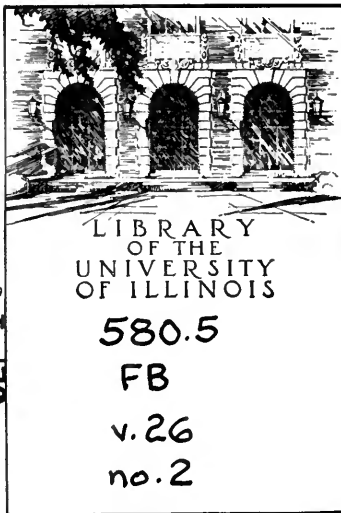


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ORCHIDS OF GUATEMALA

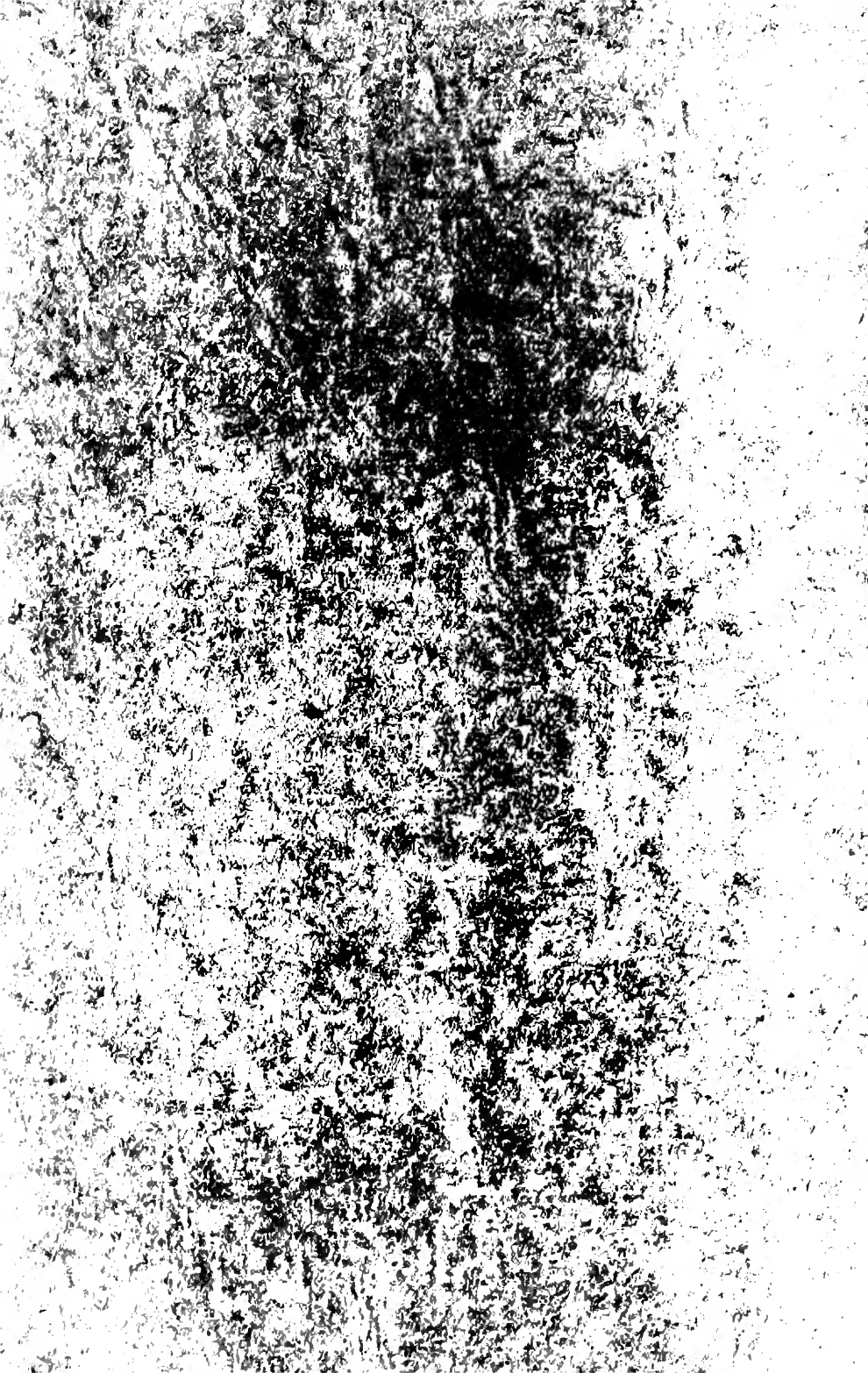
OAKES AMES

AND

DONOVAN STEWART CORRELL

FIELDIANA: BOTANY
VOLUME 26, NUMBER 2

Published by
CHICAGO NATURAL HISTORY MUSEUM
SEPTEMBER 25, 1953



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OAKES AMES

Director, Botanical Museum of Harvard University, 1935-1950

AND

DONOVAN STEWART CORRELL

United States Department of Agriculture

Formerly Research Associate, Botanical Museum of Harvard University

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FIG. 108. *Diacrium bilamellatum*. 1, flowering and fruiting plant ($\times \frac{1}{3}$); 2, flower ($\times 1$); 3, column and lip, side view (almost $\times 2$). Drawn by G. W. Dillon.

Orchids of Guatemala

30. DIACRIUM Lindl.

Epiphytic plants with fleshy-thickened elongate pseudobulbs that support several coriaceous leaves at the summit. Inflorescence a few- to many-flowered simple or sparsely branched raceme terminating an elongate peduncle. Flowers rather showy, subtended by small bracts. Sepals free, about equal, spreading, fleshy, elliptic in outline. Petals similar to the sepals. Lip spreading from the base of the column, more or less 3-lobed, about as long as the petals; lateral lobes tooth-like or prominent lobules, spreading or reflexed; mid-lobe triangular to lanceolate; disk adorned with a pair of prominently elevated fleshy calli that are excavated from below, thus forming two pits on the lower surface of the lip. Column short, winged, somewhat curved; clinandrium oblique, obtuse, anther terminal, operculate, incumbent, 2-celled; pollinia 4, waxy. Capsule ellipsoid.

This genus consists of about a half dozen species, mostly in South America. It is very closely allied to *Epidendrum* and has been included in that genus by some orchidologists.

Diacrium bilamellatum (Reichb. f.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 222. 1883. *Epidendrum bilamellatum* Reichb. f. in Walp. Ann. Bot. 6: 345. 1862 (type: eastern Guatemala, *Hort. Schill.*). *E. bigibberosum* Reichb. f. in Walp. Ann. Bot. 6: 346. 1862 (type: eastern Guatemala, *Hort. Schill.*). *Diacrium bigibberosum* (Reichb. f.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 222. 1883. ?*Diacrium Ulmckei* Kränzl. Mitteil. Instit. Allg. Bot. Hamb. 6: 419. 1927 (type: Guatemala, *Ulmcke*). Figure 108.

Epiphytic on trees in swamps and wet forests at low altitudes, up to 150 meters alt. Uncommon in Guatemala, British Honduras, Costa Rica, Panama and Venezuela.

Plant erect or ascending, up to 6.5 dm. tall. Pseudobulb conspicuous, fusiform-elongate, terete, apparently hollow, 5-21 cm. long, 1-3 cm. in diameter. Leaves 2-several at summit of pseudobulb, linear-oblong to oblong-ligulate, obtuse, somewhat conduplicate and recurved, coriaceous, 1.5-20 cm. long, 7-25 mm. wide. Inflorescence composed of a simple or few-branched raceme terminating a long peduncle; raceme few- to many-flowered, up to 10 cm. long; peduncle rather stout, 2-3 mm. in diameter, suffused with purple, provided with scarious tubular sheaths up to 2.5 cm. long. Floral bracts triangular-cucullate, acute, the margins more or less involute, 3-5 mm. long. Flowers fleshy, white-tinged or marked

with lavender, on purplish pedicellate ovaries 2–2.5 cm. long. Sepals broadly elliptic, obtuse and occasionally apiculate, longitudinally concave, 1.2–1.7 cm. long, 6–8 mm. wide. Petals suborbicular-elliptic, with a short slender claw, narrowly obtuse to acute, 1.1–1.6 cm. long, 6–9 mm. wide. Lip free from the column, more or less 3-lobed or with a small obtuse tooth on each side above the middle, 1.2–1.6 cm. long, 5–7 mm. wide across the lateral lobules or teeth, the lower half oblong-quadrate and sometimes minutely auricled on each side at the base, apical portion triangular-ovate and short- or long-acute; disk with a pair of large fleshy erect or spreading excavated triangular plate-like calli on the lower part, with two pits on the under side corresponding with two excavated calli. Column stout, 8–10 mm. long, with wide longitudinal wings on each side of the anterior margins. Capsule ellipsoid, about 2.5 cm. long.

The characteristic feature of this species is the lip, which possesses comparatively large fleshy calli that are excavated from the under side, thus creating two deep pits on the lower surface. No material has been seen of *D. Ulmckei*. However, from the description it seems to be a small-flowered form of this species and is so treated here.

Izabal: Between Milla 49.5 and Cristina, *Steyermark* 38389. Bay of Santo Tomás, between Escobas and Santo Tomás, *Steyermark* 39341. Shores of Lago Izabal, opposite San Felipe, between San Felipe and mouth of Río Juan Vicente, *Steyermark* 39692. Montúfar Flats, *Lewis* 217; 40.

31. CATTLEYA Lindl.

Plant epiphytic or growing on rocks, with thickened pseudobulbous stems supporting one or two leaves at the summit. Leaves coriaceous or fleshy, usually thick. Inflorescence a simple terminal raceme; peduncle usually subtended by a spathaceous sheath. Flowers few, mostly large and showy. Sepals free, about equal, spreading or connivent. Petals mostly much broader than the sepals. Lip sessile, erect, free or rarely somewhat adnate to the column, simple to deeply 3-lobed, with the sides or lateral lobes enfolding the column. Column usually long, wingless, semiterete, more or less arcuate; anther terminal, operculate, incumbent, the two cells each with a longitudinal septum; pollinia 4, ceraceous, somewhat compressed, parallel. Capsule ellipsoid.

In this genus there are about thirty species, all of which are confined to the American tropics. The flowers of some of the group are among the most beautiful in the Orchidaceae. The species, which are widely cultivated and used in hybridization, form a large part of floral industry.

1. Lip deeply 3-lobed *C. granulosa*.
1. Lip simple or obscurely 3-lobulate.
 2. Flowers orange-red, yellow or whitish.
 3. Lip less than 2.5 cm. long; flowers orange-red *C. aurantiaca*.

3. Lip more than 2.5 cm. long; flowers yellowish or whitish. . . . *C. Pachecoii*.
2. Flowers purple.
 4. Lip with a white blotch on the disk.
 5. Lip obtuse to emarginate, mostly more than 3.5 cm. long; flowering in the spring. *C. Skinneri*.
 5. Lip acute, mostly 3 cm. or less long; flowering in the fall.
 - C. Bowringiana*.
 4. Lip whole-colored a deep purple. *C. Deckeri*.

Cattleya aurantiaca (Batem. ex Lindl.) P. N. Don, Fl. Journ. 185. 1840, as *aurantica*. *Epidendrum aurantiacum* Batem. ex Lindl. Bot. Reg. 24: Misc. p. 8. 1838 (type: Guatemala, *Skinner*; also Mexico).

Epiphytic on trees in damp tropical forests and on shade trees in coffee plantations, up to 1,600 meters alt. Rather common in Mexico, Guatemala, El Salvador and Honduras.

Plant stout, up to 55 dm. tall, caespitose, sometimes forming mats up to one foot in diameter. Stem thickened, fusiform-clavate, dilated upward, up to 35 cm. long, 1–1.5 cm. in diameter near the summit, provided with several short scarious sheaths. Leaves two, more or less conduplicate and recurved, when spread out broadly ovate to oblong-elliptic and retuse at the apex, 5.5–18 cm. long, 2.5–5.3 cm. wide. Inflorescence a short few- to many-flowered raceme. The short rachis and peduncle up to 10 cm. long, subtended by a compressed spatheaceous sheath; sheath scarious, spotted, 4–10 cm. long, often concealing the peduncle and rachis. Floral bracts triangular, acute, cucullate, 4–5.5 mm. long. Flowers orange-red, orange or orange-yellow with brownish spots and streaks, with slender pedicellate ovaries 3.5–5 cm. long. Sepals linear-elliptic to lanceolate, subobtuse to acute, 1.8–2.7 cm. long, 4–6 mm. wide; lateral sepals oblique. Petals elliptic-oblancoolate, somewhat obtuse to acute, 1.8–2.5 cm. long, 4–5.5 mm. wide. Lip broadly ovate to oblong-elliptic and somewhat dilated below the middle, rounded to acute, often apiculate, variously marked with maroon or blackish streaks, 1.7–2.2 cm. long, 8–10 mm. wide. Column cylindrical, somewhat arcuate, about 8 mm. long. Capsule ellipsoid, deeply grooved and angled, 4–5 cm. long.

This species represents a connecting link between the genera *Epidendrum* and *Cattleya*. It resembles very closely some species in the section *Barkeria* of *Epidendrum*.

Guatemala: Market in Guatemala City, *Standley* 60626.—Quezaltenango: Colomba, *Skutch* 1984.—Retalhuleu: Above Asintal, on road toward Colomba, *Standley* 87882. Near Retalhuleu, *Steyermark* 33904.—Santa Rosa: Casillas, *Heyde & Lux* 4591.—Sacatepéquez: Santa María de Jesús, *Hunnell* 17115.—Suchitepequez: Slopes of Volcán Zunil, between Finca Alvidas and Finca Panchas east of Pueblo Nuevo, *Steyermark* 35462.—Zacapa: Oak-pine woods along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, *Steyermark* 42256; 42278.—“Guatemala,” *Lewis* 24.

Cattleya Bowringiana Veitch, Gard. Chron. 2: 683. 1885.
Cattleya Skinneri var. *Bowringiana* (Veitch) Kränzl. Xenia Orch.
 3: 82. t. 245. 1892.

Mostly growing on rocks and cliffs in ravines along streams in a moist atmosphere, in shade or exposed to the sun. Rare in British Honduras and Guatemala.

This species differs from *C. Skinneri* chiefly in its more vigorous growth and its larger number of smaller flowers, which appear in the fall instead of late winter and spring. It also differs from that species in the long joint at the base of the leaves and in the swollen base of the stipitate pseudobulb. It differs from *C. Deckeri*, its nearest relative, mainly in the lip, which has a white blotch on the disk instead of being uniformly colored a deep purple.

Guatemala (fide Kränzlin).

Cattleya Deckeri Kl. Allgem. Gartenz. 23: 81. 1855. *C. Skinneri* var. *parviflora* Hook. Bot. Mag. 82: t. 4916. 1856 (type: Guatemala, *Skinner*). *C. guatemalensis* Moore, Fl. Mag. 1: t. 61. 1861 (type: Guatemala). Figure 109.

Epiphytic, usually high up on large trees in open sunlight. Rare from Mexico through Central America to Panama, the West Indies and (?) northern South America.

This species is vegetatively similar to *C. Skinneri*. However, florally, it differs from that species in that the flowers usually are much smaller and the lip is uniformly colored a true purple instead of having a whitish center. The lip, sepals, and petals are acute, and the blooming season is usually in September and October instead of winter and spring as in the case of *C. Skinneri*. It is also very common for the floral segments to remain rather compact.

Plants of this species are confined to low altitudes, mostly at sea level, while *C. Skinneri* is found up to 1,250 meters altitude.

Escuintla: Osuna, *Johnston* 1570.

Cattleya granulosa Lindl. Bot. Reg. 28: t. 1. 1842 (type: Guatemala, *Hartweg*).

Very rare in Guatemala and Brazil.

Plant erect, stout. Stem pseudobulbous, elongate, cylindrical-compressed, 3-5 dm. long, 1-2 cm. in diameter, with membranaceous sheaths 4-9 cm. long. Leaves two, at the summit of the stem, oblong-lanceolate, obtuse, spreading, coriaceous, 12-15 cm. long, 3.5-5 cm. wide. Flowers large, showy, the segments spreading, in a rather short terminal 5-8-flowered raceme, supported by stout pedicellate ovaries 3-6 cm. long; peduncle stout, short, enveloped at the base in a large compressed spathaceous sheath 3-7 cm. long. Floral bracts thick, rigid, concave, ovate-triangular, acute, 3-5 mm. long. Sepals coriaceous, olive green mottled with rich brown spots, with slightly undulate margins; dorsal sepal oblong-



FIG. 109. *Cattleya Deckeri*. Plant (about $\times \frac{2}{3}$); right center, lip, spread out (about $\times \frac{2}{3}$). Drawn by Blanche Ames.

elliptic, obtuse to acute, 6–8.5 cm. long, 1.2–2.3 cm. wide; lateral sepals elliptic-lanceolate, acute to subacuminate, strongly falcate, 4–7 cm. long, 1.4–2 cm. wide. Petals obliquely obovate-oblong to oblanceolate, broadly rounded to obtuse at the apex, the margins undulate-crested, submembranaceous, same color as the sepals, 5.5–7.5 cm. long, 2.5–3.5 cm. wide. Lip deeply 3-lobed, 4.5–5.5 cm. long, 3–5 cm. wide across the base, white on the sides and at the apex, orange-spotted with crimson in the middle; lateral lobes semicordate to triangular-semiovate, obtuse to acute at the apex, erect and curved over the column, 2.5–4 cm. long, free portion 1–1.5 cm. wide across the base; mid-lobe with the basal portion a linear isthmus about the length of the lateral lobes from the sinus and 6–9 mm. wide, abruptly dilated above into a flabellate-subreniform retuse plate with crisped to somewhat fimbriate margins, the plate 2.3–3.5 cm. wide; disk of plate and upper part of mid-lobe densely covered with rose-colored granulations. Column thick, clavate, somewhat arcuate, 2.5–3 cm. long.

There is some question concerning the exact origin of this species. The English growers attributed the first collections to Hartweg and Skinner, who were supposed to have collected the species in Guatemala. However, no authentic botanical specimens apparently exist in the form of dried material pressed in the field. Specimens seem only to have been taken from horticultural houses where the plants were growing. Hence, considering the intense rivalry and intrigue which existed among the English orchid growers of that period and the lack of herbarium specimens taken directly from the field in Guatemala, it is very possible that we have been misled as to the correct place of origin for the species.

“Guatemala,” *Skinner* (fide Cogniaux).

Cattleya Pachecoi Ames & Correll, *Orch. Soc. Bull.* 11, no. 9: 401. pl. 11. 1943 (type: Guatemala, Dept. Suchitepequez, in lowland forests of Mazatenango, *M. Pacheco H.*). Figure 110.

Apparently epiphytic in lowland forests, up to 1,200 meters alt. Found only in Guatemala, where it is apparently endemic.

Plant stout, up to 5 dm. tall. Pseudobulbs fusiform, compressed, bifoliate at the apex, provided with chartaceous deciduous sheaths. Leaves two, subopposite, spreading, oblong-elliptic, retuse at the broadly rounded apex, 15–18 cm. long, about 4 cm. wide. Peduncle stout, fleshy, provided with several small triangular bracts, nearly concealed by a spathaceous sheath that is 7–8 cm. long. Floral bracts triangular, acute, about 4 mm. long. Flowers 6 to 10, fragrant, lemon-yellow and pale buff to nearly white, in a showy lax raceme, with reddish-tinged pedicellate ovaries that are 5–7 cm. long. Sepals lemon-yellow or whitish, with somewhat reflexed margins, linear-oblong to elliptic-oblong or elliptic-lanceolate, obtuse to acute, 3.8–4 cm. long, 7–11 mm. wide; lateral sepals slightly oblique. Petals lemon-yellow or whitish, with undulate margins, elliptic to elliptic-lanceolate, subacute to broadly obtuse and minutely apiculate at the apex, slightly oblique, 3.5–4 cm. long, 1.3–1.6 cm. wide at about the middle. Lip pale



FIG. 110. *Cattleya Pachecoi*. 1, plant ($\times \frac{1}{2}$); 2, dorsal sepal ($\times 1$); 3, petal ($\times 1$); 4, lateral sepal ($\times 1$); 5, lip, spread out ($\times 1$); 6, column and ovary ($\times 1$). Drawn by G. W. Dillon.

buff or light yellow, with the lateral margins incurved so as to envelop the column and somewhat expanded at the apex in natural position, when spread out broadly elliptic-subquadrate in outline, minutely retuse at the broadly rounded to subtruncate apex, slightly dilated on each side in the middle, about 3.2 cm. long, 1.5–2.3 cm. wide across the widest point; disk venose, with the three central veins slightly raised at the base, marked with short inconspicuous reddish brown broken lines on the lower third of the disk. Column clavate, sulcate on the ventral surface, 1–1.2 cm. long.

This species is most closely allied to *C. aurantiaca*, a rather common and widespread species. However, *C. Pachecoii* differs from that species not only in the color of the flowers, which are about a third or more larger, but also in the somewhat differently shaped floral segments. The flowers of *C. aurantiaca* are characteristically orange-red in color. The petals of *C. Pachecoii* are 3.5–4 cm. long and 1.3–1.6 cm. wide, while those of the largest *C. aurantiaca* known to us are less than 2.5 cm. long and 6 mm. wide. The lip is 3.2 cm. long and 1.5–2.3 cm. wide, while the largest *C. aurantiaca* is less than 2.3 cm. long and 1 cm. wide.

Costa Cuca, west coast near the Mexican border, *Margaret Ward Lewis* 232.—“Guatemala,” *Standley* 92863.

Cattleya Skinneri Batem. Orch. Mex. and Guat. t. 13. 1838 (type: Guatemala, *Skinner*). Figure 111.

Epiphytic on trees in humid forests and on terrestrial granite banks, up to 1,250 meters alt. Uncommon from Mexico through British Honduras, Guatemala, Honduras and Costa Rica to Panama(?).

Plant stout, up to 5 dm. tall, often growing in dense large clumps. Stem pseudobulbous, much-thickened, compressed, 1.5–3.5 dm. long, 2–3 cm. wide, concealed when young by long tubular scarious sheaths. Leaves two, at summit of pseudobulb, oblong, obtuse, fleshy-coriaceous, 10–20 cm. long, 2.5–6 cm. wide. Raceme short, 4–12-flowered, rachis with the peduncle up to 14 cm. long, subtended by a large spathaceous sheath; sheath 6–12 cm. long. Floral bracts triangular-ovate, acute, concave, 3–5 mm. long. Flowers large, showy, rose-colored or true purple, on slender pedicellate ovaries 4–6.5 cm. long. Sepals linear-lanceolate or elliptic-lanceolate, obtuse to acute or apiculate at the apex, 4–6.5 cm. long, 1–1.8 cm. wide; lateral sepals slightly oblique. Petals broadly oval, rounded to apiculate at the apex, undulate along the margins, 4–6.7 cm. long, 1.8–3.5 cm. wide. Lip funnel-shaped and folded closely over the column in natural position, when spread out broadly oblong-elliptic in outline, entire, somewhat obscurely 3-lobed or pandurate, the apex emarginate or bluntly obtuse, cucullate below the middle, 3–5 cm. long, 2–3.5 cm. wide, somewhat whitish on the disk, with a small elevated ridge transversing the entire length. Column small, slender, somewhat 3-toothed at the apex, 8–12 mm. long. Capsule ellipsoidal, prominently ribbed, 4–5 cm. long.



FIG. 111. *Cattleya Skinneri*. Plant (about $\times \frac{1}{3}$). Drawn by Dorothy O. Allen.

This is the most attractive *Cattleya* found in Guatemala. The plants often form large clumps and, with the vividly true purple flowers, present a very beautiful sight. The white-flowered forms are highly prized. This species is the national flower of Costa Rica where it is most commonly found. It is also common in Honduras. It is known as "guaria morada" or "flor de San Sebastian."

Escuintla: Osuna, *Johnston* 1411.—Guatemala: Guatemala City, cultivated in garden of Don Mariano Pacheco H., *Steyermark* 39865. Near Finca La Aurora, *I. Aguilar* 191 (probably).—Retalhuleu: Retalhuleu, *Kellerman* 6038. Near Retalhuleu, *Steyermark* 34421. Vicinity of Retalhuleu, *Standley* 88299.—Santa Rosa: Santa Rosa, *Heyde & Lux* 4593.—"Guatemala," *Lewis* 25 (in part).

32. LAELIA Lindl.

Terrestrial or epiphytic plants, with thickened, often hollow, orbicular or cylindrical pseudobulbs; pseudobulbs compressed or terete. Leaves one or several, coriaceous. Inflorescence a subsessile solitary flower or a simple or compound raceme terminating an elongated scape. Flowers usually large and showy. Sepals about equal, free, spreading, flat or undulate. Petals similar to the sepals, usually larger or smaller. Lip free or slightly adnate to the column, more or less 3-lobed; lateral lobes usually convolute to enfold the column, mostly larger than the mid-lobe; disk smooth or adorned with lamellae. Column mostly long, winged or wingless, usually toothed at the apex; anther operculate, incumbent; pollinia 8, four in each cell of the anther, waxy, ovoid or laterally compressed. Capsule ellipsoid.

In this genus there are more than fifty species which are natives of the warmer parts of America from Mexico and the West Indies south to Brazil. The species of *Laelia* have long been sought for purposes of cultivation. A number of the species have been crossed artificially with species of *Cattleya* and *Brassavola* to produce very attractive and commercially worth while flowers. The hybrid genera resulting from these crosses are *Laeliocattleya*, *Brassolaelia*, and *Brassolaeliocattleya*.

1. Inflorescence subtended by a large spathe, 1-flowered.
 2. Lip deeply lacerate-fringed *L. Digbyana*.
 2. Lip not deeply lacerate-fringed *L. glauca*.
1. Inflorescence not subtended by a large spathe, few- to several-flowered.
 3. Pseudobulbs short, compressed, roundish to oblong, typically 1-leaved.

L. rubescens.
 3. Pseudobulbs fusiform-cylindric, terete, typically 2- or more-leaved.
 4. Flowers small; lip mostly less than 2 cm. long *L. Wendlandi*.
 4. Flowers large; lip more than 2.5 cm. long.
 5. Floral bracts large, usually longer than the pedicellate ovaries.

L. superbiens.
 5. Floral bracts small, usually less than 1 cm. long *L. tibicinis*.

Laelia Digbyana Benth. Journ. Linn. Soc. 18: 314. 1880.
Figure 112.

Epiphytic on trees near sea level. Rare in Mexico and British Honduras.

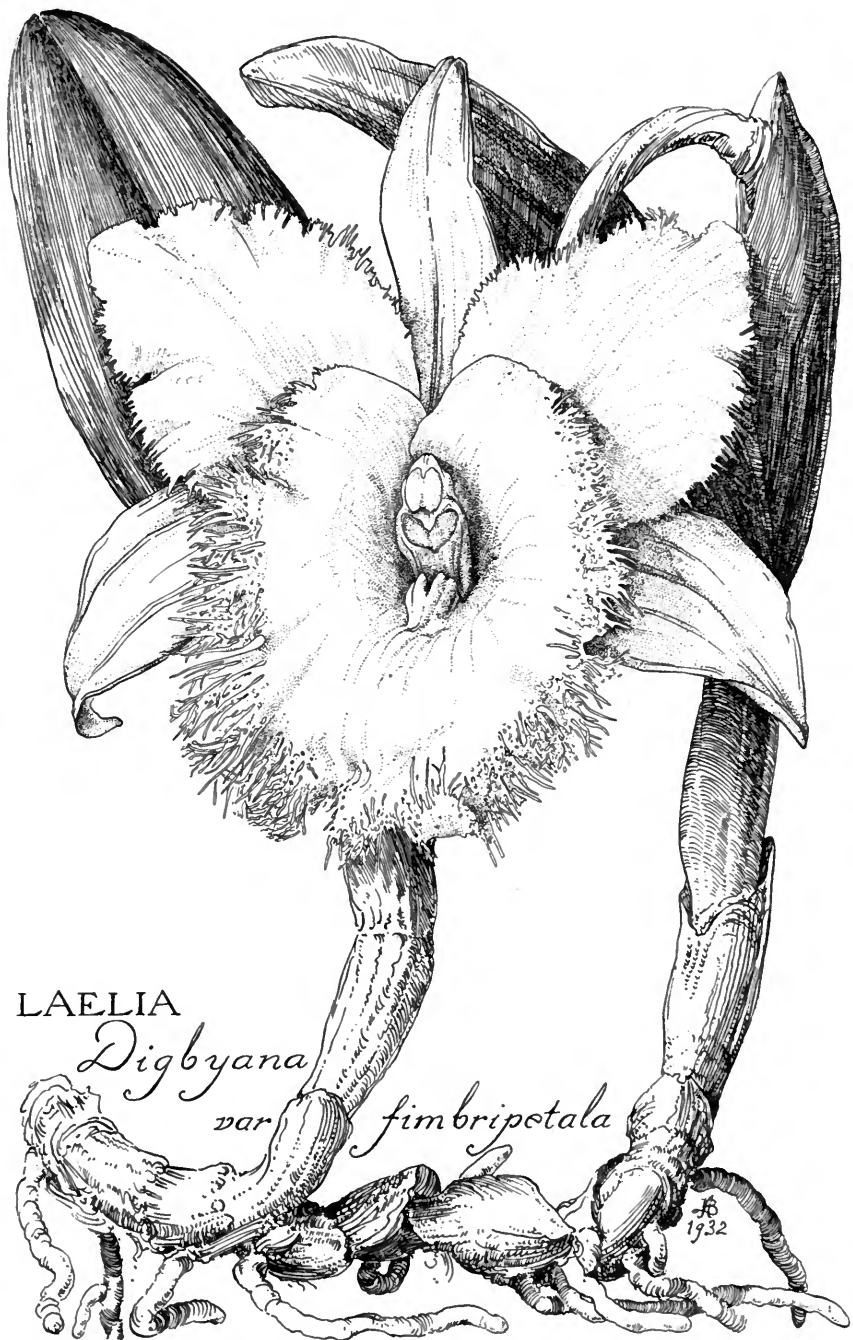
Plant erect, often forming large colonies. Pseudobulbs elongated, jointed, claviform, compressed, unifoliate, concealed by whitish chartaceous sheaths, up to 15 cm. or more long. Leaves fleshy-coriaceous, rigid, elliptic, obtuse, glaucous green, dorsally carinate, up to 20 cm. long and 5.5 cm. wide. Peduncle terminal on the pseudobulb, short, stout, one-flowered, concealed by a spathaceous sheath that is up to 13 cm. long. Flower showy, very fragrant. Sepals elliptic-lanceolate to oblong-ligulate, obtuse, pale yellowish green, about 10 cm. long and 2.5 cm. wide; lateral sepals oblique. Petals pale yellowish green, obliquely elliptic-oblancheolate, broadly obtuse at the apex, with the margins somewhat undulate, about 9 cm. long and 3 cm. wide. Lip large, obscurely 3-lobed, emarginate at the apex, in natural position involute at the base to envelop the column and expanded above, cream-white with a greenish hue, when spread out suborbicular in outline, with the upper margins deeply lacerate-fringed, about 7.5 cm. long and 8 cm. wide; disk provided just in front of the column with several short prominent fleshy lamellae. Column stout, semicylindrical, about 3.5 cm. long. Capsule obovoid-ellipsoid, about 6 cm. long, with an elongated curved rostrum that is up to 15 cm. long.

No specimen has been seen from Guatemala. However, since it occurs in Mexico (Yucatan) and British Honduras, and is represented in Honduras by var. *fimbripetala* Ames, it is included here, as it should eventually be found in Guatemala.

Laelia glauca (Lindl.) Benth. Journ. Linn. Soc. 18: 314. 1880.
Brassavola glauca Lindl. Bot. Reg. 26: t. 44. 1840. *Bletia glauca* (Lindl.) Reichb. f. in Walp. Ann. Bot. 6: 422. 1862. *Rhyncholaelia glauca* (Lindl.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 477. 1918.

Terrestrial or epiphytic on trees in open mountain forests, up to 1,500 meters alt. Uncommon in Mexico, Guatemala, Honduras and (?)Panama.

Plant short, stout, up to 30 cm. tall. Pseudobulbs short, oblong-fusiform, compressed, mostly less than 10 cm. long, rising at intervals along the stout creeping rhizome, concealed by scarious imbricated tubular sheaths. Leaf solitary at the summit of the pseudobulb, oblong-elliptic, obtuse, occasionally retuse, coriaceous, glaucous, 6-12 cm. long, 2.5-3.5 cm. wide. Flower solitary, large, showy, nodding, fragrant, subsessile at the apex of the pseudobulb, on an elongated pedicellate ovary about 10 cm. long which is arcuate just below the flower; pedicellate ovary enclosed for the most part in a long membranaceous compressed spathaceous sheath up to 10 cm. long. Sepals olive-green to white or lavender, linear-elliptic to oblong-lanceolate, subobtuse to subacuminate, 5.5-6.5 cm. long, 1-1.5 cm. wide; lateral sepals somewhat oblique. Petals olive-green to whitish, obliquely linear-elliptic, elliptic-oblong or oblanceolate-elliptic, acute to sub-



LAELIA
Digbyana
var. *fimbripetala*

FIG. 112. *Laelia Digbyana* var. *fimbripetala*. Plant ($\times \frac{2}{3}$). [Note: the fimbriate-petaled variety is a Honduran plant.] Drawn by Blanche Ames.

acuminate, margins slightly undulate-cripsed, 5–6.3 cm. long, 1.3–2.2 cm. wide. Lip white or yellowish with a rose-pink spot or several reddish stripes in the throat, large, more or less 3-lobed, the lobes large and rounded, 5–5.5 cm. long, the basal portion of lateral lobes convolute to involve the column, when spread out oblong-quadrate to suborbicular-cordate in outline, truncate and usually apiculate at the apex, cordate at the base, 4–5 cm. wide below the middle. Column short, semi-cylindrical, clavate, somewhat 5-toothed at the apex, about 1 cm. long. Capsule ovoid, deeply grooved, about 4 cm. long.

Alta Verapaz: On oak tree along road, between San Cristóbal Verapaz and Chixoy, *Steyermark* 43882.—Baja Verapaz: Sierra de las Minas, El Rancho, *Kellerman* 7682.—Guatemala: Sanarate, *Kellerman* 5566.—Jalapa: Near Jalapa, *Kellerman* 7926. Mountains about Chahuite, northwest of Jalapa, *Standley* 77425a.

Laelia rubescens Lindl. Bot. Reg. 26: Misc. p. 17. t. 41. 1840.
L. acuminata Lindl. Bot. Reg. 27: Misc. p. 17. t. 24. 1841 (type: Guatemala, Dept. Retalhuleu, Retalhuleu, *Hartweg*). Figure 113.

Epiphytic on trees in dry country or dense tropical forests, up to 1,650 meters alt. Widespread and rather common from Mexico through Central America to Panama.

Plant slender, up to 7.5 dm. tall. Pseudobulbs orbicular, ovoid or oblong, strongly compressed, glossy, 3–6.5 cm. long, 2.5–3.5 cm. wide, subtended by several short clasping ovate membranaceous sheaths up to 5 cm. long. Leaves one or rarely two, at the apex of the pseudobulb, oblong-elliptic, obtuse to obliquely retuse at the apex, fleshy-coriaceous, glossy, marginate, 4.5–20 cm. long, 2–4.5 cm. wide. Scape elongated, terete, nearly concealed by short sheathing scarios bracts, supporting a subcorymbose few- to several-flowered raceme. Floral bracts oblong-lanceolate, obtuse to subacute, canaliculate, scarios, 5–10 mm. long. Flowers from almost white to rose-purple, fragrant, on slender pedicellate ovaries 2.5–3.5 cm. long. Sepals variable, linear-elliptic, linear-lanceolate, oblong-lanceolate or oblanceolate-elliptic, obtuse to narrowly acute, 2.8–4.2 cm. long, 6–9 mm. wide; lateral sepals somewhat oblique. Petals narrowly or broadly elliptic, obtuse to acute or apiculate at the apex, 3–4.5 cm. long, 0.8–1.8 cm. wide. Lip distinctly 3-lobed about the middle, 2.2–3.5 cm. long, 2–2.2 cm. wide across the lateral lobes when spread out, adorned with a purplish or carmine blotch on the central portion; lateral lobes short, rounded-obtuse, involute, enclosing the column; mid-lobe oblong-quadrate to oblong-oval, subtruncate to acute at the apex, with the margins wavy, 1–1.7 mm. wide; disk with 2–3 slightly elevated lines along the central portion. Column semiterete, clavate, tridentate at the apex, 8–10 mm. long.

This attractive orchid has very fragrant flowers. It is known as “flor de Jesús” by the natives of Guatemala.

Alta Verapaz: In market place, *Johnston* 1391.—Chiquimula: Montaña Castilla, vicinity of Montaña Cebollas, along Río Lucía Saso, 3 miles southeast of Quezaltepeque, *Steyermark* 31314.—Guatemala: Market in Guatemala City, *Standley* 60624.—Jutiapa: West



FIG. 113. *Laelia rubescens*. Plant ($\times \frac{1}{2}$). Drawn by Elsie H. Froeschner.

of Jutiapa, *Standley* 77601. Between railroad station of Mita and town of Asunción Mita, *Steyermark* 31753. Lago Retana, between Ovejero and Progreso, *Steyermark* 32021.—“Guatemala,” *Hayes*; *Lewis* 20; *Johnston* 1374.

Laelia superbiens Lindl. Bot. Reg. 26: Misc. p. 46. 1840 (type: Guatemala, *Skinner*). *Cattleya superbiens* (Lindl.) Beer, Prakt. Orch. 214. 1854. *Schomburgkia superbiens* (Lindl.) Rolfe, Orch. Rev. 25: 49. 1917.

Epiphytic on trees in open or damp forests, or terrestrial in sheltered ravines, up to 2,000 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant large, stout, up to 3.5 meters or more tall. Pseudobulb elongated, oblong-fusiform, somewhat compressed, up to 3 dm. or more long, as much as 3.5 cm. in diameter, furrowed, provided with large scarios sheaths. Leaves 1-2, at summit of pseudobulb, oblong to oblong-lanceolate, obtuse to acute, very coriaceous, up to 30 cm. long and 6.5 cm. wide. Inflorescence a conspicuous, simple, usually many-flowered raceme; peduncle stout, up to 8 dm. or more long and 1 cm. in diameter, nearly concealed by long tubular, closely appressed scarios sheaths. Floral bracts large, lanceolate, acuminate, brownish and spotted, up to 12 cm. long. Flowers large, handsome, purple, variegated with yellow, with slender pedicellate ovaries up to 7.5 cm. long. Sepals spreading, linear-oblong, oblong-lanceolate or narrowly lanceolate, obtuse to acute, sometimes undulate, rose-mauve, paler toward the base, 5-7 cm. long, 1-1.5 cm. wide; lateral sepals somewhat oblique, a little shorter and wider than the dorsal sepal. Petals spreading, narrowly oblong to narrowly oblanceolate-oblong, broadly rounded to acute at the apex, oblique, the margins more or less undulate, 4.5-7 cm. long, up to 1.8 cm. wide. Lip free, distinctly 3-lobed above the middle, arcuate-decurved in natural position, the margins convolute, enfolding the column, 4-5.5 cm. long, when spread out oval-oblong to suborbicular-ovate in outline, 2.8-3.5 cm. wide across the lower half; lateral lobes short, oblong, rounded at the crisped apex, up to 1.2 cm. long to the sinus; mid-lobe much larger than the lateral lobes, broadly obovate to obcordate, emarginate, the edges waved and crisped, up to 2 cm. wide; disk yellowish, covered with 5-6 longitudinal prominent crisped and serrated lamellae. Column elongate, clavate, arcuate, canaliculate on the anterior face, white, tinged with purple, 2.5-3 cm. long.

The raceme of large purple flowers is beautiful. In Guatemala this species is called “candelaria” and “la var a del Señor San José.”

Chimaltenango: San Martín, *Johnston* 1370. Along road from Chimaltenango to San Martín Jilotepeque, *Standley* 57934.—Chiquimula: Volcán Quezaltepeque, 3-4 miles northeast of Quezaltepeque, *Steyermark* 31522.—“Guatemala,” *Lewis* 183.

Laelia tibicinis (Batem. ex Lindl.) L. O. Wms. Darwiniana 5: 77. 1941. *Epidendrum tibicinis* Batem. ex Lindl. Bot. Reg. 24:

Misc. p. 8. 1838. *Schomburgkia tibicinis* Batem. Orch. Mex. and Guat. t. 30. 1841. ?*Schomburgkia exaltata* Kränzl. Mitteil. Instit. Allgem. Bot. Hamb. Bd. 6, H. 2: 342. 1926 (type: Guatemala, near Livingston, in virgin forest on Río Dulce, April 11, 1925, *Ulmcke*).

Terrestrial or epiphytic on trees or shrubs in sand dunes, savannas, and xerophytic or humid forests, up to 600 meters alt. Rather common from Mexico through Central America to Panama.

Plant large, stout, up to 3 meters tall. Pseudobulb fusiform-elongate, tapering toward the apex, hollow, up to 5.5 dm. long and 4 cm. in diameter. Leaves several, at the summit of the pseudobulbs, oblong-elliptic, rounded to obtuse at the apex, coriaceous, 10–35 cm. long, 3.5–7 cm. wide. Inflorescence a many-flowered compound raceme or panicle supported by an elongated scape; scape stout, up to 1 cm. in diameter, provided with short scarious sheaths at the nodes. Floral bracts and bracts subtending the branches of the inflorescence similar, broadly ovate to ovate-oblong, obtuse, scarious, deeply concave, up to 1.5 cm. long. Flowers brownish orange to bright purplish magenta, showy, with slender pedicellate ovaries 3–5 cm. long. Sepals narrowly oblong-elliptic to elliptic-oblancoelate, broadly rounded to obtuse at the apex, the margins more or less tortuously undulate, 2.5–5 cm. long, 4–17 mm. wide near the apex; lateral sepals somewhat oblique. Petals linear-spatulate to oblanceolate, rounded to subacute at the apex, the margins prominently and tortuously undulate-cripsed, 3–5 cm. long, 2.5–15 mm. wide near the apex. Lip strongly 3-lobed above the middle, whitish yellow to purplish, 2.5–4 cm. long, 2–4 cm. wide across the lateral lobes when spread out; lateral lobes large, semiorbicular, semiobovate or semicordate, broadly rounded at the apex, convolute in natural position to enclose the column; mid-lobe small, suborbicular-obcordate or somewhat rhomboidal, retuse, separated from the lateral lobes by a more or less distinct broad isthmus, the margins erose-cripsed or almost entire, 1–2.3 cm. wide; disk with 5–7 closely parallel keels along the central portion. Column stout, clavate, arcuate, conspicuously tridentate at the apex, with wings on the anterior margins, 1.2–2.3 cm. long. Capsule obovoid-ellipsoidal, prominently 3-ridged, about 5 cm. long.

This species is commonly called “canyo.” The large hollow pseudobulbs are usually infested with black ants. Bateman wrote: “The hollow cylindrical stems are used as trumpets by the native children: hence the name.” (Lindl. Bot. Reg. 24: Misc. p. 8. 1838.) *Schomburgkia exaltata* seems to be a small-flowered form of *Laelia tibicinis*. We have seen small-flowered specimens that might be referred to *S. exaltata* if it were recognized as distinct from *L. tibicinis*.

Izabal: Livingston, *Watson*. (?) Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38563.—Petén: La Libertad, *Lundell* 3000; 3229.

Laelia Wendlandi Reichb. f. in Walp. Ann. Bot. 6: 431. 1862. *Bletia Wendlandi* Reichb. f. in Walp. Ann. Bot. 6: 431. 1862 (type: Guatemala, *Wendland*).

Epiphytic on trees in dense forests or semiarid country, up to 1,000 meters alt. Uncommon in Guatemala and Honduras.

Plant rather stout, up to 2.2 meters tall, often growing in dense clumps. Pseudobulbs fusiform-thickened, tapering toward the apex, longitudinally grooved, provided with scarios sheaths when young, 7-18 cm. long, 1.5-3.5 cm. in diameter. Leaves 2-3, at the summit of the pseudobulb, oblong-elliptic, broadly rounded to subacute at the apex, suberect, thick-coriaceous, 10-22 cm. long, 2.5-5.5 cm. wide. Inflorescence a few- to many-flowered simple or paniculate raceme, up to 2 meters long; peduncle short, provided with several short sheathing bracts up to 1 cm. long. Floral bracts and bracts subtending the branches of the inflorescence similar, triangular-ovate, obtuse to acute, scarios, concave, up to 1 cm. long. Flowers rather small, with slender pedicellate ovaries 1.3-2 cm. long. Sepals greenish brown, linear-oblancoolate to oblanceolate, obtuse to acute, 1.5-2.7 cm. long, 2-6 mm. wide above the middle; lateral sepals slightly oblique. Petals greenish brown, linear, oblanceolate to narrowly elliptic-oblancoolate, obtuse to subacute, slightly oblique, the margins crisped but not undulate. Lip greenish white to pale yellow with purplish striations or tinge, adnate to base of column, distinctly 3-lobed above the middle, arcuate in natural position, oblong-quadrate to oblong-elliptic when spread out, 1.4-2.2 cm. long; lateral lobes obtuse, curved upward around the column; mid-lobe suborbicular, broadly rounded to more or less emarginate at the apex, with the margins erose, 4-9 mm. long, about as wide as long; disk with three erose-fimbrillate greenish yellow lavender-tinted ridges extending from near the base to near the apex. Column light green with a lavender tinge, semitubular, arcuate, 8-10 mm. long. Capsule ellipsoidal, about 3.5 cm. long.

The hollow pseudobulbs of this species are usually infested with ants.

Chimaltenango: San Martín Jilotepeque, *Johnston* 1423 (also from Jilotepeque, Dept. Chiquimula).—Near Iguana, *Lewis* 117.

33. BRASSAVOLA R. Br.

Epiphytic or rock-inhabiting plants with slender or somewhat thickened stems supporting a solitary leaf, or rarely two leaves. Leaves terete or flattened. Inflorescence a 1-several-flowered raceme on a terminal or radical (lateral) peduncle. Flowers usually large and showy. Sepals and petals similar, about equal, spreading, linear to linear-lanceolate, often long-attenuate. Lip with a claw, more or less enfolding the column, dilated into a broad lamina that has entire or fimbriate margins and a plain surface. Column erect, mostly shorter than the claw of the lip, usually 2-winged, footless; anther operculate, incumbent; pollinia 8, four in each cell of the anther. Capsule ellipsoidal.

This genus consists of about fifteen species, which are natives of tropical America. The species usually have large, showy flowers.

1. Lip with a long cymbiform claw, apex merely short-acuminate, the margins entire or undulate-crenate.
2. Peduncle short, lateral, less than 3 cm. long. *B. acaulis*.

2. Peduncle elongated, terminal, rarely less than 5 cm. long *B. nodosa*.
 1. Lip with a short inconspicuous claw, apex long-acuminate and attenuate, the margins more or less fimbriate *B. cucullata*.

Brassavola acaulis Lindl. & Paxt. in Paxt. Fl. Gard. 2: 152, f. 216. 1851-52.

Epiphytic on trees in shady damp places, up to 1,300 meters alt. Very rare from Guatemala to Panama.

Plant usually small, caespitose, from creeping rhizomes that often string out along limbs for 3-4 feet, up to 7.5 dm. tall including the leaves. Stem short, about 7 cm. long, terete, concealed by scarios grayish sheaths. Leaves solitary, pendent, terete, grooved, fleshy-coriaceous, rigid, curved, tapering at the apex, up to 45 cm. or more long, 3-5 mm. in diameter. Peduncle short, lateral, rising directly from the rhizome adjacent to the aerial stem, mostly less than 2 cm. long, nearly concealed by short scarios more or less imbricating bracts, supporting one or rarely two large showy flowers at the summit. Flowers white, marked or spotted with purple, on rather stout pedicellate ovaries about 5 cm. long. Sepals and petals similar, linear-lanceolate to almost subulate, tapering to the acuminate apex, pale greenish yellow, tinged with purplish suffusions or dots, 7-8.5 cm. long, 3-6 mm. wide near the base. Lip large, white, about 6 cm. long including the claw; claw tubular-cymbiform, concealing the column, about 2 cm. long; lamina spreading, flat, suborbicular-ovate to broadly cordate-ovate, acuminate, more or less crenate-wavy on the margins, venose, about 4 cm. long and 4 cm. wide. Column short, semiterete, terminated by three horns.

Superficially, this species very closely resembles *B. nodosa*. However, it differs from that species mainly in having terete leaves and in bearing its solitary flower or flowers on a short lateral peduncle, instead of having the flat leaves and a terminal elongated inflorescence characteristic of *B. nodosa*.

Guatemala (fide Schlechter).

Brassavola cucullata (L.) R. Br. in Ait. Hort. Kew. ed. 2, 5: 216. 1813. *Epidendrum cucullatum* L. Sp. Pl. ed. 2: 1350. 1763. *Brassavola cuspidata* Hook. Bot. Mag. 66: t. 3722. 1839. *Brassavola cucullata* var. *elegans* Schltr. Orchis 13: 46. 1919.

Epiphytic on trees in humid tropical forests, up to 1,800 meters alt. Uncommon in Mexico, Guatemala, El Salvador, Honduras, the West Indies and northern South America.

Plant erect-ascending, slender, often in large colonies, up to 40 cm. tall. Stem slender, terete, jointed, up to 21 cm. long, concealed by long close-fitting whitish scarios sheaths. Leaf solitary at apex of stem, linear-subulate, nearly terete, somewhat flattened above, fleshy-coriaceous, 18-35 cm. long, up to 7 mm. wide. Peduncle short, up to 1.5 cm. long, subtended by 1-2 scarios sheaths 1.5-4.5 cm. long. Floral bracts tubular, cuspidate, scarios, about 1 cm. long. Flowers 1-3, large, showy, on elongated pedicellate ovaries that are up to 23 cm. long; pedicellate

ovaries dilated at the base for 4–5 mm. in diameter. Sepals linear-lanceolate, long-attenuate, yellowish or whitish, usually tinged with reddish brown on the outer surface, 7–12.5 cm. long, 6–9 mm. wide near the base; lateral sepals oblique. Petals similar to the sepals but narrower, 3–5 mm. wide near the base. Lip white, with a short claw, 6–9.5 cm. long, broadly cordate-ovate to suborbicular-ovate, with more or less fringed margins, abruptly long-acuminate, 1.5–2.5 cm. wide across the basal portion, which is involute-cucullate to clasp the column. Column clavate, stout, toothed at the apex, with wings on the anterior margins, 1.5–2 cm. long. Capsule ellipsoidal, about 5 cm. long, with the upper part of the pedicellate ovary conspicuously elongated.

According to Mrs. Margaret Ward Lewis, the fragrance of the flowers of this species is almost oppressive at night. The abbreviated peduncle and commonly narrower and longer leaves of this species readily distinguish it from *B. nodosa*.

Chiquimula: Río Grande (Río Concepción), on Socorro Mountain, above Finca San José, southeast of Concepción de las Minas, *Steyermark* 31114.—Escuintla: Near Escuintla, *Lewis* 145.—Jalapa: Mountains along the road between Jalapa and San Pedro Pinula, *Standley* 77065. Brushy oak slopes of Cerro Alcoba, east of Jalapa, *Standley* 77211.—Jutiapa: Hills between Jutiapa and Plan de Urrutia, north of Jutiapa, *Standley* 75488. Quebrada above Ovejero, on road between Monjas (Dept. Jalapa) and El Progreso, *Standley* 77651.

Brassavola nodosa (L.) Lindl. Gen. & Sp. Orch. Pl. 114. 1831. *Epidendrum nodosum* L. Sp. Pl. 2: 953. 1753. *B. venosa* Lindl. Bot. Reg. 26: t. 39. 1840. *B. rhopalorrhachis* Reichb. f. Bot. Zeit. 10: 855. 1852 (type: Guatemala, Minogalpa 1046, *Friedrichsthal*). *B. nodosa* var. *rhopalorrhachis* (Reichb. f.) Schltr. Orchis 13: 77. 1919. Figure 114.

On rocks or epiphytic on trees in open fields and woods, often on cacti and on roots of mangroves along sea shore up to 500 meters alt. Widespread from Mexico through Central America to Panama and Venezuela.

Plant rather short, ascending, caespitose, up to 4.5 dm. tall. Stem short, slender, terete, 4–15 cm. long, concealed by scarios tubular sheaths. Leaves solitary, more or less erect, linear to linear-elliptic, acute to acuminate, fleshy-coriaceous, sulcate on the upper surface, grass-green, up to 32 cm. long and 2.3 cm. wide. Peduncle slender, terminal, elongated, up to 20 cm. or more long, provided with short tubular scarios bracts, supporting one to several large showy flowers at the summit. Floral bracts triangular-lanceolate, acute to acuminate, scarios, concave, 5–10 mm. long. Pedicellate ovaries slender, 4–5 cm. long. Sepals pale green, linear-elongate, attenuate above, 5–9.5 cm. long, 3–5 mm. wide; lateral sepals somewhat oblique. Petals pale green, linear-elongate, attenuate



FIG. 114. *Brassavola nodosa*. Flowering and fruiting plant ($\times \frac{1}{2}$). Drawn by G. W. Dillon.

above, more or less sigmoid or falcate, 5-9 cm. long, 2-5 mm. wide. Lip white, with purple spots on the interior of the tubular claw, total length including the claw 4.5-7 cm.; claw tubular-cymbiform, often with the margins serrulate, 2-3 cm. long; lamina flat, spreading, suborbicular to suborbicular-ovate, abruptly apiculate-acuminate and strongly recurved backward at the apex, often conspicuously venose, 2.5-5.5 cm. long, 2.2-4.5 cm. wide. Column minute, about 8 mm. long. Capsule ellipsoidal, prominently ridged, 3-4 cm. long.

This species is not uncommon at low elevations. It is often found growing on the roots of mangroves along sea shores. Commonly called "Dama de la Noche."

El Progreso: El Rancho, *Maxon* 3775.—Escuintla: Port of San José, 1860, *Hayes*. San José, *Eyerdam* 8638.—Izabal: Santo Tomás River, near Puerto Barrios, *Hatch & Wilson*. Bay of Santo Tomás, between Escobas and Santo Tomás, *Steyermark* 39358; 39359.—Quezaltenango: Monte Grande, Coatepeque, *Solas* 92.—Retalhuleu: San Sebastián, *Percy Davies* (*Skutch* 1411).—Zacapa: Between Río Hondo and waterfall, *Steyermark* 29402.

34. MEIRACYLLIUM Reichb. f.

Small epiphytic plants with creeping rhizomes that are concealed by scarious sheaths. Secondary stems short or nearly obsolete, unifoliate, somewhat thickened. Leaves short, broad, sessile, fleshy-coriaceous. Inflorescence terminal, several-flowered. Flowers large for the plant, delicate. Sepals similar, erect-spreading, the lateral sepals oblique and forming an inconspicuous mentum at the base. Petals narrower than the sepals. Lip simple, adnate to the base of the column, conspicuously scoop-shaped or saccate. Column short, with a slender or triangular-thickened base, wingless, with a prominent point (rostellum) at the apex; anther incumbent on the back of the column, imperfectly 2-celled; pollinia 8, in two fascicles, oblong or clavate, waxy.

The following are the only species found in this genus.

Petals elliptic; lip strongly saccate; column with a broad base. . . . *M. trinasutum*.

Petals linear-oblancoolate; lip scoop-shaped; column with a slender base.

M. Wendlandi.

Meiracyllium trinasutum Reichb. f. *Xen. Orch.* 1: 12, t. 6. figs. II, 8-12. 1854. Figure 115.

Creeping on trees in forests and on rocks of canyons, up to 1,300 meters alt. Rare in Mexico and Guatemala.

Plant prostrate, creeping. Rhizome 3-4 mm. in diameter, concealed when young by tubular imbricated scarious sheaths, giving rise at intervals to minute or nearly obsolete secondary stems. Leaves sessile on the secondary stems, orbicular to broadly elliptic or elliptic-obovate, broadly rounded to obtuse at the apex, fleshy-coriaceous, 2.8-5 cm. long, 1.5-3.5 cm. wide. Flowers several, red-purple, on a short peduncle about 1 cm. long at the apex of the secondary stems, on re-



FIG. 115. *Meiracyllium trinasutum*. 1, plant ($\times 1$). *Homalopetalum pumilio*. 2, plant ($\times 1$). Drawn by G. W. Dillon.

curved pedicellate ovaries 1.5–2 cm. long. Floral bracts short, sharply triangular, about 2 mm. long. Dorsal sepal ovate-elliptic, acute to shortly acuminate, 8–11 mm. long, 3.5–4.2 mm. wide below the middle. Lateral sepals broadly and obliquely triangular-ovate, obliquely acuminate and recurved at the apex, with the central nerve prominent, 8–11 mm. long, 4.5–5.2 mm. wide across the basal portion. Petals obliquely elliptic, acute, prominently 3-nerved, 7.2–10 mm. long, about 3 mm. wide. Lip sessile, fleshy, strongly saccate-cucullate, acuminate, more or less cordate-ovate when spread out, somewhat auricled on each side on the basal margins, 7–9 mm. long, the sac 4–5 mm. deep. Column short, stout, triangular, from a broad base, with a long point at the apex, 4–6 mm. long. Capsule cylindrical, strongly ribbed, about 1.5 cm. long.

Chiquimula: Near Finca San José, southeast of Concepción de las Minas, *Steyermark* 31133.—Escuintla: Escuintla, *Smith* 2254. Near Escuintla, *Hunnewell* 14679.—Huehuetenango: Canyon tributary to Río Trapichillo, between Democracia and canyon of Chamushú, *Steyermark* 51250.—Retalhuleu: Near Retalhuleu, *Spinden*.—Sacatepéquez: Near Barranca Hondo, southeast of Alotenango, *Standley* 65039.—Suchitepequez: Chilión, Mazatenango, *Bernoulli* 372. Mazatenango, *Margaret Ward Lewis* 59.—“On trees at Paten on the road from Guatemala to the ‘Port,’ July 21, 1860,” *Hayes*.

Meiracyllium Wendlandi Reichb. f. *Beitr. Orch. Centr.-Am.* 73. 1866 (type: Guatemala, Río Sucio, February 10, 1857, *Wendland*). *M. gemma* Reichb. f. *Gard. Chron.* 988. 1869.

Epiphytic on trees in mixed forest, often growing in dense mats among mosses, up to 1,500 meters alt. Uncommon in Mexico and Guatemala.

Plant prostrate, creeping. Rhizome rather stout, knobby, up to 6 mm. in diameter, concealed when young by brownish imbricated sheaths. Secondary stems curved-ascending, up to 1 cm. long. Leaves sessile on the secondary stems, oblong to obovate, rounded to obtuse or apiculate at the apex, fleshy-coriaceous, 1.5–5.5 cm. long, 1.2–2.3 cm. wide. Flowers several, purple, yellowish at the base, on a short peduncle at the apex of the secondary stem; peduncle with the rachis 1.5–3.5 cm. long, provided with 1–several brownish sheaths at the base. Pedicellate ovaries 1–2 cm. long. Floral bracts triangular-ovate, acute, often minute, 1–3 mm. long. Dorsal sepal oblong-elliptic, acute to subacuminate, nervose, concave, 1–1.7 cm. long, 3–4 mm. wide. Lateral sepals obliquely oblong-lanceolate or triangular-lanceolate, dorsally keeled at the acute to acuminate apex, 1–1.7 cm. long, 3–4 mm. wide near the base. Petals linear-oblanceolate to oblanceolate-spatulate, conspicuously narrowed below the middle, prominently nerved, the margins minutely denticulate, 8–15 mm. long, 1–2.5 mm. wide above the middle. Lip sessile, fleshy, scoop-shaped, with the sides upturned and decurved at the apex in natural position, 1–1.3 cm. long; when spread out broadly obovate to flabellate and abruptly acuminate at the apex, about 7 mm. wide. Column from a slender stalk-like base, about 8 mm. long, with a long point at the apex. Capsule obliquely ellipsoidal, prominently ridged, about 1 cm. long.

These two species are quite similar in appearance. However, the leaves are usually more oblong and the secondary stem more developed in this species than in *M. trinasutum*. The petals are linear-oblong rather than elliptical and the base of the column is also more slender than in *M. trinasutum*. There is also a distinct difference in the lip. The lip of *M. Wendlandi* is shallowly scoop-shaped while that of *M. trinasutum* is deeply saccate.

Represented from Guatemala only by the type of *M. Wendlandi*.

35. HOMALOPETALUM Rolfe

Small epiphytic herbs with creeping rhizomes. Pseudobulbs short, monophyllous, arising at intervals along the rhizome. Leaves short, very fleshy-coriaceous. Inflorescence at the apex of the pseudobulb, 1-flowered. Flowers rather large for plant. Sepals and petals erect-spreading, similar, narrowly lanceolate. Lip simple, free, with a small auricle on each side of the claw (in ours). Column slender, arcuate, wingless; anther incumbent, operculate; pollinia 8, four large and four small ones, waxy. Capsule ovoid.

There are only a few species in this tropical American genus. It is represented in Central America by the following species.

Homalopetalum pumilio (Reichb. f.) Schltr. Repert. Sp. Nov. Beih. 19: 48. 1923. *Brassavola pumilio* Reichb. f. Linnaea 18: 402. 1844. *Pinelia Tuerckheimii* Kränzl. Ann. Naturhist. Mus. Wien 44: 326. 1930 (type: Guatemala, in high woods of Chima near Cobán, *Selten*; *Türkheim* 32). Figure 115.

Epiphytic on trees in forests and on rocks up to 2,000 meters alt. Uncommon in Mexico, Guatemala and Costa Rica.

Plant small, ascending to suberect, up to 10 cm. tall including the flower, densely caespitose, from a creeping rhizome 1-3 mm. in diameter. Pseudobulbs minute, congested or arising at short intervals along the rhizome, recurved-ascending, obliquely ovoid to oblong-cylindrical, often tinged with purple, monophyllous, 4-10 mm. long, 2-3 mm. in diameter, subtended by a close-fitting scarious bract. Leaf erect, ovate, ovate-lanceolate, oblong or linear, obtuse to acute, very fleshy-coriaceous, 1-3 cm. long, 2.5-5 mm. wide. Peduncle scapose, solitary at the apex of the pseudobulb, 1-flowered, erect-ascending, filiform, 2.5-7 cm. long, provided with several short tubular sheaths. Flowers large for the plant, transparent pale greenish, often tinged with purple, on a short pedicellate ovary up to 6 mm. long. Floral bract tubular, subtruncate to acute, about 5 mm. long. Sepals and petals spreading-erect, recurved, essentially alike, linear-lanceolate, long-acuminate or attenuate, 1.5-3 cm. long, 2-3.8 mm. wide near the base; lateral sepals and the somewhat shorter petals falcate. Lip with a short claw, oval-elliptic to elliptic-lanceolate, acute to shortly acuminate, 1.5-2.7 cm. long, 5-11 mm. wide near the middle; disk with a thickened flap-like ridge on each side at

the base; claw 2-3 mm. long, with a small triangular auricle on each side. Column slender, terete, arcuate, 4-7 mm. long. Capsule ovoid, about 1.5 cm. long.

Baja Verapaz: Moist ravine slopes of Sierra de Chuacús, south of San Gerónimo, *Steyermark* 43874.—Zacapa: Along Rillito del Volcán de Monos, Volcán de Monos, Sierra de las Minas, *Steyermark* 42328.

36. SCAPHYGLOTTIS Poepp. & Endl.

Epiphytic or rock-inhabiting caespitose or creeping plants with indurated or pseudobulbous stems. Stems simple or much-branched or clustered in fascicles. Leaves one or several from the apex of the sections of the stem, thin and grass-like, broad and fleshy-coriaceous or occasionally nearly terete. Inflorescence terminal or at the nodes of the stem, a fascicle of flowers or a slender raceme. Flowers small. Sepals nearly equal, erect or spreading; dorsal sepal free; lateral sepals more or less adnate to the column-foot and conjoined to form a mentum. Petals usually smaller and narrower than the sepals. Lip subarticulate to the column-foot, with or without a claw, nearly straight, geniculate or reflexed and curved, entire, 3-lobed or emarginate. Column short, broadly winged, essentially wingless or auriculate, produced into a foot at the base; anther terminal, operculate, incumbent; pollinia 4 or 6, all of them equal or if 6 occasionally two smaller than the other four, waxy, laterally compressed. Capsule ovoid to ellipsoid.

As considered now, this tropical American genus comprises about twenty species. The segregates of *Hexadesmia* are here included in this genus.

1. Lip more or less quadrate, emarginate, simple or sometimes 3-lobed.
2. Flowers in glomerules at nodes; lip 3-lobed *S. minutiflora*.
2. Flowers solitary or in fascicles at apex of pseudobulbs or at nodes; lip not 3-lobed.
3. Lip less than 3 mm. long, with a pair of small calli at base; stems not vernicose *S. livida*.
3. Lip more than 4 mm. long, ecallose; stems vernicose *S. confusa*.
1. Lip cuneate-spatulate, oblong-obovate or flabellate, occasionally 3-lobed.
4. Leaves broad, more than 1.8 cm. wide *S. Lindeniana*.
4. Leaves narrow, less than 1.5 cm. wide.
5. Inflorescence a slender few- to many-flowered raceme supported by a filiform peduncle.
6. Lip about 2 mm. long, apiculate at apex *S. micrantha*.
6. Lip more than 5 mm. long, emarginate at apex.
7. Lower half of lip suborbicular *S. hondurensis*.
7. Lower half of lip elliptic-oblong or cuneate *S. cruriger*.
5. Inflorescence a solitary flower or several flowers in a fascicle.
8. Leaves linear-attenuate, grass-like.
9. Lip oblong-cuneate, sinuately trilobulate at the truncate apex.
S. longicaulis.
9. Lip obovate-cuneate, more or less 3-lobed above the middle.
S. Behrii.
8. Leaves linear-oblong, not grass-like.
10. Lip deeply 3-lobed at about the middle *S. amethystina*.

10. Lip rounded, retuse or lightly 3-lobulate at apex.
 11. Uppermost leaves 5.5 cm. or less long. *S. cuneata*.
 11. Uppermost leaves more than 5.5 cm. long. *S. cuneata* var. *major*.

Scaphyglottis amethystina (Reichb. f.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 456. 1918. *Ponera amethystina* Reichb. f. in Saund. Ref. Bot. 2: t. 93. 1869.

Epiphytic on trees in forests or open places, up to 300 meters alt. Rare in Guatemala, Costa Rica and Panama.

Plant short, stout, erect or ascending, caespitose, 10–26 cm. tall, fasciculate-branched, usually producing roots at the nodes. Stem usually short, pseudobulbous, the basal section often producing several stems in a fascicle at the apex; pseudobulbs stipitate, curved, bifoliate at the apex, subtended by several large membranaceous sheaths, up to 12 cm. long and 1 cm. in diameter. Leaves linear to oblong-elliptic, obliquely bilobulate at the apex, 2.5–12.5 cm. long, 5–12 mm. wide. Flowers several to many in a fascicle at the apex of the pseudobulbs, white to lilac, with slender pedicellate ovaries that are about 8 mm. long, subtended by several short scarious imbricated bracts. Sepals linear-oblong to oblong-elliptic, subobtusate to acute, concave, 5–8 mm. long, 1.2–2 mm. wide; lateral sepals somewhat oblique, decurrent on the lateral margins at the base and conjoined to form a prominent obtuse mentum. Petals linear, acute, falcate, occasionally slightly constricted above the middle, 5–6 mm. long, 1–1.2 mm. wide. Lip attached to foot of column, cuneate-flabellate, from a slender base, deeply 3-lobed above, 6.5–8 mm. long, 4.1–5 mm. wide across the lateral lobes; lateral lobes obliquely oblong-oval, obtuse-rounded at the apex; mid-lobe subquadrate, retuse, with the margins undulate-crenulate, 1.5–3 mm. wide. Column slender, clavellate, with a very prominent foot, with an ascending triangular acuminate auricle on each anterior margin near the apex, 5.5–7 mm. long. Capsule obliquely ellipsoid, about 8 mm. long.

Guatemala (fide Schlechter).

Scaphyglottis Behrii (Reichb. f.) Benth. & Hook. ex Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 219. 1883. *Ponera Behrii* Reichb. f. Bonpl. 3: 220. 1855. *Scaphyglottis guatemalensis* Schltr. Repert. Sp. Nov. 2: 133. 1906 (type: Guatemala, Dept. Alta Verapaz, epiphytic in woods near Cubilgüitz, March, 1902, *H. von Türckheim* II 526). Figure 116.

Epiphytic on trees or on rotten logs in dense or open forests or thickets, at low elevations, up to 350 meters alt. Rather common

FIG. 116. I. *Scaphyglottis longicaulis*. Plant ($\times 1$); 1, flower, floral bracts, and peduncle, side view ($\times 4$); 2, lip, spread out ($\times 7$). II. *S. Behrii*. Plant ($\times 1$); 3, flower, floral bracts, and peduncle, side view ($\times 4$); 4, lip, spread out ($\times 7$); 5, column, front view ($\times 5$). Drawn by Blanche Ames.



from Guatemala and British Honduras through Central America to Panama.

Plant slender, caespitose, fasciculate-branched, usually pendent, up to 45 cm. tall. Stem more or less thickened, pseudobulbous, the pseudobulbs stipitate and superposed one above the other or produced in 2- to several-stemmed fascicles, concealed when young by scarios sheaths, each individual pseudobulb 5-20 cm. long and 2-5 mm. in diameter. Leaves linear, grass-like, obtuse and obliquely retuse at the apex, firmly membranaceous to subcoriaceous, 7-28 cm. long, 1.5-6 mm. wide, two produced at the apex of each pseudobulb. Flowers small, white, produced in fascicles at the apex of each progressive pseudobulb, with slender pedicellate ovaries that are 4-7 mm. long. Floral bracts ovate-oblong, apiculate, scarios, 2-3 mm. long. Sepals oblong-ligulate to narrowly triangular-oblong, subobtuse to acute, canaliculate, prominently keeled on the back, 3.5-5.5 mm. long, 1-2.2 mm. wide; lateral sepals somewhat oblique, usually conjoined at the base to produce a short mentum. Petals linear to linear-oblancoate, obtuse to subacute, slightly oblique, 3-4 mm. long, 1.2 mm. or less wide. Lip attached to foot of column, obovate-cuneate, more or less 3-lobed above the middle, 4-6 mm. long, 2-3.5 mm. wide across the lateral lobules when spread out; lateral lobes nearly obsolete to prominently semiobovate, broadly rounded above; mid-lobe subquadrate, more or less retuse at the apex, with the margins lightly undulate-crenulate; disk sometimes adorned with a small inconspicuous keel along the center. Column with a distinct foot, slender, semiterete, somewhat thickened above, entire to minutely 3-lobulate at the apex, 3-5 mm. long. Capsule small, reddish brown, ovoid-ellipsoid, about 7 mm. long.

Alta Verapaz: Lowland forest in valley, "pantano," 2½ miles west of Cubilgüitz, *Steyermark* 44331. Cubilgüitz, *Türkheim* 4069; 7730; 8309; 8586.—Izabal: Between Milla 49.5 and Cristina, *Steyermark* 38682. Finca Transvaal, *Wilson*. Near Virginia, *Lewis* 37.—"Eastern portions of Vera Paz and Chiquimula," 1885, *Watson* 175.

Scaphyglottis confusa (Schltr.) Ames & Correll, *Bot. Mus. Leafl. Harv. Univ.* 10: 85. 1942. *Hexadesmia confusa* Schltr. *Repert. Sp. Nov.* 10: 361. 1912 (type: Guatemala, Dept. Alta Verapaz, epiphytic in woods near Cobán, May, 1908, *H. von Türkheim* II 2348).

Epiphytic on trees in dense humid forests or dry open woods, occasionally on large boulders, up to 2,000 meters alt. Rather common in Mexico, Guatemala and Honduras.

Plant erect-ascending to spreading, caespitose, fasciculate-branched, usually producing roots at the nodes, 10-45 cm. tall. Stem somewhat thickened, pseudobulbous, cylindrical, sulcate, mostly vernicose, each pseudobulb bifoliate at the apex and up to 22 cm. long and 4 mm. in diameter, subtended by several imbricated scarios sheaths. Leaves erect-spreading, linear to linear-lanceolate, obliquely bilobulate at the obtuse apex, firmly membranaceous, 2-8 cm. long, 3-7 mm. wide. Flowers greenish white or bronze-green, solitary or occasionally several in a fas-

cicle at apex of pseudobulbs, the stout pedicellate ovary concealed by several lanceolate imbricated scarious bracts. Sepals ovate-lanceolate, triangular-ovate or oblong-elliptic, acute to subacuminate, 4-6.2 mm. long, 2-3 mm. wide; lateral sepals somewhat oblique, conjoined on the basal lateral margins to form an inconspicuous mentum. Petals oblong-cuneate, oblong-obovate or elliptic-spatulate, the margins often minutely toothed, 4-6 mm. long, 2-3 mm. wide near the apex. Lip arcuate below the middle in natural position, oblong-quadrate and somewhat pandurate when spread out, emarginate at the truncate apex with an apicule in the sinus, the margins minutely denticulate, 4-5 mm. long, 3-4.5 mm. wide across the widest point. Column short, stout, with a short foot, broadly winged on the anterior margins, 2-3 mm. long. Capsule obliquely ovoid, reddish brown, about 1 cm. long.

Scaphyglottis confusa, as distinguished from *S. livida*, a closely allied species, has a crenulate lip-margin and pedicellate ovaries that are always concealed by the closely imbricated floral bracts. The flower, itself, is often partially concealed by the subtending bracts.

Alta Verapaz: Near Cobán, *Standley* 69151. Near the Finca Sepacuite, *Cook & Griggs* 401. Tactic, *Johnston* 1830; 1860. Vicinity of Cobán, *Standley* 90853. La Isla, south of Santa Cruz, *Standley* 90234. Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 89908. Large swamp east of Tactic, *Standley* 92309.—Baja Verapaz: Rocky hills near and above Santa Rosa, in pine-oak forest, *Standley* 91208. North of Santa Rosa, *Standley* 69868; 69869.—Chiquimula: Volcán Quezaltepeque, 3-4 miles northeast of Quezaltepeque, *Steyermark* 31446.—Zacapa: Along Rillito del Volcán de Monos, Volcán de Monos, Sierra de las Minas, *Steyermark* 42332. Sierra de las Minas, upper slopes, along Río Repollal to summit of mountain, *Steyermark* 42523.—“Guatemala,” *Margaret Ward Lewis*.

Scaphyglottis crurigera (Batem. ex Lindl.) Ames & Correll, Bot. Mus. Leaflet. Harv. Univ. 10: 85. 1942. *Hexopia crurigera* Batem. ex Lindl. Bot. Reg. 26: Misc. p. 46. 1840, *nomen*; ex Lindl. Bot. Reg. 30: Misc. p. 2. 1844, in synonymy. *Hexadesmia crurigera* Lindl. Bot. Reg. 30: Misc. p. 2. 1844 (type: Guatemala, introduced to Bateman).

Epiphytic on trees in humid forests and in damp thickets, up to 1,500 meters alt. Not particularly common in Mexico, Guatemala, El Salvador and Costa Rica.

Plant slender, erect-ascending, densely caespitose, often in dense clumps, 8-33 cm. tall. Stem fusiform-cylindrical, long-stipitate, somewhat curved, unbranched, bifoliate at the apex, 4-14 cm. long, 4-7 mm. in diameter. Leaves erect-spreading, linear, grass-like, membranaceous, obliquely retuse at the apex,

sulcate, 5.5–20 cm. long, 2–4 mm. wide. Flowers pure white, delicately fragrant, in 1–2 slender, usually fractiflex racemes that are 4.5–13 cm. long including the peduncle; peduncle filiform, bluish green, subtended by 1–several yellowish scarious sheaths; pedicellate ovaries filiform, 6–10 mm. long. Floral bracts whitish, lanceolate, acuminate, 4–5 mm. long. Sepals oblong-elliptic to oblong-lanceolate, obtuse, acute or long-apiculate at the apex, keeled on the back, longitudinally concave, 5–7 mm. long, 2–3 mm. wide near the base; lateral sepals oblique, with the lateral margins decurrent and conjoined at the base to form a pronounced mentum. Petals linear-oblong to elliptic-obovate, obtuse to acute-apiculate and often slightly recurved at the apex, oblique, more or less undulate-crenulate along the margins. Lip attached to the foot of the column, arcuate-decurved in natural position, oblong-cuneate or oblong-obovate in outline when spread out, deeply bifurcate at the apex, with the lobules broadly rounded, incurved and usually overlapping to form a shallow volute, 7–10 mm. long, 4–5 mm. wide across the apex; basal portion below the arch sulcate, conforming to the column, with the margins incurved; apical portion above the arch with the margins minutely undulate-crenulate. Column green-purple, slender-clavellate, with a prominent foot, slightly arcuate, 5–6 mm. long. Capsule ovoid, 3-angled, about 9 mm. long.

Chimaltenango: Yepocapa, *Johnston* 593.—Guatemala: Near Finca La Aurora, *I. Aguilar* 192.—Jalapa: San Martín Jilotepeque, *Johnston* 1421.—Quezaltenango: Finca Pireneos, below Santa María de Jesús, *Standley* 68416. Slopes of Volcán Santa María, between Santa María de Jesús and Calahuaché, along great barranca between Finca Pirineos and San Juan Patzulín, *Steyermark* 33670.—Sacatepéquez: Volcán Fuego, *Smith* 2640. Wooded quebrada just above Barranca Hondo, *Standley* 88943.—Santa Rosa: Santa Rosa, *Heyde & Lux* 3497.—“Guatemala,” *Bates* 10.

Scaphyglottis cuneata Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 398. 1918 (type: Guatemala, epiphytic along bank of Río Dulce near Livingston, February, 1884, *H. von Türckheim*). *S. prolifera* Cogn. in Mart. Fl. Bras. 3, pt. 5: 15. 1898.

Epiphytic on trees in pine forests or low dense woods, up to 600 meters alt. Widespread but not common from Guatemala and Honduras through Central America to Panama, throughout the West Indies and northern South America.

Plant variable in size, erect-ascending, densely caespitose, fasciculate-branched, usually producing aerial roots at the nodes, up to 25 cm. tall. Stem (or internodes) more or less thickened-cylindrical, pseudobulbous, the individual stems tapering at each end and superposed one above the other or produced in 2- to several-stemmed fascicles, each stem-member subtended by several distichous imbricated scarious sheaths, up to 10 cm. long and 2–4 mm. in diameter. Leaves erect-spreading, linear-ligulate, obtuse and obliquely retuse at the apex, firmly membranaceous to coriaceous, 1–5.5 cm. long, up to 8 mm. wide, two produced at the apex of each pseudobulb. Flowers white, with a purplish lip, faintly fragrant,

one or several in a fascicle at the apex of each pseudobulb, each flower subtended by several membranaceous equitant imbricated bracts, with stout pedicellate ovaries that are about 4 mm. long. Sepals oblong-elliptic to rarely elliptic-obovate, subobtuse to acute, somewhat concave, 4-6 mm. long, 1.5-2 mm. wide; lateral sepals oblique, conjoined at the base to produce a short mentum. Petals linear, obtuse, occasionally slightly dilated above the middle, about 5 mm. long and 0.5 mm. wide. Lip attached to the foot of the column, oblong-spatulate to cuneate-flabellate, rounded or retuse at the apex, occasionally obscurely 3-lobed above, 5-6 mm. long, 2.5-4 mm. wide across the dilated apical portion; lamina with a small fleshy somewhat transverse callus at the base of the dilated portion. Column slender, semiterete, with a short foot, up to 5 mm. long. Capsule narrowly ovoid, 4-6 mm. long.

Alta Verapaz: Cerro de Agua Tortuga (Sahacoc), vicinity of Cubilgüitz, *Steyermark* 44617. Cubilgüitz, *Türkheim* 8307. Near the Finca Sepacuite, *Cook & Griggs* 840. Jocoló, *Johnson* 1066.—Izabal: Between Virginia and Lago Izabal, Montaña del Mico, *Steyermark* 33915. Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38528. Oneida-Chickasaw connection, *Lewis* 17. Along railroad, between Puerto Barrios and Milla 7, *Steyermark* 42055. Along Río Frio and tributaries, Cerro San Gil, *Steyermark* 41525.

Scaphyglottis cuneata var. **major** (C. Schweinf.) C. Schweinf. in Correll, *Lloydia* 10: 212. 1947. *S. Wercklei* Schltr. var. *major* C. Schweinf. Bot. Mus. Leafl. Harv. Univ. 4: 117. 1937.

Found in British Honduras and Guatemala, where it is epiphytic on tree trunks in forests at low elevations.

The variety *major* differs from the typical *S. cuneata* in being a stouter plant with the lower stem-members much longer (up to 17 cm. long), and with longer leaves (5.5-12 cm. long).

Alta Verapaz: Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, *Steyermark* 45632.—Izabal: Bay of Santo Tomás, between Escobas and Santo Tomás, *Steyermark* 39343.

Scaphyglottis hondurensis (Ames) L. O. Wms. *Ceiba* 1: 127. 1950. *Hexadesmia hondurensis* Ames, Bot. Mus. Leafl. Harv. Univ. 1: 1. t. 1933. Figure 117.

Epiphytic in open mountain forests and on trees in coffee plantations, up to 1,500 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant densely caespitose, up to 4.5 dm. tall. Stems erect, minutely pseudobulbous at the base, very slender and many-sheathed for about 6 cm. then ab-

ruptly thickened to form an elongate secondary pseudobulb that is 8–10 cm. long and about 5 mm. in diameter when dry, subtended by several imbricated truncate sheaths and bifoliate at the apex. Leaves linear, grass-like, 15–26 cm. long, about 3 mm. wide, narrowly obtuse and apiculate at the apex, obliquely erect. Raceme one or more, arising in the axils of the leaves, 4–8 cm. long, erect-spreading, with several imbricating scarious sheaths at the base, 7–10-flowered. Floral bracts about 5 mm. long, narrowly lanceolate, conduplicate, acute to acuminate. Flowers pale yellow with lavender striations on the lip, or dull lavender with a dull green or orange-brown infusion, with slender pedicellate ovaries that are 8–13 mm. long. Sepals 4.8–6 mm. long, about 3 mm. wide; dorsal sepal oblong-lanceolate, acute, closely appressed to the petals, 3-nerved to the tip; lateral sepals ovate-lanceolate, acute, strongly concave, connate at the base to form a conspicuous rounded mentum, lightly carinate along the mid-vein on the outer surface. Petals oblong, abruptly rounded at the tip, subacute, 5–6 mm. long, 2–3 mm. wide. Lip 7–9 mm. long, 5–6 mm. wide across the bilobed apex, obliquely ascending then sharply deflexed, subpandurate from a rounded base; apical lobes about 3 mm. long and wide, rounded, slightly divaricate, obscurely erose on the margin; disk with two obliquely placed basal calli from each of which a lightly raised keel extends nearly to the sinus formed by the terminal lobes, with a central keel between them and a short supplementary keel on each side. Column about half as long as the dorsal sepal, produced at the base into a conspicuous foot.

Zacapa: Oak-pine woods along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, Sierra de las Minas, *Steyermark* 42268.

Scaphyglottis Lindeniana (A. Rich. & Gal.) L. O. Wms. in Woodson & Schery, *Ann. Mo. Bot. Gard.* 28: 423. 1941. *Hexadesmia Lindeniana* A. Rich. & Gal. *Ann. Sci. Nat. sér. 3*, 3: 23. 1845. *H. fasciculata* Brongn. *Ann. Sci. Nat. sér. 2*, 17: 44. 1842, not *Scaphyglottis fasciculata* Hook. *H. rhodoglossa* Reichb. f. *Bonpl.* 4: 328. 1856. *H. pachybulbon* Schltr. *Repert. Sp. Nov. Beih.* 17: 26. 1922.

Epiphytic on trees in forest, up to 1,350 meters alt. Widespread from Mexico through Central America to Panama.

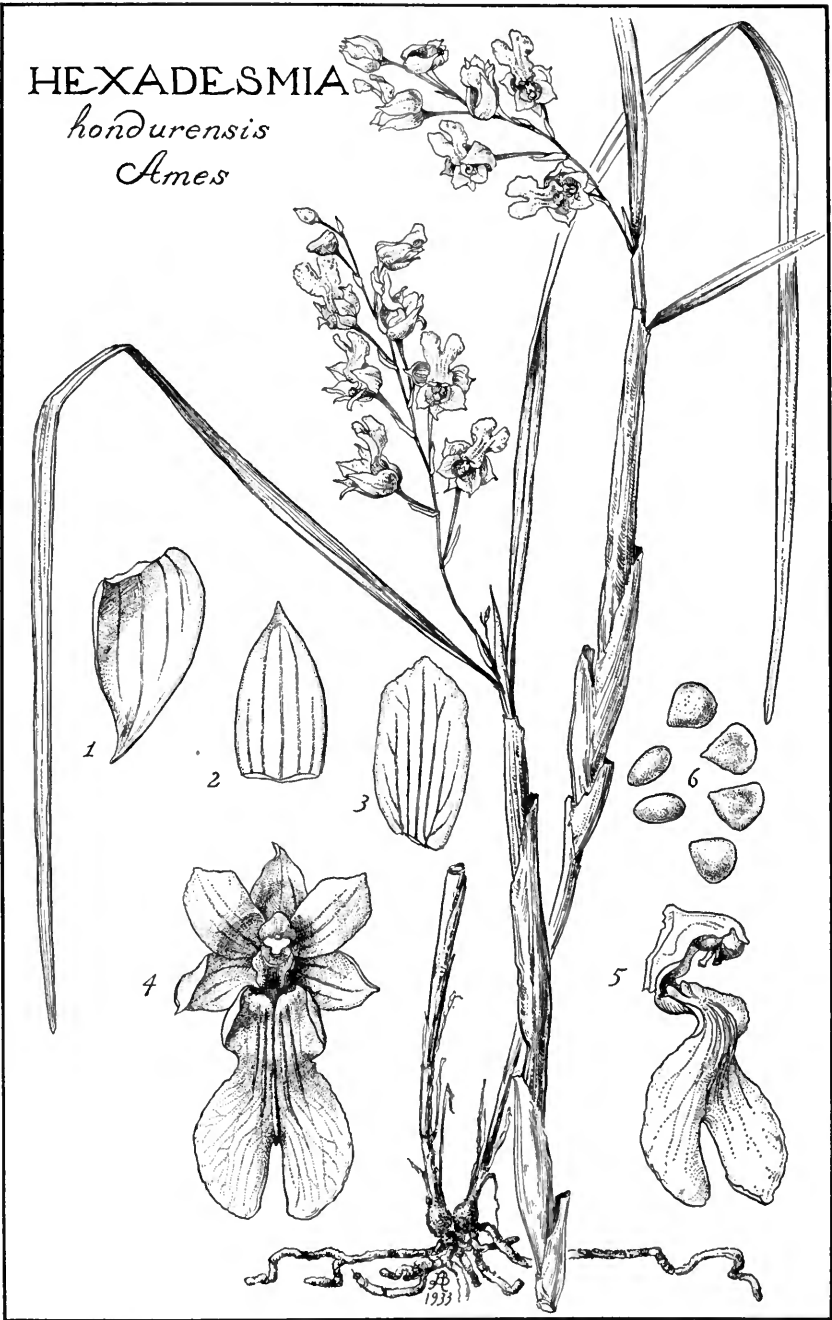
Plant usually large, stout, erect or ascending, 1.2–4.5 dm. tall. Stem slender at the base, more or less abruptly dilated above to form a somewhat fusiform compressed pseudobulb, bifoliate at the apex, 5–30 cm. long, up to 2.5 cm. wide at the widest point, nearly concealed when young by large membranaceous sheaths. Leaves obliquely ascending, linear-ligulate to broadly oblong-elliptic, obliquely retuse at the obtuse apex, coriaceous, 5.5–25 cm. long, 2–4.5 cm. wide. Peduncles terminal, up to 4 cm. long, fasciculate, 2–several-flowered, subtended by numerous small scarious sheaths. Floral bracts lanceolate, acuminate, conduplicate,

FIG. 117. *Scaphyglottis hondurensis* (*Hexadesmia hondurensis*). Plant ($\times 1$); 1, lateral sepal ($\times 5$); 2, dorsal sepal ($\times 5$); 3, petal ($\times 5$); 4, flower (about $\times 3$); 5, lip and column, side view (about $\times 3$); 6, pollinia (much enlarged). Drawn by Blanche Ames.

