante unguem brevem donatum; lamina subquadrato-ovata, emarginata, basi plusminusve truncata. Columna crassa, apice obtuse tridentata, basi in pedem latum elongatum producta.

Plant caespitose, 1.5–8.5 dm. tall, from a short rhizome with large coarse roots. Stem slender, reed-like,

terete, 2–3 mm. in diameter, leafy above, concealed by closely appressed leaf-sheaths, vernicose when exposed. Leaves distichous, articulated to the leaf-sheaths, narrowly lanceolate, obliquely bidentate at the apex, firmly membranaceous, occasionally verrucose, 6–14 cm. long, 5–10 mm. wide; leaf-sheaths densely verruculose, when deciduous leaving a reddish brown ring at the point of attachment. Inflorescence or inflorescences a short terminal crowded several-flowered paniculate raceme or 1–2 flowers arising opposite the leaf axils at the nodes along the defoliated lower part of the stem; raceme up to 3 cm. long, subtended by several inconspicuous membranaceous imbricated bracts, the bracts and peduncle verruculose; individual peduncles of the flowers 4–5 mm. long. Floral bracts amplexicaul, ovate-cucullate, acute, verruculose, 2–3 mm. long. Flowers small, fleshy, with short stout ovaries. Sepals fleshy, smooth or somewhat corrugated and apparently vernicose on the outer surface. Dorsal sepal oval-elliptic to suborbicular-oval, subobtuse to acute, concave, 6–6.5 mm. long, 4–5 mm. wide. Lateral sepals obliquely triangular to suborbicular-ovate, obtuse to acute, concave below, recurved at the apex, 6–7 mm. long, 5.5–7 mm. wide across the broad base, adnate to the column-foot to form a prominent mentum. Petals oblong-elliptic to broadly oval, rounded and usually somewhat apiculate at the apex, slightly oblique, 3–5-nerved, minutely ciliolate-erose on the apical margin or nearly entire, 5.5–6.2 mm. long, 3–3.8 mm. wide, noticeably decurrent on the column. Lip subarticulated to the column-foot, strongly arcuate-recurved in natural position, with a distinct slender claw, minutely ciliolate on the under surface, provided with a fleshy cushion just in front of the claw, 7–8 mm. long including the claw; lamina 6–8 mm. wide across the base, subquadrate-ovate, emarginate, entire or crenulate above the middle, the veins

often fleshy-thickened, truncate or nearly so at the base. Column short, stout, obtusely 3-toothed at the apex, 4 mm. long, produced at the base into a broad elongated foot; column-foot 4–4.5 mm. long.

This species is best distinguished from *P. striata*, with which it has been confused, by the distinctly pedunculate fleshy-thickened flowers which are subtended by small inconspicuous bracts instead of large bracts as in *P. striata*. Furthermore, the flowers are marked with dull purple, whereas those of *P. striata* are marked with bright purple or lavender. The lip which is provided with a slender claw has a subquadrate lamina. The lamina is truncate or subtruncate at the base rather than cuneate-oblong as in *P. striata*.

Mexico: Chiapas, forests above Santa María de los Arcos, E. of Comitán, on oak trees, fls. tawny with violet stripes and designs, about 1500 meters alt., October 24, 1938, *Otto Nagel 4469* (Herb. Ames); Chiapas, oak-pine-Liquidambar forests on shore of Lake Montecello, epiphyte in humid forest, fls. yellow-green with heavy dull purplish marks and veins, 1350 meters alt., March 1935, *Otto Nagel 4482* (Herb. Ames); Chiapas, mountain forests above Hacienda Santa María de los Arcos, on old oak trees, E. of Comitán, fls. dull yellowish with dull purplish streaks and veins, 1450 meters alt., November 20, 1937, *Otto Nagel 5655* (Herb. Ames); Pueblo, near Necaxa, fls. yellow-green with dull purplish veins, about 1000 meters alt., September 21, 1933, *Erik Hultén 1467* (Herb. Ames); Vera Cruz, on old walls and cliffs, near Orizaba, January 23, 1895, *C. G. Pringle 5919* (Type in Herb. Ames No. 3491); Vera Cruz, near Jalapa, 1400 meters alt., September 29, 1933, *Erik Östlund 1466* (Herb. Ames); Vera Cruz, Mt. San Cristobal, S. W. of Orizaba, very humid mixed forest, on trees, fls. yellow-green with dull purplish veins and marks, 1500 meters alt., October 12, 1933, *Otto Nagel 2522* (Herb. Ames); Vera Cruz, Zacuapán, March 1913, *C. A. Purpus 6454* (Herb. Ames); Vera Cruz, Zacuapán, January 1913, *C. A. Purpus 6623* (Herb. Gray, U. S. Nat. Herb.); Vera Cruz, on trees, Zacuapán, November, *C. A. Purpus 10502* (U.S. Nat. Herb.); Vallée de Cordova, January 10, 1866, *M. Bourgeau 1766* (in part) (Herb. Ames, U.S. Nat. Herb.).

Excluded Species

In so far as we have been able to ascertain, the following citations include all of the concepts originally proposed for the genus *Ponera*, or wrongly attributed to that genus, which have subsequently been transferred to other genera. It has been impossible to study critically all of the species cited. However, it is very probable that when the North and South American species of *Scaphyglottis* are considered as a whole and are thoroughly investigated, a number of the present concepts will prove to be untenable.

Ponera *Reichenbach filius* in Walpers Ann. 6 (1862) 452, *sect. B* = **Scaphyglottis**.

Neo-Urbania adendrobium *(Reichb.f.) Fawcett & Rendle* in Journ. Bot. 47 (1909) 125.

Ponera adendrobium Reichenbach filius in Flora 48 (1865) 278.

Pleuranthium adendrobium Bentham & Hooker filius ex Jackson Index Kew. 3 (1895) 563.

Camaridium parviflorum Fawcett & Rendle in Urban Symb. Antill. 1 (1900) 472.

Cuba and Jamaica.

Scaphyglottis affinis *Poeppig & Endlicher* Nov. Gen. ac Sp. Pl. 1 (1836) 59, t. 99A.

Ponera conferta Reichenbach filius in Bonpl. 2 (1854) 22 (pro parte).

Brazil.

Scaphyglottis amethystina *(Reichb.f.) Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 456.

Ponera amethystina Reichenbach filius in Saunders Refug. Bot. 2 (1869) t. 93.

Guatemala, Costa Rica and Honduras.

Scaphyglottis Behrii *(Reichb.f.) Bentham & Hooker filius ex Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 219.

Ponera Behrii Reichenbach filius in Bonpl. 3 (1855) 220.

Ponera albida Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 103.

Scaphyglottis guatemalensis Schlechter in Fedde Repert. 2 (1906) 133.

Scaphyglottis pauciflora Schlechter in Fedde Repert. 3 (1906) 47.

Scaphyglottis albida Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 456.

Scaphyglottis Sanctae Martae Schlechter in Fedde Repert. Beih. 7 (1920) 122.

Scaphyglottis Bradeorum Schlechter in Fedde Repert. Beih. 19 (1923) 113.

Guatemala, British Honduras, Costa Rica and Panama.

Scaphyglottis bilineata *(Reichb.f.) Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 456.

Ponera bilineata Reichenbach filius Beitr. Orch. Centr.-Am. (1866) 88.

Costa Rica.

Scaphyglottis caricalensis *(Kränzl.) Correll comb. nov.*

Ponera caricalensis Kränzlin in Notizbl. Bot. Gart. Berl. 7 (1920) 425.

The column of *Ponera caricalensis* was described as being slender and lobulate-winged on each side above, characters attributed to the genus *Scaphyglottis* but not to the genus *Ponera*. The column of the species of *Ponera* is short, thick and wingless. Kränzlin also stated that the middle of the stem of his plant was lightly fusiform, a character which is lacking in the genus *Ponera*. The

flowers are described as pale yellow, suffused with brown. This species was collected in Colombia.

Scaphyglottis conferta *Poeppig & Endlicher* Nov. Gen. ac Sp. Pl. 1 (1836) 59, t. 100.

Ponera conferta Reichenbach filius in Bonpl. 2 (1854) 22 (ex parte).

Brazil.

Scaphyglottis esuriens *(Reichb.f.) Schlechter* in Fedde Repert. Beih. 7 (1920) 242.

Ponera esuriens Reichenbach filius in Allg. Gartenz. 24 (1856) 98.

"Colombia."

Scaphyglottis Felskyi *(Reichb.f.) Schlechter* in Fedde Repert. Beih. 6 (1919) 66.

Ponera Felskyi Reichenbach filius in Linnaea 41 (1876) 85.

Venezuela.

Scaphyglottis graminifolia *Poeppig & Endlicher* Nov. Gen. ac Sp. Pl. 1 (1836) 59, t. 99B.

Ponera conferta Reichenbach filius in Bonpl. 2 (1854) 22 (pro parte).

Peru and Brazil.

Scaphyglottis Kienastii *(Reichb.f.) Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 219.

Ponera Kienastii Reichenbach filius in Gard. Chron. n.s., 7 (1877) 810.

Mexico.

Scaphyglottis leucantha *Reichenbach filius* in Linnaea 22 (1849) 856.

Ponera leucantha Reichenbach filius in Bonpl. 2 (1854) 22.

Venezuela.

Scaphyglottis livida *(Lindl.) Schlechter* in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 457.

Isochilus lividum Lindley in Bot. Reg. 25 (1839) Misc. p. 36.

Isochilus dubius A. Richard & Galeotti in Ann. Sci. Nat. ser. 3, 3 (1845) 23.

Ponera dubia Reichenbach filius in Bonpl. 4 (1856) 327.

Scaphyglottis dubia Bentham & Hooker filius ex Hemsley in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 219.

Pachystele dubia Schlechter in Fedde Repert. Beih. 19 (1923) 114.

Mexico, Guatemala and Honduras.

Scaphyglottis mesocopis *(Endr. & Reichb.f.) Bentham & Hooker filius ex Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 3 (1883) 220.

Ponera mesocopis Endres & Reichenbach filius in Xen. Orch. 2 (1874) 222, t. 200.

Scaphyglottis Powellii Schlechter in Fedde Repert. Beih. 17 (1922) 28.

An examination and comparison of the plate of *Ponera mesocopis* with a drawing and analysis of *Scaphyglottis Powellii*, made under the supervision of Schlechter, reveal no characters whereby they may be kept separate.

Costa Rica and Panama.

Scaphyglottis modesta *(Reichb.f.) Schlechter* in Fedde Repert. 23 (1926) 46.

Tetragamestus modestus Reichenbach filius in Bonpl. 2 (1854) 21.

Ponera modesta Reichenbach filius in Linnaea 41 (1876) 85.

The West Indies, Venezuela, British Guiana and Brazil.

Scaphyglottis prolifera *(R.Br.) Cogniaux* in in Martius Fl. Bras. 3, pt. 5 (1898) 15.

Isochilus prolifer R. Brown in Aiton Hort. Kew. ed. 2, 5 (1813) 209.

Isochilus proliferum Lindley Gen. & Sp. Orch. Pl. (1831) 113 (excl. syn. Sw.).

Ponera prolifera Reichenbach filius in Bonpl. 2 (1854) 22.

Scaphyglottis cuneata Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 398.

Tetragamestus gracilis Schlechter in Beih. Bot. Centralbl. 36, Abt. 2 (1918) 400.

Ponera mapiriensis Kränzlin in Fedde Repert. 25 (1928) 22.

An examination of drawings and analyses made under the supervision of Schlechter of the types of *Scaphyglottis cuneata* and *Tetragamestus gracilis*, and a comparison of descriptions show that there is no essential difference between these two concepts and that of *S. prolifera*.

An examination of sheets of the type collection in the Herbarium of the New York Botanical Garden and in the United States National Herbarium shows that *Ponera mapiriensis* is referable to this species.

Guatemala, Honduras, the West Indies, Bolivia, Colombia, Venezuela, British Guiana and Brazil.

Scaphyglottis stellata *Loddiges ex Lindley* in Bot. Reg. 25 (1839) Misc. p. 44.

Ponera stellata Reichenbach filius in Walpers Ann. 6 (1862) 454.

British Guiana and Brazil.

Scaphyglottis striolata *(Reichb.f.) Correll comb. nov.*

Ponera striolata Reichenbach filius in Linnaea 41 (1876) 39.

Reichenbach described the stem of *P. striolata* as "... caulibus clavato fusiformibus diphyllis, . . .," characters which are attributed to the genus *Scaphyglottis* but lacking in the genus *Ponera*. Later (l.c., p. 85) he stated that *Ponera Felskyi*, which is decidedly a *Scaphyglottis*, was closely related to *P. striolata*. The flowers of *S. striolata* are described as white with violet stripes. The native habitat of this species was not given.

Scaphyglottis violacea *Lindley* in Bot. Reg. 22 (1836) t. 1901.

Cladobium violaceum Lindley Introd. Nat. Syst. Bot. ed. 2 (1836) 446.

Scaphyglottis rosea Hooker Icon. Pl. 4 (1841) t. 313.

Ponera violacea Reichenbach filius in Bonpl. 2 (1854) 22.

Ponera rosea Reichenbach filius in Bonpl. 2 (1854) 22.

Venezuela, British Guiana and Brazil.

Doubtful Species

Ponera pellita *Reichenbach filius* in Gard. Chron. n.s., 14 (1880) 8.

Reichenbach, in describing this species, wrote: "A highly curious botanical plant. It has on the whole the shape of an Arundina, as Mr. B. S. Williams well observes. The shoots may be compared to Palm leaves. They have brown sheaths, which, when decayed, fall off, leaving nothing but a dark brown ring at the base under the naked green joint of the stem, shining like bamboo. The leaves are from 5 inches long by $\frac{1}{2}$-$\frac{1}{4}$ inch wide, linear, bidentate. The small flowers, equal to those of Ponera striata, are terminal—perhaps also sometimes lateral, as in the just-mentioned species. They are much like those of a small Maxillaria. It is covered outside on the sepals and ovary with stiff hairs, just as in some Eria of the Trichotosia

section, a most remarkable thing, the first instance in the genus. Inside they are greenish. The petals are broader, short apiculate, yellowish, with purple longitudinal lines. Lip probably whitish or yellowish, with dark purple radiating streaks, quadrilobed, with distinct stalks. Column trigonous, three-toothed at the apex, most probably whitish; an arborescent yellow blotch in front over the base. I confess that I did not see the anther, and that the curious flower had suffered from heat when it came, so that some of the indications about colour are rather undecided. Thus I felt rather doubtful. Mr. B. S. Williams was, however, so very kind as to send me the whole plant; and seeing all the details of roots and stems and leaves so much like those of Ponera striata, I have not the least hesitation to declare the curious plant a new Ponera."

Reichenbach did not give the native country of this horticultural plant.

It is quite possible that Reichenbach had in hand a plant of *Eria* when he described this species. The plant was grown by Mr. Williams who apparently did not know where it was originally collected. Although the flowers of some species of *Ponera* and *Eria* superficially resemble one another, we do not know of any species of *Ponera* whose flowers have sepals and ovary covered with stiff hairs or whose lip is distinctly 4-lobed. It is also true that some of the species of *Ponera* are vegetatively similar to some of the species of *Eria* in the Trichotosia section. It is regrettable that Reichenbach did not see the anther, a critical character, because *Eria* has eight pollinia while *Ponera* has only four.

Ponera pleurostachys *Linden & Reichenbach filius* in Bonpl. 2 (1854) 282.

Without the type or authentic material of this species,

it has been impossible to ascertain its true status. It is apparently not referable to the genus *Ponera*. The column was described as being broadly winged, a character not attributed to this genus. It was also implied that the plant was much branched, and the peduncles were described as being clothed with acute white sheaths. The lip was described as flabellate, rounded and bilobed at the apex with an apicule in the sinus. Except for the apicule, the lip is apparently similar in outline to that of *P. glomerata*. The specimen was collected in Colombia.

Ponera inconspicua *Loddiges ex Baxter* in Loudon Hort. Brit. ed. 3 (1839) 616, supplement, *nomen nudum*.

Attributed to Guatemala.

The writer is indebted to Charles Schweinfurth for his helpful coöperation during the preparation of this paper, and to Gordon W. Dillon for the excellent illustrations.

TWO NEW AMERICAN ORCHIDS

BY

DONOVAN S. CORRELL

I. A NEW CORALLORRHIZA FROM MEXICO

The genus *Corallorrhiza* comprises a small group of saprophytic plants which attain their greatest development in the United States. Some of the species are widely distributed. For instance, *C. odontorhiza* (Willd.) Nutt. (to which this new species is most closely allied) is found from southern Maine, through the eastern and south-central United States, south to Honduras in Central America.

Corallorrhiza Williamsii *Correll sp. nov.*

Herbae simplices, graciles, nudae, saprophyticae. Caulis erectus, basi bulboso-incrassatus, vaginis arcte adpressis obtectus. Inflorescentia racemosa, laxa, pauciflora. Bracteae minutae. Flores parvi. Sepala lineari-oblonga, subobtusa vel acuta; sepala lateralia leviter obliqua. Petala lineari-elliptica, obtusa, leviter obliqua, crenulata. Labellum obovato-suborbiculare, apice truncatum vel rotundatum, ecallosum, trinervium, marginibus lateralibus subintegris vel erosis. Columna generis. Capsula ovoidea.

Slender leafless saprophytic herbs, 15–30 cm. tall. Stem erect, bulbous-thickened at the base, yellowish brown, concealed by closely appressed sheaths. Inflorescence a lax few-flowered raceme, up to 7.5 cm. long. Floral bracts minute, less than 1 mm. long. Flowers small, on filiform pedicels which are about 3.5 mm. long. Sepals and petals purplish. Sepals linear-oblong, subobtuse to acute, 4.5–6 mm. long, 0.8–1 mm. wide; lateral sepals slightly oblique. Petals with a slender claw, linear-elliptic, obtuse, slightly oblique, the margins often crenulate, 4–5.5 mm. long, 1–1.2 mm. wide. Lip white, marked with purple, with a slender claw, obovate-suborbicular, trun-

cate to broadly rounded at the apex, ecallose, 3-nerved, the lateral margins nearly entire to erose, 4.5–6 mm. long, 2.8–3.8 mm. wide. Column slender, compressed, 3–4 mm. long. Capsule ovoid, about 7 mm. long.

This species differs from *C. odontorhiza*, which it superficially resembles, in the larger, broadly obovate, ecallose lip and in the decidedly longer and narrower sepals and petals. So far as we know, this is the only species of *Corallorrhiza* whose flowers possess an ecallose lip.

This species is named in honor of Dr. L. O. Williams, an assiduous student of the orchids of Mexico.

Mexico: Morelos, barrancas N.W. of Cuernavaca, under trees, about 1800 m. alt., March 19, 1937, *Otto Nagel & Juan G. 6655* (Type in Herb. Ames No. 52598); Morelos, mts. above, W. of Cuernavaca, in barranca under trees, 1800 m. alt., lip with purple stains, rest purple, March 4, 1937, *Otto Nagel & Juan G. 6608* (Herb. Ames); terrestrial near Tepeyte, mountain N. W. of Cuernavaca, 2200-2600 m. alt., May 15, 1938, *L. O. Williams 3833* (in part) (Herb. Ames).

II. A new Variety of Habenaria blephariglottis from the Cumberland Plateau

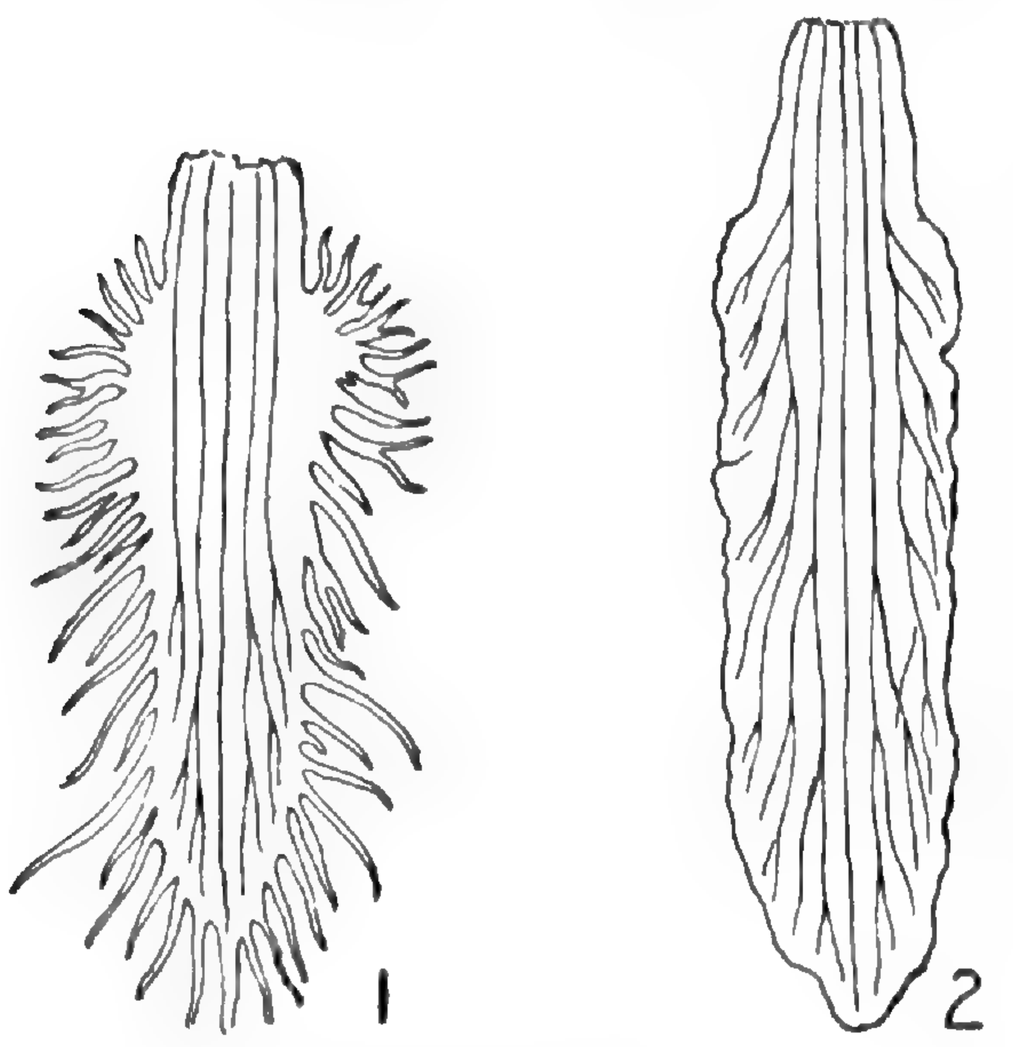
In the course of a recent study of the Orchidaceae of the southeastern states, several specimens of *Habenaria blephariglottis* (Willd.) Hook. were observed which had flowers whose lip was entire or nearly so rather than long- or short-fringed (a characteristic of the species). At that time (Bot. Mus. Leafl. Harvard Univ. 8 (1940) 89) these plants were referred to *H. blephariglottis* var. *holopetala* (Lindl.) A. Gray. It now seems best to consider *H. blephariglottis* and var. *holopetala* as identical, and to describe as a new variety of *H. blephariglottis* the plants with flowers possessing an entire lip.

Habenaria blephariglottis *(Willd.) Hook.* var. **integrilabia** *Correll var. nov.*

Herba a speciei typo labello plusminusve integro solum differt.

Plant differs from the type of the species only in the entire or nearly entire lip.

All of the material from Kentucky and Tennessee which has been examined has flowers with an entire lip. This variety would seem to be fairly common locally on the Cumberland Plateau, with two outlying stations in the Smoky Mountains in North Carolina and several scattered stations on the higher Piedmont Plateau, and on the Coastal Plain of Alabama and Mississippi.