HEXADESMIA

hondurensis

Ames



glumaceous, about 8 mm. long. Flowers yellow-green or reddish green, usually with purplish veins or infusion, with slender pedicellate ovaries 1.3–2.2 cm. long that are blackish when dry. Sepals oblong-elliptic to oblong-lanceolate, subobtusate to acuminate at the usually triangular-thickened and recurved apex, concave, somewhat keeled on the back, 7–11 mm. long, 1.5–3.5 mm. wide near the middle; lateral sepals oblique, decurrent and conjoined at the base on the anterior margins to form a distinct mentum. Petals variable, linear-lanceolate to elliptic-obovate, acute to shortly acuminate, falcate, the margins somewhat crenulate, 6.5–10 mm. long, 1.5–3 mm. wide. Lip attached to the foot of the column, variable, arcuate-decurved in natural position, oval, elongate-pandurate or oblong-cuneate when spread out, abruptly acute or truncate and retuse with an apicule in the sinus at the apex, somewhat concave below the middle, with the disk nervose, minutely denticulate-erose on the margins, 7–11 mm. long, 3–6 mm. wide at the widest point. Column slender, gradually dilated upward, with an inconspicuous wing on each side and a prominent posterior tooth, 5.5–8 mm. long. Capsule obliquely ellipsoid, 1.5–2 cm. long.

This species is extremely variable in the size and shape of the floral segments. The length and shape of the long-stipitate pseudobulb are also variable characters.

Quezaltenango: *Hartweg* (fide Hemsley).—Suchitepequez: Guatemala, Finca Mocá, *Hatch* 500.

Scaphyglottis livida (Lindl.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 457. 1918. *Isochilus lividus* Lindl. Bot. Reg. 25: Misc. p. 36. 1839.

Epiphytic on trees in virgin forests or in coffee plantations, also on fence posts, up to 2,000 meters alt. Rather common in Mexico, Guatemala and Honduras.

Plant erect or ascending, caespitose, densely fasciculate-branched, broom-like in appearance, 10–35 cm. tall, usually producing roots at the nodes. Stems narrowly fusiform-cylindrical, pseudobulbous, superposed one above the other, often producing several stems in a fascicle at the apex; pseudobulbs stipitate, longitudinally sulcate, bifoliate, up to 12 cm. long and 5 mm. in diameter, subtended at the base by several long scarious imbricated sheaths. Leaves rigidly erect or erect-spreading, linear, obliquely bilobulate at the apex, deeply grooved, firmly membranaceous, 5.5–20 cm. long, 2–4.5 mm. wide. Flowers pale yellow-green, purplish pink or green with purplish stripes, solitary or several in a fascicle, with pedicellate ovaries that are about 7 mm. long, each flower subtended by several short light brown scarious imbricated bracts. Dorsal sepal oblong-elliptic, subobtusate to acute, concave, 3.5–4.5 mm. long, 1.8–2.2 mm. wide. Lateral sepals very obliquely triangular-ovate, obtuse to acute, concave, 2.5–3.5 mm. long, 1.5–2 mm. wide, the lateral margins decurrent and conjoined at the base to form an inconspicuous mentum. Petals linear, recurved at the apiculate-acute apex, oblique, the margins entire or somewhat undulate, 3–4 mm. long, 0.8–1.3 mm. wide. Lip attached to the column-foot, arcuate in natural position, broadly subquadrate to ovate-quadrate, emarginate at the truncate apex, with or without an apicule in the sinus, cordate at the base, with a small mammillate callus on the

somewhat uplifted basal auricles, canaliculate, 2-3 mm. long, 2-2.8 mm. wide at the base. Column short, thick, with a short foot, about 1.2 mm. long, with a minute tooth on each anterior margin at the apex. Capsule obliquely cylindrical-ellipsoidal, ridged, about 8 mm. long.

Alta Verapaz: Vicinity of caves, southwest of Lanquín, *Steyermark* 44139; 44037.—Baja Verapaz: Sierra de las Minas, *Kellerman* 7863.—Huehuetenango: Between Ixcán and Río Ixcán, Sierra de los Cuchumatanes, *Steyermark* 49291.—Izabal: Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38643.—Petén: La Libertad, *Lundell* 2231.—Zacapa: Sierra de las Minas, along Rillito del Volcán de Monos, Volcán de Monos, *Steyermark* 42333.

Scaphyglottis longicaulis S. Wats. Proc. Am. Acad. 23: 286. 1888 (type: Guatemala, from the Chacon forests, eastern portion of Vera Paz and Chiquimula, 1885, *S. Watson*). *Scaphyglottis unguiculata* Schltr. Repert. Sp. Nov. 12: 206. 1913. Figure 116.

Epiphytic on trees in dense forests, up to 900 meters alt. Widespread but not common from Guatemala and Honduras through Central America to Panama and Colombia.

Plant slender, ascending, densely caespitose, occasionally fasciculate-branched, 9-30 cm. tall. Stem slender or slightly pseudobulbous-thickened above the slender base, terete, sometimes superposed one above the other, each section or pseudobulb 2-3-leaved and subtended by several long scarios sheaths, up to 15 cm. long and 2-3 mm. in diameter. Leaves erect-spreading, linear, grass-like, very obliquely bilobulate at the apex, 5-18 cm. long, 2-4.5 mm. wide, firmly membranaceous. Flowers small, white, purplish or white with lavender spots or suffusion, one or several in a fascicle at the apex of the stem and nodes, with filiform pedicellate ovaries that are 7-10 mm. long. Floral bracts lanceolate, acuminate, about 2.5 mm. long. Sepals linear-oblong to oblong-elliptic, canaliculate, somewhat broadened above the middle, acute to apiculate, 6-7 mm. long, 1.5-2 mm. wide; lateral sepals oblique, obliquely acute or apiculate at the apex, the lateral margins decurrent at the base to form a rather prominent obtuse mentum. Petals linear-oblong, obtuse to apiculate, falcate, 5.5-6 mm. long, about 1 mm. wide. Lip attached to the foot of the column, oblong-cuneate, trilobulate at the abruptly dilated apex, 6-6.5 mm. long, 2.7-4 mm. wide across the apical portion; lateral lobules obliquely obtuse, incurved over the column; mid-lobe triangular, acute. Column slender, slightly dilated above the middle, with a distinct foot, 4.5-6 mm. long. Capsule ovoid, about 7 mm. long.

This species is closely allied to *S. Behrii*. However, *S. Behrii* is usually a much stouter plant. The lips of the flowers of the two species are also quite dissimilar.

Izabal: La Vigia, between Bananera and Quiriguá, *Margaret Ward Lewis* 169.

Scaphyglottis micrantha (Lindl.) Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 10: 85. 1942. *Hexadesmia micrantha* Lindl. Bot. Reg. 30: Misc. p. 2. 1844 (type: Guatemala, no. 389 of Messrs. Loddiges' Catalogue).

Epiphytic on trees in forests, up to 1,200 meters alt. Rare in Guatemala and Honduras, widespread in Costa Rica.

Plant small, erect-ascending, densely caespitose, 5–16 cm. tall. Stem pseudobulbous, stipitate, curved, unbranched, bifoliate at the apex, 1.5–6 cm. long, 4–6 mm. in diameter, subtended by several scarios imbricated fugaceous sheaths. Leaves suberect, linear, firmly membranaceous, obliquely retuse at the apex, 4–11 cm. long, 4–6 mm. wide. Racemes 1–2 at the apex of the pseudobulbs, 3–11 cm. long including the peduncle, few- to many-flowered; peduncle filiform, provided with several spreading scarios sheaths, subtended by several similar sheaths. Floral bracts ash-colored, linear-lanceolate, acuminate, scarios, 4–7 mm. long. Flowers whitish or violet-green, with filiform pedicellate ovaries that are 5–7 mm. long. Sepals ovate-oblong to elliptic, apiculate, concave-cymbiform, 1-nerved, 2–2.1 mm. long, 1–1.3 mm. wide; lateral sepals oblique, conjoined at the anterior base to form an inconspicuous mentum. Petals obliquely elliptic or oblong-elliptic, rounded and apiculate at the apex, thin, the margins minutely crenulate, 1- to 3-nerved, 2–2.2 mm. long, about 1.1 mm. wide. Lip attached to the foot of the column, distinctly 3-lobed, flabellate in outline when spread out, about 2 mm. long and 2.5 mm. wide when spread out, 5-nerved; lateral lobes obliquely subquadrate, broadly rounded at the apex, involute in natural position to enclose the column; mid-lobe semiorbicular to obliquely subquadrate, apiculate at the apex, the margins minutely crenulate. Column slender-clavellate, arcuate, with a short foot, about 1.5 mm. long. Capsule narrowly ellipsoid, 3–5 mm. long.

“Guatemala,” *Johnston* 1652.

Scaphyglottis minutiflora Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 10, no. 4: 83. pl. 9. 1942 (type: Guatemala, Dept. Izabal, La Vigia, between Bananera and Quiriguá, Sept. 15, 1936, *Margaret Ward Lewis* 186). Figure 118.

Epiphytic on trees along streams and on ridges, up to 1,000 meters alt. Uncommon in British Honduras, Guatemala and Panama.

Plant fasciculate, straggly, frequently branching, with adventitious roots at the nodes, 2.5–7.5 dm. tall. Stem terete, slender-fusiform, constricted at the nodes, the individual internodes enveloped at the base by several scarios tubular imbricated sheaths; lowermost internode up to 26 cm. long and 5 mm. in diameter. Leaves produced in pairs at the nodes, erect to erect-spreading, articulate with the leaf-sheaths, linear to linear-lanceolate, obliquely bidentate at the acuminate apex, firmly membranaceous, 5–18 cm. long, 3–10 mm. wide. Inflorescences glomerate, produced at the nodes, composed of several or numerous almost sessile flowers that appear successively from between dry fibrous bracts that form tufts around the flowers. Flowers minute, with pedicellate ovaries that are 3–4

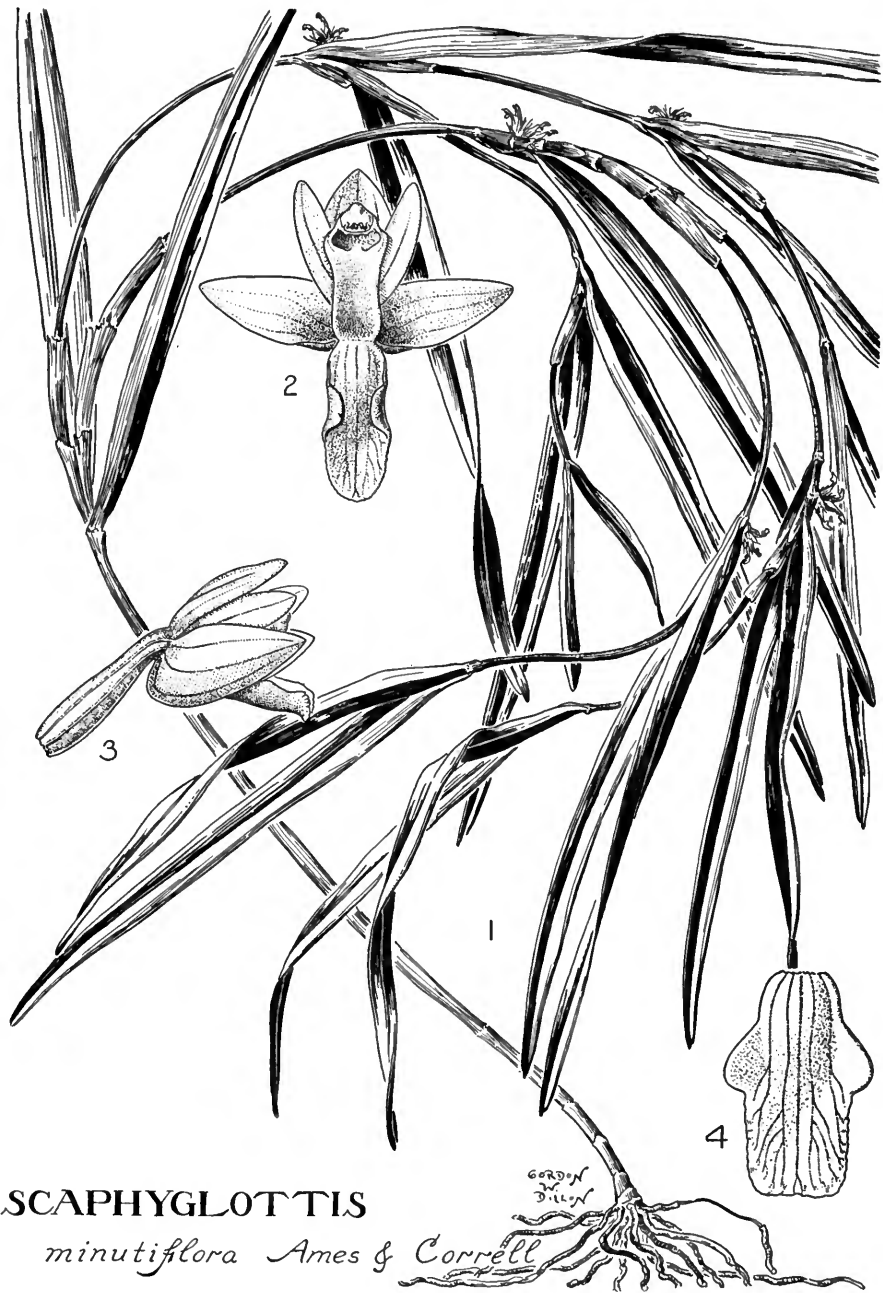


FIG. 118. *Scaphyglottis minutiflora*. 1, plant ($\times \frac{1}{2}$); 2, flower, spread open ($\times 7\frac{1}{2}$); 3, flower, side view ($\times 7\frac{1}{2}$); 4, lip, spread out ($\times 10$). Drawn by G. W. Dillon.

mm. long, white or greenish white marked with maroon or deep violet. Sepals ovate-elliptic, subobtusate to acute, 3-nerved, concave, 2.2-3 mm. long, 1.2-1.5 mm. wide; lateral sepals slightly oblique and conjoined below the column-foot to form a small mentum. Petals slightly oblique, linear-oblong, obtuse, 1-nerved, 2-2.5 mm. long, about 0.7 mm. wide. Lip subarticulate with the column-foot, elliptic to oblong-subquadrate in outline, lightly 3-lobed, 5-nerved, truncate to lightly retuse at the apex when spread out, with two deep violet or maroon blotches on each side near the apex, 3-3.5 mm. long, 1.7-2 mm. wide across the lateral lobes when spread out; lateral lobes small, rounded, arising about the middle of the lip, erect in natural position; mid-lobe quadrate when spread out, with crenulate margins upcurved in natural position. Column 2-2.5 mm. long. Capsule obliquely ovoid, 5-6 mm. long.

Scaphyglottis minutiflora is most closely allied to *S. Behrii*. However, it differs from that species not only in its smaller flowers and broader leaves but also in the shape of the lip. The lip of *S. minutiflora* is elliptic or oblong-subquadrate in outline and has a broad base. The lateral lobes are also produced at about the middle of the lip. The lip of *S. Behrii* is spatulate or obovate in outline and is narrowed at the base. The lateral lobes are also produced above the middle or near the apex of the lip. The flowers of both species are produced in fascicles at the nodes. However, the flowers and capsules of *S. minutiflora*, which are essentially sessile, are borne in glomerules and are surrounded by tufts of fibrous bracts, whereas the flowers and capsules of *S. Behrii* are distinctly pedicellate and are subtended by solitary bracts.

Izabal: Between Bananera and "La Presa" in Montaña del Mico, *Steyermark* 38248. Cerro San Gil, along Río Frío, *Steyermark* 41645.

OBSURE SPECIES

Hexadesmia lurida Batem. mss. Hemsley (in Godm. & Salv. Biol. Centr.-Am. 3: 220. 1882-86) cites this from Bateman as from Guatemala or Mexico. However, as it is only a manuscript name it has no taxonomic standing. It is impossible to say what species Bateman had in mind.

37. PONERA Lindl.

Epiphytic or rock-inhabiting plants with creeping rhizomes. Stems leafy on the upper part, slender or robust, terete, reedlike, never pseudobulbous, simple or rarely branching. Leaves six or more, alternate, distichous, linear or narrowly lanceolate. Inflorescence or inflorescences composed of short or sessile 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 column to form a mentum under the lip. Petals longer than or about equal to the dorsal sepal, somewhat narrower than the sepals, more or less decurrent on the column. Lip subarticulated to the apex of the column foot; claw incumbent; lamina arcuate-recurved and spreading, nearly entire to deeply emarginate at the apex. Column short, stout, wingless, produced into a foot at the base; anther terminal, operculate, incumbent; pollinia 4, equal, waxy, laterally compressed. Capsule ovoid or ellipsoid.

The six species comprising this small genus are found only in Central America and northern South America.

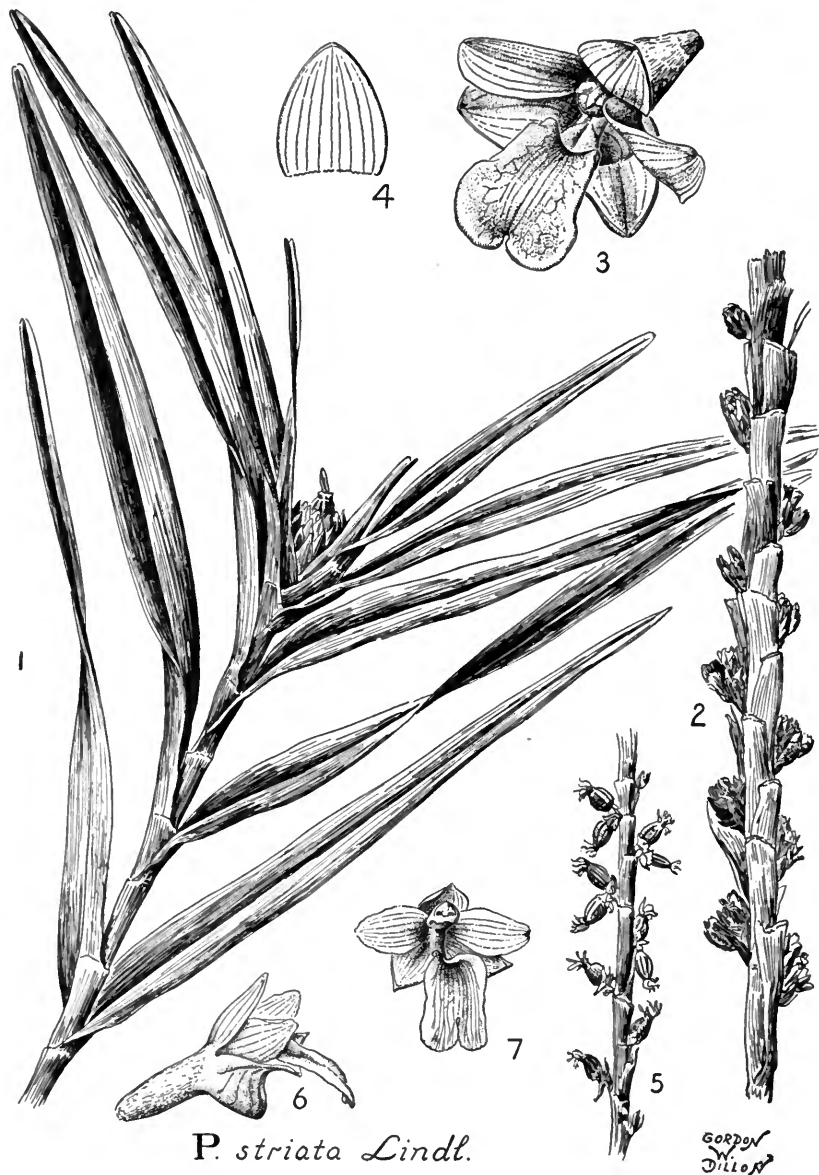
1. Flowers borne in glomerules, subtended by numerous bracts. . . . *P. glomerata*.
1. Flowers not borne in glomerules, fasciculate.
 2. Lip rhombic-ligulate, tapering to a narrow retuse apex. . . . *P. macroglossa*.
 2. Lip cuneate-oblong, broadest at the apex and deeply emarginate. *P. striata*.

Ponera glomerata Correll, Bot. Mus. Leaf. Harv. Univ. 9, no. 8: 132. pl. 1. 1941. Figure 119.

Epiphytic on trees in oak or pine forests, sometimes terrestrial, up to 2,700 meters alt. Rare in Mexico and Guatemala.

Plant caespitose, stout, coarse, up to 1.5 meters tall, with numerous coarse fibrous roots that are densely tomentose. Stem robust, reedlike, 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 projecting 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 fibers. Flowers small, with short stout ovaries that 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.

PONERA glomerata Correll



P. striata Lindl.

FIG. 119. *Ponera glomerata*. 1, terminal portion of plant ($\times \frac{1}{2}$); 2, defoliated section of stem showing inflorescences ($\times \frac{1}{2}$); 3, flower, front view, partly spread open ($\times 2\frac{1}{2}$); 4, dorsal sepal ($\times 2\frac{1}{2}$). *P. striata*. 5, defoliated section of stem showing inflorescences ($\times \frac{1}{2}$); 6, flower, side view ($\times 2\frac{1}{2}$); 7, flower, front view, partly spread open ($\times 2\frac{1}{2}$). Drawn by G. W. Dillon.

The 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 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*.

Chimaltenango: Cerro de Tecpam, region of Santa Elena, *Standley* 60925.—Quezaltenango: Volcan Santa María, between Santa María de Jesús, Los Mojadas, and summit of volcano, *Steiermark* 33962.—Sacatepéquez: Origin near San Juan, *Lewis* 85.

Ponera macroglossa Reichb. f. Bot. Zeit. 10: 639. 1852 (type: Guatemala, *Houtte*). *Scaphyglottis macroglossa* (Reichb. f.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 457. 1918.

No specimens have been seen of this species.

Original description (liberal translation): flowers fasciculate; the dorsal sepal oblong; the lateral sepals triangular, forming an almost right-angled mentum; the petals unguiculate, obtusely angled on each side, obtuse; lip longer than the other segments, from an unguiculate base, obtusely angled on each side, strongly attenuate toward the apex, bilobed, one lobe overlapping the other; near *P. striata* but differing from that species in the form of the lip.

When the type of *P. macroglossa* is examined it may prove to be a variety of *P. striata* or conspecific with that species. However, for the time being, we are recognizing *P. macroglossa*, with some doubt as to its true status. It has been collected only in Guatemala.

Ponera striata Lindl. Bot. Reg. 28: Misc. pp. 18–19. 1843 (type: Guatemala, *Skinner*). Figure 119.

Epiphytic on trees on open hills and in dense tropical forests, up to 3,000 meters alt. Widespread and rather common in Mexico, Guatemala, British Honduras, Honduras, El Salvador, Costa Rica, Venezuela and Brazil.

Plant pendent or descending, caespitose, rather coarse, 3–8 dm. tall. Stem slender, reedlike, leafy above, concealed by the close-fitting leaf-sheaths, 2–4 mm. in diameter, sometimes branching and producing roots at the nodes when injured or covered by debris; leaf-sheaths brownish, verrucose, fugaceous with age. Leaves distichous, erect-spreading, narrowly linear-lanceolate, tapering to the obliquely bidentate apex, firmly chartaceous or subcoriaceous, 6.5–20 cm. long, 4–9 mm. wide near the base. Flowers sessile or essentially so, solitary or 2–4-fasciculate, terminal or produced opposite the leaf axils at the nodes along the defoliated stem, subtended by several conspicuous close-fitting bracts. Floral bracts tan, fibrous-membranaceous, usually with hyaline margins and verru-

culose above the middle on the outer surface, suborbicular-ovate to oblong, 2-5 mm. long. Sepals and petals light green with lavender or light reddish brown stripes; dorsal sepal broadly ovate to oblong-elliptic, obtuse to acute and somewhat thickened at the apex, concave, 5-7 mm. long, 2-4 mm. wide; lateral sepals obliquely triangular, acute and somewhat dorsally keeled and recurved at the apex, 6-8 mm. long, 4-6 mm. wide across the broad base, decurrent on and adnate to the elongated column-foot to form a prominent mentum. Petals broadly oval to elliptic-oblong, rounded to subobtuse at the apex, narrowed below the middle, with entire or slightly erose margins, slightly oblique, 3-5-nerved, 5-7 mm. long, 2-4 mm. wide. Lip white with several lavender stripes, subarticulated to the column-foot, arcuate-recurved in natural position with the margins of the lower third fleshy and incurved to form a channel, the upper half thin, often with a small transverse fleshy cushion in the middle about one fourth the distance from the base, minutely ciliolate below the middle, when expanded oblong-cuneate and deeply emarginate at the rounded apex, occasionally somewhat pandurate, 6.5-10 mm. long, 3-5.5 mm. wide near the apex. Column stout, with a blunt apical tooth curved over the anther, up to 5 mm. long; column-foot 3.5-4 mm. long. Capsule obliquely ovoid, deeply several-grooved, 1 cm. long.

The flowers of *Ponera striata* are variable in size and are thin-textured in contrast to the usually fleshy flowers found in other species in the genus. The typically fasciculate, sessile flowers on the defoliated stem subtended by several conspicuous bracts immediately distinguish this species from all others in the genus *Ponera*.

Chimaltenango: San Martín Jilotepeque, *Johnston* 1416.—El Progreso: Sierra de las Minas, hills north of Finca Piamonte, between Finca Piamonte and summit of Volcán Santa Luisa, *Steyermark* 43517.—Guatemala: Near Guatemala City, purchased from Indian, *Lewis* 71.—Petén: Uaxactun, *Bartlett* 12277.—San Marcos: Finca El Porvenir, along Río Cabús above Potrero Matasán, Volcán Tajumulco, *Steyermark* 37607.—Zacapa: Along Río Lima, Sierra de las Minas, between Río Hondo and summit of mountain at Finca Alejandría, *Steyermark* 29609.

EXCLUDED SPECIES

Ponera inconspicua Lod. ex Baxt. Loud. Hort. Brit. ed. 3: 616. 1839 (supplement), *nomen nudum*. Attributed to Guatemala.

38. JACQUINIELLA Schltr.

Small epiphytic caespitose plants from a short rhizome. Stem slender, straight or fractiflex, leafy throughout. Leaves small, fleshy, distichous, linear. Inflorescence a solitary flower or fascicle of flowers at the apex of the stem. Sepals free or shortly united at the base, subequal, fleshy. Petals similar to the sepals but smaller. Lip free, connivent with the other floral segments, with a short claw, sometimes geniculate and constricted below the middle, the upper part oblong,

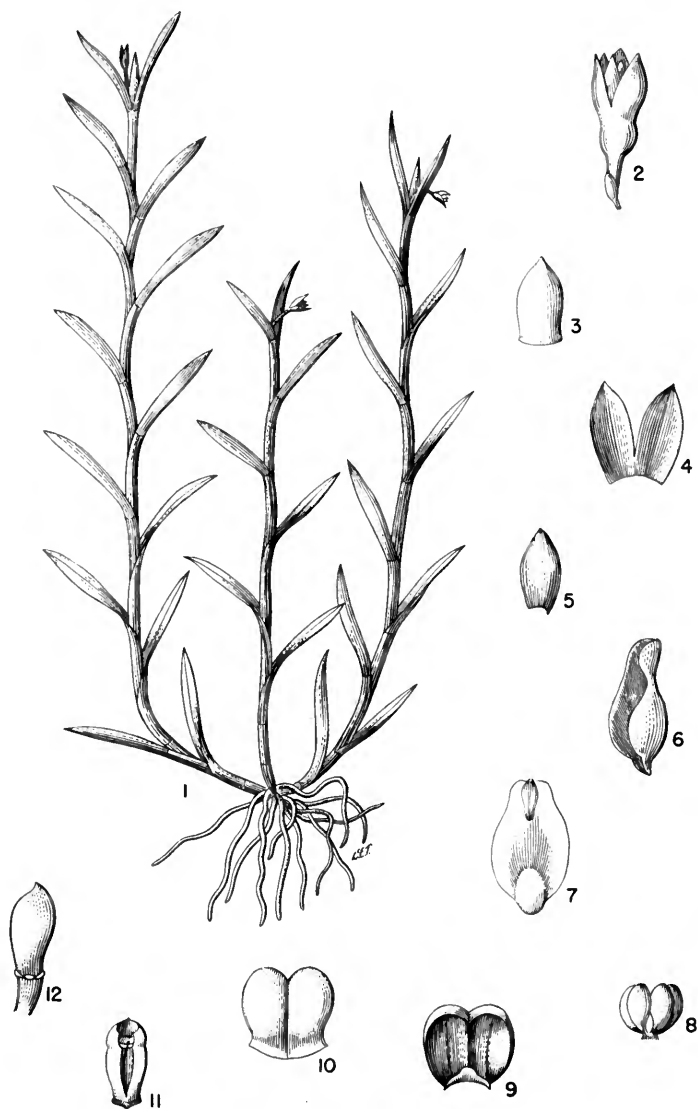


FIG. 120. *Jacquiniella globosa*. 1, plant (about $\times \frac{2}{3}$); 2, flower, side view ($\times 5$); 3, dorsal sepal ($\times 4$); 4, lateral sepals ($\times 4$); 5, petal ($\times 4$); 6, lip, side view ($\times 6$); 7, lip, spread out ($\times 6$); 8, pollinia (much enlarged); 9, anther, ventral view (much enlarged); 10, anther, dorsal view (much enlarged); 11, column, ventral view ($\times 8$); 12, column, side view ($\times 8$). Drawn by D. E. Tibbitts. Adapted in part from Martius, *Flora Brasiliensis* 3, pt. 5: pl. 9. 1898–1902.

suborbicular or subrhombic and concave, simple or 3-lobed at the apex. Column short, nearly terete, free from the lip, somewhat dilated above, with a short inconspicuous foot; pollinia 4, waxy, laterally compressed. Capsule ovoid-globose.

This small genus of the American tropics is extremely close to *Isochilus* and may eventually be included in that genus.

Jacquiiniella globosa (Jacq.) Schltr. Repert. Sp. Nov. Beih. 7: 124. 1920. *Epidendrum globosum* Jacq. Sel. Stirp. Am. 222. t. 133, f. 1. 1763. Figure 120.

Epiphytic on trees, usually at low elevations, up to 900 meters alt. Widespread but not common from Mexico(?) through Central America to Panama, the West Indies and northern South America.

Plant small, densely caespitose, rigidly erect or ascending, 2-15 cm. tall. Stem leafy throughout, slender, occasionally fractiflex, concealed by closely appressed leaf-sheaths. Leaves distichous, articulate to the leaf-sheaths, linear, obliquely obtuse to acute, fleshy-coriaceous, somewhat triangular in cross-section, usually marked with purple, 1-2.5 cm. long, 2-3 mm. wide; leaf-sheaths prominently ribbed, tinged with purple. Flowers solitary or in a fascicle at the apex of the stem, deflexed, yellowish with the sepals often tipped with red or dull rose, on slender pedicels about 2 mm. long, the pedicels enveloped at the base by several short closely imbricated bracts. Floral bracts amplexicaul, infundibuliform, obliquely subtruncate and apiculate at the apex, with a light keel extending to the apicule, about 1.3 mm. long. Sepals elliptic, fleshy-thickened at the subacute apex, concave, 3-nerved, 2-2.5 mm. long, 1.2-1.3 mm. wide; lateral sepals united at the base and conforming with the lower part of the lip to form a goitre-like sac. Petals elliptic, acute, slightly narrowed below the middle, 1-nerved, 2-2.3 mm. long, about 1 mm. wide. Lip abruptly geniculate and constricted just below the middle, 2.5-3.2 mm. long, 1-1.5 mm. wide above the middle, 3-nerved, orbicular-saccate below the constriction, suborbicular-rhombic above the constriction, acute-apiculate and fleshy-thickened at the apex. Column terete, slightly dilated above, about 1.3 mm. long. Capsule obliquely globose-ovoid, prominently 6-ribbed, 5-6 mm. long.

This species is vegetatively similar to *J. leucomelana* (Reichb. f.) Schltr., a Mexican species. It differs from that species mainly in that the lip is geniculate below the middle instead of being straight, and in the shape of the apical portion of the lip.

Izabal: Los Andes District, Entre Ríos, *Lewis* 34.—Petén: La Libertad, *Lundell* 2236; 2256.

39. ISOCHILUS R. Br.

Caespitose or repent epiphytic, terrestrial or rock-inhabiting plants with slender stems and numerous distichous leaves, the rhizomes concealed by dark brown warty sheaths. Leaves strictly erect to spreading, articulate with the leaf-sheath, linear, lanceolate or oblong, more or less retuse at the apex, rigidly mem-

branaceous to subcoriaceous. Inflorescence a terminal, densely or loosely flowered unilateral or distichous raceme of one to many flowers, often scorpioid. Floral bracts short or elongate, suborbicular to oblong, paleaceous. Flowers small, variously colored from nearly white to deep rose-purple, with short pedicellate ovaries, often partly concealed by the subtending bracts or upper leaves. Sepals subequal, erect or recurved, concave, varying from free to coherent almost to the apex, gibbous at the base under the lip, more or less dorsally carinate along the mid-nerve or occasionally broadly winged on the back (especially the lateral ones), the free part elliptic to lanceolate and obtuse to subacuminate. Petals with a slender claw, a little shorter and broader than the sepals, ecarinate, oblique, oblong-lanceolate, elliptic or obovate. Lip with a short claw, subequal to the petals but narrower, adnate to the base of the column or the short column-foot, linear to linear-oblancoelate, obtuse to acute, commonly sigmoid-flexuose below or slightly above the middle or both, sometimes constricted near the middle, variously marked on the claw and at about the middle of the lamina. Column erect, semiterete, wingless, toothed at the apex, apparently footless or produced at the base into a short inconspicuous foot; anther terminal, operculate, incumbent, 2-celled; pollinia 4, waxy, ovoid-oblong, elongate and laterally compressed. Capsule small, ellipsoid or ovoid.

This is a small genus consisting of two species and four varieties. As in the case with many other species included in the Ponereae, the segregates of *Isochilus* are on the whole more readily distinguished from one another on vegetative than on floral characters. The flowers of the various segregates have no constant characters whereby they may be readily distinguished. They may consist of a graduated series from large to small, and the freedom or coherence of the sepals may vary considerably even among flowers in the same raceme.

According to Steyermark, plants of *Isochilus* are used in Guatemala in the treatment of colic, dysentery, and other intestinal disorders. The species are commonly known as "calaqual," "sanguinaria," "nido de Pajaro," and "cresta de Gallo."

1. Flowers in a loose distichous or occasionally unilateral raceme, one or only a few; leaf-sheaths more or less verrucose.
 2. Leaves narrowly linear, strict or somewhat erect-spreading. *I. linearis*.
 2. Leaves oblong to linear-lanceolate, short, erect-spreading.
 - I. linearis* var. *carnosiflorus*.
1. Flowers in a dense compact unilateral scorpioid raceme, usually numerous; leaf-sheaths characteristically smooth and green-spotted or vernicose, occasionally verrucose.
 3. Leaf-sheaths commonly smooth; leaves narrow.
 4. Leaves linear-lanceolate, somewhat spreading or occasionally strict.
 - I. major*.
 4. Leaves linear, strict, often closely appressed to the stem.
 - I. major* var. *Amparoanus*.
 3. Leaf-sheaths densely brownish verrucose; leaves oblong-ligulate to oblong-lanceolate, erect-spreading. *I. major* var. *alatus*.

Isochilus linearis (Jacq.) R. Br. in Ait. Hort. Kew. ed. 2, 5: 209. 1813. *Epidendrum lineare* Jacq. Sel. Stirp. Am. 221. t. 131, fig. 1. 1763.

This is the most common and widespread *Isochilus*. It is found from near sea level up to 3,900 meters altitude in cloud forests in Mexico, throughout Central America and the West Indies, and in the northern half of South America. It occurs as terrestrial, on rocks and logs, or on various species of trees, mainly in pine-oak forests.

The generic description covers this species very well. However, the following notes may be added:

Plant up to 6 dm. or more tall, subcaespitose to repent. Stem slender, leafy, about 1 mm. in diameter, concealed by verrucose leaf-sheaths. Leaves narrowly linear, obliquely retuse at the obtuse apex, strict or somewhat erect-spreading, up to 6.5 cm. long, usually about 2.5 mm. wide, sometimes more or less wide. Flowers one to several, up to 8 mm. long, arranged in a loose distichous or sometimes unilateral raceme.

Isochilus linearis is related to its var. *unilateralis* (Robins.) Correll, a Mexican plant, in the linear leaves and verrucose leaf-sheaths. It is related to its var. *carosiflorus* through the verrucose leaf-sheaths and the type of flowers, which are commonly arranged in a loose distichous raceme. The flowers are variously colored. Collectors' notes give the color as "white," "orange-yellow," "brick-red," "orange," "rose-purple with two dark stains on the lip," "vermillion-orange," "red-violet," "purple," "flame scarlet," "bright red," "cerise pink," "violet" and "lilac."

Amatitlán: Volcán Pacaya, *Shannon* 3671.—Chimaltenango: Above Las Calderas, *Standley* 60075. Cerro de Tecpam, region of Santa Elena, *Standley* 60924. Chichavac, *Skutch* 505. Volcán Acatenango, *Hunnewell* 17117.—El Progreso: Sierra de las Minas, trail between Finca Piamonte east to Finca San Miguel, passing Finca Polonia, Finca Delicias, and Caldea Cimiento, *Steyermark* 43740. Sierra de las Minas, hills north of Finca Piamonte, between Finca Piamonte and summit of Volcán Santa Luisa, *Steyermark* 43549. Sierra de las Minas, between Calera and summit of Volcán Siglo, *Steyermark* 43060.—Guatemala: Calderas, *Porter* 1. Volcán de Pacaya, above Las Calderas, *Standley* 58440. Pacaya, *Johnston* 1313; 1379. Road to Mataquesuintla, *Lewis* 115. Slopes of Volcán de Pacaya, between San Francisco Sales and the base of the active cone, *Standley* 80741; 80781. Active cone of Volcán de Pacaya, *Standley* 80559; 80579.—Huehuetenango: Soloma, *Skutch* 1041.

Above San Juan Ixcoy, Sierra de los Cuchumatanes, *Steyermark* 50023. Cerro Pixpíx, above San Ildefonso Ixtahuacán, *Steyermark* 50583. Cerro Cananá, between Nucapuxlac and Cananá, Sierra de los Cuchumatanes, *Steyermark* 49014.—Jalapa: Montaña Miramundo, near Miramundo, *Steyermark* 32829. Between Miramundo and summit of Montaña Miramundo, between Jalapa and Mataquesuintla, 6 miles south of Miramundo, *Steyermark* 32772.—Quezaltenango: Near Quezaltenango, *Skutch* 797 (in part).—San Marcos: Upper south-facing forested slopes of Volcán Tajumulco, between Las Canoas and top of ridge, 7 miles from San Sebastián, *Steyermark* 35809. Along Quebrada Canjulá, between Sibinal and Canjulá, Volcán Tacaná, *Steyermark* 36048.—Sololá: Volcán Santa Clara, south-facing slopes to summit, *Steyermark* 46884. Volcán Atitlán, south-facing slopes, *Steyermark* 47419.—Zacapa: Sierra de las Minas, middle and upper south-facing slopes of Volcán Gemelos, *Steyermark* 43286.

Isochilus linearis* var. *carosiflorus (Lindl.) Correll, Bot. Mus. Leaf. Harv. Univ. 10, no. 1: 7. 1941. *Isochilus carosiflorus* Lindl. in Paxt. Mag. Bot. 11: 213. 1844; 12: 263. 1845.

This variety is found from near sea level up to 2,800 meters altitude, in Mexico, British Honduras, Guatemala, Honduras and Costa Rica. It occurs usually in dense shade and is commonly found on mangroves at sea level, on coco plum, in mixed oak-pine forests or on rocks.

Isochilus linearis var. *carosiflorus* is related to *I. major* var. *alatus* in the shape and arrangement of the leaves and in the verrucose leaf-sheaths. Except for the difference in the type of inflorescence, some of the forms of this variety approach var. *alatus* very closely. It is allied to var. *unilateralis* in the rather large flowers and in the type of inflorescence in some of the plants. The differences in the leaves, however, immediately distinguish these two varieties.

According to collectors' notes, the flowers are "magenta and wax-like," "dark rose and wax-like," "purplish pink with two dark stains on the lip," "red-purple," "rose-purple," "purple," "pink," "bright magenta" and "mallow-purple." It would seem that the flowers are quite fleshy in this variety since they are characterized by some collectors as "wax-like."

Alta Verapaz: Near Samac, *Johnson* 295. Jocoló, Río Jocoló, *Johnson* 1067.—Izabal: Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38614.—San Marcos: 6 miles south and west of town of Tajumulco, slopes of Volcán Tajumulco, *Steyermark* 36697a.—Suchitepequez: Slopes of Volcán Zunil, in vicinity of Finca Montecristo, southeast of Santa María de Jesús,

Steyermark 35250. Volcán Santa Clara, between Finca El Naranjo and upper slopes, *Steyermark* 46603.

Isochilus major Cham. & Schlecht. *Linnaea* 6: 60. 1831. Figure 121.

Isochilus major is found on the mainland from southern Mexico to Panama. It is represented in Jamaica by two collections. It occurs as a terrestrial or epiphyte from about 600 to 2,000 meters altitude in open or cloud forests, and is often found growing in large clumps on rocks.

The generic description covers this species very well. However, the following notes may be added:

Plant caespitose to shortly repent, up to 7.5 dm. or more tall. Stem slender, leafy, about 2 mm. in diameter, somewhat compressed, concealed by smooth leaf-sheaths. Leaves linear-lanceolate, obliquely retuse at the obtuse apex, somewhat spreading or occasionally strict, up to 9 cm. long, usually about 5 mm. wide, sometimes more or less wide. Flowers up to 12 mm. long, several to many in a dense compact unilateral scorpioid raceme.

This species typifies the second line of development found in *Isochilus*. The comparatively large unilateral raceme and the lanceolate leaves distinguish it at once from *I. linearis* and its varieties. The upper leaves, which commonly half conceal the inflorescence, are nearly always tinged the color of the flowers. The flowers, according to collectors' notes, are "rose-colored," "lavender," "white, stained magenta-purple on the lip," "white with pink hue," "pink" and "pink, at lip-base two darker stains." •

Jutiapa: Volcán Suchitán, northwest of Ascunción Mita, *Steyermark* 31893 (atypical).—Quiché: José Ignacio Aguilar 1293.—Zacapa: Sierra de las Minas, San Lorenzo, *Steyermark* 43176.

Isochilus major Cham. & Schlecht. var. ***alatus*** (Schltr.) Correll, Bot. Mus. Leaflet. Harv. Univ. 10, no. 1: 11. 1941. *Isochilus alatus* Schltr. Repert. Sp. Nov. 10: 360. 1912 (type: Guatemala, Dept. Alta Verapaz, epiphyte in woods, Cobán, July, 1907, *Türckheim* II 1831).

Variety *alatus* is found only in Guatemala, where it is rare. It occurs up to 3,800 meters altitude and is found on trees in damp mixed forests. The flowers are said to be "orchid-colored."

Isochilus major var. *alatus* and *I. major* are similar in their leaf-size and type of inflorescence, both of which are larger than those of var. *Amparoanus*. They differ somewhat in the shape of the leaves and in the leaf-sheaths. The leaves of var. *alatus* are oblong, oblong-lanceolate or lanceolate and the leaf-sheaths are

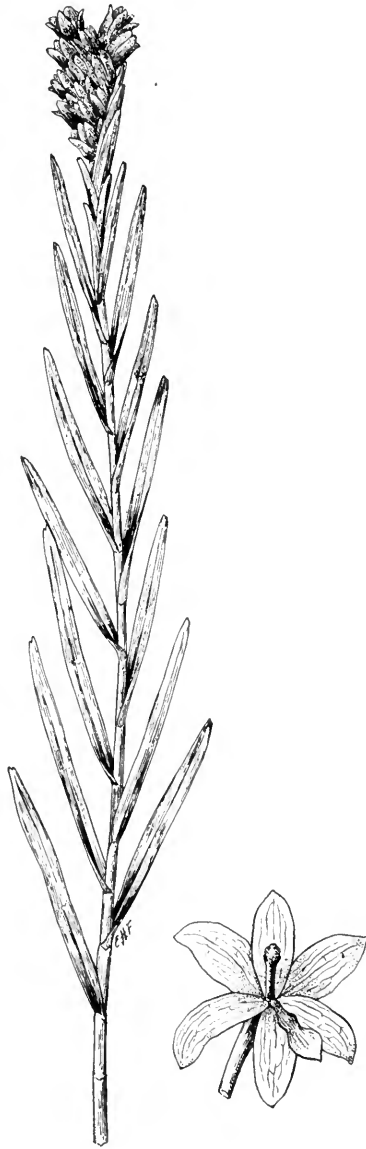


FIG. 121. *Isochilus major*. Plant ($\times \frac{1}{2}$); flower, spread open, front-side view ($\times 1\frac{1}{3}$). Drawn by Elsie H. Froeschner.

densely brownish verrucose, whereas the leaves of *I. major* are linear-lanceolate and the leaf-sheaths are smooth.

Alta Verapaz: Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, *Steyermark* 45656. Along Río Frío, about 8 km. below Tactic, *Standley* 90831.—Quezaltenango: Above Mujuliá, between San Martín Chile Verde and Colomba, *Standley* 85493.—Sololá: Volcán Atitlán, south-facing slopes, *Steyermark* 47379.

Isochilus major Cham. & Schlecht. var. ***Amparoanus*** (Schltr.) Correll, Bot. Mus. Leafl. Harv. Univ. 10, no. 1: 11. 1941. *Isochilus Amparoanus* Schltr. Repert. Sp. Nov. Beih. 19: 27. 1923.

Variety *Amparoanus* is found in Mexico, Guatemala, El Salvador, Honduras and Costa Rica. It occurs at from 670 to 2,300 meters altitude where it is found as a terrestrial, on rocks, in lava fields, on trees in dry oak forests or in moist tropical forests.

Isochilus major var. *Amparoanus* has only the characteristic inflorescence of this group in common with var. *alatus*. It agrees with *I. major* in the typically smooth leaf-sheaths and in the type of inflorescence. It is related to *I. linearis* var. *unilateralis* in the strict linear leaves and in the rather large flowers of some of its forms.

The flowers are said by collectors to be "lavender," "purple," "rose-purple," "pinkish purple," "phlox-purple," "rose-color," and "orange-red."

Alta Verapaz: Tukurú, *Smith* 1665. Above Tamahú, *Standley* 70923. Tactic, *Johnston* 1829.—Amatitlán: Pacaya, *Johnston* 1381.—Chiquimula: Volcán Quezaltepeque, 3-4 miles northeast of Quezaltepeque, *Steyermark* 31505.—Guatemala: Near Finca La Aurora, *Aguilar* 172.—Huehuetenango: "Nanax-kanal," *Seler* 2724. Between Finca San Rafael and Amelco, in vicinity of Río Amelco, *Steyermark* 49559.—Jalapa: Jalapa, *Kellerman* 7868.—Quezaltenango: Near Quezaltenango, *Skutch* 797 (in part).—Retalhuleu: San Felipe, *Rojas* 444.—San Marcos: Finca El Porvenir, along Río Cabús above Potrero Matasán, Volcán Tajumulco, *Steyermark* 37630.—Santa Rosa: Near Santa Rosa, *Maxon & Hay* 3374. Cenaguilla, *Heyde & Lux* 3864. Teocinte, *Heyde & Lux* 6243.—Zacapa: Along Río Lima, Sierra de las Minas, between Río Hondo and summit of mountain at Finca Alejandría, *Steyermark* 29607. Sierra de las Minas, San Lorenzo, *Steyermark* 43176.—"Chocola," *Morton* 263.

40. ARPOPHYLLUM Llave & Lex.

Epiphytic or terrestrial plants from a stout simple or branched rhizome. Stem indurated or somewhat pseudobulbous, concealed or nearly concealed by

scarious sheaths, unifoliolate. Leaves fleshy-coriaceous, articulate. Inflorescence terminal, a spicate showy raceme of numerous flowers, subtended by a large spathaceous sheath. Sepals about equal, spreading, the lateral sepals mostly gibbous at the base, adnate to the column. Petals smaller than the sepals. Lip uppermost, usually longer than the petals and sepals, conspicuously gibbous or saccate at the base, the anterior portion elliptic-obovate, somewhat flabellate or obovate-subquadrate. Column erect, somewhat arcuate, wingless; column-foot short, nearly obsolete; pollinia 8, waxy, pyriform. Capsule ellipsoid-cylindric.

This genus probably consists of only two valid species, both of which are found in Guatemala.

Lip less than 8 mm. long *A. spicatum*.
Lip more than 8 mm. long *A. alpinum*.

Arpophyllum alpinum Lindl. in Benth. Pl. Hartw. 93. 1842.
A. medium Reichb. f. Beitr. Orch. Centr.-Am. 89. 1866 (type: Guatemala, Las Nubes, January 9, 1857, *Wendland*). Figure 122.

Epiphytic on trees or terrestrial, usually in cloud forests, up to 3,200 meters alt. Not common in Mexico, Guatemala and Honduras.

Plant rather stout, erect-ascending, often dwarf at high altitudes. Stems arising at intervals from a stout creeping rhizome, unifoliolate, somewhat compressed, 4.5–33 cm. long, up to 1 cm. in diameter, nearly concealed by several large imbricated spathaceous sheaths; sheaths more or less verrucose. Leaf at the apex of the stem, linear-ligulate, acute or subobtusate, coriaceous, usually exceeding the inflorescence, 1–5 dm. long, 1.4–3 cm. wide. Raceme cylindrical, densely many-flowered, conspicuous, 3–14 cm. long, 2–4 cm. in diameter, supported by a stout peduncle. Rachis and pedicellate ovaries covered with a black scurfiness. Peduncle 5–13 mm. long, provided with several scarious scalelike bracts, nearly concealed by a long spathaceous sheath 3–11 cm. long. Floral bracts minute, triangular, acute, about 3 mm. long. Flowers purplish pink, with dark brown-purple stout pedicellate ovaries that are 6–12 mm. long. Dorsal sepal oblong-elliptic to elliptic-obovate, rounded to obtuse at the apex, 7–11 mm. long, 3.2–3.8 mm. wide. Lateral sepals oblong-elliptic, rounded to subobtusate at the apex, oblique, somewhat gibbous at the base due to conforming with the saccate base of the lip, 8.5–11 mm. long, 3.5–5 mm. wide. Petals linear to linear-oblong-ovate, rounded to subobtusate at the apex, minutely erose-crenulate along the upper margins, slightly oblique. Lip uppermost, gibbous at the base, somewhat arcuate just above the base, 9–15 mm. long; lamina elliptic-obovate to obovate-subquadrate, rounded and occasionally retuse at the apex, the incurved erose margins undulate-crested and wavy, 4.5–7 mm. wide when spread out. Column almost terete, stout, slightly dilated above, 3.5–5 mm. long. Capsule obliquely ellipsoid-cylindrical, about 1 cm. long.

This species is quite variable as to the size of the plants, racemes and leaves. As its name indicates, it is usually found at high elevations.

Alta Verapaz: Cobán, *Türckheim* 1140; II 1632. Vicinity of Cobán, bought from peddler from country near Cobán, *Standley*



FIG. 122. *Arpophyllum alpinum*. 1, plant ($\times \frac{1}{2}$); 2, flower, side view (about $\times 2$). Sketched by G. W. Dillon; completed by D. E. Tibbitts.

92186.—Amatitlán: Volcán de Pacaya, above Las Calderas, *Standley* 58508. Pacaya, *Johnston* 1385. Near base of Volcán Pacaya, *Porter* 61.—Chimaltenango: Santa Elena, *Skutch* 144.—Chiquimula: Middle slopes of Montaña Norte to El Jutal, on Cerro Brujo, south-east of Concepción de las Minas, *Steyermark* 31028.—Guatemala: Near Guatemala City, *Lewis* 118. Market, Guatemala, *Johnston* 1859.—Huehuetenango: Top of Cerro Chemalito, Sierra de los Cuchumatanes, 3½ miles west of Santa Eulalia, *Steyermark* 49944.—Jalapa: Volcán Jumay, north of Jalapa, *Steyermark* 32369. Laguna de Ayarza, *Heyde & Lux* 6385.—Quezaltenango: Densely forested damp white sand quebrada, El Pocito, south of San Martín Chile Verde, on road to Colomba, *Standley* 84946.—San Marcos: Barranca Eminencia, road between San Marcos and San Rafael Pie de la Cuesta, in upper part of the barranca between Finca La Lucha and Buena Vista, *Standley* 86497.—Sololá: Along road east of Los Encuentros, *Standley* 62357.—Totonicapán: Totonicapán, *Lewis* 215; *Johnston* 1327.—Zacapa: Sierra de las Minas, slopes of Monte Virgen, around summit of mountain, *Steyermark* 42637. Sierra de las Minas, between Loma El Picacho and Cerro de Monos, *Steyermark* 42826. Sierra de las Minas, middle and upper south-facing slopes of Volcán Gemelos, *Steyermark* 43254.

Arpophyllum spicatum La Llave & Lex. Nov. Veg. Descr. 2, Orch. Opusc. 20. 1825.

On trees and rocks in open mountain forests or in dense humid forests, usually at less than 1,500 meters alt., rarely up to 2,400 meters. Widespread in Mexico, less common in Guatemala, Honduras and Costa Rica.

Plant up to 7.5 dm. tall, ascending from a creeping rhizome that is about 8 mm. in diameter and covered with sheaths. Stem compressed, composed of several joints, nearly concealed by long tubular sheaths that are up to 16 cm. long. Leaf solitary, ligulate, obtuse, keeled below, flat above, fleshy-coriaceous, sometimes conduplicate-ensiform, up to 5 dm. long and 4 cm. wide. Peduncle nearly concealed by a compressed spathaceous sheath that is up to 15 cm. long and 2 cm. wide. Raceme spicate-cylindric, densely many-flowered, up to 22 cm. long, 1.7–3 cm. (usually about 2.5 cm.) in diameter; rachis and pedicellate ovaries sparsely covered with black hispid glands. Floral bracts triangular, acute, about 1.5 mm. long. Flowers purplish pink, with stout rigid pedicellate ovaries that are 4–8 mm. long. Dorsal sepal 3-nerved, oblong to elliptic-obovate, broadly obtuse to apiculate at the apex, 4.8–5.5 mm. long, 1.5–2.8 mm. wide above the middle. Lateral sepals 3-nerved, elliptic-oblong, subacute to broadly rounded at the apex, oblique, saccate at the base to conform with the base of the lip, 5–6 mm. long, 2–3 mm. wide. Petals narrowly elliptic to linear-oblong, rounded to obtuse and with the margins erose at the apex, 1-nerved, 5–5.5 mm. long, 1.5–1.8 mm.

wide. Lip 7-nerved, 5.5–6 mm. long, saccate at the base, constricted in front of the sac, then expanded into an obovate lamina that forms a hood over the column; lamina broadly rounded and erose at the apex, about 3.5 mm. wide when spread out. Column 3.5–4 mm. long, arcuate. Capsule ellipsoid, 7–8 mm. long.

The species of *Arpophyllum* are closely allied and are separable primarily on the size of the flower. However, besides the above difference, *A. alpinum* is usually confined to higher elevations and usually has a shorter peduncle and a shorter and wider inflorescence than *A. spicatum*.

Suchitepequez: Finca Mocá, *Skutch* 1563.

EXCLUDED SPECIES

Schlechter reported *Arpophyllum giganteum* Hartweg ex Lindley from Guatemala. However, no specimens referable to this concept have been seen from Guatemala. Except for the somewhat smaller flowers, *A. giganteum* is vegetatively and florally identical with *A. alpinum*. It should doubtless be considered only a small-flowered form of *A. alpinum*, and is probably synonymous with *A. spicatum*.

Reichenbach reported *Arpophyllum cardinale* Linden & Reichenbach from Guatemala, a species originally described from Venezuela. It is doubtful that this species occurs in Guatemala.

41. COELIA Lindl.

Epiphytic plants with swollen pseudobulbous stems from a short creeping rhizome. Leaves several, from the apex of the pseudobulb, the rolled sheaths simulating a stem. Inflorescence lateral, at the base of the pseudobulbs, a loosely flowered raceme. Sepals nearly alike, the lateral sepals concave at the base, free from the column. Petals about equal to the sepals. Lip shorter than the sepals and petals, sagittate, from a broad base. Column erect, stout, short, wingless, the foot almost obsolete; pollinia 8, waxy. Ovary conspicuously winged.

This monotypic genus is represented by the following species.

Coelia triptera (Smith) G. Don ex Steud. *Nom. ed.* 2, 1: 394. 1840. *Epidendrum tripterum* Smith, *Ic. Pic. t.* 14. 1793. Figure 123.

Epiphytic on trees, up to 1,200 meters alt. Uncommon in Mexico, Guatemala and the West Indies.

Plant from a pseudobulbous base, rather coarse, 2.5–6 dm. or more tall. Pseudobulbs ovoid, extended above as a short slender stem, subtended by several scarios sheaths, 2.5–5 cm. long, 1.5–2.5 cm. wide. Leaves several, at the apex of the pseudobulb, erect-spreading, linear-lanceolate, long-acuminate, plicate, subcoriaceous, articulated to the tubular sheaths, 1.2–4 dm. long, 1–2.3 cm. wide;



FIG. 123. *Coelia triptera*. 1, plant ($\times \frac{2}{5}$); 2, flower, with sepals and petals removed, front view (about $\times 1$); 3, flower, with dorsal sepal held down, dorsal view (about $\times 1$); 4, anther (much enlarged); 5, pollinia (much enlarged); 6, column (much enlarged); 7, flower, with sepals and petals removed, side view (about $\times 1$). Drawn by D. E. Tibbitts. Adapted in part from Fawcett and Rendle, *Flora of Jamaica* 1: pl. 13. 1910.

leaf-sheaths toothed on the margin when the leaves fall off. Inflorescence lateral, arising at the base of the pseudobulbs; scape 12–17 cm. long including the loosely flowered raceme; peduncle nearly concealed by brown glossy distichous imbricated sheaths. Floral bracts linear-lanceolate to linear-setaceous, 2–4 cm. long. Flowers white, very fragrant, with slender pedicellate ovaries about 12 mm. long. Ovaries strongly angled and winged, with the wings excurrent and recurved at the apex. Dorsal sepal ovate-elliptic to elliptic-oblong, obtuse, concave, 8.5–9 mm. long, 4–5 mm. wide. Lateral sepals obliquely ovate, obtuse, slightly concave and conjoined at the base, recurved at the apex, 8–9 mm. long, 4.5–5 mm. wide near the base. Petals obliquely oblong-spatulate to oblong-obovate, rounded at the apex, 8–9 mm. long, 3.5–4.7 mm. wide above the middle. Lip erect, recurved below the middle, about 6.5 mm. long and 5 mm. wide at the widest point when spread out, the basal part broadly subquadrate, abruptly triangular-sagittate above with the lateral margins convex and fleshy-thickened, narrowly triangular acute at the apex, the upper surface minutely papillose. Column stout, essentially without a foot, about 2 mm. long. Capsule conspicuously winged, about 1 cm. long.

Guatemala (fide Schlechter).

42. BOTHRIOCHILUS Lem.

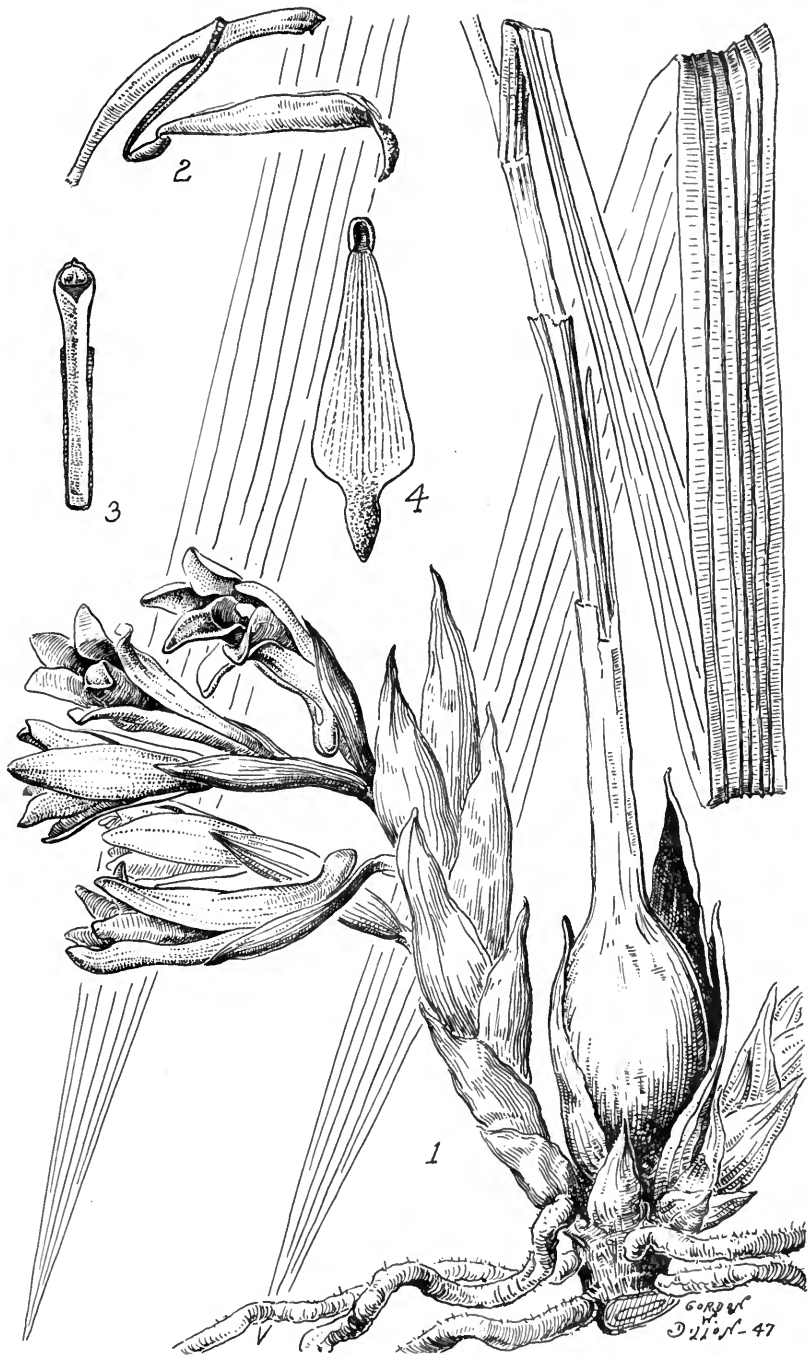
Terrestrial, rock-inhabiting or epiphytic caespitose plants with pseudobulbs from a coarse repent rhizome. Pseudobulbs ovoid or obpyriform, several-leaved at the summit. Leaves subcoriaceous, plicate, linear-lanceolate, articulated with their sheaths, which simulate a stem. Inflorescences lateral, from the base of the pseudobulbs. Dorsal sepal free. Lateral sepals decurrent on the column-foot to form a conspicuous mentum. Petals similar to the dorsal sepal but usually smaller. Lip about as long as the petals, sharply declined or prominently saccate at the base, dilated above the middle and more or less 3-lobed near the apex. Column erect, long and slender, sometimes clavate, essentially wingless, produced at the base into a long foot; foot about as long as or longer than the column; pollinia 8, waxy. Capsule obliquely ovoid, strongly ribbed but not winged.

All of the species comprising this genus are found in Guatemala.

1. Flowers more than 3 cm. long.....*B. bellus*.
1. Flowers less than 2.5 cm. long.
 2. Inflorescence a dense headlike ovoid raceme.....*B. densiflorus*.
 2. Inflorescence a loose-flowered raceme.
 3. Flowers numerous, in a cylindrical raceme; lip with a globular somewhat bilobed sac at the base; petals broadest above middle. *B. macrostachyus*.
 3. Flowers several, scattered; lip without a sac at the base; petals broadest below the middle.....*B. guatemalensis*.

Bothriochilus bellus Lem. Illustr. Hort. 3: Misc. p. 30. 1856.
Coelia bella (Lem.) Reichb. f. in Walp. Ann. Bot. 6: 218. 1861.
 Figure 124.

FIG. 124. *Bothriochilus bellus*. 1, plant ($\times \frac{1}{6}$); 2, column and lip, side view ($\times 1$); 3, column, front view ($\times 1$); 4, lip, spread out ($\times 1$). Drawn by G. W. Dillon.



Terrestrial or epiphytic on trees in humid forests, up to 1,500 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant from a pseudobulbous base, slender above, 3–8 dm. tall. Pseudobulbs ovoid-globose, somewhat compressed, smooth, when young concealed by shiny scarious sheaths, 3–5 cm. long, 1.5–2.5 cm. thick, extended above into a short slender terete stem. Leaves several, clustered, articulated with the tubular stem sheaths, erect-spreading, linear-lanceolate, long-acuminate, attenuate, plicate, membranaceous, with several prominent nerves, 1.5–6 dm. long, 1–2 cm. wide, reduced below to distichous imbricated acuminate sheaths. Inflorescence lateral, arising at the base of the pseudobulbs; scape 2–several-flowered, up to 15 cm. long including the flowers, clothed with distichous imbricated tumid ovate-lanceolate acuminate tan glossy sheaths. Flowers large, nearly erect, tubular below and funnel-shaped above, yellowish white with the segments rose-purple at the tips, the mid-lobe of the lip orange-colored, fragrant of bitter almonds, with pedicellate ovaries up to 2.5 cm. long. Dorsal sepal oblong-elliptic, obtuse, about 3.5 cm. long and 1 cm. wide. Lateral sepals obliquely oblong, obtuse to subacute, long-decurrent on the column-foot to form a conspicuous mentum, about 5 cm. long from apex to base of column-foot, about 1 cm. wide; mentum nearly 2 cm. long. Petals obliquely oblong-spatulate, broadly rounded at the apex, about 3.5 cm. long and 1 cm. wide above the middle. Lip with a saccate base, about 4.5 cm. long; lamina narrowly cuneate, distinctly 3-lobed near the apex, about 1.2 cm. wide across the lateral lobes; lateral lobes angular or rounded; mid-lobe triangular-oblong, acute, about 1 cm. long and 5 mm. wide, the upper surface granulose-thickened and orange-colored. Column slender, minutely toothed at the dilated apex, with a dorsal apicule recurved over the anther, about 1.5 cm. long, produced at the base into a long slender foot about 2 cm. long.

This species has the largest flowers of any in the genus.

Alta Verapaz: Río Cobán, between Cobán and San Pedro, *Johnson* 757.—Baja Verapaz: Panjal, *Türckheim* 3973.

Bothriochilus densiflorus (Rolfe) Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 10: 86. 1942. *Coelia densiflora* Rolfe, Kew Bull. 375. 1906.

Epiphytic on trees, up to 1,000 meters alt. Rare in Guatemala.

Plant large, coarse, 6–7 dm. tall, from a pseudobulbous base. Pseudobulbs ovoid, somewhat attenuate at the apex, slightly compressed, 5–7 cm. long, 3–5 cm. wide, subtended by a pair of sheathing imbricated bracts when young. Leaves about five, at apex of pseudobulb, linear or narrowly lanceolate, acuminate, subcoriaceous, nervose, conduplicate at the base, 2.5–5 dm. long, 3–4 cm. wide. Inflorescence lateral, arising at the base of the pseudobulbs; scape supporting a short dense many-flowered ovoid headlike raceme, 6–7 cm. long, concealed by broad ovate-acuminate imbricated sheaths; raceme about 4 cm. long, 3.5 cm. in diameter, consisting of 150–200 small white flowers disposed in spiral rows around the rachis. Floral bracts obliquely elliptic-lanceolate, narrowly obtuse, scarious, 1.3–2 cm. long, about 6 mm. wide. Flowers on pedicellate ovaries 5–8 mm. long. Dorsal sepal elliptic-oblong to oblong-lanceolate, obtuse to subacute, concave,

7.5–10 mm. long, 3–3.5 mm. wide. Lateral sepals decurrent on the column-foot to form a prominent mentum about 5 mm. long, obliquely oblong-elliptic to elliptic-lanceolate, obtuse to subacute, somewhat sigmoid, 1.3–1.9 cm. long from apex to base of mentum, 4 mm. wide. Petals elliptic to oblong-lanceolate, obtuse to acute, slightly oblique, 7–10 mm. long, 2–2.5 mm. wide. Lip with a narrowed cuneate base, dilated and lightly 3-lobed above, more or less obovate-cuneate in outline, 1–1.2 cm. long, 5–6 mm. wide across the lateral lobes when spread out; lateral lobes rounded, upcurved along side of column; mid-lobe deltoid, obtuse to subacute. Column clavate, recurved, 8–10 mm. long including the elongated slender foot.

This species is unusual in that the inflorescence is composed of numerous small flowers in a dense headlike raceme.

Concepción de las Minas, near El Salvador-Honduras border, *Lewis* 197.

Bothriochilus guatemalensis (Reichb. f.) L. O. Wms. Bot. Mus. Leaflet. Harv. Univ. 8: 147. 1940. *Coelia guatemalensis* Reichb. f. in Walp. Ann. Bot. 6: 219. 1861 (type: Guatemala).

Epiphytic on trees, up to 3,000 meters alt. Rare in Guatemala.

Plant from a pseudobulbous base, slender above, in loose clumps. Pseudobulbs conical, subrhomboidal, smooth in young plants, extended above into short slender terete stems about 5 cm. long, subtended by dark brown scarios sheaths, about 4 cm. long and 1.5 cm. thick. Leaves several, articulated with the tubular stem sheaths, erect-spreading, narrowly linear-lanceolate, acuminate, plicate, subcoriaceous, prominently nervose, 1.6–3 dm. long, 1–1.5 cm. wide. Inflorescence lateral, arising at the base of the pseudobulbs; scape several-flowered, up to 16 cm. long including the flowers, concealed by distichous imbricated tumid acuminate brown sheaths. Floral bracts oblong-lanceolate, acuminate, scarios, 1.5–3 cm. long. Flowers small, white and pink, with slender pedicellate ovaries about 1 cm. long. Dorsal sepal oblong-lanceolate to oblong-elliptic, obtuse to subacute, concave over the column, 1 cm. long, 4.2 mm. wide. Lateral sepals decurrent on the column-foot to form a prominent mentum about 5 mm. long, oblong-lanceolate, thickened at the acute-apiculate apex, the apicule incurved, 1.5–1.7 cm. long from apex to base of mentum, 4–4.2 mm. wide at the middle. Petals obliquely ovate-elliptic to elliptic-lanceolate, acute, 1 cm. long, 3.5–4 mm. wide near center. Lip obovate-cuneate, abruptly contracted on upper third to form a triangular acute recurved apex, 1.5–1.7 cm. long, 4–5.5 mm. wide at widest point, mid-nerve prominently depressed, with a fleshy thickening in the center just below the apex, margins curved upward to clasp the column. Column clavate, produced at the base to form a conspicuous slender foot, 1.2–1.4 cm. long including the foot.

Guatemala: Road to Mataquesuintla, about 25 miles from Guatemala City, *Lewis* 94.—Huehuetenango: Along Aguacatán road east of Huehuetenango at km. 13–14, *Standley* 82015.—Sololá: Volcán Santa Clara, south-facing slopes to summit, *Steyermark* 46928.

Bothriochilus macrostachyus (Lindl.) L. O. Wms. Bot. Mus. Leaf. Harv. Univ. 8: 148. 1940. *Coelia macrostachya* Lindl. in Benth. Pl. Hartw. 92. 1842. Figure 125.

Terrestrial, on rocks or epiphytic on trees in mountain forests, up to 2,500 meters alt. Widespread in Mexico, Guatemala, Honduras, Costa Rica and Panama.

Plant large, coarse, 6 dm. or more tall, from a pseudobulbous base. Pseudobulbs nearly globose to ovoid, slightly compressed, extended above into a slender stem, subtended by large brown imbricated scarious bracts, 4–10 cm. long, 2–4.5 cm. wide. Leaves three or more at apex of pseudobulb, erect-spreading, linear-lanceolate, long-acuminate, articulated with the leaf-sheaths, plicate, firmly subcoriaceous, up to 8 dm. long and 3 cm. wide; leaf-sheaths with strong teeth on the margins when the leaf falls off. Inflorescence lateral, arising at the base of the pseudobulbs; scape up to 6 dm. long including the raceme, nearly concealed by tubular-involute acute sheaths 5–7 cm. long, the peduncle sometimes fractiflex; raceme cylindrical, densely many-flowered, 10–15 cm. long, 3.5–7 cm. in diameter. Floral bracts conspicuous, linear-lanceolate, long-attenuate, scarious, fugaceous, 4–6.5 cm. long, 4–6 mm. wide near the base. Flowers crystalline pink or pinkish white, occasionally rose-colored, with slender pedicellate ovaries that are 9–15 mm. long. Sepals fleshy-thickened, corrugated on the outer surface; dorsal sepal elliptic-lanceolate, acute to acuminate, concave, somewhat dorsally keeled, 10–11 mm. long, 4–4.5 mm. wide; lateral sepals decurrent on the column-foot to form a pronounced saccate mentum about 4 mm. long, obliquely ovate-oblong, recurved at the narrowly acute to subacuminate apex, 12–16 mm. long, 4–5 mm. wide. Petals obliquely oblong-obovate, obtuse to acute, concave below the middle, 9–11 mm. long, 4–4.5 mm. wide. Lip with a small globular somewhat bilobed sac at the base, cuneate and somewhat dilated above, lightly 3-lobed near the apex, 11–14 mm. long and 5–6 mm. wide across the lateral lobes when spread out; lateral lobes triangular and somewhat apiculate, upcurved around the column; mid-lobe narrowly triangular-lanceolate and strongly recurved, subacute; lamina granulose-thickened on the inner surface near the apex, usually with a short keel on the inner surface near the base. Column nearly terete, more or less 3-toothed at the apex with the lateral teeth divergent, about 8 mm. long including the foot. Capsule obliquely ovoid, prominently ribbed, 8–10 cm. long.

This species is perhaps the most common *Bothriochilus* in Central America.

Huehuetenango: Oak-pine woods on steep rocky slopes above La Libertad, on Cerro Pueblo Viejo, *Steeyermark* 50978.—Jalapa: Potrero Carillo, around Minas de Croma, 13 miles northeast of Jalapa, *Steeyermark* 33053.—Quezaltenango: Montaña Chicharro, on lower southeast-facing slopes of Volcán Santa María, 2–4 miles south of Santa María de Jesús, *Steeyermark* 34268. Along Río Samalá, below Zunil, *Steeyermark* 34987.—San Marcos: Above Finca El Porvenir, along Río Cabús, within 2 miles of Cueva de las Palomas, south-facing slopes of Volcán Tajumulco, *Steeyermark* 37967.—Zacapa: San Lorenzo, *Steeyermark* 43173.

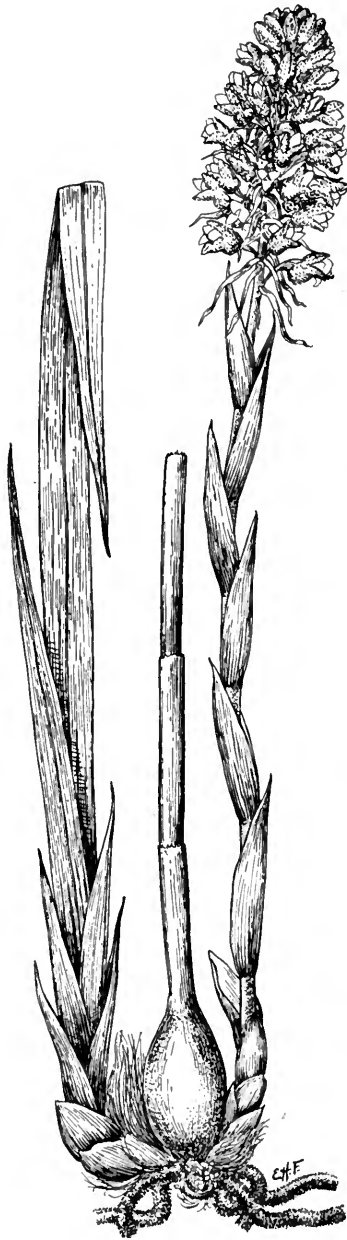


FIG. 125. *Bothriochilus macrostachyus*. Plant ($\times \frac{1}{2}$). Drawn by Elsie H. Froeschner.

43. POLYSTACHYA Hook.

Epiphytic or rock-inhabiting caespitose plants with small thickened or pseudobulbous leafy stems. Leaves one or several, distichous, articulated with the sheaths. Inflorescence a simple or paniculate raceme terminating a rather long closely sheathed peduncle. Flowers small. Dorsal sepal free. Lateral sepals larger than the dorsal sepal, attached to the foot of the column to form a more or less prominent mentum. Petals usually linear. Lip erect, non-resupinate, nearly entire to deeply 3-lobed; disk of the lip usually with a conspicuous callus, mostly covered with mealy hairs. Column short, not winged, with a prominent foot; pollinia 4, waxy. Capsule oblong-ellipsoid.

In this genus there are about two hundred species, which are mainly natives of tropical and southern Africa. Some species also occur in India and Malaya, and sparsely in the American tropics and subtropics. The species in our area are extremely difficult to separate.

1. Pedicellate ovary pubescent.....*P. masayensis*.
1. Pedicellate ovary glabrous.
 2. Lip cuneate-oblong to subrhombic in outline; mid-lobe of lip triangular-ovate.....*P. lineata*.
 2. Lip obovate-cuneate to subquadrate in outline; mid-lobe of lip suborbicular to subquadrate.
 3. Lip and petals about 2 mm. long.....*P. clavata*.
 3. Lip and petals 2.5 mm. or more long.
 4. Mentum angled and prominent; lateral lobes of lip somewhat incurved; callus of disk linear, extending from near base to about middle of lip.
P. luteola.
 4. Mentum rounded and inconspicuous; lateral lobes of lip mostly divaricate; callus of disk conical, at base of lip.....*P. cerea*.

Polystachya cerea Lindl. Bot. Reg. 26: Misc. p. 86. 1840. *P. minor* Fawc. & Rendle, Journ. Bot. 48: 106. 1910. *P. guatemalensis* Schltr. Repert. Sp. Nov. 17: 141. 1921 (type: Guatemala, Chajojá, near Mazatenango, July, 1867, *Bernoulli & Cario* 452, Retalhuleu, October, 1877, *Bernoulli & Cario* 606). Figure 126.

On rocks or epiphytic on trees in humid forests, up to 1,500 meters alt. Widespread and rather common from Mexico through Central America to Panama, throughout the West Indies and probably in South America.

Plant slender, erect, 7-60 cm. tall, often growing in dense clumps. Pseudobulbs slightly thickened and lightly compressed, 2-4 cm. long, up to 12 mm. thick, concealed by membranaceous sheaths. Leaves several, erect-spreading, linear, oblong-linear or linear-oblongate, obtuse to subacute and obliquely retuse at the apex, coriaceous, 4-27 cm. long, 0.5-3 cm. wide. Inflorescence a slender paniculate raceme, the branches up to 4.5 cm. long and usually nodding; peduncle somewhat compressed, concealed by closely appressed sheaths. Floral



FIG. 126. *Polystachya cerea*. Plant ($\times \frac{2}{3}$); 1, flower, spread out (about $\times 4$); 2, flower, side view (about $\times 4$); 3, column and lip, side view (about $\times 6$). Drawn by Blanche Ames.

bracts small, triangular, shortly acuminate, about 1.5 mm. long. Flowers fleshy, yellowish white, occasionally tinged with purple, with stout glabrous pedicellate ovaries that are about 5 mm. long. Sepals 2.5–5 mm. long, 1.5–3 mm. wide at the widest point, apiculate and recurved at the apex, 3-nerved, concave; dorsal sepal ovate-oblong to oblong-elliptic; lateral sepals obliquely triangular-ovate, adnate to the column-foot and conjoined to form a rounded mentum. Petals obliquely linear-subspatulate, obtuse-apiculate, 1-nerved, 2.5–3 mm. long, less than 1 mm. wide. Lip erect and parallel with the column, somewhat recurved, often very fleshy, subquadrate to oblong-subquadrate in outline when spread out, 3-lobed below or about the middle, 2.7–4 mm. long, 2.2–3.3 mm. wide across the lateral lobes; lateral lobes small, obliquely ovate, obtuse to rounded at the apex, more or less divaricate; mid-lobe subquadrate-elliptic to suborbicular-quadrate, slightly retuse at the apex, obscurely apiculate, the margins crisped; disk with very short mealy hairs, adorned with a projecting conical callus at the base. Column short, fleshy, about 1 mm. long. Capsule narrowly ellipsoid, up to 1 cm. long.

This species should probably be considered as only a variety of *P. luteola*, to which it is closely allied.

Alta Verapaz: Cubilgüitz, *Türckheim* II 205. Cobán, *Türckheim* II 2033. Chamá, *Johnson* 457.—Chiquimula: Montaña Castilla, vicinity of Montaña Cebollas, along Río Lucía Saco, 3 miles southeast of Quezaltepeque, *Steyermark* 31320.—Escuintla: Between Río Jute and Río Pantaleón, on road between Escuintla and Santa Lucía, *Standley* 63483.—Huehuetenango: Between Las Palmas and Chaculá, Sierra de los Cuchumatanes, *Steyermark* 51758.—Izabal: Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38632; 38529. Los Andes District, Inca Farm, near Entre Rios, *Lewis* 132.—Quezaltenango: Colomba, *Skutch* 1327.

The following collections are in fruit but probably represent this species: Baja Verapaz: Rocky hills near and above Santa Rosa, in pine-oak forest, *Standley* 91240.—Zacapa: Sierra de las Minas, oak-pine forest along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, *Steyermark* 42240.

***Polystachya clavata* Lindl. Bot. Reg. 28: Misc. p. 61. 1842.**

Epiphytic on trees in oak-pine forests, near sea level. Uncommon in British Honduras, Guatemala and Honduras.

Plant small, rigidly erect, caespitose, up to 2.4 dm. tall, usually much smaller; pseudobulbs obsolete. Stem (peduncle) clothed by long scarios sheaths. Leaves linear to linear-oblong, subequally tridentate at the obtuse apex, coriaceous, up to 11 cm. long and 1.2 cm. wide. Inflorescence a many-flowered paniculate raceme composed of short stiffly erect branches; branches up to 3 cm. long; rachis sparsely covered with a reddish puberulence. Floral bracts ovate-triangular, cuspidate, up to 3 mm. long. Flowers greenish yellow, becoming orange-colored with age, with stout recurved pedicellate ovaries that are about 3 mm. long. Dorsal sepal 3-nerved, ovate-elliptic, obtuse, about 2.3 mm. long and 1.5 mm. wide.

Lateral sepals obliquely ovate-triangular, subacute, 3-nerved, concave, about 2.8 mm. long and 2 mm. wide. Petals obliquely linear, obtuse, 1-nerved, about 2 mm. long and 0.4 mm. wide. Lip from a cuneate claw, broadly obovate-cuneate in outline, 3-lobed about the middle, 2 mm. long and 2 mm. wide across the lateral lobes when spread out; lateral lobes semicordate, obtuse; mid-lobe subquadrate, notched at the apex, with crenulate margins; claw adorned with a large smooth conical callus at the base. Column short, fleshy, about 1 mm. long. Capsule obliquely ellipsoid, about 5 mm. long.

This species has the smallest flowers of any *Polystachya* in Guatemala.

Izabal: Cerro San Gil, El Golfete de Río Dulce, Cayo Piedra, *Steyermark* 41754.

Polystachya lineata Reichb. f. in Saund. Ref. Bot. 2: t. 80. 1869 (type: Guatemala).

Epiphytic on trees in dense humid forests, up to 1,100 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant slender or stout, erect, 8-30 cm. tall. Pseudobulbs slender, tapering from a thickened base, clothed with sheaths, 1.5-5 cm. long. Leaves as many as 8, linear to linear-ligulate, obliquely retuse at the obtuse apex, subcoriaceous and flexible, often conduplicate and recurved, 3-15 cm. long, 7-25 mm. wide. Inflorescence a simple or branched raceme, few- to many-flowered, the raceme often recurved or nodding; peduncle compressed, nearly concealed by closely appressed scarios sheaths, up to 25 cm. long including the inflorescence. Floral bracts small, triangular, acuminate, 1-3 mm. long. Flowers fleshy, greenish, greenish brown or lemon-yellow, usually striped with lavender or cinnamon-color, with recurved pedicellate ovaries that are 3-5 mm. long. Dorsal sepal oblong-triangular, acute, somewhat concave, about 4.5 mm. long and 2.5 mm. wide. Lateral sepals obliquely ovate, acute and recurved at the apex, the lateral margins conjoined and adnate to the column-foot to form a prominent mentum, 4-5 mm. long, about 3.5 mm. wide. Petals narrowly linear to linear-spatulate, acute, slightly falcate, 3-3.5 mm. long, 0.5-1 mm. wide. Lip erect and parallel to the column, cuneate-oblong to subrhombic when spread out, 3-lobed above the middle, 3-4.5 mm. long and 2.5-3 mm. wide when spread out; lateral lobes obtusely angled, upcurved; mid-lobe triangular-ovate, acute and rigidly decurved at the apex; disk with a conical mealy tubercle at the base, more or less mealy all over the surface. Column short, fleshy.

Izabal: Río Dulce, between Livingston and 6 miles up river on north side, *Steyermark* 39396.

Polystachya luteola (Sw.) Hook. Ex. Fl. 2: 103. 1824. *Cranichis luteola* Sw. Fl. Ind. Occ. 3: 1433. 1804. *Polystachya minuta* (Aubl.) Frappier ex Cordemoy, Fl. Ile Réunion 190. 1895. Figure 127.

Epiphytic on trees or on rotten logs and stumps at low elevations, mostly below 400 meters alt. Widespread and rather common

in Florida and the West Indies, uncommon in Central and South America; also in the Old World tropics.

Plant erect, often growing in large clumps, from a swollen pseudobulbous base, 1-6 dm. tall. Pseudobulbs tapering from a thickened base, concealed by imbricated scarious sheaths. Leaves one or several, oblong-elliptic, linear-lanceolate or oblanceolate, obtuse to acute, subcoriaceous, 4-30 cm. long, 1-4 cm. wide. Inflorescence a few- to many-flowered slender simple or branched raceme that is often unilateral; peduncle compressed, up to 55 cm. long including the inflorescence, more or less concealed by long tubular imbricated membranaceous sheaths, the sheaths glaucous and semitranslucent. Floral bracts suborbicular-ovate, acuminate, with hyaline margins, about 3 mm. long. Flowers yellowish green, fragrant, with slender glabrous arcuate pedicellate ovaries that are 4-5 mm. long. Dorsal sepal triangular-ovate to ovate-oblong, acute to apiculate, shallowly concave, 4-5 mm. long, about 3 mm. wide. Lateral sepals obliquely and broadly triangular, acute to apiculate, adnate to the column-foot and conjoined to form a prominent saccate mentum, about 6 mm. long and 4 mm. wide across the base. Petals narrowly linear-spatulate, subobtuse, apiculate, about 3 mm. long, mostly less than 0.5 mm. wide. Lip erect and parallel with the column, arcuate-recurved, obovate to broadly cuneate in outline when spread out, deeply 3-lobed above the middle, 4-4.5 mm. long, 3.5-4 mm. wide across the lateral lobes; lateral lobes entire, incurved, obtuse, with the free part about 1 mm. long; mid-lobe oblong-quadrate to suborbicular, often slightly dilated at the apex, truncate, with irregularly undulate-crenulate margins; disk entirely covered with inconspicuous glandular hairs, prominently crested on the central portion from the base to about the middle with a solitary fleshy ridge. Capsule ellipsoid, 8-12 mm. long, glabrous.

This species is evidently extremely rare in Guatemala. No specimens have been seen from that country. However, it is included here on the basis of Fawcett and Rendle's and Schlechter's reports. It is best distinguished from *P. cerea*, its nearest ally, by the usually larger flowers, prominently incurved lateral lobes and linear callus of the lip, and the large mentum formed by the lateral sepals.

***Polystachya masayensis* Reichb. f. Bonpl. 3: 217. 1855.**

On rocks or epiphytic on trees in forests or in coffee plantations, up to 1,340 meters alt. Widespread and rather common in Mexico, Guatemala, Nicaragua, Costa Rica and Panama.

Plant short, densely caespitose, often growing in large masses, 5.5-25 cm. tall. Pseudobulbs small, short, fleshy-thickened, concealed by scarious sheaths, 1-4

FIG. 127. *Polystachya luteola*. Flowering plant (almost $\times 1$); fruiting inflorescence ($\times 1$); 1, flower, side view (about $\times 4$); 2, lateral sepals, spread out to show their attachment to the column-foot, and column ($\times 4$); 3, petal ($\times 5$); 4, lip, spread out to reveal the lateral lobes and farinaceous callus ($\times 5$). Drawn by Blanche Ames.



B. Ames 1905

cm. long, up to 1 cm. thick. Leaves early fugaceous, when present linear to linear-oblongate, obtuse, often conduplicate, 2.5–20 cm. long, 5–18 mm. wide. Inflorescence a simple or few-branched raceme; peduncle short, stout, nearly concealed by closely appressed imbricated sheaths, up to 20 cm. long including the inflorescence, pubescent. Floral bracts minute, suborbicular-triangular, acuminate, less than 2 mm. long. Flowers deep yellow or greenish yellow, fragrant, with stout pedicellate ovaries; ovaries densely covered with short reddish brown hairs, up to 5 mm. long. Dorsal sepal oblong-elliptic, acute, concave, 2.2–2.5 mm. long, 1.3–1.7 mm. wide. Lateral sepals obliquely suborbicular-ovate, acute, deeply concave, adnate to the column-foot and conjoined to form a small mentum, 2–3 mm. long, about 2 mm. wide. Petals obliquely linear, subacute, 2–2.2 mm. long, about 0.4 mm. wide. Lip erect and parallel with the column, recurved, suborbicular-quadrate in outline when spread out, distinctly 3-lobed about the middle, 2–3 mm. long, 2.5–2.8 mm. wide across the lateral lobes; lateral lobes more or less prominent, porrect, obtuse to broadly rounded, often slightly incurved; mid-lobe often fleshy-thickened, suborbicular, somewhat retuse at the apex, with a short deurved apicule from the sinus; disk with a mealy linear ridge or conical tubercle on the lower part, the entire surface more or less mealy. Column short and fleshy, with a short foot. Capsule obliquely cylindrical-ellipsoid, pubescent, 5–7 mm. long.

This species is closely allied to *P. cerea* but differs from that species primarily in the densely pubescent pedicellate ovary.

Izabal: Near Puerto Barrios, *Lewis*.

44. GALEANDRA Lindl.

Terrestrial or epiphytic herbs. Stem pseudobulbous, fusiform, short or elongated, concealed by leaf-sheaths. Leaves distichous, articulated with a large sheath, narrow, plicate. Inflorescence terminal, a simple or paniculate raceme. Flowers showy. Sepals free, spreading, equal. Petals similar to the sepals but a little wider. Lip from the base of the column, produced at the base into a prominent spur, entire or more or less lobed; disk crested or lamellate along the center. Column short to somewhat elongated, with a short foot, shortly 2-winged at the apex and dorsally rostrate; clinandrium oblique; anther terminal, operculate, incumbent, imperfectly 2-celled; pollinia 4, ovoid, cereous. Capsule erostrate.

This small genus is composed of about six species, which are confined to the American tropics.

Galeandra Baueri Lindl. in Bauer, *Illustr. Orch. Pl. Gen. t. 8.* 1830–38. Figure 128.

Epiphytic on trees in pinelands and open forest, usually on palms, up to 800 meters alt. Uncommon in Mexico, British Honduras, Honduras, Panama and French Guiana.

Plant up to 4.5 dm. tall, often growing in clumps. Stem fusiform, ancipitous and slightly fractiflex, concealed by leaf-sheaths, up to 27 cm. long. Leaves erect-spreading, linear to linear-elliptic or linear-lanceolate, acute to acuminate,



FIG. 128. *Galeandra Baueri*. Plant (about $\times \frac{1}{2}$). Drawn by Elsie H. Froeschner.

plicate, up to 23 cm. long and 2 cm. wide; sheaths scarious, spotted with reddish brown. Peduncle up to 10 cm. long, provided with long slender scarious maculate bracts. Raceme simple or branched, few-flowered. Flowers showy, yellow-brown sepals and petals, lip purple in front grading to white and brown below, with slender pedicellate ovaries that are up to 3 cm. long. Floral bracts lanceolate, acuminate, scarious, about 5 mm. long. Sepals 5-6-nerved, narrowly oblanceolate, acute, about 2 cm. long and 4.5-5 mm. wide above the middle; lateral sepals oblique. Petals 5-nerved, narrowly oblanceolate, acute, about 1.8 cm. long and 5.3 mm. wide above the middle. Lip about 5 cm. long (including the spur), involute below, spreading above, produced at the base into a spur; lamina rhombic-ovate when spread out, broadly rounded and crenulate on the margins, about 3 cm. long and 3.5 cm. wide; disk with a pair of small parallel keels near the base in the center; spur tapering from a broad base, curved, about 2 cm. long. Column arcuate, subtriangular in cross section, with a pair of ciliate lateral lobes at the apex and a dorsally recurved rostrum, about 1 cm. long.

No specimen has been seen from Guatemala. However, since Guatemala occurs within the area of distribution of the species it is included here. It is commonly known as "Chit-kok" in British Honduras.

45. EPIDANTHUS L. O. Wms.

Small simple or branched epiphytic plants with slender leafy repent or caespitose stems, non-pseudobulbous. Leaves distichous, articulated to the leaf-sheaths, linear to subfiliform and terete. Inflorescence a terminal distichous fractiflex raceme. Flowers small. Sepals similar, free, lanceolate, reflexed or spreading. Petals somewhat callose at the base, linear. Lip simple or 3-lobed, adnate to and sometimes enveloping the column. Column short, terete, adnate to the lip or callus of the lip for its entire length; anther terminal, operculate, incumbent, 2-celled.

This is a small genus containing only three species, all of which are confined to Mexico and Central America. The species were formerly referred to *Epidendrum*.

Epidanthus paranthicus (Reichb. f.) L. O. Wms. Bot. Mus. Leafl. Harv. Univ. 8: 150. 1940. *Epidendrum paranthicum* Reichb. f. Bot. Zeit. 10: 732. 1852.

Epiphytic on trees in humid forests, up to 1,800 meters alt. Rather common from Mexico through Central America to Panama.

Plant erect-ascending or decumbent, much-branched, often growing in dense masses, the individual stems up to 25 cm. long. Stem slender, leafy, strict or flexuose, more or less fractiflex, concealed by closely appressed striate sheaths, usually emitting roots at the point of branching, about 1 mm. in diameter. Leaves pale green, erect-spreading or recurved, distichous, articulated with the sheaths, fleshy, narrowly linear to almost terete, 1-2.5 cm. long, 1-1.5 mm. wide. Inflo-

rescence a lax few-flowered fractiflex raceme; peduncles short, clothed by ancipitous sheaths. Floral bracts about as long as the pedicellate ovary, ovate, acuminate, concave, strongly compressed and with a keel on the back. Flowers usually less than 10, small, fleshy, erect, distichous, yellow, greenish yellow or white, often marked with purple, with small pedicellate ovaries that are 2-3 mm. long. Sepals and petals more or less spreading or reflexed. Sepals oblong-lanceolate, acute to acuminate, the median nerve carinate-thickened, 3-4 mm. long, 1.2-1.5 mm. wide; lateral sepals somewhat oblique, concave. Petals obliquely linear-oblong to linear-lanceolate, acute to somewhat acuminate, lightly keeled on the back, 2.2-2.5 mm. long, 0.7-1.2 mm. wide. Lip with a short broad claw, adnate to the column; lamina deeply three-lobed, somewhat reniform in outline when spread out, 2-3 mm. long including the claw, 2.5-3 mm. wide across the lateral lobes; lateral lobes obliquely oblong, rounded at the apex, upturned and directed backwards, nearly surrounding the column; mid-lobe rostrate-acuminate; disk with a fleshy callus on the central portion. Column short, thick, 3-lobulate at the apex, about 1 mm. long. Capsule obliquely ovoid-ellipsoid, about 5 mm. long.

Alta Verapaz: Mountains along road between Tactic and the divide on road to Tamahú, *Standley* 90783. Dense wet limestone forest near Chirriacté, on the Petén highway, *Standley* 91983. Pansamalá, *Türckheim* 927. Cobán, *Türckheim* II 1915. Chamá to Cobán, *Johnson* 557. Cerro Sillab Senahú, *Hatch & Wilson* 179. —Chiquimula: Cerro Tixixí, 3-5 miles north of Jocotán, *Steyermark* 31559.—“Guatemala,” *Liebmann*.

46. HEXALECTRIS Raf.

Terrestrial scapose saprophytic herbs arising from slender or stout coralloid and annulated rhizomes. Stem flesh-colored or purplish, apparently lacking in chlorophyll, simple or occasionally branched. Leaves reduced to purplish sheathing scales. Inflorescence a lax terminal few-flowered raceme. Flowers showy, rose-lavender, purplish red or yellowish, often variously striped or mottled with purple, rarely nearly white. Sepals and petals free, spreading or somewhat revolute. Lip 3-lobed, crested on the disk with several longitudinal central lamellae or ridges. Column slender, shallowly winged on each side at the summit; pollinia 8, four in each cell of the anther, subequal, fasciculate, waxy.

Hexalectris consists of only six species, which are found primarily in the United States and Mexico, with one in Guatemala. Most of the species comprising the genus have been described within the last fifteen years.

Hexalectris parviflora L. O. Wms. Amer. Orch. Soc. Bull. 9: 126. pl. 1940. Figure 129.

Terrestrial in dry oak forests, on broken limestone slopes, up to 2,300 meters alt. Rare in Mexico and Guatemala.

Plant slender, leafless, up to 38 cm. tall. Stem dull rose-lavender, with several rose-lavender scarious bracts. Raceme several-flowered. Flowers smallest in the genus, brown-brick red, nervose, with side lobes of lip white. Dorsal sepal narrowly elliptic to narrowly elliptic-oblancheolate, acute, 5-nerved, 1-1.3 cm. long, 2.7-3.5 mm. wide. Lateral sepals similar to the dorsal sepal except somewhat falcate. Petals linear-oblancheolate, obtuse, 3-nerved, 1-1.2 cm. long, about 2 mm. wide. Lip 1.2-1.4 cm. long, 6-7 mm. wide, narrowly obovate in outline, 3-lobed, with 5 to 7 longitudinal lamellate calli; lateral lobes much smaller than the mid-lobe, oblong, obtuse; mid-lobe obovate-orbicular. Column 7-9 mm. long, narrowly winged, more or less arcuate; anther bicornute, the cornua blunt.

This is the smallest-flowered species in the genus.

El Progreso: Montaña Canahui, between Finca San Miguel and summit of mountain, near upper limits of Finca Caieta, Sierra de las Minas, *Steyermark* 43830.

47. CORALLORHIZA [Hall.] Chat.

Inconspicuous, terrestrial, saprophytic, scapose herbs with short underground rhizomes that are much-branched, toothed and coralloid. Stem brownish, yellowish or purplish, destitute of green foliage, clothed with several membranaceous sheaths. Inflorescence terminating the simple naked scape, a lax raceme of yellowish, brownish or purplish flowers. Sepals about equal, ascending, spreading or connivent; lateral sepals united at the base to form a short mentum, which is more or less adnate to the ovary. Petals mostly larger than the sepals. Lip simple or 3-lobed, slightly adherent to the base of the column. Column compressed; anther terminal: pollinia 4, waxy, free. Capsule ovoid or ellipsoid, nodding.

This is a small complex genus of about a dozen species, mainly in North and Middle America, with the greatest number of species in Mexico. The genus attains its greatest development in the United States and Canada. One species is found in Eurasia.

1. Lip prominently 3-lobed.

2. Mid-lobe of lip more than 7.5 mm. wide *C. macrantha*.

2. Mid-lobe of lip less than 6 mm. wide *C. maculata*.

1. Lip simple, not 3-lobed, at most notched, erose or undulate along the margins.

3. Lip 5-8 mm. long *C. maculata*.

3. Lip 3-4.5 mm. long *C. odontorhiza*.

Corallorhiza macrantha Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 411. 1918.

Terrestrial, in rocky soil under conifers at high elevations, up to 3,800 meters alt. Rare in Mexico and Guatemala.

Plant erect, slender, leafless, bronze or yellowish, 4-4.5 dm. tall. Stem succulent, provided with several closely appressed sheaths, about 5 mm. in diameter. Raceme loosely flowered, 7-10 cm. long, about 3 cm. in diameter. Floral

HEXALECTRIS
parviflora L. Wms.

H. brevicaulis L. Wms.

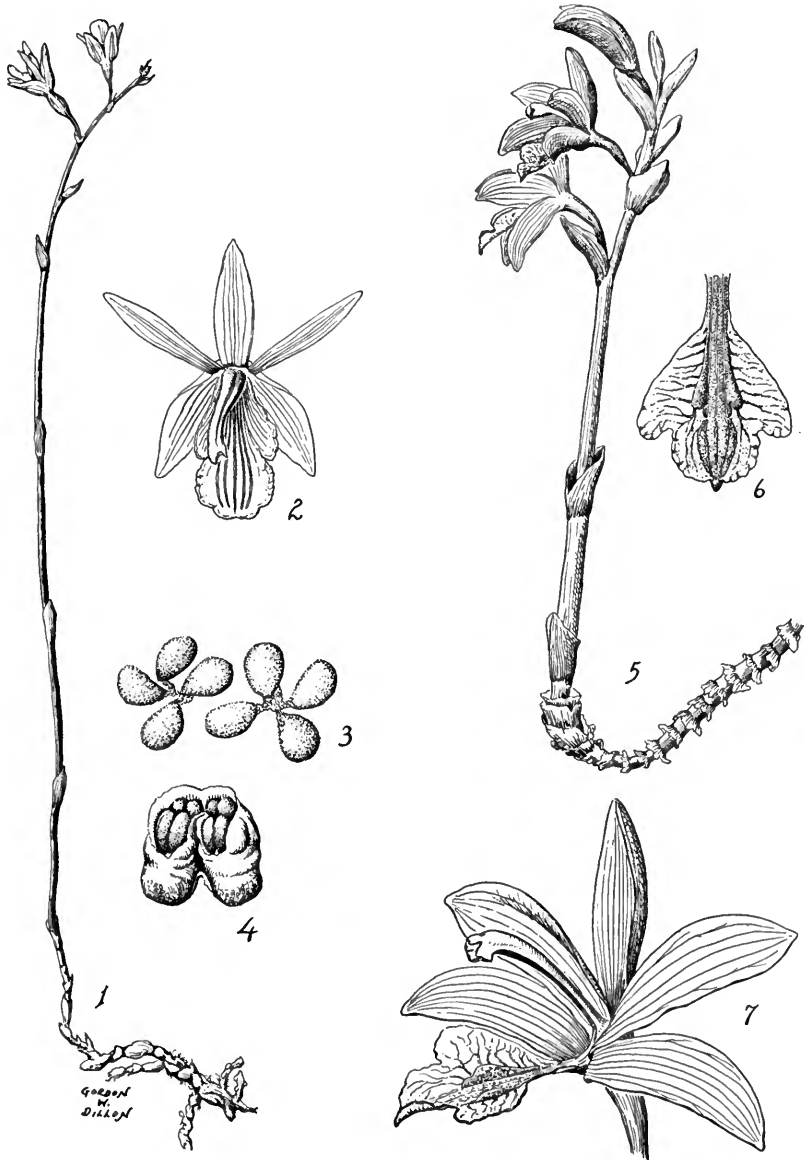


FIG. 129. *Hexalectris parviflora*. 1, plant ($\times \frac{1}{2}$); 2, flower, spread open ($\times 2$); 3, pollinia, spread out ($\times 10$); 4, anther and pollinia *in situ* ($\times 10$). [Note: *H. brevicaulis* is a Mexican species.] Drawn by G. W. Dillon.

bracts minute, suborbicular-ovate, apiculate, about 1 mm. long. Flowers white and greenish bronze, marked with purple, with slender pedicellate ovaries about 1 cm. long. Sepals linear-oblong to oblong-lanceolate, acute, 9–14 mm. long, 2–3 mm. wide; lateral sepals falcate, the anterior margins united at the base and decurrent on the ovary to form a saccate obtuse mentum; mentum sometimes partly free from the ovary, 3–4.5 mm. long. Petals obliquely oblong-elliptic, obtuse to acute, 8–12 mm. long, 3–3.7 mm. wide. Lip with a short claw, deeply 3-lobed near the base, 9–14 mm. long, adorned with a pair of subparallel fleshy erect-spreading lamellae near the base in front of the lateral lobes; lateral lobes obliquely linear-ligulate, porrect, obtuse and sometimes toothed at the apex, 2.5–4 mm. long, 1.2–1.5 mm. wide; mid-lobe flabellate-obcordate, rhombic-flabellate or suborbicular-obovate, retuse, the margins somewhat crenulate, 7–12 mm. long, 8–12 mm. wide at widest point. Column semiterete, arcuate, 6–10 mm. long, with a short thick foot.

This species is closely allied to *C. maculata* but is easily separated from that species by the large mid-lobe of the lip.

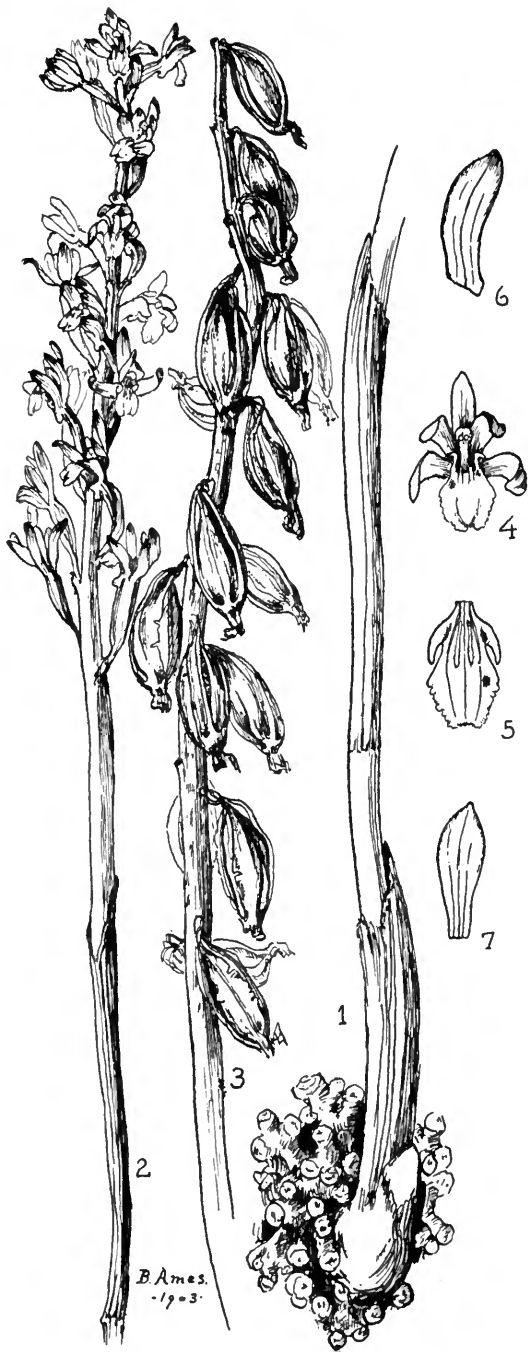
Huehuetenango: Sierra Cuchumatanes, *Skutch* 1245. In wooded ravine, alpine areas in vicinity of Tunimá, Sierra de los Cuchumatanes, *Steyermark* 48381. Cerro Chémal, summit of Sierra de los Cuchumatanes, *Steyermark* 50298.

Corallorhiza maculata Raf. Am. Month. Mag. 2: 119. 1817. *C. mexicana* Lindl. Gen. & Sp. Orch. Pl. 534. 1840. Figure 130.

Terrestrial, on dry rocky slopes or in rich decaying humus and rotten leaves under oaks and pine trees in dense forests, up to 3,700 meters alt. Widely distributed throughout the United States and adjacent Canada, Mexico and Guatemala.

Plant stout or slender, erect, leafless, bronze or yellowish, 1.5–7.5 dm. tall. Stem succulent, provided with several whitish tubular sheaths that are 4–9 cm. long. Inflorescence a few- to many-flowered lax raceme, 4–23 cm. long, 2.5–3.5 cm. in diameter. Floral bracts minute, subulate, translucent, 1.5–3 mm. long. Flowers spreading, on rather stout pedicels about 3 mm. long. Sepals and petals pale green to mostly crimson-purple, 3-nerved. Dorsal sepal linear, obtuse or broadly rounded at the apex, 7–8.5 mm. long, 1.5–2 mm. wide. Lateral sepals obliquely linear to oblong-lanceolate, obtuse to acute, concave, 7–8.5 mm. long, 1.5–2.5 mm. wide, united at the base to form an obsolescent mentum that is adnate to the ovary or slightly projecting. Petals oblong-lanceolate, oblong-elliptic or oblanceolate, broadly rounded, obtuse or acute at the apex, 5.5–7.5 mm. long, 1.5–3 mm. wide near the apex. Lip deeply 3-lobed, 5–8 mm. long, 3.5–5 mm. wide across the lateral lobes when spread out, pure white or white spotted with magenta-crimson; lateral lobes directed forward, somewhat falcate, obtuse to acute and rarely bifid at the apex, 1–1.5 mm. long; mid-lobe oblong-

FIG. 130. *Corallorhiza maculata*. 1, basal half of plant to show the coralloid rhizome ($\times 1$); 2, inflorescence ($\times \frac{1}{6}$); 3, fruits ($\times 1$); 4, flower, front view ($\times 1\frac{1}{2}$); 5, lip, spread out ($\times 2\frac{1}{2}$); 6, lateral sepal ($\times 2\frac{1}{2}$); 7, petal ($\times 2\frac{1}{2}$). Drawn by Blanche Ames.



quadrate, obovate or suborbicular, retuse, abruptly obtuse or broadly rounded at the apex, rarely somewhat apiculate; disk with two narrow longitudinal lamellae near or below the middle. Column yellow with magenta spots on the inner surface, strongly curved, compressed, 4-5 mm. long. Capsule nodding, ovoid, 1.5-2.5 cm. long.

This widespread saprophyte has flowers whose segments are quite variable in size and shape, particularly the lip. The lip of some flowers is occasionally entire or with only one lateral lobe present. The mentum is usually decurrent on the ovary. However, in plants that were formerly recognized as var. *occidentalis* (Lindl.) Cocker. the mentum is slightly projected away from the ovary.

Chimaltenango: Chichavac, *Skutch* 75; 513.—Huehuetenango: Alpine areas, trail between Tunimá and Quisil, Sierra de los Cuchumatanes, *Steysmark* 48421. Between Tojquiá and Caxín bluff, summit of Sierra de los Cuchumatanes, *Steysmark* 50198.—Suchitepequez: Volcán Santa Clara, between Finca El Naranjo and upper slopes, *Steysmark* 46762.

Corallorhiza odontorhiza (Willd.) Nutt. Gen. Am. Pl. 2: 197. 1818. *Cymbidium odontorhizon* Willd. Sp. Pl. 4: 110. 1805. *Corallorhiza Pringlei* Greenm. Proc. Am. Acad. 33: 475. 1898. Figure 131.

Terrestrial in light soil or rich humus in coniferous, deciduous or mixed pine-hardwood forests, up to 3,300 meters alt. Widespread and rather common in the eastern and south-central United States west to Texas, Mexico, Guatemala and Honduras.

Plant slender, frail, rather abruptly bulbous-thickened at the base, erect, leafless, light brown to madder-purple, 1-4 dm. tall. Stem more or less concealed by several closely appressed tubular sheaths. Raceme loosely few- to many-flowered, up to 11 cm. long and 2 cm. in diameter. Floral bracts minute, subulate, mostly less than 1 mm. long. Flowers purplish or purplish-green, with the lip white and blotched with purple, the sepals and petals connivent, on filiform reflexed pedicels that are 2-3 mm. long. Sepals linear to oblong-lanceolate, rarely somewhat spatulate, obtuse to acute, the margins somewhat upcurved, 1-nerved, 3-5 mm. long, 1-1.5 mm. wide; lateral sepals oblique, not producing a mentum. Petals from a short claw, oblong-elliptic, subacute to acute, somewhat concave, with the lateral margin nearly entire to crenulate-erose, 1- to rarely 3-nerved, 3-4 mm. long, 1.3-2 mm. wide. Lip with a short slender claw, arcuate-decurved near the base, obovate, suborbicular, quadrate-orbicular, ovate-rotund or broadly elliptic, occasionally wider than long, emarginate, obtuse or rarely subapiculate at the apex, irregularly crenulate or erose along the more or less undulate margins, bearing two short somewhat divergent lamellae on the disk below the middle, 3-5-nerved, 3-4.5 mm. long including the claw, 3-5.2 mm. wide. Column slender, slightly curved, about 2 mm. long. Capsule ovoid to oblong-elliptic, reflexed on the pedicels, 6-8 mm. long.

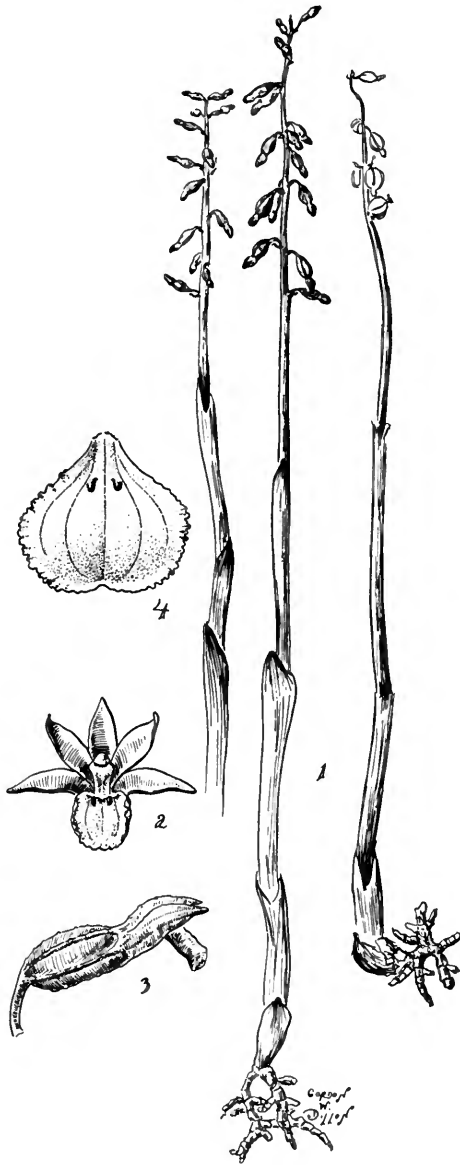


FIG. 131. *Corallorrhiza odontorhiza*. 1, plants, two in flower and one in fruit (about $\times \frac{1}{2}$); 2, flower, partly spread open ($\times 2\frac{1}{2}$); 3, flower and ovary, side view ($\times 2\frac{1}{2}$); 4, lip, spread out ($\times 6$). Drawn by G. W. Dillon.

An examination of the type of *C. Pringlei* reveals that it is identical in size and floral structure with *C. odorhiza*. Plants of this saprophyte are usually frail and spindly. It is closely allied to *C. Williamsii* Correll, a Mexican species, but differs from that species in floral structure.

Chimaltenango: San Martín, *Ramirez* 1382.—El Progreso: Between Calera and summit of Volcán Siglo, *Steyermark* 43033 (peloric).—Zacapa: Sierra de las Minas, between Santa Rosalía and upper slopes of Río Repollal, *Steyermark* 42685 (peloric). Sierra de las Minas, upper slopes, along Río Repollal to summit of mountain, *Steyermark* 42448.

48. CALANTHE R. Br.

Terrestrial herbs with a short rhizomatous stem. Leaves two, ample, prominently veined, contracted into a sheathing petiole. Peduncle tall, stout, provided with a solitary linear-lanceolate bract. Raceme simple, laxly many-flowered. Floral bracts long, narrow. Sepals free, spreading, subequal. Petals similar to the sepals but smaller. Lip with a claw that is connate with the column to form a tube, produced at the base into a short curved spur, variable, entire. Column short, erect, broadly winged at the apex above the tube; anther subterminal, incumbent, 2-celled; pollinia 8, waxy, narrowly pyriform. Capsule large, ellipsoid.

The genus consists of about 140 species, which are widely distributed in the Old World tropics, especially Asia. One species and two varieties are found in tropical America.

Calanthe mexicana Reichb. f. *Linnaea* 18: 406. 1844. *Ghiesbreghtia calanthoides* A. Rich. & Gal. *Ann. Sci. Nat.* sér. 3, 3: 28. 1845. Figure 132.

Terrestrial in leaf mold of wet dense forests and barrancas, from 80 to 3,500 meters alt. Widespread in southern Mexico, Guatemala, Costa Rica and Panama, represented in the West Indies by var. *lanceolata* Correll.

Plant coarse, from a short thick rhizome, up to 7 dm. or more tall when in flower. Stem reduced to a short rhizome. Leaves two, basal, opposite, narrowly elliptic to broadly elliptic, abruptly acute, plicate, tapering to the broad petioles that clasp the peduncle, 2-6 dm. long including the petiole, 4-15 cm. wide at the widest point, subtended by two or more membranaceous fibrous appressed sheaths. Peduncle erect, slender, 3-7 dm. long, glabrous below, hispidulous above, naked except for a solitary linear-lanceolate bract. Raceme laxly many-flowered, 6-13 cm. long, usually densely hispidulous. Floral bracts linear-lanceolate, long-acuminate, 1-3 cm. long, about 3 mm. wide near the base. Flowers white or pink, marked with yellow and reddish brown, more or less hispidulous throughout, on slender pedicels that are 4-8 mm. long, with the perianth segments prominently nervose. Sepals ovate-elliptic to elliptic, spreading-recurved and tapering to the acute apex, 8-15 mm. long, 5-7 mm. wide below the middle; lateral sepals oblique.



FIG. 132. *Calanthe mexicana*. Plant ($\times \frac{1}{2}$); upper left, dorsal sepal ($\times 3$); lower left, lateral sepal ($\times 3$); left center, petal ($\times 2\frac{1}{2}$); upper right, lip and spur, front-side view ($\times 2$); lower right, flower, side view ($\times 3$). Drawn by G. W. Dillon.

Petals obovate to cuneate or oblanceolate, rarely linear-elliptic, rounded to broadly acute at the apex, oblique, 7-10 mm. long, 2.5-4 mm. wide near the apex. Lip attached to the column, variable, fleshy, hairy, more or less conduplicate and recurved in natural position, when spread out obovate-cuneate to elliptic or rarely subquadrate, subtruncate to subacute at the apex, sometimes with a small apicule and thickened along the center, produced at the base to form a spur, 4-9 mm. long, 3.5-6 mm. wide above the middle; spur conical, acute, 4-6 mm. long. Column short, thick, with a projecting angle on each side at the apex, 4-5 mm. long. Capsule ellipsoid, pendent, about 3 cm. long.

The flowers of this species are variable in the shape of the lip. In Guatemala, this plant is commonly called "tarsote."

Alta Verapaz: Cobán, *Türkheim* II 1338. Samac, Finca, *Johnson* 605.—Chiquimula: Middle slopes of Montaña Norte to El Jutal on Cerro Brujo, southeast of Concepción de las Minas, *Steyermark* 31066.—Huehuetenango: Trail between Tunimá and Quisil, Sierra de los Cuchumatanes, *Steyermark* 48431. Cerro Huitz, between Barillas and Mimanhuitz, Sierra de los Cuchumatanes, *Steyermark* 48539. Cerro Cananá, between Nucapuxlac and Cananá, Sierra de los Cuchumatanes, *Steyermark* 48999.—Sololá: Volcán Atitlán, south-facing slopes, *Steyermark* 47436.—Zacapa: Middle and upper south-facing slopes of Volcán Gemelos, Sierra de las Minas, *Steyermark* 43270; 43248.

49. BLETIA Ruiz & Pavón

Erect terrestrial herbs with the leaves arising from the top of the corm and the inflorescence borne on a lateral leafless flowering branch. Leaves one to several, often early fugaceous, plicate, petiolate. Inflorescence a simple or branched raceme, rarely one-flowered. Sepals free, the lateral sepals somewhat connate and gibbous at the base, subequal. Petals free, similar to the sepals. Lip attached to the base of the column, free, entire to 3-lobed, arcuate-recurved or spreading; lateral lobes usually broad and upcurved in natural position to clasp the column; mid-lobe erect or recurved, spreading, often emarginate or bilobed; disk mostly lamellate or papilliferous. Column elongate, semiterete, winged above, arcuate, usually biauriculate at the base, essentially without a foot; anther operculate, incumbent; pollinia 8, waxy. Capsule cylindrical to ellipsoid.

This genus contains about fifty species, which are mostly in the American tropics, with a few in Asia. It is comprised of a number of accepted species that are often difficult to distinguish because of apparent intergradations.

1. Lip broadly cordate-rounded at the base. *B. purpurea*.
1. Lip cuneate and tapering at the base.
 2. Disk of the lip papilliferous along the nerves, not lamellate. *B. Roezlii*.
 2. Disk of the lip provided with lamellae.
 3. Lip spreading, less than 1.2 cm. wide across the lateral lobes when spread out. *B. gracilis*.

3. Lip strongly reflexed, more than 1.2 cm. wide across the lateral lobes when spread out.
4. Lip less than 2 cm. long; leaves grass-like. *B. ensifolia*.
4. Lip more than 2 cm. long; leaves usually broad. *B. reflexa*.

Bletia ensifolia L. O. Wms. Bot. Mus. Leafl. Harv. Univ. 12, no. 7: 245. 1946.

Terrestrial on rocky dry wooded hills and ridges, up to 1,700 meters alt. Rare in Mexico and Guatemala.

Plant slender, up to 7 dm. tall. Corms approximate, pyriform, up to 4 cm. long and 1.5 cm. thick. Leaves 8–30 cm. long, 2–8 mm. wide, ensiform to linear-ensiform, acute to acuminate. Inflorescence few-flowered. Floral bracts lanceolate, acuminate, scarious, 4–10 mm. long. Sepals buff-colored with lavender; dorsal sepal about 2 cm. long, 4.5 mm. wide, oblanceolate to elliptic, acute, several-nerved; lateral sepals arcuate, lanceolate to elliptic-lanceolate, acute, several-nerved, about 1.8 cm. long, 5.5 mm. wide. Petals about 2 cm. long, 4.5 mm. wide, oblanceolate, obtuse, slightly oblique, apical portion more or less serrulate. Lip buff-colored with reddish-purple stripes, about 1.8 cm. long and wide, obovate-orbicular in outline, 3-lobed, with several ridge-like thickened veins on the disk with the central ones lightly lamellate; lateral lobes broad, rounded at the apex; mid-lobe short, emarginate. Column 1–1.2 cm. long.

The distinguishing characters of this species are the narrow leaves and the broad lip, which is about as wide as long. It is interesting to note that the lip resembles in shape that of the large-flowered *B. reflexa*. This species is called "cebollin" in Guatemala.

Huehuetenango: Between Democracia and Canyon of Chamushú, *Steyermark* 51086.

Bletia gracilis Lodd. Bot. Cab. 20: t. 1977. 1833.

Terrestrial in loam between granite rocks or in red clay on steep grassy sunny slopes, occasionally in pine-oak forests, up to 2,000 meters alt. Rather common in Mexico, rare in Guatemala.

Plant slender, from a small ovoid corm, with the corm and basal portion enveloped in scarious imbricated sheaths; corm 2.5–3 cm. long, purplish. Leaf solitary, from apex of corm, shortly petiolate, elliptic-ovate, oblong-elliptic or lanceolate, acute to acuminate, plicate, purplish on the lower surface, membranaceous, 5–28 cm. long, 2–6 cm. wide. Peduncle sublateral, slender, wiry, purplish, 15–35 cm. long, supporting 1–several flowers at the summit, provided with several clasping sheaths. Floral bracts triangular-lanceolate, acuminate, up to 1 cm. long. Flowers spreading, with pedicellate ovaries 2.2–2.5 cm. long. Sepals and petals pale purplish, green-yellow or purple-rose. Sepals about equal, oblong-lanceolate, acute-apiculate, 1.8–2.6 cm. long, 5–6 mm. wide. Petals elliptic-obovate to elliptic-lanceolate, obtuse, oblique, 1.7–2.3 cm. long, 7–8 mm. wide. Lip green, veined with dark red and purple, rose-colored below, yellowish green in front, prominently 3-lobed above the middle, obovate-cuneate in outline, 2.2–2.5 cm. long, 1–1.2 cm. wide across the lateral lobes, basal portion of lip often

lamellate but not tuberculate; lateral lobes small, triangular, obliquely rounded-obtuse, upcurved; mid-lobe orbicular-obcordate to orbicular-subquadrate, emarginate, the margins undulate, 8–13 mm. wide, with three or rarely one flesh-red or orange-colored flaplike lamella in the center. Column about 1 cm. long.

This species is similar in habit to *B. Roezlii*. However, it differs primarily from that species in that the flowers have a lamellate instead of a tuberculate lip.

Guatemala (fide Schlechter).

Bletia purpurea (Lam.) DC. Mem. Soc. Phys. Hist. Nat. Genève 9: 97, 100. 1841. *Limodorum purpureum* Lam. Encycl. Meth. Bot. 3: 515. 1791. *Bletia verecunda* (Salisb.) R. Br. in Ait. Hort. Kew. ed. 2, 5: 206. 1813. *B. Pottsii* S. Wats. Proc. Am. Acad. 22: 478. 1887 (type: Guatemala, on dry slopes bordering the Camina Real near El Mico). Figure 133.

Terrestrial or on rocks in dry woods and fields, also on the base of tree trunks, on logs and stumps in swamps or floating on clumps of weeds and grasses in water, up to 2,000 meters alt. Widespread in southern Florida, throughout Central America and the West Indies.

Plant glabrous, consisting of a short thick depressed corm bearing at the summit a few approximate leaves and a lateral flowering branch; corm 2–3 cm. in diameter. Leaves linear to narrowly elliptic-lanceolate, plicate, long-acuminate, the lower part sheathing the scape, 2–9 dm. long, 1–5 cm. wide. Inflorescence a simple or paniculate raceme borne on a long slender lateral peduncle; peduncle provided with remote tubular sheaths, 2.5–17 dm. long. Raceme or panicle open, few- to many-flowered. Floral bracts mostly small, ovate-triangular to ovate-lanceolate, acute to acuminate, 2–9 mm. long. Flowers pink, rose-purple or deep purple, rarely almost white, showy, with slender pedicellate ovaries 9–18 mm. long, variable in size. Dorsal sepal oblong-elliptic to ovate-lanceolate, subobtuse to acute, 1.5–2.6 cm. long, 5–9 mm. wide. Lateral sepals obliquely ovate-oblong to elliptic-oblong, abruptly acute to acuminate, the margins involute, 1.2–2 cm. long, 5–8 mm. wide. Petals obliquely ovate-oblong to elliptic or oblong-lanceolate, obtuse to acute, 1.2–2.1 cm. long, 7–11 mm. wide. Lip broadly cordate, ovate-cordate or cordate-subquadrate when spread out, conspicuously 3-lobed above the middle, strongly recurved in natural position, with the base truncate to subauriculate, 1–1.8 cm. long, 8–14 mm. wide across the lateral lobes; lateral lobes incurved in natural position, broadly rounded at the base, tapering to a triangular-obtuse to rounded apex; mid-lobe suborbicular, truncate to deeply emarginate at the apex, the margins undulate-crenate, 5–10 mm. wide; disk venose, with 5–7 yellowish lamellae extending from near the base of the lip to near the apex of the mid-lobe, with two shorter lamellae on the lateral lobes. Column strongly arcuate, clavellate, with narrow lateral wings, 8–12 mm. long. Capsule obliquely cylindrical, erect or essentially so, reddish or chocolate-brown, 2–4.5 cm. long, 8–10 mm. in diameter.

Like most of the species of *Bletia*, the flowers of *B. purpurea* are variable in size.



FIG. 133. *Bletia purpurea*. 1, plant ($\times \frac{1}{2}$); 2, flower, front view, spread open ($\times 1\frac{1}{2}$); 3, lip and column, side view ($\times 2$); 4, lip, spread out ($\times 2\frac{1}{2}$); 5, fruiting inflorescence ($\times \frac{1}{2}$). Drawn by G. W. Dillon.

Alta Verapaz: Cobán, *Türkheim* 365. Samac, *Johnson* 935. Panzós, *Muenschner* 12566. Slopes above Finca Seamay, *Wilson* 205. Saquijá, 43 km. northeast of Cobán, *Standley* 70163. Above Santa Cruz, *Standley* 71036. Along road between San Cristóbal Verapaz and Chixoy, *Steyermark* 43891. Finca Samac, northwest of Cobán, *Standley* 89647. Between Cobán and Finca Chimoté, near Rubeltein, *Steyermark* 44181. Vicinity of Cobán, *Standley* 92697. Along Río Frío, about 8 km. below Tactic, *Standley* 90547. Near Cobán, *Hunnewell* 17114.—Chimaltenango: Calderas, *Johnston* 1567.—Huehuetenango: Aguacatán, *Skutch* 1923. Near crossing of Río San Juan Ixtán, east of San Rafael Petzal, *Standley* 82955.—Izabal: In graveyard near Virginia, *Lewis* 47. Quiriguá, *Cockerell*. Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38637.—Petén: Lake Zatz, *Lundell* 3323. Sabana Zizha, *Lundell* 2710.—Quezaltenango: Along Río Samalá, near Santa María de Jesús, *Standley* 84797. Finca Pirineos, slopes of Volcán Santa María, between Santa María de Jesús and Calahuaché, *Steyermark* 33185.—Suchitepequez: Finca Mocá, *Skutch* 2067.—Zacapa: Sierra de las Minas, oak-pine woods along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, *Steyermark* 42213. Along Rillito del Volcán de Monos, Volcán de Monos, Sierra de las Minas, *Steyermark* 42410. Sierra de las Minas, trail between Santa Rosalía de Mármol and Vegas, *Steyermark* 42903.

***Bletia reflexa* Lindl. Bot. Reg. 21: t. 1760. 1835.**

Terrestrial, grassy slopes, on rocks on dry hills, in grassy patches between lava rocks and in scrubby open woods, up to 2,800 meters alt. Rather common in Mexico, through Central America to Panama and in (?) South America.

Plant erect or erect-ascending, up to 10 dm. or more tall, from a small subglobose corm; corm small for the plant. Leaves 2-several, sheathing the stem below, plicate, narrowly ensiform to elliptic-lanceolate, long-acuminate, 1.7–4.5 dm. long, 0.8–5 cm. wide. Inflorescence a 2–12-flowered raceme borne on a long slender or stout lateral peduncle. Peduncle provided with remote tubular scarious sheaths, 2.8–9.5 dm. long including the raceme, terete, the base enclosed with the base of the leaf-bearing stem by 2-several imbricated scarious fugaceous sheaths. Floral bracts triangular-ovate to oblong-lanceolate, acuminate, scarious, 5–20 mm. long. Flowers purplish, rather large, showy, the lip usually whitish green below and purple in front, with slender pedicellate ovaries 1.5–2.5 cm. long. Sepals and petals greenish marked with purple. Dorsal sepal linear-ob lanceolate to elliptic-ob lanceolate, acute-apiculate to acuminate, 2.3–4.3 cm. long, 7–14 mm. wide above the middle. Lateral sepals oblong-elliptic to elliptic-lanceolate, acuminate, dorsally carinate above the middle, often strongly reflexed, oblique, 2.3–

4.1 cm. long, 7–15 mm. wide. Petals oblong-obovate to narrowly oblanceolate, obtuse to acute, oblique, 2.3–4 cm. long, 6.5–15 mm. wide. Lip elliptic to cuneate-oblong in outline when spread out, prominently 3-lobed above the middle, arcuate with the lateral lobes and the sides of the middle lobe incurved in natural position, 2.3–4.2 cm. long, 1.6–3 cm. wide across the lateral lobes when expanded; lateral lobes semiobcordate, free portion broadly rounded, the anterior margin irregularly crenate; mid-lobe ovate-oblong, oblong-subquadrate or obcordate, truncate, deeply emarginate or occasionally mucronate at the apex, the margins undulate-crenate, 8–20 mm. long, 8–20 mm. wide; disk traversed in the center by 5 parallel lamellae, the 2–3 central lamellae conspicuously raised about the middle of the lip and on the mid-lobe. Column purple, semiterete, clavate, winged, biauriculate at the base, 2–3 cm. long.

This variable species could be divided into a number of entities. The various forms and size of flowers comprise a graduated series.

Chimaltenango: San Martín, *Johnston* 1244. Between Chimaltenango and San Martín, *Porter* 16. Calderas, *Johnston* 1390.—Guatemala: Plains about Guatemala, *Hayes*; *Tonduz* 693; 740.—Huehuetenango: Near Chiantla, along the river south and east of the town, *Standley* 82470. Cerro Pixpíx, above San Ildefonso Ixtahuacán, *Steyermark* 50632. Huehuetenango, *Skutch* 1634.—Jalapa: Mountains along the road between Jalapa and Paraíso, *Standley* 77301. Cerro Alcoba, just east of Jalapa, *Steyermark* 32499.—Sacatepéquez: Santiago, *Gomez* 910.—Santa Rosa: Casillas, *Heyde & Lux* 4273.—Zacapa: Along Río Lima, Sierra de las Minas, between Río Hondo and summit of mountain at Finca Alejandría, *Steyermark* 29611. Sierra de las Minas, along Rillito del Volcán de Monos, *Steyermark* 42326. Upper slopes along Río Repollal to summit of mountain, Sierra de las Minas, *Steyermark* 42444.—“In woods near the Sapoti baranca,” *Hayes*.

Bletia Roezlii Reichb. f. *Linnaea* 4: 7. 1877. Figure 134.

Terrestrial in thick humus or under brush in clayey soil, occasionally on rocks and in rock crevices in oak-pine forests up to 2,200 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant slender, erect, from a small ovoid corm, the corm and basal part of scape enveloped by several scarios sheaths; corm 2–3.5 cm. long, about 1.5 cm. in diameter. Leaves 1–2, from apex of corm, broadly elliptic to linear-lanceolate, acute to acuminate, purplish on the lower surface, tapering to a narrow sulcate base, 7.5–25 cm. long, up to 6.3 cm. wide. Peduncle lateral, slender, wiry, supporting several flowers at the summit, provided with several scarios clasping sheaths, 2.5–8.5 dm. long, up to 2 mm. in diameter. Floral bracts triangular-lanceolate, acuminate, scarios, 5–12 mm. long. Flowers as many as four, with slender pedicellate ovaries 1.3–2.3 cm. long. Sepals and petals pale brick color, green or yellow-green. Sepals similar, oblong-lanceolate to linear-lanceolate, acute, 1.2–2.5 cm. long, 3.5–6.2 mm. wide; lateral sepals lightly carinate at the

BLETIA *papillifera* Ames



FIG. 134. *Bletia Roezlii* (*B. papillifera*). Plant ($\times 1$); 1, flower, front view, spread out ($\times 1\frac{1}{2}$); 2, flower, side view ($\times 1\frac{1}{2}$); 3, column ($\times 1\frac{1}{2}$). Drawn by Blanche Ames.

somewhat recurved apex. Petals oblong-elliptic to elliptic-lanceolate, acute to acuminate, falcate, the margins lightly erose-crenulate, 1.4–2.3 cm. long, 3.5–7.5 mm. wide. Lip with a yellow throat with radiating red or pansy purple veins or lines, oblong-elliptic to oblong-subquadrate in outline, 3-lobed about the middle, cuneate below the middle, 1.4–2.6 cm. long, 1–1.4 cm. wide across the lateral lobes; lateral lobes semicuneate or triangular, obliquely obtuse, upcurved; mid-lobe orbicular-obcordate, emarginate, 7–13 mm. wide; disk papilliferous along the nerves up to the base of the middle lobe, the papillae purplish. Column dilated upward, with a rounded purplish wing or lobe on each side at the base.

According to Steyermark, this species is known as “cebollin de tierra” in Guatemala where the inside of the glutinous corms is used for gluing things together.

Guatemala: *I. Aguilar* 114.—Huehuetenango: Between San Sebastián H. and large peñasco above town, *Steyermark* 50500.—Jalapa: Incienso, Aserradero de San Vicente, also along road to San Juan Sacatepéquez, *Lewis* 204.—Santa Rosa: Cenaguilla, *Heyde & Lux* 3862 (in part).

50. CHYSIS Lindl.

Epiphytic or rock-inhabiting herbs with fleshy fusiform pseudobulbous stems that are provided with sheaths and support several leaves at the summit. Leaves long, plicate, nervose. Peduncle lateral, from the nodes of the old pseudobulbs, the base often enveloped by leaves. Flowers several, showy. Floral bracts small or large and foliaceous. Sepals subequal, free, spreading; lateral sepals broader than the dorsal, obliquely adnate to the column-foot with the lateral margins connate to form a mentum. Petals similar to the dorsal sepal. Lip shortly adnate to the column-foot, incumbent, erect, 3-lobed; lateral lobes broad, erect-incurved; mid-lobe spreading or reflexed, entire to somewhat 2-lobed; disk venose, with several parallel lamellae on the lower part. Column erect, incurved, thickened, broadly 2-winged, produced into a foot at the base; anther affixed to a dorsal tooth, operculate, incumbent, 2-loculate with each locule imperfectly 2–4-celled; pollinia 8, waxy. Capsule obovoid-ellipsoid.

This is a small genus of less than a half dozen species, which are limited to Mexico, Central America and Andean South America. The two species native to Guatemala are so closely allied that they are not clearly separated. It is quite possible that they should be considered as only varietally different.

Floral bracts usually more than 2.5 cm. long; pedicellate ovaries less than 2 cm. long; sepals and petals white. *C. bractescens*.

Floral bracts usually less than 2.5 cm. long; pedicellate ovaries commonly more than 2.5 cm. long; sepals and petals yellow. *C. aurea*.

***Chysis aurea* Lindl. Bot. Reg. 23: t. 1937. 1837. Figure 135.**

Epiphytic in dense shade of humid forests and in dense palm thickets, up to 1,700 meters alt. Widespread but not common

from Mexico through Central America to Panama, Colombia and Venezuela.

Plant rather coarse, pendent, 7.5 dm. or more tall. Pseudobulbs fusiform-elongate, flattened-terete, stipitate, nearly concealed when young by large scarios sheaths, up to 45 cm. long. Leaves several, from the apex of the pseudobulbs, articulated with the leaf-sheaths, oblong-lanceolate, acuminate, undulate, nervose, membranaceous, up to 45 cm. long and 6 cm. wide. Peduncle lateral, about as long as or longer than the leaves, bearing 6-12 flowers, provided with several bracts. Floral bracts triangular to ovate-lanceolate, acuminate, concave, up to 2.5 cm. long. Flowers with lemon-yellow sepals and petals that are occasionally marked with brown and a whitish lip marked with maroon or dull brown, with pedicellate ovaries up to 3.5 cm. long. Dorsal sepal linear-oblong to oblong-elliptic, obtuse to rounded at the apex, 3-4.5 cm. long, 8-15 mm. wide. Lateral sepals triangular-lanceolate, obtuse to shortly subacuminate, conspicuously falcate, adnate to the column-foot to form a mentum, with the margins usually crisped, 2.5-3.5 cm. long, 1.2-2 cm. wide across the base. Petals obovate-oblongate, rounded to subobtuse at the apex, strongly falcate, with undulate-crisped margins, 3-4 cm. long, 7-15 mm. wide above the middle. Lip strongly arcuate near the base, deeply 3-lobed, concave below, 2-2.5 cm. long, when spread out broadly cuneate-obovate in outline and 2.5-3.5 cm. wide across the lateral lobes; lateral lobes oblong, obtuse to rounded at the apex, somewhat falcate, upcurved in natural position, the free portion about 7 mm. wide; mid-lobe suborbicular to transversely elliptic, shallowly emarginate, the margins undulate-crisped, up to 2.3 cm. wide; disk with 3-5 yellowish white velvety keels extending from the base of the lip to the base of the mid-lobe. Column light yellow, incurved, with a prominent foot, about 1.5 cm. long. Capsule obovoid, up to 8 cm. long.

San Marcos: Above Finca El Porvenir, up Cerro de Mono, south-facing slopes of Volcán Tajumulco, *Steyermark* 37416.—Suchitepequez: Slopes of Volcán Zunil, between Finca Montecristo and Finca Asturias, southeast of Santa María de Jesús, *Steyermark* 35307.

The following collection is in fruit but probably represents this species: Alta Verapaz: Along road, between San Cristobal Verapaz and Chixoy, *Steyermark* 43906.

Chysis bractescens Lindl. Bot. Reg. 26: Misc. p. 61. 1840. Figure 136.

Epiphytic on trees and on calcareous rocks in humid forests, up to 850 meters alt. Rare in Mexico, Guatemala and British Honduras.

Plant coarse, stout, up to 5 dm. or more tall. Pseudobulbs thickened, fusiform, nearly concealed when young by whitish scarios sheaths, up to 30 cm. long and 4 cm. in diameter. Leaves at the summit of the pseudobulbs, linear-lanceolate to oblong-lanceolate, acuminate, undulate, up to 40 cm. long and 6 cm. wide. Peduncle lateral, from the lower nodes of the old pseudobulbs, often with the base enveloped in leaf-sheaths, stout, usually shorter than the leaves, bearing 4-8 large flowers, provided with several foliaceous bracts. Floral bracts large, foliaceous, triangular-ovate to suborbicular-ovate, acute to acuminate,



FIG. 135. *Chysis aurea*. Plant ($\times \frac{1}{3}$). Drawn by Dorothy O. Allen.

CHYSIS *bractescens* Lindl.

(*THORVALDSENIA speciosa* Liebm.)



FIG. 136. *Chysis bractescens*. Plant ($\times \frac{2}{3}$). Drawn by G. W. Dillon.

deeply concave, green, up to 4.5 cm. long. Flowers with ivory-white petals and sepals and a yellow lip marked with red-purple, the segments coriaceous-thickened, with a thick short pedicellate ovary 1.5–1.8 cm. long. Dorsal sepal oblong, obtuse to rounded at the apex, 3.8–4.5 cm. long, 1.5–2.3 cm. wide. Lateral sepals obliquely ovate-triangular, obtuse, 3.5–4 cm. long, about 2 cm. wide at the base, adnate to the column-foot to form a prominent mentum. Petals obliquely oblong-spatulate, obtuse to rounded at the apex, the margins crisped, 3.5–4.5 cm. long, 1.6–2.3 cm. wide above the middle. Lip suborbicular-flabellate in outline when spread out, deeply 3-lobed, 2.5–3.5 cm. long, up to 4 cm. wide across the lateral lobes when spread out; lateral lobes oblong, rounded at the apex, falcate, upcurved in natural position; mid-lobe obovate-subquadrate to suborbicular-obcordate, emarginate, 1.8–2.2 cm. wide; disk with 5–7 parallel velvety-pubescent lamellae extending from the base of the lip to the base of the mid-lobe. Column fleshy, incurved, white and yellow, produced into a long foot at the base, about 1.2 cm. long.

Alta Verapaz: Cubilgüitz, *Türckheim* 7988.—Izabal: Virginia, *Spinden*.

51. BULBOPHYLLUM Thou.

Repent epiphytic herbs with the creeping rhizome more or less covered with scariosus sheaths. Pseudobulbs stout, sessile, arising at intervals along the rhizome, unifoliate or bifoliate. Inflorescence lateral, from the base of the pseudobulbs, leafless, simple, provided with sheaths, the rachis sometimes swollen. Flowers small (in our specimens), numerous, in a spike. Dorsal sepal free. Lateral sepals adnate to the column-foot, otherwise free or connate. Petals much smaller and shorter than the sepals. Lip simple (in ours) or 3-lobed, articulated with the column-foot, incumbent on the column-foot, recurved, variously thickened. Column erect, short, produced at the base into a foot, with a pair of aristate terminal teeth (in ours) or wings; anther operculate, terminal, incumbent, generally 2-celled; pollinia normally 4, waxy. Capsule globose, ovoid or ellipsoid.

This genus attains its greatest development in the eastern hemisphere, where about 500 species are scattered mainly through tropical regions of Africa, Asia and Australasia. Only a few species are found in the western hemisphere.

Petals aristate, membranous; capsule rugose-corrugated *B. aristatum*.
 Petals obtuse, fleshy-thickened; capsule smooth *B. pachyrhachis*.

Bulbophyllum aristatum (Reichb. f.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 213. 1883. Figure 137.

Epiphytic on trees in humid forests or open pine forests, up to 1,500 meters alt. Uncommon from Mexico through Central America to Panama.

Plant pendent, composed of numerous bifoliate pseudobulbs (arising at intervals from a rather stout rhizome) and lateral inflorescences. Rhizome about 5 mm. in diameter, provided with imbricated scariosus sheaths. Pseudobulbs ovoid-conical, angular, 4–6 cm. long, 2–3 cm. in diameter, subtended by two or

more scarious sheaths. Leaves two, at the summit of the pseudobulbs, linear-oblong, obtuse, coriaceous, 10–27 cm. long, 1–3.3 cm. wide. Inflorescence a small-flowered lateral spike, up to 5.5 dm. long including the peduncle; peduncle 3–4 mm. in diameter, usually much longer than the spike, provided with scarious amplexicaul sheaths at the nodes; rachis somewhat swollen, slightly thicker than the peduncle. Floral bracts triangular-ovate, obtuse, concave, scarious, 4–6 mm. long, 3.5–5 mm. wide near the base. Flowers numerous, occasionally con-

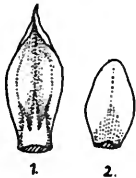


FIG. 137. *Bulbophyllum aristatum*. 1, petal ($\times 5$). *B. pachyrhachis*. 2, petal ($\times 5$).

gested, purple or dark red and commonly marked with white stripes, the sepals sometimes dull green with numerous small red dots. Sepals 3-nerved, caudate, occasionally with a thin loose yellowish readily deciduous membrane covering the inner surface, lepidote on the outer surface, 5–6 mm. long, 2–2.5 mm. wide; dorsal sepal elliptic-lanceolate, concave-cymbiform; lateral sepals obliquely triangular-lanceolate, the posterior margin slightly inrolled, adnate to the column-foot. Petals elliptic to elliptic-lanceolate, aristate, ciliolate on the margins, membranous, 3.4–4 mm. long, about 1.5 mm. wide. Lip articulated with the column-foot, very fleshy, 3-angled in cross section, incumbent, lingulate, obtuse, minutely papillose along the margins, 2–2.5 mm. long, 1.3–1.8 mm. wide. Column short, stout, with lateral aristate teeth at the apex, produced at the base into a foot, about 2 mm. long. Ovary stout, lepidote, with a bracteole on each side extending from the base to between the dorsal and lateral sepals where the bracteoles are produced into a free triangular tip. Capsule obliquely ellipsoidal, rugose-corrugated, with six broad keels, about 8 mm. long and 5 mm. in diameter.

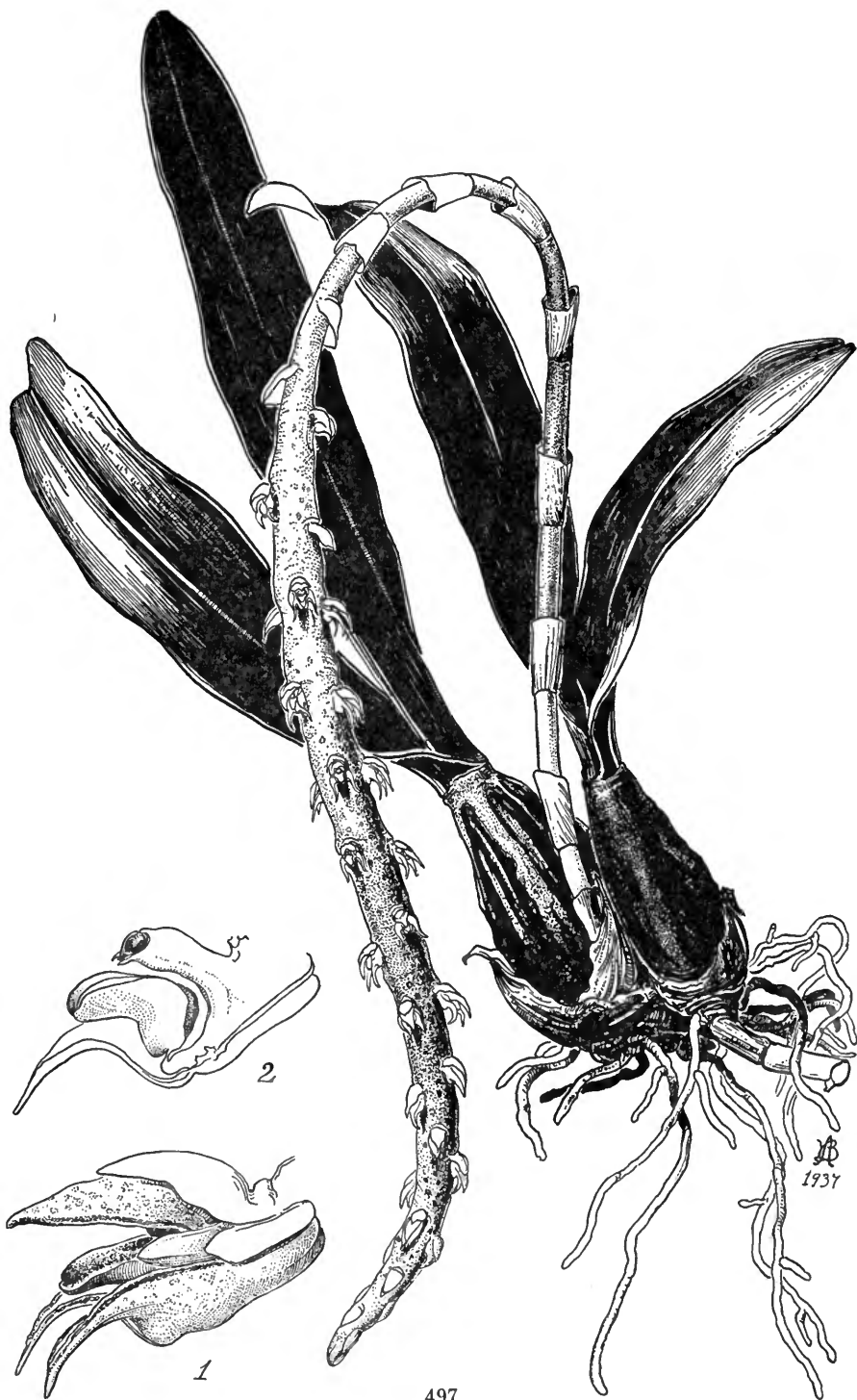
This species is distinguished from *B. pachyrhachis*, to which it is closely allied, by the aristate petals and rugose-corrugated capsules.

Alta Verapaz: Vicinity of caves, southwest of Lanquín, *Steyermark* 44125.—Petén: Chicbul, La Libertad, *Lundell* 2636.

Bulbophyllum pachyrhachis (A. Rich.) Griseb. Fl. Brit. W. Ind. 613. 1864, as *Bolbophyllum pachyrrhachis*. *Pleurothallis pachyrachis* A. Rich. in La Sagra, Hist. Cub. 11: 234. t. 74. 1850. Figures 137, 138.

Epiphytic on trees in humid forests and thickets, up to 600 meters alt. Widespread from Mexico through Central America to Panama and the West Indies.

FIG. 138. *Bulbophyllum pachyrhachis*. Plant ($\times 1$); 1, flower, side view ($\times 5$); 2, flower, cross section with petals, dorsal sepal, and one lateral sepal removed, side view ($\times 5$). Drawn by Blanche Ames.



Plant pendent, composed of numerous bifoliate pseudobulbs (arising at intervals from a slender rhizome) and lateral inflorescences. Rhizome 2-5 mm. in diameter, provided with sheaths. Pseudobulbs ovoid-conical, 4-angled, 2-5 cm. long, 8-15 mm. in diameter, subtended by two or more scarious sheaths. Leaves two, at the summit of the pseudobulbs, linear-oblong to linear-oblongate, obtuse, somewhat leathery, 7-19 cm. long, 0.8-2.3 cm. wide. Inflorescence a lateral stipitate spike of small flowers, 1-4.5 dm. long including the peduncle; peduncle slender, about as long as or shorter than the spike, 1-2 mm. in diameter, provided with small scarious amplexicaul sheaths at the nodes; rachis swollen, fleshy, 3-6 mm. in diameter. Floral bracts triangular-ovate, acute, 2-5 mm. long, 2.5-3.5 mm. wide when spread out, scarious. Flowers numerous, green-yellow and spotted with purple or wine-colored. Sepals 3-nerved, smooth or occasionally lepidote, triangular-ovate to ovate-lanceolate, acuminate-caudate, 4.5-7 mm. long, 1.5-3 mm. wide below the middle; dorsal sepal concave-cymbiform; lateral sepals adnate to the column-foot, obliquely recurved. Petals 1-nerved, oblong-elliptic, obtuse, fleshy-thickened, 1.7-2 mm. long, about 1 mm. wide. Lip thick and fleshy, 3-angled in cross section, with the thick 3-angled claw articulated with the column-foot, incumbent, lingulate-elliptical, obtuse, slightly sulcate below the middle, about 2.5 mm. long and 1.5 mm. wide. Column short, 3-toothed at the apex, 1.5-2 mm. long, produced into a foot at the base; foot about 2 mm. long. Ovary with a bracteole on each side extending from the base to between the dorsal and lateral sepals where the bracteoles are produced into free triangular tips. Capsule obliquely ellipsoidal, smooth, with six broad keels, 8-10 mm. long, about 5 mm. in diameter.

Alta Verapaz: Cubilgüitz, *Türckheim* 7997.—“Eastern portion of Vera Paz and Chiquimula,” *Watson* 356b.

EXCLUDED SPECIES

Bulbophyllum sordidum Lindl. Bot. Reg. 26: Misc. p. 89. 1840.

Reichenbach (in Walp. Ann. 6: 242. 1861) attributed this plant to Guatemala under the name *Bulbophyllum sordida*. Kew Index places this plant in *Bulbophyllum bracteolatum* Lindl., from Guiana, northern South America. We have seen no material from Guatemala.

52. EULOPHIA R. Br.

Rather large terrestrial (rarely epiphytic) scapose herbs arising from thickened rhizomes or corms. Leaves several, clustered, sheathing the lower part of the scape. Inflorescence a loose or dense few- to many-flowered lateral raceme, arising at the base of the corms. Sepals and petals free; lateral sepals sometimes adnate to the base of the column. Lip articulated with the foot of the column, saccate at the base, 3-lobed; lateral lobes erect and embracing the column; mid-lobe spreading or recurved, mostly entire (occasionally bilobed); disk naked or crested. Column short, often with two lateral wings; anther terminal, incumbent, operculate, imperfectly 2-celled; pollinia 2 or 4, waxy. Capsule ellipsoid or ovoid, erect or pendent.

This is a large genus comprising about 200 species, which are widely diffused through the tropics of both hemispheres. It is most numerous in Africa, and rare in Malaya, Polynesia, Australia, and tropical and subtropical America.

Eulophia alta (L.) Fawc. & Rendle, Fl. Jam. 1: 112. pl. 22, figs. 4-8. 1910. *Limodorum altum* L. Syst. Nat. ed. 12, 2: 594. 1767. Figure 139.

Terrestrial in savannas, swamps, open fields, open pinelands, hammocks, shady places along streams and on grassy open hillsides, usually at low elevations, up to 1,000 meters alt. Widely distributed in southern Florida, Mexico, through Central America to Panama, the West Indies, Trinidad and northern South America; also Africa (probably introduced).

Plant erect, coarse, from a bulbous corm, 7.5-15 dm. tall. Corm 4-6 cm. in diameter. Stem short, mostly concealed by elongated tubular membranaceous sheaths. Leaves 3-4, clustered, from the summit of the corm, sheathing the short stem, elliptic-lanceolate, plicate, 2-12 dm. long, 3-11 cm. wide. Inflorescence a lax many-flowered lateral raceme, from the base of the corm (the flowers often opposite or verticillate along the rachis), up to 10.5 dm. long including the peduncle; peduncle up to 1 cm. in diameter. Floral bracts ovate-lanceolate to linear-subulate, acuminate, 1-3 cm. long. Flowers numerous, as many as 60 or more, greenish or bronze with the lip marked with purple, with slender arcuate pedicellate ovaries that are 1.5-2 cm. long. Sepals elliptic-oblong to oblong-lanceolate, acute to acuminate, often slightly dilated above the middle, 1.5-2.6 cm. long, 5-7.5 mm. wide above the middle; dorsal sepal shorter than the lateral sepals; lateral sepals oblique, adnate to the column-foot. Petals broadly oblong-spatulate to oblanceolate, obtuse to broadly rounded at the apex, 1.5-1.8 cm. long, 6-8 mm. wide above the middle. Lip articulated with the column-foot, brownish green, tinged and veined with purple, 3-lobed, saccate at the base, the terminal half strongly recurved downward, 1.8-2.5 cm. long, 1.4-1.6 cm. wide across the lateral lobes when spread out; lateral lobes incurved and embracing the column in natural position, the free part short and broadly rounded at the apex; mid-lobe ovate-orbicular, broadly rounded at the apex, with the margins undulate-crested and somewhat erose, 8-12 mm. wide; disk with two erect flap-like subquadrate callus-like projections on the posterior rim of the saccate base, papillose-crested along the central veins. Column erect, with a broad shallow foot at the base and shallow lateral wings above, 7-9 mm. long, arcuate, compressed. Capsule ellipsoid, pendent, 3-3.5 cm. long, about 1.2 cm. in diameter.

The flowers of this species are variable in size. It is commonly called "cebollin," or "amol." The corms are used for gluing purposes.

Alta Verapaz: Cubilgüitz, *Türckheim* 8612.—Baja Verapaz: Finca San José, *Lewis* 212.—Huehuetenango: Between Finca San Rafael and Finca Providencia, *Steyermark* 49558. Ciénaga de Lagartero, below Mira-mar, *Steyermark* 51557. Trail between Demo-



FIG. 139. *Eulophia alta*. 1, plant ($\times \frac{1}{6}$); 2, inflorescence ($\times \frac{3}{4}$); 3, lip and column, front view, lip spread open ($\times 1\frac{2}{3}$). Drawn by Blanche Ames.

cracia and Santa Ana Huista, Sierra de los Cuchumatanes, *Steyermark* 51289.—Quezaltenango: Colomba, *Skutch* 1303.

53. CYRTOPODIUM R. Br.

Large epiphytic, terrestrial or rock-inhabiting herbs with long fusiform pseudobulbs that bear several membranaceous leaves near the summit and a lateral flowering branch at the base. Inflorescence a large spreading panicle of numerous flowers. Flowers inconspicuous because of their coloration. Perianth parts free, spreading. Lip inserted on the foot of the column, 3-lobed; lateral lobes incurved over the column; mid-lobe with a verrucose apical margin; disk adorned with a callus. Column semiterete, dilated above, produced into a foot at the base; anther terminal, incumbent, operculate; pollinia 2 or 4, contiguous, waxy.

This is a small genus of perhaps less than a dozen species which are confined to the tropics and subtropics of the western hemisphere.

Cyrtopodium punctatum (L.) Lindl. Gen. & Sp. Orch. Pl. 188. 1833. *Epidendrum punctatum* L. Syst. Nat. ed. 10, 2: 1246. 1759. Figure 140.

Epiphytic or terrestrial, on various species of dead or living trees, logs and stumps, and on boulders or in soil between rocks, up to 1,400 meters alt., mostly at low elevations. Widespread and fairly common in southern Florida, Mexico, Guatemala, Costa Rica, the West Indies and south to Argentina.

Plant large, glabrous, spreading and much-branched, up to 1.2 meters or more tall. Pseudobulbs clustered, erect, rigid, elongate-fusiform, with numerous articulations, leafy when young, 15–40 cm. long (rarely 1 meter), 1.5–3.5 cm. in diameter, when young concealed by large grayish-white inflated scarious sheaths, the sheaths distichously imbricated. Leaves linear to elliptic-lanceolate, acute to long-acuminate, plicate, distichous, approximate, spreading, recurved and finally drooping, 1–6.5 dm. long, 1–5 cm. wide. Inflorescence lateral, paniculate, with a stout peduncle; peduncle provided with large scarious sheaths. Bracts subtending the branches of the inflorescence and the flowers ovate-oblong to oblong-lanceolate, acute to acuminate, with strongly undulate margins, similar to the sepals in coloration and markings, 1.5–12 cm. long, 7–20 mm. wide. Flowers numerous, with slender pedicellate ovaries that are 2.5–3.5 cm. long. Sepals greenish-yellow, irregularly marked with madder-brown spots, oblong-lanceolate to elliptic-lanceolate or oval, acute, with the margins strongly undulate, 0.7–2.6 cm. long, 7.5–11 mm. wide. Petals broadly oblong-ovate to oblong-obovate, mostly with a short slender claw, somewhat undulate-cripsed on the margins, with the apex subtruncate, broadly rounded or obtuse (rarely mucronate), bright yellow, sparingly spotted with madder-brown, 1.3–2.1 cm. long, 8.5–12 mm. wide. Lip inserted by a narrow claw on the foot of the column, 3-lobed, almost twice as wide as long, 1.1–1.6 cm. long, 1.7–2.2 cm. wide; lateral lobes obliquely and broadly obovate or rounded, erect, arching over the column, madder-brown,

yellow at the base, 8-9 mm. long, 8-10 mm. wide; mid-lobe short, rigid, much broader than long, with a crisped erose-tuberculate broadly rounded apical margin, madder-purple with a yellow center, 7.5-10 mm. wide; disk provided with a median fleshy grooved callus extending from the base to midway between the lateral lobes; sinus between the median and lateral lobes 2-3 mm. deep. Column clavellate, subapiculate, with a foot projected forward at right angles to the column, about 7 mm. long. Capsule large, oblong-oval, up to 8 cm. or more long, 3-5 cm. in diameter.

The "cow's horn" orchid, a rather ungainly plant, produces a large panicle of very attractive flowers. The plant often grows in dense masses in shallow soil on boulders exposed to full or partial sunlight. A paste used in book-binding is extracted from the large hornlike pseudobulbs.

Izabal: Motagua River, near Managuá, *Lewis* 226.—Petén: Sabana San Francisco, La Libertad, *Lundell* 2131.—Quiché: *José Ignacio Aguilar* 1056.—Zacapa: Sierra de las Minas, Valley of Vegona, between Vegas and Calera, *Steyermark* 42978.—Alotenango, *Johnston* 1579.

54. GOVENIA Lindl.

Terrestrial herbs with a rhizome sometimes thickened into tuber-like pseudobulbs, with one or two leaves and several elongated sheaths at the base; sheaths sometimes conspicuously inflated. Leaves ample, plicate, with many veins, articulate with the leaf-sheaths. Peduncle slender or stout, simple, provided with one or more clasping sheathing bracts. Inflorescence a terminal few- to many-flowered raceme. Floral bracts narrow, rarely exceeding the pedicellate ovary. Flowers colorful, congested or distant. Dorsal sepal incurved, longer and narrower than the lateral sepals. Lateral sepals falcate or decurved, at the base forming a short mentum with the foot of the column. Petals similar to the lateral sepals. Lip attached to the foot of the column, articulate, arcuate and longitudinally concave in natural position, conforming with the column, simple and ecallose, usually shorter than the sepals and petals. Column incurved, semiterete, winged on the anterior margins, produced into a short foot at the base; clinandrium truncate; anther terminal, opercular, incumbent, very convex, sometimes crested on the back, 1-celled; pollinia 4, waxy, broadly ovate, compressed, without appendages, on the dehiscence of the anther attached by an oblong or broad stalk, gland small or dilated. Capsule ellipsoid, without a beak.

Govenia is a small genus of eight species and varieties scattered throughout Middle and South America, with one species in the West Indies. It is a difficult genus, from a systematic viewpoint. The

FIG. 140. *Cyrtopodium punctatum*. Plant (about $\times \frac{1}{2}$); flowers, from a many-flowered panicle ($\times 1$); 1, lip and column, spread out ($\times 2$); 2, column, side view ($\times 3$); 3, pollen masses (much enlarged). Drawn by Blanche Ames.



1

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3

flowers are variously colored but are quite similar in most of the species when seen in a dried state.

1. Lip more or less panduriform when spread out, abruptly tapering on the upper third to the acute-apiculate apex, with the tapering margins erose-crested.
2. Leaves two, large, always exceeding the inflorescence. *G. mutica*.
2. Leaf solitary, small, shorter than the inflorescence. *G. mutica* var. *Purpusii*.
1. Lip ovate to ovate-elliptic, not tapering on the upper third, obtuse to subacute, not crested above.
3. Flowers yellow to yellowish brown, variously marked with reddish brown; inflorescence usually many-flowered and elongated. *G. superba*.
3. Flowers white or light cream-colored, variously marked and tinged with reddish brown and light purple.
4. Inflorescence usually somewhat elongated, not capitate, usually less than 8 cm. in diameter; sepals 2.5 cm. or less long. *G. utriculata*.
4. Inflorescence usually more or less capitate, up to 10 cm. in diameter; sepals occasionally up to 4 cm. long. *G. utriculata* var. *capitata*.

Govenia mutica Reichb. f. Bot. Zeit. 10: 856. 1852.

Terrestrial in rich soil among rocks and on rotten logs in jungles, second-growth forests and barrancas, up to 1,150 meters alt. Uncommon in Mexico and Guatemala.

Plant large, up to 7.5 dm. tall, subtended at the base by large tubular sheaths that are up to 25 cm. or more long. Peduncle stout, provided with two or more clasping sheathing bracts that are up to 7 cm. long. Leaves two, large, exceeding the inflorescence, articulate with the leaf-sheaths, broadly elliptic to elliptic-ovate, abruptly acuminate, plicate, up to 40 cm. long and 14 cm. wide. Raceme laxly many-flowered, up to 14 cm. long and 6.5 cm. in diameter. Floral bracts chartaceous, elliptic-lanceolate, acute, up to 1.5 cm. long. Flowers white, pinkish white or cream-colored, adorned with reddish brown spots at apex of lip and sometimes with a few spots scattered on the other floral segments, with slender pedicellate ovaries that are about 2 cm. long. Floral segments all 5-nerved. Dorsal sepal linear to linear-elliptic, narrowly obtuse, 1.2–1.9 cm. long, 2–3.5 mm. wide. Lateral sepals elliptic-lanceolate to narrowly lanceolate, falcate, recurved at the obtuse to acute apex, 1–1.4 cm. long, 2.5–3.8 mm. wide. Petals narrowly elliptic-lanceolate to elliptic-oblancheolate, oblique, subobtuse to shortly acuminate at the recurved apex, 1–1.6 cm. long, 3.5–4 mm. wide above the middle. Lip arcuate in natural position, when spread out more or less constricted about the middle so that it appears panduriform, in outline ovate-lanceolate to oblong-subquadrate or rarely obovate, rounded at the base, with the upper third irregularly crenulate or erose and abruptly tapering to the apiculate apex, 7–9 mm. long, 3.5–4.7 mm. wide at the widest point. Column stout, winged on the anterior margins, 6–7 mm. long. Capsule ellipsoid, pendent, about 3.5 cm. long.

Govenia mutica differs from other Guatemala members of this genus primarily by its somewhat panduriform, acute-apiculate lip.

Alta Verapaz: Tukurú, Johnson 1002.—Quezaltenango: Finca Helvetia, Skutch 1386.—San Marcos: Salas 93.

Govenia mutica Reichb. f. var. **Purpusii** (Schltr.) Correll, *Lloydia* 10: 222. 1947. *Govenia Purpusii* Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 412. 1918; Schltr. Repert. Sp. Nov. Beih. 59: t. 61, fig. 421. 1931. *Govenia liliacea* (Llave & Lex.) Lindl. var. *Purpusii* (Schltr.) L. O. Wms. Bot. Mus. Leaflet. Harv. Univ. 7: 146. 1939.

Terrestrial in cool rocky places in oak-pine forests, at high elevations, up to 3,600 meters alt. Rare in Mexico, Guatemala and Honduras.

Plant small, 1.5–4.2 dm. tall, subtended at the base by small tubular sheaths that are up to 12 cm. long. Peduncle slender, provided with a solitary sheathing bract that is up to 3.5 cm. long. Leaf solitary (rarely two when young), small, lanceolate to narrowly elliptic, acute to acuminate, plicate, up to 20 cm. long and 5 cm. wide, shorter than the inflorescence. Raceme usually much exceeding the leaf (rarely shorter than the leaf), few-flowered, up to 6 cm. long. Floral bracts linear-lanceolate, acuminate, up to 1.3 cm. long. Flowers three to about eight, white or white with the tips of the segments lavender-tinged, with reddish brown spots on the apex of the lip and often sparsely scattered on the other floral segments, occasionally with reddish cross-striations on the petals, with slender pedicellate ovaries that are up to 2 cm. long. Floral segments similar to those of the typical form but sometimes broader.

Florally, var. *Purpusii* is almost identical with the typical form, although it has several differences in gross morphology, besides occurring at much higher elevations. The few-flowered short inflorescence, which normally exceeds the solitary leaf, and the solitary sheath present on the peduncle are obvious characters that separate it from typical *G. mutica*.

Sololá: Volcán Santa Clara, south-facing slopes to summit, *Steyermark* 46984. Volcán Atitlán, south-facing slopes, *Steyermark* 47488.

Govenia superba (Llave & Lex.) Lindl. ex Lodd. Bot. Cab. 18: t. 1709. 1831; Lindl. Bot. Reg. 21: pl. 1795. 1836 (plate dated 1835). *Maxillaria superba* La Llave & Lex. Nov. Veg. Descr. (Orch. Opusc.) 2: 13. 1825. Figure 141.

Terrestrial in moist soil and leaf mold in oak-pine forests and rocky woodlands, up to 2,700 meters alt. Rather common in Mexico, less frequent in Guatemala, El Salvador, Costa Rica, Panama, Colombia, and Venezuela.

Plant large, up to 10 dm. or more tall, subtended at the base by large tubular sheaths; sheaths more or less inflated, up to 25 cm. long. Peduncle stout, provided with a clasping sheathing bract on the upper third. Leaves two, large, shorter than the inflorescence, articulate with the leaf-sheaths, broadly elliptic to obovate-elliptic, rounded and apiculate to abruptly and shortly acuminate at the apex,



FIG. 141. *Govenia superba*. Plant (about $\times \frac{2}{3}$). Sketched by G. W. Dillon; completed by D. E. Tibbitts.

up to 40 cm. long and 15 cm. wide. Raceme cylindrical, elongated, laxly many-flowered, up to 35 cm. long and 7 cm. in diameter. Floral bracts linear-lanceolate to elliptic-lanceolate, acuminate, somewhat shorter than the pedicellate ovaries. Flowers fragrant, yellow, yellowish brown or greenish yellow, with reddish brown spots on the upper part of the lip, floral segments often with a reddish design and occasionally suffused with reddish brown, with slender purplish pedicellate ovaries that are up to 2 cm. long. Floral segments 5-nerved. Dorsal sepal linear-oblancheolate, obtuse, 1.4–2 cm. long, 3–5 mm. wide above the middle. Lateral sepals falcate-lanceolate, obtuse to acute, 9–13 mm. long, 3–5 mm. wide. Petals obliquely elliptic-oblancheolate, obtuse to subacute, 1–1.9 cm. long, 3.5–6 mm. wide above the middle. Lip arcuate in natural position, when spread out broadly ovate to ovate-elliptic, rounded to obtuse or apiculate at the apex, 6–11 mm. long, 3.5–7 mm. wide near the base. Column stout, arcuate, winged on the ventral surface, 5–9 mm. long.

Govenia deliciosa Reichb. f. was reported from Guatemala (in Bull. Herb. Boiss. 7: 544. 1899). However, this report was based on a specimen (*Seler* 2325) that is referable to *G. superba*.