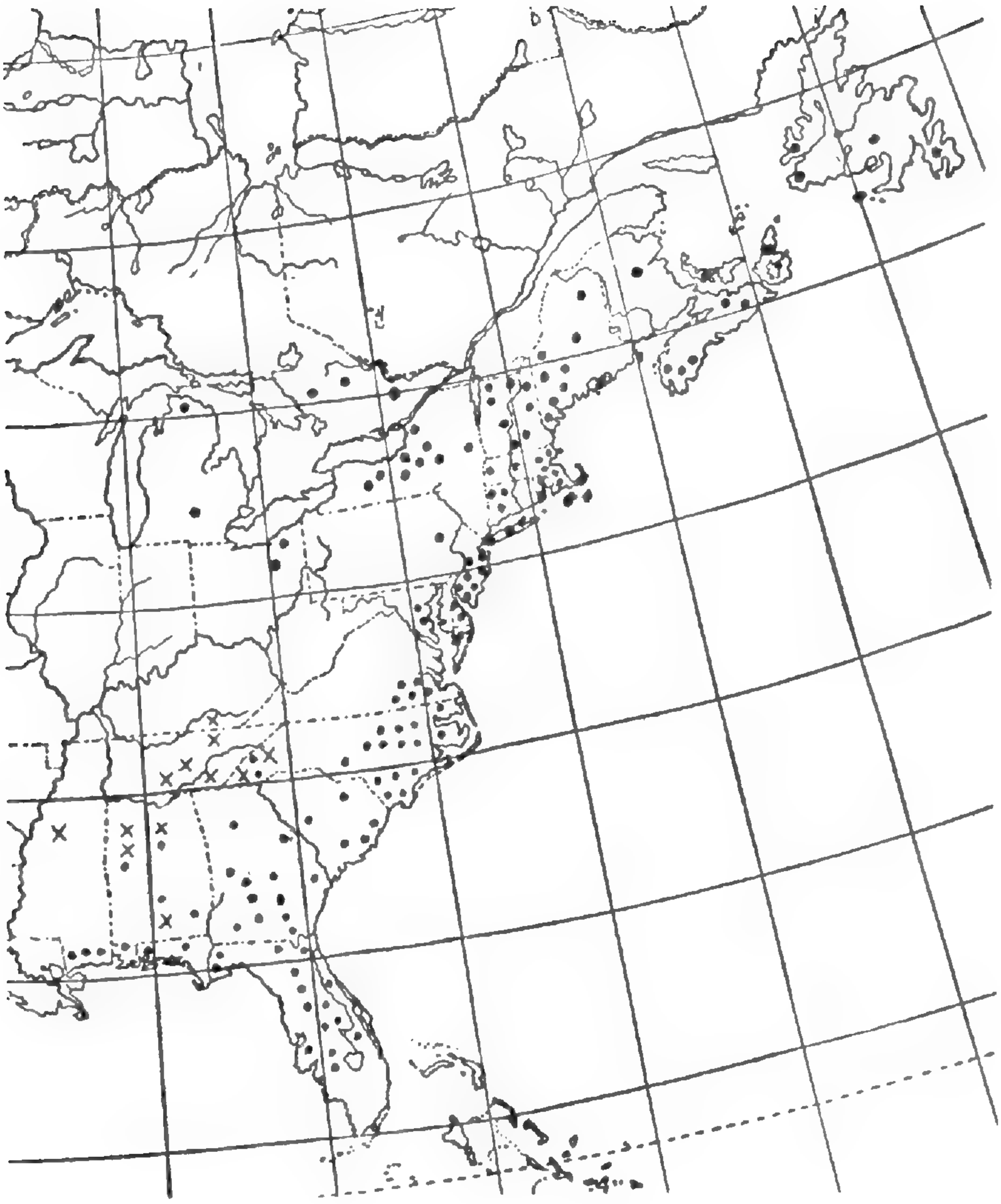


1. *Habenaria blephariglottis*, lip, taken from a typical plant from North Carolina, three times natural size.

2. *Habenaria blephariglottis* var. *integrilabia*, lip, three times natural size.

Drawn February 1941 by G. W. Dillon

An interesting letter regarding a collection of this variety in Tennessee was received from Dr. H. K. Svenson dated September 15, 1938. It is, in part, as follows: "These [plants] were collected on the Cumberland Plateau near Beersheba Springs. I saw approximately two hundred specimens in grassy swamps, accompanied by *H. ciliaris* and *H. cristata*. This is undoubtedly the plant mentioned in Ames, Orchidaceae, IV, 171, 1910—'Tennessee (?) Cumberland Mts., 1888, Mrs. Bennett (8) (a form with entire labellum).' It appears to be a large-flowered *H. blephariglottis*, with large petals and with a labellum which is consistently entire or practically so. It occurred in two swamps about five miles apart and is known from other places in the vicinity. Like the other



Map showing the distribution of *Habenaria blephariglottis*, represented by dots and *H. blephariglottis* var. *integrilabia*, represented by crosses.

species of *Habenaria* it is known locally as 'Monkey-face'."

In a recent letter Dr. McFarland wrote as follows concerning the type station of this variety: "There are literally 100's of these plants in this sphagnum bog. ..."

The map shows the distribution of the typical form of *H. blephariglottis* and of var. *integrilabia*. Plants from the southeastern states, particularly along the Gulf Coast, commonly have open racemes of large, long-spurred flowers whose lip is long-fringed, whereas plants from Newfoundland and eastern Canada commonly have dense racemes of small, short-spurred flowers whose lip is short-fringed. Conditions intermediate between these extremes occur in the northeastern and eastern United States. The southern plants have been segregated by some authors as *H. conspicua* Nash or *H. blephariglottis* var. *conspicua* (Nash) Ames, based mainly on the length of the spur. This character, however, depends too much on habitat conditions to be of taxonomic value. It seems best to regard as *H. blephariglottis* all of the white-flowered plants whose flowers have a fringed lip, and to segregate as a geographical variety those plants whose flowers possess a lip which is entire or nearly so.

North Carolina: Cherokee County, in a bog in the southwest corner of the county, August 2, 1935, *D. S. Correll 3621* (Herb. Duke Univ.); Henderson County, Hendersonville, 1892-1900, *Margaret C. Campbell* (Herb. Univ. North Carolina).

Kentucky: boggy sphagnum ravine three miles north of Whitley City, McCreary County, August 27, 1940, *F. T. McFarland & H. J. Rogers 97* (Type in Herb. Ames No. 59555; Iso-types distributed by the University of Kentucky in their First Century of plants); McCreary County, bog along stream about 3 miles south of Pine Knot, soil mediacid, September 11, 1927, *E. T. Wherry & F. W. Pennell* (Herb. Ames); McCreary County, sphagnum bog, 2.3 miles north of Whitley City, on U. S. Route 27, August 2, 1939, *H. J. Rogers 120* (Herb. Ames, Herb. Univ. Kentucky).

Tennessee: Fentress County, Mayland, August 16, 1934, *J. B. Porter 3092* (Herb. Univ. Tennessee); Franklin County, Sewanee, 1880,

E. K. Smith (Herb. Univ. Minnesota); Grundy County, Mont Eagle, August 16, 1930, *Mrs. A. G. Richards & Mrs. R. R. Maguire* (Herb. Cornell Univ.); Grundy County, near Beersheba Springs, grassy swamps, 1900 ft. alt., August 12, 1938, *H. K. Svenson 8580* (Herb. Ames, Herb. Duke Univ., Herb. Brooklyn Bot. Gard.); Hamilton County, W. Ridges, Chattanooga, August 1923, *M. S. Colby* (Herb. Univ. Chattanooga).

ALABAMA: Butler County, Greenville, swamps, August 11, 1900, *Biltmore Herb. 691d* (Herb. N.Y. Bot. Gard.); Culman County, Long Island, marshy ground on Sand Mt., August 1920, *V. Peterson* (Herb. Missouri Bot. Gard.); Tuscaloosa County, Tuscaloosa, June, *E. A. Smith 1489* (Herb. Mohr); Winston County, 1866, *T. M. Peters* (Herb. Brown Univ.).

MISSISSIPPI: Glendale [possibly Glenville, Panola County] 1863, *J. T. Stewart* (Herb. Field Museum).

EXPLANATION OF THE ILLUSTRATIONS

PLATE I. PONERA GLOMERATA *Correll.* 1, terminal portion of plant, one half natural size. 2, defoliated section of stem showing inflorescences, one half natural size. 3, flower, from front, partly spread open, two and one half times natural size. 4, dorsal sepal, two and one half times natural size.

PONERA STRIATA *Lindl.* 5, defoliated section of stem showing inflorescences, one half natural size. 6, flower, side view, two and one half times natural size. 7, flower, from front, partly spread open, two and one half times natural size.

PLATE II. PONERA LONGIPETALA *Correll.* 1, section of plant, one half natural size. 2, flower, from front, partly spread open, one and one half times natural size. 3, flower, side view, one and one half times natural size.

PONERA SUBQUADRILABIA *Correll.* 4, defoliated section of stem showing inflorescences, one half natural size. 5, flower, spread out, twice natural size.

PONERA JUNCIFOLIA *Lindl.* 6, plant, one half natural size. 7, flower, subtended by bracts, twice natural size. 8, lip, spread out, five times natural size.

PLATE III. CORALLORRHIZA WILLIAMSII *Correll.* 1, plant, natural size. 2, flower, from front, spread open, five times natural size. 3, column and lip, with sepals and petals removed, side view, five times natural size.

Plates drawn 1941 by G. W. DILLON

PLATE I

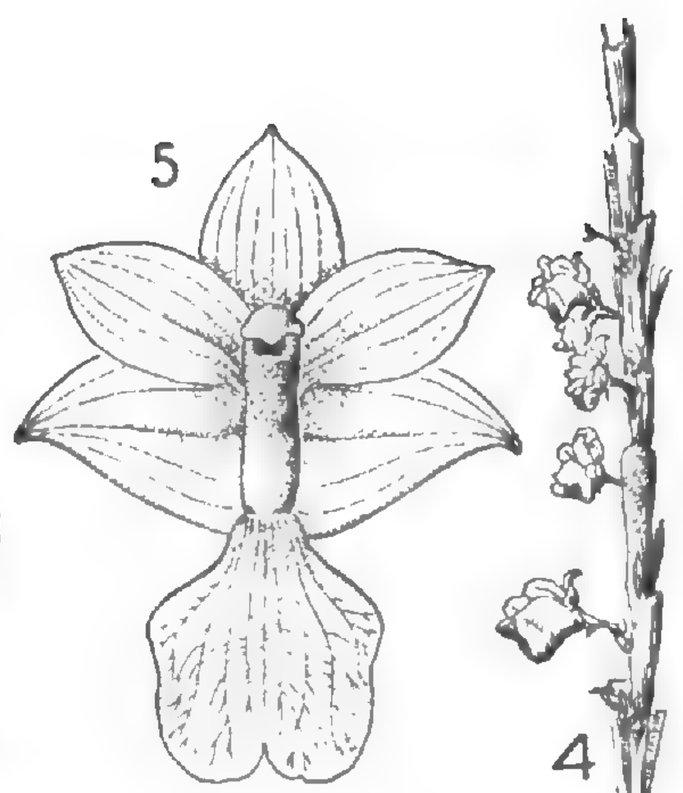
PONERA *glomerata* *Gorrell*

P. striata Lindl.

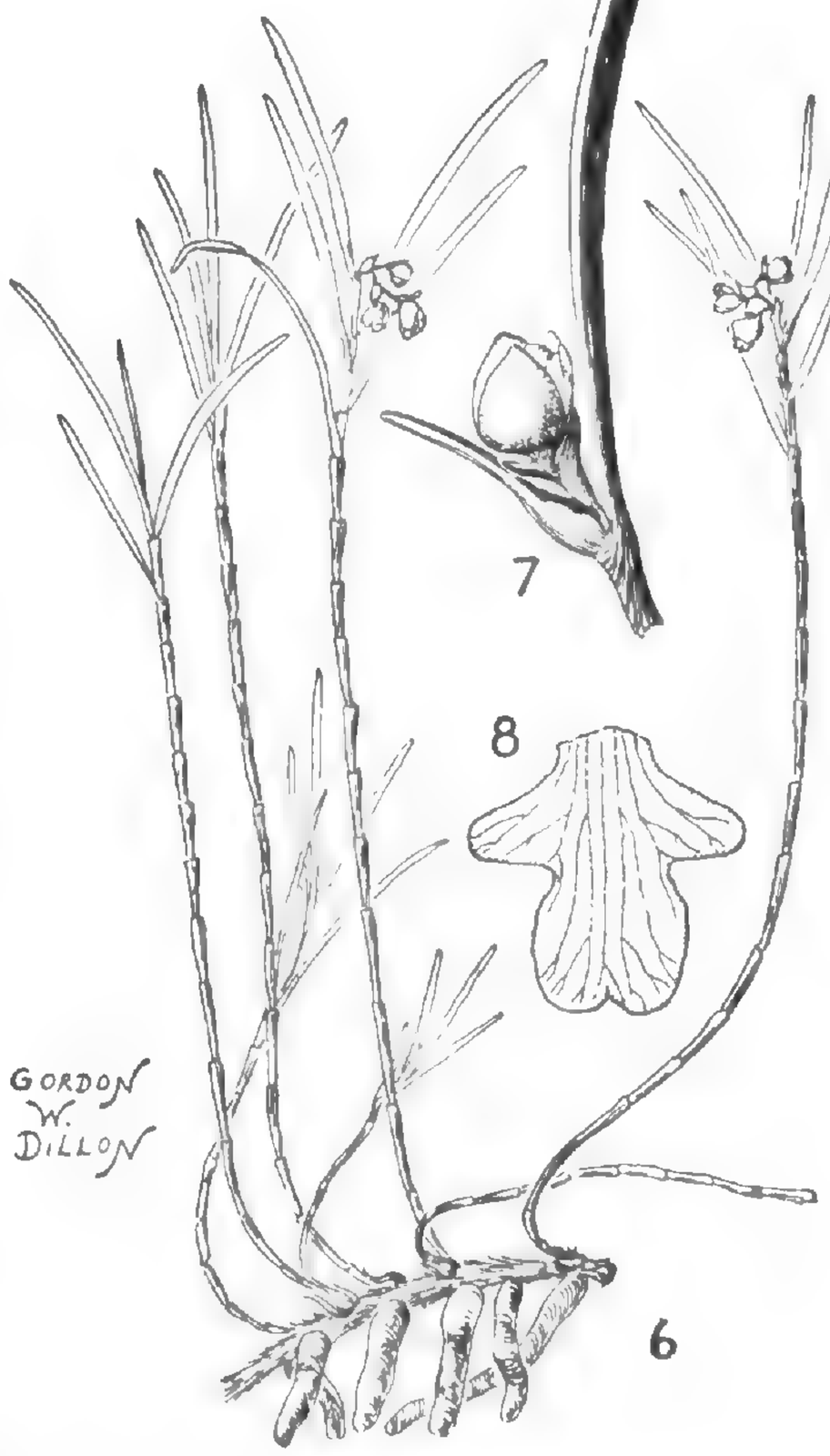
GORDON W. DILLON

PLATE II

PONERA *longipetala* Correll

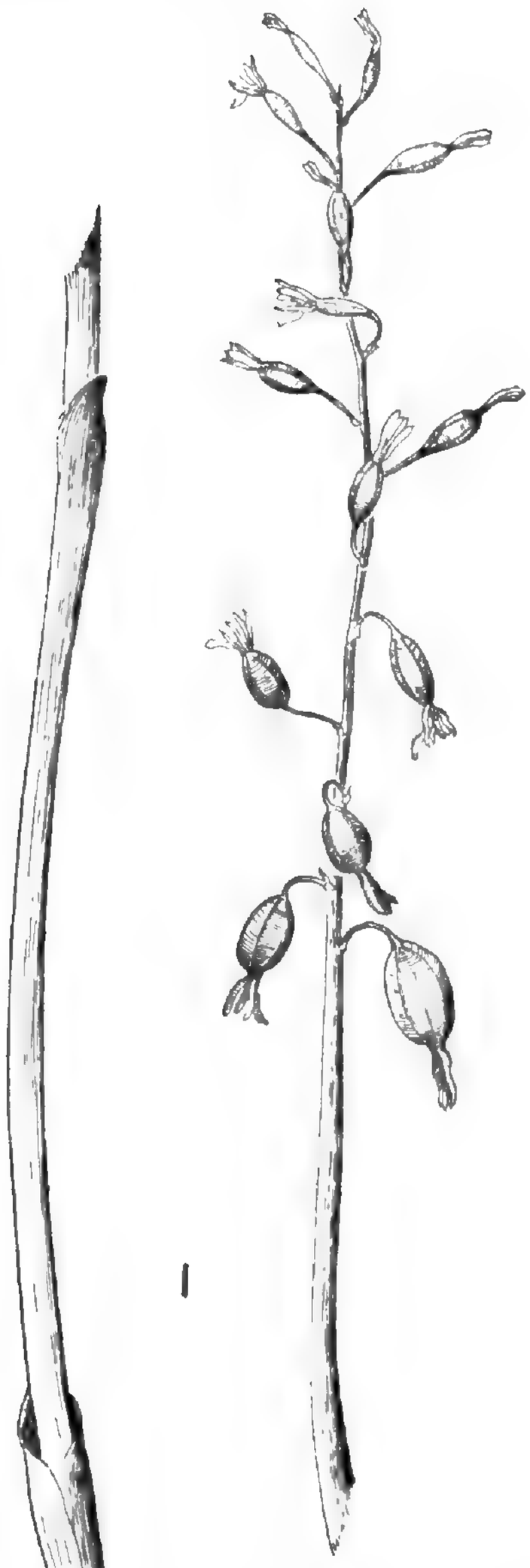


P. *subquadrilabia*
Correll



P. *juncifolia Lindl.*

PLATE III



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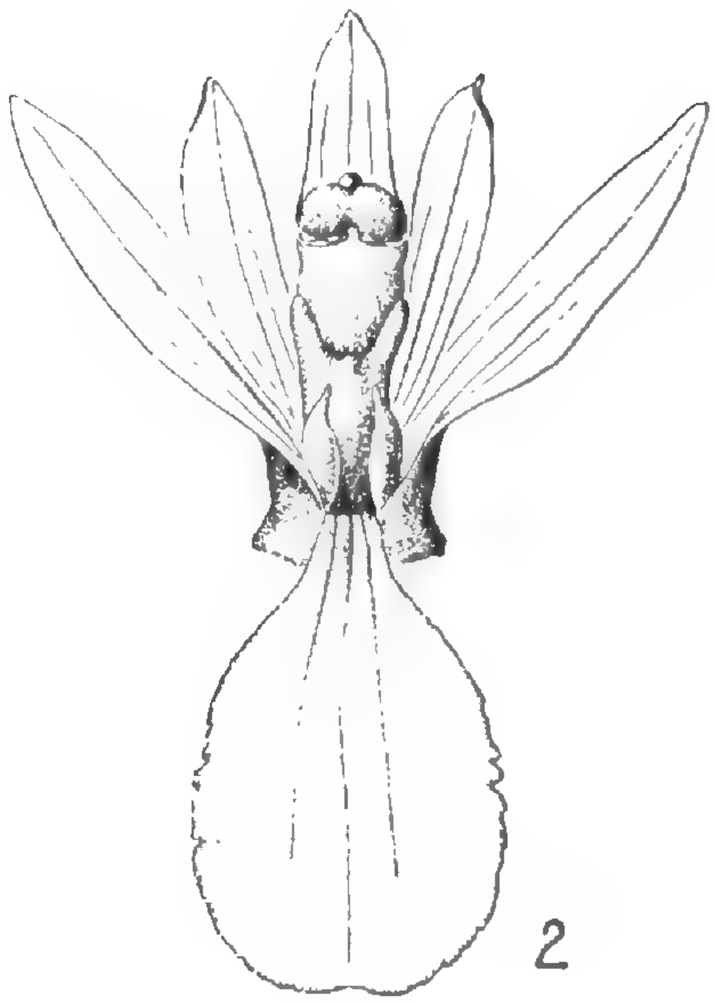

2

CORALLORRHIZA

Williamsii Correll

3

GORDON W. DILLON

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

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PLANTAE MEXICANAE X

BY
RICHARD EVANS SCHULTES

NEW OR CRITICAL SPECIES FROM OAXACA

DURING the course of recent botanical and ethnobotanical studies made in the northeastern districts of the State of Oaxaca, Mexico, a number of rare or hitherto undescribed plants were collected, some of which are of economic importance among the Indians of this region. It has also seemed advisable to discuss several of these plants because of their taxonomic, phytogeographical, or ethnobotanical interest.

In the following treatment, the families are arranged in accordance with the botanical sequence proposed by Engler-Gilg.

All of the localities mentioned in this article are indicated on the map of northeastern Oaxaca which was published in the Botanical Museum Leaflets, Harvard University 9 (1941) 109.

I wish to thank Doctor Paul C. Standley of the Field Museum of Natural History, Doctor C. L. Lundell of the University of Michigan and Doctor W. H. Camp of the New York Botanical Garden for permission to publish their manuscript descriptions and comments.

PINACEAE

Pinus Strobus *Linnaeus* var. **chiapensis** *Martínez* in An. Inst. Biol. 11 (1940) 81.

MEXICO: Oaxaca, District of Cuicatlán, between San Juan Zautla and San Pedro Teutila, long. 96°38′, lat. 17°58′, alt. 850 m., July 1, 1939, *Schultes 765* (Econ. Herb. Oakes Ames No. 9282; Herb. Arnold Arb.).

This endemic variety of *Pinus Strobus* was described in 1940 from several collections which were made in the extreme western part of Chiapas. The collection cited above represents a considerable extension of range northwestward.

Pinus Strobus var. *chiapensis* is very distinct from the other pines of northeastern Oaxaca. It is tall and has a straight and smooth trunk which lacks branches near the base. *Schultes 765* was collected in an extensive forest which is a pure stand of this variety.

PALMAE

Geonoma binervia *Oersted* in Vidensk. Meddel. Kjöbenhavn (1859) 33.

MEXICO: Oaxaca, District of Villa Alta, Los Llanos de Ozumazín, long. 96°10′, lat. 17°42′, alt. 300 m., April 29, 1939, *Schultes & Reko 704* (Bailey Hort.).

Geonoma binervia has hitherto not been reported from Mexico. It has been known from Guatemala, Nicaragua, Costa Rica, and Panama (L. H. Bailey in Gentes Herb. 3 (1933) 78-9).

CYCLANTHACEAE

Carludovica Labela *R. E. Schultes sp. nov.*

Planta acaulescens, terrestris vel epiphytica. Petiolus tenuis, basi dilatatus. Folium bipartitum, plusminusve 50 cm. longum; folii segmenta oblanceolata, acuminata, plusminusve 10 cm. lata. Spadix masculinum quam femineum majus. Florum masculinorum pedicellus complanatus, abrupte dilatatus, receptaculum planum formans; receptaculum intus truncatum, extus cum octo

perianthii segmentis ovatis, obtusis liberisque; stamina duodecim usque ad viginti, receptaculum tegentia: antherae paene subsessiles, in circuitu late oblongae. Florum femineorum perianthii segmenta octo, triangulari-ovata, acutiuscula liberaque; stigmata carnosa, cruciformia, in circuitu oblonga. Staminodia filiformia, plusminusve 4 cm. longa.

An acaulescent, terrestrial or epiphytic plant up to nearly 1 meter in height. Petioles slender, dilated at the base, 28–40 cm. long. Leaves 46–53 cm. long, bipartite for two thirds or more of their length, prominently 3-nerved, the mid-nerve a common mid-rib; segments of the leaves oblanceolate, acuminate, 7–13 cm. wide. Staminate inflorescences borne on a stout stem 12–18 cm. long with four large, lanceolate, acuminate, unequal, foliaceous spathes which are 4–10 cm. long and 1–1.5 cm. wide, the lowest one closely enclasping the spike. Pistillate inflorescences borne on a more slender, shorter stem about 5 cm. long with four large, foliaceous spathes. Staminate spadix 4–5 cm. long; the pistillate 2.5–3 cm. long. Pedicel of the staminate flower flattened, abruptly dilated into a flat receptacle which is about 3 mm. in diameter, truncate on the inner side, bearing eight perianth segments on the outer side; segments ovate, obtuse, free, about 1.5 mm. long, 0.5 mm. wide. Stamens twelve to twenty, completely covering the flat receptacle; anthers broadly oblong in outline, each about 1 mm. long, 0.5 mm. wide, almost subsessile, with a filament about 0.2 mm. long. Perianth segments of the pistillate flower eight, triangularly ovate, acutish, free, about 1.2 mm. long, 0.5 mm. wide, exceeding the stigmas. Stigmas fleshy, cruciform, 0.8 mm. long, 0.6 mm. wide, green; staminodia filiform, 3.5–4.5 cm. long.

Mexico: Oaxaca, District of Choapam, on floor of dark rain-forest or on rotten logs, summit of the mountains between Santa María

Yahuivé and Santiago Yaveo, long. 95°45′, lat. 17°20′, alt. 1000 m., May 15, 1939, *Richard Evans Schultes & Blas Pablo Reko 920* (TYPE in Econ. Herb. Oakes Ames No. 1070, 1070a; ISOTYPE in Herb. Gray); Vera Cruz, on moist rocks, Zacuapán, May 1917, *C. A. Purpus 7839* (U.S. Nat. Herb. No. 884563).