Alta Verapaz: Cobán, *Türckheim* II 1927 (probably).—Baja Verapaz: Patal, *Türckheim* II 2343.—Chiquimula: Upper slopes of Montaña Tajuran, in vicinity of El Barriol, *Steyermark* 30832.—Huehuetenango: *Seler* 2325.—Quezaltenango: *Skutch* 821.—Santa Rosa: Volcán Jumaytepeque, *Heyde & Lux* 4619 (probably).—Sololá: Trail between village of San Pedro, via San Juan, San Cristóbal, Buena Vista, and northwestern slopes of Volcán Santa Clara, *Steyermark* 47312.—“Road to Puerta Parada near Finca Socorro,” *Lewis* 93.

Govenia utriculata (Sw.) Lindl. Bot. Reg. 25: Misc. p. 47. 1839.

Terrestrial in rich humus of dense or open moist oak-pine forests and thickets, up to 3,000 meters alt. Widespread from Mexico through Central America to Panama, in South America to Argentina and in the West Indies.

Plant large, up to 9 dm. tall, subtended at the base by several brown scarios tubular sheaths; sheaths more or less inflated, up to 22 cm. long. Peduncle stout, provided with one or more clasping sheathing bracts. Leaves two (rarely one), large, articulate with the leaf-sheaths, obovate-lanceolate to oblanceolate or broadly elliptic, obtuse to acute or more or less abruptly acuminate, plicate, up to 6 dm. long and 15 cm. wide. Raceme laxly few- to many-flowered, 6–15 cm. long, cylindrical. Floral bracts linear-lanceolate to elliptic-lanceolate, acute to acuminate, shorter than the pedicellate ovaries. Flowers white or light cream-colored, often tinged with light purple or lilac on the outer surface and adorned on the inner surface with reddish brown spots and transverse bands and lines of light purple, with slender purplish pedicellate ovaries that are up to 2 cm. long. Sepals 5-nerved; dorsal sepal elliptic-oblancheolate to elliptic-oblong, broadly obtuse to subacute at the apex, 1.3–2.5 cm. long, 3–7 mm. wide above

the middle; lateral sepals elliptic-obovate to elliptic, falcate, obtuse, 1–1.5 cm. long, 3–6 mm. wide above the middle. Petals 5- to 6-nerved, elliptic to elliptic-oblongate, oblique, obtuse to subacute, 1–2.2 cm. long, 5–9 mm. wide above the middle. Lip 5-nerved, with a short claw, arcuate in natural position, ovate to ovate-elliptic when spread out, rounded to obtuse or subacute at the apex, 6.5–12 mm. long, 4–8 mm. wide near the base. Capsule pendent, ellipsoid, about 3 cm. long.

Govenia utriculata and *G. superba* are not morphologically very distinct either in vegetative or floral structure. They are best distinguished by the difference in color of the flowers. The flowers of *G. utriculata* are commonly white or light cream-colored, marked with pale purple or yellow. The flowers of *G. superba* are commonly yellow, yellowish brown or orange-colored, marked with lavender. The inflorescence of *G. utriculata* is typically short and often congested, whereas that of *G. superba* is usually long-cylindrical and open. The flowers of *G. utriculata* are usually but not always larger than those of *G. superba*. The petals of *G. utriculata* are characteristically much broader than the lateral sepals, while those of *G. superba* are usually about as broad as the lateral sepals. This character, however, is variable and intergradations are found. The lips of the two species are apparently of the same ovate or ovate-elliptic pattern, although the lip of some forms of *G. utriculata* is more often orbicular-ovate and wider near the base.

Huehuetenango: Cerro Pixpí, above San Ildefonso Ixtahuacán, *Steyermark* 50603.—Quiché: "Zona Reyna," *Skutch* 1803.—Sacatepéquez: Santiago, *Rosalío Gómez* 889 (probably).

***Govenia utriculata* (Sw.) Lindl. var. *capitata* (Lindl.) Correll**, *Lloydia* 10: 226. 1947. *Govenia capitata* Lindl. Bot. Reg. 21: sub t. 1795. 1836 (plate dated 1836). *Govenia liliacea* (Llave & Lex.) Lindl. Bot. Reg. 21: sub t. 1795. 1836 (plate dated 1836).

Habitat similar to the typical form. Rather common in Mexico, less abundant in Guatemala, Honduras and Costa Rica.

This is a superficial variety based primarily on size and habit. The more compact raceme is usually but not always less than 8 cm. long and is up to 10 cm. in diameter, thus giving the inflorescence a capitate appearance. The flowers are characteristically longer, the sepals occasionally becoming as much as 4 cm. in length. The flowers, also, often have a stronger suffusion and veining of lavender-purple than those of the typical form, especially on the inner surface of the floral segments.

Guatemala: Near San Rafael, frequent on slopes of Volcán de Agua, *Lewis* 61. San Rafael, *Porter* 10.—Santa Rosa: Teocinte, *Heyde & Lux* 6242.—San Miguel, *Johnston* 1310.

55. **MORMODES** Lindl.

Epiphytic or terrestrial herbs, occasionally on rotten wood. Stem short, several-leaved, becoming oblong to fusiform fleshy pseudobulbs. Leaves elongate, distichous, plicate. Inflorescence lateral, one or several, arising at the nodes of the pseudobulbs; raceme simple, often pendulous. Flowers often showy, monomorphic or polymorphic. Sepals free, about equal, spreading or reflexed, rarely connivent. Petals similar to the sepals or wider. Lip entire, 3-lobed or with lateral teeth on the lower part, smooth or variously pubescent, subarticulated with the base of the column, usually contracted into a claw, incurved-ascending, reduplicate or rarely concave; lateral lobes usually reflexed, contorted or rarely flat and spreading; mid-lobe usually apiculate. Column thick, erect, mostly twisted to one side, concave on the anterior side, without antennae, wingless, footless, the apex (clinandrium) long-acuminate; anther terminal, operculate, incumbent, convex, 1-2-loculate; pollinia 4, incumbent, oblong, waxy.

This is a complex genus of about twenty species, which are limited to tropical America. It is an interesting genus because of the torsion of the floral segments and the peculiar coloration of the flowers. The flowers of the species are variously colored and until recently were thought to be of only one form in each species. However, flowers of several sizes and forms have been found on the same plant (Correll, Bot. Mus. Leafl. Harv. Univ. 10: 16-17. 1941).

1. Lip 3-lobed or with a tooth on each side below the middle.
 2. Lateral teeth subulate, flat, incurved, less than 6 mm. long. *M. lineatum*.
 2. Lateral teeth linear-falcate, acute, variously contorted, more than 8 mm. long. *M. histrio*.
1. Lip simple, at most tridentate or apiculate at the apex.
 3. Lip obovate-oblong, tapering to the base. *M. stenoglossum*.
 3. Lip transversely elliptic-oval when spread out, constricted into a slender claw.
 4. Lip smooth and glabrous. *M. buccinator*.
 4. Lip villous. *M. Skinneri*.

Mormodes buccinator Lindl. Bot. Reg. 26: Misc. p. 10. 1840.

Epiphytic or on rotten trees and logs in open forests, up to 1,500 meters alt. Widespread but apparently uncommon in Mexico, Central and South America.

Plant 3-5 dm. tall. Pseudobulbs oblong-conical, green, slightly compressed, 10-20 cm. long, about 3.5 cm. wide, partially concealed by imbricated pale or whitish scarios leaf-sheaths. Leaves membranaceous, plicate, oblong to lanceolate, acuminate, up to 30 cm. long. Inflorescence lateral, borne at or near the base of the pseudobulb, a simple few- to many-flowered raceme, up to 4.5 dm. long; peduncle stout, slightly compressed, provided with several tubular-amplexicaul inflated scarios bracts. Floral bracts membranaceous, triangular-ovate, acute, concave, 5-7 mm. long. Flowers extremely variable in coloration, pungent, ranging in color from ivory white to pale green, deep yellow, brownish purple and striped or spotted, with slender brownish green pedicellate ovaries that are

2.5–4 cm. long. Sepals linear to oblong-lanceolate, acute to acuminate, the margins reflexed, 2–3 cm. long, up to 1.5 cm. wide; lateral sepals oblique, abruptly retrorse, somewhat wider than the dorsal sepal. Petals linear to elliptic-lanceolate, acute to acuminate, oblique, with the margins undulate-crisped and somewhat reflexed, similar to the lateral sepals. Lip fleshy-coriaceous, with a slender thickened subterete claw, 2–3 cm. long, strongly upcurved over the column; lamina strongly reflexed-conduplicate, prominently apiculate or occasionally somewhat 3-lobulate at the truncate apex, when spread out transversely elliptic-oval and up to 3 cm. wide. Column semicylindrical, twisted, long-caudate at the apex, about 1.8 cm. long.

This is one of the most polychromatic species in the genus. A number of color varieties have been described.

Izabal: Origin of plant unknown but supposedly Quiriguá (on loan from Miss Ellerby), *Lewis* 188.

Mormodes histrio Lind. & Reichb. f. *Hamb. Gartenz.* 15: 54. 1859; Correll, *Bot. Mus. Leaflet. Harv. Univ.* 10: 16, figs. 2, 3. 1941. *M. lineatum* in *Bot. Reg.* 28: t. 43. 1842 (only table). Figure 142.

Epiphytic and on rotten tree trunks and stumps in open mountain forests and coffee plantations, up to 1,800 meters alt. Uncommon in Mexico, Guatemala and Honduras.

Plant up to 5 dm. or more tall, consisting of an elongated leafy pseudobulb and one or more lateral inflorescences. Pseudobulbs with as many as 18 internodes, elliptical in cross section, concealed by scarios whitish imbricated leaf-sheaths, up to 16 cm. long and 5 cm. thick. Leaves linear-lanceolate to elliptic-lanceolate, acuminate, plicate, membranaceous, articulated with the leaf-sheaths, 15–23 cm. long, 1–4.5 cm. wide. Inflorescences usually several, arising at the nodes of the pseudobulbs, up to 50 cm. long, consisting of a simple several-flowered raceme supported by a slender terete peduncle; peduncle provided with several short tubular inflated bracts. Floral bracts ovate-cucullate, acute, up to 7 mm. long. Flowers polymorphic, variable in size and coloration, with slender pedicellate ovaries that are up to 3 cm. long. Sepals and petals somewhat fleshy to thick-coriaceous, maroon, green or yellowish heavily marked with brownish purple or brick-red stripes and dots. Sepals oblong-lanceolate to lanceolate, acute-apiculate to shortly acuminate and apiculate-recurved at the thickened apex, the margins more or less reflexed, 1.7–3.5 cm. long, 5–12 mm. wide; lateral sepals slightly oblique. Petals elliptic-lanceolate, acute to shortly acuminate and somewhat recurved at the apex, slightly oblique, the margins undulate-crisped and reflexed, 1.7–3.2 cm. long, 6–13 mm. wide. Lip deeply 3-lobed just above the base, smooth, pilose or pubescent, brown-vinaceous, greenish white or yellow marked with a few purple or reddish dots, 1.7–3 cm. long; lateral lobes linear-falcate, subobtuse to acute, divergent or projected downward, twisted or with the apical portion merely inrolled, when spread out 8–15 mm. long and 2–5 mm. wide; mid-lobe broadly triangular-obcuneate to linear, truncate to broadly rounded and conspicuously apiculate at the apex, strongly upcurved over the column, with the thickened margins somewhat reflexed, 1.2–2 cm. long, 3–12 mm.

wide. Column 1.3–2.7 cm. long, somewhat twisted, arcuate, sulcate. Capsule large, ovoid, up to 6 cm. long.

This polymorphic species has been the source of some confusion. First it was mistakenly illustrated, in the Botanical Register, as *M. lineatum*, a most distinct species. The form illustrated had flowers whose lips were pilose. Reichenbach later described *M. histrio*, based on a plant whose flowers possessed smooth lips. We have not only found both types of flowers on the same raceme but

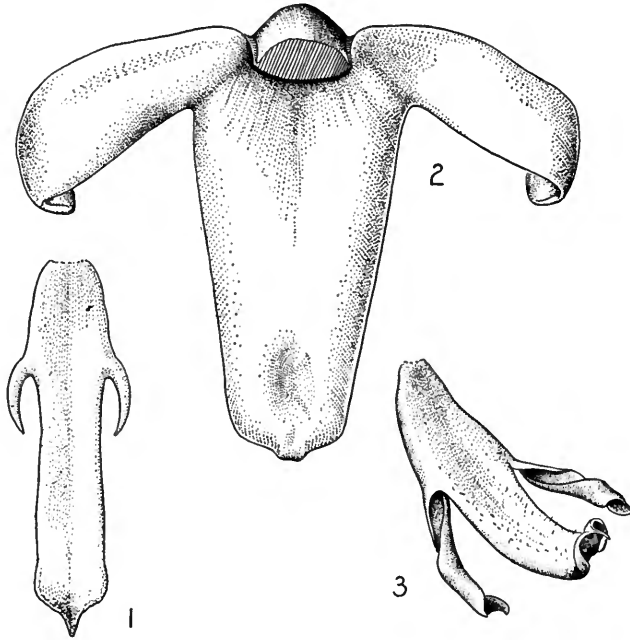


FIG. 142. *Mormodes lineatum*. 1, lip, spread out ($\times 2\frac{1}{2}$). *M. histrio*. 2 and 3, two types of lip taken from the same raceme, natural position ($\times 2\frac{1}{2}$). Drawn by G. W. Dillon.

also flowers of several sizes on the same plant. Apparently, the smallest flowers always possess pilose or pubescent lips, whereas the intermediate and largest flowers have smooth or very sparsely pilose lips.

Chiquimula: Montaña Castilla, vicinity of Montaña Cebollas, along Rio Lucía Saso, 3 miles southeast of Quezaltepeque, *Steyermark* 31206.—Quezaltenango: Colomba, *Skutch* 2002. Finca San José Buena Vista, near Colomba, *Lewis* 182.—Sacatepéquez: Barranca Hondo, slopes of Volcán de Fuego, *Standley* 60258.

Mormodes lineatum Batem. ex Lindl. Bot. Reg. 27: Misc. p. 52. 1841 (type: Guatemala, *Skinner, Hartweg*); Correll, Bot. Mus. Leaf. Harv. Univ. 10: 15, fig. 1. 1941. Figure 142.

Guatemala, very rare.

Plant inadequately known. Presumably typical of the genus. Inflorescence (of our material) 24 cm. long, composed of short peduncle and a several-flowered simple raceme; peduncle terete, provided with several scarios amplexicaul bracts. Floral bracts ovate-cucullate, acute, about 6 mm. long. Flowers dull olive-green, striped and spotted with dull brown, with slender pedicellate ovaries that are up to 3 cm. long. Sepals linear-oblong or linear-lanceolate, acute-apiculate, dorsally carinate at the apex, with the margins reflexed, 2.5–2.8 cm. long, 5–7 mm. wide; lateral sepals slightly oblique and a little wider than the dorsal sepal. Petals elliptic-lanceolate, acute-apiculate, with the margins undulate-cripsed and somewhat reflexed, 2.5 cm. long, 9–10 mm. wide. Lip linear, slightly dilated at the apex, strongly apiculate, fleshy, incurved, sparsely pilose, 2–2.2 cm. long, 3.5 mm. wide near the apex, with a small subulate incurved tooth on each side near the base; teeth up to 6 mm. long. Column pubescent on the back and margins, with the apical margins coarsely and irregularly serrulate, arcuate and somewhat twisted, about 1.5 cm. long.

This species is extremely rare. It has been confused in the past with the more common *M. histrio*. Only the description of the flowers was given in the original description, and since we have only an inflorescence it is impossible to describe the entire plant at this time.

Guatemala: Guatemala City, alt. 1,600 meters, cultivated, in garden of Don Mariano Pacheco H., December 29, 1939, *Steyermark* 39868.

Mormodes Skinneri Reichb. f. Gard. Chron. p. 50. 1869.

Found in Guatemala (fide Schlechter) and Costa Rica.

Plant typical of the genus. Pseudobulbs fusiform-elongate, large and stout, up to 3 dm. long. Inflorescence a many-flowered raceme, about 3 dm. long. Floral bracts broadly ovate, obtuse, concave, 8–11 mm. long, about 7 mm. wide when spread out. Flowers dull yellow, striped and marked with purplish red, spicy fragrant, with pedicellate ovaries that are about 3 cm. long. Sepals and petals similar, strongly reflexed, elliptic-lanceolate, acute to subacuminate, about 2.8 cm. long and 1–1.2 cm. wide, dull yellow, with 5–7 longitudinal irregular purplish red stripes that are formed by more or less confluent spots, colored somewhat similarly on the back. Lip arcuate in natural position, with the sides strongly reflexed, when spread out transversely elliptic-oval, apiculate, about 2.3 cm. long and wide, thickened along the center below, tapering into a short thick claw, dull yellow and densely spotted with purplish red; disk pubescent with long white hairs. Column 1.5 cm. long, yellow except for a few minute spots of purplish red on the dorsal surface.



FIG. 143. *Mormodes stenoglossum*. Plant (about $\times \frac{1}{2}$); 1, column, side view ($\times 1$); 2, lip, spread out ($\times 1$). Drawn by G. W. Dillon.

No Guatemalan material of this species has been seen. The only material examined was a tracing made by Schlechter from a drawing in the Reichenbach Herbarium and a raceme of flowers from a plant recently collected in Costa Rica. The description has been prepared not only from the above material but also from the original description and from some notes made by Harold F. Loomis.

Mormodes stenoglossum Schltr. Repert. Sp. Nov. Beih. 19: 225. 1923. *M. Nagelii* L. O. Wms. Am. Orch. Soc. Bull. 9: 153. t. 1940. Figure 143.

Terrestrial or epiphytic in forests, up to 700 meters alt. Rare in Mexico, Guatemala and Costa Rica.

Plant erect, up to 6.5 dm. tall. Pseudobulbs thickened-fusiform, more or less concealed by the leaf-sheaths, about 10 cm. long and 3.5 cm. in diameter. Leaves from the young pseudobulbs, distichous, imbricated, articulated with the leaf-sheaths, linear-lanceolate, acuminate, plicate, membranaceous, 15-35 cm. long, 1.2-4 cm. wide. Inflorescence lateral, up to 5 dm. long including the peduncle and loosely flowered raceme; peduncle terete, provided with short scarios amplexicaul sheaths that are about 1 cm. long; rachis fractiflex. Floral bracts small, ovate-cucullate, acute, about 6 mm. long. Flowers fleshy-thickened, yellow-brown, sometimes suffused with brick red, with slender pedicellate ovaries that are up to 7.5 cm. long. Sepals and petals strongly reflexed, elliptic-lanceolate to narrowly lanceolate, acuminate or narrowly acute, 3.5-4.5 cm. long, 8-12 mm. wide; lateral sepals and petals somewhat oblique, the margins usually undulate-crested. Lip obovate-oblong, broadly rounded to subtruncate and with a conspicuous apicule at the apex, 3.6-5.0 cm. long, 1-2.2 cm. wide. Column twisted, shortly subulate at the apex, 1.5-1.8 cm. long.

Alta Verapaz: Near Quebradas Secar, *Johnson* 300.

56. CATASETUM L. C. Rich.

Terrestrial or epiphytic plants with short several-leaved stems that are soon thickened into ovoid or fusiform pseudobulbs. Leaves usually large, plicate, narrowed at the base and articulate with the leaf-sheath. Inflorescence lateral, near the base of the pseudobulb, a simple raceme, erect or pendent. Flowers usually large and showy, in a few- to many-flowered raceme, unisexual or hermaphroditic, monomorphic, dimorphic or trimorphic, non-resupinate. Sepals and petals free, subequal, fleshy-membranaceous, spreading or more or less connivent, narrow or broad. Lip thin or fleshy and rigid, sessile.

Male flowers: Lip fleshy-thickened or occasionally thin, broad or laterally compressed, deeply concave, galeate or saccate-calceolate, margin of the orifice often crenulate, dentate or fimbriate. Column erect, thickened, footless, with or without a pair of reflexed antennae at the base; anther terminal, operculate, incumbent, 1-celled or imperfectly 2-celled; pollinia 4, waxy.

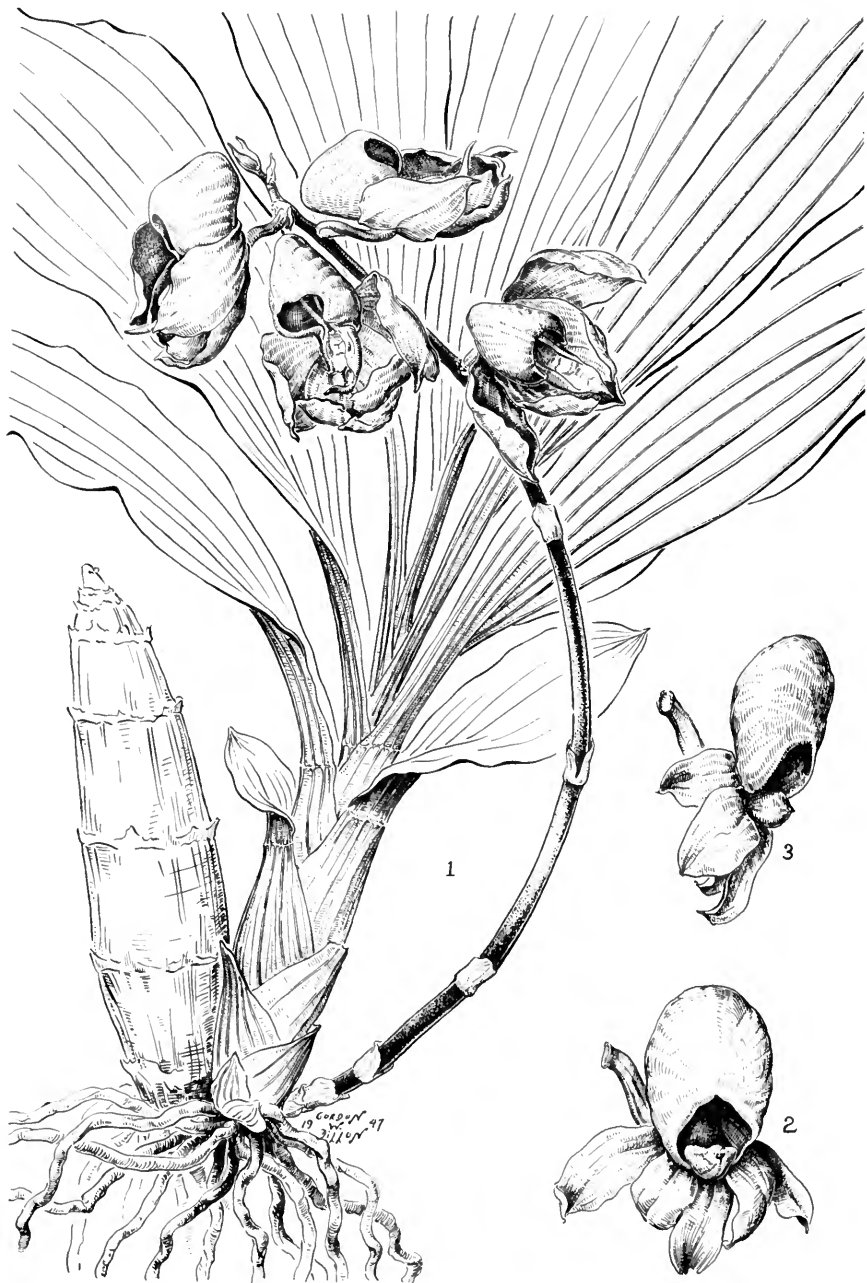


FIG. 144. *Catasetum integerrimum*. 1, plant with male flowers ($\times \frac{1}{2}$); 2, female flower, from above (about $\times \frac{1}{2}$); 3, female flower, front-side view (about $\times \frac{1}{2}$). Drawn by G. W. Dillon.

Female flowers: Lip somewhat similar to that of the male flowers, often dorsally compressed. Column much shorter and thicker than that of the male flowers, without antennae; anther about as in the male flowers but smaller; pollinia imperfect. Capsule oblong, large.

Perfect flowers: Lip narrowly oblong to ovate, flat or with the base somewhat concave. Column similar to that of the male flowers or without antennae, the stigma perfect.

There are about fifty species of *Catasetum*, which are found in the tropical regions of America. It is a difficult genus because of the polymorphism of the flowers.

Orifice of the lip developed as a thin lamina above the saccate portion.

C. Russellianum.

Orifice of the lip not laminate.....*C. integerrimum*.

Catasetum integerrimum Hook. Bot. Mag. 67: 3823. 1840 (type: Guatemala, *Skinner*). *Catasetum maculatum* of authors, not of Kunth. Figure 144.

Epiphytic on trees in humid forests, coffee plantations or open country, up to 1,820 meters alt. Rather common from Mexico through Central America to Nicaragua.

Plant stout, usually consisting of one leaf-bearing pseudobulb and numerous coarse defoliated pseudobulbs, up to 5 dm. tall. Pseudobulbs semifusiform, conical, 8-15 cm. long, 4-5 cm. in diameter, when young covered by scarious imbricated leaf-sheaths. Leaves about six, distichous, linear-lanceolate, elliptic-lanceolate or oblong-elliptic, abruptly acute, membranaceous, plicate, up to 65 cm. long and 12 cm. wide. Inflorescence lateral, erect, a simple 3-10-flowered raceme supported by a stout bracted peduncle, up to 40 cm. long. Floral bracts ovate-lanceolate, acute, about 1 cm. long. Flowers yellowish green to purplish, suffused or spotted, with rather stout arcuate pedicellate ovaries that are up to 3 cm. long. Male flowers: Sepals broadly oblong-elliptic to subquadrate, apiculate to abruptly acute at the apex, erect-arcuate, occasionally widest above the middle, 3.2-4.8 cm. long, 1.5-2.3 cm. wide, the lateral sepals oblique; petals oval-elliptic to elliptic-obovate, obtuse and mucronate at the apex, 3-4 cm. long, 1.8-2.6 cm. wide; lip saccate-calceolate, rigid and fleshy, laterally compressed, bluntly conical at the base, about 3 cm. long, 2-2.5 cm. wide, 2.3-2.8 cm. deep, margin of the orifice ciliate-toothed on the basal portion, otherwise smooth; column up to 3.5 cm. long, long-rostrate at the apex, concave on the anterior surface, with a terete curved antenna on each side at the base which projects downward. Female flowers: Sepals and petals concave-incurved over the column; sepals oblong-quadrate to obovate-subquadrate, broadly rounded and apiculate at the apex, 2.8-3.5 cm. long, about 2 cm. wide; petals suborbicular-quadrate, abruptly acute, about 2.7 cm. long and 2 cm. wide; lip broadly calceolate, dorsally compressed, rigid and fleshy, about 4 cm. long, 4 cm. wide, 2.5 cm. deep, margin of the orifice smooth; column about 2 cm. long, fleshy-thickened, long-rostrate at the apex.

Alta Verapaz: Cubilgüitz, *Türkheim* II 462.—Izabal: Puerto Barrios, *Lewis* 11 (in part).—Petén: La Libertad, Oneida-Chickasaw

connection, *Lewis* 11 (in part). La Libertad, *M. Aguilar* 220.—Sacatepéquez: Barranca Hondo, Alotenango, *Johnston* 1650.

Catasetum Russellianum Hook. Bot. Mag. 67: t. 3777. 1840 (type: Guatemala, *Skinner*). *Catasetum calceolatum* Lem. Jard. Fleur. 1: Misc. p. 45. 1851.

Epiphytic on trees in open mountain forests, up to 600 meters alt. Rarely found in Mexico, Guatemala, Honduras, El Salvador and Panama.

Pseudobulbs elliptic-conical, grayish green, 6–8 cm. long or longer, 4–5 cm. in diameter, when young concealed by the leaf-sheaths. Leaves several, linear-oblong to obovate-elliptic, subobtusely to abruptly acute or acuminate at the apex, succulent-membranaceous, plicate, distichous, 1–5 dm. long, 3.5–12 cm. wide, tapering at the base into a sulcate petiole. Inflorescence a 15–20-flowered raceme, pendent, up to 35 cm. long including the peduncle. Floral bracts triangular-lanceolate, up to 1.6 cm. long. Flowers odoriferous, grayish green to nearly white, glaucous, marked with deep green stripes, with pedicellate ovaries that are up to 3 cm. long. Dorsal sepal arcuate over the petals, linear, apiculate, up to 3.75 cm. long and 1.1 cm. wide; lateral sepals obliquely linear-oblong, apiculate, the lower margin incurved near the center, 3.5–4.1 cm. long, up to 1.4 cm. wide at the base. Petals elliptic to obovate-elliptic, obtuse-apiculate, 3–4.2 cm. long, 1.3–1.8 cm. wide above the middle. Lip inflated, saccate-calceolate, 2.5–3.1 cm. long, 1.2–1.6 cm. wide, about 1 cm. deep, the apical margin developed and projecting as a thin lamina parallel with and above the saccate portion; lamina elliptic to ovate-oblong, retuse, 2–2.5 cm. long, about 1.2 cm. wide, with the reflexed margins crisped and irregularly toothed, adorned in the central portion by a V-shaped somewhat winged and toothed callus that extends from within the saccate portion to within about 5 mm. of the apex of the lamina. Column up to 2 cm. long, erect, dilated toward the apex, with narrow wings, somewhat toothed along the apical margins.

Sololá: Patulúl, *Heyde & Lux* 6388.—“Guatemala,” *Lewis* 196.

EXCLUDED SPECIES

Catasetum tricolor Reichb. f. fide Schlechter (not Hort. ex Planch.) in Beih. Bot. Centralbl. 36, Abt. 2: 485. 1918.

Schlechter erroneously attributes this combination to Reichenbach filius and cites Reichenbach in Hamb. Gartenz. 13: 313. 1857 where nothing is mentioned concerning this combination. According to Mansfeld (Repert. Nov. Sp. 30: 268. 1932), *Catasetum tricolor* Hort. ex Planch. (a synonym of *C. macrocarpum* L. C. Rich. ex Kunth) is a native of South America.

Catasetum triodon Reichb. f. in Otto, Hamb. Gartenz. 13: 313. 1857.

According to Mansfeld (Repert. Nov. Sp. 31: 109. 1932), Reichenbach was in error in reporting this Brazilian species from Central America.

57. CYCNOCHES Lindl.

Epiphytic or terrestrial plants with elongated fusiform-cylindrical leafy pseudobulbs. Leaves membranaceous, plicate. Inflorescence lateral, on the pseudobulbs, erect or arcuate-pendent, bearing few to many flowers in a simple raceme. Flowers small and numerous or rather large and few, unisexual, dimorphic. Sepals subequal, free, spreading or reflexed. Petals similar to the sepals but broader. Lip fleshy or thin, subsessile or with a distinct claw, the lamina orbicular to lanceolate, entire or variously lobed, crested or fringed, usually adorned with variously shaped calli. Column elongated and slender or stout and fleshy, more or less arcuate and clavate, footless; anther terminal, operculate, incumbent, 1-celled or imperfectly 2-celled; pollinia 2, waxy, ovoid, sulcate. Capsule large.

This is a small genus of about a dozen species, which are found in tropical America. Dimorphism, a characteristic of the genus, is most interesting but has served to create confusion in this extremely difficult and imperfectly known group of plants. Efforts to match the male and female phases of the same species are trying when only herbarium specimens are available.

1. Flowers on an elongated pendent raceme, numerous, deep purple to watery green or purple-spotted; lip with four processes on each side of the thin orbicular lamina (male flowers).....*C. Egertonianum*.
1. Flowers on short erect racemes, several, yellowish green and white; lip entire, without appendages.
 2. Lip with a prominent blackish or dark green callus at the base, mostly more than 3.5 cm. long; flowers usually more than four.
 3. Lip suborbicular-ovate to oval, rounded at the apex or abruptly acute or apiculate; callus dark green.....*C. Warscewiczii*.
 3. Lip ovate to ovate-lanceolate, tapering at the apex, acute to subacuminate; callus blackish.....*C. ventricosum*.
2. Lip with a small callus at the base, mostly less than 3.5 cm. long; flowers usually one or two (female flowers).....*C. Egertonianum*.

Cycnoches Egertonianum Batem. Orch. Mex. and Guat. t. 40. 1843 (type: Guatemala, *Skinner*). *C. ventricosum* var. *Egertonianum* (Batem.) Hook. Bot. Mag. 70: t. 4054. 1844. *C. Egertonianum* var. *viride* Lindl. Bot. Reg. 32: t. 46. 1846. *C. Rossianum* Rolfe, Gard. Chron. 1: 456. 1891.

Epiphytic on trees in dense tropical forests at low elevations. Uncommon in British Honduras, Guatemala, Honduras, Costa Rica and (?)Nicaragua.

Plant consisting of leafy pseudobulbs and one or two racemes. Pseudobulbs aggregated, erect, subfusiform, up to 12 cm. long and 2 cm. in diameter. Leaves 2-7, the lowermost small, the uppermost lanceolate, acuminate, 7-21 cm. long, up to 3 cm. wide, articulate with the broad sheaths. Raceme and flowers sexually dimorphic. Male raceme: Arcuate-pendent, slender-elongated, up to 8.5 dm. long including the peduncle; peduncle and rachis slender, terete, bearing a number of bracts at the base. Floral bracts lanceolate, acute, membranaceous, 0.7-2 cm. long. Flowers erect, deep purple to watery green or purple spotted, as many as 20. Sepals and petals linear-lanceolate to lanceolate, acute, the dorsal sepal narrower and longer than the somewhat oblique lateral sepals and petals, the margins more or less reflexed, 1.5-3 cm. long, 4-7 mm. wide. Lip somewhat obovate in outline, with a narrowly cuneate claw 7-10 mm. long and a membranaceous narrowly triangular acute apex 3-5 mm. long; lamina thin, suborbicular, shallowly concave, 5-6 mm. in diameter, on each side four more or less clavate processes that are 3-3.5 mm. long and a solitary similar process at the base of the triangular apex, adorned near the base of the lamina with a pair of green fleshy truncate nearly cylindrical outgrowths that are 4-5 mm. long and variously united along their inner margins. Column arcuate, slender-clavate, 2.5-3 cm. long. Female raceme: Short, erect, with several broad ovate imbricated bracts below and one to several fleshy green-white flowers. Floral bracts ovate-oblong, acute, 2 cm. long. Sepals and petals spreading, lanceolate, acuminate, 3-4 cm. long, 0.8-1.4 cm. wide, the petals broader than the sepals. Lip with a short broad claw, ovate-lanceolate, acute, very fleshy, somewhat convex, 2.5-3.5 cm. long, 1.2-1.5 cm. wide. Column short, stout, slightly incurved, thickened at the apex, 1-1.2 cm. long.

This species has been a source of great confusion. According to Rolfe, Bateman's original illustration of the species had the large male flowers of *C. ventricosum* (previously illustrated by Bateman) on the same plant with the small male flowers of *C. Egertonianum*. This error was due to a composite illustration—the flowers of one species had been added to the plant of another species. *C. Egertonianum* belongs to the section *Heteranthae*, in which the male and female flowers are entirely different in appearance.

Alta Verapaz: Cubilgüitz, *Türckheim* 7777 (in part).

Cycnoches ventricosum Batem. Orch. Mex. and Guat. t. 5. 1837 (type: Guatemala, Istapa, *Skinner*).

Epiphytic on trees or on rotten tree trunks in dense tropical forests, up to 1,000 meters alt. Uncommon in Mexico, through Central America to Costa Rica and Panama.

Plant consisting of leafy pseudobulbs and one or more racemes of flowers. Pseudobulbs cylindrical-fusiform, slightly compressed, up to 30 cm. long, about 3 cm. in diameter. Leaves 5-6, linear-lanceolate to elliptic-lanceolate, acute to acuminate, plicate, membranaceous, the uppermost longest, up to 35 cm. long and 8 cm. wide, articulate with the broad leaf-sheaths. Raceme and flowers sexually dimorphic. Male raceme: From the axils of the uppermost leaves, bearing

several green-white flowers that open simultaneously and last only a few days, up to 30 cm. long including the terete peduncle; peduncle provided with several ovate-oblong scarious bracts. Floral bracts broadly ovate, acute, up to 2.5 cm. long. Dorsal sepal greenish, linear-elliptic, acute to subacuminate, 4-6.2 cm. long, 1-1.5 cm. wide. Lateral sepals greenish, obliquely lanceolate, acute to acuminate, somewhat wider and shorter than the dorsal sepal. Petals greenish, broadly elliptic to elliptic-lanceolate, subobtuse to subacuminate, very oblique, 4-6 cm. long, 1.8-2.7 cm. wide. Lip white, with a short stout claw, ovate to ovate-lanceolate, acute to subacuminate, convex, much swollen on the upper side, 4-5 cm. long, about 2 cm. wide, adorned with a black callosity at the base of the claw. Column slender-clavate, arcuate, 2.5-3.5 cm. long. Female raceme and flowers similar to those of the male except for smaller flowers and much shorter and stouter column. Capsule large, oblong.

This species belongs to the section *Eucycnoches* in which the male and female flowers are essentially alike in appearance.

Alta Verapaz: Cubilgüitz, *Türckheim* 7776; 7777 (in part).

Cycnoches Warscewiczii Reichb. f. Bot. Zeit. 10: 734. 1852. (male). *C. Tonduzii* Schltr. Repert. Sp. Nov. Beih. 19: 298. 1923. Figures 145, 146.

Epiphytic on trees, on rotten logs or terrestrial, up to 1,000 meters alt. Rare in Guatemala, Costa Rica and Panama.

Plant consisting of leafy pseudobulbs and short racemes of rather large flowers. Pseudobulbs stout, fusiform-cylindrical, up to 20 cm. long and 3 cm. in diameter, concealed by scarious imbricating leaf-sheaths. Leaves as many as eight, linear-oblong to linear-lanceolate, acuminate, plicate, membranaceous, articulate with the leaf-sheaths, up to 45 cm. long and 6 cm. wide. Raceme and flowers sexually dimorphic. Male raceme: Spreading, 5-6-flowered, up to 22 cm. long including the short bracteate peduncle. Floral bracts oval to ovate-oblong, subacute to acute, about 2 cm. long. Flowers large, spreading, fleshy. Sepals and petals greenish yellow; dorsal sepal linear to linear-elliptic, obtuse to acute, 4.5-6.5 cm. long, 1.2-1.8 cm. wide; lateral sepals obliquely oblong-elliptic, subobtuse to subacuminate, 4-4.5 cm. long, 1.5-2 cm. wide. Petals obliquely oblong-elliptic to broadly elliptic, obtuse to acute, the margins somewhat crisped, 4-6 cm. long, 1.8-3 cm. wide. Lip sessile or with a very short claw, white, fleshy, suborbicular-ovate to oval, broadly rounded to abruptly acute or apiculate at the apex, convex, 3.5-4.5 cm. long, 2-3.5 cm. wide, adorned with a dark green triangular callus on the basal portion. Column very slender, clavate at the apex, arcuate, 3-3.5 cm. long. Female raceme and flowers similar to those of the male except for the usually larger flowers and short thick column, which is about 2 cm. long.

This species was considered by Rolfe (Kew Bull. 1909, p. 276) as questionably the female of *C. aurem* Lindl. and included in the section *Heteranthae*. Schlechter (Orchis 10, no. 3, p. 58, 1916) accepted Rolfe's opinion in his treatment of the genus. We, however, are of the opinion that *C. Warscewiczii* belongs to the section



FIG. 145. *Cynoches Warscewiczii*. Male plant ($\times \frac{1}{2}$). Drawn by G. W. Dillon.

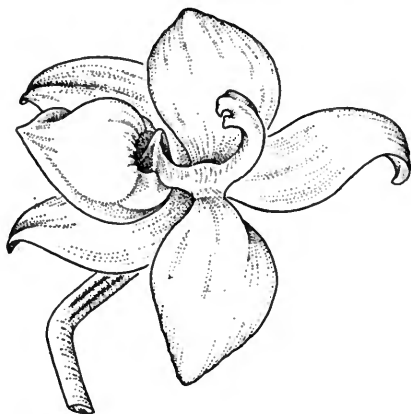


FIG. 146. *Cynoches Warscewiczii*. Female flower ($\times \frac{1}{2}$). Drawn by G. W. Dillon.

Eucynoches and that its male phase is represented by *C. Tonduzii* Schltr.

Alta Verapaz: Chamá, Johnson 903.

EXCLUDED SPECIES

Cynoches maculatum Lindl. Bot. Reg. 26: Misc. p. 10. 1840.

This South American species was doubtfully attributed to Mexico and Guatemala by Schlechter. However, since no specimens were seen from Guatemala it is excluded from this work.

58. LACAENA Lindl.

Epiphytic plants consisting of short thickened pseudobulbs with 2-3 plicate leaves at the summit and one or more lateral inflorescences. Inflorescence from the base of the pseudobulb, recurved or pendent, consisting of a simple raceme of fleshy showy flowers. Sepals subequal, spreading; dorsal sepal free; lateral sepals forming a short mentum with the column-foot. Petals similar to the dorsal sepal but smaller. Lip 3-lobed, articulate with the column-foot; lateral lobes upcurved; mid-lobe spreading, deflexed. Column semiterete, slightly incurved, subclavate, narrowly winged above, the base produced into a short foot; anther subterminal, operculate, incumbent, imperfectly 2-celled; pollinia 2, waxy.

This genus consists of two species, both of which are rare and confined to Middle America.

Lacaena bicolor Lindl. Bot. Reg. 29: Misc. p. 68. 1843 (type: Guatemala). Figure 147.

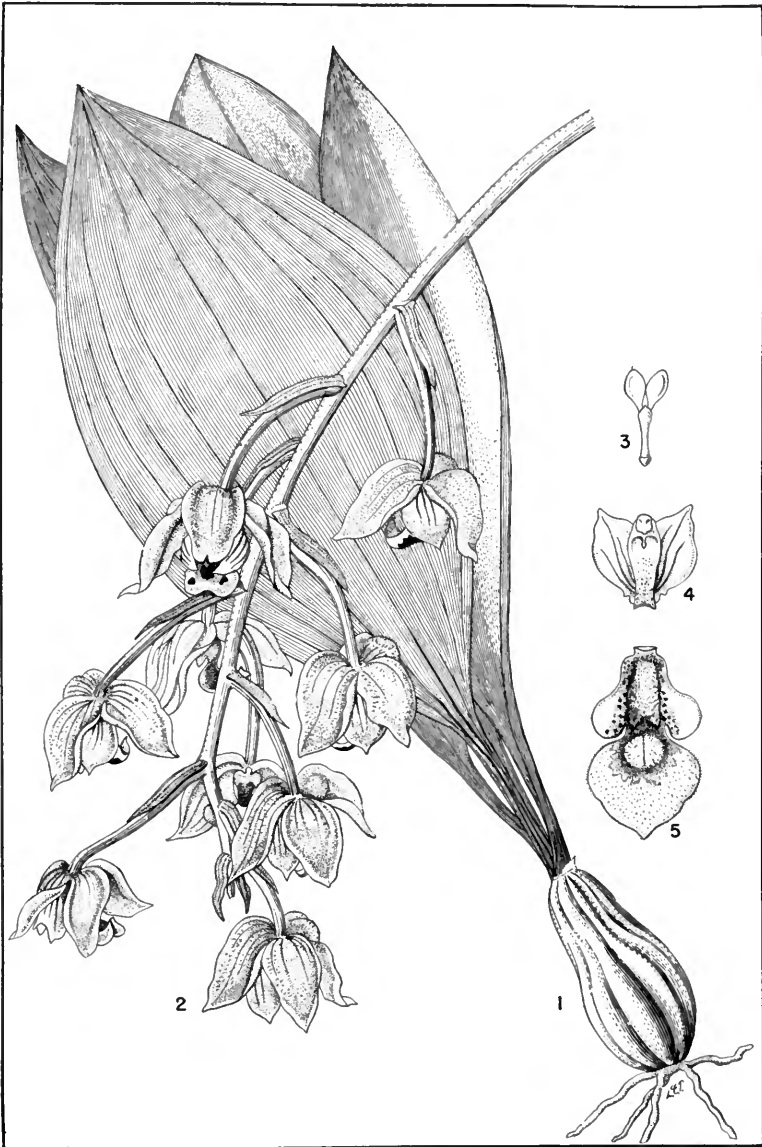


FIG. 147. *Lacaena bicolor*. 1, pseudobulb and leaves ($\times \frac{1}{3}$); 2, inflorescence ($\times \frac{3}{8}$); 3, pollinia and gland (much enlarged); 4, column and petals ($\times \frac{2}{3}$); 5, lip, spread out ($\times 1\frac{1}{4}$). Drawn by D. E. Tibbitts. Adapted in part from Edwards' Botanical Register 30: t. 50. 1844.

Epiphytic on oaks, palms and pines, in forests and thickets, up to 1,600 meters alt. Rare in Mexico, Guatemala and Honduras.

Plant large, coarse, up to 60 cm. tall. Pseudobulbs oblong-ovoid, sulcate, green, somewhat compressed, 7.5–12 cm. long, up to 7 cm. wide, when young subtended by several brown scarios sheaths. Leaves usually three, broadly elliptic to elliptic-lanceolate, narrowly acute to acuminate, from the apex of the pseudobulb, plicate, 3–5 dm. long, 9–15 cm. wide. Inflorescence lateral, from the base of the pseudobulb, pendent, usually two or more cylindrical 25–30-flowered racemes; rachis and pedicellate ovaries scurfy; peduncle provided with inflated tubular scarios sheaths that are 2–3 cm. long. Floral bracts oblong-lanceolate, acuminate, scarios, scurfy, 1.5–2 cm. long. Flowers white, marked and spotted with purple, very fragrant, with slender pedicellate ovaries that are 2.5–3 cm. long, arcuate. Sepals and petals white, striped with purple, antrorsely campanulate, with the apical portion recurved; sepals subquadrate-oval to obliquely oval, obtuse to acute and somewhat dorsally keeled at the apex, concave, 2.2–2.5 cm. long, 1.3–1.5 cm. wide; petals with a short rufous claw, trulliform to obliquely ovate-lanceolate, subobtuse or mucronate at the apex, concave, the anterior margin very oblique, 1.7–2 cm. long, 9–12 mm. wide. Lip about 2 cm. long, subarticulated with the foot of the column, angular on each side at the base, deeply 3-lobed, the upper surface more or less pubescent, arcuate about the middle; lateral lobes subquadrate, truncate, erect to clasp the column, about 5 mm. wide, 3 mm. to base of sinus; mid-lobe separated from the lateral lobes by a short narrow isthmus, suborbicular-quadrate to triangular-ovate, acute or apiculate and abruptly recurved at the apex; disk with a prominent elevated densely pubescent maroon callus between the lateral lobes and a smaller callus on the isthmus separating the lateral lobes and mid-lobe. Column white with numerous purple dots on the inner surface, dilated about the middle, about 1.5 cm. long. Capsule 6-angled, ellipsoid, 4 cm. long, 1.5–2 cm. in diameter.

Guatemala: Garden of Don Mariano Pacheco H., Guatemala, said to have come originally from San Guayaba, Dept. Guatemala, *Steiermark* 46396.—Jalapa: Above Aserradero San Vicente, *Lewis* 219.—Zacapa: Sierra de las Minas, between Santa Rosalía de Marmol and San Lorenzo, *Steiermark* 43154.

59. HOULETTIA Brongn.

Epiphytic plants, with a fleshy-thickened pseudobulb surmounted by a solitary leaf and a lateral inflorescence. Leaf large, plicate, contracted into a petiole. Inflorescence from the base of the pseudobulb, erect or recurved, composed of several large flowers in a lax simple raceme. Sepals subequal, free, spreading. Petals similar to the sepals but narrower at the base, simple or lobed on the posterior margin. Lip continuous with the base of the column, spreading, fleshy, divided into two segments; lower half narrow, provided with a pair of arcuate horns on the margin near the base; terminal portion articulate with the basal portion, rather large, simple, truncate or provided with prominent auricles at the base. Column erect-incurved, semiterete, wingless, footless or produced into a short foot at the base; anther subterminal, operculate, incumbent, 1-celled; pollinia 2, waxy.



FIG. 148. *Houletia Landsbergi*. Plant (about $\times \frac{2}{3}$). Drawn by G. W. Dillon.

This is a small tropical American genus consisting of less than ten species, mostly in South America.

Houlletia Landsbergi Lind. & Reichb. f. in Regel, *Gartenflora* 2. 1855. Figure 148.

Rare in Guatemala and Costa Rica.

Pseudobulbs small, ovoid, obtusely angled, about 2.5 cm. long, dark green. Leaf solitary, oblong-elliptic to elliptic-ovate, acute, about 9-nerved, nearly 30 cm. long and 10 cm. wide, pale green. Peduncle stout, strongly decurved, about 10 cm. long, dark red-brown below, violet-colored above, provided with several spathaceous sheaths, supporting a several-flowered raceme. Floral bracts inflated, tubular, suborbicular-ovate when spread out, obtuse, about 2 cm. long. Flowers rather large, showy, with pedicellate ovaries that are about 3 cm. long. Sepals reddish orange, densely mottled with round red-brown spots, elliptic to broadly ovate-oblong, slightly cucullate at the broadly obtuse apex, concave, 3-3.5 cm. long, 1.2-1.5 cm. wide; lateral sepals oblique, united for about 3 mm. at the base. Petals darker colored than the sepals, triangular-ovate to oblong-lanceolate, obtuse, up to 3 cm. long and 1 cm. wide, with a broad deep or shallow excised notch on the posterior basal margin and there produced into an acute or acuminate horn. Lip about 4.5 cm. long, with a transversely elliptic bisaccate base, divided into two parts; lower half fleshy-coriaceous, white with several crossbars of blood-red, about 2.5 cm. long and 1 cm. wide, provided on each side about the middle with a linear-lanceolate acuminate erect-incurved horn, the horns about 2 cm. long and 3 mm. wide below the middle; terminal half articulated with the lower half, fleshy, broadly and hastately ovate-quadrate, broadly rounded at the apex, about 2 cm. long and 2.3 cm. wide across the base when spread out, the basal lateral angles produced into prominent white erect incurved triangular horns, the disk profusely adorned with violet-purple tubercles. Column semiterete, incurved, slightly clavate, golden yellow marked with red, about 2.5 cm. long.

We have seen no specimens of this species from Guatemala. However, since Schlechter reported it from that country it has been included in this work.

60. PAPHINIA Lindl.

Epiphytic plants with leafy pseudobulbs and one or more lateral inflorescences produced at the base of the pseudobulbs. Pseudobulbs usually small, ovoid. Leaves membranaceous, plicate. Inflorescence pendent, few-flowered; flowers showy. Sepals and petals similar, the petals somewhat smaller than the sepals. Lip smaller than the sepals and petals, unguiculate, 3-lobed, variously crested with glandular hairs and fleshy calli; lateral lobes oblong, porrect; mid-lobe obliquely triangular to sagittate. Column clavate, semiterete, auricled at the apex, produced into a foot at the base; anther subterminal, incumbent, operculate, 1-celled; pollinia 4, obovate, with a long caudicle.

This is a small genus of about three species, which are, with the following exception, located in northern South America.



FIG. 149. *Paphinia cristata*. 1, plant (about $\times \frac{3}{6}$); 2, column, front-side view (about $\times 1$); 3, clavellate process from the apex of the lip (much enlarged); 4, lip, front-side view (about $\times 1$); 5, pollinia and gland (much enlarged). Drawn by D. E. Tibbitts. Adapted from Curtis's Botanical Magazine 81: t. 4836. 1855.

Paphinia cristata Lindl. Bot. Reg. 29: Misc. p. 14. 1843.
Figure 149.

Apparently epiphytic. Rare in Guatemala, Trinidad and British Guiana.

Plant up to about 30 cm. tall, consisting of 1-3-foliolate pseudobulbs and 1-2 inflorescences. Pseudobulbs clustered, oblong-ovoid, compressed, sulcate, about 4 cm. long and 2 cm. wide, when young subtended by several scarios sheaths. Leaves linear-lanceolate to oblong-lanceolate, acuminate, plicate, spreading, 10-25 cm. long, 3-6 cm. wide. Peduncle lateral, from the base of the pseudobulbs, 1-2-flowered, provided with several loose brown scarios bracts. Floral bracts tubular, obtuse, about 2 cm. long. Sepals and petals similar but the petals smaller than the sepals, spotted and striped with red or reddish brown, spreading, linear-lanceolate to elliptic-lanceolate, acuminate, concave, about 5 cm. long, 0.9-1.5 cm. wide; lateral sepals oblique, forming a prominent mentum with the column-foot, which is about 1 cm. long; petals oblique with a slender claw. Lip about 2 cm. long, dark red, adorned with white fringes, fleshy, articulate with the column-foot, deeply 3-lobed, with a slender claw, the claw and lower part traversed by several linear fleshy ridges that possess several thread-like glands and terminate at the base of the mid-lobe into a flaplike dissected callus; lateral lobes oblong-falcate, acute, porrect, about 1 cm. long and 3 mm. wide; mid-lobe separated from the lateral lobes by a short isthmus, triangular-hastate to subsagittate, obtuse, about 8 mm. long and 1 cm. wide across the basal angles, the upper surface covered with minute glandular papillae and the apical margins adorned with a crest of thread-like clavellate processes. Column yellow-green, banded with reddish brown near the base, semiterete, slender-clavate, with a pair of pendent auricles near the apex, about 2.5 cm. long, produced at the base into a slender column-foot that forms a right angle with the column.

We have seen no specimens of this species from Guatemala. It is included here on the basis of Schlechter's report of its occurrence in Guatemala.

61. **STANHOPEA** Frost ex Hook.

Epiphytic, terrestrial or rock-inhabiting plants with rather small unifoliolate pseudobulbs and a lateral pendent inflorescence. Leaf usually large, plicate, contracted into a slender sulcate petiole. Inflorescence from the base of the pseudobulb, one-flowered or a several-flowered loose raceme; bracts of the peduncle and inflorescence usually large and chartaceous. Flowers large, showy, fleshy, often very fragrant, with long pedicellate ovaries. Sepals free or with the lateral ones slightly united at the base, spreading-reflexed, subequal, the lateral ones broadest. Petals similar to the sepals but smaller and narrower, usually undulate. Lip affixed to or sometimes shortly connate with the base of the column, fleshy-thickened; lateral lobes with erect margins and mostly thickened to form a hypochile that is variously shaped; hypochile commonly globose or calciform; mid-lobe (when present) entire or variously divided, usually forming a simple or bicornute mesochile and an epichile that is articulate with the mesochile; epichile entire or 3-lobulate at the apex and variously shaped. Column long, erect, more or less

arcuate, essentially wingless to broadly winged above, apparently without a foot; anther terminal, operculate, incumbent; pollinia 2, waxy. Capsule large, ellipsoidal.

This is a genus of about twenty-five species, which are scattered throughout tropical America. Most of the proposed species have been described from cultivated plants, often without accurate knowledge as to their source of origin. The species of *Stanhopea* are widely cultivated. The bizarre and exotic flowers, which often remain for only a day or two in perfect condition, are highly variable in coloration, a characteristic that has resulted in multiplication of invalid species based solely on flower-color. A conservative estimate would place the number of species proposed for this genus around five hundred.

1. Lip without horns. *S. ecornuta*.
1. Lip with a pair of lateral horns arising near the middle.
 2. Horns of the lip free for less than 1 cm. *S. Lewisae*.
 2. Horns of the lip free for more than 1.5 cm.
 3. Epichile tridentate or 3-lobulate at the apex.
 4. Hypochile globose, about 3 cm. wide; horns subterete, with a fleshy tubercle at the base; lobules of the epichile subequal. . . . *S. devoniensis*.
 4. Hypochile deeply saccate, about 1.5 cm. wide; horns flat, without a tubercle at the base; lateral lobules of the epichile much longer than the middle one. *S. saccata*.
 3. Epichile simple, obtuse or acute at the apex.
 5. Hypochile with a pair of short horns under the column. *S. quadricornis*.
 5. Hypochile hornless, at most with the lateral margins angular or toothed.
 6. Hypochile cymbiform-concave, with entire margins, the concave portion about 1.5 cm. long. *S. oculata*.
 6. Hypochile shortly saccate, angled or toothed on each side near the base, the saccate portion about 5 mm. long. *S. Wardii*.

Stanhopea devoniensis Lindl. Sert. Orch. t. 1. 1838.

Epiphytic on trees and on rocks in forests, up to 1,900 meters alt. Rare in Mexico and Guatemala.

Pseudobulb ovoid-conical, oblique, monophyllous, 6 cm. long, 3 cm. wide, subtended by scariosus-fibrous sheaths. Leaf oblong to elliptic-lanceolate, acuminate, with a slender-sulcate petiole that is about 10 cm. long; lamina 20-30 cm. long, 5-6.5 cm. wide. Inflorescence lateral, from the base of the pseudobulb; peduncle rather stout, invested with membranaceous lepidote sheathing bracts. Flowers two or three, large and fragrant, with lepidote pedicellate ovaries that are about 7.5 cm. long. Sepals and petals light yellow or yellowish orange spotted with reddish brown blotches. Dorsal sepal ovate-elliptic, obtuse to rounded at the apex, 5.5-6.5 cm. long, about 2.5 cm. wide. Lateral sepals oblique, ovate-oblong, obtuse to rounded at the apex, 5.5-6.5 cm. long, 3.2-3.8 cm. wide. Petals oblong-lanceolate, acute, recurved, 4-5 cm. long, 1.5-2 cm. wide. Lip complex, white stained with purple, very fleshy; hypochile subrotund-globose, gibbous, the inner surface studded with radiating granulated lines, about 2.5 cm. long,

3 cm. wide and 2 cm. deep; mesochile with a pair of sharp incurved, somewhat sulcate horns that are about 2.5 cm. long and meet at the base in a broad fleshy tubercle that projects at the base of the epichile and closes up the entrance to the cavity of the hypochile; epichile ovate, somewhat canaliculate, more or less tridentate at the apex with the teeth rather blunt, about 2.5 cm. long and 1.5 cm. wide, when spread out ovate-subquadrate. Column very narrowly winged or essentially wingless, white spotted with crimson, 4-5.5 cm. long.

Stanhoepa devoniensis differs from *S. Hernandezii* (Kth.) Schltr. (*S. tigrina* Batem.), a closely allied Mexican species, in the flowers, which are only about half as large, and in the warty, not lamel-

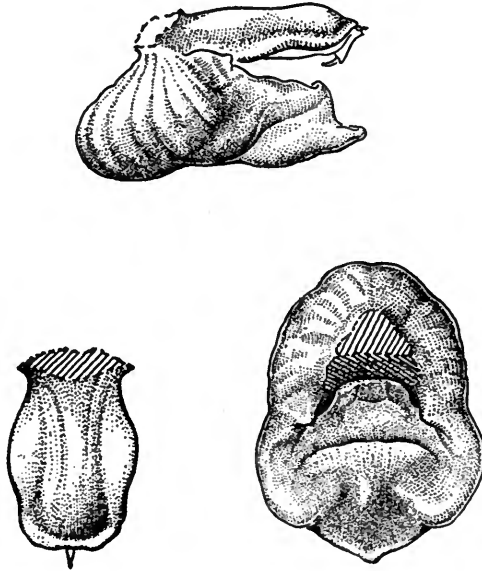


FIG. 150. *Stanhoepa ecornuta*. Top, column and lip, side view ($\times 1$); lower left, column, dorsal view ($\times 1$); lower right, lip, from above ($\times 1$). Drawn by G. W. Dillon.

lated, inner surface of the hypochile. The horns of *S. devoniensis* arise from a broad fleshy tubercle, whereas those of *S. Hernandezii* arise from two roughened calli. The epichile of *S. devoniensis* is small and ovate with rather blunt apical teeth while that of *S. Hernandezii* is large and rhombic-obovate with sharp apical teeth. The column of *S. devoniensis* is only slightly winged above the middle while that of *S. Hernandezii* is broadly winged about the middle.

"Guatemala," fide Schlechter.

Stanhopea ecornuta Lem. Fl. des Serres 2: t. 181. 1846.
Figure 150.

Epiphytic on trees in forests, up to 1,200 meters alt. Uncommon in Guatemala, Honduras, Nicaragua and Costa Rica.

Plant consisting of small monophyllous pseudobulbs and a pendent inflorescence. Pseudobulbs ovoid, sulcate, often forming dense masses, up to 6 cm. long and 3 cm. in diameter, subtended by several scarios fibrous sheaths. Leaf broadly elliptic to oblong-elliptic, acute to subacuminate, plicate and membranaceous, tapering at the base into a slender sulcate petiole; lamina 35-40 cm. long, 8-18 cm. wide; petiole up to 12 cm. long. Inflorescence from the base of the pseudobulb, 1-3-flowered, pendent; peduncle up to 12 cm. long, provided with inflated lepidote bracts. Floral bracts large, inflated, deeply concave, membranaceous, about 6 cm. long. Flowers large, fleshy, with pedicellate ovaries that are 6-7 cm. long. Sepals and petals cream-white. Dorsal sepal oblong-subquadrate, subtruncate and slightly thickened at the apex, convex, 4.5-5.5 cm. long, 2.7-3 cm. wide. Lateral sepals broadly ovate to ovate-elliptic, obtuse and somewhat dorsally carinate at the apex, oblique, deeply concave below, 5-6.3 cm. long, about 3.8 cm. wide below the middle. Petals obliquely and broadly elliptic, obtuse, convex, usually spotted with purple at the base, 3.8-4 cm. long, 2.2-2.5 cm. wide. Lip simple, without horns, cymbiform-calceolate, compressed, obtuse, thick and wax-like, yellow, deepening to orange-yellow at the base and on the inside, with several tumor-like swellings on the interior base and at the apical margin of the interior, 3.8-4.5 cm. long, about 3 cm. wide. Column rigid, cymbiform-sulcate, yellow, about 2 cm. long.

"Guatemala," *Lewis* 140 (in part).

Stanhopea Lewisae Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 10, no. 4: 86, pl. 10. 1942 (type: Guatemala, Dept. Izabal, Los Andes District, near Entre Ríos, 15 feet alt., June 12, 1935, *Margaret Ward Lewis* 140). Figure 151.

Epiphytic in lowland forests. Rare in Guatemala.

Plant composed of a small monophyllous pseudobulb and a pendent several-flowered inflorescence, 3.5-7.5 dm. tall. Pseudobulb round to rhomboidal, 4-5 cm. long, 2.5-3 cm. wide at the base, partially concealed by fibrous scarios sheaths. Leaf solitary, at the apex of the pseudobulb; petiole sulcate, 9-12 cm. long, 7-8 mm. in diameter; lamina dark green, glossy, elliptic, subapiculate at the apex, plicate toward the base with five prominent nerves that form dorsal keels, 40-50 cm. long, 12-14 cm. wide. Inflorescence a 3- to 5-flowered raceme, drooping from the base of the pseudobulb and covered with dry hard imbricating bracts that vary from 1.5 to 4 cm. in length. Floral bracts suborbicular-elliptic when spread out, apiculate, fibrous, whitish, deeply concave, with the margins involute, 5-6.5 cm. long, up to 5.5 cm. wide when spread out. Flowers large, showy, creamy white with purple or reddish flecks, with slightly triangular papillose pedicellate ovaries that are 6.5-9 cm. long. Dorsal sepal oblong-elliptic, rounded or subapiculate at the dorsally keeled apex, 5-5.7 cm. long, 2.5-3 cm. wide. Lateral sepals oblique, ovate-elliptic, broadly obtuse to apiculate at the dorsally keeled

apex, deeply concave, united at the base for a short distance and conforming with the basal half of the lip, 5.5–6 cm. long, 3.3–3.7 cm. wide below the middle. Petals slightly oblique, ovate-lanceolate, acute to shortly acuminate, 4–4.7 cm. long, 1.6–1.9 cm. wide near the base. Lip fleshy and rigid with a glossy wax-like appearance, 4–4.5 cm. long, complex in structure; basal half deep yellow with striations of purple flecks, subglobose-saccate, sulcate beneath along center, verrucose-corrugated on the interior surface, the upper front portion very fleshy-thickened and sulcate, 2.3–2.8 cm. wide, 1.5–2 cm. deep, provided on each side with a short terete horn; horns incurved, conforming with and clasping the basal margins of the upper half of the lip, the free part about 6 mm. long; upper half of the lip flat, whitish, densely flecked with red, broadly rhombic-ovate, rounded-obtuse at the apex, lightly and broadly sulcate, about 2 cm. long and 2–2.5 cm. wide. Column flat, somewhat arcuate, lightly winged above, about 3.5 cm. long and 1.2 cm. wide above the middle.

Stanhopea Lewisae is without close allies. It is distinguished from all other species of *Stanhopea* by the extremely short lateral horns on the lip, which are terete and free for only about 6 mm. The rigid apical portion of the lip is also characteristic of this species. It is a great pleasure to associate with this species the name of Margaret Ward Lewis, who has added much to our knowledge of the orchids of Guatemala.

Represented from Guatemala only by the type collection.

Stanhopea oculata (Lodd.) Lindl. Gen. & Sp. Orch. Pl. 158. 1832. *Ceratochilus oculatus* Lodd. Bot. Cab. t. 1764. 1832. *S. cymbiformis* Reichb. f. Xen. Orch. 2: 84, t. 124. 1865.

Epiphytic on trees in humid forests or terrestrial in rocky soil, up to 1,500 meters alt. Mexico, British Honduras, Guatemala and Honduras.

Plant consisting of small ovoid monophyllous pseudobulbs and a pendent inflorescence. Pseudobulbs obliquely ovoid, 3.5–6.5 cm. long. Leaf broadly lanceolate to elliptic, acute to acuminate, 30–45 cm. long, 8–13.5 cm. wide, with a slender sulcate petiole up to 12 cm. long. Inflorescence a 5–8-flowered raceme; peduncle provided with clasping distichous inflated ovate-infundibuliform sheaths that are 3–4 cm. long. Floral bracts broadly ovate-oblong, acute, involute, 4–7 cm. long. Flowers showy, variable in color, usually yellow with large reddish purple spots, rarely almost white, fragrant of vanilla, with rather slender pedicellate ovaries that are 7–10 cm. long. Dorsal sepal broadly elliptic to ovate-elliptic, obtuse to subacute, concave below, 5.5–6.5 cm. long, 2.5–3.5 cm. wide near the base. Lateral sepals obliquely and broadly ovate, obtuse to acute, concave, 5.5–7 cm. long, 3–5 cm. wide below the middle. Petals oblong-lanceolate, acute, with the margins undulate-cripsed, 5–5.5 cm. long, 1–2 cm. wide. Lip up to 6.5 cm. long, very fleshy; hypochile cymbiform-concave, with a large reddish purple blotch on each side, thickened and sulcate just in front of the concave portion, 3–3.5 cm. long, about 2 cm. wide, 1.2–1.5 cm. deep; mesochile with a pair of falcate porrect acute horns projecting over the epichile, the horns about

STANHOPEA

Lewisae Ames & Correll



FIG. 151. *Stanhopea Lewisae*. 1, plant ($\times \frac{1}{2}$); 2, lip and column, side view ($\times 1$); 3, lip, from above ($\times 1$); 4, column, anterior surface ($\times 1$). Drawn by G. W. Dillon.

3 cm. long; epichile ovate-elliptic to ovate-oval, acute, somewhat conduplicate, 2–3.2 cm. long, 1.5–3.2 cm. wide. Column arcuate, broadly winged above the middle, 5–6 cm. long.

Stanhopea oculata is at once distinguishable from *S. Wardii* in that the hypochile is transversely cleft below, resulting in a prominent hump just below the mesochile. The lower portion of the hypochile is also cymbiform, with the margins smooth, straight, and not angular or toothed. The concave portion is about 1.5 cm. long. In *S. Wardii* the hypochile is not deeply cleft below. The lower portion of the hypochile is only shortly saccate with the margins more or less angular-toothed on each side just beneath the column. The saccate portion is about 5 mm. long.

Alta Verapaz: Cobán, *Türkheim* 2431; *Lewis* 521; 522.—Coastal region along Pacific slope of Guatemala, *Lewis* 227.

Stanhopea quadricornis Lindl. Bot. Reg. 24: t. 5. 1838.

No specimens of this species have been seen. The following has been composed from the description and plate (Bot. Reg. 24: t. 5. 1838).

Plant similar to the other species of *Stanhopea*, composed of short ovoid monophyllous pseudobulbs and a pendent several-flowered inflorescence. Pseudobulbs subtended by two brownish fibrous bracts. Leaves oblong-elliptic, acute, with a short sulcate petiole. Peduncle clothed with imbricating sheaths. Flowers large, showy, yellowish orange, spotted with crimson, lip with a large crimson blotch at the base. Dorsal sepal ovate-oblong, obtuse and minutely retuse at the apex. Lateral sepals obliquely ovate, obtuse. Petals elliptic-oblong, obtuse, undulate. Lip fleshy; hypochile concave-saccate, with a pair of short horns arising under the column and projecting forward over the saccate portion; mesochile with a long pair of lateral falcate horns arising near the constriction and curved over the upper half of the lip; epichile broadly ovate, obtuse. Column arcuate, bidentate at the apex, with a pair of broad lateral wings above the middle, nearly as long as the lip.

This species is distinguishable from all other species of *Stanhopea* found in Guatemala by the short pair of crimson horns projecting from the base of the lip just under the column.

“Guatemala,” fide Schlechter.

Stanhopea saccata Batem. Orch. Mex. and Guat. t. 15. 1839 (type: Guatemala, *Skinner*). *S. Marshii* Reichb. f. Xen. Orch. 1: 120. 1855. *S. radiosa* Lem. Illustr. Hort. 6: Misc. 72, figs. 1, 2. 1859. Figure 152.

Epiphytic on trees in humid forests, up to 1,400 meters alt. Uncommon in Mexico, Guatemala and El Salvador.

Plant consisting of small monophyllous pseudobulbs and a pendent inflorescence. Pseudobulbs ovoid to rhomboidal, sulcate, stout, 3–6.5 cm. long, 2–3 cm. in diameter, enclosed by two evanescent scarious sheaths that are 6–9 cm. long. Leaf erect, elliptic to elliptic-lanceolate, acuminate, plicate, 2–4.5 dm. long including the slender sulcate petiole, 4–7 cm. wide. Inflorescence from the base of the pseudobulbs, 2–3-flowered; peduncle up to 25 cm. long including the flowers, more or less concealed by large membranaceous sheaths that are 1.5–3 cm. long.

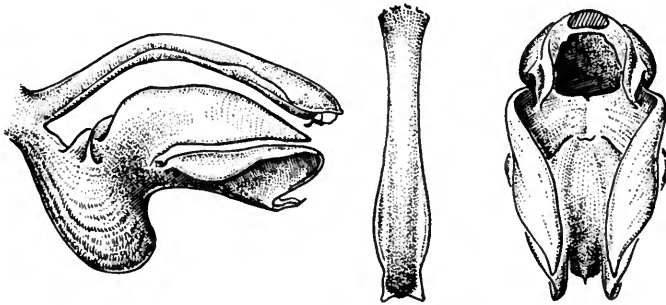


FIG. 152. *Stanhopea saccata*. Left, column and lip, side view ($\times 1$); center, column, dorsal view ($\times 1$); right, lip, from above ($\times 1$). Drawn by G. W. Dillon.

Floral bracts oblong, somewhat inflated, concave, spotted, 3–5 cm. long. Flowers large, fleshy, greenish white or cream-color, flecked finely with purple and brown, fragrant of orange peels or cinnamon, with pedicellate ovaries that are 7 cm. long, white, flecked with purple. Dorsal sepal oblong-elliptic, bluntly obtuse at the apex, broadest below the middle, 5–5.5 cm. long, 1.3–2.5 cm. wide. Lateral sepals obliquely ovate-subquadrate, triangular-ovate or ovate-elliptic, obtuse, 5–6.5 cm. long, 2.3–4.3 cm. wide. Petals oblong-elliptic to oblong-lanceolate, obtuse to acute, the margins undulate-crisped, 4.3–5 cm. long, 1.5–2.5 cm. wide. Lip fleshy and wax-like, with a deeply saccate orange base terminating in two long narrow horns and a somewhat conduplicate 3-lobulate lamina, about 4 cm. long, the sac (hypochile) about 1 cm. long, 1.5 cm. wide and 1.5 cm. deep; horns arising on each side of the mesochile above the pouch, linear-lanceolate, acute, flat, falcate, bent slightly inwards, 2.3–3 cm. long, 8–10 mm. wide; lamina (epichile) ovate-subquadrate, conduplicate, 3-lobulate at the apex, about 2.2 cm. long and 2 cm. wide across the base, the middle acute-apiculate lobule shorter than the projecting obtuse lateral lobes. Column slender, arcuate below the middle, with a pair of narrow revolute wings near the apex, 4–4.5 cm. long. Capsule large, ellipsoid, 4–5 cm. long, about 2 cm. in diameter.

Schlechter referred *S. Marshii* to Guatemala. However, an examination of a drawing of a specimen of *S. Marshii* in the Reich-enbach Herbarium shows that it is apparently referable to *S. saccata*. The type material is extremely poor.

Guatemala: El Fiscal, *Deam* 6197.—“Guatemala,” *Bates* 16; *Lewis* 67 (in part).—Near Chicacao, *Lewis* 122 (in part).

Stanhopea Wardii Lodd. ex Lindl. Sert. Orch. t. 20. 1838. Figures 153, 154.

Epiphytic on trees and on rocks in humid forests, up to 2,700 meters alt. Widespread but not common in Mexico, Guatemala, Costa Rica and Panama.

Plant consisting of a monophyllous short pseudobulb and pendent inflorescence. Pseudobulbs ovoid-conical or rhomboidal, sulcate, somewhat compressed, 5-7 cm. long, up to 4 cm. thick, subtended by scarios-fibrous sheaths. Leaf broadly obovate-elliptic to elliptic-lanceolate, abruptly acute, 2-5 dm. long, 8.5-17 cm. wide, with a slender sulcate petiole that is up to 15 cm. long. Inflorescence a pendent 3-9-flowered raceme; peduncle from the base of the pseudobulb, provided with scarios inflated infundibuliform lepidote sheaths that are 2-6 cm. long. Floral bracts broadly oblong, acute to acuminate, lepidote, scarios, 4-7 cm. long, 1.5-2.5 cm. wide. Flowers fragrant, large, creamy white or greenish white, marked with reddish purple dots, with lepidote pedicellate ovaries that are 6-10 cm. long. Dorsal sepal broadly ovate-elliptic, rounded and slightly apiculate at the apex, 4.8-6.3 cm. long, 2.6-3.5 cm. wide. Lateral sepals oblique, broadly ovate-oblong to subrotund-oblong, obtuse to rarely acute, concave, conjoined at the base for about 1 cm., 5-6.5 cm. long, 3.3-4.5 cm. wide. Petals elliptic-lanceolate, acute to acuminate, recurved, with the margins undulate-crisped, 4.5-5.5 cm. long, 1.3-2.3 cm. wide. Lip complex; hypochile short, orange-yellow or maroon, usually with two brownish purple blotches on each side near the base, shortly saccate, angled or toothed on each side near the base, thickened and sulcate above, 2-2.3 cm. long, 1.2-1.8 cm. wide, 1-1.5 cm. deep; mesochile with a pair of arcuate porrect fleshy sharply acuminate horns that are 3-3.5 cm. long; epichile loosely attached at the base, subrotund-ovate, abruptly acute and reflexed at the apex, broadly sulcate through the center, with the lower margins somewhat revolute, 2-3.3 cm. long, 2-3 cm. wide. Column arcuate, broadly winged above, 4-5 cm. long. Capsule ellipsoidal, about 6 cm. long.

Quezaltenango: *Vaght* 292.—Zacapa: Sierra de las Minas, between Río Hondo and summit of mountain at Finca Alejandría, *Steyermark* 29710.—“Guatemala,” *Porter*; *Lewis* 528; 228.

EXCLUDED SPECIES

Stanhopea graveolens Lindl. Bot. Reg. 26: Misc. p. 59. 1840.

R. E. Arnold reported this South American plant from Guatemala (Orch. Rev. 36: 142. 1928). It is quite possible that *S. graveolens* and *S. oculata* are conspecific; hence the basis for this report.

62. GONGORA Ruiz & Pav.

Epiphytic plants with short fleshy bifoliate pseudobulbous stems and a lateral inflorescence. Leaves large, plicate-venose, contracted at the base. Inflorescence from the base of the pseudobulb, a long simple laxly flexuose raceme, reflexed.



STANHOPEA

Wardii Lodd.

FIG. 153. *Stanhopea Wardii*. In background, flowering plant ($\times \frac{1}{2}$); inflorescence (about $\times 1$). Drawn by Blanche Ames.

Flowers rather large, with long pedicellate ovaries. Floral bracts small, narrow. Dorsal sepal erect-spreading, adnate from the base of the column to near its apex. Lateral sepals broader, adnate to the foot of the column, spreading and reflexed, strongly oblique. Petals adnate to the sides of the column, spreading free from the column near the dorsal sepal, the free part erect to spreading. Lip continuous with the foot of the column, spreading to ascending, narrow, fleshy; lateral

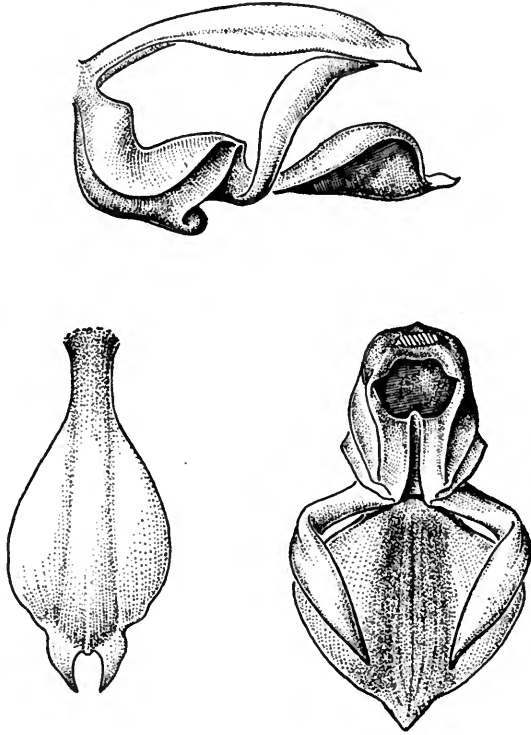


FIG. 154. *Stanhopea Wardii*. Top, column and lip, side view ($\times 1$); lower left, column, dorsal view ($\times 1$); lower right, lip, from above ($\times 1$). Drawn by G. W. Dillon.

lobes thick, erect, variously horned to aristate; mid-lobe variously saccate to broadly compressed, bilobed or acute to long-acuminate at the apex. Column erect to ascending, produced at the base into a foot, semiterete above, wingless to broadly winged at the apex, and bicornute or naked at the apex; anther terminal, operculate, incumbent, 1-celled to imperfectly 2-celled; pollinia 2, ovoid to narrowly oblong. Capsule oblong to fusiform.

Gongora includes about twenty-five species, which are confined to the American tropics and comprise a group of plants that possess extremely complicated and multicolored flowers. Some of the more attractive species are widely cultivated. A number of species

have been described from horticultural specimens whose original native habitat is unknown.

Lip prominently bilobed at the apex *G. cassidea*.
Lip long-acuminate at the apex *G. maculata*.

Gongora cassidea Reichb. f. Bot. Zeit. 22: 298. 1864 (type: Guatemala, *Schiller*).

Epiphytic on trees in forests, up to 1,800 meters alt. Rare in Guatemala, Honduras and Nicaragua.

Pseudobulbs obliquely ovoid-conical, 4-angled, slightly compressed, bifoliate, light green, 3-6 cm. long, 3-4 cm. wide, about 2.5 cm. thick, subtended by scarious fibrous sheaths. Leaves from apex of pseudobulbs, narrowly lanceolate to elliptic-lanceolate, acuminate, prominently 3-nerved, tapering to the slender sulcate petiole, plicate, 15-36 cm. long including the petiole, 2-6.5 cm. wide. Inflorescence lateral, from base of pseudobulb, pendent, a loosely few-flowered raceme up to 30 cm. long; peduncle wiry, slender, flattened near the inflorescence, brown or rufous green, provided near the base with tubular-conduplicate bracts that are 1-1.5 cm. long; rachis more or less fractiflex. Floral bracts small, lanceolate, acuminate, scarious, about 5 mm. long. Flowers 5-10, greenish brown or pinkish brown, with slender wiry arcuate pedicellate ovaries that are 3-6 cm. long. Dorsal sepal inserted on the back of the column near its base, suborbicular to broadly elliptic, conspicuously cucullate, 2-2.5 cm. long, 1.5-2 cm. wide when spread out. Lateral sepals inserted on the sides of the column, broadly oblong to suborbicular-elliptic, obtuse to subapiculate, oblique, antrorsely falcate, 2-2.5 cm. long, 1.5-1.8 cm. wide. Petals adnate to and conforming with the column to about its middle, antrorsely falcate and recurved, obliquely oblong-lanceolate and sigmoid, aristate at the apex, 7.5-12 mm. long, 2.5-4 mm. wide. Lip with a linear-quadrate claw, subarticulate with the column-foot, complex, 2-2.5 cm. long, about 5 mm. wide throughout, arcuate; claw about 4 mm. long and 3 mm. wide, with a small rounded callus at the apex; lower portion of lip saccate, thickened and compressed in front of the sac, with a pair of erect parallel lobules arising from the margins of the saccate portion; lobules obliquely cuneate-obovate, obliquely subacute, about 7 mm. long and 4-5 mm. wide; upper part of lip about 1.3 cm. long, broadly gibbous at the base, narrowed and linear in the middle, slightly dilated and bilobulate at the apex with an apicule in the sinus, the lobules linear-lanceolate and obtuse. Column arcuate, produced into a short foot at the base, mottled with purple, broadly winged on each side at the apex, with the subulate rostellum projecting forward at a right angle to the column, up to 15 mm. long.

Alta Verapaz: Río Cobán, *Johnson* 611.—Chiquimula: Montaña Nonojá, 3-5 miles east of Camotán, *Steyermark* 31691.—San Marcos: Finca El Porvenir along Río Chopal, slopes of Volcán Tajumulco, *Steyermark* 37487.—Sololá: In ravine adjacent to pine woods bordering Río Bravo, in vicinity of Finca Mocá, south-facing slopes of Volcán Atitlán, *Steyermark* 48006. Virgin forested slopes (south-facing) of Volcán Atitlán in Aposento woods, above Finca Mocá, *Steyermark* 48038.—Pastores, *Sierra* 1578.—Quezaltenango: Finca

San José Buena Vista near Colomba, *Lewis* 194.—“Guatemala,” *Bates* 1.

Gongora maculata Lindl. Bot. Reg. 19: t. 1616. 1833. *G. quinquenervis* Ruiz & Pav. Syst. Veg. 227. 1798. Figure 155.

Epiphytic in humid forests, up to 1,400 meters alt. Common and widespread in Mexico through Central America to Panama.

Pseudobulbs ovoid-conical or cylindrical-conical, sulcate, bifoliate, 5–12 cm. long, 2.5–3.5 cm. in diameter, subtended by two or more acute scarios sheaths that are 8–10 cm. long. Leaves elliptic to elliptic-obovate, acute to acuminate or apiculate, with undulate margins, plicate and strongly nervose, 15–60 cm. long including the short petiole, 4.5–15 cm. wide. Inflorescence lateral, pendent, a laxly many-flowered raceme, up to 9 dm. long including the long slender peduncle; peduncle terete below, angular above, reddish-tinged, provided with several small scarios bracts. Floral bracts minute, green, ovate-lanceolate, acute, 2–6 mm. long. Flowers variously colored, usually brownish red or red with yellow or white markings, commonly maculate, often very fragrant, with long slender spreading pedicellate ovaries that are 2–4 cm. long and often minutely papillose. Dorsal sepal from near the apex of the column, broadly elliptic to elliptic-lanceolate, recurved at the acute to acuminate apex, with revolute margins, 1.5–2.3 cm. long, 8–12 mm. wide; lateral sepals strongly reflexed and oblique, broadly ovate to lanceolate, acute to acuminate, with revolute margins, 2–3 cm. long, 8–18 mm. wide below the middle. Petals adnate to the sides of the column; free part spreading and recurved, semiterete or flat and thickened, incurved and sigmoid, lanceolate, long-acuminate, up to 1.2 cm. long and 2.5 mm. wide. Lip continuous with the column-foot, fleshy, projecting horizontally, 2–3 cm. long, laterally compressed, divided into two subequal portions; lower half conduplicate, saccate, provided with a dorsal tubercle or upcurved lobules on each side near the base, the forward portion terminated on each side above and below by an acute angle with the upper angles supplemented by a long porrect awn; upper half laterally compressed, sulcate above, dorsally gibbous at the base, with a spur-like apex. Column arcuate, 1.5–2.5 cm. long including the foot.

This species is extremely variable in the color of the flowers.

Alta Verapaz: Chamá, *Johnson* 233. Río Chiacté, near Finca Volcán, *Wilson* 278. Cubilgüitz, *Türckheim*.—Izabal: Shores of Lago Izabal, opposite San Felipe, between San Felipe and mouth of Río Juan Vicente, *Steyermark* 39696. (?) Between Dartmouth and Morales towards Lago Izabal, Montaña del Mico, *Steyermark* 39044. Los Andes district, near Entre Rios, *Lewis* 136.—Petén: La Libertad, *Aguilar* 372.—Eastern portions of Vera Paz and Chiquimula, *Watson*.

63. CORYANTHES Hook.

Epiphytic plants with short to elongated fleshy pseudobulbous bifoliate stems and a laxly few-flowered inflorescence. Leaves large, plicate, prominently ner-



FIG. 155. *Gongora maculata*. Plant (about $\times \frac{1}{2}$). Drawn by Dorothy O. Allen.

vose. Inflorescence lateral, from the base of the pseudobulb, reflexed, a simple raceme. Flowers large and showy. Sepals free, spreading, large, irregularly undulate-flexuose, dorsal sepal much shorter than the lateral ones. Petals smaller than the sepals, erect, twisted. Lip fleshy, long-unguiculate, spreading and continuous from the base of the column; lateral lobes united to form a cup-shaped hypochile; mid-lobe large, galeate. Column long, terete, the apex inflexed-clavate to shortly 2-winged, footless, 2-winged to 2-horned at the base; anther terminal, operculate, incumbent, 2-celled; pollinia 2, waxy.

The species of *Coryanthes*, of which there are about fifteen, mainly in Central and South America, have extremely complex flowers that are peculiarly adapted to pollination by insects.

Flowers yellowish green flecked with purple.....*C. picturata*.
Flowers yellowish brown.....*C. speciosa*.

***Coryanthes picturata* Reichb. f. Bot. Zeit. 22: 332, 415. 1864.**

No specimen has been available and if there were it probably would be found to be a variant of *C. speciosa*. The species is included here on the basis of its occurrence in British Honduras, where it was originally collected.

This species apparently differs from *C. speciosa* mainly in the color of its flowers and in its very short and broad mesochile (according to the original drawing seen of a flower). The flowers are said to be yellowish green flecked with bright purple.

***Coryanthes speciosa* Hook. in Paxt. Mag. Bot. 2: 135. 1835.
Figure 156.**

Epiphytic in dense tropical forests, up to 1,000 meters alt. Rare in Guatemala, Honduras, the West Indies and northern South America.

Pseudobulbs narrowly oblong, deeply multisulcate, bifoliate, 7-15 cm. long, about 1.5 cm. thick. Leaves narrowly elliptic to linear-lanceolate, acuminate, conspicuously 3-5-nerved, 3.5-5.5 dm. long including the slender sulcate petiole, 2-6 cm. wide. Inflorescence robust, from the base of the pseudobulb, 3-5.5 dm. long, 2-5-flowered; peduncle provided with several small distant brown tubular sheaths that are 2-3 cm. long. Floral bracts ovate-lanceolate, acuminate, convolute, 3-4 cm. long. Flowers large, complex, yellowish brown, with rather stout scurfy pedicellate ovaries that are up to 10 cm. long. Sepals and petals reflexed and spreading, inserted on the base of the column. Dorsal sepal suborbicular-flabellate to rhombic, apiculate, somewhat undulate, 2.5-3 cm. long, 2.5-3.5 cm. wide. Lateral sepals broadly falcate, ovate-oblong, acute to subobtuse, the apex slightly thickened, longitudinally striate, 6-8 cm. long, 3-4 cm. wide. Petals oblique, linear-oblong, undulate and somewhat twisted, 3-4 cm. long, 5-8 mm. wide. Lip yellowish and yellow-brown, joined to the base of the column by a narrow slightly compressed claw that is 1-1.2 cm. long and about 3 mm. wide; hypochile helmet-shaped or obliquely hemispherical, puberulent on

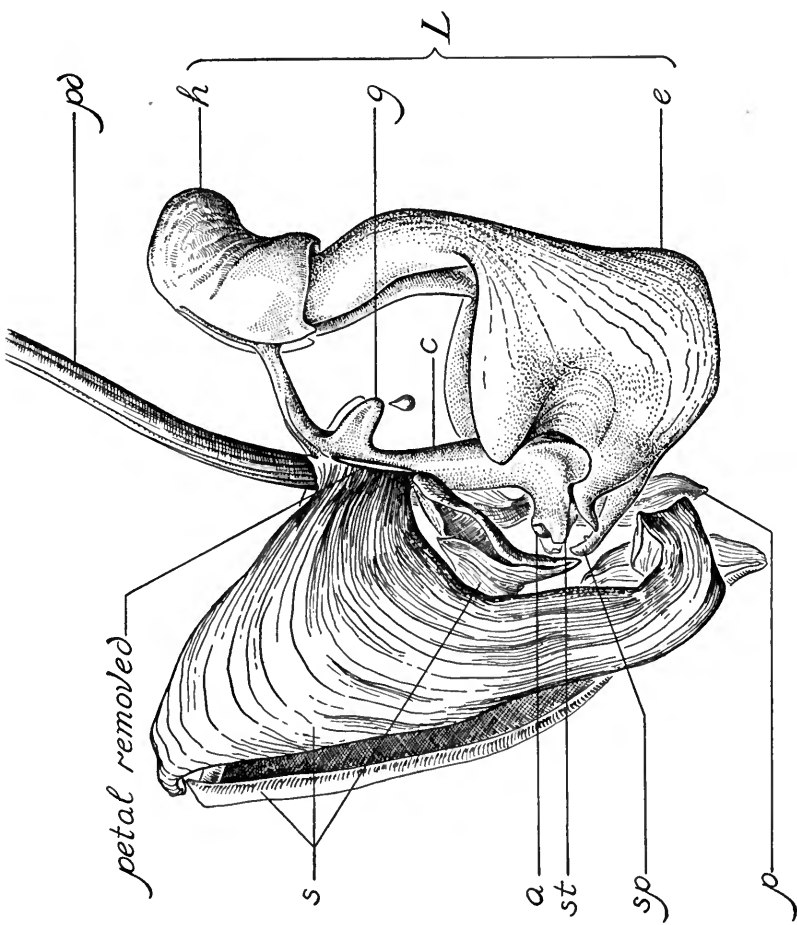


FIG. 156. *Coryanthes speciosa*. Flower ($\times 1$); *L*, lip; *pd*, peduncle; *h*, hypochile; *g*, gland (with drop of liquid falling away); *e*, epichile; *s*, sepals; *a*, anther; *st*, stigma; *sp*, spout; *p*, petal. Drawn by G. W. Dillon.

the outer surface, about 2 cm. deep, 2.5 cm. wide, 1.5 cm. thick; mesochile arising from within the hypochile, broadly semicylindrical, dorsally pubescent, with the margins strongly inrolled to form a tube, slightly sulcate on the back, about 3.5 cm. long and 1.5 cm. wide near the middle; epichile pendent from the mesochile, galeate-hemispherical, deeply cleft in front with three projecting teeth at the base of the cleft, with all the teeth provided with a small tubercle at the base, the sac about 3 cm. deep and 3.5 cm. broad, the lateral teeth uncinately incurved and acute, the middle tooth (about 1.3 cm. long) linear and obtuse. Column fleshy-thickened, nearly terete, with narrow lateral wings near the truncate and abruptly recurved apex, greenish, 3-4 cm. long, provided with a pair of short recurved glandular horns at the base.

Alta Verapaz: Cubilgüitz, *Türckheim* 7680.—Izabal: Los Andes District, *Lewis* 160.

64. XYLOBIUM Lindl.

Epiphytic, terrestrial or rock-inhabiting plants with short or elongated pseudobulbous 1-3-leaved stems. Leaves large, plicate-venose, contracted into a short or long petiole. Inflorescence from the base of the pseudobulbs, erect, simple, a few- to many-flowered raceme. Floral bracts usually linear-attenuate. Flowers medium-sized. Sepals nearly equal, erect and spreading; dorsal sepal free; lateral sepals broader than the dorsal, oblique, adnate to the base of the foot of the column to form a prominent mentum. Petals similar to the dorsal sepal but smaller, somewhat oblique. Lip subarticulate with the foot of the column, sessile or contracted at the base and incumbent, then erect, subentire to prominently 3-lobed; lateral lobes or sides erect, embracing the column; mid-lobe short, broad, spreading; disk lamellate or callose. Column erect, semiterete, sulcate or narrowly two-winged, produced at the base into a prominent foot; another terminal, operculate, incumbent, 1-celled; pollinia 4, ovoid. Capsule ellipsoidal, erect.

This small genus of about fifteen species comprises a very distinctive group of plants, which are widespread in tropical America. The species, for the most part, are quite distinct. However, there are several that are very closely allied. The genus resembles *Maxillaria* in some ways, but its plicate leaves and racemose inflorescence immediately distinguish it from that genus.

1. Pseudobulb terete, elongated, usually more than 15 cm. long; lip with all the veins more or less papillose on both surfaces. *X. elongatum*.
1. Pseudobulb commonly fusiform-thickened to subcylindrical, less than 10 cm. long; lip not papillose all over.
 2. Lip narrowly cuneate below the middle, suborbicular-obovate above. *X. brachypus*.
 2. Lip elliptic-oblong in outline, not conspicuously narrowed below the middle.
 3. Lip distinctly 3-lobed at the apex; mid-lobe of lip provided with a fleshy callus on the back; lateral sepals strongly keeled. *X. foveatum*.
 3. Lip obscurely 3-lobed at the apex; mid-lobe of lip more or less verrucose or papillose but not provided with a dorsal callus; lateral sepals only slightly keeled.

4. Lip 6-7-lamellate; lamellae distant, extending from the base of the lip and running into the densely verrucose mid-lobe; lateral lobes rounded.
X. sulfurinum.
4. Lip with 5 short lamellae about the middle of the disk; mid-lobe only slightly papillose; lateral lobes obtuse and somewhat erose.
X. Tuerckheimii.

Xylobium brachypus (Reichb. f.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 252. 1883. *Maxillaria brachypus* Reichb. f. Bot. Zeit. 10: 734. 1852 (type: Guatemala, *Warszewicz*).

Apparently epiphytic. Guatemala, rare.

Pseudobulb pyriform, monophyllous. Leaf large, striate, oblong-obovate, subacute, with a short stout petiole. Peduncle abbreviated, densely clothed with distichous bracts, few-flowered, flexuose. Floral bracts ovate, acute, scarious, concealing the pedicellate ovaries. Flowers congested. Sepals oblong-ligulate, subacute; lateral sepals oblique. Petals elliptic, subacute, about equal to the dorsal sepal. Lip narrowly cuneate, then dilated into a suborbicular-obovate acute lamina with the margins repand-undulate, adorned with a pair of parallel thickened lines on the slender basal portion.

Since no specimens of this species were seen, the above description was compiled from Reichenbach's original description, supplemented by an analytical sketch of the type of *Maxillaria brachypus* in the Reichenbach Herbarium. Both Hemsley and Schlechter gave only Nicaragua as the area of distribution of this species. However, since the original description cited Guatemala as the type locality, it is included here.

Xylobium elongatum (Lindl.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 252. 1883. *Maxillaria elongata* Lindl. in Paxt. Fl. Gard. 3: 69, fig. 264. 1852-53. Figure 157.

Epiphytic, terrestrial or on rocks in humid forests, up to 1,750 meters alt. In Mexico, Guatemala, Costa Rica and Panama.

Stem erect, terete, elongated and pseudobulbous, finely sulcate, bifoliate, 1.7-2.6 dm. long, 7-12 mm. in diameter, subtended by several scarious imbricated sheaths. Leaves linear-lanceolate, oblong-lanceolate or broadly elliptic, acute or acuminate, often abruptly so, plicate, prominently nervose, 1.8-5 dm. long including the thick petiole, 4-11 cm. wide. Inflorescence lateral, one or two, a rather compact 5-15-flowered raceme, 12-30 cm. long including the peduncle; peduncle provided with several brownish red sheaths that are 2-6 cm. long. Floral bracts linear-attenuate, acuminate, 1-3 cm. long. Flowers white or cream-colored, usually with brownish or purplish markings, with slender pedicellate ovaries that are about 1.5 cm. long. Dorsal sepal narrowly lanceolate, acute to acuminate, somewhat dorsally keeled above the middle, with the margins recurved, 2-2.3 cm. long, about 5 mm. wide near the base. Lateral sepals falcate, triangular-lanceolate, strongly keeled on the back especially above the middle,

slightly conduplicate at the acute apex, produced at the base to form an obtuse mentum, 2.5-3 cm. long, 7-10 mm. wide below the middle. Petals oblique, narrowly lanceolate, conduplicate at the acuminate apex, 1.5-1.8 cm. long, 3-5 mm. wide near the base. Lip articulate with the foot of the column, shallowly 3-lobed, fleshy, elliptic in outline when spread out, 1.8-2 cm. long, 8-9 mm. wide across the lateral lobes, slightly arcuate, all of the nerves more or less reddish papillose on both inner and outer surfaces of the lip; lateral lobes erose at the apex, rounded and upcurved; mid-lobe very fleshy, ovate-oblong, densely glandular-papillose; disk with a small 3-5-carinate papillose callus about the center. Column short, compressed, arcuate, 1-1.3 cm. long including the prominent foot, about 3 mm. wide. Fruit ellipsoidal, green, about 2.5 cm. long.

This species is distinguished from the other species of *Xylobium* found in Guatemala by its elongated, slender, pseudobulbous stem. The lip is also more densely papillose than that of any other species found in Guatemala.

Alta Verapaz: Cobán, *Lewis* 224. Finca Volcán, *Wilson* 319.

Xylobium foveatum (Lindl.) Nicholson, Gard. Dict. 4: 225. 1887; Cogn. in Mart. Fl. Bras. 3, pt. 5: 469. 1902. *Maxillaria foveata* Lindl. Bot. Reg. 25: Misc. p. 2. 1839. *Xylobium concavum* (Lindl.) Hemsl. in Godm. & Salvin, Biol. Centr.-Am. 3: 252. 1883. *Maxillaria concava* Lindl. Bot. Reg. 30: Misc. p. 4. 1844 (type: Guatemala, *Hartweg*).

Epiphytic on trees in forests, up to 1,300 meters alt. Uncommon in Mexico, Guatemala, Costa Rica, Panama and throughout northern South America.

Pseudobulbs oblong-conical, sulcate, 2-3-leaved, 2.5-9.5 cm. long, 1.5-4 cm. wide, subtended by scarios-fibrous sheaths. Leaves broadly elliptic to oblanceolate, often widest near the apex, more or less abruptly acute or acuminate, 21-45 cm. long, 6-7 cm. wide. Inflorescence lateral, erect-ascending, usually a many-flowered raceme, 1-3.3 dm. long including the rather stout peduncle; peduncle provided with several inflated-conduplicate scarios sheaths. Floral bracts setaceous, up to 2.5 cm. long. Flowers white or yellowish, with slender pedicellate ovaries. Dorsal sepal oblong-elliptic, fleshy-thickened and obtuse or apiculate at the apex, 1-1.4 cm. long, 3.5-5 mm. wide. Lateral sepals oblong-elliptic to oblong-lanceolate, falcate, acute to subacuminate, strongly dorsally carinate especially at the apex, with the carina somewhat erose and excurrent, about 1.5 cm. long and 5 mm. wide. Petals elliptic-lanceolate, obtuse and thickened at the apex, oblique, about 1 cm. long and 3-3.5 cm. wide near the middle. Lip fleshy, elliptic-oblong in outline when spread out, more or less 3-lobed at the apex, concave at the base, canaliculate, often marked with reddish stripes, 1-1.1 cm. long, 6-7.5 mm. wide; lateral lobes upcurved, rounded-obtuse at the apex; mid-lobe broader than long, about 4 mm. wide, broadly rounded, truncate or lightly retuse, fleshy, sometimes concave, adorned on the back with a fleshy callus; disk with a 3-5-carinate callus in the center, with the carinae often fused together. Column about 1 cm. long.

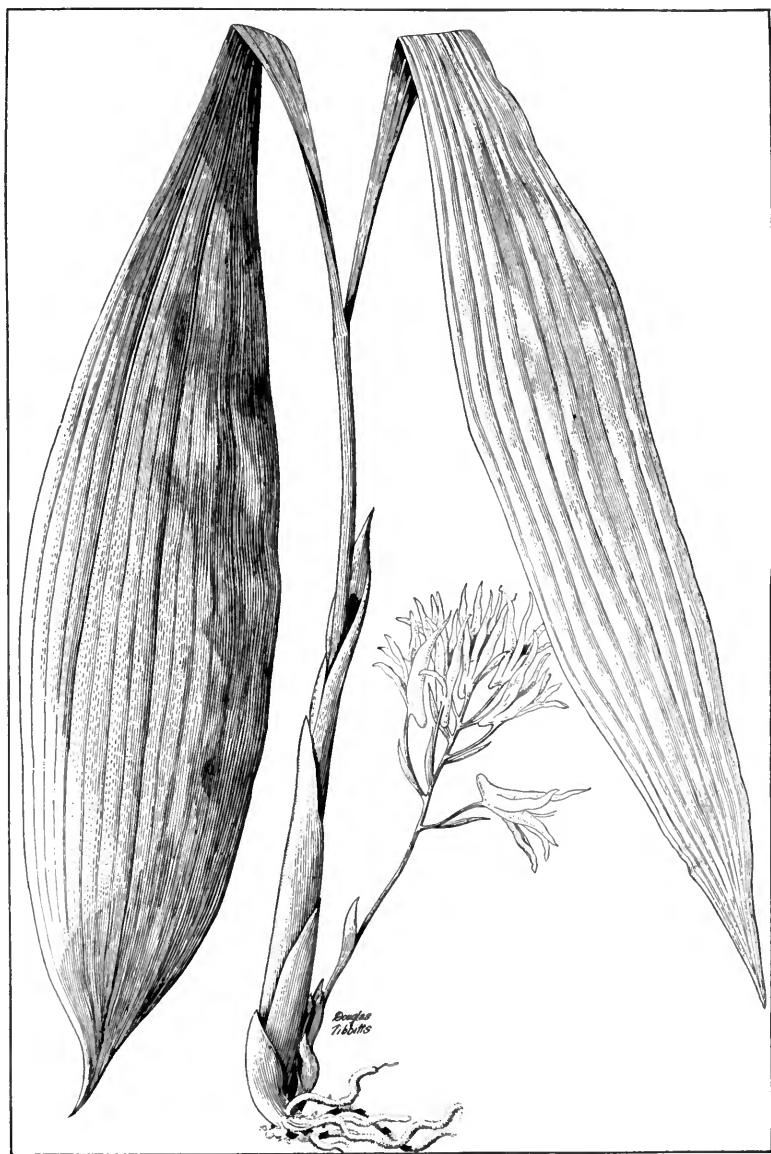


FIG. 157. *Xylobium elongatum*. Plant ($\times \frac{1}{2}$). Drawn by D. E. Tibbitts.

Represented from Guatemala only by the type collection of *Maxillaria concava*.

Xylobium sulfurinum (Lem.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 493. 1918. *Maxillaria sulfurina* Lem. Fl. des Serres 1: 330b. 1848 (type: Guatemala?).

Apparently an epiphyte. Extremely rare in Guatemala.

Pseudobulb fusiform-cylindrical, striate, 1-2-leaved, 5.5-6 cm. long, about 1.5 cm. in diameter. Leaves narrowly lanceolate, subacuminate, plicate, nervose, 35 cm. long, 3.5 cm. wide. Inflorescence short, 2-flowered (in ours), 5 cm. long including the abbreviated peduncle, subtended by several short imbricated bracts which have hyaline margins. Floral bracts linear-attenuate, exceeding the pedicellate ovaries. Flowers apparently yellow. Dorsal sepal linear-oblong, subobtuse, 1.7 cm. long, 5 mm. wide. Lateral sepals falcate, triangular-lanceolate, subobtuse, dorsally keeled, with the margins revolute, 2 cm. long, 7 mm. wide, produced at the base to form a prominent mentum which is about 7 mm. long. Petals oblique, oblong-lanceolate, obtuse to acute, 1.7 cm. long, 4 mm. wide. Lip broadly oblong to oblong-obovate, obscurely 3-lobed above the middle, canaliculate, 1.8 cm. long, 1.2 cm. wide across the lateral lobes when spread out; lateral lobes small, rounded; mid-lobe broadly semiorbicular, obtuse to truncate and sinuate at the apex, very fleshy-verrucose; disk 6-7-lamellate. Column compressed, sulcate, semicylindrical, 1.5 cm. long including the prominent foot, 4 mm. wide.

This species is apparently very rare and possibly endemic to Guatemala. We have seen only the following specimen which we believe to be referable to this species. The broad lip is adorned with seven prominent lamellae which terminate in the verrucose apical lobe. It is very closely allied to *X. Tuerckheimii*.

Chimaltenango: Chichabac, near Tecpam, 8,500 ft. altitude, August, 1932, *Hatch* 501.

Xylobium Tuerckheimii Kränzl. Ann. Naturhist. Mus. Wien 44: 325. 1930 (type: Guatemala, Im Walde an der Strasse von Tactic in das Polochictal in 9,600 Fuss ü. M., July, 1878, *Türckheim* 163).

Epiphytic on trees in humid forests, up to 3,000 meters alt. Rare in Mexico and Guatemala.

Pseudobulbs aggregated, slender, subcylindrical, monophyllous, 5-7 cm. long, about 1.5 cm. in diameter, subtended by scarious-fibrous sheaths. Leaf 25-50 cm. long including the slender petiole, oblong to slightly oblanceolate, acute to subacuminate, strongly 3-5-nerved, plicate, 5.5-10 cm. wide. Inflorescence lateral, a several-flowered loose raceme, 15-27 cm. long including the slender wiry peduncle; peduncle provided with several tubular sheaths that are 2-3 cm. long. Floral bracts linear-lanceolate, long-acuminate, 1.5-2.5 cm. long. Flowers small, the sepals and petals yellow, lip white, with slender pedicellate ovaries

that are about as long as the floral bracts. Dorsal sepal oblong-lanceolate, acute to acuminate, 9–15 mm. long, 2–5 mm. wide. Lateral sepals falcate, triangular-lanceolate, acute, up to 18 mm. long and 7.5 mm. wide below the middle, produced at the base to form an obtuse mentum. Petals linear-lanceolate, acute to acuminate, somewhat falcate, up to 1.5 cm. long, 3–4 mm. wide. Lip subrhombic or broadly elliptic, subobtuse to somewhat truncate at the apex, 10–13 mm. long, 7–8 mm. wide, obscurely 3-lobed above the middle, with the lateral margins upcurved, the apical ovate portion more or less papillose, adorned with five short parallel lamellae about the middle of the disk. Column thick, short, about 7 mm. long, with a foot about 4 mm. long. Capsule ellipsoid, about 2.5 cm. long.

Alta Verapaz: Río Frio, *Johnson* 733.

65. LYCASTE Lindl.

Epiphytic, terrestrial or rock-inhabiting plants with short thickened pseudobulbs. Leaves several, at the apex of young pseudobulbs, large, plicate-venose. Inflorescences lateral, usually several from the base of the pseudobulb, erect or spreading-ascending, one-flowered (in ours). Flowers mostly large and showy, often fragrant. Sepals subequal, erect-spreading to more or less revolute; lateral sepals oblique, broader than the dorsal sepal, conjoined at the base to form (with the column-foot) a saccate mentum. Petals similar to the sepals but smaller and thinner. Lip loosely attached to or articulate with the column-foot, sessile to unguiculate, shorter than the sepals, 3-lobed; lateral lobes erect, broad to narrowly falcate; mid-lobe broad to narrowly elongate, spreading-decurved, entire to variously ciliate or fringed, occasionally pubescent; disk usually more or less pubescent, with a variously shaped and arranged transverse or callose appendage about the middle. Column long, arcuate, semiterete, wingless to narrowly 2-winged above, produced into a foot at the base; anther terminal, operculate, incumbent, 1-celled; pollinia 4. Capsule oblong to fusiform, large, erect or sometimes pendent.

This genus consists of about twenty-five closely allied species, which are found throughout Mexico, Central America, the West Indies and South America. The species are easily cultivated and are represented in horticulture by a number of color varieties. One, *L. virginialis*, formerly known as *L. Skinneri*, has been adopted as the national flower of Guatemala. Most of the species have been placed in *Maxillaria* at one time or another, but their plicate leaves immediately separate them from that genus.

1. Lip more than 3.5 cm. long.
 2. Mid-lobe of lip small, oblong, densely covered with long soft hairs; callus ovate-triangular *L. lasioglossa*.
 2. Mid-lobe of lip large, suborbicular to oblong-triangular, without long hairs; callus narrow.
 3. Lip bright yellow, marked with reddish spots and stripes *L. Deppei*.
 3. Lip grading in color from white to deep purple, commonly flecked or veined with reddish violet *L. virginialis*.
1. Lip less than 3.5 cm. long.

4. Lip yellow or deep orange, variously marked with red, crimson or maroon, distinctly saccate at the base.
5. Lip with a crimson blotch at the base; lateral lobes bluntly rounded; callus small. *L. cruenta*.
5. Lip without a crimson blotch at the base; lateral lobes elliptic, prominent; callus large, covering the base of the mid-lobe. *L. cochleata*.
4. Lip differently colored from those above, concave-tubular below the middle, not saccate at the base.
6. Lip yellow, sparingly spotted with orange on the inner surface; callus a large broad thin truncate flap-like plate. *L. aromatica*.
6. Lip white or stained with rose-color, marked with deep rose-color; callus small and thick.
7. Lip deeply 3-lobed; callus obovate; sepals narrow, elliptic-lanceolate, spreading. *L. tricolor*.
7. Lip shallowly 3-lobed; callus narrow, obtuse; sepals broad, oblong-elliptic, reflexed to somewhat revolute above the middle. *L. candida*.

Lycaste aromatica (Graham) Lindl. Bot. Reg. 29: Misc. p. 16. 1843. *Maxillaria aromatica* Graham ex Hook. Exot. Fl. 3: t. 219. 1826.

Epiphytic or on rocks in humid forests, up to 1,200 meters alt. Rare in Guatemala, rather common in Mexico, British Honduras and Honduras.

Plant up to 6 dm. tall. Pseudobulb ovate, compressed, 7-10 cm. long, about 4.5 cm. wide, subtended by fibrous sheaths. Leaves several, from the apex of a young pseudobulb, lanceolate, acuminate, plicate, up to 5.5 dm. long and 10 cm. wide. Inflorescences several, lateral, from base of pseudobulb, one-flowered; peduncle slender, up to 15 cm. long, provided with several brown inflated sheaths. Floral bracts usually shorter than the pedicellate ovaries. Flowers large, handsome and fragrant. Sepals yellow, elliptic-oblong to ovate-lanceolate, acute, spreading, slightly pubescent at the base on the inner surface, 3-4 cm. long, 1.2-1.8 cm. wide; lateral sepals oblique, conjoined at the base to form a blunt mentum. Petals deep yellow, elliptic to ovate-elliptic, obtuse to acute, 2.8-3.5 cm. long, 1.5-2 cm. wide. Lip yellow, sparingly dotted with orange on the inner surface, hinged to the column-foot, concave below, 3-lobed above, 2.8-3.2 cm. long, 1.5-2 cm. wide when spread out; lateral lobes elliptic to nearly lanceolate, obtuse, porrect, somewhat crenulate on the apical margin, the lower part up-curved to form a tube; mid-lobe variously shaped, from narrowly cuneate-spatulate to elliptic-suborbicular, recurved, mostly undulate-crenulate on the margins; disk pubescent, thickened along the center and with a broadly cuneate truncate flap-like callus extending over the base of the mid-lobe. Column deep yellow, pubescent on the anterior surface, about 2.5 cm. long including the foot.

Lycaste aromatica is distinguished by its broad, thin, truncate, flaplike callus, which extends as a concave plate over the lower part of the mid-lobe of the lip. The mid-lobe is extremely variable in shape. It was originally described as spatulate with a tapering base. However, forms are known where the mid-lobe is elliptic and

without a tapering base. This species and *L. cochleata* are closely allied.

Alta Verapaz: Cubilgüitz, *Türckheim* 8760.—Izabal: Cerro San Gil, along Río Frío, *Steyermark* 39916.

Lycaste candida Lindl. ex Paxt. Fl. Gard. 2: 37, figs. 151–152. 1851–52.

Apparently epiphytic. Guatemala, Costa Rica and Panama, uncommon.

Pseudobulb ovoid-oblong, compressed, glazed, up to 7 cm. long, 2.5–3.5 cm. wide, subtended by tough fibrous sheaths. Leaves several, from the apex of a young pseudobulb, oblong-elliptic, rather abruptly acuminate, plicate, up to 30 cm. long. Inflorescence one or more, lateral, from base of pseudobulb, one-flowered; peduncle usually short, up to 12 cm. long, provided with scarios tubular-involute sheaths that are 1.5–2 cm. long. Floral bracts similar to the sheaths of the peduncle. Flowers showy, with short pedicellate ovaries. Sepals greenish, rose-spotted on the inner surface, oblong-elliptic, obtuse or apiculate, somewhat pubescent at the base on the inner surface, strongly reflexed at the apex, 2.5–4 cm. long, 1.1–1.9 cm. wide; lateral sepals conjoined at the base to form a short mentum. Petals white, rose-spotted on the inner surface, obovate-elliptic, rounded to obtuse at the apex, the margins undulate-crested, 2.2–3.2 cm. long, 1.2–1.9 cm. wide. Lip pure white, lightly rose-spotted, hinged to the column-foot, shallowly 3-lobed above, concave below, 2.3–3.2 cm. long, 1.8–2 cm. wide across the lateral lobes when spread out; lateral lobes bluntly rounded above, involute to form a tube; mid-lobe suborbicular, reflexed, subtruncate to somewhat emarginate at the apex, crested-denticulate along the margins, about 1 cm. long and wide; disk slightly pubescent, thickened along the center, with a narrow obtuse callus projecting from between the lateral lobes. Column white, somewhat rose-spotted, pubescent on the anterior surface, 1.5–2.5 cm. long including the foot.

The shallowly 3-lobed lip, which is white and rose-spotted, is characteristic of this species.

“Guatemala,” *Lewis* 131.

Lycaste cochleata Lindl. ex Paxt. Fl. Gard. 1: 126. 1850–51.

Apparently terrestrial. Guatemala, rare.

Pseudobulb ovate-elliptic, compressed, up to 7 cm. long, subtended by scarios-fibrous sheaths. Leaves several, from the apex of a young pseudobulb, plicate, elliptic-lanceolate, acuminate. Inflorescences several, lateral, one-flowered, from the base of the pseudobulb; peduncles slender, up to 12 cm. long, provided with several involute-inflated scarios sheaths that are about 2 cm. long. Floral bracts similar to the sheaths of the peduncle, about twice as long as the short pedicellate ovary. Flowers small for the genus, showy. Sepals greenish yellow, triangular-ovate to elliptic-lanceolate, acute to apiculate, somewhat pubescent on the inner surface at the base, 2.4–3 cm. long, 1–1.4 cm. wide; lateral sepals conjoined at the base to form a blunt mentum. Petals deep orange, elliptic, obtuse,

2.2–2.5 cm. long, 1.1–1.2 cm. wide. Lip hinged to the column-foot, 2.2–2.4 cm. long, deep orange, sparingly striped with red on the inner surface below the middle, saccate below and somewhat pubescent in the saccate portion, 3-lobed above; lateral lobes elliptic, obtuse to subacute, incurved below, porrect and slightly divaricate above; mid-lobe suborbicular, rounded to emarginate at the apex, crisped-crenulate on the margins, 1.3–1.4 cm. long, 1.1–1.3 cm. wide; disk thickened along the center, with a thick callus extending over the basal portion of the mid-lobe; callus slightly sulcate, rounded at the apex. Column about 2 cm. long including the prominent foot, whitish yellow, pubescent on the anterior face.

This species is apparently very rare. It is closely allied to *L. aromatica* but differs from that species in its more deeply orange-colored flowers and its narrower and thicker callus.

Zacapa: Sierra de las Minas, trail between Santa Rosalía de Mármol and Vegas, *Steyermark* 42960.—“Guatemala,” *Johnston* 1237.

Lycaste cruenta Lindl. Bot. Reg. 29: Misc. p. 16. 1843. *Maxillaria cruenta* Lindl. Bot. Reg. 28: t. 13. 1842 (type: Guatemala, *Skinner*).

Epiphytic on trees in forests, up to 2,200 meters alt. Uncommon in Mexico, Guatemala and El Salvador.

Plant up to 5 dm. tall. Pseudobulb large, ovoid-oblong, compressed, up to 10 cm. long and 5 cm. wide, subtended by several imbricate scarious-fibrous sheaths. Leaves several, from the apex of a young pseudobulb, elliptic-lanceolate to broadly elliptic, acute to acuminate, plicate, up to 4.5 dm. long and 15 cm. wide. Inflorescences several, lateral, from base of pseudobulb; peduncles slender, one-flowered, 7–17 cm. long, provided with several scarious somewhat inflated sheaths that are about 2 cm. long. Floral bract conduplicate, broadly elliptic when spread out, acute, about 2 cm. long. Flowers showy, with stout pedicellate ovaries that are 2–2.5 cm. long. Sepals yellow-green, oblong-elliptic to ovate-triangular, somewhat thickened at the acute apex, concave below, recurved above, 3–5 cm. long, 1.8–2.5 cm. wide, often pubescent at the base on the inner surface. Petals bright yellow or orange-yellow, broadly elliptic, obtuse or sometimes retuse, 3–4 cm. long, 2–2.3 cm. wide. Lip hinged to the column-foot, yellow, flecked with maroon and with a crimson blotch at the base, saccate, 3-lobed, about 2.5 cm. long, usually provided with long whitish hairs in the saccate portion; lateral lobes broadly rounded, erect; mid-lobe suborbicular to broadly ovate, sometimes notched at the apex, decurved, with the margins crisped, somewhat pubescent on the upper surface, 8–13 mm. long, 7–12 mm. wide; disk corrugated at the base, provided with a small central cuneate-subquadrate truncate callus. Column stout, arcuate, pubescent on the anterior face, about 2 cm. long including the short foot.

The short saccate lip, with the disk corrugated and deep crimson at the base, distinguishes this species. The mid-lobe is usually much smaller in proportion to the lateral lobes. This is the com-

monest species found in Guatemala, where it is commonly called "ipo."

Guatemala: In market, Guatemala City, *Standley* 58545.—Huehuetenango: Paso del Boquerón, along Río Trapichillo, below La Libertad, *Steyermark* 51202.—Jalapa: Mountains about Chahuite, northwest of Jalapa, *Standley* 77493.—Sacatepéquez: Wooded quebrada just above Barranca Hondo, *Standley* 88932. Volcán Fuego, *Smith* 2636.—Santa Rosa: Santa Rosa, *Heyde & Lux* 3501.—Suchitepequez: Southwestern slopes of Volcán Zunil, in vicinity of Finca Montecristo, southeast of Santa María de Jesús, *Steyermark* 35257.—Zacapa: Sierra de las Minas, between Santa Rosalía de Mármol and San Lorenzo, *Steyermark* 43156.—At base of Volcán de Agua not far from Palin, *Porter* 22.—"Guatemala," *Bates* 14.

Lycaste Deppei (Lodd.) Lindl. Bot. Reg. 29: Misc. p. 15. 1843.
Maxillaria Deppei Lodd. Bot. Cab. 17: t. 1612. 1830.

On trees or rocks in humid forests, up to 1,200 meters alt. Rather common in Mexico; rare in Guatemala.

Plant up to 6 dm. tall. Pseudobulb ovoid, compressed, 6–10 cm. long, about 5 cm. wide, subtended by scarios sheaths. Leaves several, from the apex of a young pseudobulb, elliptic-lanceolate, acuminate, plicate, 2–5 dm. long, 8–10 cm. wide. Inflorescence lateral, from the base of the pseudobulb, one-flowered; peduncle erect, 12–15 cm. long, provided with inflated red-brown scarios sheaths that are 1.5–4.5 cm. long. Floral bract involute, broadly elliptic, acuminate, concealing the pedicellate ovary, up to 4.5 cm. long. Flower showy, with a stout pedicellate ovary that is about 2 cm. long. Sepals pale green flecked with red, elliptic to ovate-elliptic, obtuse to subacute, concave below, spreading above, 5–6 cm. long, 2–2.4 cm. wide; lateral sepals oblique, conjoined at the base to form an obtuse mentum. Petals white flecked with red toward the base, obovate-elliptic, obtuse, concave, recurved above, 4–4.5 cm. long, about 2 cm. wide. Lip hinged to the column-foot, bright yellow marked with red spots and with red lateral striations on the basal portion, 3-lobed, arcuate, prominently nervose and granular-ciliate, 3.5–4 cm. long; lateral lobes bluntly rounded at the apex, involute to form a cymbiform tube that envelops the column; mid-lobe ovate-oblong to oblong-triangular, obtuse, conduplicate and strongly decurved, with the undulate margins slightly crenate, up to 2 cm. long and 1.2 cm. wide when spread out; disk thickened along the center, with a free short callus extending over the base of the mid-lobe, the callus rounded and somewhat sulcate. Column white minutely flecked with red, arcuate, produced below into a short foot, about 2.5 cm. long including the foot.

The long, strongly decurved mid-lobe of the lip is characteristic of this species.

Alta Verapaz: Cobán, sent to Don Jorge Figeroa, definite data lacking, *Lewis* 220.

Lycaste lasioglossa Reichb. f. Gard. Chron. 215. 1872 (type: Guatemala).

Probably terrestrial. Apparently endemic to Guatemala.

Plant up to 6 dm. tall. Pseudobulb ovoid, compressed, 5–10 cm. long, about 4 cm. broad, bifoliate. Leaves several, from the apex of a young pseudobulb, elliptic-lanceolate, acute to acuminate, strongly nervose, plicate, with a short sulcate petiole, up to 5.5 dm. long and 12 cm. wide. Inflorescence a solitary flower borne on a slender lateral peduncle; peduncle from base of pseudobulb, up to 25 cm. long, provided with several inflated scarios conduplicate sheaths that are up to 3 cm. long. Floral bract broadly ovate, acuminate, about 2 cm. long and 1.3 cm. wide. Flower showy, with a pedicellate ovary that is about 2.5 cm. long. Sepals reddish brown, elliptic-lanceolate, acute to apiculate, with a tomentum at the base within, 5–7 cm. long, 1.5–2 cm. wide; lateral sepals slightly oblique, conjoined at the base to form a sharp mentum. Petals yellow, elliptic, rounded and usually mucronate at the apex, arcuate over the column and recurved at the apex, 3.5–4 cm. long, 1.5–2 cm. wide. Lip hinged to the column-foot, 3-lobed, when expanded obovate in outline, yellow with purple flecks and striations, 3.5–4 cm. long, tubular below, about 2 cm. wide across the lateral lobes when spread out; lateral lobes narrowly semiobcordate, nearly truncate and somewhat emarginate at the apex; mid-lobe oblong, obtuse, about 1 cm. long and 5 mm. wide, decurved, the entire upper surface densely covered with long soft hairs; disk with an ovate-triangular callus directed forward, minutely notched at the tip. Column arcuate, densely pubescent above the middle on the anterior face, produced at the base into a prominent foot, 2.5–3 cm. long including the foot.

This species is apparently very rare. We have seen no specimens that have been prepared in the field. It is distinguished from all other *Lycastes* found in Guatemala by its densely pubescent mid-lobe of the lip.

“Purchased in Guatemala City; said to have come from Baja Verapaz; plant received with roots established in earth; probably terrestrial,” *Lewis* 213.

Lycaste tricolor (Kl.) Reichb. f. in Walp. Ann. Bot. 6: 603. 1861. *Maxillaria tricolor* Kl. Allgem. Gartenz. 20: 186. 1852. Figure 158.

Epiphytic, up to 2,700 meters alt. Guatemala, Costa Rica and Panama, rare.

Plant up to 4 dm. tall. Pseudobulb ovoid, up to 8 cm. long and 3.5 cm. wide, subtended by scarios-fibrous sheaths. Leaves several, at the apex of a young pseudobulb, elliptic-lanceolate, acuminate, plicate, 20–35 cm. long, up to 7 cm. wide. Inflorescences several, lateral, from the base of the pseudobulb, one-flowered; peduncles slender, up to 9 cm. long, nearly concealed by long imbricate sheaths. Floral bracts involute, long-acuminate, nearly exceeding the flower. Flower showy. Sepals elliptic-lanceolate, acute to subacuminate, green-

ish tinged with rose-pink, spreading but not revolute, 3.2–4 cm. long, 7–12 mm. wide; lateral sepals somewhat oblique, conjoined at the base to form a short mentum. Petals elliptic to oblanceolate, obtuse, whitish or pink, often variously striped or spotted with rose-color, about 3.3 cm. long, 8–13 mm. wide. Lip hinged to the column-foot, usually stained and marked with a deep rose-color, deeply 3-lobed, obovate in outline, 2.5–3 cm. long, about 1.5 cm. wide across the lateral lobes when spread out; lateral lobes rounded at the apex, involute to form a tube; mid-lobe suborbicular-obovate, somewhat toothed on the margins,



FIG. 158. *Lycaste tricolor*. Plant (about $\times \frac{1}{2}$). Drawn by Dorothy O. Allen.

about 1 cm. long; disk thickened along the center, with a small concave-ascending callus between the lateral lobes; callus obovate, usually notched at the apex. Column about 2 cm. long including the short foot, somewhat pubescent on the anterior surface.

The narrow sepals, long floral bracts and small concave, ascending callus are characteristic of this species.

“Guatemala” (fide Schlechter).

Lycaste virginalis (Scheidw.) Lind. *Lindenia* 4: 22, in text. 1888. *Maxillaria virginalis* Scheidw. Bull. Acad. Roy. Sci. Brux. 9: 25. 1842. *Maxillaria Skinneri* Batem. ex Lindl. Bot. Reg. 28: Misc. p. 10. 1842 (type: Guatemala, *Skinner*), non *M. Skinneri* Batem. ex Lindl. Bot. Reg. 26: Misc. p. 48. 1840. *Lycaste Skinneri* (Batem. ex Lindl.) Lindl. Bot. Reg. 29: Misc. p. 15. 1843, based on *Maxillaria Skinneri* Batem. (1842). *Lycaste Jamesiana* Hort. ex The Garden. Frontispiece, No. 1, this volume.

Epiphytic on trees in humid forests, up to 1,800 meters alt. Rather common in Mexico, Guatemala and Honduras.

Plant up to 10 dm. or more tall. Pseudobulb large, ovoid, somewhat compressed, 5–10 cm. long, 3–5 cm. wide, 2–3.5 cm. thick. Leaves several, from the apex of a young pseudobulb, elliptic-lanceolate, acuminate, plicate, up to 7.5 dm. long and 15 cm. wide. Inflorescence lateral, from the base of the pseudobulb, one-flowered; peduncle up to 30 cm. long, often nearly concealed by large inflated sheaths that are 3–6 cm. long. Floral bract large, involute, acuminate, up to 5 cm. long, concealing the pedicellate ovary. Flower large and showy, with a pedicellate ovary that is 1.5–2 cm. long. Sepals white to pale violet-pink, ovate-elliptic to elliptic-oblong, obtuse to subacute, sometimes mucronate, somewhat keeled on the back, 5.5–8 cm. long, 3–3.5 cm. wide; lateral sepals conjoined at the base to form a short blunt mentum. Petals reddish violet, fading toward the apex, broadly elliptic, reflexed at the apiculate apex, 4.5–7.5 cm. long, 2.5–4 cm. wide. Lip hinged to the column-foot, flecked or veined with reddish violet, sometimes appearing as a solid color on the lower side, 3-lobed, 4.5–5 cm. long; lateral lobes pubescent, nearly truncate at the apex, erect to form a cymbiform tube; mid-lobe suborbicular, obtuse, about 2 cm. long, strongly decurved; disk thickened and somewhat pilose along the center, with a short fleshy tongue-like callus projecting from between the lateral lobes. Column white, spotted with crimson at the base, arcuate, pubescent on the anterior surface, 3–3.5 cm. long.

Lycaste virginalis, the national flower of Guatemala, is commonly known as “Monja Blanca.” In 1939, it appeared on a two-centavo stamp issued by Guatemala. It is represented by a large number of horticultural varieties, which are based upon color differences. These forms vary from pure white (var. *alba* Hort.) to deep purple.

Alta Verapaz: Río Tzimañil, near Cobán, bought from a peddler, *Standley* 90270. Cobán, *Türckheim* 226; II 894. Near Cobán, *Stand-*

ley 69293.—Chiquimula; Montaña Nonojá, 3–5 miles east of Camotán, *Steyermark* 31703.

× *Lycaste Smeana* Reichb. f. ex Warner & Williams, *Orchid Album* 11: t. 516. 1897.

This is a putative natural hybrid between *L. virginalis* (*L. Skinneri*) and *L. Deppei*.

The color of the flower is said to be white except the lip, which is bordered with light purple and spotted over its entire surface. The callus is said to be short, with an obscure central keel.

We have seen no material of this putative hybrid, although it is attributed to Guatemala.

66. ZYGOPETALUM Hook.

Epiphytic plants with short thick leafy pseudobulbs. Leaves two or more, from apex of pseudobulb, distichous, membranaceous to rigid, elevated-venose to subplicate, elongate. Inflorescence one or more, lateral, from base of pseudobulb, one- to several-flowered. Flowers large or small, usually showy. Sepals subequal, spreading, free to shortly connate at the base; lateral sepals inserted on column-foot. Petals similar to sepals. Lip hinged to column-foot, sessile, spreading, 3-lobed; lateral lobes small and spreading or rather large and erect, clasping the column; mid-lobe expanded, spreading, broadly ovate or suborbicular-obovate; disk transversely crested or prominently adorned with fleshy entire or lobed processes. Column incurved, semiterete, wingless or shortly 2-winged at the apex, produced into a short foot at the base; clinandrium oblique, entire to membranaceous with the margins fimbriate; anther terminal or affixed within the margin of the clinandrium, operculate, incumbent, 2-celled; pollinia 4. Capsule ovoid to oblong.

This genus comprises about forty species, which are centered in South America. The usually large transverse crest at the base of the lip is the character that most easily distinguishes the species of this genus from those of closely allied genera.

Zygopetalum grandiflorum (A. Rich.) Benth. & Hook. ex Hemsl. in Godm. & Salvin, *Biol. Centr.-Am.* 3: 251. 1883. *Galeottia grandiflora* A. Rich. *Ann. Sci. Nat. sér. 3*, 3: 25. 1845. *Bateman-nia grandiflora* (A. Rich.) Reichb. f. *Bonpl.* 4: 323. 1856. Figure 159.

Epiphytic on trees in open woods, up to 1,070 meters alt. Mexico, Guatemala, British Honduras and Costa Rica, rare.

Pseudobulb ovoid, narrow, 4–8 cm. long, about 2.5 cm. wide, subtended by scarious sheaths. Leaves two, from the apex of the pseudobulb, oblanceolate-elliptic to lanceolate, rather abruptly acuminate, subcoriaceous-plicate, up to 4 dm. long and 7 cm. wide. Inflorescence one or more, lateral, from base of pseudo-

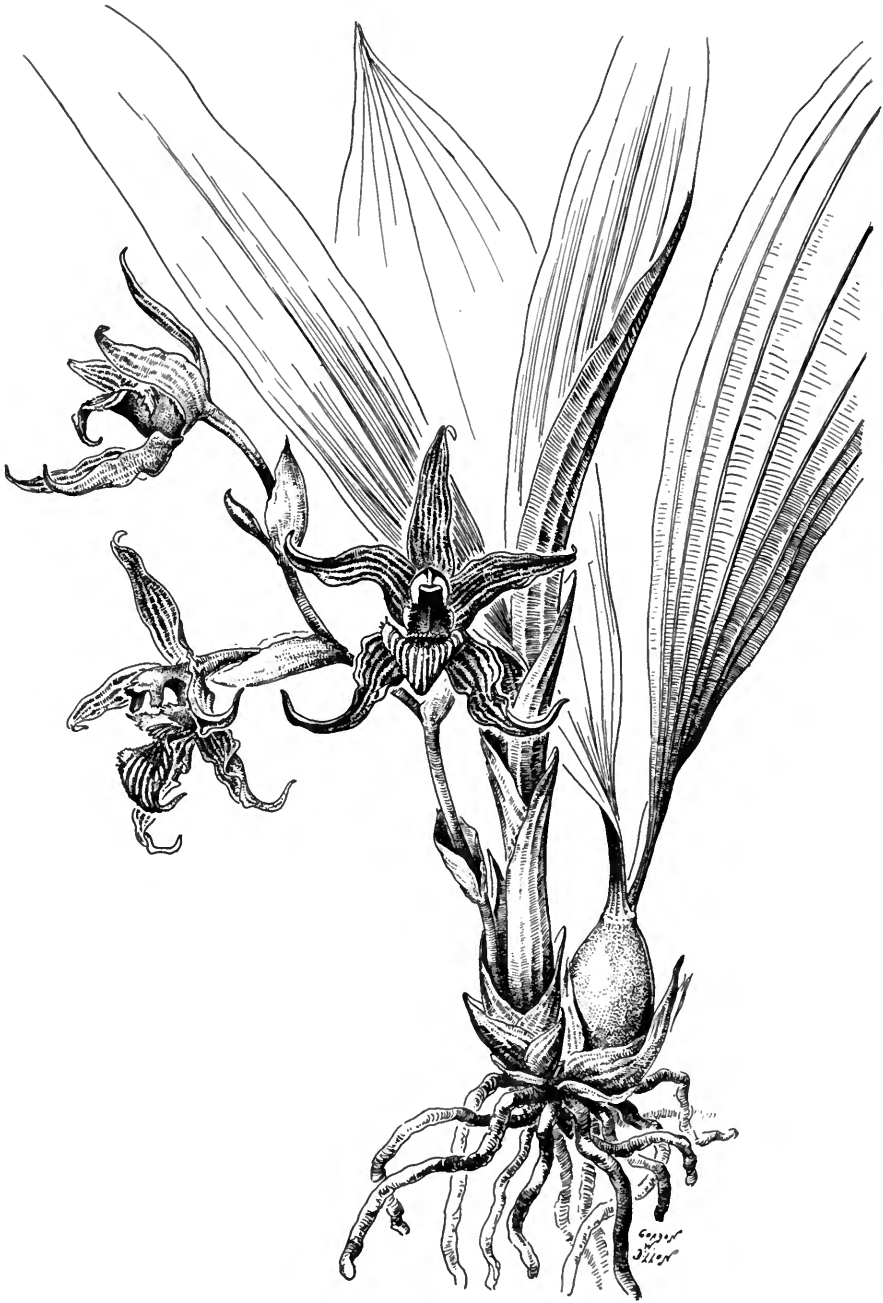


FIG. 159. *Zygopetalum grandiflorum*. Plant ($\times \frac{1}{2}$). Drawn by G. W. Dillon.

bulb, two- to several-flowered, up to 20 cm. long; peduncle short, stout, provided with one or more large inflated sheaths. Floral bracts suborbicular-ovate to ovate-lanceolate, acute, conduplicate-involute, 3-4.5 cm. long, 2-3 cm. wide when spread out. Flowers showy, with stout pedicellate ovaries that are about 5 cm. long. Sepals yellowish green with five to seven broad reddish brown stripes, lanceolate, acuminate, attenuate and recurved at the apex, 4.5-5 cm. long, 1.1-1.5 cm. wide near the base; lateral sepals united with the column-foot to form a prominent mentum, undulate-contorted, gibbous near the base on the anterior margin, dilated near the base on the posterior margin. Petals colored like the sepals, decurrent on the column-foot, lanceolate, acuminate, long-attenuate and recurved at the apex, falcate, 4-4.5 cm. long, about 1.5 cm. wide below the middle. Lip hinged to the column-foot, 3-lobed, white with coarse longitudinal streaks of red, fibrillose-erose on the margins; lateral lobes small, obliquely ovate, porrect, forming with the lower part of the lip a broad shallow cup which is about 8 mm. long and 2 cm. wide, with the base of the cup adorned with a number of fin-like keels that project as blunt teeth beyond the edge of the thickened plate; mid-lobe broad, arcuate, rhombic-ovate, abruptly triangular-lanceolate and long-attenuate at the strongly decurved apex, slightly recessed at the base, about 2.8 cm. long and 2 cm. wide. Column white or pale yellow and finely streaked with red, arcuate-cymbiform, with a pair of small subquadrate toothed wings on the anterior margins near the apex, and minute horn-like processes in the middle at the apex, 2.5-3 cm. long including the prominent foot, about 1 cm. wide.

The thickened plate adorned with fin-like ridges found at the base of the lip, along with the fibrillose margins of the lip, distinguishes this species from all others found in Guatemala.

Izabal: La Vigia, between Quiriguá and Bananera, *Lewis* 185.

67. CHONDRORHYNCHA Lindl.

Epiphytic plants with short leafy non-pseudobulbous stems. Leaves oblong-oblancheolate, plicate-venose, contracted into the petiole, articulate with the leaf-sheaths. Inflorescence arising directly from the short rhizome, one-flowered. Sepals subequal in length, narrowly oblong-elliptic to lanceolate; dorsal sepal with its base adnate to the column; lateral sepals oblique, divergent, adnate to the short column-foot. Petals broader than the sepals, obovate-elliptic. Lip articulate with the column-foot, sessile, broad, erect, concave, simple, with a toothed callus at the base. Column semiterete, slightly dilated above, produced into a short foot at the base; clinandrium oblique, entire; anther terminal, operculate, incumbent, 1-celled; pollinia 4, waxy.

This small genus consists of several species, which are confined to the tropics of Middle and South America.

Chondrorhyncha Lendyana Reichb. f. Gard. Chron. n. s. 26: 103. 1886. Figure 160.

Epiphytic on tree trunks in humid forests, up to 1,700 meters alt. Mexico, Guatemala, Costa Rica and Panama, uncommon.

Plant caespitose, leafy, 1-3 dm. tall. Leaves distichous; blades linear-lanceolate to oblanceolate, abruptly acute to acuminate, tapering below the middle, subcoriaceous, 8-30 cm. long, 1.2-4 cm. wide, articulate with the conduplicate leaf-sheaths; leaf-sheaths clasped by imbricated sheaths. Inflorescence usually solitary, arising directly from the short stem from the axils of the leaves; peduncle slender, 5.5-15 cm. long, provided with several short clasping sheaths, subtended by large scarios conduplicate sheaths with hyaline margins. Floral bracts produced in pairs, 8-12 mm. long; lower bract ovate-infundibuliform and acute; upper bract lanceolate, acuminate. Flowers yellowish or white with a yellow tinge, with sulcate arcuate pedicellate ovaries that are 1.5-2 cm. long. Sepals narrowly elliptic to lanceolate, acute to subobtuse, somewhat concave and dorsally carinate, 2-3 cm. long, 5-7 mm. wide; lateral sepals conjoined with the base of the column, retrorsely divergent. Petals elliptic-oblanceolate, rounded to obtuse at the recurved apex, minutely undulate along the apical margins, 2-2.5 cm. long, 1-1.5 cm. wide. Lip tubular with the lateral margins clasping the column, retuse at the apex, undulate-cripsed on the apical margins, suborbicular-obovate when spread out, 2-2.7 cm. long, 2-2.7 cm. wide when spread out; disk with a flat triangular-subquadrate bidentate or several-toothed callus at the base. Column arcuate, semiterete, lightly winged on the margins, truncate at the apex, 1-1.3 cm. long.

The retrorsely divergent lateral sepals distinguish this species.

Alta Verapaz: Cobán, *Türkheim* II 1830. Pansamalá, *Türkheim* 1016. Río Cobán, *Johnson* 738. Origin probably near Cobán (obtained from garden of Don Mariano Pacheco), *Lewis* 190. Vicinity of Cobán (cultivated), *Standley* 92820.—Huehuetenango: Vicinity of Maxbal, about 17 miles north of Barillas, Sierra de los Cuchumatanes, *Steyermark* 48878. Cerro Huitz, between Mimanhuitz and Yulhuitz, Sierra de los Cuchumatanes, *Steyermark* 48614.

68. MAXILLARIA Ruiz & Pavón

Epiphytic, terrestrial or rock-inhabiting plants with abbreviated or elongated leafy or non-leafy rhizomes that produce few or many fleshy one- to several-leaved pseudobulbous stems. Leaves coriaceous, thin or fleshy-thickened, with a prominent central vein. Peduncles always produced in the axil of a rhizome- or leaf-sheath, often produced near the base of the pseudobulbs so that they appear lateral, solitary, fasciculate or glomerate, always one-flowered, bracteate. Flowers small or rather large. Sepals subequal, free; lateral sepals adnate to the column-foot to form a more or less prominent mentum, spreading or occasionally campanulate. Petals similar to the sepals but smaller, usually coherent with the dorsal sepal. Lip articulate with or more or less continuous with the column-foot, erect so as to be parallel with the column, often with a short inflexed claw, sometimes concave to subsaccate at the base, simple to more or less 3-lobed, usually smaller and shorter than the sepals; lateral lobes erect; mid-lobe variously shaped, usually ovate-oblong to oblong-subquadrate, spreading-decurved; disk nearly naked to variously adorned with calli, papillae, lamellae or tubercles. Column erect, more or less arcuate, fleshy, semiterete, concave on the anterior face, wingless, produced into a foot at the base; anther terminal, operculate, incumbent,



FIG. 160. *Chondrorhyncha Lendyana*. Plant (about $\times \frac{1}{2}$). Drawn by D. E. Tibbitts.

1-celled to imperfectly 2-celled, often pubescent; pollinia 4, waxy. Capsule ovoid to ellipsoid.

This large, polymorphic genus comprises about 250 species, which are rather difficult and variable. They are widely scattered in tropical and subtropical regions of the western hemisphere.

1. Plants very small; leaves small, never more than 7 cm. long, usually 5 cm. or less long.
 2. Lip cuneate-obovate in outline, obscurely 3-lobed, 1 cm. or less long; leaves usually elliptic, more than 7 mm. wide. *M. cobanensis*.
 2. Lip linear to linear-spatulate, entire, 1.3 cm. or more long; leaves linear, less than 6 mm. wide. *M. uncalata*.
1. Plants usually large; leaves usually much longer than 7 cm. long.
 3. Lip entire, never deeply 3-lobed.
 4. Rhizome more or less leafy, concealed (in part) by cataphyll-sheaths; pseudobulbs 1-4-leaved.
 5. Pseudobulbs numerous, 2-4-leaved; peduncles exerted beyond the cataphyll-sheaths, provided with several or many triangular compressed imbricated hard bracts. *M. Friedrichsthali*.
 5. Pseudobulbs few, often solitary at the summit of a short rhizome, 1-2-leaved; peduncles concealed by the cataphyll-sheaths, provided with lanceolate scarious bracts.
 6. Lip linear-oblong to ovate-oblong, 1.8-2 cm. long, 6 mm. or more wide. *M. elatior*.
 6. Lip panduriform, 1.2-1.6 cm. long, about 6 mm. wide. *M. Nagelii*.
 4. Rhizome not leafy, concealed by non-leaf-bearing sheaths; pseudobulbs always 1-leaved.
 7. Peduncles exerted beyond the rhizome-sheaths; mentum conical, obtuse, 1.2 cm. long. *M. Mooreana*.
 7. Peduncles concealed by the rhizome-sheaths; mentum short, blunt, much less than 1 cm. long.
 8. Lip 1-1.3 cm. long. *M. variabilis*.
 8. Lip 1.5 cm. or more long.
 9. Leaves less than 8 mm. wide. *M. tenuifolia*.
 9. Leaves more than 14 mm. wide. *M. curtipes*.
 3. Lip deeply or obscurely 3-lobed.
 10. Rhizome more or less leafy, concealed (in part) by cataphyll-sheaths.
 11. Lip deeply or shallowly 3-lobed below the middle or at the base.
 12. Flowers small, in dense fascicles in the axils of cataphyll-sheaths; lip about 4 mm. long. *M. densa*.
 12. Flowers medium-sized, produced singly in the axils of the cataphyll-sheaths; lip 7 mm. or more long.
 13. Plant caespitose or with an abbreviated rhizome; pseudobulbs produced close together.
 14. Pseudobulbs subtended by large coriaceous leaf-bearing sheaths; flower scarcely exceeding the pseudobulb. *M. nasuta*.
 14. Pseudobulbs subtended by small chartaceous non-leaf-bearing sheaths; flower much exceeding the pseudobulb. *M. meleagris*.
 13. Plant with an elongated rhizome; pseudobulbs distant. *M. Nagelii*.
 11. Lip deeply or shallowly 3-lobed above the middle or at the apex.
 15. Lip broadly cuneate-obovate to flabellate or suborbicular, prominently 3-lobed at the apex; callus papillose; leaves usually less than 1.5 cm. wide.

16. Lip 1.1–1.4 cm. long, 1–1.3 cm. wide; pseudobulbs 2–3-leaved; leaves 8–15 mm. wide.....*M. camaridii*.
16. Lip 7–8 mm. long, 6–7 mm. wide; pseudobulbs unifoliate; leaves 3–7 mm. wide.....*M. pulchra*.
15. Lip elliptic-subquadrate, cuneate-subquadrate, oblong-elliptic or elliptic-lanceolate, slightly 3-lobed above the middle; callus not papillose; leaves usually more than 1.5 cm. wide.
17. Plant caespitose; rhizome abbreviated; callus of lip evenly thickened throughout, tomentose.....*M. crassifolia*.
17. Plant not caespitose; rhizome elongated; callus of lip unevenly thickened, terminating in a fleshy semiorbicular hump, not tomentose.
18. Petals oblanceolate to linear-elliptic, rounded and minutely apiculate at the apex.....*M. anceps*.
18. Petals oblong-elliptic to elliptic-lanceolate, acute to acuminate.
M. alba.
10. Rhizome not leafy, concealed only by obtuse to acuminate sheaths.
19. Flowers small, produced in glomerules; lip less than 5 mm. long.
M. purpurea.
19. Flowers medium-sized, produced singly; lip more than 8 mm. long.
20. Lip 3-lobed below the middle; lateral lobes prominent, sharp, falcate.....*M. rufescens*.
20. Lip 3-lobed above or about the middle or at the apex; lateral lobes small, rounded to obtuse.
21. Plant rarely subcaespitose; rhizome elongated; peduncles concealed by the rhizome-sheaths.....*M. variabilis*.
21. Plant caespitose; rhizome abbreviated; peduncles exerted beyond the rhizome-sheaths.
22. Lip 3-lobed at the apex, 9–15 mm. long, 5–7 mm. wide; callus linear.....*M. ringens*.
22. Lip 3-lobed about the middle, 1.5–3 cm. long, 7–10.5 mm. wide.
M. cucullata.

Maxillaria alba (Hook.) Lindl. Gen. & Sp. Orch. Pl. 143. 1832.

Dendrobium album Hook. Exot. Fl. 2: t. 142. 1825.

Epiphytic on trees in dense tropical forests, occasionally terrestrial, from sea level up to 1,200 meters alt. Rather widespread but not common from Guatemala to Panama, the West Indies and northern South America.

Plant composed of an elongated leafy rhizome that gives rise to distant pseudobulbs and a few inflorescences. Rhizome stout, concealed by distichous closely imbricated cataphyll-sheaths. Pseudobulbs obliquely ellipsoid to obovoid, compressed, unifoliate, 4–6.5 cm. long, 2–3 cm. wide, subtended by several imbricated sheaths. Leaves solitary from the apex of pseudobulbs, linear-ligulate, obliquely retuse at the obtuse apex, thick-membranaceous, 2–4.3 dm. long, 1.3–2.3 cm. wide. Cataphylls small, lanceolate, conduplicate. Peduncles one-flowered, arising from the axils of the cataphyll-sheaths on the new growth that arises from the base of the pseudobulbs, about 3.5 cm. long, slender, clothed by setaceous scarious bracts. Floral bracts setaceous, scarious, about 1.5 cm. long. Flowers white, somewhat campanulate, with slender strong pedicellate ovaries that are 2–3 cm. long. Sepals white, leathery, elliptic-lanceolate to oblong-ligulate,

acute to acuminate at the fleshy-thickened apex, with the margins somewhat revolute, 2–2.7 cm. long, 5–7 mm. wide; lateral sepals spreading-recurved, oblique, adnate to the column-foot to form a short mentum. Petals oblong-elliptic to elliptic-lanceolate, acute to acuminate at the thickened recurved apex, 1.6–1.9 cm. long, 4–5 mm. wide. Lip articulate with the column-foot, erect-arcuate and concave-cymbiform in natural position, oblong-elliptic when spread out, more or less 3-lobed near the apex, somewhat cellular-papillose throughout, 1.1–1.4 cm. long, 4.5–6 mm. wide when spread out; lateral lobes small, rounded-angular; mid-lobe very fleshy, suborbicular-ovate, obtuse, with a fleshy keel beneath, about 3.5 mm. long and wide; disk thickened along the center below, with the thickened keel terminating in a semiorbicular callus just below the lateral lobes. Column semicylindrical, arcuate, white with a yellowish base, up to 1.5 cm. long including the foot. Capsule cylindrical-ellipsoidal, about 3 cm. long.

This species is closely allied to *M. anceps*.

“Guatemala” (fide Fawcett & Rendle).

Maxillaria anceps Ames & C. Schweinf. Sched. Orch. 10: 84. 1930.

Epiphytic on trees in forests, up to 1,190 meters alt. Guatemala and Costa Rica, very rare.

Plant stout, simple or branched, 60 cm. or more tall, composed of an elongated leafy rhizome that gives rise to numerous pseudobulbs and scattered axillary inflorescences. Rhizomes stout, strongly compressed, about 8 mm. wide, entirely concealed by cataphyll-sheaths; sheaths membranaceous-fibrous, distichous, compressed, imbricated, truncate, smooth, brown, up to 7 cm. long. Pseudobulbs numerous, strongly ancipitous in the dried specimen, complanate-obovoid, 2.5–5 cm. long, 1.5–2.5 cm. wide, unifoliate, subtended by two or more large sheaths that are like those of the rhizome. Leaves produced singly at the apex of the pseudobulbs and along the rhizome (as cataphylls), linear-ligulate, obliquely retuse at the rounded to obtuse apex, conduplicate at the base, chartaceous, 22–35 cm. long, 1.8–2.6 cm. wide. Peduncles produced in the axils of the bracts of the new growth, slender, one-flowered, about 3 cm. long, nearly concealed by several imbricated scarios bracts. Flowers greenish, slightly fragrant, medium-sized, with slender pedicellate ovaries that are about 2.5 cm. long. Sepals oblong to elliptic-oblong, rounded at the apex with a minutely mucronate tip, concave below, with more or less revolute margins, 1.7–1.9 cm. long, 6–6.5 mm. wide; lateral sepals slightly oblique, adnate to the column-foot to form a blunt mentum. Petals oblanceolate to linear-elliptic, rounded and minutely apiculate at the apex, 1.4–1.7 cm. long, 3–5 mm. wide above the middle. Lip parallel to the column and gently recurved in natural position, with the sides of the lower portion erect, when expanded elliptic-subquadrate to cuneate-subquadrate in outline, rounded to subtruncate at the apex, slightly 3-lobed above the middle, 1.4–1.7 cm. long; basal portion cuneate-obovate, up to 8.4 mm. wide; anterior portion orbicular-subquadrate, somewhat sulcate, up to 7.4 mm. wide; disk with an indistinct median thickening at the base terminating in a fleshy semiorbicular callus a little below the middle. Column arcuate, clavate, about 1.2 cm. long, extended into a short indistinct foot at the base.



FIG. 161. *Maxillaria camaridii*. Plant (about $\times \frac{1}{2}$); right center, lip ($\times 1\frac{1}{3}$); lower left, lip and column, side view ($\times 1\frac{1}{3}$). Drawn by Dorothy O. Allen.

This species is very similar in habit to *M. alba*, but the perianth segments, especially the lip, are quite dissimilar.

Alta Verapaz: Finca Mocá, *Johnson* 49.

Maxillaria camaridii Reichb. f. *Hamb. Gartenzeit.* 19: 547. 1863. *Camaridium ochroleucum* Lindl. *Bot. Reg.* 10: t. 844. 1824, not *Maxillaria ochroleuca* Lodd. ex Lindl. Figures 161, 162.

Epiphytic on trees. Uncommon from Guatemala to Panama.

Plant ascending to spreading, composed of an elongated rhizome that gives rise to distant pseudobulbs and a few inflorescences. Rhizome about 5 mm. wide, much-branched, proliferous, concealed by closely appressed distichous imbricated cataphyll-sheaths; sheaths conduplicate; cataphylls short, ovate-oblong. Pseudobulbs scattered 6–10 cm. apart on the rhizome, ellipsoid-oblong, compressed, 2–3-leaved, smooth, 3–5 cm. long, 1.5–2.5 cm. wide, subtended by a pair of long leaves. Leaves 2–3 from the apex and 2 from the sides of the pseudobulbs, linear, obliquely retuse at the broadly rounded apex, 8–36 cm. long, 8–15 mm. wide. Peduncles one-flowered, from the axils of the cataphyll-sheaths of the new growth that arises from the base of the uppermost pseudobulbs, up to 3 cm. long, concealed by narrow scarious brown bracts. Floral bracts similar to those of the peduncle, tubular-involute, inflated, 1.8–2 cm. long, exceeding and enveloping the pedicellate ovary. Flowers white or cream-color with a yellowish lip, fragrant, rather large. Sepals oblong-elliptic to oblanceolate-elliptic, subacute to acute, concave below, 2.5–2.9 cm. long, 8–9.2 mm. wide; lateral sepals slightly oblique, adnate to the column-foot to form a short mentum. Petals oblong-oblanceolate, obtuse to subacute, concave, oblique, about 2.5 cm. long, 5.5–6 mm. wide. Lip subarticulate with the column-foot, yellow, transversely streaked with red, suborbicular in outline when spread out, prominently 3-lobed above the middle, 1.1–1.4 cm. long and 1–1.3 cm. wide when spread out; lateral lobes rounded, obtuse at the apex; mid-lobe suborbicular, rounded to obtuse at the apex, concave, fleshy-cushioned in the center; disk crested in the center below the middle with orange-colored papillae, the papillae passing into toothed lamellae at the apex of the crest. Column semicylindrical, arcuate, clavate, about 1 cm. long including the foot, cream-colored and spotted with red at the base. Capsule obliquely ellipsoid, prominently winged on the sutures, 2–2.5 cm. long.

This species is distinctive among Guatemalan *Maxillarias* in that it has a papillose callus or crest on the lip.

“Guatemala,” *Schmidt*.

Maxillaria cobanensis Schltr. *Repert. Sp. Nov.* 10: 195. 1912 (type: Guatemala, Dept. Alta Verapaz, near Cobán, July, 1907, *H. von Türckheim* II 1890).

Epiphytic on trees in dense humid forests, up to 1,350 meters alt. Rare in Mexico, Guatemala, Honduras, and Costa Rica.

Plant small, creeping, consisting of numerous congested pseudobulbs on a short rhizome, up to 10 cm. tall. Pseudobulbs ellipsoid-cylindrical, slightly com-



FIG. 162. *Maxillaria camaridii*. Plant ($\times 1$). Drawn by Blanche Ames.

pressed, unifoliate, green, somewhat rugose, 1-3 cm. long, 4-5 mm. in diameter, subtended by two or more large scarious-fibrous dark brown imbricated sheaths. Leaf solitary at the apex of the pseudobulbs, erect to erect-spreading, ovate-oblong, elliptic, oval or oblanceolate, obliquely retuse at the obtuse apex, dark green, coriaceous, abruptly contracted into a short sulcate petiole, 1-7 cm. long, 7-16 mm. wide. Inflorescence from the axil of bracts of the new growth near the base of the pseudobulb, a solitary flower on a short stout peduncle; peduncle about 1 cm. long, concealed by several scarious imbricated sheaths. Floral bracts similar to those of the peduncle. Flower pale pink-buff, translucent, with the prominent veins dark reddish brown, with short stout pedicellate ovaries that are 1-1.5 cm. long. Sepals linear to slightly lanceolate, obtuse to acute or apiculate at the apex, 1.1-1.4 cm. long, 3-4 mm. wide; lateral sepals falcate, recurved at the apex, adnate to the column-foot to form a short mentum. Petals oblanceolate, rounded to subacute at the apex, oblique, 1.2-1.3 cm. long, 4-4.5 mm. wide above the middle. Lip articulate with the column-foot, concave in natural position, more or less 3-lobed, cuneate-obovate in outline when spread out, 9-10 mm. long, 5.5-7.5 mm. wide; lateral lobes rounded, upcurved in natural position; mid-lobe subquadrate, usually broader than long, retuse; disk with a linear inconspicuous callus in the lower half, the callus often toothed. Column slender-clavellate, arcuate, about 9 mm. long including the short foot. Capsule ovoid, about 8 mm. long.

This species and *M. uncata* are the smallest Maxillarias found in Guatemala.

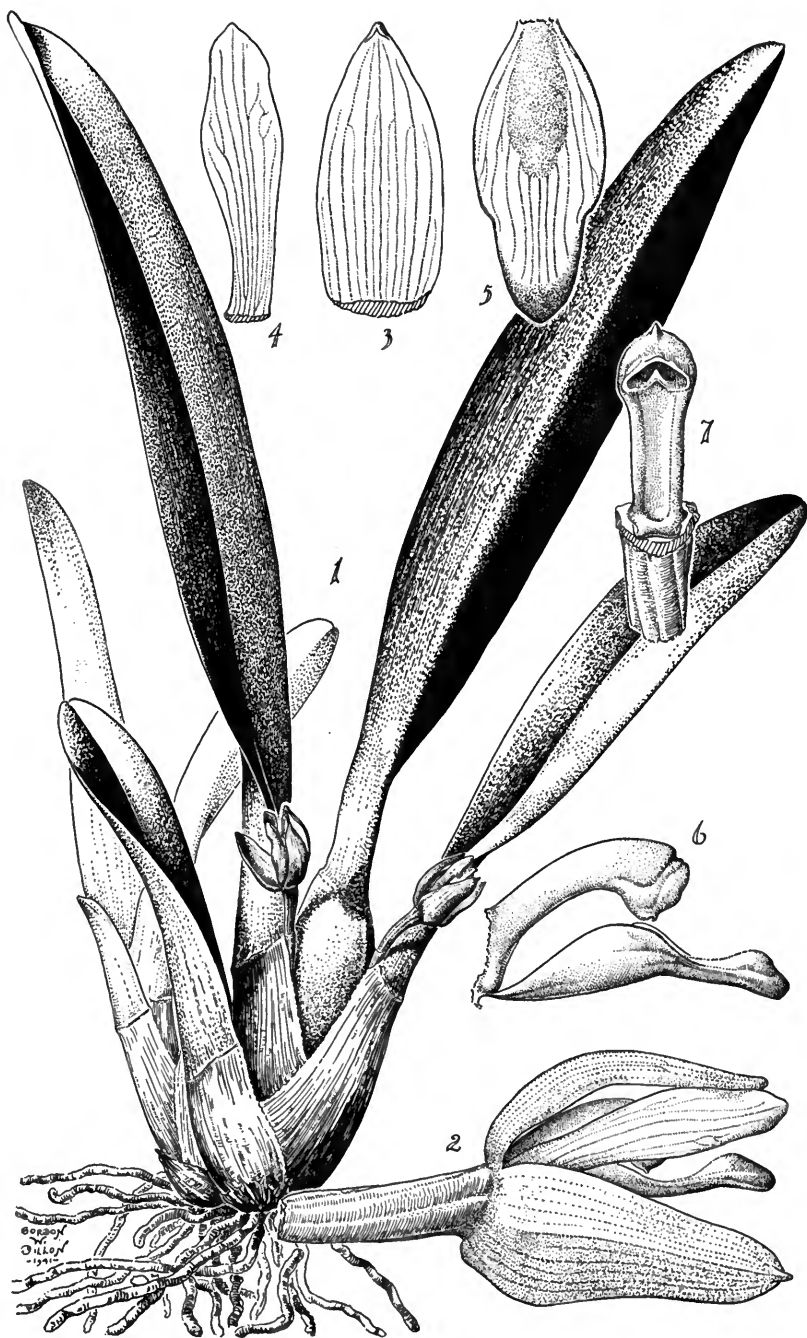
Alta Verapaz: Cobán, *Johnson* 551.—Cerro Azul, Guatemala-Honduras border, *Lewis* 114.

Maxillaria crassifolia (Lindl.) Reichb. f. *Bonpl.* 2: 16. 1854.
Heterotaxis crassifolia Lindl. *Bot. Reg.* 12: t. 1028. 1826. Figure 163.

Epiphytic on trees in humid forests or on rocks of cliffs, from near sea level up to 1,500 meters alt. Widespread from Florida, Mexico through Central America to Panama, the West Indies, Venezuela, and Brazil; rather common.

Plant terminating in an inconspicuous oblong compressed unifoliate pseudobulb that is supported by a short rhizome and concealed by distichously imbricating cataphyll-sheaths; pseudobulbs 1.5-3 cm. long, about 1.5 cm. wide. Leaves coriaceous, articulate with the leaf-sheaths; outermost leaves (cataphylls) short and poorly developed; inner leaves (cataphylls) on each side of and on the pseudobulb, linear to linear-oblong, obtuse to subacute and apiculate, conduplicate at the base, 7-45 cm. long, 1.2-4 cm. wide. Inflorescence from the axil of a leaf, 1-flowered or rarely 2- or 3-flowered; peduncle short, usually about 1 cm. long, rarely up to 3 cm. long, mostly nearly concealed by the leaf-sheaths, provided

FIG. 163. *Maxillaria crassifolia*. 1, plant ($\times \frac{1}{2}$); 2, flower, side view ($\times 2\frac{1}{2}$); 3, dorsal sepal ($\times 2\frac{1}{2}$); 4, petal ($\times 2\frac{1}{2}$); 5, lip, front view, spread out ($\times 2\frac{1}{2}$); 6, lip and column, side view ($\times 2\frac{1}{2}$); 7, column, with upper part of ovary, front-ventral view ($\times 2\frac{1}{2}$). Drawn by G. W. Dillon.



with a scarious bract near the center. Floral bracts minute and triangular to broadly lanceolate, acute, scarious, rarely up to 1.5 cm. long, clasping the pedicellate ovary. Flowers usually solitary, yellow to orange, usually marked with purple, campanulate, with a stout pedicellate ovary that is about as long as the peduncle, the perianth parts fleshy-coriaceous and subparallel. Dorsal sepal oblong-elliptic to lanceolate, subacute to acute, conspicuously concave at the base, 1.4-1.8 cm. long, about 5 mm. wide near the base. Lateral sepals arising from a broad somewhat concave base, obliquely ovate-oblong to broadly lanceolate, acute, usually dorsally keeled and somewhat concave at the apex, 1.5-1.8 cm. long, about 6 mm. wide near the base, forming with the short column-foot an inconspicuous mentum. Petals linear-oblong, subacute to acute, with the margins entire or denticulate, occasionally curved, 1.2-1.5 cm. long, 3-3.5 mm. wide. Lip yellow or orange with reddish purple dots or tinged lavender, obscurely 3-lobed above the middle, elliptic, elliptic-lanceolate or rarely narrowly obovate, 1.3-1.5 cm. long, 6.5-8 mm. wide when spread out, with margins entire or denticulate; lateral lobes involute; disk with a broad densely tomentose or somewhat farinose callus along the central portion. Column arcuate, semiterete, 8-10 mm. long including the short foot. Capsule ellipsoid, 2.5-3.5 cm. long.

Alta Verapaz: Vicinity of caves, southwest of Lanquín, *Steyermark* 44137. Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, *Steyermark* 45604. Chamá, *Johnston* 906.—Izabal: Shores of Lago Izabal on side opposite San Felipe, between Punta Dos Reales and Punta de Lechuga, *Steyermark* 39598.—Petén: La Libertad, *Lundell* 2999.—“Guatemala,” *Lewis* 144.

Maxillaria cucullata Lindl. Bot. Reg. 26: t. 12. 1840. *M. rhombea* Lindl. Bot. Reg. 26: sub t. 12. 1840. *M. atrata* Reichb. f. Beitr. Orch. Centr.-Am. 31, t. 6, figs. I, 1-3. 1866. *M. obscura* Lindl. & Reichb. f. Beitr. Orch. Centr.-Am. 31. 1866. *M. praestans* Reichb. f. Gard. Chron. n. s. 23: 566. 1885 (type: Guatemala, *Lehman*).

Terrestrial, rock-inhabiting or epiphytic on trees in open or dense humid forests, up to 3,300 meters alt. Mexico, British Honduras, Guatemala, Honduras, and Costa Rica; rather common.

Plant usually growing in large loose clumps, consisting of a short stout rhizome that gives rise to numerous congested pseudobulbs and inflorescences. Pseudobulbs ovoid, oblong, rhomboidal, somewhat compressed, dull green or shiny, unifoliate, 2.5-9.5 cm. long, 1-3 cm. wide and about 1 cm. thick, subtended by several distichous equitant imbricated sheaths that are up to 10 cm. or more long. Leaf solitary at the apex of the pseudobulbs, linear to oblong-elliptic, obliquely retuse at the obtuse to rounded apex, subcoriaceous to coriaceous, conduplicate at the base, 11-40 cm. long, 1-5 cm. wide. Inflorescences several, from the axils of bracts subtending the pseudobulbs, a solitary flower supported by an erect slender peduncle; peduncle occasionally fractiflex, 4.5-20 cm. long, more or less concealed by tubular-involute acute bracts; bracts scarious-fibrous,

with hyaline margins, 2-3 cm. long. Floral bracts similar to the bracts of the peduncle, usually exceeding the pedicellate ovaries. Flowers yellowish to almost black, often variously striped and spotted, usually a deep maroon, with stout pedicellate ovaries that are 1.5-4 cm. long, the floral segments thick-membranaceous and rigid. Sepals elliptic-lanceolate to linear-lanceolate, acute to acuminate, spreading, more or less dorsally keeled, conduplicate at the apex, reticulate-veined, 2.3-4.5 cm. long, 4-11 mm. wide; lateral sepals reflexed, somewhat oblique, adnate to the column-foot to form a short mentum. Petals broadly elliptic to narrowly lanceolate, subacute to acuminate, often conduplicate at the apex, overlapping and projecting to form a hood over the column, 1.5-2.9 cm. long, 5-9 mm. wide. Lip articulate with the column-foot, erect-arcuate in natural position, 1.5-3 cm. long, 7-10.5 mm. wide when spread out, more or less 3-lobed about the middle, broadly elliptic to oblong-oblongate in outline when expanded; lateral lobes short, semiobcordate to bluntly triangular, upcurved to clasp the column; mid-lobe broadly oval or obovate to oblong-subquadrate, subobtusate to acute at the conduplicate apex, more or less verrucose on the upper surface; disk with a spatulate sulcate callus on the basal portion between the lateral lobes. Column stout, 1.3-1.5 cm. long including the short foot. Capsule ellipsoid, 3-4.5 cm. long.

This is an extremely variable species in the size of the flowers, the width of the floral segments and the size of the plant.

Alta Verapaz: Near Cobán, *Türckheim* II 2192; 2465; 4174. Road from Chamá to Cobán, *Johnson* 554. Finca Volcán, *Wilson* 229. Tactic, *Hunnewell* 17118.—Amatitlán: Volcán de Pacaya, above Las Calderas, *Standley* 58513. Pacaya, *Johnston* 1389. Calderas, *Johnston* 1575. Guatemala market, *Johnston* 1822.—Chimaltenango: Chichavac, *Skutch* 395.—El Progreso: Sierra de las Minas, hills north of Finca Piamonte, between Finca Piamonte and summit of Volcán Santa Luisa, *Steyermark* 43535.—Quiché: Sacabajá, *Heyde & Lux* 3510.—San Marcos: Above Finca El Porvenir, between "Todos Santos Chiquitos" and "Loma de la Paloma," south-facing slopes of Volcán Tajumulco, *Steyermark* 37302.—Suchitepequez: Volcán Santa Clara, between Finca El Naranjo and upper slopes, *Steyermark* 46647.—Zacapa: Summit of Sierra de las Minas, vicinity of Finca Planados, *Steyermark* 29980. Sierra de las Minas, between Loma El Picacho and Cerro de Monos, *Steyermark* 42828; 42774. Sierra de las Minas, upper slopes, along Río Repollal to summit of mountain, *Steyermark* 42530.—Between Chichicastenango and Sta. Tomás Quiché, *Lewis* 80.—"Guatemala," *Skinner*.

Maxillaria curtipes Hook. Ic. Pl. 4: t. 384. 1841. *Maxillaria Houtteana* Reichb. f. Hamb. Gartenz. 14: 212. 1858.

Epiphytic on trees in forests, up to 3,000 meters alt. Mexico, Guatemala and Costa Rica; uncommon.

Plant straggly, ascending or pendent, consisting of an elongated rhizome that gives rise to scattered pseudobulbs and inflorescences. Rhizome stout, concealed by closely appressed non-leaf-bearing sheaths; sheaths brownish, membranaceous, tough, imbricated, broadly lanceolate, acute to acuminate. Pseudobulbs ellipsoid-oblong, compressed, bright or pale green, 4–6.5 cm. long, up to 2 cm. wide, unifoliate, subtended by sheaths that are like those of the rhizome. Leaf solitary at the apex of the pseudobulbs, linear, somewhat obliquely retuse at the obtuse apex, coriaceous, 1–3 dm. long, 1.5–2.5 cm. wide. Inflorescence from the axil of a bract near the base of the pseudobulb, a solitary flower supported by a short peduncle; peduncle 2–4 cm. long, entirely concealed by closely imbricated sheaths. Floral bracts two, small, scarious-translucent, triangular to triangular-lanceolate, acute, up to 12 mm. long. Flowers fleshy, showy, usually deep red, with stout arcuate pedicellate ovaries that are 2.5–5 cm. long. Sepals usually yellowish on the outer surface and deep red within, with the margins orange-colored, oblong-elliptic to ovate-lanceolate or lanceolate, acute to acuminate, spreading, 2–2.8 cm. long, 4.5–6 mm. wide, rarely wider; dorsal sepal often abruptly recurved above the middle; lateral sepals somewhat oblique, reflexed, adnate to the column-foot to form a short blunt mentum. Petals colored like the sepals, linear to linear-oblong, subobtuse to subacuminate, slightly oblique, incurved, with the tips connivent to form a hood over the column, about 2 cm. long and 5 mm. wide. Lip hinged to the column-foot, arcuate in natural position, oblong to broadly elliptic when spread out, subobtuse to rounded at the apex, usually deep yellow, spotted and striped with red-brown, 1.7–2 cm. long, 8–11 mm. wide; disk papillose-puberulent, with a thick broad tumid papillose callus on the basal portion. Column semiterete, arcuate, yellowish, spotted with red-brown, about 1.5 cm. long including the short foot.

This species is closely allied to *M. tenuifolia* and *M. elatior*. It differs from *M. tenuifolia* chiefly in the longer, narrower pseudobulbs and broader bright green leaves. It differs from *M. elatior* mainly in the narrower leaves and lack of leaves subtending the pseudobulbs.

Alta Verapaz: Cobán, *Lewis* 68.—Guatemala: "Guatemala market," *Johnston* 1394. Cultivated in garden of Don Mariano Pacheco H., Guatemala City, *Steyermark* 39867.—Huehuetenango: Along Aguacatán road east of Huehuetenango at km. 13–14, *Standley* 82016.—Sacatepéquez: Volcán Fuego, *Smith* 2639.—Zacapa: Sierra de las Minas, between Santa Rosalía de Mármol and San Lorenzo, *Steyermark* 43147.

Maxillaria densa Lindl. Bot. Reg. 26: t. 1804. 1835. *Ornithidium densum* (Lindl.) Reichb. f. Bonpl. 3: 217. 1855. Figure 164.

Epiphytic on trees in damp woods at low elevations or in cloud forests, or terrestrial in pine forests, up to 2,500 meters alt. Mexico, British Honduras, Guatemala, and Honduras; rather common.

Plant loose, scandent, simple or branched, usually a thick elongated rhizome having numerous defoliated pseudobulbs and a few terminal leafy pseudobulbs and numerous flowers. Rhizome 5–10 mm. thick, concealed by distichous

ORNITHIDIUM
densum Reichb. f.