The genus *Carludovica* has not hitherto been authentically attributed to Mexico. Nearly a century ago, Liebmann collected several different species in northeastern Oaxaca belonging to this genus, but apparently never described them. In 1909, Rovirosa reported that *Carludovica utilis* Benth. occurs in Tabasco. I have been unable to find herbarium material from Tabasco to substantiate this statement, though the genus should be expected to occur there. Recently, Martínez (*Las plantas mas utiles que existen en la Republica Mexicana* (1928) 239-242) has indicated that *Carludovica palmata* Ruiz & Pav., the Panama hat plant, occurs in southern Mexico, but this refers to a cultivated introduction and not to a native element of the flora.

In the locality where the type of *Carludovica Labela* was collected, the plant occurs in great abundance as an epiphyte on fallen trees or terrestrially on the damp floor of the dark rain-forest. In the Districts of Choapam and Tuxtepec, the plant is known as *rabo de bobo* ("fish-tail") because of the characteristic bifid leaf. It is also known by the Mije name *kosh-tu-see*; by the Chinantec names *gua-ma-sin* and *ma-la*; and by the Zapotec name *la-be-la*. The Zapotec name, which, like the Spanish vernacular name, means "fish-tail", is given to this plant as the specific epithet.

Among the Indians of northeastern Oaxaca, the leaves of *Carludovica Labela* are gathered in large quantities and are used, sometimes with the leaves of species of *Chamaedorea* and other low palms, as thatching for native houses. The broad, long, flat leaves with numerous fine, parallel veins make one of the best of thatches. There is

no other use known for this plant in northeastern Oaxaca, but other species of *Carludovica* find extensive use in Central America in the manufacture of hats and matting.

Bromeliaceae

Vriesia Malzinei *E. Morren* in Belg. Hort. 24 (1874) 313.

Mexico: Oaxaca, District of Tuxtepec, Cerro Naríz, San Felipe Usila, long. 96°32′, lat. 17°50′, alt. 350 m., April 19, 1939, *Schultes & Reko 666* (Herb. Gray).

This collection of *Vriesia Malzinei* apparently is the first made since the type was collected at Cordova, Vera Cruz, in 1874. Smith (No. Am. Fl. 19 (1938) 158) states in regard to this species: "known only from the type locality, but introduced into cultivation." This plant appears to be rare in the District of Tuxtepec where it is known by the Chinantec name *lee-se*.

Annonaceae

Guatteria Galeottiana *Baillon* in Adansonia 8 (1868) 268.

Mexico: Oaxaca, District of Choapam, between Santiago Choapam and San Juan Teotalcingo, long. 95°51′, lat. 17°18′, alt. 1100 m., June 1, 1939, *Schultes 560* (Econ. Herb. Oakes Ames No. 2701; Herb. Gray); District of Choapam, Santo Domingo Latani, long. 95°48′, lat. 17°24′, alt. 900 m., May 13, 1939, *Schultes & Reko 906* (Econ. Herb. Oakes Ames No. 2700).

Guatteria Galeottiana has been known only from collections made by Galeotti in 1839 and by Liebmann in 1842: *Galeotti 4603*, Chinantla; *Liebmann 16*, San Juan Comaltepec; *Liebmann 17*, San Juan Teotalcingo ("Tuitalungo"); *Liebmann 18*, San Juan Lovani ("Lobani"). It is apparently a local endemic restricted to the Chinantla. It is interesting to note in this connection that the only other species—*Guatteria Jurgensenii* Hemsley—

in the section *Leptophyllum* is also endemic to this region of Oaxaca.

In his recent *Revision der Arten einiger Annonaceen Gattungen IV* (Bergiani 12 (1939) 373), Fries gives "southern Mexico" as the range of *Guatteria Galeottiana*, but fails to emphasize its restricted distribution within this area.

In San Juan Teotalcingo, where *Guatteria Galeottiana* is known by the Chinantec Indian name *ma-hûn-sei*, the dried fruits are said to be crushed and added to soups, coffee and other beverages as a rather peppery and aromatic condiment.

The plate which accompanies these notes was drawn from *Schultes 560*.

Lauraceae

Phoebe chinantecorum *R. E. Schultes sp. nov.*

Arbor parva, gracilis debilisque, circiter 6 m. alta. Ramuli dense villosi, ferrugineis cum pilis. Folia lanceolato-elliptica, apice in cuspidem vel mucronem angustum acutissimum usque ad 1–2 cm. longum producta, basi attenuata, cuneata, breviter petiolata, 12–20 cm. longa, 3.5–5.5 cm. lata, coriacea, supra nitidissima, olivacea, glabra vel sparsissime pubescentia, subtus opaca, ferruginea, omnino dense villoso-sericea cum pilis simplicibus et debilibus, plusminusve 0.8 mm. longis. Inflorescentiae numerosae, saepissime axillares confertim paniculatae, multiflorae, foliis breviores. Flores hermaphroditi, brunnei. Perianthium brunneum, perianthii segmenta elongato-ovata, apice rotundata vel subacuta, subaequalia, crassa, extus glabrescentia, intus cinereo-tomentosa. Antherae in serie exteriore sessiles, in circuitu rotundato-ovatae, inflexae, glabrae. Ovarium subrotundatum, brevi cum stylo.

A small, slender, weak tree about six meters high.

Branches terete or subangulate, densely villous with rust-colored hairs. Leaves opposite or subopposite, lanceolate-elliptic, often slightly asymmetrical, apically prolonged into an acuminate point which is 1–2 cm. long, basally cuneate, short-petiolate (petioles 0.5–1 cm. long), 12–20 cm. (usually about 15 cm.) long, 3.5–5.5 cm. wide, coriaceous; upper surface very lustrous, olive-green, glabrous or very sparsely pubescent, mid-rib and secondary veins strongly impressed; lower surface rust-colored, entirely and densely villous-sericeous with simple, weak hairs; mid-rib prominently elevated and very densely villous-sericeous; secondary veins conspicuous, arcuate. Inflorescences numerous, usually axillary, compactly paniculate, many-flowered, shorter than the leaves (peduncles 3.5–6 cm. long; pedicels very slender, up to 1.5 mm. long), appressed puberulent, rust-colored, 1.5–3 cm. wide. Flowers hermaphroditic, 4.6 mm. in diameter (natural size), brown. Perianth brown; perianth segments elongate-ovate, apically rounded or subacute, fleshy, subequal, 2.2 mm. long, 0.9 mm. wide, externally glabrescent, the outer three internally ashy tomentulose, the inner three internally glabrescent. Anthers of the outer series sessile, rectangular-quadrate in outline, inflexed, about 0.7 mm. wide, 0.8–0.9 mm. long, glabrous; those of the inner series triangular in outline. Staminodia six, globose, minute. Ovary subrotundate, glabrous, surrounded by a disc-like margin bearing three minute glands, surmounted by a short style about 0.5 mm. long.

Mr. William S. Benninghoff has examined the pollen of this species and has prepared the following description of it: "Grains spherical; average diameter 24.5 μ; exine thin and covered with short, blunt, conical spines approximately 0.8 μ long; intine thick and clear; pores or furrows absent; contents finely granular, nuclei prominent in fresh material."

MEXICO: Oaxaca, District of Choapam, San Juan Lalana, growing in rain-forests on the slopes of Cerro Lalana, long. 95°45′, lat. 17° 25′, alt. 550 m., May 8, 1939, *Richard Evans Schultes & Blas Pablo Reko 827* (TYPE in Econ. Herb. Oakes Ames No. 7111; ISOTYPES in Herb. Gray; Herb. Inst. Biol. [Mexico]; Herb. Univ. Michigan; Herb. Field Mus. Nat. Hist.; Herb. U.S. Nat. Mus.; Herb. Bot. Gard. Buitenzorg.)

Phoebe chinantecorum appears to be most closely related to *P. nectandrioides* Mez and *P. betazenis* Mez (the type of which was collected in northeastern Oaxaca) which occur in southern Mexico and adjacent Central America. It is also apparently allied to *Phoebe helicterifolia* (Meissn.) Mez of Chiapas and Guatemala. Vegetative characters in the shape and indument of the leaves as well as floral characters, especially in the shape of the anthers, serve to distinguish between these species.

Phoebe chinantecorum is strikingly similar in habit to some species of *Nectandra*, especially to some of those in the subgenus *Eunectandra* Nees, section *Pomatium* (Nees) Mez.

In the forests around San Juan Lalana, *Phoebe chinantecorum* is abundant and is closely associated with the following trees: *Alibertia edulis* (L. Rich.) A. Rich., *Andira Galeottiana* Standl., *Beilschmiedia mexicana* (Mez) Kosterm., *Conostegia mexicana* Cogn., *Erythroxylon lucidum* HBK., *Guatteria* spp., *Hamelia nodosa* Mart. & Gal., *Hirtella americana* Aubl., *Laplacea semiserrata* (Mart. & Zucc.) Cambess., *Miconia* spp., *Ormosia isthmensis* Standl., *Ternstroemia Tepezapote* Schlecht. & Cham., and many other species.

The Chinantec Indians of the District of Choapam are accustomed to use the reputedly small and rather aromatic fruits of *Phoebe chinantecorum* for food, and call the plant *mo-gwu*.

Connarus Schultesii *Standley sp. nov.*

Frutex scandens, ramis crassiusculis fusco-brunnescentibus teretibusque, primo ut videtur tomentosis sed cito glabratis, internodiis abbreviatis; folia modica pinnatim trifoliolata, petiolo 2.5–5.5 cm. longo tereti glabrato, rhachide vix ultra 8 mm. longa, petiolis crassis 3–5 mm. longis; foliola subaequalia, subcoriacea, anguste oblonga vel oblanceolato-oblonga, plerumque 10–13 cm. longa et 3–4 cm. lata, subabrupte acuminata, acumine ipso obtuso, basim obtusam versus paullo angustata, in statu adulto glabra, supra in sicco subcinerea, costa nervisque non elevatis, sublucida, subtus fere concoloria, costa tenera elevata, nervis lateralibus utroque latere circa novem teneris, subarcuatis, angulo semirecto vel latiore adscendentibus, prope marginem irregulariter arcuato-junctis, venis prominentibus laxe reticulatis; flores ut videtur in paniculas racemiformes dispositi, paniculis terminalibus e basi ramosis, usque ad 13 cm. longis, divaricato-ramosis, ramis gracilibus rigidiusculis, primo dense brunneo-tomentosis, glabrescentibus, floribus breviter crasseque pedicellatis; folliculi insigniter asymmetrici, fere semi-orbiculares, circa 2.5 cm. longi et 1.5 cm. lati, subcompressi, basi in stipitem crassum usque ad 7 mm. longum contracti, apice obtusi apiculatique, ubique densissime pilis longiusculis dense intertextis brunneis hispido-tomentosi.

A scandent shrub, the branches rather stout, blackish brown, terete, apparently at first tomentose but soon glabrate, the internodes short; leaves medium-sized, pinnately 3-foliolate, the petiole 2.5–5.5 cm. long, terete, glabrate, the rachis barely 8 mm. long, the petiolules thick, 3–5 mm. long; leaflets subequal, subcoriaceous, narrowly oblong or oblanceolate-oblong, mostly 10–13

cm. long and 3–4 cm. wide, rather abruptly acuminate, with an obtuse tip, slightly narrowed toward the obtuse base, glabrous at maturity, dark above when dried, slightly lustrous, the venation not elevated, almost concolorous beneath, the slender costa prominent, the lateral nerves about nine on each side, slender, subarcuate, ascending at an angle of forty-five degrees or more, irregularly arcuate-anastomosing near the margin, the prominent veins laxly reticulate; flowers apparently in raceme-like panicles, the panicles terminal, branched from the base, up to 13 cm. in length, divaricately branched, the branches rather stiff, slender, at first densely brown-tomentose, becoming glabrate, the flowers borne on short, thick pedicels; follicles conspicuously asymmetric, almost semiorbicular, about 2.5 cm. long and 1.5 cm. broad, subcompressed, contracted at the base into a thick stipe which is 7 mm. long or less, obtuse and apiculate at the apex, densely hispid-tomentose with rather long, densely matted, brown hairs.

MEXICO: Oaxaca, District of Choapam, San Juan Lalana, a tangled vine growing on large forest trees, long. 95°45′, lat. 17°25′, alt. 700 m., May 9, 1939, *Richard Evans Schultes & Blas Pablo Reko 833* (TYPE in Herb. Field Mus. Nat. Hist.; ISOTYPES in Econ. Herb. Oakes Ames No. 8613; Herb. Gray).

In connection with the description of *Connarus Schultesii*, Dr. Standley writes: "The only representative of the genus recorded previously for Mexico is *Connarus lentiginosus* Brandegee, of which, through oversight, no mention is made in Trees and Shrubs of Mexico. That species, of Chiapas, differs in having more numerous leaflets, and is evidently not closely related to this plant of Oaxaca. While a respectable number of *Connarus* species are known from Central America, none of them have fruit similar to that of *C. Schultesii*, whose indument

is exceedingly dense, brown and coarse. The follicles also are larger than is usual in the genus."

The reddish sap which exudes when the stems of this vine are broken is extremely bitter. A decoction made of the stems of *Connarus Schultesii* is said to be used locally by the Chinantecs of the District of Choapam as a taenifuge. In this connection, it is significant that a species of *Connarus* is similarly employed by primitive peoples in various parts of Africa (Heckel & Schlagenhauffen in Ann. Fac. Sci. Marseilles 6, fasc. 2 (1897) 1-26).

LEGUMINOSAE

Erythrina horrida *DeCandolle* Prodr. 2 (1825) 413.

MEXICO: Oaxaca, District of Ixtlán, Santa Mariá Jaltianguis, long. 96°32′, lat. 17°21′, alt. 2000 m., June 20, 1939, *Schultes 644a.*

This species of *Erythrina* is known only from the State of Oaxaca. Krukoff (*The American species of Erythrina* in Brittonia 3 (1939) 259) cites ten collections. However, none of these are from the northeastern part of the state where *Schultes 644a* was collected. In the District of Ixtlán, *Erythrina horrida* is called *sompantle.*

Erythrina mexicana *Krukoff* in Brittonia 3 (1939) 309.

MEXICO: Oaxaca, District of Tuxtepec, Cerro Verde near San Felipe Usila, long. 96°34′, lat. 17°51′, alt. 300 m., April 19, 1939, *Schultes & Reko 687*; District of Choapam, near Río Chisme, Santiago Yaveo, long. 95°41′, lat. 17°20′, May 30, 1939, *Schultes & Reko 952.*

Erythrina mexicana, known from Mexico (San Luis Potosí, Guerrero) and Guatemala, has previously not been reported from Oaxaca where, in the Districts of Tuxtepec and Choapam, it is the commonest species of the genus. It is known by the Spanish names *colorín* and

sompantle, by the Chinantec *ma-nya*, and by the Zapotec *betutsa-gitse*.

Ormosia isthmensis *Standley* in Field Mus. Nat. Hist. Bot. Ser. 17 (1937) 264.

Mexico: Oaxaca, District of Juchitlán, Ubero, alt. 30-90 m., June 1937, *Llewelyn Williams 9423*; District of Choapam, San Juan Lalana, long. 95°45′, lat. 17°25′, alt. 550 m., May 8, 1939, *Schultes & Reko 822*; District of Choapam, Santiago Yaveo, long. 95°41′, lat. 17°20′, alt. 450 m., May 1939, *Reko s.n.* (seeds); Vera Cruz, Fortuño Coatzacoalcos River, alt. 30-50 m., February-March 1937, *Llewelyn Williams 8926*.

Although it is a very tall and conspicuous tree, often attaining a height of 125 feet, *Ormosia isthmensis* was not collected until very recently. It has apparently been collected only four times. According to the field notes which accompany *Llewelyn Williams 8926* and *9423*, it is relatively abundant in Ubero and at Fortuño Coatzacoalcos River, both of which localities are on the Isthmus of Tehuantepec. In the District of Choapam, immediately northwest of the Isthmus, however, *Ormosia isthmensis* is a rarity, occurring sporadically in the forests. Dr. Reko procured seeds of this species from natives in Yaveo, but we were unable to discover any trees in this village. In the neighboring town of Santiago Choapam, I heard several references to *Ormosia isthmensis* and to its brilliant vermillion seeds but was unable to make a collection of the tree from this locality. In Lalana, it is known by the Spanish names *palo de Salvador* and *colorín* and by the Chinantec name *mu-sa*, and it is used to some extent for its wood. According to Williams' field notes, the tree is used extensively in the Isthmus for ". . . axe-handles, railroad ties, house posts and general construction" and ". . . to a limited extent for canoes".

According to the natives, the flowers of *Ormosia isthmensis* are borne in profusion in July and August and

are white and rose-purple in color. The bright seeds are abundant and, later in the season, are very noticeable on the forest floor beneath the trees.

Bombaceae

Ochroma pyramidale (*Cav.*) *Urban* var. **concolor** (*Rowlee*) ***R. E. Schultes comb. nov.***

Ochroma concolor Rowlee in Journ. Wash. Acad. Sci. 9 (1919) 161.

Mexico: Tabasco, Villahermosa, 1926, *Martínez s.n.* (U. S. Nat. Herb. No. 1635968); Vera Cruz, Villa Azueta, 1926, *Martínez s.n.* (U.S. Nat. Herb. No. 1315933); Vera Cruz, Fortuño Coatzacoalcos River, alt. 30–50 m., February-March 1937, *Llewelyn Williams 8923*; Oaxaca, District of Juchitlán, Ubero, alt. 30–90 m., June 1937, *Llewelyn Williams 9486*; Oaxaca, District of Juchitlán, Ubero, alt. 30-90 m., May, 1937, *Llewelyn Williams 9236*; Oaxaca, District of Tuxtepec, San José Chiltepec, long. 96°08′, lat. 18°00′, alt. 100 m., April 23, 1939, *Schultes & Reko 692*.

Although it is a very widespread genus in Central America, *Ochroma* has apparently only recently been collected in southeastern Mexico. In his *Trees and shrubs of Mexico* (Contrib. U.S. Nat. Herb. 23 (1926) 1674), Standley stated: "No specimens of *Ochroma* from Mexico have been seen by the writer, but *O. Lagopus* Swartz (= *O. pyramidale* (Cav.) Urban) has been reported from Tabasco. This species is a West Indian one, but it seems probable that one of those described recently by Rowlee occurs in southern Mexico." Later, he wrote (in Field Mus. Nat. Hist. Bot. Ser. 18 (1937) 682): "The Costa Rican trees were referred formerly to *O. Lagopus* Swartz of the West Indies, which probably does not extend to the continent."

In 1903, Conzatti (*Los géneros vegetales mexicanos* (1903) 20) reported that *Ochroma Lagopus* existed in the southern part of Mexico. He did not, however, cite specimens. In 1909, Rovirosa (*Pteridografía del sur de*

México (1909) 20) stated that *O. Lagopus* grew in Tabasco. This is apparently the source of Standley's report referred to above.

In 1926, Professor Maximino Martínez of Mexico City sent two specimens of *Ochroma* to Record for determination. He stated in a letter accompanying the collections: "En la literatura de que despongo no se dice que exista en este país, sin embargo de que lo hay con abundáncia en Tabasco y Vera Cruz. No he visto las flores y no he podido determinar la especie." These specimens cited above are apparently the first Mexican collections which are represented in herbaria. In *Las plantas mas utiles que existen en la Republica Mexicana* (1928) 248-250, Martínez pointed out that this genus had been hitherto unknown from Mexico, but that it was now represented in Tecolotepec, Vera Cruz, and from other localities in Tabasco, Oaxaca and Chiapas.

Llewelyn Williams collected specimens of *Ochroma* from the Isthmus of Tehuantepec which are referable to *O. pyramidale* var. *concolor*. He reported his collections (in Lilloa 4 (1939) 157, 166) as *Ochroma concolor* Rowlee. Williams' collections from Ubero are apparently the first from the State of Oaxaca. *Schultes & Reko 692* represents the most northern collection of the variety.

An examination of the collections of *Ochroma* from Mexico indicates that the slight characters which Rowlee used to separate the West Indian *Ochroma pyramidale* from *O. concolor* break down. There has been a general tendency to doubt the specific validity of the numerous Central American "species" of *Ochroma*. For example, Standley stated (in Field Mus. Nat. Hist. Bot. Ser. 18 (1937) 681): "Rowlee, who studied the trees in their native habits, recognized nine species, four of them Central American. I do not believe that there are so many of them in Central America, and it seems far from cer-

tain that there is more than one. . .'' Likewise, Record, who studied the wood of the American *Bombacaceae*, has observed (in Trop. Woods 59 (1939) 15): ''Some botanists claim to recognize 10 or more species but for all practical purposes there is only one, *O. pyramidale* (Cav.) Urban (=*O. Lagopus* Sw.), of which the others are varieties or forms.''

Record's observation is borne out by the available specimens of *Ochroma* from southern Mexico. The specimens which have been called *Ochroma concolor* differ somewhat from true *O. pyramidale* of the West Indies, but the differences are trivial and deserve no more than varietal status. *Ochroma pyramidale* var. *concolor* is usually a much larger plant than *O. pyramidale*. *Schultes & Reko 692* was collected from a very tall tree which attains a height of from seventy to eighty feet. The trunk is stout and smooth with a greyish bark. The leaves of the variety tend to be larger, thinner and glabrous or nearly so. The flowers of the two plants are of the same size, but those of the variety are produced two months later than are those of the species. In the District of Tuxtepec, the variety fruits late in April and early May.

Ochroma pyramidale var. *concolor* represents a clearly distinct geographical variety centering around southern Mexico and Guatemala. Rowlee recognized this when he stated: ''It is known only from the country surrounding the head of the Bay of Honduras. It has not been reported outside of Guatemala, but undoubtedly grows in adjacent Honduras and British Honduras, and, in all probability, in southern Yucatan.''

In the Chinantec village of San José Chiltepec, *Ochroma pyramidale* var. *concolor* is known by the Spanish name *gonote reál* and by the Chinantec name *ma-ho*. It is said to grow in the adjacent parts of the District of Choapam where the Chinantecs call it *mo-ma-ah*.

Theaceae

Laplacea semiserrata (*Mart. & Zucc.*) *Cambessedes* in St. Hilaire Fl. Bras. Mer. 1 (1825-1827) 300.

Mexico: Oaxaca, District of Tehuantepec, Ubero, alt. 20-90 m., April 1937, *Llewelyn Williams 9170*; District of Choapam, between Monte Negro de Lalana and San Juan Lalana, long. 95°45′, lat. 17° 26′, alt. 450 m., May 6, 1939, *Schultes & Reko 798*.

Although *Laplacea semiserrata* is rather widespread, occurring throughout Central America and in South America southward to Brazil, it is known from Mexico from only two collections. In his *Flora of Costa Rica* (Field Mus. Nat. Hist. Bot. Ser. 18 (1937) 702), Standley stated that the occurrence of this species in Mexico was open to question. Since that time, however, the two collections which are cited above have established the presence of *L. semiserrata* in the lowland tropical forests of eastern Oaxaca. The localities of these collections lie in adjacent districts.

The collection, *Llewelyn Williams 9170*, which has been labelled "*Laplacea Williamsii* Standl. sp. nov.", (a *nomen nudum*), is the basis of Williams' reference to *Laplacea Williamsii* Standley in his *Arboles y arbustos del istmo de Tehuantepec* (in Lilloa 4 (1939) 145). I have examined an isotype from this collection and find that it is referable to *L. semiserrata* (Mart. & Zucc.) Cambess.

Araliaceae

Oreopanax capitatum (*Jacq.*) *Planchon & Decaisne* in Rev. Hort. 1854 (1854) 108.

Mexico: Oaxaca, District of Choapam, Santiago Choapam, long. 95°55′, lat. 17°20′, alt. 1000 m., May 13, 1939, *Schultes & Reko 907* (Econ. Herb. Oakes Ames No. 5833; Herb. Gray).

This collection was cited (in Bot. Mus. Leafl. Harv. Univ. 9 (1940) 27) as *Oreopanax platyphyllum* Marchal,

but Dr. A. C. Smith of the Arnold Arboretum, who is monographing this genus, has called my attention to the fact that it appears to be an unusual form of *O. capitatum*. Dr. Smith writes in part: "It is a difficult plant to place and is probably best left in *O. capitatum*, a widespread and variable species, with some specimens of which it is a fair match. It differs from the usual West Indian and Mexican form by its suggestion of rhomboid leaf-blades, its comparatively small inflorescence, and its subsessile heads, but all of these characters are to be found in *O. capitatum* sens. lat., although seldom in combination.

"The leaf-shape, except for the acuminate rather than rounded apex, is suggestive of *O. guatemalensis* (Lem.) Dec. & Pl., a species with usually only 3–5 fruits per head. *No. 907* also suggests *O. Sanderianum* Hemsl., but the leaf-blades are hardly sufficiently broad to be considered representative of that species.

"It is probable that the two species mentioned above are recently developed segregates from *O. capitatum*, with which they still show intermediate stages. *No. 907* is less conspicuously different from the basic species and in my opinion is not worthy of nomenclatural recognition."

ERICACEAE

Gaultheria acuminata *Chamisso & Schlechtendal* var. **Rekoi** *Camp var. nov.*

A specie ramulis et inflorescentiae rhachide et bracteis sparse glanduloso-pubescentibus differt.

MEXICO: Oaxaca, District of Teotitlán, road between Teotitlán del Camino and Huautla de Jiménez, long. 96°53′, lat. 18°10′, alt. 1400 m., August 2, 1938, *Richard Evans Schultes & Blas Pablo Reko 374*, (TYPE in Herb. N.Y. Bot. Gard.).

In a recent letter, Dr. Camp has written: "The scattered glandular pubescence on the twigs, rachis and bracts of the inflorescence of *Gaultheria acuminata* var. *Rekoi*

serves adequately to separate it from *G. acuminata* as well as from *G. acuminata* var. *nitida* (Benth.) Camp. Judging from the glandular pubescence of the inflorescence axis, it would seem that *Gaultheria acuminata* var. *Rekoi* represents a form somewhat intermediate between *G. acuminata* and the recently described *G. Pringlei* Camp, which is also from the State of Oaxaca. The new variety may be distinguished from *Gaultheria Pringlei* by the lack of gland-hairs on its corollas. The prescence of these gland-hairs on the corollas is a diagnostic character of *Gaultheria Pringlei* which serves to separate it from *G. acuminata.*"

The fruits of *Gaultheria acuminata* var. *Rekoi* are used as food by the Mazatec Indians of Huautla de Jiménez, who call the plant *ya-to-skwa-ree*, and its fruit *to-skwa*.

Gaultheria Schultesii *Camp sp. nov.*

Frutex usque ad 0.7 m. altus, ramulis albido-puberulis et sparse glanduloso-pubescentibus. Folia caulis principalis subrotundata vel late ovata, 1.5–2 cm. longa; folia ramorum floriferorum oblonga vel ovalia, 1–3 cm. longa, 0.6–1 cm. lata, subcoriacea, supra venis albido-puberulentibus exceptis glabra, subtus punctata, margine serrulata (serraturis minute glandulosis), petiolo 1–2 mm. longo. Flores axillares, solitarii in summo ramulorum digesti; pedicellis dense albido-puberulis et sparse glanduloso-pubescentibus, 4–8 mm. longis; bractea albido-puberula, margine ciliata; corolla globoso-urceolata, rosea, hirsuta, circa 7 mm. longa, apice contracta et quinque lobata, lobis circa 1 mm. longis; calyx quinquelobatus, lobis circa 2 mm. longis, glabris, margine ciliatis; stamina decem, filamentis circa 2.5 mm. longis, basi dilatatis et subcarnosis, pubescentibus, antheris circa 1.5 mm. longis, quadricornutis; ovarium globosum, puberulum; stylus glaber.

Gaultheria Schultesii is a graceful shrub sometimes reaching the height of 0.7 meter and generally growing in rocky areas. The branches are white-puberulent and bear scattered gland-hairs. On the main stem the leaves are almost round or occasionally broadly ovate and 1.5 2 cm. long; on the flowering branches the leaves are oblong to oval, 1–3 cm. long and 0.6–1 cm. wide, basally subcordate to truncate (rarely obtuse) and apically obtuse (rarely acutish). The upper surface of the leaves is glabrous except for a minute puberulence on the veins; the lower surface is punctate, the punctations representing the bases of early deciduous hairs; the margin is minutely glandular-serrate. The flowers are solitary in the axils at the ends of the branches, their pedicels white-puberulent and sparsely glandular-pubescent. The corolla is globose-urceolate and pink or red in color, hirsute, about 7 mm. long and apically contracted. Except for the ciliated margin, the 5-lobed calyx is glabrous. There are ten stamens, the filaments are pubescent and about 2.5 mm. long, basally dilated and subcarnose; the anthers are about 1.5 mm. long and bear four awns. The ovary is puberulent at anthesis. From material other than the type, it would appear that the mature fruit is black-purple at maturity and gaultherioid in structure.

MEXICO: Oaxaca, District of Ixtlán, Cerro Cuasimulco near San Pedro Yolox, long. 96°25′, lat. 17°44′, alt. 2600-2700 m., June 24, 1939, *Richard Evans Schultes 678* (TYPE in Herb. N.Y. Bot. Gard.); District of Villa Alta, half way to the summit of Cerro Zempoaltepetl, long. 96°04′, lat. 17°10′, alt. 2500-2800 m., May 25, 1939, *Richard Evans Schultes 517* (Econ. Herb. Oakes Ames No. 6116; Herb. N.Y. Bot. Gard.); District of Villa Alta, at the summit of Cerro Zempoaltepetl, February 19-27, 1937, *W.H.Camp 2659, sheet II pars* (Herb. N.Y. Bot. Gard.).

In connection with the description of *Gaultheria Schultesii*, Dr. Camp writes: "*Gaultheria Schultesii* is, like many others of this group, subject to a certain variability

in height of plant and size of leaf, specimens other than the type varying from over a meter (*Schultes 517*: a "shrub to four feet") to as low as 2 dm. (*Camp 2659* Sheet II pars). Of greater interest, however, is the fact that this new species does not properly belong in the genus *Gaultheria sensu stricto.* I collected it myself on Cerro Zempoaltepetl in 1937. At that time, I thought it to be only a much reduced and possibly depauperate form of the plant later described as *G. Conzattii* Camp var. *mijorum* Camp. It is now evident, however, that this is not the case; that my previous disposition of this material was an error; and that it should be separated from *G. Conzattii* var. *mijorum* and be given specific rank.

"This new species—*Gaultheria Schultesii*—has been placed in *Gaultheria* tentatively, until such time as the entire *Gaultheria-Pernettya* complex can be more carefully studied. The inflorescence of *G. Schultesii* would relate it more closely to *Pernettya* than to *Gaultheria.* It has not been placed in the recently described hybrid genus × *Gaulthettya* because, from the material now available, it would appear not to be a casual and recent hybrid between species of the two genera but, rather, a genetically stabilized entity, having arisen as a segregate from some previous chance hybrid between species of these two genera. A number of South American species which have traditionally been placed in *Gaultheria* would seem to have much the same type of ancestral background. The material of *Gaultheria Schultesii* which I collected on Cerro Zempoaltepetl in 1937 indicates that the fruit is typically gaultherioid and not intermediate as is often the case with many of these bigeneric hybrids."

The fruits of *Gaultheria Schultesii* are used as food by the Chinantec and Mije Indians. The Mije name of the plant is *tzinutpe*; the Spanish, *capulincillo del diablo.*

Ardisia Rekoi *Lundell sp. nov.*

Frutex vel arbor parva; ramuli graciles, novelli glanduloso-puberuli. Petioli 0.8–1.5 cm. longi. Lamina membranacea, oblanceolata vel oblonga, 7–15 cm. longa, 2.2–5.5 cm. lata, apice acuminata, basi acuta vel subacuminata, supra glabra, subtus parce glanduloso-puberula, acute serrata. Inflorescentiae terminales, pyramidales, glanduloso-puberulae; flores umbellati. Pedicelli 3–4 mm. longi, glanduloso-puberuli. Sepala quinque, glanduloso-puberula et glanduloso-ciliolata, punctata, anguste ovato-oblonga, fere 2 mm. longa. Corolla 5–5.5 mm. longa, punctata. Filamenta glanduloso-pilosa.

A shrub or small tree; branchlets slender, at first densely glandular-puberulent with minute reddish hairs. Petioles canaliculate or narrowly winged, glabrous in the groove, glandular-puberulent elsewhere, 0.8 to 1.5 cm. long. Leaf-blades membranaceous, slightly paler beneath, oblanceolate or oblong, 7 to 15 cm. long, 2.2 to 5.5 cm. wide, apex long-acuminate (the acumen entire, often subfalcate, up to 1.8 cm. long) base entire, acute or subacuminate, decurrent, the margin elsewhere conspicuously serrate with numerous erect acute teeth, sparsely red glandular-puberulent beneath, glabrous above except for a few minute scattered hairs along midvein, the costa impressed above, elevated beneath, primary veins seven to fourteen on each side, inconspicuous above, evident beneath. Inflorescence terminal, paniculate, the panicles pyramidal, bright red, somewhat shorter than the leaves, glandular-puberulent; flowers umbellate; bracts and bractlets small, ligulate, obtuse, glandular-puberulent, early deciduous. Pedicels rather stout, glandular-puberulent, 3 to 4 mm. long. Flower buds about 5 mm. long. Sepals five, rather sparsely glandular-puberulent, the

margins hyaline and glandular-ciliolate, red-punctate, narrowly ovate-oblong, about 2 mm. long, obtusish. Corolla 5–5.5 mm. long, glabrous outside, shortly glandular-pilose within at base; petals five, united at base, ovate, strongly reflexed at anthesis, red-punctate. Anthers about 2.3 mm. long, lanceolate, attenuate to a short subulate apex, red-punctate dorsally. Filaments glandular-pilose, stout, subequaling the anthers. Ovary punctate, ovoid, glabrous. Style 3.5 mm. long, slender.

MEXICO: Oaxaca, District of Teotitlán, barranca Nin-du-da-gé, San Antonio Eloxochitlán, a small tree, long. 96°45′, lat. 18°21′, alt. 1100 m., July 24, 1938, *Richard Evans Schultes & Blas Pablo Reko 273* (TYPE in Herb. Univ. Michigan); District of Teotitlán, Cerro de los Frailes, a small shrub, 2 m. tall, in dense rain forest, alt. 1800 m., August 2, 1938, *Schultes & Reko 388* (Econ. Herb. Oakes Ames No. 7121); District of Teotitlán, barranca Nin-du-da-gé, San Antonio Eloxochitlán, a small tree 12–15 feet tall, in forest near arroyo, July 6, 1939, *Schultes 792* (TOPOTYPE in Econ. Herb. Oakes Ames No. 8445).

Dr. Lundell writes: "*Ardisia Rekoi* is a remarkably distinct species clearly allied to *A. nigrescens* Oerst. of the subgenus *Icacorea*."

The Mazatec Indians of San Antonio Eloxochitlán report that the small fruits of *Ardisia Rekoi* are edible. The plant is referred to by the Spanish name *capulín* and by the Mazatec name *shka-na-tau*.

Parathesis Schultesii *Lundell sp. nov.*

Frutex, ramulis ferrugineo-tomentosis. Folia integra, membranacea vel subchartacea, oblanceolata, 7.5–13 cm. longa, 2–3.5 cm. lata, apice attenuata, obtusa, basi acuta, utrinque ferrugineo-pubescentia; petiolis usque ad 7 mm. longis. Inflorescentiae paniculatae, pauciflorae, axillares, ferrugineo-tomentosae. Pedicelli 7–12 mm. longi. Sepala lanceolato-subulata, circa 2 mm. longa. Fructus pubescentes.

A tall shrub, branchlets slender, ferruginous-tomentose

with stalked stellate hairs. Petioles tomentose, canaliculate, up to 7 mm. long. Leaf blades essentially entire, membranous or subchartaceous, oblanceolate, 7.5 to 13 cm. long, 2 to 3.5 cm. wide, apex attenuate and subacuminate, the acumen long and obtuse, base attenuate and acute, pilose above, stellate-pubescent beneath with ferruginous stalked hairs, the pubescence densest along costa and veins, costa and primary veins slightly impressed above, rather conspicuous beneath. Inflorescence paniculate, strictly axillary, few-flowered, less than half as long as the leaves, the rachis and branches very slender, weak, ferruginous-tomentose. Fruiting pedicels slender, pubescent, 7 to 12 mm. long. Persistent sepals short, connate at base, lanceolate-subulate, about 2 mm. long, hirtellous outside. Fruits drying red, ovoid-globose, up to 8 mm. in diameter, persistently pubescent over the entire surface; style hairy at base.

MEXICO: Oaxaca, District of Choapam, Cerro Caracól, near San Juan Lalana, a tall shrub in forest, long. 95°45′, lat. 17°25′, alt. 1100 m., May 11, 1939, *Richard Evans Schultes & Blas Pablo Reko 862* (TYPE in Herb. Univ. Michigan).

Dr. Lundell writes: "The species is well marked and appears to be nearest *P. Rekoi* Standl., also of Oaxaca. *P. Rekoi*, according to description, has considerably wider leaves, a glabrous ovary, and much larger many-flowered inflorescences. The fruits of *P. Schultesii* are persistently hairy; hence the ovary probably is pubescent."

Parathesis tenuis *Standley* in Contrib. U.S. Nat. Herb. 23 (1924) 1111.

MEXICO: Oaxaca, District of Choapam, Cerro Caracól, between San Juan Lalana and Santo Domingo Latani, long. 95°45′, lat. 17°26′, alt. 1400-1650 m., May 11, 1939, *Schultes & Reko 865* (Econ. Herb. Oakes Ames No. 6217; Herb. Gray).

Standley described this species of *Parathesis* on the

basis of one collection which Liebmann made almost a century ago. The precise locality of this collection (*Liebmann 14*) is unknown, but Standley believed that it was "collected somewhere in southern Mexico, probably in Oaxaca or Vera Cruz". It is very probable that the collection was made in northeastern Oaxaca—where Liebmann made some of his most extensive and valuable collections. *Schultes & Reko 865* represents apparently the second collection which has been made of this rare species.

An examination of the isotype of *Parathesis tenuis* which is in the Gray Herbarium indicates that it agrees strikingly in all details with *Schultes & Reko 865*. On the basis of field notes and an examination of the numerous specimens which constitute *Schultes & Reko 865*, the following amplified description and drawing of *Parathesis tenuis* is offered.

Arbor parva, tenuis, usque ad quindecim pedes alta. Folia alterna, elliptica, integra, valde et obtuse longe-acuminata, cuspidata. Petiolus 3–9 mm. longus. Inflorescentia terminalis, subcorymbosa, foliis brevior, paucos flores ferens; bracteae minutissimae, lineares, obtusae. Sepala elongato-triangularia, acutiuscula, basi connata, minute puberula, fulva. Petala lanceolata, acutiuscula, basi breviter connata, intus alba glandulosis cum pilis, extus circiter sex lineas latas ornata, anthesi explanata, apicibus valde reflexis antheras exhibentibus. Filamenta glabra. Antherae lineares, petalis breviores, aureae. Ovarium punctatum, puberulum, ovoideum. Stylus tenuissimus, apice saepissime recurvatus, anthesi exsertus et persistens. Fructus ignotus.

A small, slender tree up to 15 feet tall with weak, minutely brown-tomentulose branches. Leaves alternate, elliptic, strongly and obtusely long-acuminate, entire, cuspidate, cuneate at the base, thin, 3.5–6 cm. long, 1–2

cm. wide; mid-vein prominent, secondary veins pinnate, prominulous. Petiole 3–9 mm. long. Inflorescence terminal, subcorymbose, shorter than the leaves, few- (up to eight) flowered, on a long, filiform peduncle. Pedicels filiform, 5–9 mm. long, ferruginous, cylindrical. Bracts very minute, linear, obtuse, less than 1 mm. long, 0.25 mm. wide. Buds about 2.5 mm. long, minutely tomentulose, predominantly brownish. Sepals elongate-triangular, acutish, connate at the base, about 1.5 mm. long, 0.5 mm. wide at the base, minutely puberulent, brown. Petals lanceolate, acutish, 3.5 mm. long, 1 mm. wide, shortly connate at the base, interiorly whitish and clothed with glandular hairs, exteriorly marked by about six broad brown lines, at anthesis explanate with the apex very strongly reflexed, exposing the anthers. Filaments glabrous, 1.25 mm. long. Anthers linear, 2 mm. long or less, shorter than the petals, bright yellow. Ovary punctate, puberulent, ovoid. Style 2.5 mm. long, very slender, usually bent at the apex, at anthesis exserted, persisting. Fruit unknown.

This interesting species of *Parathesis* is very frequent in the dark, damp, cool rain-forests on the northern and eastern slopes of Cerro Caracól between the villages of San Juan Lalana and Santo Domingo Latani. Apparently it does not occur widely in northeastern Oaxaca. It is notable because of the small size of all its parts.

The floral coloration of *Parathesis tenuis* is peculiar. The petals are brown and white, while the stamens are brilliant yellow. The petals are strongly reflexed at anthesis exposing the brilliant stamens which constitute the conspicuous part of the flower.

The Chinantec Indians of this region called the tree *ma-ku-lai*, the meaning of which could not be ascertained. The fruits are said to be small, but they are used as a source of food by the natives inasmuch as the trees are

abundant and bear profusely. According to reports, the fruits are agreeable to the taste in spite of the fact that they are rather acid.

Sapotaceae

Bumelia eloxochitlensis *R. E. Schultes & C. Conzatti sp. nov.*

Arbor. Folia elliptica, acuminata, subcoriacea, utrinque glabra, breviter petiolata. Ramuli glabri, spinosi. Flores parvi, fulvi, fasciculati. Sepala quinque, subaequalia, ovata, extus dense ferrugineo-pubescentia. Petala ovata, apice rotundata, margine membranacea inaequali duabus cum appendicibus parvis. Staminodia petaloidea, elliptica, margine inaequaliter laciniata et membranacea. Stamina conspicua. Ovarium globosum, dense pubescens, apice stylum carnosum glabrumque ferens. Fructus ignotus.

A tree about 25 feet tall with spreading branches. Leaves elliptic, apically acuminate, basally acute, mostly 6–8.5 cm. long, 2–2.8 cm. wide, subcoriaceous, glabrous on both sides, lustrous above. Petioles short, about 8–10 mm. long. Branchlets glabrous, armed with a few short spines which are 6–9 mm. long. Flowers small, yellow-brown, in loose lateral and axillary fascicles up to 12-flowered; pedicels 8–12 mm. long, ferruginous-pubescent. Sepals five, subequal, ovate; the outer three apically subacute, 1.2 mm. wide, 3 mm. long, externally densely ferruginous-pubescent; inner two slightly wider, apically subrotund, externally ferruginous-pubescent. Petals ovate, apically rotund, with irregular membranaceous margins, 2.9–3.1 mm. long, each with two small infolded appendages. Staminodia petaloid, elliptic with irregularly laciniate and membranaceous margins. Stamens large; filaments fleshy, 1.5 mm. long; anthers 2 mm. long. Ovary globose, 1 mm. in diameter, densely pubescent

with white hairs which are 0.8 mm. long, surmounted by a glabrous fleshy tapering style about 3 mm. long, exserted in bud. Fruit unknown.

Mexico: Oaxaca, District of Teotitlán, in barranca Nin-du-da-gé, San Antonio Eloxochitlán, long. 96°45′, lat. 18°12′, alt. 1000 m., July 6, 1939, *Richard Evans Schultes 791* (Type in Econ. Herb. Oakes Ames No. 8988; Isotypes in Herb. Conzatti; Herb. Gray; Herb. Inst. Biol. [Mexico]).

Bumelia eloxochitlensis appears to be very closely related to *B. persimilis* Hemsley of Vera Cruz, a rare plant which, so far as I have been able to ascertain, has not been found again since the type collection was made. I have examined an isotype of *Bumelia persimilis* which is in the United States National Herbarium and find that it differs from *B. eloxochitlensis* chiefly in having apically obtuse or very rarely subacute, instead of long acuminate, leaves. The leaves of *Bumelia eloxochitlensis* are larger and the flowers appear to be grouped in looser fascicles. There are also minor differences in the flowers which serve to distinguish between the two; the most important floral differences are in the size and shape of the anthers and petals.

In its habit, *Bumelia eloxochitlensis* is very similar to *Dipholis salicifolia* (L.) A. DC., but it is armed with small woody spines whereas *D. salicifolia* is unarmed.

The small fruits of *Bumelia eloxochitlensis* are borne in great abundance and are said by the Mazatecs of San Antonio Eloxochitlán to be eaten. They are reported to be sweet and mucilaginous and to possess diuretic properties if eaten in quantity. The tree is known by the Spanish names: *tempiste* and *zapotillo bravo*; and by the Mazatec name: *ya-ntsin-tsu*.

Gentianaceae

Leiphaimos aphylla (*Jacq.*) *Gilg* in Engler Nat. Pflanzenfam. 4, abt. 2 (1895) 104.

MEXICO: Oaxaca, District of Choapam, San Juan Teotalcingo, long. 95°51′, lat. 17°18′, March 25, 1919, *Reko 4150*; District of Choapam, San Juan Lalana, long. 95°45′, lat. 17°25′, alt. 700 m., May 9, 1939, *Schultes & Reko 835*.

This small, bright yellow root-parasite is apparently very local and has been collected in Mexico only twice, both times in the District of Choapam. Indeed San Juan Teotalcingo and San Juan Lalana are almost adjacent towns.

Schultes & Reko 835 occurred on the same roots with the parasitic *Apteria aphylla* (Nutt.) Barnh. of the *Burmanniaceae* (*Schultes & Reko 834*) which, like *Leiphaimos aphylla*, has not been collected in any other section of Mexico.

There is one other species of *Leiphaimos* in Mexico—*L. parasitica* Cham. & Schlecht. This is represented in the United States National Herbarium by two collections, one from Vera Cruz, the other from Quintana Roo.

APOCYNACEAE

Prestonia guatemalensis *Woodson* in Ann. Mo. Bot. Gard. 23 (1936) 339.

MEXICO: Oaxaca, District of Choapam, Monte Negro de Lalana, long. 95°55′, lat. 17°35′, alt. 150 m., May 3, 1939, *Schultes & Reko 747* (Econ. Herb. Oakes Ames No. 7113).

Hitherto, *Prestonia guatemalensis* has been known only from Guatemala.

GESNERIACEAE

Alloplectus strigosus (*Oerst.*) *Hanstein* in Linnaea 34 (1865-66) 374.

MEXICO: Oaxaca, District of Choapam, in forests along Río Chiquíto, near town of Río Chiquíto, long. 96°02′, lat. 17°40′, alt. about 150 m., May 1, 1939, *Schultes & Reko 724*.

Hitherto, this beautiful epiphytic shrub has been known apparently from only three collections, all of which were cited in the original description. According to the citations, these collections were made in 1842 by Liebmann in the Chinantla of northeastern Oaxaca very close to the locality of *Schultes & Reko 724*.

Acanthaceae

Chileranthemum trifidum *Oersted* in Vidensk. Meddel. Kjöbenhavn 1854 (1854) 166.

Mexico: Oaxaca, District of Tuxtepec, San José Chiltepec, long. 96°08′, lat. 18°00′, alt. 150 m., April 11, 1939, *Schultes & Reko 577* (Econ. Herb. Oakes Ames No. 9649).

Apparently, this rare shrub has not hitherto been collected in the State of Oaxaca. The type collection was made in Vera Cruz.

Ruellia stemonacanthoides (*Oerst.*) *Hemsley* in Godman & Salvin Biol. Centr.-Am. Bot. 2 (1882) 507.

Mexico: District of Choapam, near Río Chiquito, long. 96°02′, lat. 17°38′, alt. about 150 m., May 2, 1939, *Schultes & Reko 739*; Tabasco, June 19-25, 1939, *Matuda 3472*.

Schultes & Reko 739 and *Matuda 3472* are apparently the first Mexican collections of *Ruellia stemonacanthoides* from outside of the Yucatan Peninsula. According to Leonard (in Bot. Maya Area: Misc. Pap. 10 (1936) 206), this species is known from Campeche, British Honduras, Guatemala, and Costa Rica. It is very infrequent in northeastern Oaxaca.

Ruellia Harveyana *Stapf* in Bot. Mag. 139 (1913) pl. 8485.

Mexico: Oaxaca, District of Choapam, Monte Negro de Lalana, long. 95°52′, lat. 17°40′, alt. about 200 m., May 3, 1939, *Schultes & Reko 767*.

Leonard (in Bot. Maya Area: Misc. Pap. 10 (1936) 204-205) states that *Ruellia Harveyana* is known only from Guatemala and British Honduras. *Schultes & Reko 767*, therefore, extends the range of this species northwestward, placing it in Mexico for the first time.