FIG. 164. *Maxillaria densa* (*Ornithidium densum*). Plant ($\times 1$); 1, flower, front view ($\times 4$); 2, column and lip (separated), side view ($\times 6$); 3, pollinia (much enlarged). Drawn by Blanche Ames.

imbricated cataphyll-sheaths or bracts; bracts brown, fibrous-scarious, dorsally keeled, obtuse. Pseudobulbs scattered or congested on the rhizome, unifoliate, yellowish green, elliptic-oblong to ovate-oblong, compressed-ancepitous, 1.5-7 cm. long, 1-2.5 cm. wide, subtended by the sheaths of the rhizome. Leaf solitary at the apex of the pseudobulbs or produced as minute cataphylls along the rhizome, linear or linear-oblong to rarely oblanceolate, obliquely retuse at the obtuse apex, conduplicate at the base, olive-green, coriaceous, 4.5-40 cm. long, 1-4 cm. wide. Inflorescences composed of dense fascicles of one-flowered peduncles in the axils of the cataphyll-sheaths of the new growths. Peduncles numerous, slender, more or less fractiflex, 3-5 cm. long, nearly concealed by thin scarious-fibrous bracts; bracts tubular-involute, dorsally keeled, obtuse to acute, 8-12 mm. long. Floral bracts similar to those of the peduncle, exceeding and concealing the pedicellate ovary. Flowers variable in color, greenish white and yellowish, white with a purplish tinge to deep maroon or reddish brown, with rather stout pedicellate ovaries that are 6-7 mm. long. Sepals linear-elliptic to elliptic-lanceolate, acute to acuminate, more or less conduplicate at the fleshy keeled apex, concave, 6.5-9 mm. long, 2-2.7 mm. wide; lateral sepals oblique, adnate to the column-foot to form an inconspicuous mentum. Petals elliptic-lanceolate to occasionally oblanceolate-elliptic, acute to subacuminate, oblique, 5-7.5 mm. long, 1.5-2.5 mm. wide. Lip continuous with the column-foot, fleshy, 3-lobed, about 4 mm. long; lateral lobes basal, auricle-like, rounded, less than 1 mm. long, upcurved to clasp the column and to form with the callus a deeply concave base to the lip; mid-lobe suborbicular to broadly ovate, rounded to obtuse at the apex, provided beneath with an apiculate keel at the apex, 2.2-3 mm. long, 2-2.5 mm. wide; disk with a concave plate-like obtuse callus between the lateral lobes. Column short, stout, claviform, forming a deep saddle with the prominent foot, 3-4 mm. long including the foot. Capsule ovoid, 8-10 mm. long.

The coloration of the flowers is extremely variable in this species. Flowers have been found with all degrees of coloration varying from almost pure white to deep maroon or reddish brown. However, morphologically, the flowers are all similar. This species is very closely related to *M. meleagris*.

Alta Verapaz: La Isla, south of Santa Cruz, *Standley* 90230. Cubilgüitz, *Türckheim* 8584. Río Cobán, *Johnson* 736. Above Tamahú, *Standley* 70921.—Amatitlán: Volcán Pacaya, *Kellerman* 6703.—Chimaltenango: Region of Los Positos, above Las Calderas, *Standley* 80154. Chichavac, *Skutch* 376. Along road from Chimaltenango to San Martín Jilotepeque, *Standley* 57932. San Martín, *Johnston* 1378.—Guatemala: Slopes of Volcán de Pacaya, between San Francisco Sales and the base of the active cone, *Standley* 80745. Calderas, *Johnston* 1469. Near Calderas, *Porter* 4. About 16 miles from Guatemala, on road to Mataquesuintla, *Lewis* 93; 25 (in part).—Huehuetenango: Cerro Huitz, between Mimanhuitz and Yulhuitz, Sierra de los Cuchumatanes, *Steyermark* 48594.—Izabal: Virginia, *Lewis* 25 (in part).—Jalapa: Mountains about Chahuite, northwest of Jalapa, *Standley* 77490.—Quezaltenango: Densely for-

ested damp white sand quebrada, El Pocito, south of San Martín Chile Verde, on road to Colomba, *Standley* 85113. Palmar, *Skutch* 1432. Volcán Zunil, *Skutch* 955.—Sacatepéquez: Santiago, *Gomez* 886.—San Marcos: Finca El Porvenir, Potrero Tojó, Volcán Tajumulco, *Steyermark* 37649.—Suchitepequez: Slopes of Volcán Zunil, between Finca Montecristo and Finca Asturias, southeast of Santa María de Jesús, *Steyermark* 35299. Upper forested slopes of barranca by Loma Grande, above Finca El Naranjo, on Volcán Santa Clara, *Steyermark* 46826.—Zacapa: Quebrada Alejandria, summit of Sierra de las Minas, vicinity of Finca Alejandria, *Steyermark* 29891. Slopes of Monte Virgen, around summit of mountain, *Steyermark* 42632.—“Guatemala,” *Spinden*.—Vera Paz: San Cristobal, *Bernoulli* 1049.

Maxillaria elatior Reichb. f. in Walp. Ann. Bot. 6: 532. 1863. *M. triangularis* Lindl. Bot. Reg. 31: Misc. p. 9. 1845 (type: Guatemala, Quezaltenango, *Hartweg*).

Terrestrial or epiphytic on trees in humid, open or dense forests, usually at low elevations, up to 1,500 meters alt. Mexico, Guatemala, Honduras and Costa Rica; rather common.

Plant large, coarse, caespitose, pendent or erect-ascending, consisting of an elongated leafy rhizome that gives rise to axillary inflorescences and a few scattered pseudobulbs, up to 45 cm. or more tall. Rhizome stout, 7–10 mm. in diameter, often creeping and then assurgent at the terminal portion, entirely concealed by scarious-fibrous leaf-sheaths. Pseudobulbs few, often solitary at the summit of a short rhizome, ovoid to oblong-ellipsoid, compressed, 1- or 2-leaved, 4.5–9 cm. long, 2–4 cm. wide, about 1 cm. thick, subtended by large leaf-bearing sheaths. Leaves large, 1–2 from the apex of the pseudobulbs and rising directly from the rhizome, articulate, with large distichous compressed leaf-sheaths on the rhizome, linear to linear-elliptic or narrowly lanceolate, somewhat obliquely retuse at the obtuse apex, conduplicate at the base, coriaceous, 12–40 cm. long, 2–6 cm. wide. Inflorescence from the axil of leaf-sheaths on the rhizome, a solitary flower supported by a short peduncle; peduncle slender, 5–7.5 cm. long, subtended by lanceolate scarious sheaths. Floral bracts apparently obsolescent. Flowers fleshy-subcoriaceous, reddish yellow to deep brick-red, often variously mottled, spotted or striped, with stout pedicellate ovaries that are 4.5–5.5 cm. long. Sepals oblong-elliptic to triangular-lanceolate or ovate-oblong, obtuse to acute or apiculate, with the margins reflexed, 2.2–3.2 cm. long, 1–1.5 cm. wide at the widest part; dorsal sepal concave, only slightly recurved at the apex; lateral sepals spreading-reflexed, slightly oblique, adnate to the column-foot to form a short blunt mentum. Petals slightly oblique, oblong-lanceolate to ovate-lanceolate, acute to apiculate, strongly recurved at the apex, appressed to the column, 1.7–2.5 cm. long, 5–9 mm. wide. Lip articulate with the column-foot, entire, broadly concave and arcuate in natural position, strongly decurved at the obtuse to rounded apex, when spread out linear-oblong to ovate-oblong, 1.8–2 cm. long, 6–10 mm. wide; disk with a large flat oblong blackish smooth callus in the lower

half, the callus about 1 cm. long. Column semicylindrical, arcuate, reddish on the anterior surface, 1–2 cm. long including the foot. Capsule ellipsoid-cylindrical, about 5 cm. long.

This species is closely allied to *M. curtipes* but it is easily distinguished by its leafy rhizome, which is concealed by the sheaths of the leaves (cataphylls). The rhizome of *M. curtipes* is concealed only by brownish sheaths and has no cataphylls. The inflorescences of *M. elatior* are produced in the axils of the leaf-sheaths on the rhizome, whereas those of *M. curtipes* are produced near the base of the pseudobulbs along with the new growths. Florally, the two species are quite similar.

Izabal: Oneida-Chickasaw connection, near La Veja, near Bananera, *Lewis* 141. Between Virginia and Lago Izabal, Montaña del Mico, *Steyermark* 38810.—San Marcos: Potrero Matasán, Finca El Porvenir, slopes of Volcán Tajumulco, *Steyermark* 52125.—Suchitepequez: Finca Mocá, *Skutch* 1546.

Maxillaria Friedrichsthali Reichb. f. Bot. Zeit. 10: 858. 1852 (type: Guatemala, Prov. Chontales, in monte Aragua, *Friedrichsthal* 828). *M. aciantha* Reichb. f. Bot. Zeit. 10: 858. Figure 165.

Epiphytic on trees in humid forests, from sea level up to 1,850 meters alt. Mexico, British Honduras, Guatemala, Honduras, Nicaragua, Costa Rica, and Panama; common.

Plant caespitose or straggly, consisting of a creeping rhizome that gives rise to clustered or distant pseudobulbs and short inflorescences, semipendent, bracteate, with all the bracts having hyaline margins, up to 40 cm. or more tall. Rhizome stout, about 7 mm. in diameter, concealed by tough brown or olive-green imbricated cataphyll-sheaths or non-leaf-bearing sheaths. Pseudobulbs olive-green, ellipsoid, flattened and rectangular, 2–4-leaved at the apex, subtended by a pair of leaf-sheaths, 2–6.5 cm. long, 0.8–2.5 cm. wide, up to 1 cm. thick. Leaves 2–4 from the apex of the pseudobulbs and a pair of smaller ones subtending the pseudobulbs, linear to narrowly elliptic, obliquely retuse at the apex with a short mucro in the sinus, olive-green, subcoriaceous, flexible, articulate, 5–27 cm. long, 5–18 mm. wide. Inflorescence from the axils of the bracts of the rhizome, a solitary flower supported by a short peduncle; peduncles usually in pairs or almost clustered, jointed, about 1.5 cm. long, concealed by triangular compressed imbricated olive-green or yellowish bracts. Floral bracts 2, opposite, conduplicate, up to 2.5 cm. long. Flowers arcuate, fleshy-subcoriaceous, not showy, with pedicellate ovaries that are about 3 cm. long. Sepals and petals olive-green to light yellow, marked with deep yellow or light purple. Sepals lanceolate, acute, acuminate or apiculate at the apex, cymbiform, 1.3–4 cm. long, 4–10 mm. wide; lateral sepals falcate, slightly spreading, adnate to the column-foot to form a short mentum. Petals narrowly elliptic-lanceolate, subacute to acute, 1.3–2.7 cm. long, 2.5–4 mm. wide. Lip articulate with the column-foot, erect-recurved,



FIG. 165. *Maxillaria Friedrichsthalii*. Plant ($\times \frac{1}{2}$); lower left, lip and column, side view ($\times 1$); lower right, lip, spread out ($\times 1$). Drawn by Blanche Ames.

greenish yellow, spotted with purple on the margins or tinted with lavender, elliptic-lanceolate, tapering at both ends, obtuse at the fleshy-thickened apex with the thickened portion sulcate above, lateral margins upcurved, 1.2–2.5 cm. long, 4–7.5 mm. wide across the middle when spread out; disk with a linear obtuse yellowish callus on the basal half. Column arcuate, semiterete, concave on the anterior side, fringed at the dilated apex, up to 2.3 cm. long, light green to almost white, marked with lavender. Capsule ovoid-ellipsoid, 2.5–4 cm. long.

This species is extremely variable in the size of the flowers. The large number of triangular, compressed, imbricated, shiny,

olive-green bracts with which the plant is provided is characteristic of this species. It is commonly called "Pico de pava."

Alta Verapaz: Cubilgüitz, *Türckheim* II 591; 829. Jocoló, *Johnston* 1177; 1179.—Escuintla: Concepción, *Smith* 2245.—Guatemala: Near Finca La Aurora, *Aguilar* 225.—Izabal: Along Río Frio, Cerro San Gil, *Steyermark* 39968. Shores of Lago Izabal, opposite San Felipe, between San Felipe and mouth of Río Juan Vicente, *Steyermark* 39680.—Quezaltenango: Between Finca Pirineos and Calahuaché, *Steyermark* 35019.—Sacatepéquez: Wooded quebrada just above Barranca Hondo, *Standley* 88931. Near Barranca Hondo, southeast of Alotenango, *Standley* 64985; 64974; 65036; 65038.—San Marcos: Finca El Porvenir, on Potrero Matasán along Río Cabús, Volcán Tajumulco, *Steyermark* 37634.—Sololá: Pine woods bordering Río Bravo, in vicinity of Finca Mocá, south-facing slopes of Volcán Atitlán, *Steyermark* 47988.—Osuna, *Johnston* 1415.—Finca El Zapote, *Lewis* 123.—"Guatemala," *Spinden*.—"Coastal region," *Lewis* 29 (in part).

Maxillaria meleagris Lindl. Bot. Reg. 30: Misc. p. 3. 1844.
M. Lindeniana A. Rich. & Gal. Ann. Sci. Nat. sér. 3, 3: 24. 1845.
M. punctostriata Reichb. f. *Linnaea* 41: 28. 1876.

Epiphytic on trees in damp forests, up to 1,800 meters alt. Rare from Mexico through Central America to Panama.

Plant subcaespitose, composed of a short rhizome that gives rise to numerous crowded pseudobulbs and a few inflorescences. Rhizome stout, concealed by sheaths. Pseudobulbs ellipsoid-oblong to ovoid, compressed, unifoliate, 2–5.5 cm. long, 1–2.2 cm. wide, subtended by several distichous imbricated sheaths; sheaths brown, chartaceous, conduplicate, acute to often truncate at the apex. Leaves solitary at the apex of the pseudobulb, also sometimes produced (as cataphylls) on the short rhizome, linear to linear-ligulate, obliquely retuse at the obtuse apex, coriaceous, conduplicate at the base, 15–40 cm. long, 6–22 mm. wide. Peduncles produced from axils of bracts of new growth near base of pseudobulb, one-flowered, somewhat fractiflex, slender, 3–8 cm. long, provided with tubular-involute inflated bracts; bracts scarious, acute to acuminate, 1.3–2 cm. long. Floral bracts similar to the bracts of the peduncle. Flowers variable in size and texture; sepals and petals rather thin or fleshy-thickened, tawny, olive-buff or flesh-colored, stained or spotted with dark red. Sepals elliptic-lanceolate to linear-elliptic, subobtuse to acuminate, more or less conduplicate at the fleshy, dorsally keeled apex, 1.2–2.9 cm. long, 3.5–7 mm. wide; dorsal sepal strongly concave, often dorsally keeled its entire length; lateral sepals oblique, spreading adnate to the column-foot to form a short mentum. Petals coherent with the dorsal sepal, elliptic to elliptic-lanceolate, obtuse to subacuminate at the somewhat thickened apex, slightly oblique, 1–2.2 cm. long, 3–6.5 mm. wide. Lip dark red, articulate with the column-foot, arcuate in natural position, 3-lobed at the base, 7–16 mm. long when spread out; lateral lobes occasionally whitish, small, rounded, thin,

upcurved to clasp the column; mid-lobe much larger than the lateral lobes, fleshy-thickened, suborbicular-ovate to broadly elliptic, rounded at the sulcate apex, convex, with a prominent dorsal keel at the apex, 4–8 mm. wide; disk thickened between the lateral lobes, with a transverse fleshy ridge connecting the lateral lobes in front and a small variously shaped lamellate or sulcate callus superimposed on the thickened portion between the lateral lobes, with the transverse fleshy ridge rounded to retuse in front. Column stout, 5–10 mm. long including the foot. Capsule ellipsoid, 2–2.5 cm. long.

This species is extremely variable in the length and size of its floral segments. The small callus superimposed on the fleshy disk between the lateral lobes is also variable in its shape and structure, being sulcate with several angles at its apex or composed of several parallel ridges that often extend from the base of the lip to the transverse ridge above. In spite of such variations, it does not seem feasible to recognize more than one species. *Maxillaria meleagris* is closely related to *M. densa*. However, the flowers are much larger than in that species.

Alta Verapaz: Finca Mocá, Johnson 53.—Baja Verapaz: Lewis.—“Guatemala,” Bernoulli.

Maxillaria Mooreana Rolfe, Kew Bull. 1895: 36. 1895 (type: Guatemala).

No material of this species has been seen. The following is a free translation of the original description.

Pseudobulbs oblong, monophyllous, 4 cm. long. Leaves oblong-lanceolate, acute, 20–25 cm. long, 2.2–4 cm. wide. Peduncles short, 10 cm. long, provided with loose acute subimbricated sheaths. Bracts oblong-lanceolate, spathaceous, acute, 2.5 cm. long. Flowers cream-colored, with seven maroon-purple stripes on each petal. Dorsal sepal elliptic-oblong, acute, subcarinate, subconcave, 2.2 cm. long, 1.1 cm. wide. Lateral sepals triangular-ovate, subobtuse, forming a mentum, 1.3 cm. wide; mentum conical, obtuse, 1.2 cm. long. Petals elliptic-lanceolate, acute, 1.8 cm. long, 8 mm. wide. Lip entire, elliptic-oblong, obtuse, narrowly margined with maroon-purple, 1.2 cm. long, 6 mm. wide; disk farinaceous; callus broadly oblong, obtuse. Column clavate, 1 cm. long.

The long mentum separates *M. Mooreana* from all other species of *Maxillaria* found in Guatemala.

Maxillaria Nagelii L. O. Wms. in Correll, Lloydia 10: 212. 1947. *Camaridium Tuerckheimii* Schltr. Repert. Sp. Nov. 10: 296. 1912 (type: Guatemala, Dept. Alta Verapaz, epiphytic in woods near Cobán, 1907, *H. von Tuerckheim* II 1771), non *Maxillaria Tuerckheimii* Schltr., 1912.

Epiphytic on trees in humid cloud forests, up to 1,800 meters alt. Very rare in Mexico and Guatemala.

Plant elongated, spreading and straggly, up to 5 dm. or more tall. Rhizome stout, about 5 mm. in diameter, giving rise to pseudobulbs that are 3–5 cm. apart, concealed by acute bracts or cataphyll-sheaths; sheaths scarious-fibrous, brown, compressed, often truncate. Pseudobulbs rather large, obovoid, strongly compressed, unifoliate, 2.5–4.5 cm. long, 1–3.5 cm. wide. Leaves solitary at the apex of the pseudobulbs and produced along the rhizome (cataphylls), linear to linear-oblong, obliquely retuse at the obtuse apex, conduplicate at the base, grass-green, 12–32 cm. long, 1–3.2 cm. wide. Inflorescences composed of solitary flowers produced in the axils of the cataphylls on the new growths. Peduncle filiform, 1–2 cm. long, shorter than the pedicellate ovary, surrounded by long scarious sheaths. Floral bracts (when present) about 1.5 cm. long, tubular-involute, acuminate, scarious. Flowers pale yellowish green, whitish, with slender pedicellate ovaries that are 2.5–3.5 cm. long. Sepals elliptic-lanceolate to lanceolate, acute to long-acuminate or cuspidate, somewhat dorsally carinate at the apex, slightly spreading, 1.8–2.3 cm. long, 4–5 mm. wide; dorsal sepal concave below; lateral sepals oblique, adnate to the column-foot to form a short mentum. Petals linear to linear-oblong, narrowly obtuse to acute or shortly acuminate, oblique, somewhat dorsally carinate, 1.3–1.7 cm. long, 3–3.5 mm. wide. Lip articulate with the column-foot, concave below, recurved above, rather thin, 1.2–1.6 cm. long, about 6 mm. wide at the widest point when spread out, when expanded panduriform or ovate-oblong in outline, sometimes more or less 3-lobed below the middle, rounded to acute at the apex, usually ciliate or ciliate-erose; disk provided with a short flat or linear-spatulate callus below the middle. Column white, semiterete, arcuate, 7–11 mm. long including the prominent foot.

The flowers of this species resemble those of *M. tenuifolia*.

Alta Verapaz: Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 89786.—Chiquimula: Montaña Nonojá, 3–5 miles east of Camotán, *Steyermark* 31676.

Maxillaria nasuta Reichb. f. *Beitr. Orch. Centr.-Am.* 104. 1866.

Epiphytic on trees in wet forests, up to 1,600 meters alt. Uncommon in Guatemala and Costa Rica.

Plant large and stout, caespitose; roots stout, fibrous, glabrous. Pseudobulb ovoid or ellipsoid, strongly compressed, unifoliate, up to 8 cm. long and 4 cm. wide, surrounded on each side by two or more distichous imbricating sheaths; sheaths coriaceous, strongly dorsally carinate along the mid-vein, leaf-bearing. Leaves oblong-ligulate, obliquely bilobed at the obtuse apex, conduplicate in the basal part, coriaceous, dorsally carinate along the mid-nerve, sulcate on the upper surface, up to 55 cm. long and 4 cm. wide. Peduncle short, axillary from the leaf-sheaths, with the pedicellate ovary entirely concealed by inflated sheaths that are distichous, chartaceous, and imbricating. Flowers rather large, with lemon-yellow sepals and petals and a deep carmine lip. Sepals lanceolate, acuminate, thickened longitudinally along the center on the outer surface, about 4 cm. long and 1 cm. wide below the middle; lateral sepals subfalcate. Petals elliptic-lanceolate, tapering to an acute apex, oblique, with the upper part much thickened on the outer surface, about 2.5 cm. long and 6 mm. wide. Lip more or less 3-lobed near the middle, erect, with the lateral lobes incurved and the

apical half of the mid-lobe abruptly recurved in natural position, when expanded lanceolate in outline, obtuse, about 2 cm. long and 8 mm. wide across the lateral lobes; disk with the basal half obscurely thickened longitudinally to about midway between the lateral lobes. Column stout, arcuate, about 1 cm. long, concave on the ventral surface.

Although this is a larger plant with wider leaves, it is very similar in habit to *M. crassifolia*.

Alta Verapaz: Dense wet limestone forest near Chirriacté, on the Petén highway, *Standley* 91988.

Maxillaria pulchra (Schltr.) L. O. Wms. in Correll, *Lloydia* 10: 212. 1947. *Camaridium pulchrum* Schltr. *Repert. Sp. Nov.* 10: 251. 1911 (type: Guatemala, Dept. Alta Verapaz, near Cubilgüitz, April, 1902, *H. von Türckheim* II 332).

Epiphytic on trees in forests, usually at low elevations, up to 600 meters alt. Mexico, British Honduras, Guatemala and Honduras; uncommon.

Plant straggly, pendent, consisting of an elongated rhizome that gives rise to distant pseudobulbs and inflorescences. Rhizome rather stout, about 5 mm. in diameter, concealed by closely appressed imbricated cataphyll-sheaths or bracts; bracts triangular-ovate, acute, reddish brown, membranaceous, rugose, with hyaline margins. Pseudobulbs ovoid to ellipsoid, flattened, vernicose, unifoliate, subtended by leaf-sheaths, produced about every 4.5 cm. along the rhizome, 2-5.5 cm. long, 1.5-2.5 cm. wide. Leaves solitary from the apex of the pseudobulbs, with several additional ones (cataphylls) produced at the base of the pseudobulbs, linear, tapering to the long-acuminate apex, subcoriaceous, 7-35 cm. long, 3-7 mm. wide. Inflorescences several, from the axils of the bracts covering the rhizome, up to 8 cm. long, a solitary flower supported by a slender peduncle; peduncle usually somewhat fractiflex, up to 5 cm. long, concealed by tubular-involute bracts; bracts acuminate, scarious, 1-3 cm. long. Floral bracts similar to those of the peduncle, concealing the pedicellate ovaries. Flowers rather showy and fragrant, sparkling white or cream-white, with slender pedicellate ovaries that are 1.5-2 cm. long. Sepals elliptic-oblong to elliptic-oblong, obtuse to subacute, wavy on the margins, 2.7-3.5 cm. long, 7-10 mm. wide above the middle; lateral sepals slightly oblique, adnate to the column-foot to form an inconspicuous mentum. Petals linear-oblong to linear-oblong, rounded to subobtusate at the apex, slightly oblique, wavy on the margins, 2.3-2.5 cm. long, about 4 mm. wide above the middle. Lip small, continuous with the column-foot, white or yellowish, usually marked with purplish brown, broadly cuneate-obovate to flabellate, bluntly 3-lobed at the apex, with all the lobes subequal and broadly rounded, the lateral lobes upcurved and nearly clasping the column, 7-8 mm. long, 6-7 mm. wide across the lobes; disk provided with a white linear-oblong papillose callus through the center on the lower half. Column small, arcuate, 5-8 mm. long including the short foot.

This species is closely allied to *M. camaridii*. However, it differs from that species in its narrower leaves, leafless rhizome,

differently shaped bracts of the rhizome and type of inflorescences. It superficially resembles *M. tenuifolia*. However, besides striking floral differences, it differs from that species in its smooth, vernicose (not verrucose and dull) pseudobulbs, narrower leaves and type of inflorescences.

Alta Verapaz: Along Río Sebol, downstream from Carrizal, *Steyermark* 57874. Cubilgüitz, *Türkheim* 7990; II 332.—Izabal: Between Virginia and Lago Izabal, Montaña del Mico, *Steyermark* 38914. Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38574. Near Virginia, *Lewis* 44 (in part); 46.—Petén: Monte Santa Teresa, *Lundell* 2978.—“Eastern portions of Vera Paz and Chiquimula,” *Watson*.

Maxillaria purpurea (Spreng.) Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 11: 16. 1943. *Epidendrum vestitum* Sw. Prodr. 124. 1788, non *Maxillaria vestita* Schltr. (1924). *Camaridium purpureum* Spreng. Syst. Veg. 3: 735. 1826. *Ornithidium vestitum* (Sw.) Reichb. f. in Walp. Ann. Bot. 6: 491. 1863. *O. simulans* Ames & C. Schweinf. Sched. Orch. 10: 99. 1930 (type: Guatemala, Dept. Alta Verapaz, Cubilgüitz, 1901, *H. von Türkheim* 8302).

Epiphytic on trees in forests and on rocks, at low altitudes. Widespread but not common in Guatemala, Honduras, the West Indies, and northern South America.

Plant straggly, pendent, up to 8 dm. or more tall, consisting of an elongated branching rhizome that gives rise to pseudobulbs and inflorescences. Rhizome about 3 mm. thick, completely concealed by tightly appressed membranaceous sheaths; sheaths triangular-ovate, acute, distichous, imbricated, dorsally keeled. Pseudobulbs produced on the rhizome at intervals of 3–7 cm., ovoid-oblong to oblong-ellipsoid, strongly compressed, unifoliate, 1–5 (commonly 3–4) cm. long, 1.5–2 cm. wide, subtended by a pair of opposite sheaths. Leaf solitary at the apex of the pseudobulbs, linear-lanceolate to narrowly elliptic, tapering to the obtuse to acute apex, conduplicate at the base, subcoriaceous to firmly membranaceous, 6–26 cm. long, 1–2.5 cm. wide. Peduncles clustered in dense glomerules in the axils of the rhizome-bracts just below each pseudobulb, one-flowered, less than 1 cm. long, several-jointed, provided with reddish brown bracts at each joint and at the base; bracts fibrous-scarious, ovate-lanceolate, acuminate, dorsally keeled and compressed, 7–12 mm. long. Floral bracts similar to those of the peduncles. Flowers minute, white, with pedicellate ovaries that are 4–5 mm. long. Sepals broadly ovate, ovate-elliptic or broadly elliptic, dorsally keeled at the acute apex, 5–7-nerved, 4–5.5 mm. long, 1.5–3 mm. wide; lateral sepals oblique, adnate to the column-foot to form an inconspicuous mentum. Petals ovate-oblong to oblong-lanceolate, obtuse to acute, occasionally somewhat constricted above the middle and dorsally keeled at the apex, 3–5-nerved, 3–4.5 mm. long, 1–1.8 mm. wide. Lip continuous with the column-foot, fleshy, upcurved and parallel to the column in natural position, concave at the base, rhombic-

ovate in outline, 3-lobed below the middle, rounded to subcordate at the base, 2-4 mm. long, about 2 mm. wide across the lateral lobes when spread out; lateral lobes small, rounded, semiobovate, incurved, connected at their apices by a fleshy transverse semilunate callus; mid-lobe triangular-ovate, obtuse, somewhat dorsally apiculate. Column short, stout, about 2 mm. long including the stout upcurved foot; column-foot dilated above, abruptly 3-lobulate at the apex with the central tooth gently retuse. Capsule smooth, about 1 cm. long.

Vegetatively, this species is almost identical with *M. neglecta* (Schltr.) L. O. Wms., a Costa Rican species. However, the flowers of *M. purpurea*, besides being much smaller, lack the prominent mentum of *M. neglecta* and the lip has a different form.

Alta Verapaz: Cubilgüitz, *Türckheim* II 465. Jocoló, *Johnson* 1005. Río Chocón, *Johnson* 1248.—Izabal: On mango tree, Virginia and Inca farm, Los Andes district near Entre Rios, *Lewis* 14.—Suchitepequez: Guatalón, Finca Mocá, *Hatch*.

Maxillaria ringens Reichb. f. in Walp. Ann. Bot. 6: 523. 1863 (type: Guatemala, *Warszewicz*, and Mexico). *M. yzabalana* S. Wats. Proc. Am. Acad. 23: 286. 1888 (type: Guatemala, in the forests of the Río Dulce, *S. Watson*). *M. Tuerckheimii* Schltr. Repert. Sp. Nov. 10: 295. 1912 (type: Guatemala, Dept. Alta Verapaz, near Cubilgüitz, *H. von Türckheim* II 790; II 1048).

Epiphytic on trees in dense humid tropical forests, up to 1,700 meters alt. Common from Mexico throughout Central America to Panama and possibly South America.

Plant rather large, caespitose, erect, up to 5 dm. tall. Rhizome short, abbreviated, giving rise to closely placed pseudobulbs. Pseudobulbs unifoliate, ovoid-oblong to subglobose, somewhat compressed, 3-7 cm. long, 1.8-3 cm. wide, subtended by several imbricated scarious-fibrous sheaths; sheaths up to 8 cm. long. Leaf solitary at the apex of a pseudobulb, linear, linear-oblong or occasionally linear-oblongate, more or less obliquely retuse at the obtuse to subacute apex, conduplicate at the base to form a petiole, 1-4.5 dm. long, 1.5-5 cm. wide. Inflorescences several, from the axils of sheaths subtending the pseudobulbs, consisting of a slender peduncle supporting a solitary flower; peduncle ascending-erect, 3.5-15 cm. long, concealed by inflated tubular-involute sheaths that are 2-3.5 cm. long. Floral bract similar to the sheaths of the peduncle, usually nearly concealing and slightly exceeding the pedicellate ovary. Flower fragrant, erect, the perianth parts membranaceous and connivent, with a slender pedicellate ovary that is 2-3.5 cm. long. Sepals linear-oblong to linear-lanceolate, obtuse to acuminate, often apiculate, somewhat dorsally carinate at the apex, usually greenish yellow on the outer surface, whitish below with the upper part yellow on the inner surface, 2.2-5 cm. long, 2.5-6 mm. wide; lateral sepals oblique, adnate to the column-foot to form a prominent mentum. Petals linear-lanceolate, acute to acuminate or sometimes attenuate or apiculate, dorsally carinate-thickened at the apex, antrorsely falcate, white, 2-4.5 cm. long, up to 6 mm. wide at the base. Lip articulate with the column-foot, arcuate and with

the lateral margins upturned in natural position, more or less 3-lobed at the apex, 9–15 mm. long, 5–7 mm. wide when spread out, when expanded elliptic-oblong to broadly obovate-elliptic in outline, often with a whitish pubescence, white with a linear yellow glabrous or pubescent callus in the center and with red or purple veins on the lateral lobes; lateral lobes small, rounded to obtuse, entire or crenulate on the apical margin; mid-lobe small, roundish, fleshy, with the margin usually crisped-crenulate, sometimes spotted with purple. Column arcuate, clavate, white, usually flecked with purple at the base, 10–12 mm. long including the prominent foot. Capsule obliquely ellipsoid-cylindrical, 4–4.5 cm. long.

This species is extremely variable in the length of the peduncles and the size of the flowers. However, despite the differences in the size of the flowers, it forms a distinctive species in this genus.

Alta Verapaz: Chamá, *Johnson* 904.—Izabal: La Vigía, near Bananera, *Lewis* 172 (in part).—Quezaltenango: Near Colomba, *Lewis* 172 (in part).—Sololá: Volcán Atitlán, south-facing slopes, *Steyermark* 47398.—Coastal regions, *Lewis* 29 (in part).—Chilion, Mazatenango, *Bernoulli* 459.

Maxillaria rufescens Lindl. Bot. Reg. 21: sub t. 1802. 1836; Bot. Reg. 22: t. 1848. 1836.

Epiphytic on trees in dense forests usually at low elevations, up to 1,700 meters alt. British Honduras, Guatemala, Honduras, Costa Rica, the West Indies, and South America; rather common.

Plant caespitose, 1.2–4 dm. tall. Pseudobulbs produced in close succession on a creeping rhizome, ovoid to nearly cylindrical, flattened, unifoliate, 2.5–6 cm. long, 5–20 mm. wide, subtended by several sheaths; sheaths reddish brown, scarious, acute, compressed, mostly exceeding the pseudobulb. Leaf solitary, at the apex of a pseudobulb, linear to narrowly elliptic, obtuse to abruptly acute or apiculate at the apex, coriaceous, conduplicate at the base, 8–35 cm. long, 1.8–4.5 cm. wide. Inflorescence a solitary flower emerging from the axil of a sheath subtending the pseudobulb; peduncle short, 1–3 cm. long, provided with several infundibuliform bracts at the base. Floral bracts scarious-fibrous, about 1.2 cm. long. Flowers fragrant, small, greenish yellow, deep yellow or whitish, with a slender pedicellate ovary that is 2–3 cm. long. Sepals elliptic, oblong-elliptic or ovate-elliptic, broadly rounded to obtuse and apiculate at the apex, 1.2–2 cm. long, 5.5–8 mm. wide; dorsal sepal concave and arcuate over the column; lateral sepals somewhat oblique, spreading, united with the column-foot to form a short mentum. Petals linear-elliptic to elliptic-lanceolate, broadly rounded to obtuse, appressed to the column, usually somewhat dilated on the upper margin, 1.1–1.6 cm. long, 3.5–7.5 mm. wide. Lip articulate with the short column-foot, concave at the base, arcuate below the middle, yellow or orange, usually marked with purple dots, fleshy, 3-lobed, 1–1.5 cm. long; lateral lobes arising from a little below the middle, whitish, triangular-falcate, subobtuse to sharp-pointed, up-curved, variable in length, 1.5–5 mm. long, up to 1.5 mm. wide at base; mid-lobe large, fleshy, oblong-quadrate, emarginate, somewhat decurved, 3–4 mm. wide; disk adorned with a variously shaped callus located between the lateral lobes and

often extending above the middle of the lip; callus flat, V-shaped, diamond-shaped or linear. Column clavate, strongly dilated at the apex, spotted with purple, arcuate, 8–13 mm. long including the small foot. Capsule obovoid-ellipsoid, pendent, often warty, about 2 cm. long.

This species is easily distinguished by the sharp falcate lateral lobes of the lip.

Alta Verapaz: Jocoló, *Johnson* 1176.—Izabal: Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38631. Entre Ríos, Los Andes district, *Lewis* 35.—Petén: Uaxactun, *Bartlett*.

Maxillaria tenuifolia Lindl. Bot. Reg. 23: sub t. 1986. 1837. *M. gracilifolia* Kränzl. Mitteil. Instit. Allg. Bot. Hamb. 6: 420. 1927 (type: Guatemala, *Ulmcke*).

Epiphytic on trees in open or dense humid forests, usually at low elevations, occasionally up to 1,500 meters alt. Mexico, British Honduras, Guatemala, Honduras, Nicaragua, and possibly Costa Rica.

Plant a straggly pendent or ascending rhizome that gives rise at short intervals to pseudobulbs and short inflorescences, up to 60 cm. or more long. Rhizome slender, about 4 mm. in diameter, concealed by closely appressed sheaths; sheaths brownish, scarious-fibrous, triangular-lanceolate, imbricated. Pseudobulbs olive-green, ovoid to ellipsoid, somewhat compressed, rugose, dull, unifoliate, 2–6 cm. long, 1–2 cm. wide, subtended by long imbricated sheaths that are similar to those of the rhizome, the sheaths up to 5 cm. long. Leaf solitary at the apex of the pseudobulbs, linear, tenuously acuminate, obliquely retuse at the apex, thin but firmly subcoriaceous, grass-green, 12–50 cm. long, 2–7 mm. wide. Inflorescences from the axils of the sheaths covering the rhizome, a solitary flower supported by a short slender peduncle; peduncle up to 2 cm. long, enveloped by several thin scarious closely imbricated bracts. Floral bracts similar to those of the peduncle. Flower showy, usually dark red and variously marked with yellow or red, with a slender pedicellate ovary up to 3.5 cm. long. Sepals elliptic-lanceolate to linear-lanceolate, subobtuse to acute, recurved-spreading above the middle, with revolute margins, dark reddish purple, often somewhat mottled with darker red or yellow, 1.7–2.8 cm. long, 3–10 mm. wide; lateral sepals slightly oblique, adnate to the column-foot to form a short mentum. Petals directed forward and appressed to the column, linear-lanceolate to lanceolate, obtuse to acute, slightly oblique, recurved at the apex, colored similarly to the sepals, 1.5–2.4 cm. long, 3–7 mm. wide. Lip dark red and yellow or whitish marked with purple dots, articulate with the column-foot, arcuate-decurved, with the lateral margins upcurved, when spread out oblong-elliptic, ovate-oblong or oblong-subpandurate, usually somewhat constricted about the middle, acute to somewhat retuse and apiculate at the apex, 1.5–2.2 cm. long, 5–11 mm. wide below the middle when spread out; disk papillose, with a narrow dark maroon puberulent callus on the lower third, sulcate at the apex. Column clavate, red and yellow spotted, 1–1.5 cm. long including the short foot. Capsule ellipsoid, slightly oblique, strongly ribbed, about 3.5 cm. long.

The flowers of this species bear a marked resemblance to those of *M. curtipes* and *M. cucullata*. However, vegetatively (especially in the leaf-differences), these species are quite dissimilar. *Maxillaria gracilifolia* is here considered to be a small-flowered form of this species.

Chiquimula: Montaña Castilla, vicinity of Montaña Cebollas, along Río Lucía Saso, 3 miles southeast of Quezaltepeque, *Steyermark* 31330.—Izabal: Bay of Santo Tomás, between Escobas and Santo Tomás, *Steyermark* 39338. La Vigía, between Bananera and Quiriguá, *Lewis* 171. Virginia, *Spinden*.—Petén: Tikal, *Bartlett* 12645. Chicbul, La Libertad, *Lundell* 2632; 2638.

Maxillaria uncata Lindl. Bot. Reg. 23: sub t. 1986. 1837. *M. Macleanii* Batem. ex Lindl. Bot. Reg. 26: Misc. p. 70. 1840 (type: Guatemala, *Skinner*). *M. striatella* Kränzl. Repert. Sp. Nov. 24: 359. 1928 (type: Guatemala).

Epiphytic on trees and shrubs in swamps, dense forests or dry pinelands, from sea level up to 1,200 meters alt. British Honduras, Guatemala, Honduras, Costa Rica, Panama, and South America; rather common.

Plant variable in size and habit, from dense leafy caespitose clumps to straggling pendent stems with only a few leaves at the apex, 5–35 cm. tall. Rhizome short and arcuate or elongated, about 3 mm. in diameter, concealed by the imbricating sheaths of the pseudobulbs. Pseudobulbs small, produced along the rhizome, unifoliate, fusiform-cylindrical, dark green, 8–15 mm. long, 1.5–3 mm. in diameter, subtended and more or less concealed by reddish brown scariosus sheaths. Leaves solitary, at the apex of the pseudobulbs, linear, semiterete, fleshy, pale green, erect-recurved, sulcate above, 2–7 cm. long, 1.5–6 mm. wide. Inflorescence axillary, consisting of a solitary flower produced in the axils of the rhizome-bracts near the base of a pseudobulb on the upper part of the plant; peduncle filiform, usually less than 1 cm. long. Floral bracts elliptic-lanceolate, acute, involute, scariosus, 5–10 mm. long. Flowers variously colored, from white to pink or greenish, tinged or veined with reddish brown or purple, with slender pedicellate ovaries that are about 1 cm. long. Dorsal sepal oblong-elliptic to elliptic-lanceolate, obtuse to acute, concave below the middle, 5-nerved, 8–11 mm. long, 2.5–4 mm. wide. Lateral sepals obliquely triangular-lanceolate, obtuse to acute, decurrent on the long column-foot to form a prominent mentum, 5-nerved, 1.3–1.7 cm. long to the apex of the column-foot, 6–9 mm. wide across the oblique base. Petals linear to linear-lanceolate, obtuse to acute, somewhat falcate, 5–6-nerved, 8–10 mm. long, 2–3.5 mm. wide. Lip hinged to and abruptly recurved from the column-foot, linear, elliptic-oblancoate or linear-spatulate, commonly pandurate with the apex dilated, narrowed and sulcate below the middle with the margins usually reflexed, minutely carinate and decurved at the obtuse apex, cellular-ciliate on the margins, 1.3–1.6 cm. long, 3–4 mm. wide at the widest point; disk with a linear flat rounded yellowish callus about the middle.

Column slender, erect, lavender or with reddish striations, with a pair of obliquely triangular flaps at the apex, 1.1–1.6 cm. long including the long column-foot. Capsule grayish white, vernicose, ellipsoid, about 12 mm. long.

This species is easily distinguished by its leaves, which are the narrowest found on any Guatemalan *Maxillaria*.

Alta Verapaz: South of Cubilgüitz, *Steyermark* 44550. Vicinity of caves, southwest of Lanquín, *Steyermark* 44134. Cubilgüitz, *Türkheim* 8021. Cobán and Chamá, *Johnson* 908.—Izabal: Cerro San Gil, along Río Frio and tributaries, *Steyermark* 41528. Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38642. Swamps of Salomón Creek, $\frac{1}{2}$ –1 mile south of Bananera, *Steyermark* 38943. In valley of tributary of Río San Francisco del Mar, 2 miles northeast of Hopi, 12 miles east of Entre Ríos, *Steyermark* 39777.—Petén: La Libertad, *Lundell* 2324.—Coastal regions, *Lewis* 16.

Maxillaria variabilis Batem. ex Lindl. Bot. Reg. 23: sub t. 1986. 1837. *M. angustifolia* Hook. Ic. Pl. 4: t. 348. 1841. Figure 166.

Terrestrial, rock-inhabiting or epiphytic on trees in open or dense humid forests, up to 1,900 meters alt. Common from Mexico through Central America to Panama.

Plant growing in clusters, subcaespitose or consisting of elongated rhizomes that give rise to distant pseudobulbs and short inflorescences. Rhizome simple or branched, slender, 2–4 mm. in diameter, concealed by closely appressed imbricated sheaths; sheaths scarious, triangular-lanceolate, subobtuse to acute. Pseudobulbs yellowish green or olive-green, ovoid to ellipsoid, unifoliate, produced at intervals of about 3 cm. on the rhizome, 1.5–5 cm. long, 7–15 mm. wide, subtended by several sheaths. Leaf solitary at the apex of the pseudobulbs, linear to linear-elliptic, obliquely retuse at the acute to obtuse apex, firmly subcoriaceous, grass-green, 5–25 cm. long, 5–23 mm. wide. Inflorescences several from the axils of the sheaths covering the rhizome, a solitary flower supported by a short slender peduncle; peduncle up to 2.5 cm. long, subtended by several thin scarious bracts. Floral bracts thin, scarious, translucent, lanceolate, acuminate, about 1.5 cm. long. Flowers usually inconspicuous, varying in color from nearly white to dark red, often deep orange or greenish yellow marked with red, with slender pedicellate ovaries that are 1.5–2.5 cm. long. Sepals usually wine-red marked with orange-yellow on the upper margins and on the apical portion of the inner surface, oblong-elliptic to lanceolate, acute to rounded at the apex, often apiculate, concave below, spreading-recurved above the middle, 1–1.7 cm. long, 3.5–6 mm. wide; lateral sepals slightly oblique, adnate to the column-foot to form a short mentum. Petals usually wine-red except for the apical portion on the inner surface, appressed to the column, strongly revolute at the apex, elliptic-ob lanceolate when spread out, subobtuse to acute, papillose on the margins and inner surface, slightly oblique, 9–14 mm. long, 3–4 mm. wide above the middle.

Lip articulate with the column-foot, erect and then arcuate, fleshy, usually wine-red except for a yellowish blotch at the apex, somewhat mottled on the inner surface at the base, often obscurely 3-lobed above the middle, oblong-elliptic to oblong-subquadrate in outline when spread out, broadly rounded to truncate at the apex, tubular-concave on the lower half, sulcate at the apex, 1-1.3 cm. long, 5-6 mm. wide below the middle when spread out; disk with a rather large triangular-subquadrate blackish red glossy callus on the lower half. Column semiterete, arcuate, about 1 cm. long including the short foot, usually wine-red, blotched with red and white at the base. Capsule ellipsoid, strongly ribbed, 1.5-2.5 cm. long.

This common Central American species is extremely variable in the coloration of its flowers. It is known in some localities as "La Gloria."

Alta Verapaz: Chamá, *Johnson* 909. Pansamalá, *Türckheim* 1141. Vicinity of caves, southwest of Lanquín, *Steyermark* 44138. Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, *Steyermark* 45691.—Baja Verapaz: North of Santa Rosa, *Standley* 69872. Rocky hills near and above Santa Rosa, in pine-oak forest, *Standley* 91255.—Escuintla: Near Escuintla, *Hunnewell* 14673.—Huehuetenango: Northwest of Cuilco, two-thirds of the way up Cerro Chiquihú above Carrizal, *Steyermark* 50815.—Izabal: Virginia, *Lewis* 64. Cerro San Gil, along Río Frío and tributaries, *Steyermark* 41527.—Jalapa: Near Jalapa, *Kellerman* 7043; 7911. Potrero Carrillo, Minas de Cromá, *Steyermark* 33057. Mountains about Chahuite, northwest of Jalapa, *Standley* 77425.—Quezaltenango: Along old road between Finca Pirineos and Patzulín, *Standley* 86909.—Sacatepéquez: Near Barranca Hondo, southeast of Alotenango, *Standley* 65008.—San Marcos: Above Finca El Porvenir, along Río Cabús to within 2 miles of Cueva de las Palomas, south-facing slopes of Volcán Tajumulco, *Steyermark* 37966.—Santa Rosa: Laguna de Carrizal, *Heyde & Lux* 4594. Santa Rosa, *Heyde & Lux* 3484; 3494.—Suchitepequez: Slopes of Volcán Zunil, in vicinity of Finca Monte Cristo, southeast of Santa María de Jesús, *Steyermark* 35253.—Zacapa: Sierra de las Minas, oak-pine woods along upper reaches of Río Sitio Nuevo, between Santa Rosalía and first waterfall, *Steyermark* 42270.

OBSCURE SPECIES

Maxillaria heraldica Reichb. f. Bot. Zeit. 10: 763. 1852 (type: Guatemala, *Frege*).

It has been impossible to place this concept. The original description, as translated below, is not distinctive enough to be recog-

MAXILLARIA
variabilis Batem.



FIG. 166. *Maxillaria variabilis*. Plant ($\times 1$); 1, flower, dissected (about $\times 2$); 2, column, lip, and lower part of dorsal sepal (about $\times 2\frac{1}{2}$); 3, anther (much enlarged); 4, pollinia (much enlarged). Drawn by Blanche Ames.

nized or complete enough to place the plant in any one of the recognized Guatemalan species.

Stem densely clothed with closely appressed sheaths. Pseudobulbs oblong, ancipitous, bifoliate. Leaves linear-ligulate, bilobed at the apex. Peduncle short, provided with three bracts. Flowers yellow, fleshy, from the axils of the leaves of the rhizome. Sepals oblong, acute. Petals similar to the sepals but smaller and shorter. Lip obsoletely 3-lobed; lateral lobes obtusely angled; mid-lobe produced, obtuse; callus pandurate or oblong, in the middle of the lower half of the lip.

69. *MORMOLYCA* Fenzl.

Epiphytic plants, consisting of a short slender rhizome that produces fleshy pseudobulbous stems. Pseudobulbs unifoliate. Leaves coriaceous, ligulate. Peduncles very slender, from the axils of the bracts subtending the pseudobulbs, one-flowered. Sepals subequal, free; lateral sepals not forming a mentum. Petals similar to but smaller than the sepals. Lip suberect, much shorter than the sepals and petals, 3-lobed; lateral lobes minute, erect; disk callose; mid-lobe large and decurved. Column arcuate, wingless, footless or with the base only slightly protruded; anther terminal, operculate, incumbent; pollinia 4, waxy. Capsule ellipsoid.

The single species that comprises this monotypic genus is closely related to *Maxillaria*.

Mormolyca ringens (Lindl.) Schltr. Orchideen 436. 1914. *Trigonidium ringens* Lindl. Bot. Reg. 26: Misc. p. 57. 1840. *Mormolyca lineolata* Fenzl. Denkschr. Akad. Wiss. Math. Nat. Wein 1: 253. t. 29. 1850. Figure 167.

Epiphytic on trees in dense humid forests, from sea level up to 1,000 meters alt. Mexico, British Honduras, Guatemala, Honduras, and Costa Rica; rather common.

Plant subcaespitose, often growing in dense masses. Pseudobulbs congested or arising at intervals of 1-2 cm. along a slender wiry rhizome, subrotund to ellipsoid, compressed, unifoliate, 2-4 cm. long, 2-3 cm. wide, subtended by distichous sheaths; sheaths reddish brown, scarios, imbricated, conduplicate, acute, up to 8 cm. long. Leaf solitary at the apex of the pseudobulbs, linear-ligulate to narrowly lanceolate, obtuse to acute, conduplicate at the base, coriaceous, 9-35 cm. long, 1.5-3.5 cm. wide. Peduncles several, axillary, from the axils of the sheaths subtending the pseudobulbs, slender, elongated, often equaling the leaf, one-flowered, 6-33 cm. long, provided with tubular bracts at the nodes; bracts brownish, scarios, acute, 1-1.5 cm. long. Floral bracts similar to those of the peduncle. Flowers rather small, inconspicuous, fleshy, ringent, yellowish green to light lavender, veined with lavender or maroon, the lip lavender or dark maroon, with slender arcuate pedicellate ovaries that are 2-5 cm. long. Dorsal sepal oblong-elliptic, broadly rounded and dorsally carinate at the apex with the keel excurrent, concave, 1.6-1.9 cm. long, 6.5-8 mm. wide, slightly broadest above the middle.



FIG. 167. *Mormolyca ringens*. Plant ($\times \frac{2}{3}$). Drawn by D. E. Tibbitts.

Lateral sepals elliptic-oblong, obtuse to broadly rounded and mucronate at the apex, convex, subfalcate, 1.5–1.7 cm. long, 4.5–7 mm. wide. Petals linear-elliptic to elliptic-oblong, obtuse to rounded and somewhat dorsally keeled at the apex, convex, oblique, 1.3–1.5 cm. long, 4–6 mm. wide above the middle. Lip articulate with the base of the column, suberect and parallel with the column in natural position, 3-lobed, when spread out obovate-elliptic to elliptic-oblong in outline, downy-puberulent, ciliolate, 9–10 mm. long, 3–5 mm. wide; lateral lobes minute, arising below the middle of the lip, obliquely triangular, obtuse to acute, erect, less than 2 mm. long; mid-lobe large, broadly rounded and often dorsally thickened at the apex, strongly decurved-reflexed in natural position; disk with a fleshy thickening in the center below the middle which terminates in a broadly triangular tridentate callus about the middle. Column downy-puberulent, semiterete, arcuate, more or less sulcate on the anterior face, 8–10 mm. long. Capsule ellipsoid, 2–2.5 cm. long.

Alta Verapaz: Cubilgüitz, *Türckheim* 8291.—Escuintla: Río Gualate, *Standley* 60155. Near Escuintla, *Hunnewell* 14674.—Izabal: Jocoló, Lago Izabal, *Johnson* 1174. Near Lake Izabal, *Harris* 79. "Common in region surrounding Lake Izabal and Caribbean littoral," *Lewis* 79.—Jalapa: Mountains about Chahuite, northwest of Jalapa, *Standley* 77492.—Sacatepéquez: Near Barranca Hondo, southeast of Alotenango, *Standley* 65037 (in part).

70. TRIGONIDIUM Lindl.

Epiphytic or rock-inhabiting plants with a short or elongated rhizome that produces fleshy pseudobulbous stems and inflorescences. Pseudobulbs 1–2-leaved, variously shaped. Leaves coriaceous, linear to oblong. Peduncles elongated, bracteate, 1-flowered, axillary, produced on the rhizome. Sepals similar or dissimilar; dorsal sepal usually larger and broader than the lateral sepals, connate into a tube below, free above. Petals much smaller than the sepals. Lip suberect, 3-lobed, shorter than the petals; lateral lobes erect; mid-lobe very fleshy; disk callose. Column short, almost straight, wingless, footless or slightly protruding at the base; anther terminal, operculate, incumbent; pollinia 4, waxy. Capsule ellipsoid.

This is a small genus of less than a dozen species, which are confined to tropical America.

Trigonidium Egertonianum Batem. ex Lindl. Bot. Reg. 24: Misc. p. 73. 1838. Figure 168.

Epiphytic on trees and on rocks in forests, coffee plantations, and open dry country, from sea level up to 1,000 meters alt. Mexico, through Central America to Panama and Colombia; rather common.

Plant caespitose, often growing in large clumps. Pseudobulbs ovoid-subglobose to ellipsoid, compressed, bifoliate, oblique, 4–9 cm. long, 2–3.5 cm. wide, subtended by fibrous-scarious sheaths. Leaves two, at the apex of the pseudobulbs, linear, obtuse to acute and cuspidate at the apex, tapering below the middle

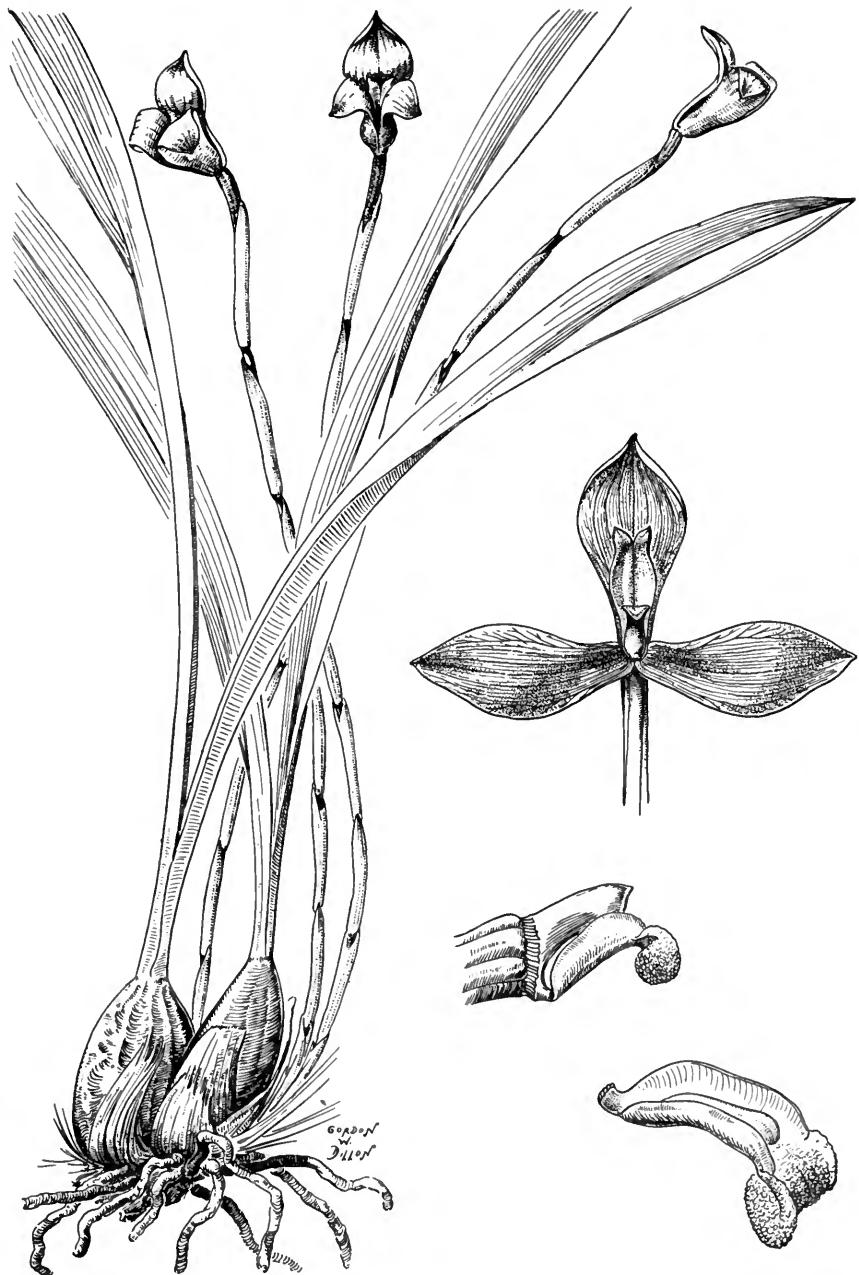


FIG. 168. *Trigonidium Egertonianum*. Plant ($\times \frac{1}{2}$); right center, flower, spread out ($\times 1$); below flower, lip and column, side view ($\times 2$); lower right, lip, front-side view (about $\times 3$). Drawn by G. W. Dillon.

to the conduplicate base, subcoriaceous, flexible, 2-6 dm. long, 1-3 cm. wide. Peduncles several to many, one-flowered, axillary, from the axils of the sheaths subtending the pseudobulbs, very slender and somewhat fractiflex, 1.5-3.5 dm. long, nearly concealed by tubular-involute bracts; bracts acute to apiculate, up to 5 cm. long. Floral bracts tubular-inflated, 3-4.5 cm. long, obtuse to rounded at the apex. Flowers tubular-campanulate, with slender pedicellate ovaries that are 4-5.5 cm. long. Sepals and petals yellowish green to greenish with conspicuous reddish brown veins. Dorsal sepal suborbicular-obovate to obovate-spatulate, broadly obtuse to subacute at the apex, rather abruptly contracted at the narrowly cuneate base, dorsally carinate along the center, concave below, the fleshy-thickened upper half recurved and somewhat convex, 2.7-4.2 cm. long, 1.4-2 cm. wide at the widest point. Lateral sepals concave below, reflexed-revolute above the middle in natural position, obliquely oblong-elliptic, more or less sigmoid, rounded to broadly acute at the apex, fleshy-thickened above the middle, 2.8-4.2 cm. long, 1-1.4 cm. wide. Petals with a narrow claw, elliptic-lanceolate to narrowly elliptic, obtuse to acute, connivent, obliquely concave, thickened above with a mammillate purple callus on the inner surface just below the apex, 1.4-2.1 cm. long including the claw, 3.5-7 mm. wide. Lip green marked with dark purple, suberect, 3-lobed, 8-10 mm. long and up to 6 mm. wide when spread out; lateral lobes thin, semielliptic, obtuse at the free crenulate apex, upturned so that they clasp the column in natural position, adorned with blackish purple veins; mid-lobe short, very fleshy-verrucose, sulcate, decurved-reflexed in natural position; disk with a linear-clavate callus that extends along the center from the base of the lip to near the apex of the lateral lobes and is slightly retuse at the apex. Column short, stout, nearly straight, subterete, puberulent, about 7 mm. long. Capsule erect, ellipsoid, 4-4.5 cm. long, glossy, green.

This species is known as "Dragon's Mouth" in Honduras, where it was originally discovered, in allusion to the tubular-campanulate flowers.

Alta Verapaz: Chamá, *Johnson* 422.—Izabal: Cerro San Gil, along Río Frío, *Steyermark* 39969. Between Virginia and Lago Izabal, Montaña del Mico, *Steyermark* 38913. Jocoló, *Johnson* 1175. Virginia, *Spinden*.—Petén: Sábana San Francisco, La Libertad, *Lundell* 2566. Uaxactun, *Bartlett* 12437.—Quezaltenango: Colomba, *Skutch* 1989.—Sacatepéquez: Near Barranca Hondo, southeast of Alotenango, *Standley* 65037 (in part).—"Eastern portion of Vera Paz and Chiquimula," *Watson*. "Guatemala," *Watson* 354; 451b. "Guatemala," *Johnston* 1591 (in part).

71. TRICHOCENTRUM Poepp. & Endl.

Epiphytic plants with short rhizomes that produce minute 1-3-flowered unifoliate pseudobulbous stems. Leaves coriaceous, small. Peduncles short or sometimes equaling the leaves, 1- or rarely 2-3-flowered, bracteate. Sepals and petals similar, free, spreading. Lip suberect, simple or obscurely 3-lobed, with a slender or gibbose spur. Column short, thick, adnate almost to its apex with the lip, prominently winged or auriculate on each side at the apex, footless; anther terminal, operculate, incumbent; pollinia 2, waxy, sulcate.

This is a small genus of less than a dozen species, which are natives of tropical America.

Trichocentrum candidum Lindl. Bot. Reg. 29: Misc. p. 9. 1843 (type: Guatemala). Figure 169.

Epiphytic on tree trunks in humid forests or open dry regions, usually at low elevations, up to 1,000 meters alt. Mexico and Guatemala; very rare.

Plant small, less than 10 cm. tall, caespitose. Pseudobulbous stem minute, about 4 mm. in diameter, supporting at its apex a solitary leaf and a 1-3-flowered inflorescence. Leaf ovate-elliptic to elliptic, obliquely tridenticulate at the obtuse apex, rigidly fleshy, 2.5-7 cm. long, 5-22 mm. wide. Inflorescence much shorter than the leaves, 1-3-flowered; peduncle short, mostly less than 1 cm. long, provided with distichous bracts; bracts broadly ovate, concave-cucullate, acute to acuminate, 4-7 mm. long. Floral bracts similar to those of the peduncle. Flowers produced consecutively on the abbreviated rachis, white marked with yellow, pink or purple on base of lip and column, with pedicellate ovaries that are 4-6 mm. long. Sepals narrowly elliptic or almost lanceolate to somewhat elliptic-oblongate, rounded to subacute at the recurved apex, dorsally carinate along the mid-rib, 8-13 mm. long, 3-5 mm. wide; lateral sepals oblique, smaller than the dorsal sepal. Petals elliptic-obovate, rounded to subobtusate at the recurved apex, 8-12 mm. long, 3-5 mm. wide above the middle. Lip adnate to the column, broadly elliptic-obovate, retuse at the apex, with the margins somewhat recurved and undulate, produced at the base into a gibbose-saccate more or less 4-lobulate spur, 1.3-1.8 cm. long from base of spur to apex, 6-9 mm. wide across the apical portion; disk with a pair of short diverging smooth fleshy ridges that extend from the mouth of the spur. Column short, stout, about 5 mm. long, pubescent at the apex, provided with a wing on each side at the apex; wing oblong-subquadrate, subacute to rounded at the apex, often somewhat undulate, about 3 mm. long and 2 mm. wide. Capsule obliquely ellipsoid, about 2 cm. long.

This is the only known Central American species in this genus having a blunt, gibbose-saccate spur. All the other species possess a more or less slender, tubular spur.

Quezaltenango: Chuikabal, Finca Las Violetas, "growing on sour orange hedge and *Yucca elephantipes*," Lewis 221.

72. IONOPSIS H.B.K.

Epiphytic or rarely terrestrial plants with short or elongated leafy rhizomes that produce small pseudobulbs and long slender or stout lateral peduncles. Pseudobulbs small, leafless or unifoliate. Leaves from the rhizome, coriaceous, rigid, distichous, imbricated. Peduncles one to three, bearing a loose simple or branching raceme (panicle). Flowers showy. Sepals subequal, erect, spreading; dorsal sepal free; lateral sepals united to form a short sac below the lip. Petals similar to the dorsal sepal. Lip attached to base of column, unguiculate, much larger than the sepals and petals, callose. Column short, stout, wingless, footless;



FIG. 169. *Trichocentrum candidum*. Plant (about $\times 1\frac{1}{4}$). Drawn by D. E. Tibbitts.

anther terminal, operculate, incumbent; pollinia 2, waxy. Capsule ovoid to ellipsoid.

This is a small genus of about ten species found in tropical and subtropical regions of the western hemisphere. The species found in Guatemala is common and widespread; the others are local and rather rare.

Ionopsis utricularioides (Sw.) Lindl. Coll. Bot. t. 39A. 1821.
Epidendrum utricularioides Sw. Prodr. 122. 1788. Figure 170.

Epiphytic on trees and shrubs in dry or dense moist forests or on citrus trees in groves, rarely terrestrial on grassy banks, from sea level up to 1,050 meters alt. Widespread and more or less common from Florida and Mexico through Central America and the West Indies to central South America.

Plant glabrous, 0.7-7.5 dm. tall. Pseudobulbs small, smooth, ellipsoid-conical, up to 3 cm. long, leafless or bearing a solitary small leaf at its apex, often completely concealed by the leaf-sheaths. Leaves from the rhizome, 2-3, rarely more, articulated with the leaf-sheaths, oblong-lanceolate to linear or linear-lanceolate, obtuse to acute and cuspidate, dorsally carinate, rigidly coriaceous, often reddish brown on the lower surface, 3-17 cm. long, 6-18 mm. wide. Inflorescence lateral, from base of pseudobulb, a simple raceme or spreading panicle, laxly few- to many-flowered, up to 7.5 dm. long including the long peduncle, as much as 25 cm. in diameter; peduncle slender or stout, brownish green, provided at the nodes with closely appressed sheaths that are up to 12 mm. long. Floral bracts minute, triangular to lanceolate, acute, less than 3 mm. long. Flowers whitish to rose-red, variegated or tinged with lavender, deep magenta or purple, showy, with slender pedicellate ovaries that are 6-14 mm. long. Dorsal sepal oblong to oblong-elliptic or rarely oblanceolate, obtuse to apiculate, somewhat concave-conduplicate, 3.2-6 mm. long, 1.5-3 mm. wide. Lateral sepals ovate-lanceolate to oblong-lanceolate, acute, 3.5-6 mm. long, 1.5-2 mm. wide, united at the base to form a small sac. Petals ovate-oblong to oblong or rarely obovate-oblong, broadly rounded to acute and shortly apiculate at the recurved apex, 6-7 mm. long, 3-3.5 mm. wide. Lip with a short claw, broadly flabellate-obcordate, deeply emarginate, with the margins entire, sinuate or somewhat crenulate, 7-16 mm. long, 7-18 mm. wide across the subquadrate terminal lobules; claw with obsolescent lateral auricles; disk with two small thin calli in the middle near the base. Column stout, truncated, about 2 mm. long. Capsule ovoid or ellipsoid, long-beaked, 1.2-1.6 cm. long, 5-7 mm. in diameter.

This species is one of the most widely distributed of all American orchids. It is commonly found in regions with dry atmospheric conditions.

Alta Verapaz: Cubilgüitz, *Türkheim* 8001; II 379. Chamá, *Johnson* 250.—Izabal: Virginia, *Lewis* 53.—Petén: Ixlu, Lake Petén, *Lundell* 3898.—“Alameda,” *Johnston* 1467.—Near Pancajché, *Standley* 70763.



73. *SCELOCHILUS* Klotzsch

Small epiphytic plants with short rhizomes that produce small unifoliate pseudobulbs and lateral inflorescences. Leaves coriaceous, non-plicate. Peduncle lateral, from the base of the pseudobulbs, erect, slender, a simple or branched raceme. Flowers medium-sized, few. Sepals subequal, erect, connivent; dorsal sepal free, concave; lateral sepals united almost to the apex, produced at the base into a saccate mentum. Petals similar to the dorsal sepal. Lip continuous with the base of the column, erect, produced at the base into a didymous spur, slender, provided near the base with a pair of terete lobules and near the apex with a pair of flattened lamellae. Column erect, semiterete, wingless, footless; anther terminal, operculate, incumbent, imperfectly biloculate; pollinia 2, waxy.

This is a small genus consisting of three or four species in American tropical and subtropical regions.

Scelochilus Tuerckheimii Schltr. Repert. Sp. Nov. 10: 252. 1911 (type: Guatemala, Dept. Alta Verapaz, near Cobán, *H. von Türckheim* II 1919). Figure 171.

Epiphytic on trees up to 1,650 meters alt. Very rare in Guatemala, Honduras, and Costa Rica.

Plant small, 12–32 cm. tall, composed of a slender short rhizome that produces small unifoliate pseudobulbs and elongated inflorescences. Pseudobulbs cylindrical, lightly compressed, 1.5–2.5 cm. long, 3–4 mm. in diameter, concealed by large sheaths; sheaths distichous, strongly compressed, imbricated, scarios, grayish, up to 5 cm. long. Leaf solitary at the apex of the pseudobulbs, elliptic, abruptly acuminate to acute-apiculate at the apex, conduplicate at the base, coriaceous, erect-spreading, 7–13 cm. long, 1.3–3 cm. wide. Inflorescence a simple or somewhat branched raceme, lateral, from the base of the pseudobulb, enclosed at the base by sheaths, 6–30 cm. long including the peduncle; peduncle slender, provided with scarios bracts that are up to 12 mm. long. Floral bracts ovate-lanceolate, acuminate, scarios, 4–6 mm. long. Flowers spreading to erect-spreading, bright yellow, often with light green veins, with slender pedicellate ovaries that are 8–10 mm. long. Dorsal sepal oblong-elliptic, rounded to obtuse at the apex, dorsally carinate along the mid-nerve, about 1.1 cm. long and 5 mm. wide, deeply concave. Lateral sepals united almost to the apex, rounded and apiculate at the apex, dorsally carinate along the mid-nerve, free for about 3 mm., produced at the base into a prominent saccate mentum; lamina oblong-elliptic when expanded, 1.4–1.7 cm. long, up to 6 mm. wide. Petals obovate-elliptic, broadly rounded to subobtuse at the apex, oblique, about 1.2 cm. long, 4.5–6 mm. wide near the apex. Lip complex, continuous with the base of the column, narrowly oblanceolate to spatulate when spread out, truncate to broadly rounded and sometimes apiculate at the decurved apex, fleshy-thickened along

FIG. 170. *Ionopsis utricularioides*. 1, plant ($\times 1$); 2, lip, front view ($\times 3$); 3, lateral sepals ($\times 3\frac{1}{4}$); 4, petal ($\times 3$); 5, dorsal sepal ($\times 3$); 6, column, with the anther raised, front-side view ($\times 10$); 7, pollinia and pedicel (enlarged). Original drawing by Blanche Ames; redrawn by G. W. Dillon.

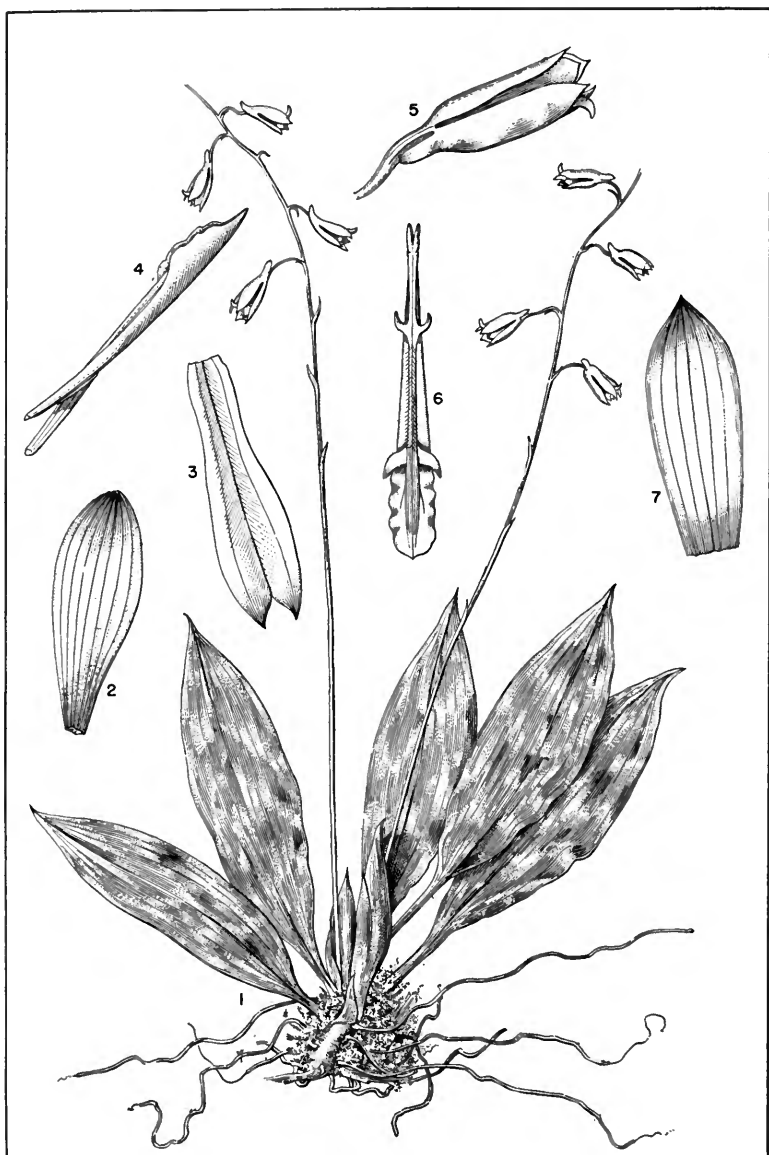


FIG. 171. *Scelochilus Tuerckheimii*. 1, plant ($\times \frac{2}{3}$); 2, petal (about $\times 3$); 3, lateral sepals (about $\times 2\frac{1}{2}$); 4, lip, side view (about $\times 3$); 5, flower, side view (about $\times 2$); 6, lip, spread out (about $\times 3$); 7, dorsal sepal (about $\times 3$). Drawn by D. E. Tibbitts. Adapted in part from Schlechter *in* Fedde, *Repert. Beih.* 59: t. 71. 1931.

the center and sulcate to near the apex, provided below the middle (on the lower fourth) with a pair of small terete antrorsely falcate lobules and above the middle (just below the expanded apex) with a pair of small obliquely erect fleshy oblong or triangular flat lamellae, produced at the base into a didymous spur that is enclosed in the mentum formed by the lateral sepals, 1.4–1.7 cm. long (including the 2 mm. long spur), 3–4 mm. wide across the thin apical portion. Column slender, dilated at the apex, 7–9 mm. long.

The lip of this species is very complex. The antrorsely falcate lateral lobules near the base and the flattened porrect lamellate calli near the apex distinguish it from all other Guatemalan orchids.

Represented from Guatemala only by the type collection.

74. *COMPARETTIA* Poepp. & Endl.

Epiphytic plants with slender short rhizomes and small unifoliate pseudobulbous stems. Leaves coriaceous. Inflorescence from the base of the pseudobulbs, simple or branched. Flowers small, showy, distant. Sepals about equal in length, erect; dorsal sepal free; lateral sepals united, extended at the base into a long spur-like mentum. Petals as long as the dorsal sepal but broader. Lip continuous with the base of the column, unguiculate, spreading, much larger and longer than the sepals and petals, produced at the base into two long terete caudae that are enclosed in the mentum formed by the lateral sepals. Column erect, wingless, footless; anther terminal, operculate, incumbent, 1-celled; pollinia 2, waxy. Capsule ellipsoid, 3-angled, long-beaked.

There are perhaps less than a dozen species in this genus, which attains its greatest development in the Andean region of South America. It is represented in Middle America by the following species.

Comparettia falcata Poepp. & Endl. Nov. Gen. & Sp. Pl. 1: 42. t. 73. 1835. *C. rosea* Lindl. Bot. Reg. 26: Misc. p. 78. 1840. Figure 172.

Epiphytic on trees and shrubs in humid forests, usually at high elevations, up to 1,800 meters alt. Widespread but not common from Mexico, Guatemala, Honduras, Costa Rica, the West Indies, and northern South America.

Plant usually small, up to 9 dm. tall. Pseudobulbs small, terete, unifoliate, 1–4 cm. long, up to 1 cm. in diameter, concealed by several grayish or brown imbricated scarios sheaths that are up to 5 cm. long. Leaf solitary at the apex of the short pseudobulbs, broadly elliptic to oblong-elliptic, obliquely tridenticulate at the broadly rounded to obtuse apex, conduplicate at the base, coriaceous, often suffused with reddish purple, 3–18 cm. long, 1–5 cm. wide. Inflorescence lateral, from the base of a pseudobulb, a lax few- to many-flowered raceme or panicle, 1–9 dm. long (including the peduncle); peduncle provided with closely appressed bracts that are up to 1.2 cm. long. Floral bracts minute, triangular-

ovate, acute to acuminate, 3–5 mm. long. Flowers small but showy, purple-violet or pinkish, often marked with white, with slender curved pedicellate ovaries that are 1–2 cm. long. Dorsal sepal broadly elliptic, acute and slightly recurved at the apex, deeply concave, 8–10 mm. long, 4.5–5 mm. wide. Lateral sepals united above, produced at the base into a long sepaline tube; lamina deeply concave in natural position, broadly elliptic and minutely bidentate at the obtuse apex when spread out, 7.5–10 mm. long, 5–6.5 mm. wide about the middle; sepaline tube terete, slightly compressed, curved, slender, 9–15 mm. long. Petals ovate-elliptic to somewhat obovate-elliptic, obtuse to subacute, coherent with the dorsal sepal to form a hood over the column, 8–10 mm. long, 4–6 mm. wide. Lip uppermost, continuous with the base of the column, with a short claw, spreading, 1.5–1.7 cm. long (including the claw), produced at the base into a pair of caudae; lamina broadly reniform, deeply emarginate, minutely erose on the somewhat undulate margin, about 1 cm. long and 1.5 cm. wide; claw sulcate, lightly winged on each side at the base, with the wings erect, provided along the central nerve with a linear callus, 5–6 mm. long, 4–6 mm. wide when spread out; caudae slender, terete, hispidulous, 7.5–10 mm. long, enclosed in the sepaline tube. Column erect, deeply concave on the anterior face, about 5 mm. long. Capsule ellipsoid, long-beaked, strongly 3-angled, usually purplish red, up to 3.5 cm. long.

Alta Verapaz: Mountains along road between Tactic and the divide on road to Tamahú, *Standley* 91333. Cobán, *Türkheim* II 1288.—Chiquimula: Montaña Nonojá, 3–5 miles east of Camotán, *Steyermark* 31690.—Guatemala: Near Guatemala, *Hayes*. Pampuna Golf Course, Guatemala City, *Lewis* 113.—Huehuetenango: Near Finca Soledad, Finca San Rafael, 10 miles southeast of Barillas, Sierra de los Cuchumatanes, *Steyermark* 49128. Vicinity of Maxbal, about 17 miles north of Barillas, Sierra de los Cuchumatanes, *Steyermark* 48764.—San Marcos: Above Finca El Porvenir, along Río Cabús to within two miles of Cueva de las Palomas, slopes of Volcán Tajumulco, *Steyermark* 37950.—Sololá: Bordering barranca on Finca Olas de Mocá, just west of Finca Mocá, south-facing slopes of Volcán Atitlán, *Steyermark* 47627.

75. TRICHOPILIA Lindl.

Epiphytic plants with a short creeping rhizome that produces clustered unifoliate pseudobulbous stems and simple inflorescences. Pseudobulbs orbicular-ancipitous to slender and stem-like. Leaves solitary at the apex of a pseudobulb, suberect, coriaceous. Inflorescence lateral, from the base of a pseudobulb, 1–few-flowered. Flowers usually large and showy. Sepals and petals similar, spreading, usually very narrow, plain to contorted and twisted. Lip adnate to the base or lower half of the column, more or less 3-lobed, with the lateral lobes tubular-involute to envelop the column. Column slender-clavellate, erect, footless, bi-auriculate or bidentate at the apex; anther terminal, operculate, incumbent, 1-celled; pollinia 2, waxy; clinandrium large, entire or lobulate, usually toothed or fringed. Capsule ovoid-ellipsoid or ellipsoid.



FIG. 172. *Comparettia falcata*. Plant (about $\times 1$); 1, lip ($\times 2$); 2, lateral sepals and spur, front-side view ($\times 2$); 3, dorsal sepal ($\times 2$); 4, petal ($\times 2$); 5, column ($\times 3$). Drawn by Blanche Ames.

This genus consists of about thirty species, which are natives of the warmer parts of America. Most of the now recognized species have very unsatisfactory specific delimitations. Doubtless, a number of proposals have been made that are not well founded, being based, for the most part, on coloration and size differences of the flowers. The number of species now accepted should be considerably reduced when a monograph of this genus is undertaken.

Floral segments 4.5 cm. or less long; sepals and petals whitish yellow, almost flat to only slightly twisted.....*T. maculata*.

Floral segments more than 4.5 cm. long; sepals and petals purplish, bordered with yellow or green, conspicuously spirally twisted.....*T. tortilis*.

Trichopilia maculata Reichb. f. Bonpl. 3: 215. 1855. Figure 173.

Epiphytic on trees, from sea level up to 600 meters alt. Guatemala and Panama; rare.

Plant caespitose, up to 18 cm. tall, consisting of a short rhizome that gives rise to unifoliate pseudobulbs and inflorescences. Pseudobulbs ellipsoid-oblong, somewhat compressed, 2.5–6.5 cm. long, 1–1.8 cm. wide, subtended by imbricated sheaths; sheaths scarios, purple-spotted, conduplicate. Leaf solitary at the apex of the pseudobulbs, suberect, narrowly elliptic to oblong-lanceolate, subobtuse to acute, conduplicate at the base, coriaceous, 7.5–14 cm. long, 1.7–3.2 cm. wide. Peduncle lateral, from the base of a pseudobulb, 1–2-flowered, 3–5 cm. long, slender, subtended by closely appressed sheaths. Floral bracts scarios, tubular-involute, about 1.5 cm. long. Flowers large, showy, with slender curved pedicellate ovaries that are about 3.5 cm. long. Sepals and petals similar, spreading, whitish yellow, almost flat to only slightly twisted, linear to linear-lanceolate, subobtuse to subacuminate, 3.5–4.5 cm. long, 5–8 mm. wide below the middle; lateral sepals and petals oblique. Lip large, adnate to the base of the column and tubular-involute below so that it envelopes the column, spreading-deflexed at the apex, white with a yellow throat marked with red lines, 3.7–4.5 cm. long, when expanded 3-lobed above and broadly obovate in outline, undulate on the margins, 2.5–3 cm. wide across the broadly rounded lateral lobes; mid-lobe transversely elliptic, notched at the apex, 1–1.3 cm. long, about 1.6–2 cm. wide; disk bifoveate below in the center just under the apex of the column. Column slender-clavellate, white, 3-lobulate at the apex with the lobules lacerate-fringed, about 1.7 cm. long.

Except for the almost flat (not spirally twisted) sepals and petals and the difference in coloration, this segregate could be considered as a small edition of *T. tortilis*. There is nothing that separates them except the size of the flower, the difference in color, and the contortion or lack of contortion of the sepals and petals.

Santa Rosa: Santa Rosa, *Heyde & Lux* 3495.—“Guatemala,” *Steyermark*.



FIG. 173. *Trichopilia maculata*. Plant ($\times 1$); 1, lip, spread out ($\times 1$); 2, column, front-side view ($\times 3$). Drawn by Blanche Ames.

Trichopilia tortilis Lindl. Nat. Syst. Bot. ed. 2: 446. 1836.

Epiphytic on trees in damp tropical forests, up to 1,500 meters alt. Mexico, Guatemala, Honduras, and El Salvador; not common.

Plant caespitose, up to 3 dm. or more tall, consisting of a short rhizome that gives rise to unifoliate pseudobulbs and inflorescences. Pseudobulbs narrowly ovoid to oblong-cylindrical, compressed, 4–12 cm. long, 1.3–2 cm. wide, more or less enveloped by sheaths; sheaths scarios, imbricate, conduplicate, brown-spotted. Leaf solitary at the apex of the pseudobulbs, suberect, elliptic-lanceolate to elliptic-oblong, acute to shortly acuminate at the apex, conduplicate at the base, coriaceous, 9–22 cm. long, 2.3–4.8 cm. wide. Peduncle lateral, from the base of a pseudobulb, 1–2-flowered, slender, 5–10 cm. long, subtended by tubular-involute sheaths. Floral bracts scarios, tubular-involute, 1.5–2.5 cm. long. Flowers large, showy, fragrant, with slender curved pedicellate ovaries that are 4–5 cm. long. Sepals and petals similar, brownish purple to light lavender, with an irregular yellowish or greenish border, spreading, linear, acute to subacuminate, conspicuously twisted and contorted, 4.8–8 cm. long, 8–10 mm. wide; lateral sepals and petals oblique. Lip large, adnate to the base of the column and tubular-involute below so as to envelop the column, spreading-deflexed at the apex, white to yellowish white with the yellow throat spotted brown or crimson, 4.8–6.5 cm. long, when expanded 3-lobed above and broadly obovate in outline, crisped-undulate on the margins, 3.8–4.5 cm. wide across the semiovate rounded lateral lobes; mid-lobe transversely elliptic-suborbicular, notched at the apex, 1.5–2 cm. long, 2.5–3.5 cm. wide; disk bifoveate below in the center just under the apex of the column. Column slender-clavellate, greenish white, 3-lobulate at the apex with the lobules fringed, about 2 cm. long. Capsule ellipsoid, erect, 4–5 cm. long.

This species is commonly known as “Flora susenne de montaña” and “Caste Monjeta” in Guatemala. Its spirally twisted and contorted sepals and petals are most attractive.

Alta Verapaz: Cubilgüitz and Cobán, *Türckheim* 8585. Finca Volcán, *Wilson*.—Guatemala: Mrs. Palmer, Guatemala City, believed to have come from near Escuintla, *Lewis* 125. Near Finca La Aurora, *Aguilar* 268.—Quezaltenango: Montaña Chicharro, on lower southeast-facing slopes of Volcán Santa María, 2–4 miles south of Santa María de Jesús, *Steyrmark* 34267.

76. ODONTOGLOSSUM H.B.K.

Epiphytic or rock-inhabiting plants with short rhizomes that give rise to pseudobulbous stems. Pseudobulbs 1–3-leaved at the apex, subtended by leaf-sheaths or non-leaf-bearing sheaths, more or less compressed. Leaves from the apex of the pseudobulbs, often produced also on the rhizome, coriaceous or fleshy, nearly rigid to flexible. Peduncle from the base of a pseudobulb, usually erect. Inflorescence a solitary flower or a simple or compound few- to many-flowered raceme. Flowers large and showy to small and inconspicuous. Sepals subequal, spreading, free or with the lateral ones more or less united. Petals similar to the

sepals but usually broader. Lip entire to 3-lobed; base of lip parallel with the column, sometimes shortly adnate to it; lateral lobes (when present) erect or revolute-spreading; terminal lobe spreading or more commonly strongly deflexed; disk at the base variously cristate, lamellate, callose or occasionally nude. Column usually long and slender as compared with *Oncidium*, wingless at the apex or with the clinandrium prominent and sometimes toothed, auricled or lobed; anther terminal, incumbent, operculate; pollinia 2, waxy, entire or sulcate. Capsule usually large, ovoid or ellipsoid.