RUBIACEAE

Faramea Schultesii *Standley sp. nov.*

Arbuscula omnino glabra, ramis gracillimis in sicco nigris et striatis, superioribus 1.5 mm. crassis, internodiis brevibus; stipulae brevissime coalitae fere semiorbiculares, 1.5 mm. longae, apice obtusissimae et in setam erectam rigidam 4–6 mm. longam contractae; folia inter minora, breviter petiolata, in sicco fusca, valde membranacea, petiolo tenui 4–9 mm. longo; lamina angustissime lanceolato-oblonga, 9–10.5 cm. longa, 18–21 mm. lata, longissime et anguste attenuato-acuminata acumine ipso obtuso, basi acute angustata, supra in sicco sublucida, costa nervisque prominulis, subtus concolor, costa tenerrima prominenti, nervis lateralibus utroque latere circa decem tenerrimis obscuris angulo fere recto abeuntibus brevibus irregularibus prope marginem conjunctis, venulis obscuris laxe reticulatis; flores visi (an normales?) ex axillis superioribus nascentes, solitarii, pedicellis gracillimis usque ad 2 cm. longis, sursum paullo dilatatis; hypanthium brevissimum, in pedicellum sensim attenuatum, calyce vix ultra 1 mm. longo, profunde dentato; corolla extus glabra, tubo gracili cylindraceo 2 cm. longo, 1.5 mm. crasso cum fauce glabro, lobis quattuor lanceolato-linearibus intus glabris anguste obtusis circa 13 mm. longis.

A shrub or small tree, glabrous throughout, the branches very slender, black and striate when dry, the terminal ones 1.5 mm. thick, the internodes short; stipules very shortly connate, almost semiorbicular, 1.5 mm. long,

very obtuse at the apex and abruptly contracted into a rigid, erect seta 4–6 mm. long; leaves small, fuscous when dried, short-petiolate, thick-membranaceous, the slender petiole 4–9 mm. long; blades very narrowly lance-oblong, 9–10.5 cm. long, 1.8–2.1 cm. wide, long and narrowly attenuate-acuminate, the tip obtuse, acutely narrowed at the base, somewhat lustrous above when dry, the costa and nerves prominulous, concolorous beneath, the costa very slender, prominent, the lateral nerves about ten on each side, very slender and inconspicuous, diverging at almost a right angle, united near the margin, the ultimate veins inconspicuous, laxly reticulate; flowers (normally?) solitary in the upper leaf axils, the very slender pedicels 2 cm. long or shorter, slightly dilated toward the apex; hypanthium very shortly and gradually attenuate into the pedicel; calyx scarcely 1 mm. long, deeply dentate; corolla glabrous outside, the very slender tube terete, 2 cm. long, 1.5 mm. thick, the throat glabrous, the four lobes lance-linear, glabrous within, narrowly obtuse, about 13 mm. long.

MEXICO: Oaxaca, District of Choapam, Cerro de Lalana, near San Juan Lalana, in forest, long. 95°45′, lat. 17°25′, alt. 1300 m., May 11, 1939, *Richard Evans Schultes & Blas Pablo Reko 855* (TYPE in Herb. Field Mus. Nat. Hist.).

Dr. Standley has written in connection with the foregoing description: "The single specimen seen is not in satisfactory condition for study, and it is possible that the inflorescence has been interpreted incorrectly. At any rate, the collection represents a quite distinct species, differing widely from the few other Mexican ones in its narrow leaves."

The fruits of *Faramea Schultesii* are rather bitter and astringent and are said by the Chinantec Indians to be used to cure sores of the mouth and tongue. The tree is called *ma-la* by the Chinantecs of San Juan Lalana.

EXPLANATION OF THE ILLUSTRATIONS

PLATE I. CARLUDOVICA LABELA *R. E. Schultes*. 1, habit of the plant, one fourth natural size. 2, leaf, one fourth natural size. 3, female inflorescence (somewhat diagrammatic), enlarged about one and one half times. 4, female flower, enlarged about two and one half times. 5, male inflorescence, enlarged about one and one half times.

Drawn by GORDON W. DILLON

PLATE II. GUATTERIA GALEOTTIANA *Baillon*. 1, flowering and fruiting branch, one half natural size. 2, flower, about natural size. 3, petal (exterior), enlarged about two times. 4, sepal (exterior), enlarged about two times.

Drawn by RICHARD EVANS SCHULTES

PLATE III. PHOEBE CHINANTECORUM *R. E. Schultes*. 1, flowering branch, one half natural size. 2, flower (the ovary omitted), enlarged five times. 3, diagram of the flower with the anthers removed (the location of the anthers shaded), enlarged ten times. 4, anther of the outer series, enlarged ten times. 5, anther of the inner series, enlarged ten times.

Drawn by GORDON W. DILLON

PLATE IV. CONNARUS SCHULTESII *Standley*. 1, fruiting branch, approximately one half natural size. 2, fruit, enlarged approximately one and one half times.

Drawn by GORDON W. DILLON

PLATE V. GAULTHERIA SCHULTESII *Camp*. 1, flowering branch, natural size. 2, flower, enlarged approximately two and one half times. 3, anther, enlarged approximately five times.

Drawn by GORDON W. DILLON

PLATE VI. ARDISIA REKOI *Lundell.* 1, flowering branch, one half natural size. 2, flower as seen from the side, enlarged about three times. 3, flower as seen from above, enlarged about three times. 4, pistil, enlarged about three times. 5, calyx, enlarged about three times. 6, stamen, enlarged about six times.

Drawn by GORDON W. DILLON

PLATE VII. PARATHESIS SCHULTESII *Lundell.* 1, fruiting branch, one half natural size. 2 and 3, fruit, enlarged approximately six times.

Drawn by GORDON W. DILLON

PLATE VIII. PARATHESIS TENUIS *Standley.* 1, flowering branch, approximately one half natural size. 2, inflorescence, slightly larger than natural size. 3, flower, enlarged approximately five times. 4, pistil, enlarged approximately five times. 5, petal, enlarged approximately five times. 6, sepal, enlarged approximately five times. 7, anther, enlarged approximately five times.

Drawn by RICHARD EVANS SCHULTES

PLATE IX. BUMELIA ELOXOCHITLENSIS *R. E. Schultes & C. Conzatti.* 1, flowering branch, one half natural size. 2, flower as seen from the side, enlarged about five times. 3, view of the corolla (dissected and laid open) as seen from the interior, showing the large petaloid staminodia, the stamens, the appendages of the petals, and the petals, enlarged about five times. 4, idealized drawing of a petal as seen from the exterior, showing (in dotted lines) the two appendages folded in under the petal, enlarged about five times. 5 and 6, stamens, enlarged about five times. 7, pistil, enlarged about five times. 8, inflorescence, about natural size.

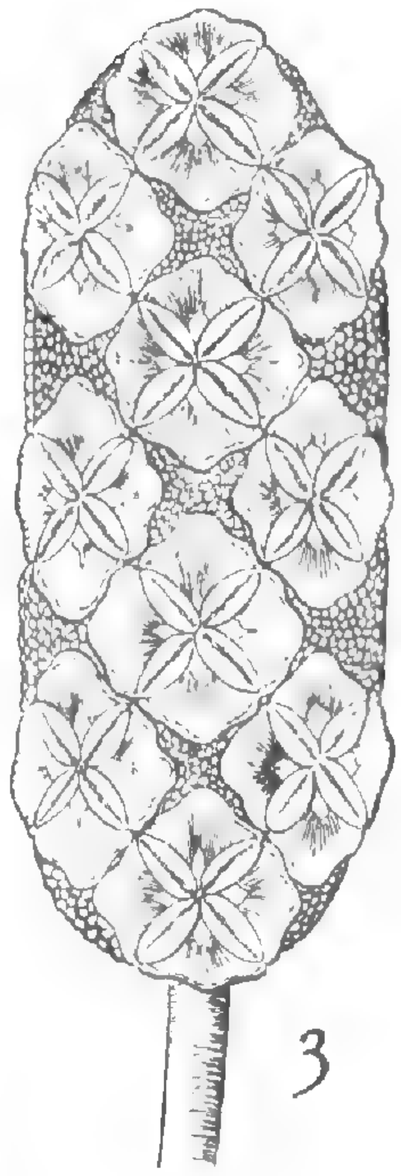
Drawn by GORDON W. DILLON

PLATE I

CARLUDOVICA

Labela R. E. Schultes


5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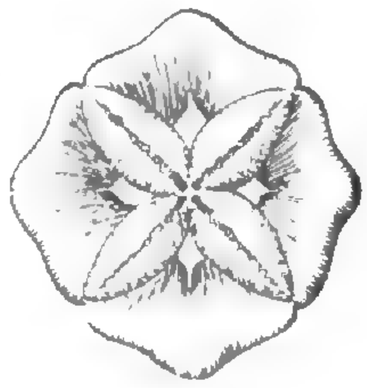
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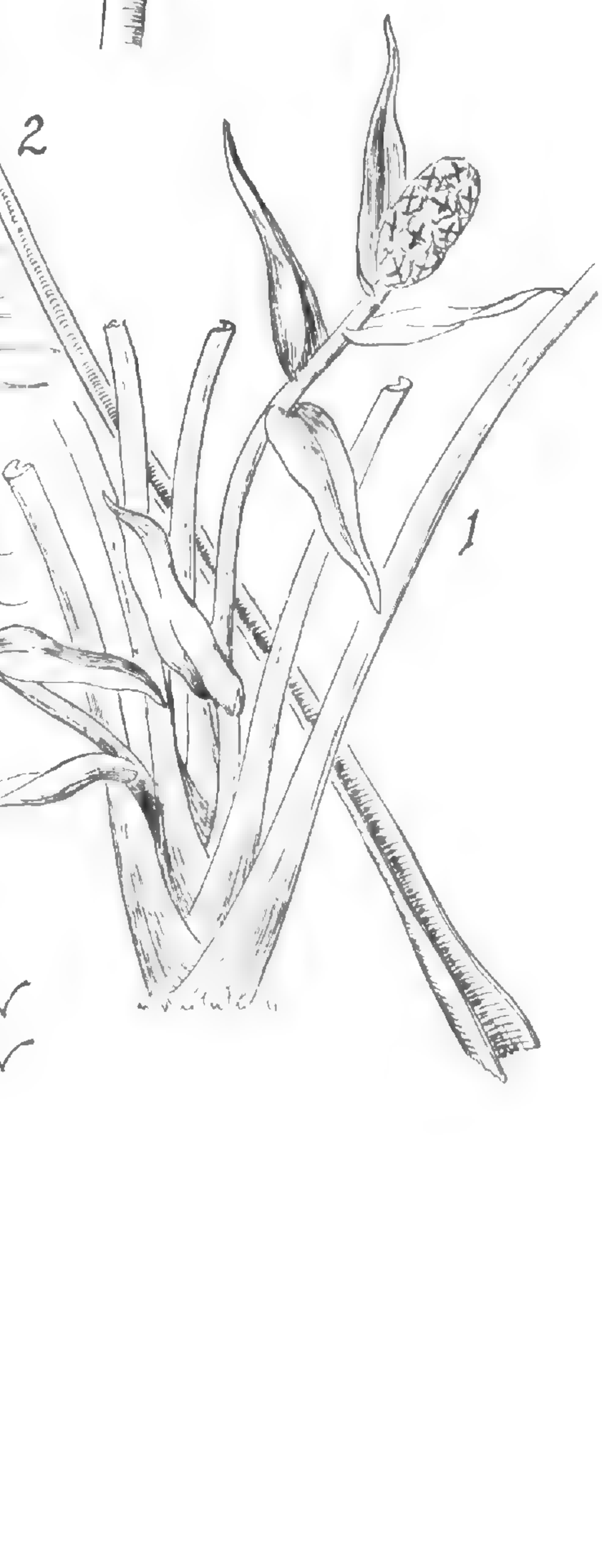
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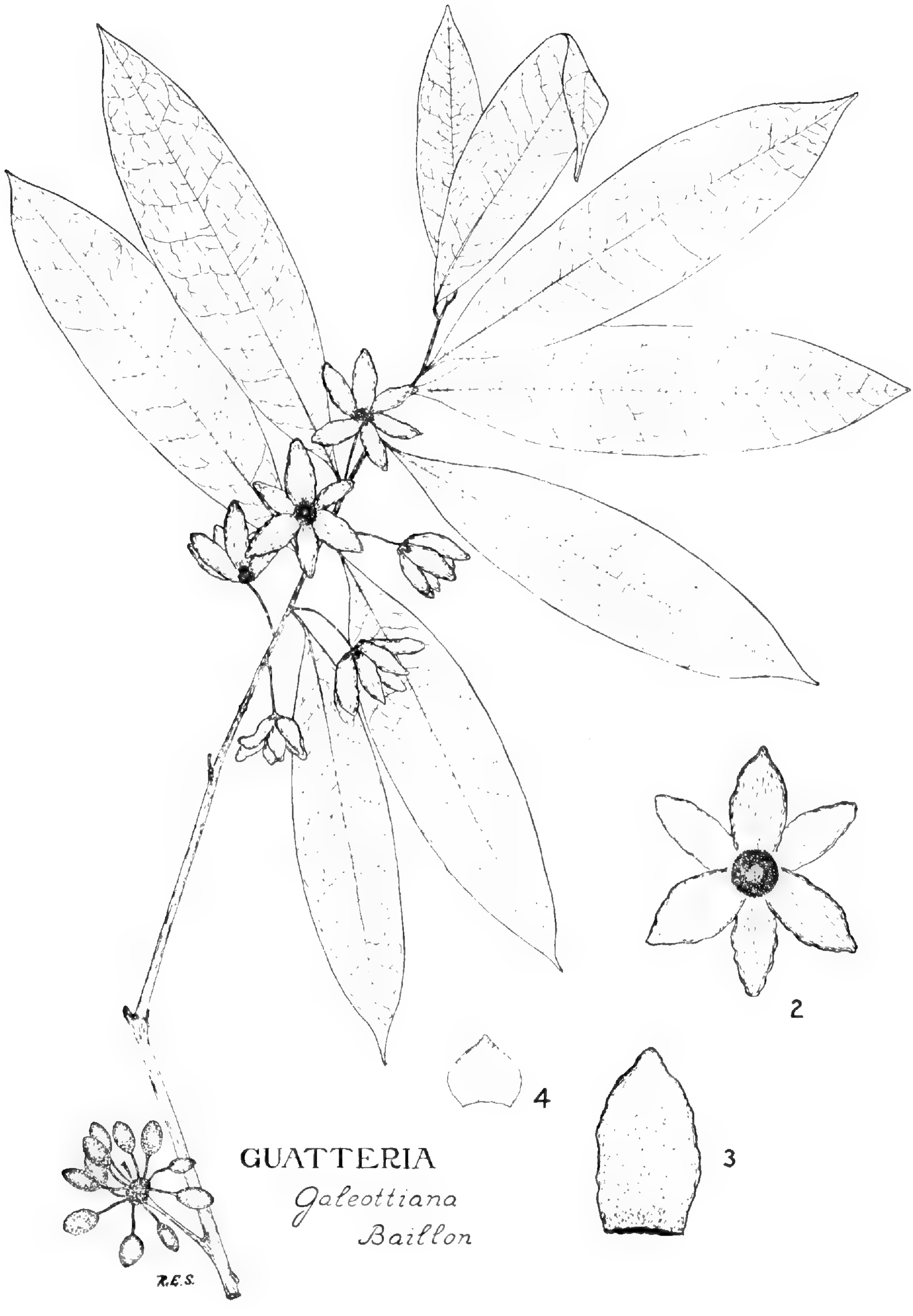
GORDON W. DILLON

PLATE II



GUATTERIA

Galeottiana

Baillon

R.E.S.

2

3

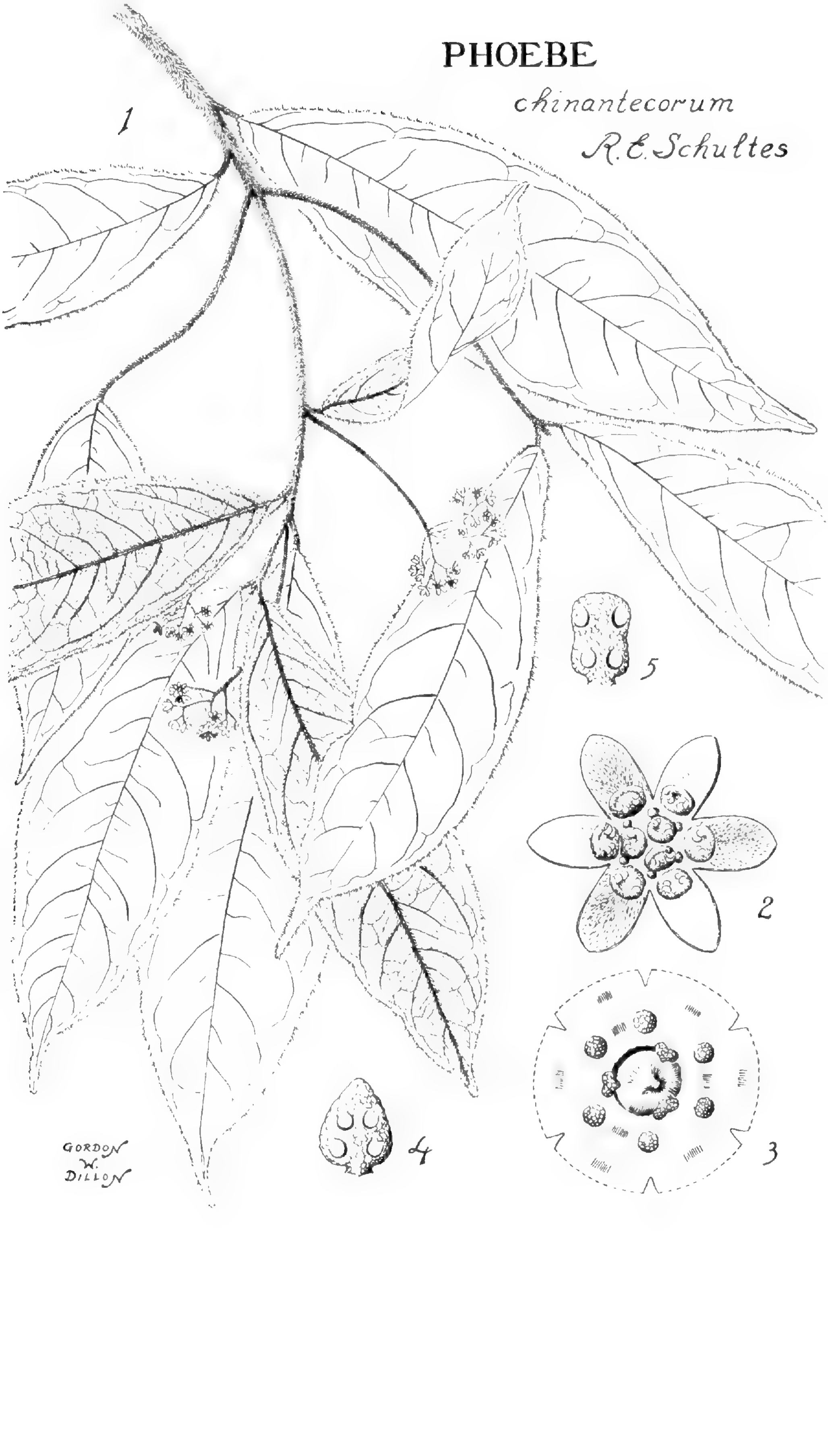
4

PLATE III

PHOEBE

chinantecorum

R. E. Schultes



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GORDON W. DILLON

Plate IV

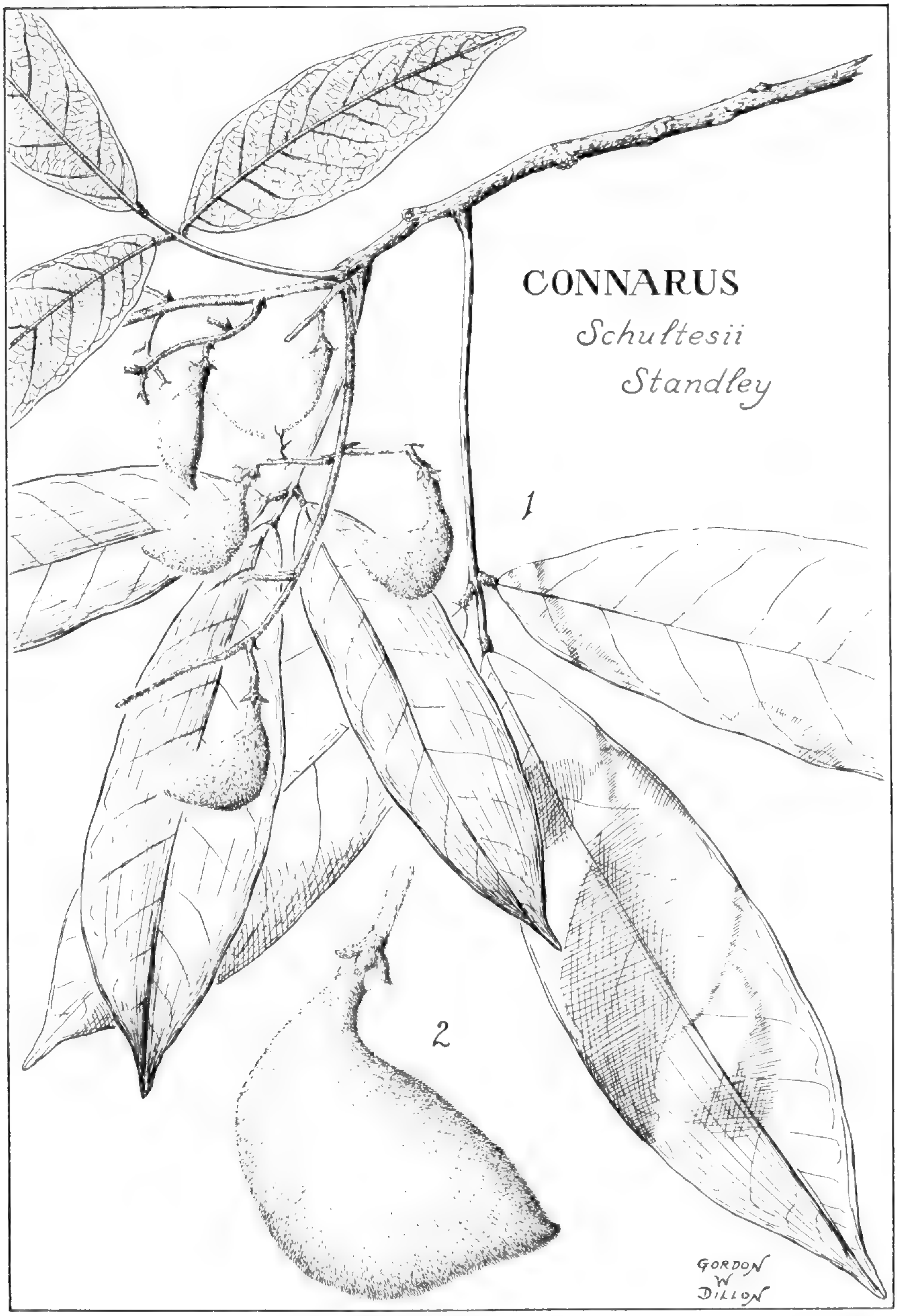
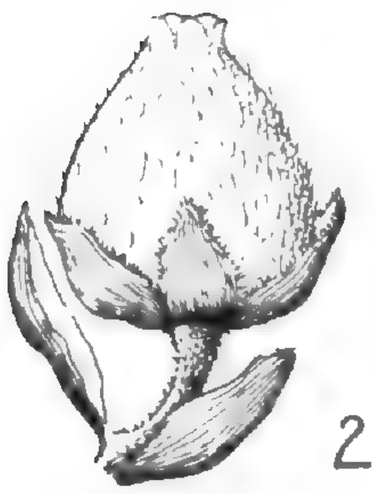


PLATE V

GAULTHERIA

Schultesii

Camp



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GORDON W. DILLON

PLATE VI

ARDISIA

Rekoi

Lundell

PLATE VII

PARATHESIS

Schultesii Lundell

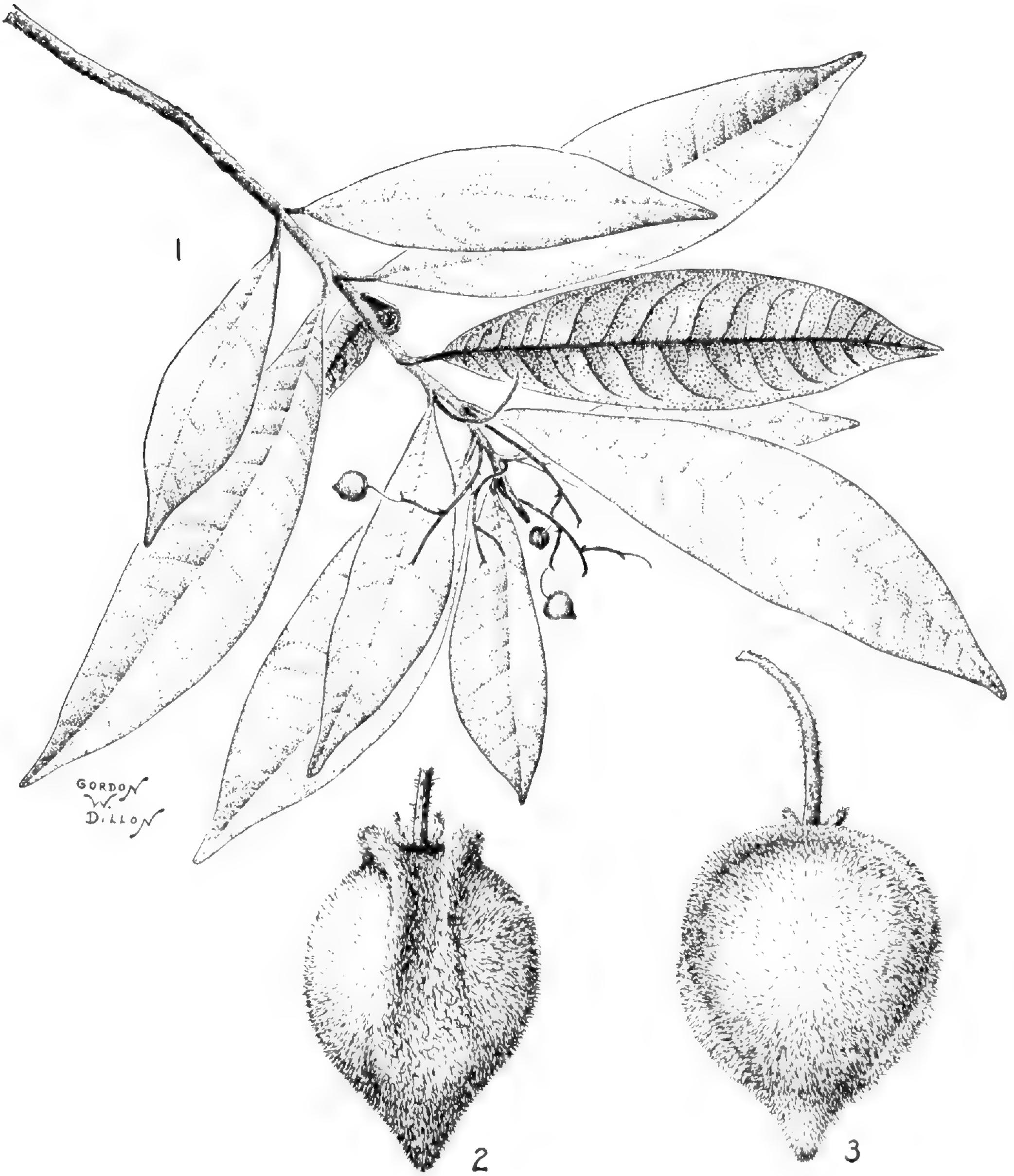
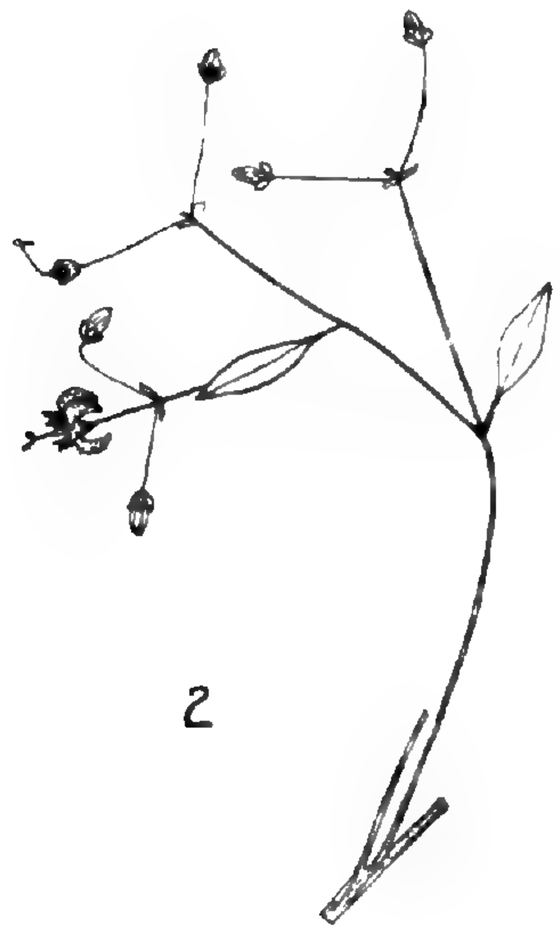
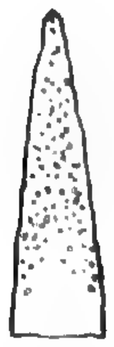


Plate VIII





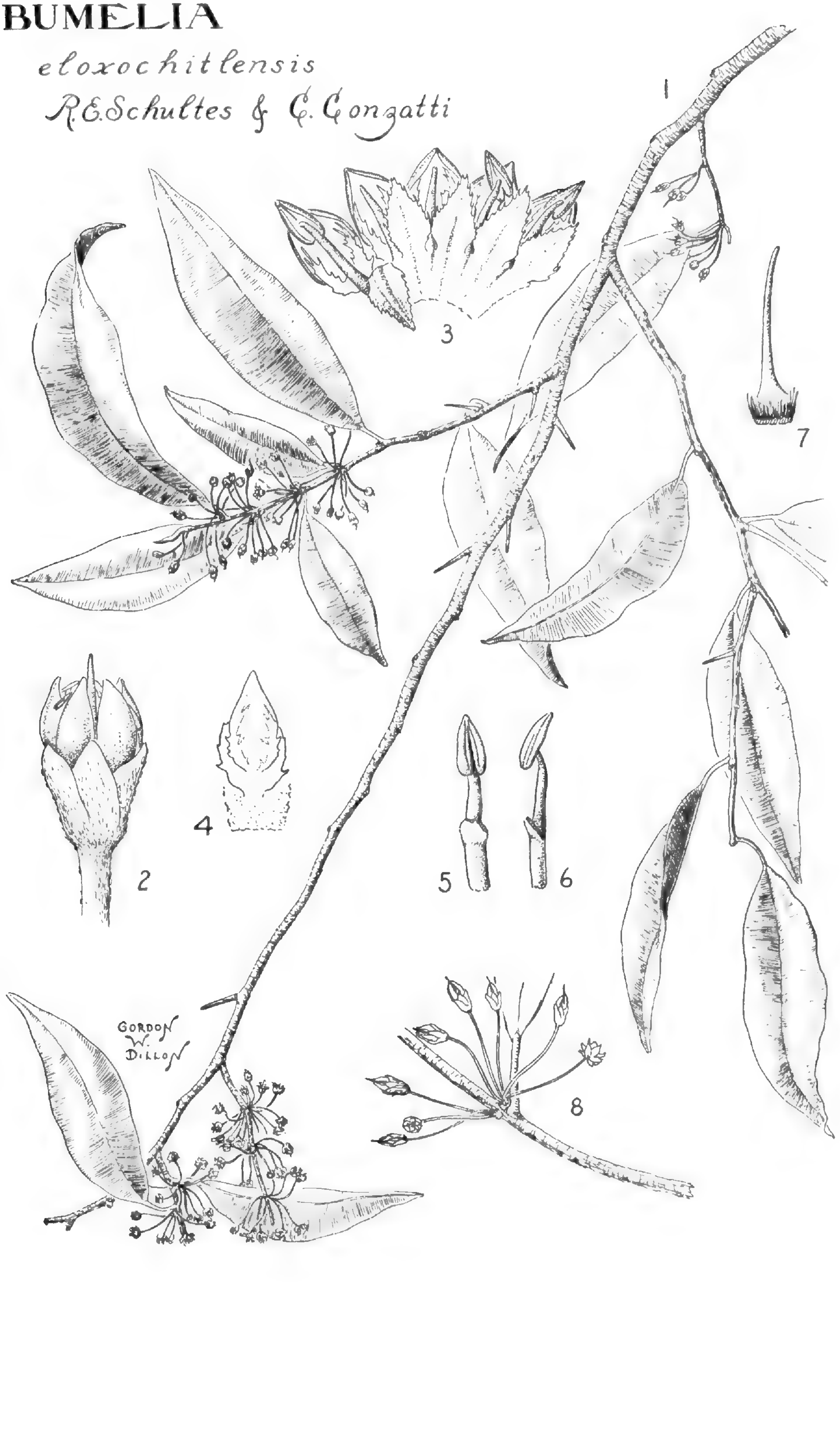
Parathesis tenuis Standley

PLATE IX

BUMELIA

eloxochitlensis

R.E.Schultes & C. Congatti



BOTANICAL MUSEUM LEAFLETS
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ORCHIDACEAE PERUVIANAE II

BY

CHARLES SCHWEINFURTH

THIS ARTICLE is the second in the series devoted to the novelties in the orchid flora of Peru. It includes eleven species and one variety that hitherto apparently have not been described.

Stenoptera ciliaris *C. Schweinfurth sp. nov.*

Herba terrestris, elata. Radices fasciculatae, tuberosae. Caulis supra tomentosulus. Folia infra fasciculata et imbricantia, supra sparsa, elliptico-oblonga vel oblongo-lanceolata, acuta vel breviter acuminata, basim versus sensim angustata. Spica elongato-cylindrica, subdense multiflora. Florum bracteae ovato-lanceolatae, dense ciliatae. Flores parvi, extus tomentosi. Sepalum dorsale columnae adnatum, elliptico-oblongum vel oblongo-lanceolatum. Sepala lateralia oblique elliptica vel elliptico-lanceolata, in tubulum brevem cum labello connata. Petala oblique linearia vel lineari-oblanceolata, margine superiore minute ciliolata. Labellum superum, tubulari-concavum, expansum late ovatum, truncato-obtusum. Columna generis.

Plant terrestrial, tall, up to about 7.4 dm. high. Roots fasciculate, stout, tuberous, lanuginose. Stem stout, glabrous or nearly so below, densely tomentulose above, with a cluster of about four crowded leaves near the base of the plant and scattering blades and tubular sheaths above.

Leaves elliptic-oblong to oblong-lanceolate (the lowermost blade sometimes broadly oval), up to about 22 cm. long and 5 cm. wide, abruptly acute to short-acuminate, narrowed to a sheathing base, with the lower cluster of blades imbricating below. Spike elongate-cylindric, subdensely many-flowered (looser toward the base), up to about 26 cm. long; rachis densely tomentulose. Floral bracts ovate-lanceolate, long-acuminate, up to 1.9 cm. long, densely tomentulose on the outer surface, finely short-ciliate (only minutely so near the apex), slightly shorter than the flower. Ovary and outer surface of flower tomentose. Flowers small, subfleshy, green or greenish white, campanulate in natural position with the lower part of the sepals tubular-concave and the apex reflexed. Dorsal sepal with its base adnate to the column, elliptic-oblong or oblong-lanceolate, narrowed to an obtuse or subacute apex, about 6 mm. long and 2 mm. wide, with one prominent nerve. Lateral sepals connate with the base of the lip into a short tube; free portion obliquely elliptic or elliptic-lanceolate, shortly acuminate, about 7 mm. long and 3.3 mm. wide, 2- to 3-nerved. Petals adnate to the sepaline tube, obliquely linear or oblanceolate-linear, subacute, 1-nerved, with the upper margins more or less minutely cellular-ciliolate, about 5.8 mm. long. Lip uppermost, adnate at base to the short sepaline tube, tubular-concave in natural position, broadly ovate in outline when expanded, with lobulate-undulate upper margins and truncate-obtuse apex having a short blunt apicule, about 7.5 mm. long through the center of the free portion, rather fleshy except near the margins, bicallose at base. Column relatively elongate, 5 mm. long in front, abbreviated and adnate to the ovary on the back, retrorsely geniculate above, densely pubescent. Anther transversely and shallowly ovoid, carinate-acute at the summit, 2-celled.

Stenoptera ciliaris is allied to *S. acuta* Lindl., but differs from that species in having shorter broader leaves, pubescent ciliolate floral bracts and dissimilar lateral sepals.

AYACUCHO: Aina, between Huanta and Río Apurimac, at 750-1000 meters altitude, in open woods, May 7, 17, 1929, *E.P.Killip & A.C. Smith 22521* (TYPE in U.S. Nat. Herb. No. 1357470); clearing, *Killip & Smith 22615*; on open hillside, August 6, 1940, *Killip & Smith 22692*. —CUZCO: Machu Picchu, Urubamba, at 2000 meters altitude, on cliffs, *C.Vargas 1889*.

Stenoptera laxiflora *C. Schweinfurth sp. nov.*

Herba elata. Radices non visae. Caulis robustus, dense tomentosus, infra dense foliatus, supra vaginatus. Folia elliptico-lanceolata vel oblongo-lanceolata, in basim vaginantem sensim angustata, infra conferta, supra in vaginas tubulatas redacta. Spica elongato-cylindrica, laxe multiflora. Florum bracteae lanceolato-ovatae, dorso tomentosae, margine ciliatae. Flores parvi, extus tomentosi. Sepalum dorsale lanceolato-ellipticum, columnae adnatum. Sepala lateralia parte basali in tubum longum connata; pars libera oblique oblongo-oblanceolata. Petala linearia. Labellum superum, tubulari-involutum cum apice patenti-reflexo, parte inferiore sepalorum tubo longe adnata, parte libera expansa spathulato-obovata. Columna longa, dorso sepalorum tubo longe adnata, supra retrorso-arcuata.

Plant tall, stout, apparently up to 10.6 dm. high. Roots lacking in our specimen. Stem stout, densely tomentose, densely leafy below, many-sheathed above. Leaves oblong-lanceolate to elliptic-lanceolate, acuminate, gradually narrowed to a sheathing base (the blades are imbricating on the lower part of the stem), up to about 21 cm. long (including the sheathing base) and 3.4 cm. wide, erect-spreading, gradually diminishing above into loose tubular sheaths (which are tomentulose below) and finally into

bracts. Spike elongate-cylindric, loosely many-flowered, up to about 26.5 cm. long; rachis densely tomentose. Floral bracts ovate-lanceolate, acuminate, tomentose on the outer surface, finely ciliate, surpassing the ovary but shorter than the flower. Ovary densely tomentose. Flowers small, "white with yellow center". Sepals tomentose on the outer surface, tubular-concave with recurved apex, subfleshy. Dorsal sepal lanceolate-elliptic, subacute, 8 mm. long, about 2.3–2.6 mm. wide, 3-nerved, adnate to the column. Lateral sepals connate below into a long tube which is about 7 mm. long; free portion obliquely oblong-oblanceolate, acute, 4-nerved, about 10.5 mm. long and 4 mm. wide. Petals linear or oblanceolate-linear, very abruptly and obliquely subacute, 1-nerved, about 8–9 mm. long, with the upper margins slightly irregular. Lip uppermost, tubular-involute in natural position with recurved-flaring apical portion, long-adnate to the sepaline tube at the base; free portion when expanded broadly spatulate-obovate with the lower part concave and very fleshy and the anterior part relatively thin, semiorbicular and lobulate, about 8.5 mm. long. Column long, slender, about 12 mm. long, retrorsely arcuate and lightly clavate above, with its posterior surface long-adnate to the sepaline tube, tomentose in front in the middle, retuse and apiculate at the summit; anther semiovoid, obtuse, 2-celled.

Stenoptera laxiflora is allied to *S. peruviana* Presl, but differs in having much taller stouter stems which are leafy, longer looser spikes and larger flowers with dissimilar lip.

HUANUCO: Pampayaco, Hacienda at mouth of Chinchao Río, at about 1070 meters altitude, July 19-25, 1923, *J. Francis Macbride 5126* (TYPE in Herb. Field Mus. No. 536176).

Stenoptera montana *C. Schweinfurth sp. nov.*

Herba terrestris, gracilior. Radices fasciculatae, nu-

merosae. Caulis glaber, prope basim conferte foliosus, supra vaginis tubulatis ornatus. Folia oblanceolata vel oblongo-oblanceolata. Spica cylindrica, saepissime laxe multiflora. Florum bracteae ovato-lanceolatae, glabrae, quam flores breviores. Flores parvi. Sepalum dorsale elliptico-lanceolatum, columnae adnatum. Sepala lateralia basi in tubum brevem connata; pars libera oblongo-lanceolata vel lineari-oblonga, falcata. Petala oblique linearia, supra paulo latiora. Labellum superum, carnosum, tubulari-involutum, expansum cucullato-obovatum, dorso dense muriculatum, marginibus eroso-denticulatis. Columna generis.

Plant terrestrial, rather slender, up to about 5.1 dm. tall. Roots fasciculate, numerous, slender-tuberous. Stem glabrous, provided above the base with about four tubular-cylindric sheaths which are loose in the dried specimen and have an acute apex. Leaves four to five, crowded at or just above the base, oblanceolate to oblong-lanceolate, acute, gradually narrowed below to a sheathing base, up to about 15.5 cm. long (including the base) and 2.5 cm. wide, with the mid-nerve carinate beneath. Spike slender-cylindric, up to 12.5 cm. long, subdensely or loosely flowered, commonly many-flowered; rachis more or less tomentose. Floral bracts ovate-lanceolate, acuminate, glabrous, scarious, surpassing the pubescent ovary but shorter than the flowers. Flowers small with erect lip and membranaceous reflexed or spreading sepals and petals, green throughout. Dorsal sepal elliptic-lanceolate, obtuse or subacute with a cucullate apex, adnate to the column at its base, about 5.2–6.2 mm. long and 2 mm. wide, 1- or 3-nerved. Lateral sepals obliquely linear-oblong to oblong-lanceolate, falcate, complicate-acute, 1-nerved, connate into a short tube at base, the free portion about 6.5–7.5 mm. long and 2 mm. wide. Petals obliquely oblanceolate-linear, adnate to the col-

umn or to the sepaline tube, about 5.9–7.3 mm. long, obliquely acute or obtuse, often with irregular upper margins. Lip uppermost, fleshy, tubular-involute in natural position, adnate to the sepaline tube, concave-obovate when expanded, obtuse, with the free part about 8–9.5 mm. long; the sides thickened at the base, the upper margins erose-denticulate and the outer surface densely muriculate. Column elongate, clavate above, about 6.5 mm. long in front, pubescent, retrorsely geniculate or arcuate above, retuse at the apex.

This species appears to be without close allies.

HUANUCO: Mito, at about 2760 meters altitude, "Bunch-grass uplands", April 8-18, 1923, *J. Francis Macbride 3357* (TYPE in Herb. Ames No. 58406; DUPLICATE TYPE in Herb. Field Mus. No. 534427).

Stenoptera pilifera (*HBK.*) *C. Schweinf.* var. **parviflora** *C. Schweinfurth var. nov.*

Herba floribus multo minoribus albidis et bracteis longioribus a specie differt.

Plant up to about 3.5 dm. tall, with only the remnants of leaves present at flowering time. Stem stout or slender, glabrous, mostly or entirely concealed by tubular white-hyaline sheaths with a free triangular-acuminate apex. Spike thick-cylindric, dense, several- to many-flowered, up to 7.7 cm. long. Floral bracts ovate-lanceolate, long-acuminate, white-hyaline, concave, somewhat surpassing the flowers (at least in the lower portion). Flowers relatively small. Dorsal sepal narrowly elliptic-lanceolate, acute, adnate to the column, 3-nerved, about 10.5 mm. long and 2.2 mm. wide. Lateral sepals connate into a neck below; free portion obliquely oblong-oblanceolate or elliptic-oblanceolate, acute, about 11 mm. long and 3 mm. wide, 4-nerved. Petals linear, adnate to the sepaline tube, about 9.6 mm. long, subacute, 1-nerved. Lip uppermost, long-adnate to the sepaline tube; free

part oblong-elliptic, lightly concave, abruptly subacute, gradually narrowed below, little shorter than the lateral sepals. Column slender, gradually dilated above, shortly adnate to the sepaline tube by the dorsal surface, densely short-pubescent on the lower half in front.

HUANUCO: Llata, at about 2150 meters altitude, on steep canyon slope in loose rocky soil, August 21, 1922, *Macbride & Featherstone 2301* (TYPE in Herb. Field Mus. No. 518784; DUPLICATE TYPE in Herb. Ames No. 58324).

Altensteinia longispicata *C. Schweinfurth sp. nov.*

Herba robusta, elata. Caulis glaber, foliis ligulatis scariosis sparse ornatus. Spica longe cylindracea, densissime multiflora. Flores parvuli. Sepala similia, elliptico-lanceolata, dorso pubescentia, lateralia basi obliqua. Petala lineari-oblanceolata, apice truncato marginibus irregularibus. Labellum superum, valde semiellipsoideo-cucullatum, crassius, marginibus fimbrillatis. Columna clavata, apice retusa.

Plant robust, up to 7.7 dm. tall including the inflorescence (the base of the plant not present), glabrous, adorned with several leaves. Leaves ligulate, acuminate, scarious, with clasping sheathing bases which are tubular-cylindric and imbricating near the base, up to 15 cm. long and 2 cm. wide, (the only complete leaf present is about 15 cm. long including the sheathing base and 1.6 cm. wide). Spike elongate, cylindric, very densely many-flowered, up to 19.6 cm. long and 2 cm. in diameter; rachis finely tomentose. Floral bracts lanceolate-ovate, acute or acuminate, concave, scarious, pubescent on the outer surface, about equaling the flowers. Ovary densely pubescent. Flowers small. Sepals and petals membranaceous. Dorsal sepal elliptic-lanceolate or ovate-lanceolate, shortly adnate to the column below, obtuse at the cucullate apex, about 7 mm. long and 3.3 mm. wide, 3-nerved,

dorsally pubescent. Lateral sepals elliptic-lanceolate, oblique at the base, about 8 mm. long and 3 mm. wide, acute, 3-nerved, dorsally pubescent. Petals linear-oblanceolate, about 7.9 mm. long and 1.3 mm. wide above the middle, 1-nerved, with irregularly fimbriate margins except near the base, truncate with irregular margins at the apex. Lip semiellipsoid-cucullate in natural position, rather fleshy, with fimbrillate margins, about 9.6 mm. long, minutely retuse when expanded, densely minute-papillose on the outer surface, 7-nerved with the side nerves branching. Column clavate, fleshy, retuse at the apex with a pair of lateral porrect ears, about 5 mm. long.

Altensteinia longispicata recalls *Altensteinia marginata* Reichb. f., but differs in having a more densely flowered inflorescence, linear-oblanceolate fimbriate petals and a densely fimbrillate-margined opening to the lip.

HUANUCO: Llata, at about 2150 meters altitude, among yuccas on top of stone fence, August 21, 1922, *Macbride & Featherstone 2254* (TYPE in Herb. Ames No. 58437. DUPLICATE TYPE in Herb. Field Mus. No. 518738).

Ponthieva lilacina *C. Schweinfurth sp. nov.*

Herba terrestris, mediocris. Folia maxima pro parte basalia, rosulata, glabra, ovalia vel oblongo-elliptica vel oblanceolata, acuta, breviter vel conspicue petiolata. Caulis infra folio parvo et supra vaginis paucis remotis ornatus. Racemus pauci-vel pluriflorus, laxissimus. Sepala dorso leviter glanduloso-pubescentia. Sepalum dorsale ellipticum, acutum. Sepala lateralia oblique late ovata, obtusa. Petala columnae supra adnata, longe unguiculata; lamina oblique triangulari-oblonga, oblique subacuta, basi extus auriculata. Labellum distincte unguiculatum; lamina conduplicata, apice trilobata, parte basali semiorbiculari, antice truncata; lobo medio parvo

ovato-oblongo apice cucullato. Columna perbrevis, supra abrupte dilatata.

Plant terrestrial. Roots fascicled, tuberous, lanuginose. Leaves mostly basal, rosulate, glabrous, two to four, oval to oblong-elliptic or oblanceolate, acute to short-acuminate, narrowed to a very short or rather long petiole; lamina up to about 12 cm. long and 3.5 cm. wide; petioles up to about 5.5 cm. long, channelled, imbricating at the base. Scape slender, up to about 22 cm. tall, adorned with one small leaf near the base and with two to three remote tubular sheaths above, finely glandular-pubescent above and often to the base. Raceme up to about 9 cm. long, few- to many-flowered, very loose in anthesis. Floral bracts lanceolate, acuminate, up to about 9 mm. long, one half as long as the pedicellate ovary or less. Flowers small, lilac, with segments spreading in anthesis. Sepals lightly glandular-pubescent without. Dorsal sepal elliptic, gradually narrowed to an acute apex, about 7 mm. long and 2.8–3 mm. wide, 3-nerved. Lateral sepals broadly ovate or elliptic-ovate, obtuse, oblique, about 7 mm. long and 4.5 mm. wide, 3- to 5-nerved. Petals adnate to the upper part of the column, long-clawed; lamina very obliquely oblong-triangular with a hastate base and a very oblique obtuse to subacute apex, about 5–5.5 mm. long; more or less minutely cellular-ciliate on the lateral margins; claw very slender, about 1.5–1.8 mm. long. Lip with a distinct claw which spreads from the column at a right angle (or is slightly ascending) and has a pair of erect triangular calli at its apex; lamina conduplicate, sharply 3-lobed at the apex, abruptly and sharply cordate at base, about 3 mm. long, when expanded the basal portion is semiorbicular and about 3.8–4 mm. wide with the anterior margins truncate; mid-lobe small, ovate-oblong, apically cucullate, about 1 mm. long. Column very short, about 3.7 mm. long, abruptly much dilated above.