This is a large genus of about one hundred species, which are distributed mainly in the mountainous regions of the subtropics in this hemisphere. Many of the species have very attractive and colorful flowers and are widely cultivated. Some of the species approach those of *Oncidium*, to which this genus is closely allied.

1. Lip sessile, when spread out more or less pandurate to occasionally oblong or oblong-quadrate, widest above the middle.
2. Callus of lip inconspicuous, composed of several obscure ridges above the geniculate portion of the lip.
 3. Lip 2-3 cm. long, 1 cm. or more wide across the prominently dilated apex; sepals and petals 2.5 cm. or more long. *O. laeve*.
 3. Lip 1.5-2 cm. long, 8.5 mm. or less across the slightly dilated apex; sepals and petals less than 2.2 cm. long. *O. stenoglossum*.
2. Callus of lip large, fleshy, variously shaped, bicornute or bidentate at the apex.
 4. Flowers large, showy, blotched and banded with reddish brown; lip 2.5 cm. or more long; callus bluntly bicornute at the apex.
 5. Column-wings suborbicular. *O. grande*.
 5. Column-wings narrowly uncinata. *O. Williamsianum*.
 4. Flowers small, inconspicuous, white, pinkish white or faint purple; lip 1.8 cm. or less long; callus more or less sharply bidentate at the apex with the teeth incurved.
 6. Lateral sepals united almost to the apex; lip not noticeably constricted below the middle; rachis usually fractiflex (zigzag). *O. Egertonii*.
 6. Lateral sepals united at most for about 5 mm.; lip constricted below the middle; rachis straight.
 7. Lip strongly geniculate-deflexed, 1-1.8 cm. long; column prominently 3-lobulate at the apex with the lobules lacerate-toothed.
 7. Lip flat, concave, not geniculate, about 9 mm. long; column at most only obscurely 3-lobulate at the apex with the lobules essentially entire. *O. convallarioides*.
1. Lip with a distinct slender claw (sometimes entirely callose); lamina varying from suborbicular to ovate-subquadrate, triangular-cordate or cordate-subreniform, widest below the middle.
8. Column with a prominent pair of auricles at the apex.
 9. Sepals and petals white to rose-colored, marked on the lower third with reddish brown transverse concentric spots and lines. *O. Cervantesii*.
 9. Sepals and petals yellowish green to nearly dark red, mottled or banded throughout with reddish brown.
 10. Lip about 2.8 cm. long, 2.8 cm. or more wide, rose-colored, irregularly veined with white; petals ovate-elliptic. *O. Uroskinneri*.
 10. Lip 2 cm. or less long, less than 2.5 cm. wide, white to pink; petals linear-elliptic to oblanceolate. *O. Bictoniense*.

8. Column not auriculate at the apex, at most narrowly winged.
11. Lip spotted and blotched throughout with purple or reddish brown.
12. Lip ovate-subquadrate, broadly truncate and more or less retuse at the apex; sepals and petals rose-colored or purplish. *O. majale*.
12. Lip broadly cordate to cordate-reniform, acute to acuminate; sepals and petals blotched and spotted with reddish brown.
13. Petals ovate-lanceolate to elliptic-lanceolate, tapering to the long-acuminate apex. *O. cordatum*.
13. Petals broadly elliptic to elliptic-obovate or oblong-subquadrate, abruptly acute to shortly acuminate. *O. maculatum*.
11. Lip white, pinkish or yellowish, unspotted or (if tinged and marked with mauve) the margins coarsely lacerate-toothed.
14. Lip with the margins coarsely and irregularly lacerate-toothed, 2 cm. or less long; petals tawny-bronze or purplish tipped with yellow.
O. stellatum.
14. Lip with margins undulate, 2 cm. or more long; petals blotched with reddish brown at the base. *O. Rossii*.

Odontoglossum Bictoniense (Batem.) Lindl. Bot. Reg. 26: t. 66. 1840. *Cyrtochilum Bictoniense* Batem. Orch. Mex. & Guatem. t. 6. 1843 (type: Guatemala, *Skinner*).

Epiphytic on trees in humid forests, on rocks of cliffs or terrestrial, up to 3,200 meters alt. Uncommon in Mexico, Guatemala, and El Salvador.

Plant up to 9 dm. tall, slender. Pseudobulbs produced on a short rhizome, ovoid to ellipsoid, compressed, 2-3- or rarely 1-leaved, 4-18 cm. long, 2-3.5 cm. wide, subtended and more or less concealed by leaf-sheaths; sheaths distichous, strongly conduplicate-ancipitous, scarious. Leaves 1-3 at the apex of a pseudobulb or produced on the short rhizome, elliptic-oblong, elliptic-lanceolate or linear, acute to acuminate, conduplicate at the base, 11.5-45 cm. long, 1.5-5.5 cm. wide, subcoriaceous. Peduncle from the base of a pseudobulb, provided with scarious sheaths, slender or stout, 3-8 dm. long including the many-flowered simple or occasionally branched raceme. Floral bracts broadly elliptic to lanceolate, subacute to acuminate, scarious, 7-20 mm. long. Flowers numerous, showy, with slender pedicellate ovaries that are 2.5-5 cm. long. Sepals and petals pale or yellowish green, banded with reddish brown, spreading. Dorsal sepal elliptic-lanceolate to elliptic-ob lanceolate, acute to subobtuse at the slightly recurved apex, concave, dorsally carinate, 1.8-2.3 cm. long, 6-8.5 mm. wide. Lateral sepals elliptic-lanceolate to linear-lanceolate, acute to acuminate at the recurved apex, oblique, dorsally carinate, 2.1-2.7 cm. long, 5-6 mm. wide. Petals oblanceolate to elliptic-lanceolate, or linear-elliptic, obtuse to acute, oblique, 1.8-2.3 cm. long, 4.5-8 mm. wide. Lip with a short claw; lamina broadly subcordate to cordate-subreniform, broadly rounded to acute at the apex, with the margins crisped-crenulate, white to lavender or pink, 1.5-2 cm. long, 1.6-2.4 cm. wide; claw about 7 mm. long, callose; callus more or less puberulent, composed of a pair of erect plates that clasp the column and are extended at the apex as erect flap-like lobes, sulcate-concave. Column cellular-papillose, slender-clavate, with quadrate incurved auricles on each side at the apex, 1.2-1.5 cm. long. Capsule broadly ellipsoid, about 4 cm. long.

This species is distinguished from closely allied species by its auriculate column. It is commonly called "sets-sish."

Alta Verapaz: Cobán, *Türkheim* II 1624.—Guatemala: Bought in market, Guatemala, *Standley* 57849. Garden of Don Mariano Pacheco H., said to have come originally from San Agustín de Minas, Finca of President Ubico at San Moran, Dept. Guatemala, *Steyermark* 46385. Near San Rafael, about 10 miles from Guatemala City, *Lewis* 129.—Huehuetenango: Trail between Soloma and Santa Eulalia, Sierra de los Cuchumatanes, *Steyermark* 48458. Cerro Cananá, between Nucapuxlac and Cananá, Sierra de los Cuchumatanes, *Steyermark* 49001. Cerro Huitz, between Barillas and Mimanhuitz, Sierra de los Cuchumatanes, *Steyermark* 48553. La Sierra (Tujimach), across river from San Juan Atitlán, Sierra de los Cuchumatanes, *Steyermark* 52016. Cuesta de las Concepción, *Seler* 2326. Near Soloma, *Skutch* 994. San Juan Atitlán, *Skutch* 1184.—Totonicapán: Totonicapán, *Johnston* 1373.—Zacapa: Sierra de las Minas, upper slopes, along Río Repollal to summit of mountain, *Steyermark* 42577. Sierra de las Minas, middle and upper south-facing slopes of Volcán Gemelos, *Steyermark* 43246.—South slope of Volcán Atitlán, *Skutch* 1513.—"Guatemala," *Bernoulli* 245.

***Odontoglossum Cervantesii* Llave & Lex. Nov. Veg. Descr. Orch. Opusc. 34. 1824.**

Epiphytic on trees and on rocky slopes, usually at extremely high elevations, from 1,500 to 3,000 meters alt. Rather common in Mexico; apparently very rare in Guatemala.

Plant usually growing in clumps, 8–32 cm. tall. Pseudobulbs produced at close intervals on a short rhizome, short, ovoid, compressed, unifoliate, 2–6.5 cm. long, 1–2.3 cm. wide, subtended by several short scarios sheaths. Leaf solitary at the apex of a pseudobulb, ovate-lanceolate to elliptic-lanceolate or oblong-elliptic, acute to subacuminate, conduplicate at the base, 4–16 cm. long, 1.2–3.2 cm. wide about the middle. Peduncle from base of pseudobulb, suberect to more or less pendent, slender, 1–6-flowered, up to 32 cm. long including the inflorescence, covered with numerous sheathing bracts; bracts convolute, lanceolate, acuminate, scarios-translucent, brownish, up to 6 cm. long. Floral bracts similar to those of the peduncle. Flowers rather large, showy, fragrant, white to rose-colored, the sepals and petals marked on the lower third with reddish brown transverse concentric spots or lines, with slender pedicellate ovaries that are 2–6 cm. long. Sepals spreading, oblong-elliptic to elliptic-lanceolate, nearly rounded to acute or shortly acuminate at the apex, 2–3.3 cm. long, 6–12 mm. wide; lateral sepals slightly oblique. Petals spreading-recurved, broadly elliptic-obovate to suborbicular-elliptic, broadly rounded to subacute or rarely retuse at the apex, 1.8–3 cm. long, 1–2 cm. wide. Lip with a short thick claw; lamina broadly cordate to suborbicular-ovate, rounded to abruptly acute at the apex, cordate to subtrun-

cate at the base, occasionally somewhat constricted about the middle, with the margins irregularly erose to subentire, 1–2.3 cm. long, 1–2.7 cm. wide across the base; claw callose, concave-sulcate, with the thickened concave purple-striped sides erect, about 6 mm. long; callus yellowish, cellular-papillose, extended beyond the claw as two sharply divergent points, with a fleshy hump in the center at the base of the two points. Column slender-clavate, cellular-papillose, about 1 cm. long, provided with a small suborbicular-quadrangle auricle on each side at the apex. Capsule suberect, ellipsoid, 4–5 cm. long.

This species is distinguished from closely allied species by the concentric arrangement of reddish brown lines and blotches on the lower third of the sepals and petals and by the conspicuously auriculate column.

No specimens of this species have been seen from Guatemala. It is included on the basis of Cogniaux's report (Dict. Icon. Orch. t. 16. 1898).

Odontoglossum convallarioides (Schltr.) Ames & Correll, Bot. Mus. Leaflet. Harv. Univ. 11: 19. 1943. *Osmoglossum convallarioides* Schltr. Repert. Sp. Nov. Beih. 19: 148. 1923.

Epiphytic on trees in forests, usually at high elevations, up to 2,700 meters alt. Rare in Mexico and Guatemala, common in Costa Rica.

Plant erect, caespitose, often growing in large masses. Pseudobulbs congested on a short rhizome, ovoid to ovoid-elliptic, ancipitous, angled, tapering to the bifoliate apex, up to 8.5 cm. long and 3 cm. wide, subtended by several distichous imbricated membranaceous sheaths, with some of the sheaths bearing immature leaves; sheaths up to 7.5 cm. long. Leaves of the pseudobulbs erect to erect-spreading, coriaceous, flexible, linear-ligulate, acute, conduplicate at the base, 1.5–4.2 dm. long, 7–12 mm. wide. Peduncle from the axil of a sheath subtending a pseudobulb, erect, compressed, slender, 1–4 dm. long (including the few-flowered raceme), provided with long closely appressed scarious sheaths. Floral bracts deltoid to triangular-lanceolate, acute to acuminate, scarious, up to 1.5 cm. long. Flowers pinkish white or whitish, fleshy, with rather stout pedicellate ovaries that are about 1.5 cm. long. Sepals broadly elliptic to oblong-elliptic, subacute to acute, deeply concave, 7–10 mm. long, 5–7 mm. wide; lateral sepals oblique, united at the base for 2–4 mm. Petals suborbicular-obovate to obovate-subquadrate, broadly rounded and often apiculate at the apex, 7–9 mm. long, 6–7 mm. wide. Lip obovate-subpandurate in outline, subobtusate to retuse at the apex, concave, usually very fleshy, often spotted with red-purple, about 9 mm. long, 6–8 mm. wide above the middle; disk adorned at the base with a yellowish orange quadrangle callus; callus about 3.5 mm. long and wide, composed of three fleshy ridges, the lateral ridges much-thickened at the apex where they are terminated by an erect-incurved triangular tooth, the central ridge narrowly triangular with the point directed back toward the column. Column short, thick, 3.5–4 mm. long, obscurely or scarcely 3-lobed at the apex, with the lobules (when present) essentially entire. Capsule obovoid, erect, about 3 cm. long.

This species forms with *O. Egertonii* and *O. pulchellum* a complex group of plants. All three species are similar in habit. However, there are floral differences that readily separate them. This species differs from *O. Egertonii* in that the broader lateral sepals are almost free instead of being united almost to the apex as in that species, and the lip is distinctly constricted below the middle, a character lacking in *O. Egertonii*. The column of *O. convallarioides* is almost without apical lobules, whereas the column of *O. Egertonii* is deeply 3-lobed, and the lobes are fringed. *Odontoglossum convallarioides* differs from *O. pulchellum* not only in the much smaller flowers but also in that the column is not conspicuously lobulate and the lip is flat and concave, not strongly arcuate-deflexed as in that species.

Chimaltenango: *Johnston* 1236.—San Marcos: Finca El Porvenir, on Potrero Matasán along Río Cabús, Volcán Tajumulco, *Steyermark* 37642.

Odontoglossum cordatum Lindl. Bot. Reg. 24: Misc. p. 50. 1838.

Epiphytic on trees in humid forests, rarely terrestrial, up to 3,000 meters alt. Mexico, Guatemala, Honduras, and Costa Rica; not common.

Plant rather coarse, caespitose, up to 5 dm. or more tall. Pseudobulbs congested on a short rhizome, ovoid-ellipsoid to ellipsoid, compressed, unifoliate, 4.5–7.5 cm. long, 2–3.5 cm. wide, subtended by leaf-sheaths; sheaths scarious, distichous, strongly conduplicate. Leaves solitary at the apex of the pseudobulbs and produced on the rhizome, elliptic-lanceolate to elliptic or oblong-ligulate, obtuse to shortly acuminate, conduplicate at the base, coriaceous, 9–30 cm. long, 3–4.5 cm. wide. Peduncle from the base of a pseudobulb, provided with closely appressed carinate compressed scarious bracts, up to 4.5 dm. long including the few- to many-flowered inflorescence. Floral bracts similar to those of the peduncle, 2.5–3 cm. long. Flowers showy, greenish, whitish or yellowish, blotched and spotted with reddish brown, with slender pedicellate ovaries that are 3–4.5 cm. long. Sepals spreading-recurved, elliptic-lanceolate to linear-lanceolate, acuminate-attenuate, strongly dorsally carinate with the keel excurrent, longitudinally concave, 3.5–5 cm. long, 6–12 mm. wide; lateral sepals oblique. Petals spreading, ovate-lanceolate to elliptic-lanceolate, long-acuminate or attenuate at the apex, oblique, 2.5–4 cm. long, 7–10 mm. wide. Lip with a short claw; lamina deltoid-cordate, rather abruptly acuminate-attenuate and with the margins involute at the apex, more or less cordate at the base, somewhat erose-crenulate on the margins, 1.8–2.5 cm. long, 1.5–1.9 cm. wide across the base; claw up to 8 mm. long, callose; callus composed of a pair of short fleshy erect auriculate lateral keels and a central keel that extends from near the base to the sinus between the pair of terete cornute tips projecting beyond the claw at the apex of the callus. Column slender-clavate, puberulent, not auriculate, 1–1.5 cm. long. Capsule obovoid-ellipsoid, about 4 cm. long.

Odontoglossum cordatum, *O. maculatum* and *O. Bictoniense* are superficially alike. However, *O. cordatum* is separated from *O. maculatum* by its long-acuminate, tapering petals in contrast to the abruptly and shortly acuminate petals of *O. maculatum*. *Odontoglossum Bictoniense* is separated from the other two species by its auriculate column, which is lacking in those species.

Guatemala: On road to Mataquesuintla, 25 miles from Guatemala City, *Lewis* 110.—Sololá: Volcán Atitlán, south-facing slopes, *Steyermark* 47454.—Zapote-Osuna, *Johnston* 1420.

Odontoglossum Egertonii Lindl. Bot. Reg. 31: Misc. p. 50. 1845 (type: Guatemala?). *Oncidium Egertonii* (Lindl.) Beer, Prakt. Stud. Orch. 285. 1854. *Osmoglossum anceps* Schltr. Repert. Sp. Nov. Beih. 19: 147. 1923.

Epiphytic on trees in forests, up to 2,600 meters alt. Widespread but not common in Mexico, Guatemala, Honduras, and Costa Rica.

Plant erect, caespitose. Pseudobulbs congested on a short rhizome, ovoid to ovoid-elliptic, compressed, usually tapering to the bifoliate apex, up to 9.5 cm. long and 3 cm. wide, subtended by several distichous imbricated membranaceous sheaths, with some of the sheaths bearing immature leaves; sheaths up to 8 cm. long. Leaves of the pseudobulbs erect to erect-spreading, coriaceous, flexible, linear-ligulate, acute, conduplicate at the base, 2–5.5 dm. long, 7–15 mm. wide. Peduncle from the axil of a sheath subtending a pseudobulb, compressed, erect, slender or rather stout, 1.5–4.5 dm. long (including the 5–10-flowered raceme), provided with long closely appressed scarious sheaths; rachis usually conspicuously fractiflex. Floral bracts deltoid to triangular-lanceolate, acute to acuminate, erect-spreading, 5–12 mm. long. Flowers white marked with lilac, fleshy, with stout arcuate pedicellate ovaries that are about 1.2 cm. long. Dorsal sepal ovate-oblong to oblong-elliptic, subobtuse to acute, 1.1–1.2 cm. long, 5.5–6 mm. wide. Lateral sepals united almost to the apex; lamina broadly elliptic, gibbose-saccate at the base, bifid at the apex with the free parts dorsally carinate and acute to acuminate, about 1.3 cm. long and 8 mm. wide. Petals broadly ovate or ovate-elliptic to broadly elliptic, obtuse to apiculate, concave, oblique, with the margin crisped, 1–1.2 cm. long, 5.5–8 mm. wide below the middle. Lip oblong-subquadrate, apiculate, conduplicate at the apex in natural position, concave, 9–12.5 mm. long, 5–9 mm. wide above the middle, often crisped on the margin and marked with yellow or brown at the base; disk adorned at the base with a yellowish often brown-spotted quadrate callus; callus 4–5 mm. long and wide, composed of three fleshy ridges, the lateral ridges terminated by erect-incurved triangular teeth, the central ridge narrowly triangular with the point directed back toward the column. Column short, thick, about 4 mm. long, 3-lobulate at the apex with the lobules lacerate-toothed. Capsule ellipsoid, erect, about 3.5 cm. long.

This species is separated from *O. convallarioides* and *O. pulchellum*, two closely allied species, in that the lateral sepals are united almost to the apex and the lip is not at all or only scarcely con-

stricted below the middle. The rachis is also usually conspicuously fractiflex, a character not evident in the other two species.

Alta Verapaz: Cobán, *Türkheim* II 718. Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 89879; 89925. Vicinity of Cobán, *Standley* 90867.—Quiché: Finca San Francisco, Cotzal, *Skutch* 1871.—San Marcos: Above Finca El Porvenir, between Loma de la Paloma and "Todos Santos Chiquitos," south-facing slopes of Volcán Tajumulco, *Steyermark* 38002.—Suchitepequez: Volcán Santa Clara, between Finca El Naranjo and upper slopes, *Steyermark* 46656.

Odontoglossum grande Lindl. Bot. Reg. 26: Misc. p. 47. 1840 (type: Guatemala, Dept. Guatemala, in a barranca near Guatemala City, *Skinner*). Figure 174.

Epiphytic on trees in forests, up to 2,660 meters alt. Uncommon in Mexico and Guatemala.

Plant rather coarse, up to 4 dm. tall. Pseudobulbs clustered on a short rhizome, orbicular to ovoid, compressed-ancipitous, 1-3-leaved, 4-10 cm. long, 3-6 cm. wide, glaucous, subtended by two or more large scarious sheaths. Leaves 1-3 at the apex of a pseudobulb, elliptic to lanceolate, acute, contracted below into a conduplicate petiole, coriaceous, glaucous, 1-4 dm. long including the petiole, 3-6.5 cm. wide. Peduncle from base of pseudobulb, rather stout, provided with several basal sheaths and distant bracts, up to 3 dm. long including the 4-8-flowered raceme. Floral bracts lanceolate, involute, closely appressed, scarious, 3.5-4.5 cm. long. Flowers large, showy, with stout pedicellate ovaries that are 3.5-6 cm. long. Sepals spreading, yellow with broad transverse bars and flecks of reddish brown, elliptic-lanceolate to lanceolate, acute to acuminate at the recurved apex, with undulate margins, 5.5-8.5 cm. long, 1-2 cm. wide; lateral sepals falcate, convex. Petals spreading, lower half reddish brown with yellow markings along the margin, upper half clear yellow, oblanceolate-elliptic to elliptic-oblong or occasionally elliptic-lanceolate, broadly obtuse to acute, with undulate margins, 5-8 cm. long, 1.8-3.2 cm. wide. Lip sessile, broadly pandurate, unequally 3-lobed, creamy white, flecked with reddish brown, 2.5-4.3 cm. long; lateral lobes near the base, small, auricle-like, revolute, about 5 mm. long and 3.5 mm. wide, rounded; mid-lobe separated from the lateral lobes by a short broad isthmus, suborbicular-quadrate, subtruncate and shallowly notched at the apex, subtruncate at the base, 2-3.7 cm. wide; disk with a fleshy bicornute quadrate callus between the lateral lobes and on the isthmus; callus adorned with one or two small porrect horns on each side at the base, about 5 mm. long and wide. Column 1-1.5 cm. long, puberulent, provided with a rounded incurved convex wing on each side at the apex.

This species is the largest-flowered *Odontoglossum* found in Guatemala, and it is used extensively for horticultural purposes. It forms with *O. Williamsianum* and several additional extra-limital species a rather complex group of plants that are somewhat intermediate

between the genera *Odontoglossum* and *Oncidium*. It is best distinguished from nearly allied species not only by its larger flowers but by the suborbicular, not uncinat, wings of the column. There are other floral differences which aid in separating the species in this complex. *Odontoglossum grande* is commonly known in Guatemala as "Boca de Tigre" and "Uña de gato."

Chimaltenango: San Martín, *Rodriguez* 1469. Along road from Chimaltenango to San Martín Jilotepeque, *Standley* 57919. Calderas, *Johnston* 1360; 1369.—Guatemala City, *Lewis* 92.—Quezaltenango: *Vaught* 292a.—Santa Rosa: Estanzuelas, *Heyde & Lux* 3856.—Bought in market, Guatemala City, *Standley* 37846.—"Guatemala," *Ostlund* 2880.

Odontoglossum laeve Lindl. Bot. Reg. 30: t. 39. 1844 (type: Guatemala, *Skinner, Hartweg*).

Epiphytic on trees in humid forests or on rocks, up to 1,600 meters alt. Rare in Mexico and Guatemala.

Plant large, coarse, up to 10 dm. or more tall. Pseudobulbs large, ovoid to ovoid-ellipsoid, strongly compressed, 2-3-leaved, 5-12 cm. long, 2.5-6.5 cm. wide, vernicose, subtended by large conduplicate scarious-fibrous leaf-sheaths. Leaves 2-3 from apex of a pseudobulb and from the short rhizome, linear-ligulate to oblong-ligulate, rounded to subacute at the apex, subcoriaceous, flexible, conduplicate at the base, 1.5-4.5 dm. long, 2.5-5.5 cm. wide. Peduncle from base of pseudobulb, stout, erect, subtended and enveloped at the base by a leaf-sheath, provided at intervals with closely appressed scarious bracts, up to 10 dm. or more long including the paniculate raceme. Floral bracts and bracts subtending the branches of the inflorescence similar, ovate-cucullate, amplexicaul, acute, scarious, up to 1.5 cm. long. Flowers usually numerous, rather showy, with slender pedicellate ovaries that are 2-2.5 cm. long. Sepals and petals spreading, yellow, blotched and banded with reddish brown. Sepals narrowly elliptic to somewhat linear-ob lanceolate, acute-apiculate, 2.5-3.5 cm. long, 6-9 mm. wide; lateral sepals strongly keeled on the back, recurved at the apex, with reflexed lateral margins. Petals obliquely linear-elliptic, 2.5-3 cm. long, 7-8 mm. wide. Lip white above, purplish below the middle, strongly deflexed below the middle in natural position, oblong-pandurate when spread out, 2-3 cm. long, 1-1.3 cm. wide across the suborbicular to broadly ovate dilated apical portion, lightly retuse at the apex with a small apicule in the sinus; disk fleshy-thickened and sulcate on the lower third or fourth, with the thickened portion terminating in 2-5 inconspicuous keels above the bend in the lip. Column clavate, with an auricle on each side at the apex, about 1 cm. long. Capsule large, ovoid-ellipsoid, about 5 cm. long.

This species is closely allied to, if not conspecific with, *O. stenoglossum*.

Guatemala: Pamplona Golf Course, Guatemala City, *Lewis* 109.—San Marcos: Finca El Porvenir, on Potrero Matasán along Río Cabús, Volcán Tajumulco, *Steyermark* 37639.



FIG. 174. *Odontoglossum grande*. Plant (about $\times \frac{2}{6}$). Drawn by D. E. Tibbitts.

Odontoglossum maculatum Llave & Lex. Nov. Veg. Descr. Orch. Opusc. 35. 1824.

Epiphytic on trees in cool forests, up to 3,000 meters alt. Rather common in Mexico; rare in Guatemala.

Plant rather coarse, 1.2-5 dm. tall. Pseudobulbs produced at intervals on a thick creeping rhizome, ovoid to ovoid-ellipsoid, compressed, 1-2-leaved, 4-9.5 cm. long, up to 3 cm. wide, subtended by both leaf-sheaths and non-leaf-bearing sheaths; sheaths scarious, distichous, strongly conduplicate. Leaves one or two at the apex of a pseudobulb and produced on the rhizome, elliptic-ligulate to elliptic-lanceolate, obtuse to acute, apiculate, conduplicate at the base, coriaceous, 7.5-32 cm. long, 1.8-5.5 cm. wide. Peduncle from the base of a pseudobulb, more or less pendent, provided with broadly elliptic acute convolute carinate bracts, up to 4 dm. long including the few- to many-flowered inflorescence. Floral bracts similar to those of the peduncle, about 2.5 cm. long. Flowers showy, yellow and greenish spotted with reddish brown, with slender pedicellate ovaries that are 3-7.5 cm. long. Sepals elliptic-lanceolate to linear-lanceolate, acuminate, conspicuously dorsally carinate with the keels excurrent, longitudinally concave, usually greenish yellow and unspotted, 2.4-3.7 cm. long, 5-10 mm. wide; lateral sepals oblique. Petals with a short narrow claw, broadly elliptic to elliptic-obovate or somewhat oblong-subquadrate, sometimes more or less pandurate, abruptly acute to shortly acuminate, yellow, spotted with reddish brown on the lower half, 2.2-3.2 cm. long, 1-1.5 cm. wide above the middle. Lip with a short fleshy claw; lamina yellow, spotted with reddish brown, broadly cordate-reniform to triangular-cordate, subacute to acuminate-attenuate, with the margins crisped and subentire to coarsely erose-dentate, 1.5-2.2 cm. long, 1.3-2.4 cm. wide; claw about 6 mm. long, callose; callus farinose, composed of a pair of purple-striped fleshy concave porrect lateral lobes and a central keel extending from near the base to the sinus between the pair of slender terete divergent horns at the apex of the callus. Column whitish, puberulent, not auriculate, about 1.2 cm. long. Capsule broadly ellipsoid, about 4 cm. long.

This species is very closely allied to *O. cordatum*, from which it differs primarily in the shortly acuminate, not long-acuminate, petals. It is related to *O. Cervantesii* but, besides being a much larger plant, it lacks the prominently auriculate column found in that species.

San Marcos: Between Canjulá and La Unión Juárez near south-east portion of Volcán Tacaná, *Steiermark* 36384.

Odontoglossum majale Reichb. f. Flora 69: 550. 1886. *O. platycheilum* Weathers, Gard. Chron. 11: 587. fig. 35. 1892 (type: Guatemala, Dept. Quiché, Chiul, alt. 2,600 meters, *Heyde & Lux* 3502).

Epiphytic on trees, up to 2,600 meters alt. Apparently endemic to Guatemala; rare.

Plant usually small, up to 3.5 dm. tall. Pseudobulbs produced close together on a short subsacendent rhizome, narrowly ovoid to ovoid-ellipsoid, unifoliate, compressed, 4–7 cm. long, 2–2.5 cm. wide, about 1 cm. thick, subtended and more or less concealed by large sheaths; sheaths scarious, light brown, conduplicate, up to 10 cm. long. Leaf solitary at the apex of the pseudobulbs, linear-ligulate, obtuse to subacute, subcoriaceous, conduplicate at the base, 1–3 dm. long, 1.8–3 cm. wide. Peduncle from the base of a pseudobulb, erect-ascending, 1–1.4 dm. long, enveloped for the most part by long scarious sheaths, supporting two to four flowers. Floral bracts ovate, subacute, scarious, 1–1.8 cm. long. Flowers showy, rose-colored or purplish, with the lip blotched with dark purple or carmine, with slender pedicellate ovaries that are 3–5 cm. long. Sepals oblong-lanceolate to lanceolate, acute to subacuminate, dorsally winged along the mid-nerve with the wing excurrent, concave, 2–2.7 cm. long, 6.5–8 mm. wide; lateral sepals slightly oblique. Petals oblong-elliptic to narrowly oblanceolate, subobtuse to acute, oblique, somewhat undulate on the margins, 2–2.5 cm. long, 5–6.5 mm. wide. Lip with a slender claw; lamina spreading, ovate-subquadrate, retuse at the subtruncate apex, more or less subtruncate at the base, slightly constricted about the middle, the margin repand, 1.7–2.8 cm. long, 1.7–3.2 cm. wide across the base; claw about 1 cm. long, callose, sulcate, with the thickened margins erect; callus extended beyond the claw as two blunt tips. Column white, slender-clavate, 1.2–1.5 cm. long, narrowly winged at the apex.

This species is distinguished from closely allied species in its ovate-subquadrate lip, which is conspicuously spotted over its entire surface. The large sheaths enveloping the peduncle are also characteristic of this species.

Alta Verapaz: "Purchased in Guatemala City; said to have come from Cobán," *Lewis* 218.—Chimaltenango: Tecpam, *Matzer* 1825.—"Purchased in Guatemala market," Guatemala City, *Johnston* 1242.—"Guatemala," *Bernoulli* 338.

Odontoglossum pulchellum Batem. ex Lindl. Bot. Reg. 27: t. 48. 1841 (type: Guatemala, *Bateman*).

Epiphytic on trees in forests, usually at high elevations, up to 2,500 meters alt. Rather common in Mexico, Guatemala, and El Salvador.

Plant erect, caespitose, often growing in dense clumps. Pseudobulbs congested on a short rhizome, ovoid to ovoid-elliptic, tapering to the bifoliate apex, compressed longitudinally, sulcate, up to 10 cm. long and 3.5 cm. wide, subtended by several distichous imbricated membranaceous sheaths, with some of the sheaths bearing immature leaves; sheaths up to 8 cm. long. Leaves of the pseudobulbs erect-spreading, linear-ligulate, acute, conduplicate at the base, coriaceous, flexible, 1–3.5 dm. long, 8–14 mm. wide. Peduncle from the axil of a sheath subtending a pseudobulb, stiffly erect, compressed, slender, 1.2–5 dm. long (including the lax 3–10-flowered raceme), provided with closely appressed scarious sheaths. Floral bracts triangular-lanceolate, acuminate, scarious, 8–13 mm. long. Flowers white with the outer surface of the sepals usually pink or purplish, fragrant, with

stout pedicellate ovaries that are 1.5–2 cm. long. Dorsal sepal broadly obovate to elliptic-obovate, apiculate at the broadly rounded apex, concave, 1–2 cm. long, 6–13.5 mm. wide above the middle. Lateral sepals broadly elliptic, obtuse-apiculate at the apex, oblique, spreading, united at the base for about 5 mm., somewhat dorsally carinate below the middle, about as long as the dorsal sepal, 5.5–10 mm. wide. Petals broadly cuneate-obovate to suborbicular-obovate, conduplicate at the broadly rounded to subobtusate or apiculate apex, oblique, concave, often crisped on the thin margin, 1.3–2 cm. long, 7–15 mm. wide near the apex. Lip complex, in natural position abruptly decurved at the apex of the large callus to form a right angle with the basal half of the lip, strongly conduplicate at the apex with the tip directed back toward the ovary; when expanded panduriform in outline, subtruncate to broadly rounded and apiculate at the apex, with the margins usually crisped, 1–1.8 cm. long, 8–11 mm. wide across the apical portion, adorned on the lower half with an oblong-quadrate callus; callus yellowish spotted with reddish brown, 5–7 mm. long, 3–5 mm. wide, composed of three fleshy ridges, the lateral ridges terminated by blunt erect angles, the central ridge narrowly triangular with the point directed back toward the column. Column short, thick, 4–5 mm. long, 3-lobulate at the apex with the lobules coarsely toothed. Capsule broadly ellipsoid, erect, about 3.5 cm. long.

This species is at once distinguished from *O. convallarioides* and *O. Egertonii*, two closely allied species, by the strongly deflexed attitude of the lip and the usually much larger flowers.

Chimaltenango: Chichoy, *Standley* 62430. Along road from Chimaltenango to San Martín Jilotepeque, *Standley* 57933; 80846.—El Progreso: Sierra de las Minas, between Calera and middle slopes of quebradas of Volcán Siglo, *Steyermark* 43013. Sierra de las Minas, hills between Finca Piamonte and slopes southeast of Finca Piamonte, *Steyermark* 43414.—Guatemala: On road to Mataquescuintla, *Lewis* 103.—Huehuetenango: Aguacatán, *Skutch* 1919. Aguacatán, *Johnston* 1680. Aguacatán road, 10 km. east of Huehuetenango, *Standley* 82107; 82017; 82041.—Jalapa: Potrero Carrillo, 13 miles northeast of Jalapa, *Steyermark* 33016.—Quiché: Nebaj, *Skutch* 1714.—Sacatepéquez: Embaulada, *Heyde & Lux* 4601.—Totonicapán: Totonicapán, *Johnston* 1374.—Zacapa: Sierra de las Minas, between Santa Rosalía de Mármol and San Lorenzo, *Steyermark* 43148.

Odontoglossum Rossii Lindl. Sert. Orch. sub t. 25. 1838.

Epiphytic on trees in humid forests, up to 3,000 meters alt. Uncommon in Mexico, Guatemala, and Nicaragua.

Plant small, suberect, usually growing in loose clumps, 1–2.5 dm. tall. Pseudobulbs clustered on a short rhizome, ovoid to ovoid-elliptic, compressed, unifoliate, 3–6 cm. long, 1.5–3.5 cm. wide, 1–2 cm. thick, clothed at the base with scarious conduplicate sheaths that are up to 7 cm. long. Leaf solitary at the apex of the pseudobulbs, elliptic to elliptic-lanceolate, acute, conduplicate at the base, sub-

coriaceous, 5–20 cm. long, 1.5–4 cm. wide. Peduncle from the base of a pseudobulb, slender, erect or curved, 6–20 cm. long, 2–4-flowered, provided with several scarious bracts. Floral bracts scarious, ovate-lanceolate, acute-apiculate, up to 3.5 cm. long. Flowers showy, large for the plant, pale yellow, white or pinkish, with the sepals and the base of the petals blotched with reddish brown, with slender pedicellate ovaries that are 3–5 cm. long. Sepals spreading, oblong-elliptic to oblong-lanceolate or linear-lanceolate, subacute to acuminate, the margins somewhat reflexed, 2.5–4.5 cm. long, 5–11 mm. wide; lateral sepals oblique, more or less dorsally carinate. Petals with a short claw, broadly elliptic to oblong-elliptic, somewhat recurved at the obtuse to acute apex, with the margins crisped-undulate, 2.5–3.8 cm. long, 8–19 mm. wide. Lip with a narrow claw; lamina broadly orbicular-subcordate, rounded to subobtuse or occasionally notched at the apex, undulate, 2–3.2 cm. long, 1.8–3.2 cm. wide near the base; claw about 1 cm. long, provided with a two-winged callus, the concave wings semiobcordate and erect; callus thickened above and subentire or notched at the apex with the blunt tips divergent, deep yellow spotted with reddish brown. Column slender-clavate, arcuate, rose-purple, cellular-papillose, with the wings obsolete, 1.5–2 cm. long. Capsule suberect, ellipsoid-cylindrical, about 4 cm. long.

This species forms with *O. majale*, *O. Cervantesii*, and *O. stellatum* a closely allied group of plants. It differs from those species not only in the shape of the lip but primarily in that the sepals are always blotched with reddish brown over the entire surface and in the non-maculate lip—a combination not observed in the other species in this group.

Alta Verapaz: Cobán, *Johnston* 1368.—Chimaltenango: Santa Elena, *Skutch* 224. Chichavac, *Skutch* 72. Chichoy, *Standley* 62345. Tecpan, *Lewis* 21.

***Odontoglossum stellatum* Lindl. Bot. Reg. 27: Misc. p. 9. 1841.**

Epiphytic on trees in forests, up to 3,000 meters alt. Rare in Mexico and Guatemala.

Plant small, usually growing in dense clumps, 1–2.6 dm. tall. Pseudobulbs produced at close intervals on a subscaudent rhizome, slender, ovoid-ellipsoid to cylindrical, compressed, unifoliate, 2–6 cm. long, up to 1.5 cm. wide, subtended by several scarious sheaths; sheaths ovate-lanceolate, acute, scarious, conspicuously hyaline-margined, up to 4.5 cm. long. Leaf solitary at the apex of a pseudobulb, narrowly elliptic to oblanceolate or linear-ligulate, subobtuse-apiculate to shortly acuminate, conduplicate and conspicuously narrowed at the base, 6.5–15 cm. long, 8–23 mm. wide. Peduncle short, from base of pseudobulb, slender, usually concealed by scarious sheaths, 1–2-flowered, 2–8.5 cm. long. Floral bracts narrowly lanceolate, acuminate, scarious, 1.3–2.5 cm. long. Flowers rather small, showy, with conspicuously elongated slender pedicellate ovaries that are 4.5–12.5 cm. long. Sepals and petals similar, spreading, tawny-bronze or purplish, tipped with yellow, the petals sometimes yellowish white, lanceolate to linear-lanceolate, acute to long-acuminate or attenuate at the apex, 2–2.8 cm. long, 3–5 mm. wide;

sepals dorsally carinate, concave. Lip with a narrow claw, white or pink, tinged or marked with mauve; lamina triangular-ovate, suborbicular-ovate to suborbicular, obtuse to rounded at the apex, broadly cuneate at the base, with the margins coarsely and irregularly lacerate-toothed, 1.5–2 cm. long, 1.3–2 cm. wide across the base; claw callose, sulcate, with the thickened sides erect, 6–8 mm. long; callus extending beyond the claw as a short thick flattened bifid plate. Column slender-clavate, cellular-papillose, about 1.2 cm. long. Capsule ellipsoid, suberect, 2–4 cm. long.

This species is distinguished from closely allied species by its coarsely and irregularly lacerate-toothed lip.

Chimaltenango: Tecpam, *Johnston* 1855. Chichavac, *Salas* 578; *Skutch* 313. Near Santa Elena, out of Tecpam, *Lewis* 75.—Huehuetenango: Wet cloud forest at Cruz de Limón, between San Mateo Ixtatán and Nucá, Sierra de los Cuchumatanes, *Steyermark* 49784.—Sacatepéquez: Embaulada, *Heyde & Lux* 4613.—Sololá: Volcán Santa Clara, south-facing slopes to summit, *Steyermark* 46902; 47012.—Zacapa: Sierra de las Minas, slopes of Monte Virgen, around summit of mountain, *Steyermark* 42666.

Odontoglossum stenoglossum (Schltr.) L. O. Wms. in Correll, *Lloydia* 10: 212. 1947. *Miltonia stenoglossa* Schltr. *Repert. Sp. Nov. Beih.* 19: 66. 1923.

Epiphytic on trees in wet or dry forests or on rocks, up to 1,600 meters alt. Mexico, Guatemala, Honduras, and Costa Rica; rare.

Plant usually large, coarse, up to 10 dm. or more tall. Pseudobulbs usually large, ovoid to ovoid-ellipsoid, strongly compressed, 2–3-leaved, up to 10 cm. long and 5.5 cm. wide, subtended by large scarious-fibrous leaf-sheaths. Leaves 2–3 from the apex of a pseudobulb and from the short rhizome, linear-ligulate to oblong-ligulate, rounded to subacute at the apex, subcoriaceous, flexible, conduplicate at the base, up to 4 dm. long and 5 cm. wide. Peduncle from base of pseudobulb, usually stout, erect, subtended and enveloped at the base by a leaf-sheath, provided at intervals with closely appressed scarious bracts, up to 10 dm. long including the simple or occasionally paniculate raceme. Floral bracts and bracts subtending the branches of the inflorescence similar, ovate-cucullate, amplexicaul, acute, scarious, up to 1.5 cm. long. Flowers scattered, usually only a few, with slender pedicellate ovaries that are about 2 cm. long. Sepals and petals spreading, yellow-green, blotched and banded with brown. Sepals linear-elliptic to linear-ligulate, acute-apiculate, more or less dorsally carinate, 1.6–2 cm. long, 5–7 mm. wide; lateral sepals oblique, arcuate, conspicuously keeled on the back, convex, with recurved margins. Petals obliquely elliptic-oblong, shortly acuminate to acute-apiculate, slightly keeled on the back, 1.5–2 cm. long, 5–7.5 mm. wide. Lip white above, purplish below the middle, strongly arcuate below the middle in natural position, oblong-subpandurate to oblong-subspatulate when spread out, 1.5–2 cm. long, 5–8 mm. wide across the more or less dilated apical portion, fleshy-apiculate at the apex; disk fleshy-thickened and sulcate on the lower third, with the thickened portion terminating in about five small keels

above the bend in the lip. Column clavate, with a small auricle on each side at the apex, about 7 mm. long. Capsule ovoid-ellipsoid, about 5 cm. long.

Vegetatively, this species is extremely close to *O. laeve*. However, its raceme is usually simple, whereas that of *O. laeve* is apparently always branched. The most apparent difference separating the two concepts is the size of the flowers, those of *O. stenoglossum* being much smaller than those of *O. laeve*. The lip of *O. stenoglossum* is often scarcely dilated at the apex and is seldom so dilated as that of *O. laeve*. *O. stenoglossum* is the more widespread of the two species.

Alta Verapaz: Cobán, *Türckheim* 4182.—San Marcos: Finca El Porvenir along Río Chopal, south-facing slopes of Volcán Tajumulco, *Steyermark* 37511. Finca El Porvenir, on Potrero Matasán along Río Cabús, Volcán Tajumulco, *Steyermark* 37640.

Odontoglossum Uroskinneri Lindl. Gard. Chron. pp. 708, 724. 1859 (type: Guatemala, Dept. Sololá, on rocks near Santa Catarina, *Skinner*).

Growing on rocks. Apparently endemic to Guatemala.

Plant robust, large. Pseudobulbs large, ovoid, compressed, 1–2-leaved, from running rhizomes. Leaves 1–2 from the apex of a pseudobulb, apparently also produced on the rhizome, lanceolate, 2–3 dm. long. Peduncle stout, from the base of a pseudobulb, supporting a simple or branched raceme. Floral bracts ovate, acute to acuminate, about 2 cm. long. Flowers rather large, showy, with slender pedicellate ovaries that are about 5.5 cm. long. Sepals and petals almost entirely dark red to greenish with brown bars and mottling. Dorsal sepal broadly elliptic, obtuse to acute, dorsally carinate, concave, 2.5–2.7 cm. long, 1.1–1.3 cm. wide. Lateral sepals oblanceolate-falcate, acute to acuminate, dorsally carinate, 2.7–3 cm. long, 7.5–8.5 mm. wide. Petals obliquely ovate-elliptic, obtuse to sub-acute, 2.3–2.6 cm. long, about 1.3 cm. wide below the middle. Lip with a short claw; lamina suborbicular-cordate to broadly triangular-cordate, rounded to obtuse at the apex, usually rose-colored and irregularly veined with white, undulate-crested on the margins, about 2.8 cm. long and 2.8–3.5 cm. wide at the base; claw about 8 mm. long, callose; callus more or less puberulent, composed of a pair of erect plates that clasp the column and are extended at the apex as erect flap-like lobes, sulcate-concave. Column cellular-papillose, slender-clavate, with oblique quadrate incurved auricles on each side at the apex, about 1.8 cm. long.

This species seems to be little more than a large-flowered form of *O. Bictoniense*. However, since we have seen no specimens collected in the wild state it probably should be retained for the time being as a distinct species. It differs from *O. Bictoniense* primarily in the somewhat differently colored larger flowers and in the differently shaped petals. Lindley thought that *O. Uroskinneri* might be a hybrid between *O. Bictoniense* and *O. Cervantesii* or *O. Rossii*.

Odontoglossum Williamsianum Reichb. f. Gard. Chron. 2: 134. 1890.

Epiphytic on trees in dense forests, up to 1,000 meters alt. Rare in Guatemala, Honduras, and Costa Rica.

Plant coarse, up to 6 dm. tall. Pseudobulbs large, broadly oblong-ellipsoid, aciculate, 1-2-leaved, 9-10 cm. long, 4-5 cm. wide, subtended and more or less concealed by two or more large inflated sheaths; sheaths scarious, usually exceeding the pseudobulb. Leaves 1-2 at the apex of a pseudobulb, large, elliptic, subobtusate to acute, tapering to the sulcate petiole, coriaceous, about 4 dm. long including the petiole, 7-8 cm. wide. Peduncle from the base of a pseudobulb, stout, provided with closely appressed scarious bracts, about 1 cm. thick near the base, up to 6 dm. tall including the 6-8-flowered raceme. Floral bracts spatheaceous, subacuminate, 2-2.5 cm. long. Flowers large, showy, with stout pedicellate ovaries that are 5.5-6.5 cm. long. Sepals spreading, elliptic-lanceolate, acute to acuminate and recurved at the apex, with somewhat undulate margins, yellow, with large cross-bars of reddish brown, 4-5.2 cm. long, 1-2 cm. wide; lateral sepals oblique, united for about 5 mm. at the base, convex. Petals spreading, abruptly contracted into a short narrow claw, obovate-elliptic, broadly rounded and often apiculate at the apex, upper half and lower margins yellow, the lower half brown in the center, 3.3-5 cm. long including the claw, 1.8-2.8 cm. wide above the middle. Lip sessile, broadly pandurate, yellow spotted with brown, unequally 3-lobed, 2.5-3.5 cm. long, 1.3-1.5 cm. wide across the lateral lobes when spread out; lateral lobes basal, small, subquadrate when spread out, auricle-like, revolute in natural position, about 5 mm. long; mid-lobes separated from the lateral lobes by a short broad isthmus, suborbicular-obovate to transversely suborbicular-quadrate, notched at the broad apex, 1.7-2.7 cm. wide; disk adorned with a very fleshy bicornute callus between the lateral lobes and on the isthmus; callus yellow with orange dots, 8-10 mm. long, 6-7 mm. wide, with the apical terete horns porrect, provided with a pair of additional blunt horns on each side at the base. Column stout, yellow, 1-1.3 cm. long, more or less pubescent especially on the anterior surface, with a pair of uncinatate wings at the apex.

This species differs from *O. grande* primarily in its uncinatate, not rounded, column-wings and in its much longer inflorescence, smaller flowers, and shorter, broadly rounded petals, which are prominently clawed. The uncinatate column-wings place it extremely close to *O. Insleayi* Lindl., of Mexico, and *O. Schlieperianum* Reichb. f., of Costa Rica. However, several minor floral differences are supposed to separate these three species.

We have seen no specimens of *O. Williamsianum* from Guatemala, but it is supposed to grow in the Sierra de las Minas in Guatemala.

DOUBTFUL SPECIES

Odontoglossum Rolliæ Lodd. Cat. ex Loud. Hort. Brit. Suppl. 3: 596. 1839. This plant is attributed to Guatemala. However, since its identity can not be established it is excluded from this work.

77. *ASPASIA* Lindl.

Plant epiphytic, with 1-2-leaved pseudobulbous stems and lateral inflorescences arising at the base of a pseudobulb. Leaves at the apex of the pseudobulb and from the stalk-like stem, subcoriaceous. Inflorescence a solitary flower or a several-flowered spicate raceme. Flowers showy. Sepals subequal, spreading; dorsal sepal adnate to the base of the column; lateral sepals free, reflexed. Petals similar to the dorsal sepal. Lip with the claw entirely adnate to the column; lamina spreading at a right angle to the column, broadly panduriform or more or less 3-lobed, with several keels on the disk. Column adnate with the claw of the lip, erect, nearly terete, somewhat sulcate or foveate above, wingless, footless; anther terminal, operculate, incumbent; pollinia 2, ovoid to pyriform. Capsule cylindrical-fusiform.

This genus consists of about a half dozen species, which are widespread but not common in Central and South America.

Aspasia epidendroides Lindl. in Hook. Journ. Bot. 1: 6. 1834.
Figure 175.

Epiphytic, usually at low elevations, up to 700 meters alt. Guatemala, Nicaragua, Costa Rica, Panama, and northern South America; not common.

Plant up to 4 dm. or more tall, caespitose. Pseudobulbs terminating a short stalk-like stem, oblong-ovoid to elliptic-oblong, ancipitous, bifoliate, subtended by leaf-sheaths, 5.5-12 cm. long, 1.5-4.5 cm. wide. Stalk-like stem leafy, concealed by distichous imbricate scarious leaf-sheaths or non-leaf-bearing sheaths, 2-7 cm. long. Leaves 2, from the apex of the pseudobulb and produced on the short stem, linear-oblong to elliptic-oblong or narrowly lanceolate, acute to acuminate, conduplicate at the base, subcoriaceous, 1.5-3 dm. long, 1.7-4 cm. wide. Peduncle from the base of the pseudobulb, erect, 1-2.5 dm. long including the few-flowered raceme, provided with closely appressed scarious acuminate bracts that are up to 2.5 cm. long. Floral bracts similar to the bracts of the peduncle, spreading from the rachis, triangular-ovate, acute to acuminate, 5-13 mm. long. Flowers distichously arranged on the rachis, variously colored, usually greenish brown, with stout arcuate pedicellate ovaries that are 1.5-3 cm. long. Sepals greenish, blotched or suffused with brown or bronze, 2-2.5 cm. long, 7-10 mm. wide above the middle, concave; dorsal sepal adnate to the base of the column, obovate-elliptic, broadly obtuse, erect; lateral sepals obliquely oblanceolate, obtuse, somewhat dorsally carinate, strongly reflexed. Petals greenish brown or dull white to reddish, obovate-spatulate, broadly obtuse and somewhat conduplicate at the apex, 1.9-2.2 cm. long, 9-10 mm. wide above the middle. Lip dull white or cream-colored, marked with purple blotches or pink, with the claw entirely united with the base of the column; lamina spreading at right angles with the column about 7 mm. above its base, subquadrate-panduriform when spread out, deeply retuse at the apex, constricted at the middle so that it appears 3-lobed, 1.7 cm. long, 1.7 cm. wide at the widest point, slightly broadest across the basal lobules; lateral lobules small, convex, about 7 mm. wide; apical lobe large, concave, with upcurved erose-crenulate margins; disk adorned with two or more elevated somewhat radiating keels. Column white stained with purple, subcylin-

dricul, fleshy, 1.8–2 cm. long. Capsule fusiform-cylindrical, erect, up to 6 cm. long.

No specimens have been seen from Guatemala. However, this species is included in this work on the basis of the report in Bot. Mag. 68: t. 3962. 1842.

78. BRASSIA R. Br.

Epiphytic or rarely terrestrial plants with stout creeping rhizomes that give rise to large 1–3-leaved pseudobulbs and lateral inflorescences. Leaves coriaceous, from the apex of the pseudobulbs or produced on the rhizomes. Inflorescence a lax few- to many-flowered raceme. Flowers usually showy. Sepals and petals free, spreading, acuminate or caudate; petals usually much shorter than the sepals. Lip sessile at the base of the column, simple, flat or convex, usually adorned with a bilamellate or sulcate callus at the base. Column short, erect, wingless, footless; anther terminal, operculate, incumbent; pollinia 2, waxy. Capsule ellipsoid, obovoid or cylindrical.

This genus is composed of about fifty species, which are natives of tropical and subtropical America, from southern Florida, Mexico, and the West Indies to Brazil and Peru. They are easily recognized by their commonly elongated, attenuated sepals. The floral segments are extremely variable in length, particularly the sepals.

1. Lip provided with green warts or excrescences on the disk. *B. verrucosa*.
1. Lip plain except for the basal callus.
 2. Lip blotched only at the base with reddish brown, not conspicuously dilated at the middle, acuminate; lamellae of the callus broken up into teeth in front. *B. caudata*.
 2. Lip spotted throughout with purple, conspicuously dilated about the middle, rounded to obtuse at the apex, usually mucronate; lamellae of the callus not broken up into teeth in front. *B. maculata*.

Brassia caudata (L.) Lindl. Bot. Reg. 10: t. 179. 1827. *Epidendrum caudatum* L. Syst. ed. 10: 1246. 1759. Figure 176.

Epiphytic on trees in humid forests, usually at low elevations, up to 1,200 meters alt. Widespread but not common from Florida and Mexico through Central America to Panama and throughout the West Indies.

Plant up to 5 dm. or more tall. Pseudobulbs oblong-elliptic, compressed, 2–3-leaved, 6–15.5 cm. long, 2–3.5 cm. wide, subtended by two or more scarious leaf-sheaths or non-leaf-bearing sheaths. Leaves from the apex of the pseudobulbs and sometimes from the short rhizome, oblong-elliptic to oblong-lanceolate or oblanceolate, obtuse to acute, coriaceous, conduplicate at the base, 1.3–3.5 dm. long, 2–6 cm. wide. Peduncle from the base of the pseudobulb, usually subtended by a leaf-sheath, provided with remote tubular scarious bracts, up to 4 dm. or more long including the loosely few- (about 12-) flowered raceme. Floral bracts triangular-cucullate, acute to subacuminate, scarious, spreading, 5–10



FIG. 175. *Aspasia epidendroides*. Plant ($\times \frac{1}{2}$); bottom, lip and column, front-side view ($\times 1\frac{1}{2}$). Drawn by G. W. Dillon.

mm. long. Flowers showy, distichously arranged on the rachis, with slender pedicellate ovaries that are 1.2–1.5 cm. long. Sepals and petals orange-yellow spotted with reddish brown. Sepals linear-lanceolate, gradually becoming long-acuminate to filiform-setaceous or caudate, 3–5 mm. wide near the base; dorsal sepal 3.5–7.5 cm. long; lateral sepals oblique, 7.5–18 cm. long. Petals narrowly lanceolate, long-acuminate, 1.5–3.5 cm. long, 3–4 mm. wide near the base. Lip sessile, yellowish or greenish, with reddish brown blotches near the base, oblong-elliptic to broadly elliptic-obovate, more or less abruptly long-acuminate, with the upper margins crenulate and involute, 1.5–4 cm. long, 7–13 mm. wide at about the middle; disk with a pair of contiguous pubescent lamellae at the base, with the lamellae broken up into teeth in front. Column erect, stout, about 4 mm. long. Capsule ellipsoid or cylindrical, stipitate, 4–5 cm. long, 1–1.5 cm. in diameter.

This species is distinguished from the other two species found in Guatemala by its differently shaped, more or less abruptly acuminate lip, which is only blotched at the base instead of being spotted over its entire disk. The dissected callus also distinguishes this species.

Petén: Tikal, *Bartlett* 12659(?). Tikal, on ruins (specimen in Herbarium of University of Michigan).

Brassia maculata R. Br. in Ait. Hort. Kew. ed. 2, 5: 215. 1813. *B. Wrayae* Skinner, Bot. Mag. 69: t. 4003. 1843 (type: Guatemala, *Skinner*). *B. guttata* Lindl. in Benth. Pl. Hartw. 94. 1842 (type: Guatemala, in loco "chono" dicto, *Hartweg*). *Oncidium Brassia* Reichb. f. in Walp. Ann. Bot. 6: 765. 1863.

Epiphytic or rarely terrestrial, usually at low elevations, up to 750 meters alt. Uncommon in British Honduras, Guatemala, and Honduras.

Plant up to 10 dm. or more tall. Pseudobulbs from a stout creeping rhizome, oblong-elliptic to ovoid, compressed, 1–2-leaved, 6–15 cm. long, 2–4.5 cm. wide, subtended by large scarious leaf-sheaths or non-leaf-bearing sheaths. Leaves from the apex of the pseudobulbs and sometimes from the rhizome, oblong-ligulate, obtuse to acute, somewhat oblique, conduplicate at the base, coriaceous, 1.3–4.5 dm. long, 3.5–5.5 cm. wide. Peduncle from the base of the pseudobulb, subtended by a leaf-sheath, provided with remote tubular bracts, green, flecked with brownish purple, up to 9 dm. long including the loosely few- to many-flowered raceme. Floral bracts ovate-cucullate, obtuse, scarious, spreading, 5–10 mm. long. Flowers showy, greenish yellow, with purple markings, distichously arranged on the rachis, with slender pedicellate ovaries that are 1.5–2.5 cm. long. Sepals greenish, spotted with purple, linear-lanceolate, acuminate-attenuate, concave below, 3.5–6.5 cm. long, 4–6 mm. wide near the base; lateral sepals oblique. Petals greenish yellow, spotted with purple on the lower half, linear-lanceolate, falcate, antrorsely erect, acuminate-attenuate, 2.2–3.5 cm. long, 3.5–4.5 mm. wide near the base. Lip yellowish and purple-spotted, sessile, from a broad base, dilated about the middle to form a triangular-ovate apical portion, with the un-

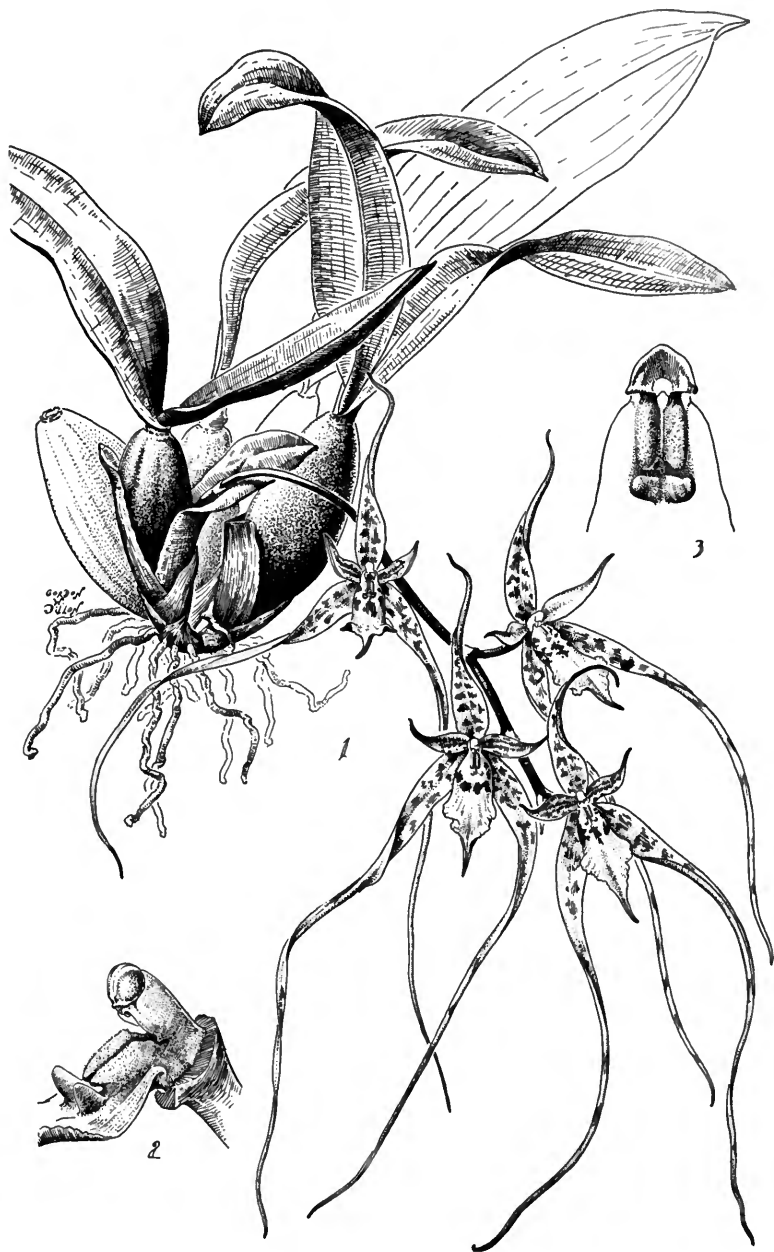


FIG. 176. *Brassia caudata*. 1, plant ($\times \frac{1}{2}$); 2, base of lip, to show calli, and column, front-side view ($\times 2\frac{1}{2}$); 3, base of lip, to show calli, with column removed, from above ($\times 2\frac{1}{2}$). Drawn by G. W. Dillon.

dulate-crenulate margins recurved, somewhat conduplicate at the rounded to obtuse apex, usually mucronate, 2.2–3.2 cm. long, 1.8–2.5 cm. wide about the middle; disk adorned at the base with a yellowish or orange-colored slightly pubescent bilamellate callus that is about 6 mm. long and 1 mm. wide. Column short, stout, bright green, flecked with brown, about 5 mm. long.

This species differs from *B. caudata* in the shape and coloration of the lip, and the entire, not dissected, callus. It differs from *B. verrucosa* in lacking the green tubercles on the lip, a characteristic of that species.

Guatemala: Fiscal, *Deam* 6151.—Petén: Uaxactun, *Bartlett* 12699. La Libertad, *Lundell* 2831.—Santa Rosa: Zamorora, *Heyde & Lux* 4617. Santa Rosa, *Heyde & Lux* 3485.—“Bought from Indian in Guatemala City who said it came from near Esclavos Bridge on road to Salvador,” *Lewis* 165. “Guatemala Market,” *Johnston* 1477.

Brassia verrucosa Lindl. Bot. Reg. 26: Misc. p. 36. 1840; Batem. Orch. Mex. & Guatem. t. 22. 1840 (type: Guatemala, *Barker*). *B. brachiata* Lindl. in Benth. Pl. Hartw. 94. 1842 (type: Guatemala, Hacienda de la Laguna, *Hartweg*). *B. aristata* Lindl. Bot. Reg. 30: Misc. p. 7. 1844 (type: Guatemala, *Skinner*). *B. odontoglossoides* Kl. & Karst. Allgem. Gartenzeit. 15: 330. 1847. *B. coryandra* Morr. Ann. Soc. Roy. Bot. Gand. 4: 295. t. 212. 1848. *B. longiloba* DC. Mem. Soc. Phys. Genève 11: 427. 1848 (type: Guatemala, *Skinner*). *Oncidium verrucosum* (Lindl.) Reichb. f. in Walp. Ann. Bot. 6: 768. 1863. *O. brachiatum* (Lindl.) Reichb. f. in Walp. Ann. Bot. 6: 768. 1863. Figure 177.

Epiphytic on trees in damp or open forests, up to 1,600 meters alt. Mexico, Guatemala, Honduras, and Venezuela; uncommon.

Plant up to 8 dm. or more tall. Pseudobulbs narrowly ovoid, compressed, clustered, 6–10 cm. long, 2.5–4 cm. wide, about 1 cm. thick, bifoliate, subtended by several scarios leaf-sheaths or non-leaf-bearing sheaths. Leaves two, from apex of pseudobulbs and sometimes from the short rhizome, oblong-elliptic to lanceolate or oblanceolate, acute, coriaceous, conduplicate at the base, 1.3–4.5 dm. long, 3–4.5 cm. wide. Peduncle from base of pseudobulb, green or often dark purple, usually subtended by a leaf, provided with remote tubular scarios bracts, up to 7.5 dm. or more long including the loosely few-flowered raceme. Floral bracts triangular-cucullate, acute, amplexicaul, spreading, 5–10 mm. long. Flowers showy, distichously arranged on the rachis, pale green spotted with red or green, with slender pedicellate ovaries that are 2–3 cm. long. Sepals linear-lanceolate, acuminate or long-attenuate, occasionally somewhat undulate, yellowish green, with dark brown spots near the base, 5–12 (rarely 15) cm. long, 3–7 mm. wide near the base; dorsal sepal shorter than the lateral sepals; lateral sepals oblique. Petals linear-lanceolate, falcate, acuminate to long-attenuate, pale green with dark brown spots near the base, 3.5–5.5 (rarely 8.5) cm. long, 3–7 mm. wide near the base. Lip sessile, whitish, adorned with green warts (especially on the

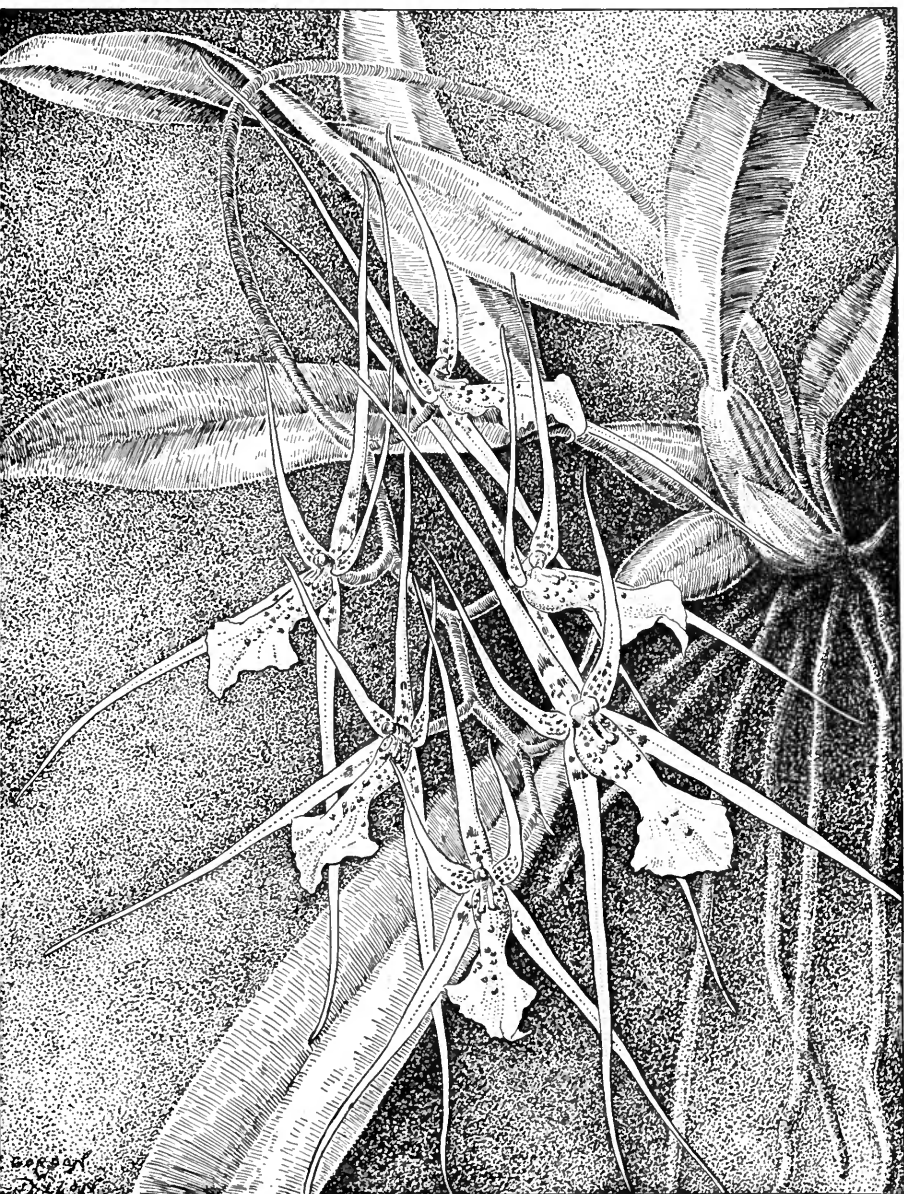


FIG. 177. *Brassia verrucosa*. Plant ($\times 1$). Drawn by G. W. Dillon.

lower half) and reddish spots at the base, broadly cuneate on the lower half, dilated about the middle to form a subcordate apical portion, with the undulate margins recurved, broadly rounded to acuminate or abruptly aristate at the apex, 1.8–3.5 (rarely 5) cm. long, 1.3–2.5 cm. wide about the middle; disk adorned at the base with a yellowish more or less pubescent bilamellate callus that is about 5 mm. long and 1.5 mm. wide, with each lamella terminating in one or two small erect or spreading excrescences. Column small, green, minutely papillose, about 5 mm. long. Capsule ellipsoid, erect, about 3 cm. long.

This species is distinguished from *B. caudata* and *B. maculata* by its conspicuously tuberculate or warty lip.

Baja Verapaz: Rocky hills near and above Santa Rosa, *Standley* 91250.—Santa Rosa: Chiapas, *Heyde & Lux* 4623.—Sololá: Bordering barranca on Finca Olas de Mocá, just west of Finca Mocá, south-facing slopes of Volcán Atitlán, *Steyermark* 47623.—“Near San Juan Sacatepéquez,” *Lewis* 126.—“Guatemala,” *Bates* 6.

79. PALUMBINA Reichb. f.

Small epiphytic plants with small unifoliate pseudobulbs and lateral few-flowered inflorescences. Leaves narrow, subcoriaceous. Flowers small, rather simple. Dorsal sepal free, erect. Lateral sepals entirely united. Petals free, spreading. Lip sessile, simple, entire, ovate-elliptic, adorned at the base with a fleshy callus which connects it firmly with the short column. Column short, thick, winged at the apex; anther depressed, terminal, operculate; pollinia 4, oblong-pyriform, provided with a double caudicle.

This monotypic genus is closely allied to *Oncidium*, to which genus it was originally referred.

Palumbina candida (Lindl.) Reichb. f. in *Walp. Ann. Bot.* 6: 699. 1863. *Oncidium candidum* Lindl. *Bot. Reg.* 29: Misc. p. 56. 1843 (type: Guatemala, 1840, *Hartweg*). Figure 178.

Apparently epiphytic. Very rare and apparently endemic to Guatemala.

Plant small, graceful, up to 4 dm. or more tall. Pseudobulbs narrowly ellipsoid, compressed, unifoliate, about 4.5 cm. long and 1.5–2 cm. wide, subtended by a pair of brownish scarios sheaths. Leaf from apex of pseudobulb, linear-elliptic to linear-lanceolate, acute to acuminate, strongly conduplicate at the base, subcoriaceous, flexuous, 1–3 dm. long, 1–1.5 cm. wide. Peduncle appearing with the young growth in the axil of the sheath, dark purple, slender, erect or spreading, provided with small scarios remote bracts, up to 3 dm. or more long including the few-flowered flexuous raceme. Floral bracts minute, triangular, acute, scarios, about 1 mm. long. Flowers of a firm texture, pure white except for several small violet dots (usually at the base of each petal) and the yellow callus at the base of the lip, with slender pedicellate ovaries that are 1.5–2 cm. long. Dorsal sepal erect, broadly elliptic to oblong-elliptic, rounded to broadly

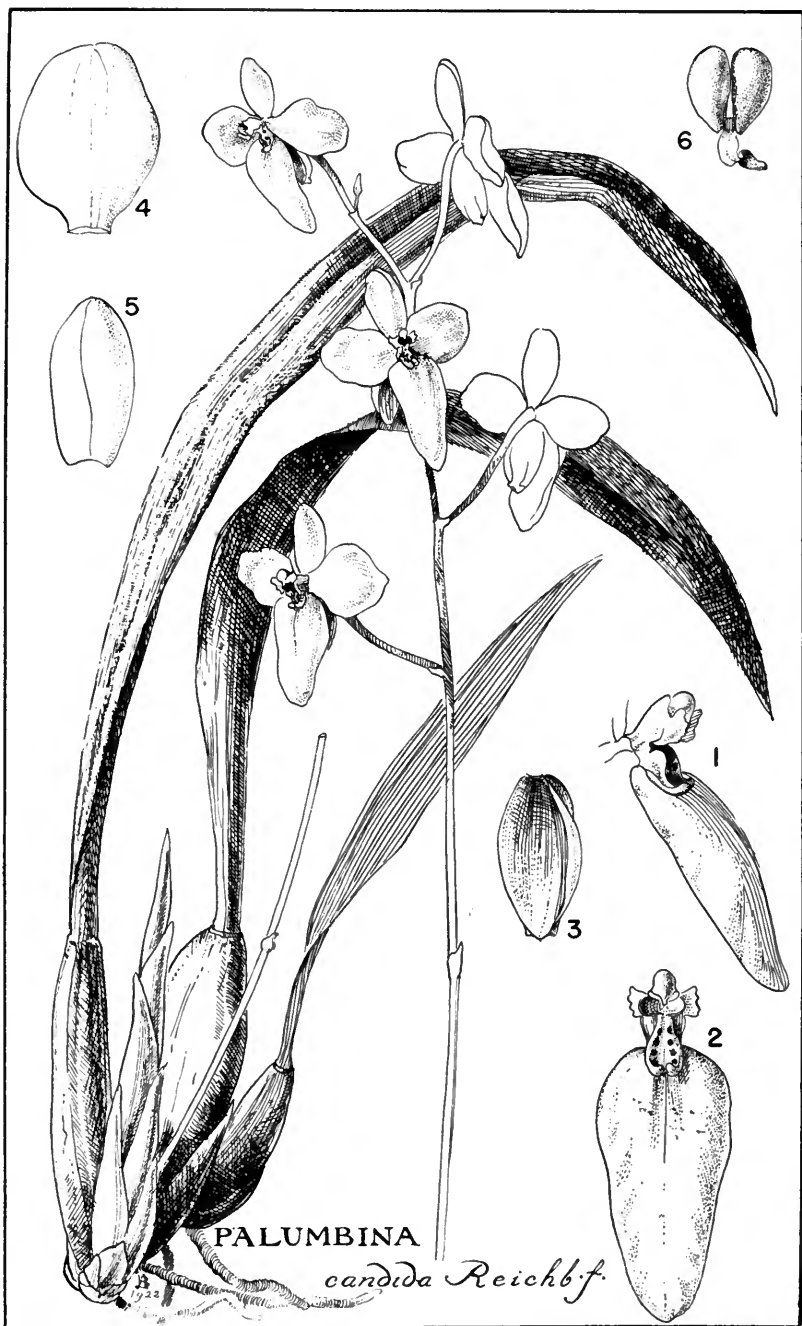


FIG. 178. *Palumbina candida*. Plant ($\times 1$); 1, column and lip, front-side view (about $\times 2$); 2, column and lip, front view (about $\times 2$); 3, lateral sepals ($\times 2$); 4, petal (about $\times 2$); 5, dorsal sepal ($\times 2$); 6, pollinia (much enlarged). Drawn by Blanche Ames.

obtuse at the apex, about 1 cm. long and 4.5–5.5 mm. wide. Lateral sepals entirely united; lamina elliptic, more or less bifid at the apex, 9–10 mm. long, about 5 mm. wide. Petals obovate, rounded to somewhat notched or rarely obtuse at the apex, 1–1.1 cm. long, 6–7.5 mm. wide above the middle. Lip sessile, ovate-elliptic, broadly obtuse to rounded at the apex, convex, adorned with a fleshy tuberculate yellow red-spotted callus at the base, 1.4–1.6 cm. long, 7.5–8.5 mm. wide across the base. Column connate with the lip, short, thick, provided with subquadrate erose spreading wings on each side at the apex, about 4 mm. long.

Only horticultural specimens of this species have been seen. As far as we know, it has not been collected in nature for nearly one hundred years.

80. ONCIDIUM Sw.

Epiphytic, terrestrial or rock-inhabiting plants with variously shaped conspicuous or greatly reduced pseudobulbs from a short or elongated rhizome, often apparently pseudobulbous; pseudobulbs terminated by one or more leaves. Leaves from the apex of the pseudobulbs or subtending the pseudobulbs, equitant, flat or terete, membranaceous to fleshy-coriaceous. Peduncle lateral, from the base of the pseudobulbs or in the axil of the leaves or sheaths. Inflorescence a raceme or simple or compound panicle, often much-elongated and branched, few- to many-flowered. Flowers variously colored, showy or inconspicuous. Sepals usually subequal, spreading or reflexed, rarely connivent, free or with the lateral ones more or less connate. Petals similar to the dorsal sepal or sometimes larger. Lip adnate to the base of the column and usually forming a right angle with the column, entire or more or less three- (or more) lobed, with the apical lobe usually much larger than the other lobes, commonly with a crest or variously tuberculate callus at the base of the lamina. Column short, thick, usually but not always provided with petaloid wings or auricles on each side at the apex, footless or occasionally with an incipient foot present; anther terminal, operculate, incumbent; pollinia 2, waxy, usually deeply sulcate. Capsule ovoid to ellipsoid or fusiform, more or less beaked.

This is a large and polymorphic genus of more than 450 species, all of which are native of the American tropics and subtropics. The species are extremely complex and form a closely allied group of plants, many of which approach *Odontoglossum*. A large number are cultivated and constitute what are known as "spray orchids" on the market.

1. Leaves equitant; plant less than 1 dm. tall.
2. Petals more than 4.5 mm. long; callus of lip not fimbriate or tufted with hairs; column-wings broadly rounded *O. pusillum*.
2. Petals less than 4.5 mm. long; callus fimbriate or tufted; column-wings not broadly rounded.
3. Petals more than 3 mm. long; callus 4-lobulate with the divergent lobules provided with a tuft of hairs at the apex; column-wings dolabriform.
O. glossomystax.
3. Petals less than 3 mm. long; callus with the apical bilobulate flap fimbriate; column-wings subquadrate-flabellate *O. Titania*.

1. Leaves not equitant; plant more than 1 dm. tall (except in *O. crista-galli*).
4. Leaves terete, fleshy-thickened.
 5. Lateral lobes of lip less than 5.5 mm. long; column-wings linear-oblong, falcate, projecting. *O. ascendens*.
 5. Lateral lobes of lip more than 5.5 mm. long; column-wings subquadrate, spreading. *O. cebolleta*.
4. Leaves flat, fleshy-thickened or chartaceous.
 6. Plant small, less than 1 dm. tall; peduncles several, less than 8 cm. long. *O. crista-galli*.
 6. Plant large, more than 1.5 dm. tall; peduncle usually solitary, more than 10 cm. long.
 7. Leaves rather broadly elliptic, short or rarely elongate, with the sides distinctly rounded, not parallel; pseudobulbs mostly 1-leaved.
 8. Pseudobulbs less than 3.5 cm. long, 1-leaved, entirely concealed by sheaths; leaves rigidly fleshy-coriaceous.
 9. Lip about as wide across the lateral lobes as across the mid-lobe or with the mid-lobe minute.
 10. Lip about as wide across the lateral lobes as across the mid-lobe. *O. carthagenense*.
 10. Lip with the mid-lobe minute and apiculate. *O. microchilum*.
 9. Lip much broader across the large mid-lobe than across the lateral lobes.
 11. Sepals and petals unspotted, greenish yellow to deep yellow, bordered with yellow or crimson; inflorescence usually a raceme. *O. bicallosum*.
 11. Sepals and petals spotted with reddish brown or purplish brown; inflorescence a panicle.
 12. Mid-lobe of lip less than 1.1 cm. wide; petals less than 1 cm. long. *O. nanum*.
 12. Mid-lobe of lip more than 1.2 cm. wide; petals more than 1 cm. long.
 13. Lip more than 1.2 cm. wide across the lateral lobes; lateral lobes prominent, obovate. *O. Cavendishianum*.
 13. Lip less than 1 cm. wide across the lateral lobes; lateral lobes small, auriculate. *O. luridum*.
 8. Pseudobulbs more than 3.5 cm. long, 1- or 2-leaved, not completely concealed by sheaths; leaves chartaceous or rigidly fleshy-coriaceous.
 14. Lip with a large mid-lobe, which is much broader than across the short or obsolescent lateral lobes.
 15. Lip about 4 cm. long. *O. splendidum*.
 15. Lip less than 3 cm. long. *O. ampliatum*.
 14. Lip without a large mid-lobe, subentire or panduriform, about as wide across the lateral lobes as across the mid-lobe.
 16. Lip rhombic-ovate in outline, obscurely lobed on each side below the middle. *O. maculatum*.
 16. Lip more or less panduriform, distinctly lobed.
 17. Sepals and petals linear-subulate, long-attenuate; pseudobulb 1-leaved. *O. phymatochilum*.
 17. Sepals and petals not as above; pseudobulb 2-leaved.
 18. Sepals more than 2 cm. long and 6 mm. wide; callus of lip linear; column-wings semiquadrate. *O. stelligerum*.
 18. Sepals less than 2 cm. long and 6 mm. wide; callus of lip obovate in outline; column-wings not semiquadrate.

19. Pseudobulbs distant, arising at intervals from a creeping rhizome; sepals less than 3.5 mm. wide; column-wings triangular *O. pergamenum*.
19. Pseudobulbs approximate; sepals more than 3.5 mm. wide; column-wings dolabriform *O. ansiferum*.
7. Leaves linear to narrowly lanceolate, sometimes very narrowly elliptic, with the sides essentially parallel, usually much-elongate; pseudobulbs mostly 2-leaved.
20. Lip simple or obscurely 3-lobed, not prominently lobed at the base.
21. Lip broadest below the middle *O. maculatum*.
21. Lip broadest above the middle.
22. Callus of lip terminated above in a free central porrect obtuse keel and a pair of short tapering lateral keels. *O. brachyandrum*.
22. Callus of lip terminated above in a pair of quadrate flap-like divergent keels, provided on each side about the middle with a fleshy divergent tooth *O. Johannis*.
20. Lip not simple, variously lobed.
23. Lip about as wide across the lateral lobes as across the mid-lobe, occasionally broader.
24. Flowers rose-colored or pinkish purple . . . *O. ornithorhynchum*.
24. Flowers basically yellow or yellowish green, usually marked with reddish brown or purplish brown.
25. Lip somewhat wider across the lateral lobes than across the mid-lobe.
26. Leaves not contracted into a petiole at the base, conduplicate; column-wings obsolescent *O. ochmatochilum*.
26. Leaves contracted below to form a petiole, not conduplicate; column-wings prominent, triangular-auriculate.
27. Petals rounded to subtruncate or retuse at the apex, more than 6 mm. wide; lip more than 1.4 cm. wide across the lateral lobes *O. Wentworthianum*.
27. Petals acute-apiculate, less than 6 mm. wide; lip less than 1.4 cm. wide across the lateral lobes.
O. Wentworthianum var. *tenuis*.
25. Lip slightly wider across the mid-lobe than across the lateral lobes or about the same width.
28. Column-wings broadly dolabriform, with denticulate margins; lip usually more than 1.4 cm. long; inflorescence paniculate and much exceeding the leaves.
29. Lateral lobes of lip 1.5-3 mm. long; sepals and petals reddish brown, margined or only tipped at the apex with yellow *O. ansiferum*.
29. Lateral lobes of lip 3-6 mm. long; sepals and petals yellowish green, blotched or suffused with purplish brown *O. reflexum*.
28. Column-wings triangular-auriculate; lip usually less than 1.4 cm. long; inflorescence usually racemose and about equal to the leaves *O. Suttoni*.
23. Lip usually much wider across the mid-lobe than across the lateral lobes.
30. Callus of lip provided with 5 to 9 slender fleshy teeth or filaments which are spreading and recurved *O. leucochilum*.
30. Callus of lip not as above.
31. Sepals and petals more than 9 mm. wide *O. oliganthum*.
31. Sepals and petals less than 8 mm. wide.

32. Column-wings subquadrate, entire; callus small, umbonate, lightly sulcate above; sepals and petals 3 mm. or less wide.
O. tenuipes.
32. Column-wings not subquadrate, mostly crenulate or denticulate; callus variously lobed; sepals and petals 3 mm. or more wide.
33. Column-wings broadly dolabriform.
34. Width across the lateral lobes of the lip about one-third as wide as the mid-lobe; callus terminated by 3 subequal keel-like tubercles. *O. nebulosum.*
34. Width across the lateral lobes of the lip about two-thirds as wide as the mid-lobe; callus terminated by 5 elongate horn-like tubercles. *O. ensatum.*
33. Column-wings auriculate.
35. Column-wings conspicuously bordered with brown; callus with a pair of divergent lateral tubercles at the apex; isthmus separating the lateral lobes from the mid-lobe of the lip broad, up to 8 mm. wide.
O. sphacelatum.
35. Column-wings not bordered with brown; callus unequally tridentate at the apex; isthmus separating the lateral lobes from the mid-lobe of the lip narrow, less than 5.5 mm. wide. *O. oblongatum.*

***Oncidium ampliatum* Lindl. Gen. & Sp. Orch. Pl. 202. 1834.**

Oncidium Bernoullianum Kränzl. in Engler, Pflanzenr., Oncidiinae 4, 50: 231. 1922 (type: Guatemala, January, 1866, *Bernoulli* 339). Figures 179, 180.

Epiphytic on trees, usually at low elevations, from sea level up to 600 meters alt. Rather common in Guatemala, Nicaragua, Costa Rica, Panama, Trinidad, and Colombia.

Plant usually stout, up to 1 meter tall. Pseudobulbs congested on a short stout rhizome, orbicular, strongly compressed, disk-shaped, 1-2-leaved, often suffused or spotted with purplish brown, up to 10 cm. in diameter, subtended by scarious-fibrous sheaths. Leaves 1-2 from the apex of a pseudobulb, elliptic-ob lanceolate to linear-elliptic, obtuse to rounded at the apex, fleshy-coriaceous, 1-4 dm. long, up to 9.5 cm. wide. Peduncle from base of pseudobulb, 4-10 dm. long, including the few- to many-flowered simple or branched inflorescence. Floral bracts small, ovate, obtuse, concave, about 3 mm. long. Flowers pale yellow or yellow-white, usually spotted with brown on the base of the lip and petals, with slender arcuate pedicellate ovaries that are 2.5-3.5 cm. long. Sepals broadly spatulate to obovate-spatulate, rounded at the apex, with the upper half cochleate or deeply concave, incurved, 6-9 mm. long, up to 9 mm. wide above the middle when spread out. Petals shortly unguiculate, cuneate-flabellate to broadly spatulate or suborbicular, rounded and sometimes crenulate at the apex, 7-11 mm. long, 6-10 mm. wide. Lip shortly unguiculate, 3-lobed, 1.4-2.5 cm. long; lateral lobes obsolescent, auricle-like, with revolute margins, obtuse, up to 3 mm. long and wide; mid-lobe large, separated from the lateral lobes by a short narrow isthmus, transversely oblong to broadly reniform, deeply emarginate or bilobulate, with the margins more or less repand, 1.8-3.2 cm. wide;

callus between the lateral lobes, composed of three reddish brown spotted lobules, the lateral lobules compressed and divergent, the middle lobule trituberculate. Column short, thick, about 3.5 mm. long, provided above with 2-3 red-spotted coarsely toothed lobules, the apical lobules smaller than the lateral ones and bifid. Capsule ellipsoid-fusiform, 3-3.5 cm. long.