Department unknown: *C. Vargas 1819*.—Cuzco: Prov. Quispicanchi, Marcapata Valley, at 1700-1800 meters altitude, "evergreen hard-leafed bushwood consisting of trees and shrubs in the shadow", February 20, 1929, *A. Weberbauer 7842* (Type in Herb. Field Mus. No. 605259; Duplicate type in Herb. Ames No. 58711).

Ponthieva similis *C. Schweinfurth sp. nov.*

Herba terrestris, mediocris. Radices fasciculatae, lanuginosae. Folia maxima pro parte basalia, elliptica, acuminata, longe petiolata, omnino dense villosa. Scapus omnino villosus, bracteis vel vaginis remotis ornatus. Racemus laxe pauci-vel multiflorus. Sepalum dorsale elliptico-lanceolatum, acuminatum. Sepala lateralia in laminam suborbicularem, profunde concavam, breviter bidentatam connata. Petala longe unguiculata, obliquissime semiovata, obtusa. Labellum perparvum, sessile, columnae medio adnatum, concavo-conduplicatum; lamina vi expansa subquadrato-obovata, basi cucullato-callosa. Columna supra dilatata.

Plant terrestrial, up to about 4.5 dm. tall. Roots fasciculate, fibrous, lanuginose. Leaves chiefly basal, rosulate, up to nine, long-petioled; lamina elliptic, up to about 9.5 cm. long and 3.1 cm. wide, sharply acuminate, gradually narrowed below, membranaceous, densely pilose on both surfaces; petioles channelled, up to 6 cm. long, densely pilose, gradually dilated toward the imbricating base. Scape densely pilose throughout, provided below with one small leaf and above with two or three remote sheaths. Raceme short, up to about 8.2 cm. long, laxly several- to many-flowered. Floral bracts lanceolate, acuminate, concave, pilose, much shorter than the pedicellate ovary. Flowers inverted with lateral sepals and lip uppermost, membranaceous. Sepals very sparsely long-pilose without. Dorsal sepal narrowly elliptic-lanceolate, gradually narrowed to an acute apex, about 12 mm. long and 3.2 mm. wide, 3- to 5-nerved. Lateral sepals connate

into a suborbicular concave, shortly bidentate lamina which is about 11.2–11.8 mm. long to the tip of a lobe in natural position and 10.4 mm. wide, about 10-nerved. Petals dimidiate, very obliquely semiovate, abruptly long-unguiculate; lamina about 8.8 mm. long and 4 mm. wide, broadly obtuse at the apex, rounded at the base which terminates next to the claw in a circinate subacute horn-like or bilobed apex; claw linear but gradually dilated above, about 3.5 mm. long, attached to the upper part of the column. Lip very small, sessile, adnate to the middle of the column, semisigmoid in profile, about 4.2–4.5 mm. long, deeply concave below, erect and parallel to the column above, at the base with a prominent porrect bilobed cucullate callus that extends on the disc as two short parallel keels; lamina conduplicate, when forcibly expanded subquadrate-obovate, indistinctly lobulate or apiculate at the broad apex. Column stout, dilated above, about 3.5–4.5 mm. long.

This species is allied to *Ponthieva maculata* Lindl., but has dissimilar lateral sepals and petals.

HUANUCO: Cani, 7 miles Northeast of Mito, at about 2600 meters altitude, "decayed leaves of dense stream-wood floor, flowers white, the upper parts brown, the lower green-veined; inner part with 2 green spots and pink-tipped", April 16-26, 1923, *J. Francis Macbride 3395* (TYPE in Herb. Field Mus. No. 534465; DUPLICATE TYPE in Herb. Ames No. 58709).

Spiranthes curvicalcarata *C. Schweinfurth sp. nov.*

Herba terrestris. Radices fasciculatae, crassae, lanuginosae. Folia basalia, rosulata, petiolata; lamina elliptico-ovata, acuta, basi late cuneata. Scapus infra glaber, supra valde pilosus, vaginis pluribus longissime acuminatis ornatus. Racemus laxius multiflorus. Flores grandes, extus glanduloso-pubescentes. Sepalum dorsale anguste oblanceolato-oblongum. Sepala lateralia basi in calcar ellipsoideum apice hamatum connata, parte libera arcuato-

decurvata, falcata, lineari-oblanceolata. Petala sepalo dorsali valde adnata, oblanceolato-linearia, acuta. Labellum apice trilobatum cum lobo medio reflexo, extensum lineari-spathulatum, basi auriculata dilatata; lobus medius rotundato-ovatus; discus maxima pro parte pubescens. Columna gracilis.

Plant terrestrial, up to about 5 dm. high. Roots fasciculate, tuberous, stout, lanuginose. Leaves seven, basal, rosulate, petioled; blade ovate-elliptic, up to about 8 cm. long and 3.6 cm. wide, sharply acute, broadly cuneate at base, with about five prominent nerves beneath; petioles rather slender, channelled, slightly dilated at the imbricating base, up to about 6 cm. long. Scape glabrous below, densely pilose to lanuginose above, provided with about six long-acuminate basally amplexicaul sheaths which are strict and up to 5.5 cm. long. Inflorescence racemose, rather laxly many-flowered. Flowers large, with dorsal sepal and petals erect and adnate, and lateral sepals arcuate-recurved. Sepals densely glandular-pubescent on the outer surface. Dorsal sepal narrowly oblong-oblanceolate, acute, about 23.8 mm. long and 5.4 mm. wide near the apex, cucullate above. Lateral sepals connate below into a narrowly ellipsoid spur about 12.7 mm. long of which the free apex is incurved and about 3 mm. long; free portion arcuate-recurved from a very oblique dilated base, falcate, linear-oblanceolate, acuminate, about 22 mm. long when extended (measuring along the dorsal margin) and 3 mm. wide near the apex, tubular-involute. Petals strongly adnate to the dorsal sepal throughout most of their length, narrowly oblanceolate-linear with a very oblique apical portion, acute, about 24 mm. long and 3.1 mm. wide near the apex, tubular-involute except near the apex, with the anterior margins and the anterior half of the outer surface (except near the apex) minutely glandular-puberulent. Lip with all

but the basal and apical margins strongly adnate to the column, 3-lobed near the apex with the mid-lobe decurved in natural position, linear-spatulate in outline when expanded, shortly unguiculate with the claw adnate to the walls of the sepaline sac, with a pair of fleshy auricles at base, about 34.5 mm. long from the apex of the mid-lobe to the tip of the retrorse auricles and about 6.5 mm. wide just below the mid-lobe; mid-lobe suborbicular-ovate, trilobulate at the broad apex, about 4 mm. long and 4.5 mm. wide near the base; disc with the basal and middle portions conduplicate and densely pubescent on both surfaces, slightly dilated below. Column long and slender, about 20 mm. long, pubescent on the anterior face (minutely so above, strongly so below), extended into an adnate foot about 7 mm. long; rostellum oblong-ligulate with erose-truncate apex. Pedicellate ovary nearly twice exceeding the sepaline spur.

Spiranthes curvicalcarata represents a true Pelexia if that genus can be maintained. It appears to be allied to the Colombian **Spiranthes hamata** *(Schltr.) C. Schweinfurth comb. nov.* (*Pelexia hamata* Schltr. in Fedde Repert. Beihefte 7 (1920) 68). From that species, however, it differs in having more numerous short-petioled leaves, larger flowers, petals which are pubescent on the anterior margin and spur distinctly shorter than the ovary.

JUNIN: La Merced, Hacienda Schunke, at about 1230 meters altitude, "humus floor of montaña, plant brownish-red thruout except yellowish-white lower lip", August 27-September 1, 1923, *J. F. Macbride 5770* (TYPE in Herb. Field Mus. No. 536800).

Spiranthes pumila *C. Schweinfurth sp. nov.*

Herba pusilla. Folia plura, basalia, fasciculata, petiolata; lamina ovata, acuminata, basi late cuneata vel rotundata; petiolus canaliculatus. Scapus tenuis, infra glaber,

supra glanduloso-pubescens, vaginis pluribus ornatus. Spica secundiflora cum floribus pluribus. Sepalum dorsale lanceolato-oblongum, uninervium. Sepala lateralia similia, paulo majora, leviter obliqua. Petala oblonga, marginibus superioribus irregularibus. Labellum expansum in circuitu subquadrato-oblongum vel obovato-oblongum, prope apicem leviter trilobatum. Columna brevis; anthera prope basim affixa.

Plant small and slender, up to about 13 cm. tall. Roots stout, fibrous, fasciculate. Leaves six, basal, rosulate, petioled; lamina ovate, acuminate, broadly cuneate to rounded at base, up to 2 cm. long and nearly 1 cm. wide, membranaceous, reticulate-veined with the mid-nerve rather prominent beneath; petioles channelled, dilated at the imbricating base, up to about 1.4 cm. long. Scape slender, glabrous below, finely glandular-pubescent above, provided with four tubular sheaths of which the lowermost is foliaceous. Inflorescence a secund spike, 8-flowered, rather lax below, about 3.5 cm. long, arcuate. Floral bracts lanceolate, long-acuminate, with the lower ones nearly equaling the mature flowers. Flowers small, membranaceous, with the segments subparallel, mostly glabrous but minutely pubescent at base. Dorsal sepal lanceolate-oblong, about 5.7 mm. long and 1.5 mm. wide, 1-nerved, obtuse. Lateral sepals similar but a little larger, about 6 mm. long and 2 mm. wide, slightly oblique, subacute. Petals oblong, very slightly broader above the middle, about 5 mm. long and 1.2 mm. wide, acute or subacute, with the margins irregular near the apex. Lip tubular-involute in natural position with the apex recurved, sessile; lamina when expanded subquadrate-oblong or obovate-oblong, obscurely 3-lobed near the apex, about 6 mm. long and 2.8 mm. wide above the middle, with the basal part oblong-pandurate and the apical part suborbicular with undulate margins. Column

or less obtuse tip), cuneate below, submembranaceous; about 3.7 mm. long, dorso-ventrally flattened, pilose above on the anterior surface, with a triangular-ovate shortly bidentate rostellum; anther large, oblong-cordate, attached near the base of the column.

Another collection (*Schunke s. n.*, Herb. Field Mus. No. 571640) referable to this species is a small immature caespitose plant up to 7 cm. tall with 2- to 3-flowered inflorescences.

Spiranthes pumila differs from *S. Fawcettii* Cogn. and from **Spiranthes cheirostyloides** *C. Schweinfurth comb. nov.* (*Hapalorchis cheirostyloides* Schltr. in Fedde Repert. Beihefte 6 (1919) 30) in having smaller flowers with dissimilar sepals and petals.

JUNIN: Chanchamayo Valley, at 1600 meters altitude, August 1929, *Carlos Schunke 1886* (TYPE in Herb. Field Mus. No. 622367); at 1800 meters altitude, November 1924-1927, *Schunke s.n.*

Erythrodes lobatocalcar *C. Schweinfurth sp. nov.*

Herba mediocris, probabiliter terrestris, infra foliosa. Folia conferta, plura, minora, elliptica, acuta vel breviter acuminata, basi cuneata. Caulis supra leviter glanduloso-pilosus. Spica cylindrica, multiflora, plusminusve elongata, tandem laxiflora. Flores parvi. Sepalum dorsale ovato-ellipticum, obtusum, concavum. Sepala lateralia similia. Petala oblique rhombico-oblanceolata, subacuta. Labellum trilobatum, parte basali expansa suborbiculari-obovata; lobus terminalis ab ungui perbrevi abrupte expansus, reniformi-lunatus, apice rotundato minute apiculatus. Calcar clavatum, apice obtuse trilobatum. Columna brevis, rostello conspicuo suborbiculari-ovato.

Plant medium-sized, up to about 30 cm. tall (incomplete below). Leaves about eight, mostly crowded on the lower part of the stem, mostly short-petioled; lamina elliptic (rarely lanceolate-elliptic), up to about 7 cm. long and 2.5 cm. wide, acute or short-acuminate (with a more

petiole very short and indistinct, channelled, expanded below into a loose infundibuliform membranaceous sheath that surrounds the stem, up to about 2.4 cm. long. Stem glabrous below, sparingly glandular-pilose above, provided with two or three lanceolate scarious sheaths. Spike cylindric, more or less elongate, up to 11 cm. long, many-flowered, becoming loose below. Flowers small, spreading. Floral bracts lanceolate, acuminate, scarious, the lower ones nearly equaling the flower. Ovary arcuate-cylindric, glandular-pilose. Sepals sparingly glandular-pilose. Dorsal sepal ovate-elliptic, obtuse, concave, up to about 4.5 mm. long and 2.2 mm. wide, 1-nerved. Lateral sepals similar to the dorsal sepal, elliptic, obtuse, concave, up to about 5.5 mm. long and 2.5 mm. wide, 1-nerved throughout. Petals obliquely rhombic-oblanceolate, subacute, about 4.9 mm. long and 2 mm. wide, 1-nerved. Lip 3-lobed, tubular-involute below in natural position with the terminal lobe recurved, when expanded about 4.9 mm. long; the lower portion is suborbicular-obovate, about 4 mm. wide, contracted into a short broad claw above; apical lobe abrupt, reniform-lunate, broadly rounded in front with a minute apicule, rounded on each side, up to about 4.2 mm. wide. Spur slightly shorter than the ovary, dorso-ventrally flattened, cylindric-clavate, obtusely 3-lobulate at the apex, about 5 mm. long, somewhat arcuate. Column short, with a prominent suborbicular-ovate erose-margined rostellar process.

Erythrodes lobatocalcar appears to be allied to *E. repens* (Poepp. & Endl.) Ames, but differs in having generally broader leaves, smaller flowers and a stouter lobulate spur.

San Martin: San Roque, at 1350-1500 meters altitude, in forest, January 7, 1930, *Llewelyn Williams 6998* (Type in Herb. Field Mus. No. 620932; Duplicate type in Herb. Ames No. 59580.)

Erythrodes marmorata *C. Schweinfurth sp. nov.*

Herba terrestris, gracilis, basi decumbens. Folia plura, prope caulis basim conferta, parva, ovata, marmorata, apice acuta, basi rotundata. Caulis villosus, vaginis pluribus inconspicuis remotis ornatus. Spica brevis, multiflora, tandem laxa. Flores spiranthiformes. Sepala extus parce pilosa. Sepalum dorsale lanceolato-oblongum, obtusum vel subacutum. Sepala lateralia lineari-oblonga, obtusa vel subacuta. Petala oblanceolato-oblonga, sepalo dorsali adnata. Labellum infra elliptico-subquadratum, supra leviter contractum, demum in lobum transversum lunato-reniformem acutum dilatatum. Calcar perbreve, ovoideo-conicum. Columna minuta, rostello bifido.

Plant slender, terrestrial, up to about 35 cm. tall. with the decumbent basal portion producing scattered long simple lanuginose roots. Leaves about five to seven, mostly approximate on the lower portion of the stem, petiolate; lamina ovate to oblong-ovate, up to 4.3 cm. long and 2.3 cm. wide, acute or short-acuminate, rounded or broadly cuneate at the base, maculate with two shades of green, with the margins more or less finely undulate in the dried specimen; petioles channelled, dilated near the middle to form a broad loose membranaceous infundibuliform sheath which clasps the stem. Stem slender, pilose, provided with four or five inconspicuous sheaths of which the lowermost is developed into a small blade. Inflorescence a many-flowered spike, up to about 7 cm. long, dense above, becoming very loose below. Floral bracts lanceolate, acuminate, membranaceous, about equaling or slightly exceeding the ovary. Ovary very slenderly obovoid-cylindric, finely pubescent, ascending. Flowers horizontally spreading like those of Spiranthes, perianth campanulate. Sepals sparingly pilose without. Dorsal sepal lanceolate-oblong, obtuse or subacute, about 5–6 mm. long and 1.8–2 mm.

wide. Lateral sepals linear-oblong, oblique at base, obtuse or subacute, about 6–6.8 mm. long and 1.5 mm. wide. Petals oblanceolate-oblong, adnate to the dorsal sepal, obtuse or subacute, lightly oblique, slightly longer than the dorsal sepal, about 1.7 mm. wide, 1-nerved. Lip tubular-involute in natural position, about 5–6.5 mm. long; when expanded the lamina is elliptic-subquadrate below, is slightly narrowed near the apex and is then abruptly dilated to form a transverse lunate-reniform terminal lobe which is about 3 mm. wide, rather abruptly and obtusely acute and rounded on each side. Spur very short, ovoid-conic or scrotiform, about 2–2.3 mm. long, provided on the inner wall near the apex with two pairs of small calli. Column very small, with a deeply bilobed rostellar process.

Erythrodes marmorata differs from *E. minor* (Presl) Ames and from *E. ovata* (Lindl.) Ames in the shape of the lip. The inner surface of the short spur bears two pairs of calli as in several American species of Erythrodes.

Cuzco: Prov. Paucartambo, Disto. Marcachea, near Achiram, at 2600 meters altitude, in moist humus, flowers white, July 30, 1939, *C. Vargas 11163* (Type in Herb. Field Mus. No. 1051165; another Vargas collection (Gray Herb. No. 7752) bears the same data as *Vargas 11163* (the type), but has 1592 as its number.

Erythrodes multifoliata *C. Schweinfurth sp. nov.*

Herba terrestris, a basi decumbenti suberecta. Caulis gracilis, glaber, foliis numerosis ornatus. Folia petiolata, elliptica vel lanceolata, acuta vel acuminata, basi late cuneata. Spica brevis, dense multiflora. Flores parvi, glabri, patentes. Sepalum dorsale oblanceolato-oblongum vel lanceolato-ellipticum, concavum. Sepala lateralia oblique oblongo-oblanceolata, margine anteriore longe producta. Petala lineari-spathulata. Labellum super medium utrinque angustatum; pars basalis concava, late obovata;

pars terminalis rhombico-lunata, apice rotundato apiculata. Calcar filiformi-cylindraceum.

Plant terrestrial from a decumbent rooting base. Roots simple, fibrous, lanuginose, apparently verticillate in twos, threes or fours. Stem slender, suberect, glabrous, leafy, about 26.5 cm. high from the tip of the spike to the rooting portion. Leaves about ten, petioled; blades elliptic to lanceolate, acute or acuminate, broadly cuneate at base, up to 11 cm. long and 3.6 cm. wide, with three to five rather prominent nerves; petioles channelled, dilated into a loose scarious infundibuliform sheath surrounding the stem, up to 2.8 cm. long. Peduncle short, wholly concealed by loose imbricating sheaths. Spike short, exceeded by some of the upper leaves, densely many-flowered, apparently quaquaversal, about 5 cm. long (the upper flowers small and immature), and up to 3 cm. in diameter in the dried specimen. Ovary slender-cylindric, very sparingly pilose. Flowers small, glabrous, spreading; segments little spreading. Dorsal sepal oblanceolate-oblong or lanceolate-elliptic, obtuse at the cucullate apex, concave, about 5.1 mm. long and 2–2.2 mm. wide, 1-nerved. Lateral sepals obliquely oblong-oblanceolate, about 5.8–6 mm. long and 2 mm. wide, subacute to obtuse at the slightly cucullate apex, with the anterior margin long-produced and adnate to the spur. Petals linear-spatulate, lightly oblique, abruptly acute to subobtuse, 1-nerved, about 5 mm. long and 1.2–1.5 mm. wide above. Lip abruptly constricted above the middle with the basal portion concave and the terminal portion recurved flat and spreading, about 4.6 5 mm. long when expanded; lower portion broadly obovate, commonly minutely angled on each side at the apex when spread out; terminal lobe rhombic-lunate, broadly rounded in front with a short apicule, narrowed to a short broad claw below, about 3.6 mm. wide between

the rounded or subtruncate sides. Spur filiform-cylindric, subacute, with the lower portion adnate to the ovary, up to 13 mm. long; near the apex there are two pairs of indistinct elongate calli on the inner walls.

Erythrodes multifoliata appears to be allied to *E. stenocentron* (Schltr.) Ames, but differs in having numerous leaves, quaquaversal spike, etc.

Loreto: Santa Rosa, lower Río Huallaga below Yurimaguas, at 135 meters altitude, terrestrial in dense forest, sepals pale green, lip and column white, September 1-5, 1929, *E. P. Killip & A. C. Smith 28759*. (Type in U. S. Nat. Herb. No. 1462260).

EXPLANATION OF THE ILLUSTRATIONS

PLATE I. STENOPTERA CILIARIS *C. Schweinfurth.* 1, plant, one half natural size. 2, flower and ovary from side (natural position), two and one half times natural size. 3, flower from front (expanded), two and one half times natural size. 4, lateral sepal and lip (natural position), four times natural size. 5, floral bract, one and one half times natural size.

PLATE II. STENOPTERA LAXIFLORA *C. Schweinfurth.* 1, plant, one half natural size. 2, flower, ovary and floral bract from side (natural position), twice natural size. 3, flower from front (expanded), twice natural size. 4, petal, four times natural size. 5, floral bract, twice natural size.

PLATE III. STENOPTERA MONTANA *C. Schweinfurth.* 1, plant, lower half, one half natural size. 2, plant, upper half, one half natural size. 3, flower and ovary, partially expanded, two and one half times natural size. 4, lip, showing attachment to lateral sepal, five times natural size. 5, petal, five times natural size.

PLATE IV. ALTENSTEINIA LONGISPICATA *C. Schweinfurth.* 1, plant, one half natural size. 2, flower, two and one half times natural size. 3, lip (expanded), four times natural size. 4, petal, four times natural size. 5, lateral sepal, four times natural size. 6, column from front, four times natural size. 7, column from side, four times natural size.

PLATE V. PONTHIEVA LILACINA *C. Schweinfurth.* 1, plant, natural size. 2, flower from front (expanded), two and one half times natural size. 3, column and lip from side (natural position), five times natural size. 4, lip with claw from front (expanded), seven and one half times natural size.

PONTHIEVA SIMILIS *C. Schweinfurth.* 5, flower from front (expanded), one and one half times natural size. 6, column and lip from side (natural position), five times natural size. 7, lip (expanded), five times natural size.

PLATE VI. SPIRANTHES CURVICALCARATA *C. Schweinfurth.* 1, plant, one half natural size. 2, flower (expanded, showing interior of spur), natural size. 3, lip, natural size.

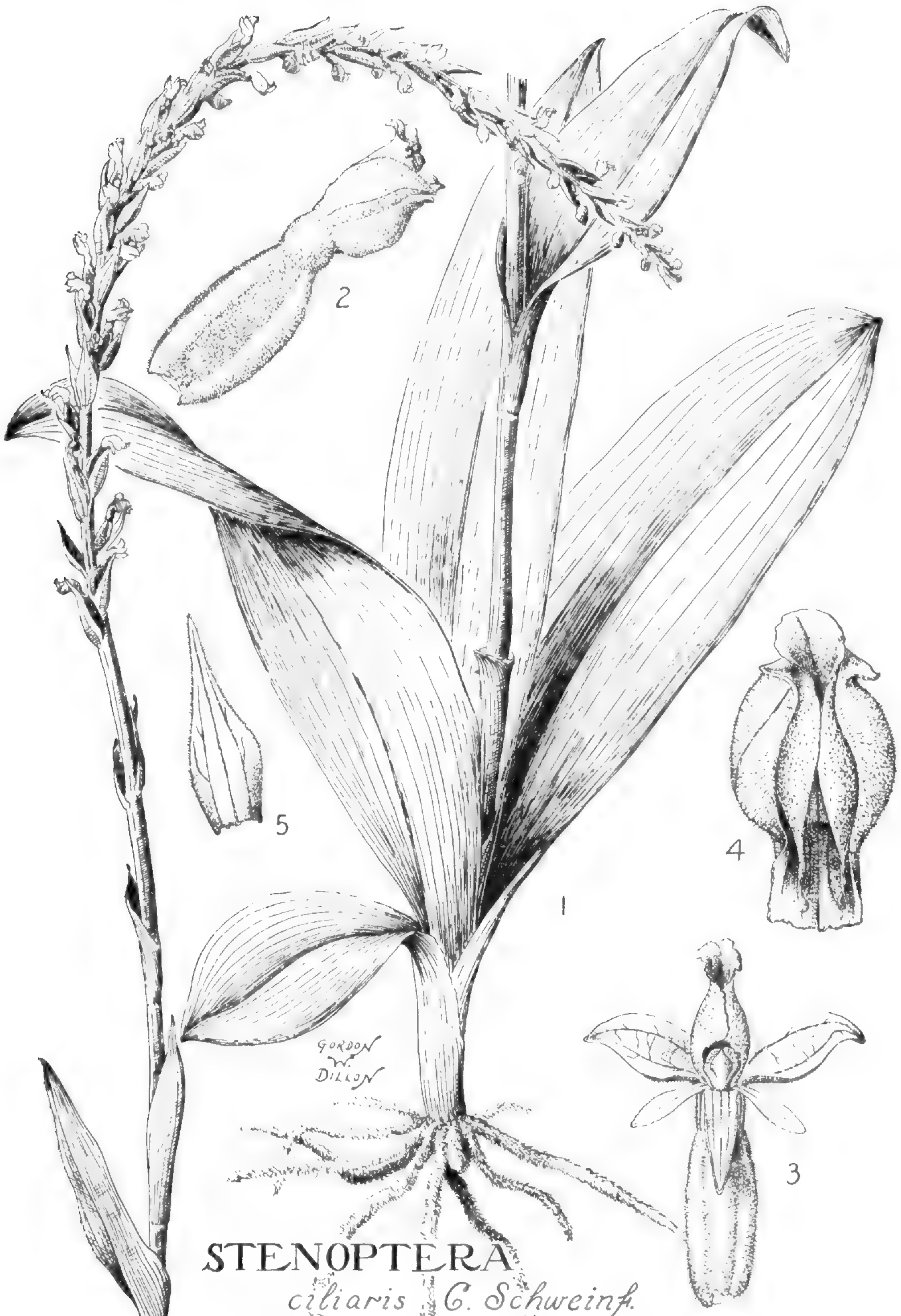
SPIRANTHES PUMILA *C. Schweinfurth.* 4, plant, one half natural size. 5, flower from front (expanded), two and one half times natural size.

PLATE VII. ERYTHRODES MARMORATA *C. Schweinfurth.* 1, plant, one half natural size. 2, flower from front (expanded), five times natural size. 3, flower from side (natural position), five times natural size.

ERYTHRODES LOBATOCALCAR *C. Schweinfurth.* 4, plant, one half natural size. 5, flower from front (expanded), five times natural size. 6, flower from side (natural position), five times natural size.

PLATE VIII. ERYTHRODES MULTIFOLIATA *C. Schweinfurth.* 1, plant, one half natural size. 2, flower from front (expanded), five times natural size. 3, flower from side (natural position), five times natural size.

PLATE I



STENOPTERA

ciliaris C. Schweinf.

Plate II

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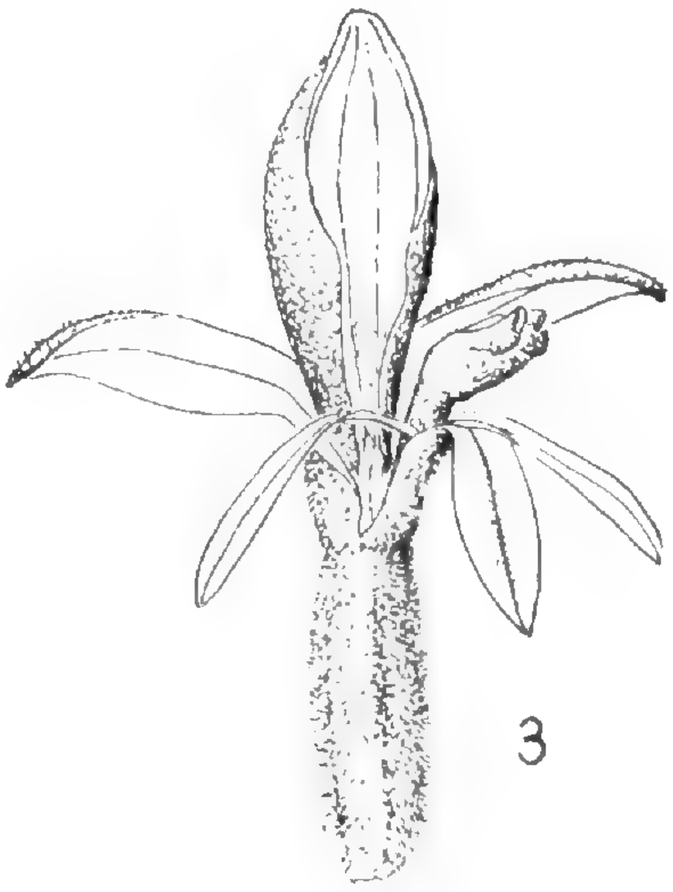
STENOPTERA

laxiflora C. Schweinf.

PLATE III

STENOPTERA

montana C. Schweinf.



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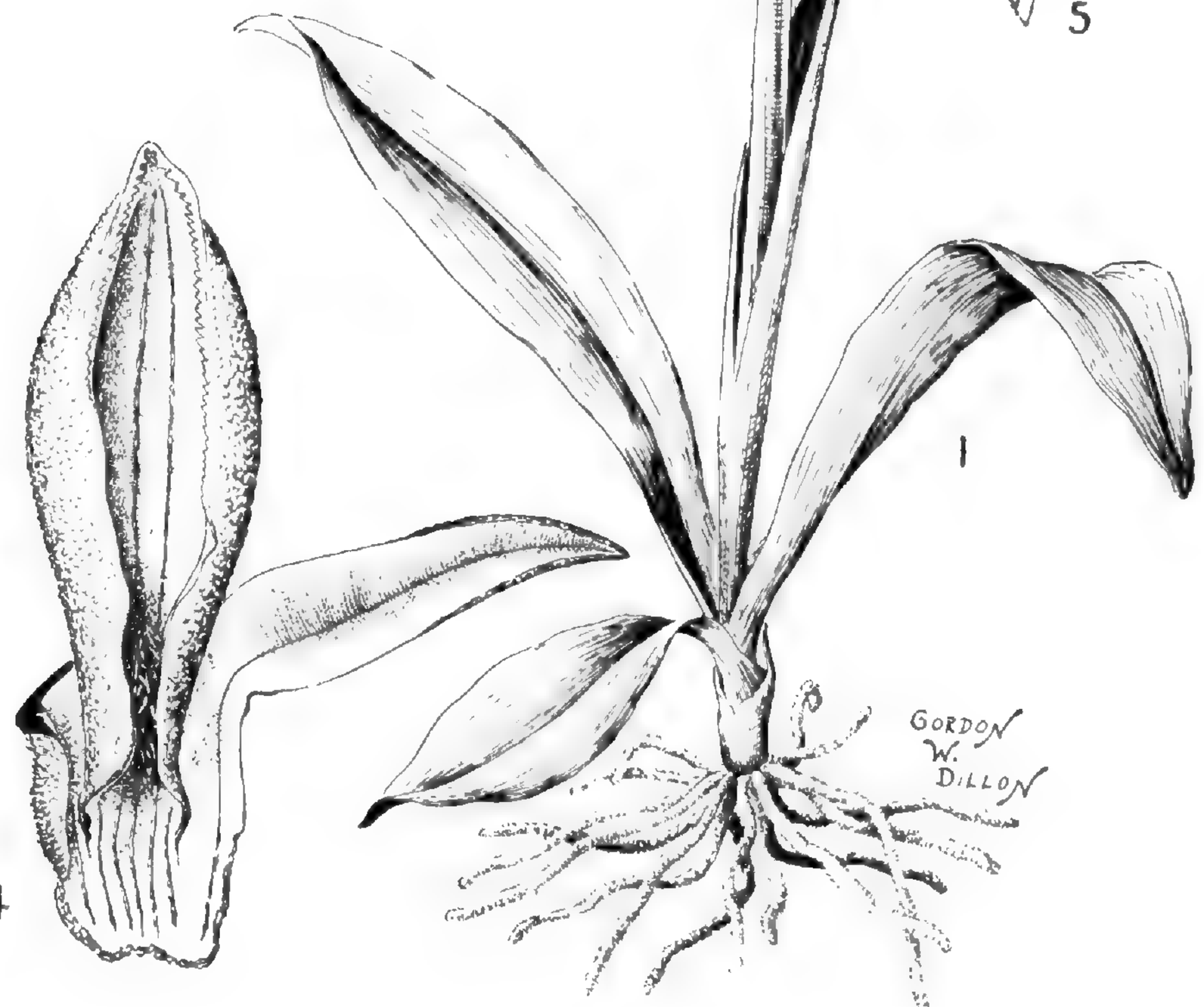

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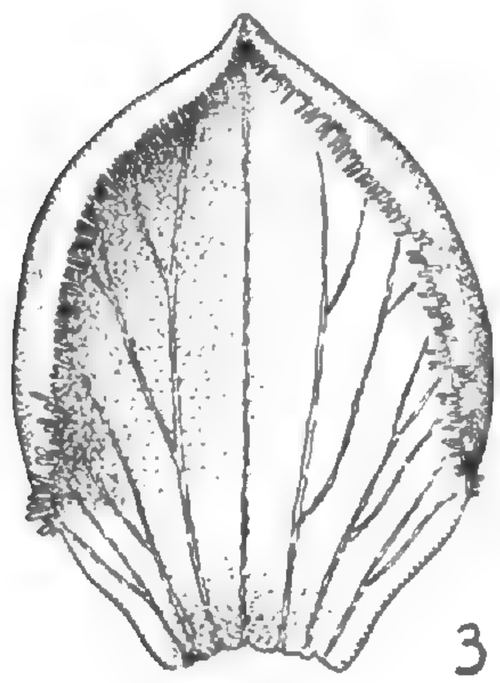
PLATE IV

ALTENSTEINIA

longispicata C. Schweinf.



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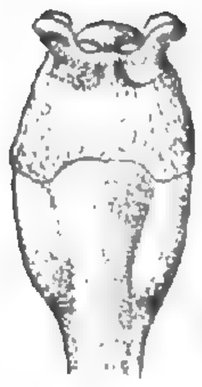

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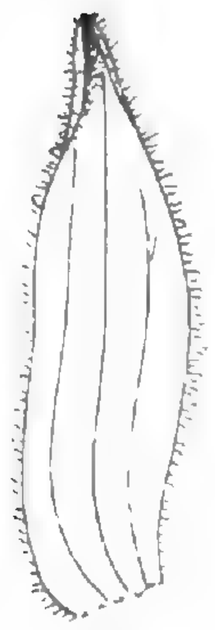

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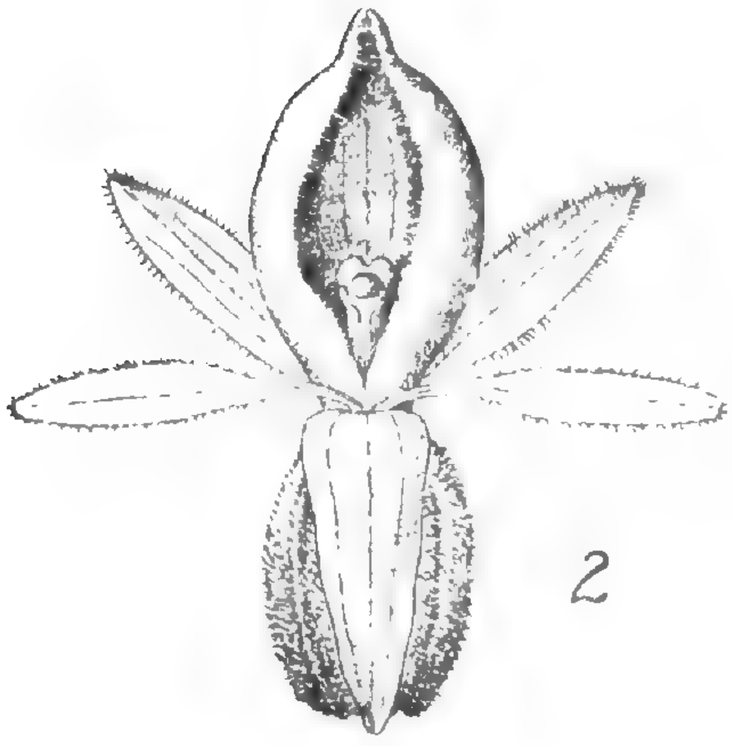

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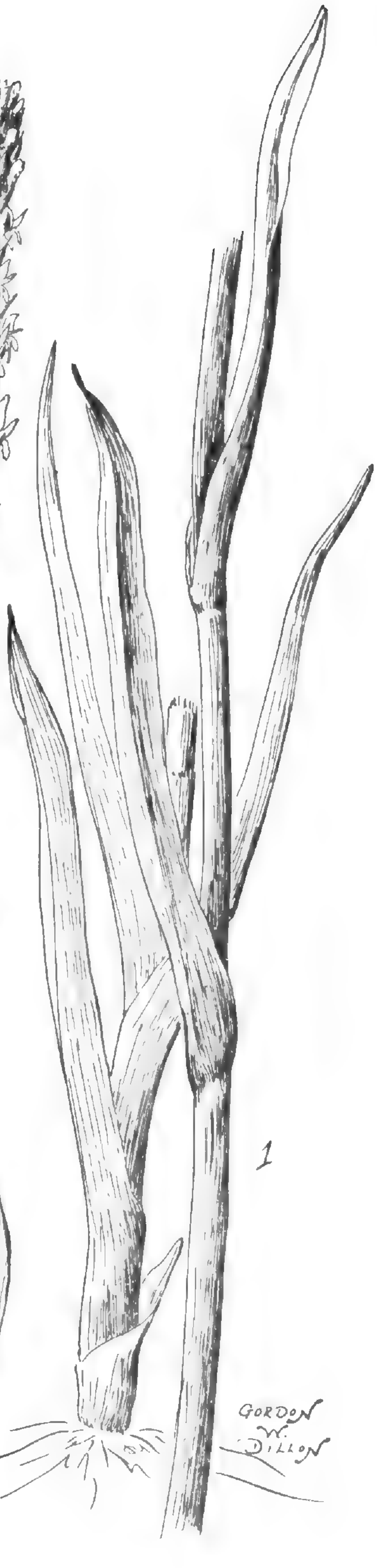

1

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PLATE V

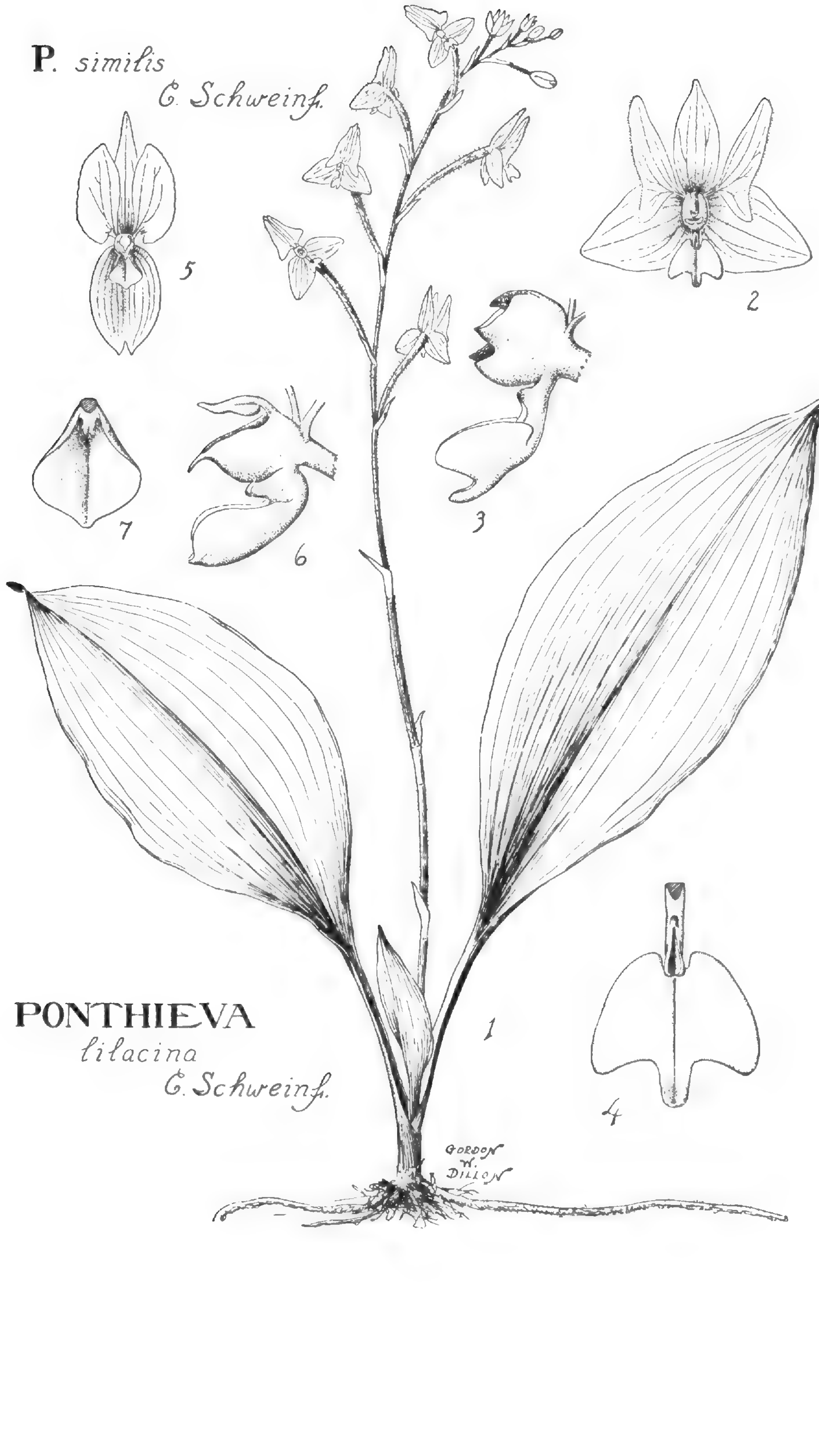

P. similis
C. Schweinf.
5
2
7
6
3
1
4
PONTHIEVA
lilacina
C. Schweinf.
GORDON W. DILLON

PLATE VI

SPIRANTHES

curvicalcarata C. Schwein f.

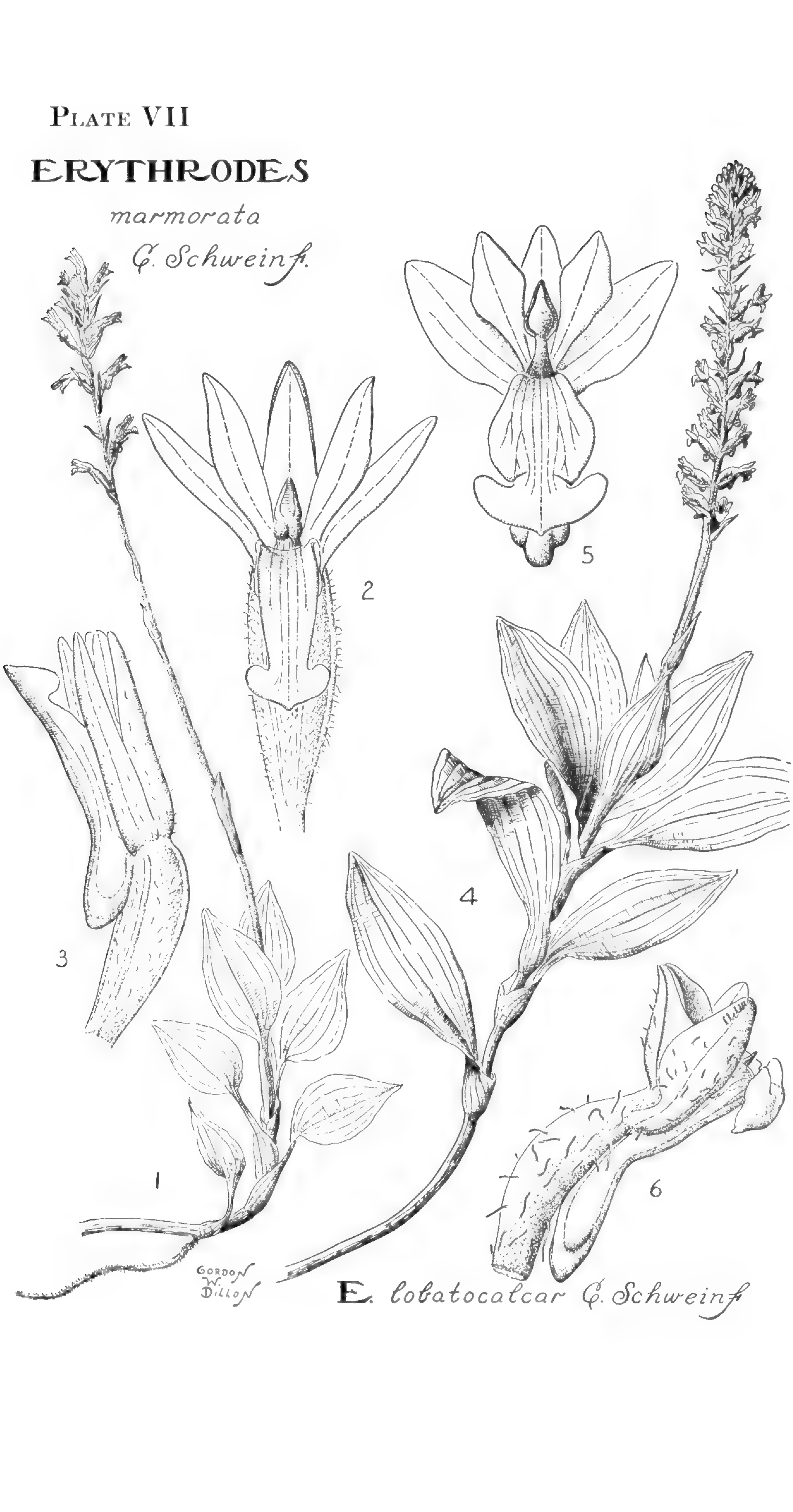
S. pumila
C. Scwein f.

PLATE VII

ERYTHRODES

marmorata

C. Schweinf.



GORDON W. DILLON

E. lobatocalcar C. Schweinf.

PLATE VIII

ERYTHRODES

multifoliata

C. Schweinf.

NOMENCLATORIAL NOTES XIV

BY

CHARLES SCHWEINFURTH

Pterichis galeata *Lindley* Gen. & Sp. Orch. Pl. (1840) 445.

Prescottia barbifrons Kränzlin in Engler Bot. Jahrb. 54, Beibl. 117 (1916) 19.

Pterichis acuminata Schlechter in Fedde Repert. Beihefte 7 (1920) 56; ex Mansfeld in Beihefte 57 (1929) t. 17, Nr. 61.

Pterichis barbifrons Schlechter in Fedde Repert. Beihefte 9 (1921) 127.

The concept *Pterichis barbifrons*, as illustrated by the type description of *Prescottia barbifrons* as well as by a photograph of the type specimen, appears to be reducible to the older *Pterichis galeata*. The only differences noticed are that the latter species is described as having glandular-tomentose floral bracts (as contrasted with the glabrous ones of *Pterichis barbifrons*) and that it has once-twisted petals, a character which is not observable in *Pterichis barbifrons*.

Pterichis acuminata Schltr. is described as having one leaf, a character not mentioned in the allied species, but otherwise it apparently differs from *Pterichis galeata* only in having straight (not twisted) petals.

The closely allied *Pterichis Weberbaueriana* Kränzl. differs from *P. galeata* in having ovate-lanceolate petals (without a basal claw) and a lip with a solid apical lobe.

Pterichis triloba *(Lindl.) Schlechter* in Engler Bot. Jahrb. 45 (1911) 389.

Acraea triloba Lindley in Ann. & Mag. Nat. Hist. 15 (1845) 386.

Pterichis seleniglossa Schlechter in Fedde Repert. Bei-

hefte 8 (1921) 42; ex Mansfeld in Beihefte 57 (1929) t. 76, Nr. 295.

The description and floral analysis of *Pterichis seleniglossa* show that this concept is specifically inseparable from *Acraea triloba* as represented by a photograph with floral analysis from the Lindley Herbarium at Kew.

Acraea triloba appears to be a somewhat taller plant with a larger leaf than the type of *Pterichis seleniglossa* and has insignificant floral differences. However, a series of Peruvian collections which have come under our observation indicates that we are here concerned with a single variable species.