This species is commonly known in Costa Rica as "Luvia de oro." It is characterized by the obsolescent lateral lobes and peculiar callus of the lip, and the trialate column.

Represented from Guatemala only by the type of *O. Bernoul-
lianum*.

Oncidium ansiferum Reichb. f. Bot. Zeit. 10: 696. 1852. *O. tenue* Lindl. var. *grandiflorum* Lindl. Journ. Hort. Soc. 8: 271, fig. 1852 (type: Guatemala, *Skinner*). *O. delumbe* Lindl. Fol. Orch., Oncid. 48. 1855 (type: Guatemala, *Skinner*).

Epiphytic on trees in forests, up to 2,500 meters alt. Rather common in Costa Rica; rare in Guatemala and Panama.

Plant usually large, coarse and stout, up to 1 meter or more tall. Pseudobulbs clustered or arising at short intervals from a stout rhizome, broadly elliptic-oblong to suborbicular, strongly ancipitous, 1-2-leaved, 6-14 cm. long, 3.5-7 cm. wide, very thin, subtended by a leaf-sheath on each side and by non-leaf-bearing sheaths. Leaves 1-2 at the apex of the pseudobulbs, also subtending the pseudobulbs and peduncles, oblong-elliptic to elliptic-oblancoate or ligulate, obtuse to acute, conduplicate at the base, more or less coriaceous, 1-4.5 dm. long, 2-5.5 cm. wide. Peduncle from the base of a pseudobulb, subtended by a leaf, provided at the nodes with short scarious bracts, up to 1 meter or more long including the inflorescence; inflorescence usually a long straggly panicle with numerous 3-8-flowered lateral branches, rarely a raceme. Bracts subtending the floral branches scarious, lanceolate, acuminate, about 1.3 cm. long. Floral bracts broadly triangular-ovate, acute, scarious, about 5 mm. long. Flowers usually somewhat malodorous, numerous, rather inconspicuous, with slender pedicellate ovaries that are 1.5-2.5 cm. long. Sepals and petals reddish brown, margined or only tipped at the apex with yellow, strongly undulate-cripsed on the margins, spreading-reflexed, recurved at the apex. Sepals with a slender short claw, oblong-elliptic to elliptic-lanceolate or linear-oblong, acute to shortly acuminate, 1.2-1.7 cm. long, 4-6 mm. wide at the widest point; lateral sepals slightly oblique, dorsally carinate with the keel usually ending above as a submarginal apicule. Petals oblong-elliptic to broadly elliptic-lanceolate, obtuse-apiculate, somewhat oblique, 1-1.6 cm. long, 4-7 mm. wide. Lip yellow, blotched with reddish brown on the broad isthmus, 3-lobed, panduriform, broadly rounded-cuneate at the base, 1.4-1.8 cm. long, 9-13 mm. wide across the small lateral lobes; lateral lobes auriculiform, rounded at the apex and directed forward, 1.5-3 mm. long and wide; mid-lobe separated from the lateral lobes by a broadly triangular isthmus, semiorbicular-bilobulate or broadly obreniform, emarginate with an apicule in the sinus, 1-1.5



cm. wide; callus basal, fleshy, obovate in outline, with 2-4 fleshy teeth on each side above the middle and 3 teeth in front, 3-5 mm. long, 2-4 mm. wide. Column stout, about 6 mm. long, provided with a broad more or less toothed-crenulate red-spotted dolabriform wing on each side at the apex. Capsule ellipsoid, 4 cm. long.

An examination of Lindley's illustration of *O. tenue* var. *grandiflorum* shows the characteristic broad, thin pseudobulbs and long-branched inflorescence of *O. ansiferum*. The floral analysis of that variety also agrees with type material of *O. ansiferum*. An examination of a photograph of the herbarium sheet bearing the type specimens of *O. tenue* and its variety *grandiflorum* shows that the material of these two segregates was apparently confused on the sheet when it was originally mounted. This has resulted in confusion ever since. Apparently even Lindley, himself, according to his later writings, was confused by this error. Some forms of *O. ansiferum* approach *O. tenue* (= *O. Wentworthianum* var. *tenue*). However, the different callus and column-wings easily separate these two segregates.

Represented from Guatemala only by the type collection of *O. tenue* var. *grandiflorum*.

Oncidium ascendens Lindl. Bot. Reg. 28: sub t. 4. 1842 (type: Guatemala).

Epiphytic on trees in swamps, open mountain forests, pastures, and coffee plantations, up to 1,500 meters alt. Widespread and rather common from Mexico to Costa Rica and in the West Indies.

Plant erect or ascending, often forming large colonies, up to 8 dm. or more tall. Pseudobulbs short, ovoid, 1.5-2 cm. long, about 1 cm. thick, 1-2-leaved, concealed by large scarios sheaths. Leaves erect or dependent-spreading, terete, shallowly sulcate, tapering to a sharp apex, up to 8 dm. long and 1 cm. thick. Peduncle from base of pseudobulb, enveloped (with the leaf) at the base by the sheaths surrounding the pseudobulb, curved-ascending, provided at the nodes with scarios bracts, 1.5-5 dm. or more tall including the simple or branched raceme; the branches subtended by rather large grayish scarios bracts. Floral bracts small, triangular, acuminate, spreading-reflexed, 1.5-3 mm. long. Flowers small, showy, yellow, marked with reddish brown stains, with slender pedicellate ovaries that are about 1 cm. long. Sepals and petals spreading-reflexed. Sepals obovate, conspicuously narrowed at the base, obtuse to rounded at the apex, deeply concave, 7-10 mm. long, 3.5-5.5 mm. wide; lateral sepals oblique. Petals elliptic to subquadrate, truncate to rounded or somewhat retuse at the apex, oblique, 7-9 mm. long, 3.5-6 mm. wide. Lip deeply 3-lobed, yellow marked with red-brown on the lower part, 8-12 mm. long; lateral lobes obliquely oblong to narrowly obovate-elliptic, obtuse to rounded at the apex, erect, 4.5-5 mm. long, 2-3.5 mm. wide above the middle; mid-lobe semiorbicular to transversely elliptic, deeply notched at the apex, 10-15 mm. wide; callus on base of lip, 3.5-5 mm. long,



FIG. 180. *Oncidium ampliatum*. Plant ($\times \frac{1}{3}$); right side, flower ($\times 1$); left side, column and basal part of lip ($\times 1\frac{1}{2}$). Drawn by Dorothy O. Allen.

2-3 mm. wide, erect, composed of a blunt rounded central keel flanked by two or more irregularly tuberculate excrescences. Column short, stout, fleshy, 4-5 mm. long, provided with a linear-oblong falcate projecting wing on each side at the apex. Capsule ellipsoid, 2-2.5 cm. long.

This species is distinguished from *Oncidium cebolleta*, to which it is closely allied, by the narrow excedent wings of the column, the smaller erect lateral lobes of the lip, and the more irregular callus.

(?)Escuintla: Between Río Jute and Río Pantaleón, on road between Escuintla and Santa Lucía Cotz, *Standley* 63485.—Petén: La Libertad, *Lundell* 2332; 2165. Uaxactun, *Bartlett* 12208. La Libertad, *Aguilar* 386.—Zacapa: Desert between Teculután and Monte Grande, *Steyermark* 42181.—Osuna, *Johnston* 1414.

Oncidium bicallosum Lindl. in Benth. Pl. Hartw. 94. 1842 (type: Guatemala, Hacienda de Diegero, *Hartweg*).

Epiphytic on trees, up to 1,500 meters alt. Rare in Mexico and Guatemala.

Plant stout, coarse, up to 6.5 dm. or more tall. Pseudobulbs small, from a short thick rhizome, less than 1.5 cm. long, unifoliate, concealed by several scarios distichous sheaths. Leaf solitary at the apex of the obsolescent pseudobulb, erect, oblong-elliptic, obtuse, sulcate, fleshy-coriaceous, 1.4-3.3 dm. long, 4-8.5 cm. wide. Peduncle from the base of a pseudobulb, provided at the nodes with scarios bracts that are up to 2.5 cm. long, 2-6.5 dm. long including the several-to many-flowered commonly pendulous raceme; raceme rarely branched. Floral bracts ovate to ovate-elliptic, obtuse, cucullate, up to 1 cm. long. Flowers large, handsome, fragrant, with slender pedicellate ovaries that are 3.5-4.5 cm. long. Sepals and petals greenish yellow to deep yellow, bordered with yellow or deep crimson, commonly suffused with brown. Sepals obovate-spatulate to suborbicular-obovate, rounded at the apex, scarcely or not at all undulate, 1.5-2 cm. long, 1.2-1.6 cm. wide; dorsal sepal galeate to form a hood over the column; lateral sepals concave, slightly oblique. Petals suborbicular-obovate, broadly rounded to somewhat obtuse at the apex, with undulate-cripsed margins, 1.5-2 cm. long, 1-1.5 cm. wide. Lip yellow, deeply 3-lobed, 2-3 cm. long; lateral lobes basal, small, auricle-like, fleshy, antrorsely falcate, rounded at the apex, with strongly revolute margins, 6.5-8 mm. long, 3.5-4.5 mm. wide; mid-lobe large, separated from the lateral lobes by a broad isthmus, transversely oblong to broadly reniform, deeply emarginate or bilobulate, with somewhat undulate-cripsed margins, 2.6-3.8 cm. wide; callus white with red spots, composed of a pair of tubercles, the basal one broad and entire, the upper one narrow and trilobulate. Column stout, 10-12 mm. long, provided on each side at the apex with a fleshy falcate deflexed auriculate wing. Capsule bright yellow, ellipsoid, about 3.5 cm. long.

This species differs from *O. Cavendishianum*, to which it is closely allied and resembles in habit, in the usually racemose (not paniculate) inflorescence, the commonly larger yellowish brown-green suf-

fused unspotted flowers, the smaller lateral lobes of the lip, and the bicallose (not tricallose) callus.

Alta Verapaz: "Purchased from Indian in Guatemala City; said to have come from Cobán," *Lewis* 87a.—Guatemala: Guatemala, *Johnston* 1372.—Quiché: Nebaj, *Skutch* 1666.

Oncidium brachyandrum Lindl. Sert. Orch. sub t. 25. 1838.
O. graminifolium Lindl. Sert. Orch. sub t. 48. 1841. *Cyrtochilum filipes* Lindl. Bot. Reg. 27: t. 59. 1841 (type: Guatemala, *Skinner*).
Oncidium filipes Lindl. Sert. Orch. sub t. 48. 1841.

Terrestrial or on rocks on stream banks and in open mountain forests, usually at high elevations, up to 3,000 meters alt. Uncommon in Mexico, Guatemala, and Honduras.

Plant slender, up to 9 dm. tall. Pseudobulbs numerous, clustered on a short creeping rhizome, ovoid to ellipsoid, compressed, somewhat purple-spotted, 2-3-leaved, 3-8 cm. long, 2-4.5 cm. wide, more or less concealed by scarios sheaths. Leaves 2-3 at apex of pseudobulbs, also produced on the rhizome, linear to linear-lanceolate, acuminate, conduplicate below, rather thin, 1-5 dm. long, 1-1.8 cm. wide. Peduncle from base of pseudobulb, slender, elongated, subtended by leaf-sheaths, provided at the nodes with closely appressed scarios sheaths that are up to 3 cm. long, up to 9 dm. long including the few- to many-flowered simple or branched inflorescence. Floral bracts small, triangular-ovate, acute, concave, 3-8 mm. long. Flowers yellow and reddish brown, with slender pedicellate ovaries that are 1.5-3 cm. long. Sepals and petals yellow or greenish yellow, mottled with reddish brown, somewhat spreading. Sepals elliptic-oblong to elliptic-ob-lanceolate, rounded to acute-apiculate at the apex, more or less dorsally carinate, concave, 1-1.5 cm. long, 4-7 mm. wide; lateral sepals oblique, free or somewhat united. Petals oblong-elliptic to elliptic-ob-lanceolate, rounded to subacute at the apex, somewhat dorsally carinate, 9-12 mm. long, 4-6 mm. wide. Lip simple, yellow, cuneate-obovate to cuneate-flabellate, broadly rounded and deeply emarginate at the apex, with the apical margin decurved and more or less repand, 1.5-2.5 cm. long, 1.1-2.5 cm. wide; callus fleshy-thickened, linear, about 6 mm. long, marked with brown, terminating in a free central porrect obtuse keel and a pair of short tapering lateral keels extending above. Column short, fleshy, about 7 mm. long, yellow, with brown dots at the apex, provided on each side at the base with a pair of rounded fleshy lobes that clasp the callus of the lip and a pair of small auriculate wings on each side at the apex.

This species is apparently entirely terrestrial or rock-inhabiting. It is said to "grow like grass" on banks in open mountain forests. The simple lip and discoid pseudobulbs are characteristic of this species. It resembles *O. Johannis* very closely.

El Progreso: Sierra de las Minas, middle slopes of Volcán Siglo, above Calera, *Steyermark* 43126.—Guatemala: road to Mataques-cuintla, about 20 miles from Guatemala City, *Lewis* 102.—Quiché: Near Chichicastenango, *Hunnewell* 14677.—Santa Rosa: Santa Rosa,

Heyde & Lux 3487.—Zacapa: Sierra de las Minas, between Cerro de Monos and upper slopes of Monte Virgen, *Steyermark* 42895.—“Guatemala,” *Johnston* 1240.—“Guatemala,” *Spingarn*.—“Western Guatemala,” *Schmidt*.

Oncidium carthagense (Jacq.) Sw. Kongl. Vet. Acad. Nya Handl. 21: 240. 1800, as *chartaginense*. *Epidendrum carthagense* Jacq. Enum. Pl. Carib. 30. 1762. *Oncidium kymatoides* Kränzl. in Engler, Pflanzenr., Oncidiinae 4, 50: 112. 1922 (type: Guatemala, *H. von Türckheim*). Figure 181.

Epiphytic on trees in low humid forests or in open mountain forests, sometimes on rocks, from sea level up to 1,050 meters alt. Widespread and rather common from Florida through Mexico and Central America to Panama, the West Indies and northern South America.

Plant usually large, up to 2 meters or more tall. Pseudobulbs very small, less than 2.5 cm. long, arising from a short stout rhizome, unifoliate, concealed by scarios sheaths. Leaf solitary at the apex of the abbreviated pseudobulb, elliptic to oblong-elliptic or lanceolate, subobtuse to acute or subacuminate, rigid and coriaceous, sometimes somewhat marginate, 9–40 cm. long, 3–7 cm. wide. Peduncle from base of pseudobulb, subtended by a scarios sheath, provided at the nodes with small scarios sheaths that are 7–10 mm. long, up to 2 meters or more long including the much-branched (or rarely simple) many-flowered spreading panicle. Floral bracts small, scarios, ovate to ovate-lanceolate, acute, about 4 mm. long. Flowers small, showy, yellowish white, blotched with lavender, magenta, or reddish brown, with filiform pedicellate ovaries that are 1.5–2 cm. long. Sepals with a slender claw, conspicuously undulate-cripsed on the margin, 8–13 mm. long; claw with the involute margins forming a channel; dorsal sepal suborbicular, 5–8 mm. wide; lateral sepals broadly spatulate, 4–6 mm. wide. Petals with a broad short claw, broadly obovate, broadly rounded and occasionally retuse at the apex, conspicuously undulate-cripsed on the margins, 7–12 mm. long, 6–8 mm. wide. Lip panduriform, 3-lobed, 9–16 mm. long, 7–14 mm. wide at the widest point (about as wide across the lateral lobes as across the large mid-lobe); lateral lobes basal, semiorbicular, broadly rounded, with strongly revolute margins; mid-lobe reniform to broadly flabellate, broadly rounded and more or less retuse at the apex, separated from the lateral lobes by a broad isthmus; callus near base of the disk, composed of a pair of porrect mammillate swellings on the lower part and a short fleshy trilobulate thickening above. Column short, fleshy, 3–4 mm. long, provided at the apex with a pair of bilobulate wings that project outward for 2–3 mm. Capsule large, ellipsoid, up to 8 cm. long.

This species is closely allied to *O. luridum*.

Guatemala: About 40 miles from Guatemala City on road to El Salvador, *Lewis* 150.—Izabal: Quiriguá, *Porter* 29.—Santa Rosa: Mataquescuintla, Chiquimulilla, *Heyde & Lux* 6384.—Zacapa: Gualan, *Deam* 6369.

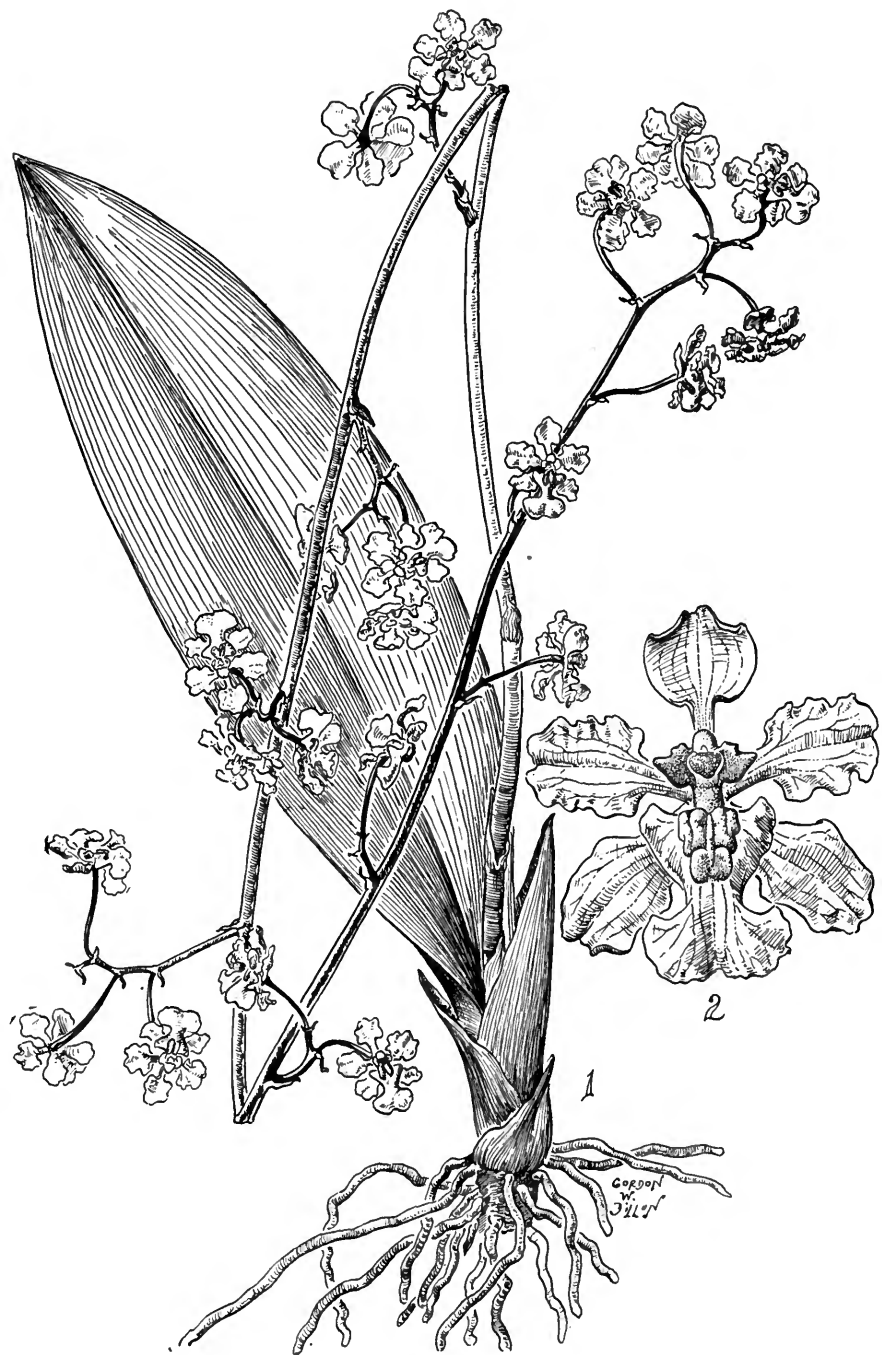


FIG. 181. *Oncidium carthagenense*. 1, plant ($\times \frac{2}{3}$); 2, flower ($\times 2$). Drawn by G. W. Dillon.

Oncidium Cavendishianum Batem. Orch. Mex. & Guatem. t. 3. 1837 (type: Guatemala, Dept. Guatemala, near Guatemala City, *Skinner*). *O. pachyphyllum* Hook. Bot. Mag. 67: t. 3807. 1840.

Epiphytic on trees, up to 2,800 meters alt. Rare in Mexico and Guatemala.

Plant large, up to 1.5 meters or more tall. Pseudobulbs obsolescent, less than 2 cm. long, unifoliate, concealed by several distichous scarious sheaths, producing large thick roots. Leaf solitary at the apex of the small pseudobulb, erect, elliptic to broadly lanceolate, acute to subobtusate, strongly carinate, fleshy-coriaceous, 1.5–4.5 dm. long, 5–13 cm. wide. Peduncle from the base of a pseudobulb, provided at the nodes with scarious bracts that are up to 2 cm. long, 6–15 dm. long including the many-flowered panicle; inflorescence rarely unbranched. Floral bracts small, triangular-ovate to ovate-elliptic, obtuse to acute, reflexed, concave, up to 8 mm. long. Flowers showy, yellow or greenish yellow, with reddish brown or chocolate-colored spots, very fragrant, with slender pedicellate ovaries that are 3.5–4.5 cm. long. Sepals obovate to suborbicular-obovate, obtuse to rounded at the apex, with undulate-cripsed margins, 1.2–1.7 cm. long, 7–12 mm. wide; dorsal sepal cochleate to form a hood over the column; lateral sepals concave, slightly oblique. Petals shortly unguiculate, oblong-obovate to elliptic-subquadrate, obtuse to rounded at the apex, with strongly undulate-cripsed margins, 1.2–1.6 cm. long, 8–11 mm. wide. Lip deep yellow, deeply 3-lobed, 1.4–2.5 cm. long; lateral lobes basal, obliquely suborbicular-obovate, rounded at the apex with strongly undulate margins, 7–13 mm. long, 6–12 mm. wide; mid-lobe large, separated from the lateral lobes by a short isthmus, transversely oblong to broadly reniform, deeply emarginate or bilobulate, with undulate-cripsed margins, 1.8–3.3 cm. wide; callus white, with reddish brown flecks, composed of a pair of erect tubercles below and a trilobulate tubercle above. Column short, thick, 8–10 mm. long, provided on each side at the apex with a falcate deflexed red-spotted auriculate wing. Capsule yellowish, about 3.5 cm. long.

This species is closely allied to *O. bicallousum*. This similarity is discussed under that species.

Guatemala: "Common around Guatemala City," *Lewis* 87. Guatemala Market, *Johnston* 1681. Market in Guatemala City, *Standley* 60625; *I. Aguilar* 180.—Sacatepéquez: Antigua, *Johnston* 1412.—Volcán Fuego, *J. D. Smith* 2642. "Guatemala," *Ruano* 815.

Oncidium cebolleta (Jacq.) Sw. Vet. Acad. Handl. Stockh. 21: 240. 1800. *Dendrobium cebolleta* Jacq. Enum. Pl. Carib. 30. 1760.

Epiphytic on trees in semiarid regions or occasionally in moist forests, usually at low elevations, up to 1,700 meters alt. Widely distributed and rather common from Mexico through Central America to Panama and the West Indies; in South America south to Paraguay.

Plant rigidly erect, variable in size, often forming large colonies, up to 12 dm. or more tall. Pseudobulbs short, conical to suborbicular, unifoliate, 1.5–2

cm. long, 1-1.5 cm. in diameter, concealed by closely appressed distichous scarios sheaths. Leaf solitary at the apex of the pseudobulb, fleshy, terete, slightly sulcate, tapering to the sharp apex, rigidly erect, often tinged or spotted with purple, 7-40 cm. long, 1-2.5 cm. in diameter. Peduncle from base of pseudobulb, enveloped (with the leaf) at the base by the sheaths surrounding the pseudobulb, erect to arcuate, provided at the nodes with scarios bracts, usually purplish-tinged, 1-12 dm. tall including the simple or branched few- to many-flowered raceme; branches of the inflorescence usually short. Floral bracts and bracts subtending the flowering branches similar, small, triangular-ovate to triangular-lanceolate, acute to acuminate, scarios, up to 1 cm. long. Flowers small, as many as 100 or more, yellow or greenish yellow with red-brown stains and spots, with slender slightly ascending pedicellate ovaries that are 1-2.5 cm. long. Sepals and petals spreading-reflexed, marked throughout with red-brown. Dorsal sepal broadly obovate, conspicuously narrowed at the base, wavy or pinched at the rounded to obtuse apex, concave, 6-9 mm. long, 3.5-5 mm. wide above the middle. Lateral sepals obliquely obovate, narrowed at the base, obtuse to subacute, 7-10 mm. long, 3-4 mm. wide above the middle. Petals obovate-oblancheolate to obovate-elliptic, rounded to subacute at the apex, undulate on the margins, 6.5-9 mm. long, 3.5-4 mm. wide above the middle. Lip deeply 3-lobed, yellow with reddish brown blotches on the central portion and on the callus, 7-20 mm. long; lateral lobes near the base, obliquely suborbicular-obovate, broadly rounded to subobtuse at the apex, entire to crenulate on the margins, 6-12 mm. long and wide; mid-lobe broadly reniform-flabellate, deeply notched at the apex, 7-20 mm. wide; callus on base of lip, 4-5 mm. long, 2.5-3.5 mm. wide, erect, composed of a sharp rounded keel projecting at the apex, which is flanked on either side by one or several erect horn-like excrescences. Column short, stout, fleshy, 3-5 mm. long, provided with a small spreading subquadrate or somewhat bilobulate wing on each side at the apex.

This species is distinguished from *O. ascendens*, a closely allied species, by its blunt subquadrate column-wings, large broadly obovate lateral lobes of the lip, and the several- not many-toothed callus.

Chiquimula: Ipala, *Lewis* 86 (in part).—Jalapa: El Rancho, *Kellerman* 7002.—Zacapa: Los Robles, *Lewis* 86 (in part). (?) Sierra de las Minas, along trail above Río Hondo, *Steyermark* 29574. Desert between Teculután and Monte Grande, *Steyermark* 42181. Sierra de las Minas, middle and upper south-facing slopes of Volcán Gemelos, *Steyermark* 43309.

The following collections are sterile but probably represent this species: Chiquimula: Quebrada Shusho, above Chiquimula, *Standley* 74320.—Santa Rosa: Near El Molino, *Standley* 78526.

Oncidium crista-galli Reichb. f. Bot. Zeit. 10: 697. 1852. *O. iridifolium* Lindl. Bot. Reg. 22: t. 1911. 1836, excluding description, non H.B.K. *O. decipiens* Lindl. Fol. Orch., *Oncidium* 22. 1855. Figure 182.

Epiphytic on trees in humid forests, up to 1,800 meters alt. Widespread but not common in Mexico, Guatemala, Honduras, Costa Rica, Panama, the West Indies, and South America.

Plant small, spreading, less than 1 dm. tall. Pseudobulbs small, ovoid, terminated by an abortive leaf, 1-1.5 cm. long, 5-10 mm. thick, enclosed and more or less concealed by the inflated bases of the leaves. Leaves produced on the short rhizome, distichously placed so as to envelop the pseudobulb, flat, spreading, thin, linear to narrowly elliptic, acute to subacuminate, somewhat contracted near the base and then inflated at the base, the outer leaves smaller



FIG. 182. *Oncidium crista-galli*. Plant ($\times 1$). Drawn by Dorothy O. Allen.

than those nearest the pseudobulb, up to 8 cm. long and 1 cm. wide. Peduncle produced in the axils of the leaves, filiform, 1-5-flowered, up to 7 cm. long, provided with several lanceolate acuminate amplexicaul concave bracts that are up to 1 cm. long. Floral bracts similar to those of the peduncle. Flower yellow with a few brown markings on the basal portion, with a filiform pedicellate ovary that is about 5 mm. long. Dorsal sepal broadly elliptic to obovate-elliptic, acute or apiculate at the apex, 3-nerved, 5-6 mm. long, 2.8-3.2 mm. wide above the middle. Lateral sepals elliptic to elliptic-lanceolate, subacute, very oblique, 1-nerved, 5-6 mm. long, 1.8-2 mm. wide. Petals oblong-subquadrate to obovate-subquadrate, truncate to rounded or apiculate at the apex, with the margin more or less undulate, 3-nerved, 6.5-9 mm. long, 3.5-4.5 mm. wide. Lip much larger than the sepals and petals, deeply 3-lobed at the base, 1.4-2.3 cm. long; lateral lobes suborbicular-obovate, oblique, broadly rounded at the apex, with the margins somewhat undulate, 5-9 mm. long, 4-6 mm. wide about the middle; mid-lobe large, prominently 4-lobulate, with broadly rounded lateral lobules and a pair of semitriangular to semiorbicular-ovate obtuse to rounded apical lobules, 1.3-2.1 cm. wide across the lateral lobules; callus between the lateral lobes, composed of

several flat rounded plates and a red-blotched flap projecting at the apex, more or less scalloped and thickened on the outer edges. Column short, thick, about 4 mm. long, provided with a pair of fleshy rounded to obliquely ovate wings at the apex.

This species is distinguished from *O. pusillum*, which it closely resembles, by its flat leaves, evident pseudobulb, wingless peduncle, spreading bracts, and differently shaped callus.

Chimaltenango: Near Finca San Rafael above Finca Montevideo, lower and middle southwestern slopes of Volcán Fuego, above Finca Montevideo, along Barranca Espinazo and tributary of Río Pantaleón, *Steyermark* 52108. Alameda, *Johnston* 1006.—Huehuetenango: Between La Libertad and Paso del Boquerón, along Río Trapichillo, *Steyermark* 51116.—Quezaltenango: Colomba, *Skutch* 1328.—Retalhuleu: San Felipe, *Lewis* 198.—Suchitepequez: Mazatenango, *Bernoulli* 50.

Oncidium ensatum Lindl. Bot. Reg. 28: Misc. p. 17. 1842 (type: Guatemala, *Skinner*).

Terrestrial on dry grassy slopes among rocks or epiphytic on trees in open mountain forests, usually at low elevations, up to 600 meters alt. Uncommon in Mexico, Guatemala, British Honduras, and Honduras.

Plant usually tall and graceful, up to 2.5 meters or more tall when in flower. Pseudobulbs ellipsoid, compressed, pale green, bifoliate, 6–12 cm. long, 2–3 cm. wide, subtended by the broad distichous imbricating sheathing base of the leaves. Leaves erect, two at the apex of the pseudobulbs, also subtending and sheathing the pseudobulbs, yellow-green, linear-ensiform, long-acuminate, subcoriaceous, prominently dorsally carinate, 4.5–13 dm. long, 1–2 cm. wide. Peduncle from base of pseudobulb, usually stout and tinged with purplish brown, provided at the nodes with scarios sheathing bracts, up to 2.5 meters or more long including the multibracteate many-flowered panicle. Floral bracts and bracts subtending the floral branches similar, elliptic-lanceolate to ovate-lanceolate, acute to acuminate, concave, scarios, up to 1.7 cm. long. Flowers numerous, inconspicuous, clear yellow or yellow marked with bronze or olive-brown, with slender pedicellate ovaries that are 2–2.5 cm. long. Sepals and petals spreading-reflexed, provided with a short claw, with the margins more or less undulate. Sepals elliptic to elliptic-lanceolate, acute at the recurved apex, 1.3–1.6 cm. long, 3.5–6 mm. wide; lateral sepals falcate, conspicuously dorsally carinate. Petals broadly ovate-elliptic to elliptic-lanceolate, acute, oblique, about 1.4 cm. long, 5–7 mm. wide. Lip broadly panduriform, 3-lobed, 1.6–1.8 cm. long, 1.2–1.3 cm. wide across the lateral lobes; lateral lobes auriculiform, rounded at the apex, with recurved margins, about 4 mm. long and wide; mid-lobe separated from the lateral lobes by a broad isthmus, broadly subreniform to suborbicular-cordate, shallowly or deeply emarginate with a decurved apicule in the sinus, 1.7–1.8 cm. wide; callus fleshy, about 5 mm. long and wide, provided above with five elongate horn-like tubercles

and a smaller bifurcate tubercle on each side at the base. Column short, fleshy, provided on each side with a broad dolabriform crenulate wing, about 5 mm. long.

This species is superficially closely allied to *O. sphacelatum*. However, its differently shaped column-wings and callus easily separate it from that species.

Alta Verapaz: Vicinity of Secanquim, *Pittier* 268.—Izabal: Los Amates, *Kellerman* 7533. Between Milla 49.5 and ridge 6 miles from Izabal, Montaña del Mico, *Steyermark* 38641.

***Oncidium glossomystax* Reichb. f. Bot. Zeit. 10: 696. 1852.**

Apparently epiphytic. Reported from Mexico, Guatemala, and northern South America.

Plant small, compressed, fan-shaped, similar to *O. Titania*, less than 6 cm. tall, pseudobulbous. Leaves produced on the short rhizome, strongly equitant and distichously arranged, ensiform, obtuse, fleshy, up to 4 cm. long and 6 mm. wide. Peduncles produced in the axils of the leaves, filiform, 1-flowered, up to 5 cm. long, provided with several small ovate acute bracts. Floral bracts similar to those of the peduncle. Flower yellow, large for the plant, with a slender pedicellate ovary that is about 7 mm. long. Dorsal sepal obovate-elliptic, rounded at the apex with the dorsal keel excurrent as an apicule, 1-nerved, concave, 3–4 mm. long, 2 mm. wide. Lateral sepals narrowly elliptic-lanceolate, subfalcate, acuminate, 1-nerved, somewhat dorsally carinate, 3.5–4 mm. long, about 1 mm. wide. Petals elliptic-quadrate to narrowly obovate, subtruncate to minutely apiculate at the apex, 1-nerved, concave, 3–4 mm. long, 2–2.5 mm. wide. Lip unguiculate, deeply 3-lobed near the base, with the margins of the lobes more or less crenate-dentate, 1–1.4 cm. long; lateral lobes obovate-cuneate, subtruncate to broadly rounded at the coarsely toothed apex, 5–6 mm. long, up to 5 mm. wide at the widest point; mid-lobe large, more or less 4-lobulate, with subquadrate rounded lateral lobules and a pair of semiovate apical lobules, 1–1.3 cm. wide across the lateral lobules; callus on basal half of lip, fleshy, 4-lobulate with the divergent ligulate lobules provided with a tuft of hairs at the apex, the apical pair of lobules often more or less coalescent. Column fleshy, thick, about 2 mm. long, provided with a pair of dolabriform undulate-crenate wings at the apex. Capsule ellipsoid-ovoid, about 1 cm. long.

This species is very near to *O. Titania* and may with further study include that species. However, for the present the two species are kept separate on the basis of the larger flowers of *O. glossomystax* and the somewhat differently shaped calli.

Guatemala, *Skinner* (fide Lindley).

***Oncidium Johannis* Schltr. Repert. Sp. Nov. 10: 362. 1912** (type: Guatemala, Dept. Alta Verapaz, epiphytic in woods near Cobán, *H. von Türckheim* II 1639).

Epiphytic on trees or on rocks in woods, up to 1,350 meters alt. Apparently endemic to Guatemala, where it is rare.

Plant erect, slender, up to 3.6 dm. tall. Pseudobulbs ovoid, compressed, unifoliate, subtended by scarios sheaths, 3-6 cm. long, 2-3 cm. wide, 7-10 mm. thick. Leaves solitary at apex of pseudobulb and produced on the short rhizome, suberect, ligulate to linear-elliptic, obliquely retuse at the rounded apex, conduplicate below, coriaceous, 5-20 cm. long, 1-2.5 cm. wide. Peduncle erect or ascending, from base of pseudobulb, slender, subtended by a leaf-sheath, provided at the nodes with small scarios bracts that are up to 1 cm. long, 1.8-3.6 dm. long including the laxly 4-10-flowered raceme. Floral bracts small, triangular-ovate, acute to acuminate, concave, scarios, 3-9 mm. long. Flowers greenish brown and yellow, urceolate, with slender pedicellate ovaries that are 1-2 cm. long. Sepals greenish brown, elliptic-obovate to elliptic or elliptic-oblanceolate, obtuse to subacute, 9-15 mm. long, 3.3-5 mm. wide; lateral sepals oblique, somewhat dorsally carinate. Petals light brown with a greenish mid-rib, broadly elliptic to oblong-ligulate, falcate, obtuse to apiculate, with the margins sometimes undulate, 9-10 mm. long, 3.5-4 mm. wide. Lip simple, bright yellow, cuneate-spatulate, rounded to deeply retuse and bilobulate at the apex, with the margins undulate, somewhat arcuate-decurved in natural position, 1.4-1.8 cm. long, 6-9.5 mm. wide across the apex; callus about 6 mm. long, linear, dilated upward, fleshy, with a lateral fleshy divergent tooth on each side about the middle, terminating in a pair of quadrate flap-like divergent keels. Column fleshy, 4-6 mm. long, deeply sulcate below on the anterior surface, provided with a subquadrate wing on each side at the apex.

Except for the usually broader and shorter leaves, this species very closely resembles *O. brachyandrum*. However, there are several floral characters, especially the difference in the calli, which easily separate these two species.

Alta Verapaz: "Purchased in Cobán," *Lewis* 222. Sa-Nim-Ta-Kah, *Johnson* 881.

Oncidium leucochilum Batem. ex Lindl. Bot. Reg. 23: sub t. 1920. 1837; Orch. Mex. & Guatem. t. 1. 1837 (type: Guatemala, *Skinner*). *O. digitatum* Lindl. in Benth. Pl. Hartw. 94. 1842 (type: Guatemala, in montibus juxta Malacatán, *Hartweg*).

Epiphytic on trees in dry or humid forests, up to 2,000 meters alt. Rare in Mexico, Guatemala and Honduras.

Plant usually large, up to 3 meters or more tall. Pseudobulbs ovoid to ovoid-ellipsoid, tapering to the 1-2-leaved apex, compressed, 5-13 cm. long, 3-6 cm. wide, subtended by scarios sheaths. Leaves 1-2 at the apex of the pseudobulbs, also produced on the short rhizome, ligulate, obtuse to subacuminate, coriaceous, conduplicate at the base, 1-6 dm. long, 1.5-4.5 cm. wide. Peduncle stout, from the base of a pseudobulb, suberect, subtended by a leaf-sheath, provided at the nodes with short scarios sheaths that are up to 2 cm. long, up to 3 meters or more long including the many-flowered panicle; inflorescence rarely racemose. Floral bracts small, triangular-ovate, obtuse, concave, scarios, 3-6 mm. long. Flowers usually reddish brown and white, with slender pedicellate ovaries that are 1.5-3 cm. long. Sepals and petals similar, bright green or greenish white, blotched with reddish brown, spreading, recurved above the middle, oblong-elliptic to

elliptic-ob lanceolate, obtuse to shortly acuminate, more or less dorsally carinate with the keel excurrent, 1.3–2.3 cm. long, 5–12 mm. wide. Lip white, sometimes tinged with pink or yellow, panduriform, deeply 3-lobed, somewhat arcuate in natural position, 1.6–2.5 cm. long; lateral lobes near the base, small, semiovate to oblong or subquadrate, with more or less reflexed margins, rounded at the apex, 4–8 mm. long, 2–3 mm. wide; mid-lobe separated from the lateral lobes by a narrow isthmus, transversely oblong to broadly reniform or subquadrate, rounded and more or less retuse at the apex with an apicule in the sinus, undulate-crenulate on the margins, 1.4–2.3 cm. wide; callus oblong, about 6 mm. long, somewhat purple-tinged, giving rise to 5–9 slender fleshy teeth or filaments, with the 3 apical filaments uncinately curved so as to be directed back toward the column, the lateral 2–6 teeth or filaments directed outward. Column short, fleshy, 7–8 mm. long, provided with a dolabriform crenulate purplish or rose-colored wing on each side at the apex.

This is one of the few Guatemalan species of *Oncidium* with a white lip. The species resembles *O. maculatum* in habit. It is commonly called "flor de cacus."

Chimaltenango: Near San Martín, *Porter* 23. San Martín, *Johnston* 1397.—Guatemala: Fiscal, *Deam* 6085. Pamplona Golf Course, *Lewis* 95 (in part).—Huehuetenango: Dry slopes between San Ildefonso Ixtahuacán and Cuilco, *Steyermark* 50740. Between La Libertad and Paso del Boquerón, along Río Trapichillo, *Steyermark* 51108. Above Aguacatán, *Skutch* 1920. Aguacatán road, 10 km. east of Huehuetenango, *Standley* 82175. Puente El Aguilar, just east of San Sebastián, *Standley* 82808.—Quiché: Sacabajá, *Heyde & Lux* 3511.—Santa Rosa: Cenajilla, *Heyde & Lux* 3855.—"Guatemala," *Bates* 7. "Bought in market of Chichicastenango," *Goodwin* 2123.

Oncidium luridum Lindl. Bot. Reg. 9: t. 727. 1823. Figures 183, 184.

Epiphytic on trees in swampy woods, open forests, and pasture lands, sometimes on rocks, from sea level up to 1,400 meters alt. Widespread and rather common from Florida and Mexico through Central America to Honduras, the West Indies and northern South America.

Plant usually large and coarse, up to 2 meters or more tall. Pseudobulbs very small, usually less than 1.5 cm. long, arising from a short stout rhizome, unifoliate, concealed by scarios imbricated sheaths. Leaf solitary at the apex of the abbreviated pseudobulb, oblong-elliptic to elliptic-lanceolate, obtuse to acute, rigid and coriaceous, more or less marginate, 1.2–8.5 dm. long, 3.5–15 cm. wide. Peduncle from the base of a pseudobulb, subtended by a scarios sheath, provided at the nodes with tubular scarios closely appressed sheaths that are about 1.5 cm. long, up to 2 meters or more long including the lax many-flowered panicle. Floral bracts small, scarios, triangular-lanceolate, acute to acuminate,



FIG. 183. *Oncidium luridum*. 1, basal portion of plant and part of inflorescence ($\times \frac{1}{2}$); 2, flower ($\times 1\frac{1}{2}$); 3, basal portion of lip, to show callus and column, spread out ($\times 2\frac{1}{2}$). Drawn by G. W. Dillon.

up to 1 cm. long. Flowers inconspicuous, variously colored, commonly greenish yellow or yellow, blotched and spotted with reddish brown or purple, with slender pedicellate ovaries that are 1.5–3 cm. long. Sepals free, with a slender claw, 1.5–2 cm. long; claw with the involute margins forming a channel; dorsal sepal broadly spatulate to obovate or suborbicular, rounded at the apex, with the margins somewhat undulate and entire to crenulate, 7.5–12.5 mm. wide; lateral sepals broadly or narrowly spatulate to obovate or elliptic, obtuse to rarely subacute at the apex, with conspicuously undulate margins, 5–11 mm. wide. Petals with a slender claw, 1.2–1.8 cm. long; lamina suborbicular to oblong-quadrate, truncate to broadly rounded or occasionally retuse at the apex, conspicuously undulate-crenulate on the margins, 7–12 mm. wide. Lip broadly panduriform, 3-lobed, 1.4–2 cm. long, 6.5–8.5 mm. wide across the lateral lobes; lateral lobes basal, small, auricle-like, obtuse, with the margins strongly revolute; mid-lobe separated from the lateral lobes by a short broad isthmus that is 5–6.5 mm. wide, semiorbicular-reniform, more or less retuse, entire or crenulate on the margins, 1.5–2.6 cm. wide (much wider across the lateral lobes); callus near base of disk, composed of a crest of five fleshy lobules that are variously colored and tuberculate, the two front lobules rounded and yellow with purplish spots. Column short, about 5 mm. long, provided at the apex with a pair of bilobulate wings that project outward for about 3 mm. Capsule ellipsoid, 3.5–4 cm. long.

This species is closely allied to *O. carthagenense*. However, it differs from that species in that the mid-lobe is much broader than the distance across the basal lateral lobes, while in *O. carthagenense* the width is about the same.

Alta Verapaz: Pila-pec, Finca Los Alpes, *Wilson* 324. Lago Isabal, *Jocoló, Johnson* 312.—Izabal: Los Andes district, near Entre Ríos, *Lewis* 119.—Petén: La Libertad, *Lundell* 3765.

Oncidium maculatum Lindl. Sert. Orch. sub t. 48. 1841. *Cyrtochilum maculatum* Lindl. Bot. Reg. 24: Misc. p. 30, t. 44. 1838.

Epiphytic on trees in forests, up to 2,000 meters alt. Uncommon in Mexico, Guatemala, and Honduras.

Plant rather coarse, stout, up to 1 meter or more tall. Pseudobulbs ovoid, strongly compressed, bifoliate, 7–10 cm. long, 3–4 cm. wide, subtended by scarios leaf-sheaths. Leaves 2, at the apex of the pseudobulbs, also produced on the short rhizome, linear-ligulate to oblong-elliptic, obtuse to acute, strongly conduplicate at the base, deep green, coriaceous, 1.8–2.5 dm. long, 2.5–5 cm. wide. Peduncle from the base of a pseudobulb, erect, subtended by a leaf-sheath, provided at the nodes with short closely appressed scarios bracts, up to 1 meter or more long including the simple or branched inflorescence. Floral bracts small, ovate to lanceolate, obtuse to acuminate, concave, scarios, 5–10 mm. long. Flowers usually numerous, colorful, fragrant, with slender pedicellate ovaries that are 2.5–3.5 cm. long. Sepals and petals similar, spreading, oblong-elliptic to elliptic-lanceolate or sometimes elliptic-oblancheolate, obtuse to acuminate and reflexed at the apex, more or less dorsally carinate, pale yellow to yellowish green, blotched with reddish brown, 1.6–3 cm. long, 5–10 mm. wide at the widest point; lateral sepals and petals somewhat oblique. Lip arcuate, rhombic-ovate to broadly

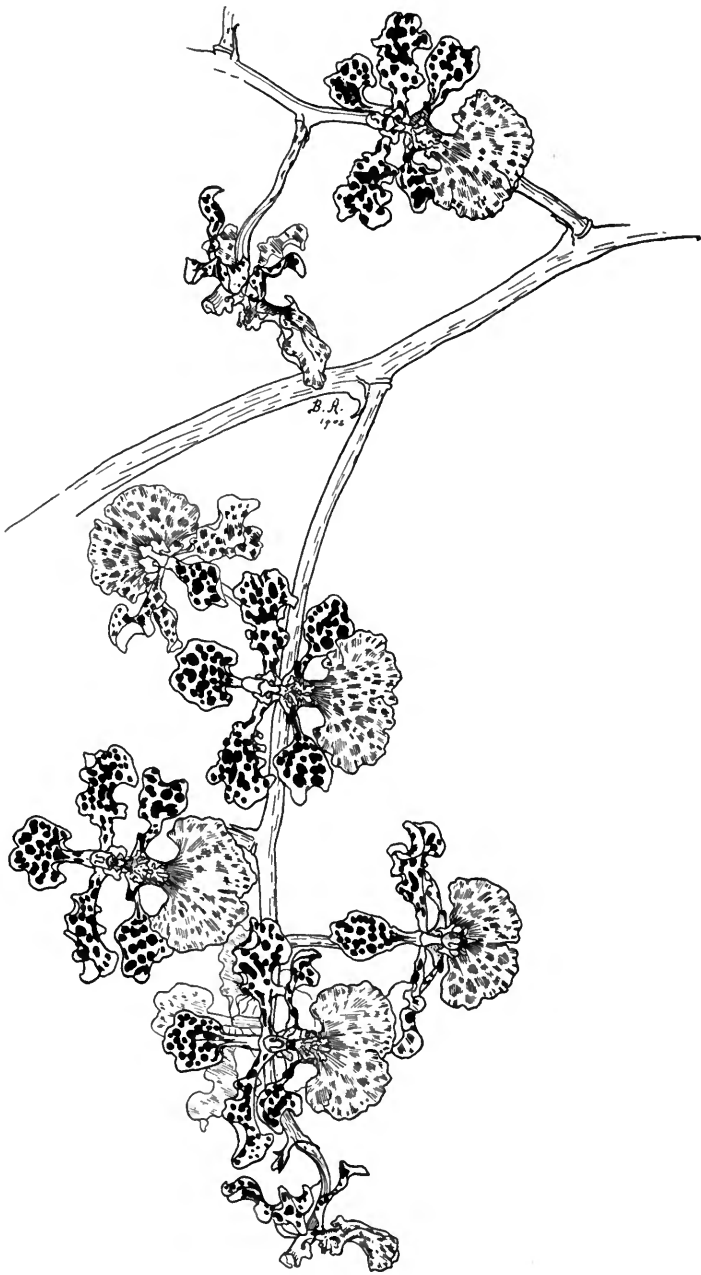


FIG. 184. *Oncidium luridum*. Flowers from a many-flowered panicle ($\times 1$).
Drawn by Blanche Ames.

rhombic-oblong in outline, more or less 3-lobed about the middle, white, marked with reddish brown on the callus, 1.8-3 cm. long, 1-2 cm. wide across the lateral lobes when spread out; lateral lobes semiobovate to semicuneate, rounded at the apex, with the margin somewhat reflexed; mid-lobe oblong-subquadrate, truncate and with a reflexed mucro at the apex, with the margin undulate; callus on basal half of lip, composed of a pair of thick tubercles that extend upward from the base as four united keels, the keels becoming free and prorect at the apex, with the inner pair of keels exceeding the lateral keels, somewhat puberulent. Column erect, stout, semiterete, bisulcate on the ventral surface, provided at the apex with a pair of dolabriform wings.

This species is closely allied to *O. hastatum* (Batem.) Lindl., a Mexican species. However, it differs from *O. hastatum* primarily in the shape and color of the lip. *Oncidium maculatum* is widely cultivated.

Chiquimula: Between Chiquimula and La Laguna, *Steyermark* 30727.—Guatemala: Guatemala market, *Johnston* 1682.—Zacapa: Sierra de las Minas, along Rillito del Volcán de Monos, Volcán de Monos, *Steyermark* 42310.—“Guatemala,” *Schmidt*.

Oncidium microchilum Batem. ex Lindl. Bot. Reg. 26: 82. 1840 (type: Guatemala, *Skinner*). Figure 185.

Terrestrial on rocks, and possibly epiphytic, up to 2,300 meters alt. Rare in Mexico and Guatemala.

Plant composed of a small unifoliate pseudobulb and an erect lateral inflorescence, 6-15 dm. tall. Pseudobulb short, round, strongly compressed, 2.5-3.5 cm. long, 2-3 cm. wide, less than 1.5 cm. thick, subtended (with the inflorescence) and nearly concealed by several chartaceous imbricate sheaths; sheaths complanate, acuminate, up to 10 cm. long. Leaf solitary, at the apex of the pseudobulb, fleshy-coriaceous, conduplicate below, flattened above, elliptic, acute, with the margins irregularly crenate, brownish green or purplish, 12.5-25 cm. long, 3-6.5 cm. wide. Inflorescence lateral, from the base of the pseudobulb, erect, tall, paniculate, up to 15 dm. long including the peduncle, the branches up to 13 cm. long and few-flowered; peduncle about 6 mm. in diameter, provided at the nodes with short triangular appressed scarious bracts. Floral bracts triangular-ovate, acuminate, 3-5 mm. long. Flowers small, rather showy, with slender pedicellate ovaries that are 1.3-1.5 cm. long. Sepals with a short claw, suborbicular to broadly elliptic, rounded to slightly retuse or mucronate at the apex, greenish brown on the outer surface, reddish brown on the inner surface, concave, 1.2-1.4 cm. long, 8-10 mm. wide; dorsal sepal subcucullate to form a galea over the column. Petals incurved, somewhat oblique, sessile or with a short claw, narrowly oblong-quadrate to broadly oblong-elliptic, rounded or truncate at the apex, occasionally retuse, with the margins undulate, colored similarly to the sepals, 1.1-1.2 cm. long, 4-7 mm. wide. Lip complex, transversely elliptic, composed of a suborbicular auriculate lobe on each side and a short apiculate apical lobe, 4-5 mm. long when spread out, 8-9 mm. wide; lateral lobes distorted, revolute, white, flecked with maroon; apical lobe abruptly decurved, obtuse, about 1 mm. long; callus

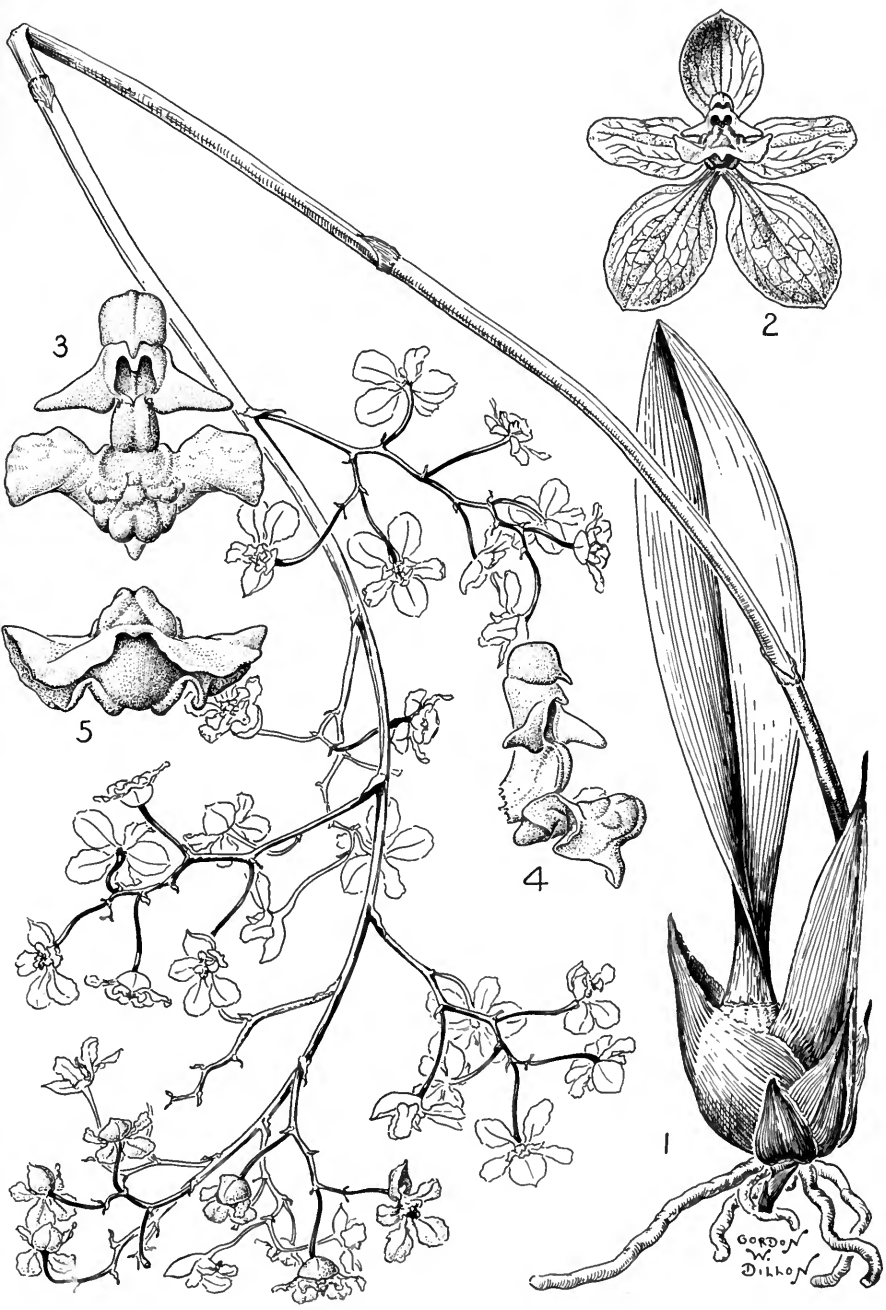


FIG. 185. *Oncidium microchilum*. 1, plant ($\times \frac{1}{2}$); 2, flower ($\times 1\frac{1}{2}$); 3, column and lip, from above ($\times 4$); 4, column and lip, side view ($\times 4$); 5, lip, front view ($\times 4$). Drawn by G. W. Dillon.

prominent, maroon, covering the entire central portion of the lip, consisting of a thickened erect slightly sulcate portion that is adnate to the column and a flat tuberculate table over the disk that projects over and beyond the apical lobe as five or more blunt deep maroon tubercles. Column deep red, somewhat puberulent, 5–6 mm. long, provided with two slender falcate lobes on each side near the apex; lobes lanceolate, about 2 mm. long, somewhat divergent and directed downward.

This species is most closely allied to *O. flavovirens* L. O. Wms., a Mexican species. However, the shape of the pseudobulb and various floral characters separate these two species.

Guatemala: Guatemala market, *Johnston* 1478; 1679. Purchased in Guatemala City, exact origin unknown, *Lewis* 148.—Huehuetenango: Northwest of Cuilco, two-thirds of the way up Cerro Chiquihú above Carrizal, *Steyrmark* 50783.

***Oncidium nanum* Lindl. Bot. Reg. 28: Misc. p. 82. 1842.**

Epiphytic on trees in forests, up to 100 meters alt. Guatemala (fide Schlechter), Peru, and British Guiana.

Plant small, coarse, up to 2.5 dm. tall. Pseudobulbs obsolescent, unifoliate, less than 1.5 cm. long and 1 cm. in diameter. Leaf solitary at the apex of a small pseudobulb, broadly elliptic to linear-elliptic or elliptic-ob lanceolate, acute, conduplicate at the base, fleshy, usually purple-spotted, 1–2.4 dm. long, 2–4 cm. wide. Peduncle from base of pseudobulb, erect, provided at the nodes with short scarious bracts, 1–2.5 dm. long including the rather congested few- to many-flowered several-branched panicle; branches short, suberect, up to 4 cm. long. Floral bracts and bracts subtending the floral branches similar, triangular-ovate, acute, scarious, 3–7 mm. long. Flowers small, fleshy, with the segments spreading, deep yellow, spotted with reddish brown, with slender curved pedicellate ovaries that are up to 1.2 cm. long. Dorsal sepal obovate, broadly rounded at the apex, cucullate-concave, 8–10 mm. long, 3.5–6 mm. wide above the middle. Lateral sepals with a short slender claw, obliquely obovate, rounded at the apex, somewhat concave, 9–11 mm. long, 3–5 mm. wide above the middle. Petals cuneate-obovate, rounded at the apex, about 9 mm. long and 5 mm. wide. Lip vernicose, broadly panduriform, 3-lobed, 7–10 mm. long, 4.5–6 mm. wide across the lateral lobes; lateral lobes small, auriculate, with revolute margins; mid-lobe large, separated from the lateral lobes by shallow sinuses, transversely oblong to reniform, emarginate, 7–10.5 mm. wide; callus large, fleshy, tuberculate, on basal half of lip, composed of a transverse ridge at the base and a longitudinal ridge in the center, the ridges placed at right angles to each other, about 4 mm. long and 3 mm. wide. Column short, fleshy-thickened, about 5 mm. long, provided about the middle on each side with a slender auriculate wing that is directed downward and is usually tipped with a lucid gland.

It is doubtful if this species occurs in Guatemala. It is included here on the basis of Schlechter's report (*Beih. Bot. Centralbl.* 36, *Abt.* 2: 512. 1918).

Oncidium nebulosum Lindl. Bot. Reg. 27: Misc. p. 81. 1841 (type: Guatemala, *Hartweg*). *O. Geertianum* Morr. Ann. Soc. Roy. Bot. Gand, 4: 55. t. 179. 1848 (type: Guatemala).

Epiphytic on trees in dry forests, at high elevations, up to 2,100 meters alt. Rare in Guatemala; rather common in Mexico.

Plant usually small, growing in dense clumps, up to 8 dm. or more tall. Pseudobulbs ovoid to suborbicular, ancipitous, maculate, bifoliate, subtended by scarious sheaths and a leaf on each side, 2.5–6 cm. long, 2–4.5 cm. wide. Leaves two at the apex of the pseudobulbs and one on each side of the pseudobulbs, erect-spreading, linear-elliptic to narrowly lanceolate, obtuse to acute, chartaceous, conduplicate at the base, 5–26 cm. long, 1–2.3 cm. wide. Peduncle from base of pseudobulb, subtended by a leaf, provided at the nodes with short scarious bracts, 1–8 dm. long including the inflorescence, rarely shorter; inflorescence a raceme or panicle, few-flowered, rarely one-flowered, the branches (when present) up to 12 cm. long. Floral bracts and bracts subtending the floral branches similar, triangular-ovate, acute, scarious, up to 1 cm. long. Flowers rather large, with slender pedicellate ovaries that are 1.2–2 cm. long. Sepals and petals spreading-reflexed, yellow or yellowish green, densely spotted or suffused with reddish brown in the central portion on the lower two-thirds. Sepals with a slender sulcate claw; dorsal sepal elliptic to elliptic-oblongate, somewhat abruptly tapering at each end, acute to acuminate, 1.2–1.6 cm. long, 4–6 mm. wide; lateral sepals linear-lanceolate to elliptic-lanceolate or linear-oblongate, obtuse-apiculate to acute or acuminate at the apex, oblique, dorsally keeled, 1.3–2 cm. long, 3–5 mm. wide. Petals obliquely linear-elliptic to broadly elliptic, slightly dorsally keeled and conduplicate at the rounded to obtuse or subacute apex, 1.2–1.7 cm. long, 3.5–6 mm. wide. Lip unequally 3-lobed, panduriform, lemon yellow, spotted or blotched with reddish brown on the isthmus, 1.4–2.5 cm. long, 8–13 mm. wide across the lateral lobes; lateral lobes small, auriciform, suborbicular, rounded, 3–4 mm. long and wide; mid-lobe large, separated from the lateral lobes by a rather narrowly triangular isthmus, transversely oblong to semioblong or subreniform, rounded and deeply retuse at the apex, with an apicule in the sinus, with more or less sinuate margins, 2–3 cm. wide; callus fleshy, oblong in outline, about 5 mm. long, 2–3.5 mm. wide, composed of a fleshy hump that terminates in three subequal keel-like tubercles, with the lateral tubercles divergent, the hump flanked by small flap-like keels, often with a minute papilla on each side about the middle. Column short, stout, 5–7 mm. long, provided on each side at the apex with a large dolabriform denticulate wing that usually tapers above. Capsule ellipsoid, about 3.5 cm. long.

This species is distinguished from its close allies mainly by the lateral lobes of the lip which are usually only about one-third as wide as the large mid-lobe. The callus and small pseudobulbs are also distinctive features.

Represented from Guatemala only by the type specimens.

Oncidium oblongatum Lindl. Bot. Reg. 30: Misc. p. 4. 1844.

Epiphytic on trees in forests, up to 2,700 meters alt. Uncommon in Mexico and Guatemala.

Plant often growing in dense clusters, up to 1.5 meters or more tall. Pseudobulbs ovoid to ovoid-ellipsoid, compressed, bifoliate, 6–10 cm. long, 2.5–3.5 cm. wide, subtended by several distichous compressed leaf-sheaths. Leaves two from the apex of the pseudobulbs and from the base of the pseudobulbs, oblong-ligulate to linear-lanceolate, obtuse to acute, subcoriaceous, suberect, narrowed and concuplicate at the base, 15–45 cm. long, 1.5–2.5 cm. wide. Peduncle from the base of a pseudobulb, subtended by a leaf-sheath, up to 1.4 meters long including the many-flowered panicle, provided with short scarios sheaths at the nodes; branches of the panicle often in fascicles, subtended by several scarios imbricated bracts. Floral bracts ovate to lanceolate, cucullate, acute, scarios, 4–10 mm. long. Flowers showy, bright yellow, irregularly marked with brown or reddish brown, with filiform pedicellate ovaries that are 2–2.5 cm. long. Sepals spreading, elliptic-oblancheolate to obovate-oblancheolate, subobtuse to abruptly acute at the apex, 1.2–1.5 cm. long, 3.5–5 mm. wide above the middle; lateral sepals oblique, dorsally keeled at the apex. Petals spreading, obliquely elliptic-oblancheolate, rounded at the apex, somewhat undulate, 1.3–1.5 cm. long, 5–7 mm. wide above the middle. Lip large, broadly panduriform in outline when spread out, 1.9–2.5 cm. long, unequally 3-lobed, 1.1–1.3 cm. wide across the basal lateral lobes; lateral lobes small, obliquely rounded, reflexed; mid-lobe large, separated from the lateral lobes by a short narrow isthmus, semiorbicular to suborbicular, deeply retuse at the apex with a minute apicule in the sinus, truncate to broadly truncate at the base, with slightly undulate margins, 1.7–2.4 cm. wide; isthmus 3.5–5 mm. wide; callus small, at the base of the lip, fleshy, obscurely 4-lobulate below, obliquely tridentate at the apex, 3–5 mm. long, 2–3 mm. wide. Column stout, fleshy-sulcate below on the anterior surface, 5–7 mm. long, provided with a pair of auriculate rounded wings above the middle.

In habit this species resembles *O. sphacelatum*. However, it differs in the differently shaped column-wings and the different color of the flowers.

Alta Verapaz: Cobán, *Türckheim* 2451; II 1794.—Chimaltenango: Chichavac, *Skutch* 549.—Guatemala: "Cultivated in garden of Don Mariano Pacheco H.," Guatemala City, *Steyermark* 39869.—Huehuetenango: Cumbre Papal, on south-facing slopes between Cuilco and Ixmiquí, *Steyermark* 50942.

Oncidium ochmatochilum Reichb. f. Bot. Zeit. 10: 698. 1852. *O. cardiochilum* Lindl. Fol. Orch., Oncid. 27. 1855 (type: Guatemala, *Skinner*).

Epiphytic on trees in forests, up to 1,200 meters alt. Widespread but not common in Guatemala, Costa Rica, Panama, Colombia, and Peru.

Plant large, stout, up to 2 meters or more tall. Pseudobulbs fusiform-cylindrical to somewhat ovoid-cylindrical, compressed, bifoliate, completely enveloped by large leaf-sheaths, 6–8 cm. long, about 2 cm. wide. Leaves two at the apex of the pseudobulbs, four or more distichously arranged on the short rhizome on each side of a pseudobulb, linear-ligulate, tapering to the acute apex, somewhat

conduplicate, thickly membranaceous, 2-7.5 dm. long, 2-6 cm. wide. Peduncle from the base of a pseudobulb, stout, subtended by leaf-sheaths, provided at the nodes with small scarious bracts, up to 2 meters or more long including the many-flowered laxly branched panicle. Floral bracts small, ovate, obtuse, scarious, concave, about 4 mm. long. Flowers small, numerous, with slender pedicellate ovaries that are 2-3.5 cm. long. Sepals and petals strongly spreading-reflexed, reddish brown, tipped with greenish white. Sepals linear to linear-elliptic, tapering at both ends, acuminate and recurved at the apex, 1.4-2.2 cm. long, 2.5-5 mm. wide at the widest point; lateral sepals oblique, dorsally strongly carinate. Petals elliptic-lanceolate to narrowly ovate-lanceolate, acute to acuminate and recurved at the apex, oblique, 1.1-1.8 cm. long, 5-8 mm. wide below the middle. Lip variable, white, suffused with purple, broadly pandurate in outline, 3-lobed, 1-1.7 cm. long, 1-1.5 cm. wide across the basal lateral lobes; lateral lobes obliquely suborbicular-obovate or auricle-like, broadly rounded at the apex, curved forward, with the margins somewhat revolute, 3-7 mm. long and wide; mid-lobe separated from the lateral lobes by a short broadly triangular isthmus, semiorbicular to semiorbicular-reniform, broadly rounded at the apex, sometimes apiculate, with the margins more or less undulate, 7-14 mm. wide; callus at base of lip, short and thick, usually with three small tubercles on each side above the middle and a larger terminal tubercle, brown-spotted, 3-5 mm. long, 2-3 mm. wide. Column erect, fleshy, semiterete, marked with reddish brown, sulcate on the ventral surface, provided with an obsolescent wing on each side at the apex, about 6 mm. long.

This is a large species, which has characteristically very narrow sepals.

Suchitepequez: Finca Mocá, *Skutch* 1471; 1564.—“Guatemala,” *Skinner*.

Oncidium oliganthum (Reichb. f.) L. O. Wms. in *Correll, Lloydia* 10: 212. 1947. *Odontoglossum oliganthum* Reichb. f. *Bonpl.* 4: 321. 1856 (type: Guatemala, *Skinner*). *Oncidium guatemalense* Schltr. *Repert. Sp. Nov.* 10: 362. 1912 (type: Guatemala, Dept. Alta Verapaz, near Cobán, *H. von Türckheim* II 2073).

Epiphytic on trees in forests, up to 2,000 meters alt. Rare in Mexico and Guatemala.

Plant erect, 2.5-4.5 dm. tall. Pseudobulbs from a short rhizome, ovoid to ellipsoid, compressed, 2-3-leaved, 4-7 cm. long, 2-3 cm. wide, subtended by distichous scarious conduplicate leaf-sheaths. Leaves 2-3 from the apex of a pseudobulb, also produced on the rhizome, erect-spreading, linear-ligulate to linear-lanceolate, obliquely retuse at the obtuse apex, coriaceous, 9-35 cm. long, 1-2 cm. wide. Peduncle from the base of a pseudobulb, rather stout, provided at the nodes with closely appressed bracts, up to 4.5 dm. long including the several-flowered simple or rarely branched raceme. Floral bracts spathaceous, obtuse, scarious, about 1.5 cm. long. Flowers showy, yellow and brown, with slender pedicellate ovaries that are 3-3.5 cm. long. Sepals and petals brown, marked with yellow. Dorsal sepal broadly obovate to obovate-elliptic, retuse at the subtruncate apex, occasionally subacute, with undulate margins, 2-2.5 cm. long,

1.3–1.7 cm. wide above the middle. Lateral sepals oblong-elliptic to elliptic-ovate, conspicuously narrowed at the base, subacute to retuse, fleshy-thickened along the center, concave, with undulate reflexed margins, oblique, 2.1–2.7 cm. long, 1–1.4 cm. wide. Petals broadly elliptic to obovate-elliptic, oblique, broadly rounded to almost retuse or obtuse at the apex, with undulate margins, 1.9–2.5 cm. long, 1.1–1.3 cm. wide above the middle. Lip sessile, panduriform, 3-lobed, 2.1–2.8 cm. long, yellow with the isthmus and basal portion brownish, dilated at the base with the auriculate lobes strongly deflexed, 1.1–1.7 cm. wide across the base when spread out, narrowed and fleshy-thickened at the middle and then abruptly dilated at the apex into a somewhat bilobed transversely elliptic-obreniform or semiorbicular lamina, deeply retuse at the apex, 1.7–3 cm. wide across the apical lamina; disk provided at the base with a fleshy clavate bicornute callus, with the blunt thick apical horns erect; callus about 7 mm. long. Column yellow with brown-purple stains, 1–1.5 cm. long, provided with large subquadrate to suborbicular purple-spotted wings on each side at the apex.

Represented from Guatemala only by the type collections of *Odontoglossum oliganthum* and *Oncidium guatemalense*.

Oncidium ornithorhynchum H.B.K. Nov. Gen. & Sp. Pl. 1: 345. t. 80. 1815. Figure 186.

Epiphytic on trees in humid forests, up to 1,500 meters alt. Uncommon in Mexico, Guatemala, El Salvador, and Costa Rica.

Plant slender, up to 5 dm. or more tall, usually growing in dense clumps. Pseudobulbs ovoid to broadly ellipsoid, smooth, compressed, 2–3-leaved, subtended by sheaths, 2.5–9 cm. long, up to 6 cm. wide and 3.5 cm. thick. Leaves 2–3 at the apex of the pseudobulbs and produced on the short rhizome, linear-elliptic to linear-lanceolate, acute to acuminate, conduplicate below, subcoriaceous, 1–3.8 dm. long, 1–3 cm. wide. Peduncle from the base of a pseudobulb, slender, subtended by a leaf-sheath, provided at the nodes with scarious bracts that are about 1.5 cm. long, recurved-pendent, up to 5 dm. long including the many-flowered panicle; rachis and branches of the inflorescence more or less fractiflex and articulate. Floral bracts small, ovate, obtuse, about 2 mm. long, scarious. Flowers rose-colored or pinkish purple, showy, with filiform pedicellate ovaries that are 1–2 cm. long. Sepals and petals subequal, shortly unguiculate, spreading-recurved, oblong-elliptic to elliptic-spatulate or oblanceolate-elliptic, obtuse to rounded at the apex, 7–11 mm. long including the short claw, 3–6 mm. wide; lateral sepals slightly oblique and dorsally carinate. Lip pandurate, 3-lobed, 1.2–1.5 cm. long, 8–10 mm. wide across the lateral lobes; lateral lobes small, auriculate, strongly revolute so as to clasp the base of the lateral sepals; mid-lobe cuneate-obovate, emarginate and bilobulate at the apex, with the lateral margins reflexed, the apical margin strongly inflexed, 6–9 mm. wide across the apex when spread out; callus deep orange-colored, fleshy, composed of five fleshy crenate radiating basal crests and a pair of horn-like tubercles in front. Column about 5 mm. long, fleshy-sulcate on the basal half, provided with a semitriangular acuminate erose wing on each side at the apex and a central descending beak at the apex of the anterior face, minutely papillose at the apex. Capsule broadly ellipsoid, about 1.5 cm. long.



FIG. 186. *Oncidium ornithorhynchum*. Plant ($\times \frac{2}{3}$); upper right corner, column and lip (about $\times 1$); middle right, column, front-side view (much enlarged); bottom, anther (much enlarged). Drawn by Blanche Ames.

This is the only *Oncidium* with rose-colored or purplish-colored flowers found in Guatemala, yellow being the predominant flower-color in this genus. The peculiar column accounts for the specific name.

Guatemala: Guatemala City, *Lewis* 13 (in part).—Quiché: Finca San Francisco, Cotzal, *Skutch* 1863; 1877.—Sacatepéquez: Cape-

tillo, *Heyde & Lux* 4645. Near Antigua, *Standley* 59339.—“Common on Pacific coast at lower altitudes,” *Lewis* 13 (in part).

Oncidium pergameneum Lindl. in Benth. Pl. Hartw. 93. 1842 (type: Guatemala, in medio monte prope urbem Guatemala, *Hartweg*).

Epiphytic on trees in forests, up to 2,000 meters alt. Rare in Mexico and Guatemala.

Plant straggly, creeping; rhizome elongate, concealed by ovate-lanceolate acuminate closely appressed scarios sheaths. Pseudobulbs produced at intervals of 1.5–3 cm. on the rhizome, ovoid, ancipitous, bifoliate, 4–5.5 cm. long, 2–3 cm. wide, subtended by several distichous leaf-bearing and non-leaf-bearing sheaths. Leaves two at the apex of a pseudobulb, also subtending the peduncles and pseudobulbs, broadly elliptic to elliptic-oblong or elliptic-oblong, subacute to shortly acuminate, conduplicate at the base, chartaceous, erect-spreading, 5–15 cm. long, 2–5 cm. wide. Peduncle from the base of a pseudobulb, weak, straggly, elongated, up to 1 meter or more long including the lax few-flowered raceme or panicle, subtended by a leaf-sheath, provided at the nodes with short scarios bracts. Floral bracts ovate-lanceolate, acute to acuminate, concave, scarios, 5–8 mm. long. Flowers small, yellow and yellowish green, blotched with reddish brown, with slender pedicellate ovaries that are up to 2 cm. long. Sepals and petals spreading-recurved, yellow, blotched with reddish brown. Sepals with a slender sulcate claw, linear-elliptic to narrowly lanceolate, acute to subacuminate at the strongly recurved apex, more or less dorsally carinate, with the margins somewhat undulate, 1–1.6 cm. long including the claw, about 3 mm. wide; lateral sepals oblique. Petals obliquely elliptic-lanceolate, acute, 9–13 mm. long, 3.5–4.5 mm. wide below the middle. Lip yellowish green, blotched with reddish brown on each side of the isthmus, with clear yellow in the center, somewhat arcuate with the lower margins reflexed in natural position, when expanded subquadrate in outline, broadly pandurate, 3-lobed, truncate at the base, subtruncate to lightly retuse and apiculate at the apex, 8–13 mm. long, 7–12 mm. wide across the base when spread out, usually broadest across the basal half; lateral lobes semitriangular, rounded; mid-lobe separated from the lateral lobes by a narrow sinus, transversely oblong-quadrate, apiculate, 6–12 mm. wide; callus small, at base in center, 2–3 mm. long and wide, obovate in outline, composed of a thickened keel on each side and three or more inconspicuous excrescences in front and above, spotted with reddish brown. Column stout, 4–5 mm. long, prominently sulcate on the ventral surface below, provided with a small crenulate triangular curved wing on each side at the thickened apex. Capsule ellipsoid-cylindrical, broadly winged, 3–4.5 cm. long.

This species is characterized mainly by the elongated rhizome that bears sharply compressed bifoliate pseudobulbs at 1.5–3 cm. intervals and the weak few-flowered inflorescences.

Alta Verapaz: Cobán, *Türckheim* II 2001. Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 90095.—Amatitlán: Epiphytic at base of Volcán Pacaya, *Porter* 67.

Oncidium phymatochilum Lindl. in Paxt. Fl. Gard. 1: 78, fig. p. 88. 1850-51.

Epiphytic on trees in forests, up to 1,300 meters alt. Rare in Mexico, Guatemala, and Brazil.

Plant stout, erect-spreading, up to 6 dm. or more tall when in flower. Pseudobulbs broadly fusiform, somewhat compressed, unifoliate, purplish brown, subtended by several large distichous imbricating subequitant scarious purplish brown sheaths, 5.5-12.5 cm. long, about 2.5 cm. wide. Leaf solitary at the apex of the pseudobulbs, also subtending the inflorescence, elliptic to elliptic-oblongate, obtuse to acute, coriaceous, 2.5-3.5 dm. long, 4.5-7.5 cm. wide. Peduncle from the base of a pseudobulb, tinged with purplish brown, provided at the nodes with short scarious bracts, up to 6 dm. or more long including the laxly flowered pendent compound panicle; rachis fractiflex. Floral bracts minute, triangular-ovate, acute, concave, about 3 mm. long. Flowers colorful, with slender pedicellate ovaries that are 2-2.8 cm. long. Sepals and petals similar in shape and color, spreading-reflexed, linear-subulate, very delicate and flaccid, occasionally somewhat twisted, pale green or yellowish with blotches of reddish brown below the middle, 1.8-3.5 cm. long, about 3 mm. wide near the base; sepals somewhat dorsally carinate, the lateral ones oblique; petals shorter than the sepals. Lip much shorter than the sepals and petals, panduriform, somewhat trulliform, 3-lobed, 1.5-1.8 cm. long, about 1.1 cm. wide across the lateral lobes when spread out; lateral lobes small, auriculiform, rounded, spreading-reflexed in natural position, undulate, about 4 mm. wide; mid-lobe separated from the lateral lobes by a triangular somewhat conduplicate isthmus, broadly ovate to suborbicular-cordate, apiculate, undulate, spotless, about 8 mm. long and 9 mm. wide; callus fleshy, on base of lip, yellow, spotted with deep orange, about 4 mm. long, composed of three triangular flattened tubercles at the apex and a subquadrate toothed flap on each side at the base. Column small and narrow, 4-5 mm. long, provided with a semicordate toothed purple-tinged wing on each side at the apex.

This species is distinguished by its laxly flowered compound panicle of yellow, reddish-brown-blotched flowers, whose sepals and petals resemble those of some species of *Brassia*. The station for the specimen cited below is shown as in Guatemala on some maps. Hence, it is included here.

Frontier between Chiapas and Guatemala, region of Tzisco, *O. Nagel* 4671.

Oncidium pusillum (L.) Reichb. f. in Walp. Ann. Bot. 6: 714. 1863. *Epidendrum pusillum* L. Sp. Pl. ed. 2: 1352. 1763. *Oncidium iridifolium* H.B.K. Nov. Gen. & Sp. Pl. 1: 344. 1815. Figure 187.

Epiphytic on trees and shrubs in pastures, coffee plantations, and hot humid forests, up to 800 meters alt. Widespread but not common from Mexico through Central America to Panama, the West Indies, and South America.

Plant small, compressed, fan-shaped, less than 1 meter tall, epseudobulbous. Leaves produced on the short rhizome, strongly equitant and distichously ar-

ranged, ensiform, obtuse to acute, fleshy, up to 8 cm. long and 1.5 cm. wide. Peduncles produced in the axils of the leaves, slender, 1-flowered, usually with several distichous crowded bracts at the apex, up to 8 cm. long, provided at intervals with short bracts that are decurrent as wings on the peduncle, the free parts of the bracts triangular-acute and conduplicate. Flower yellow, marked with reddish brown, with a slender pedicellate ovary that is about 7 mm. long.



FIG. 187. *Oncidium pusillum*. Plant ($\times 1$). Drawn by Dorothy O. Allen.

Dorsal sepal broadly obovate-elliptic, rounded at the apex with the prominent dorsal keel excurrent as an apicule, 1-nerved, 4–6 mm. long, 2.2–3.5 mm. wide. Lateral sepals elliptic-lanceolate, acuminate, very oblique, dorsally carinate, 1-nerved, 4–5.5 mm. long, 1–1.5 mm. wide. Petals yellow with red dots, subquadrate, oblong-elliptic or broadly elliptic, rounded to subtruncate and occasionally apiculate at the apex, oblique, 3-nerved, undulate, 5–10 mm. long, 3–5 mm. wide. Lip yellow, marked or bordered with reddish brown, much larger than the sepals and petals, deeply 3-lobed at the base, 1–2.3 cm. long; lateral lobes suborbicular-obovate to broadly flabellate, oblique, broadly rounded at the apex, 3–6 mm. long, 3.5–7.5 mm. wide; mid-lobe large, prominently 4-lobulate, with semiorbicular to semiquadrate lateral lobules and a pair of suborbicular to subquadrate rounded apical lobules, 1.1–2.8 cm. wide across the lateral lobules; callus fleshy, subquadrate below, sulcate, about 5 mm. long and 3 mm. wide, terminating in a pair of large flap-like divergent lobules that are flanked by a smaller lobule, provided with a transverse concave plate across the front. Column short, thick, 3–4 mm. long, provided with a broadly rounded irregularly toothed ciliate wing on each side at the apex. Capsule ellipsoid, broadly winged, 1.5–2.5 cm. long.

This species differs from *O. crista-galli*, which it closely resembles, in its strongly compressed equitant leaves, lack of a pseudobulb, more or less winged peduncle, and differently shaped callus.

Alta Verapaz: Vicinity of Cubilgüitz, *Steyermark* 44945. Vicinity of Laguna Sapalá (Chajvovuch), one mile southwest of Sibicté, *Steyermark* 44920. Along Río Icvolay between Río Apia and Río Soctelá, 8–10 miles northwest of Cubilgüitz, *Steyermark* 45047. Cubilgüitz, *Türckheim* 7675; II 98. Chamá, *Johnson* 246.—Izabal: Los Amates, *Deam* 502. Vicinity of Quiriguá, *Standley* 24196. Between Dartmouth and Morales, *Steyermark* 39003. Along road between Puerto Barrios and Santo Tomas, about 1½ miles southeast of Puerto Barrios, *Steyermark* 39871.—Petén: La Libertad, *Lundell* 2992. San Diego, Río Pasión, *Aguilar* 519.—“Eastern portions of Vera Paz and Chiquimula,” *Watson* 398c; 496a.

Oncidium reflexum Lindl. Bot. Reg. 23: sub t. 1920. 1837.

Epiphytic on trees, up to 1,500 meters alt. Rather common in Mexico; rare in Guatemala.

Plant growing in clumps, up to 1 meter or more tall. Pseudobulbs ovoid to broadly ellipsoid, compressed, bifoliate, subtended by scarious sheaths and a leaf on each side, 3–8.5 cm. long, 2–5 cm. wide. Leaves two at the apex of the pseudobulbs and one on each side of the pseudobulbs, erect-spreading, linear-ligulate to linear-lanceolate, acute to acuminate, conduplicate at the base, chartaceous, 1.5–3.5 dm. long, 1.5–3 cm. wide. Peduncle slender, from base of pseudobulb, subtended by a leaf, provided at the nodes with short scarious bracts, up to 1 meter or more long including the inflorescence; inflorescence a diffusely branched few-flowered panicle, with the branches slender and flexuous. Floral bracts small, triangular, acute, concave, less than 5 mm. long. Flowers small, with slender pedicellate ovaries that are 2–2.5 cm. long. Sepals and petals spreading and strongly reflexed, somewhat undulate, yellowish green, blotched or suffused with purplish brown. Dorsal sepal elliptic-ovovate to oblanceolate, usually rather abruptly tapering at each end, acute to subacuminate, 1.2–1.5 cm. long, 5–6 mm. wide. Lateral sepals with a slender claw, narrowly elliptic-oblanceolate, dorsally keeled and strongly reflexed at the acute to acuminate apex, slightly oblique, 1.3–1.7 cm. long, 4–5.5 mm. wide. Petals narrowly to broadly elliptic, rounded-apiculate to abruptly acute at the apex, oblique, 1.1–1.3 cm. long, 4–6 mm. wide. Lip strongly arcuate and reflexed in natural position, 3-lobed, panduriform, yellow, with a blotch of reddish brown on each side of the isthmus and a few scattered spots in the center of the isthmus, 1.3–2 cm. long, 1–1.6 cm. wide across the lateral lobes when spread out; lateral lobes small, auriculiform, suborbicular, obtuse, with strongly revolute margins, 3–6 mm. long and wide; mid-lobe separated from the lateral lobes by a broad triangular isthmus, semiorbicular, deeply retuse with an apicule in the sinus, bilobulate, 1.2–2 cm. wide; callus in the center at the base of the lip, fleshy, 3–4 mm. long, 2–3 mm. wide, composed of a central hump-like keel or a short lateral somewhat divergent keel on each side at the apex which extends beyond the central keel, with 2–4 small tubercles or flap-like keels on each side of the central keel, spotted with reddish brown. Column short, stout, about 5 mm. long, provided on each side at the apex with broad dolabriliform more or less denticulate wings that often taper above.

Lindley (Sert. Orch. sub t. 48. 1841) says of *O. reflexum*: "It is distinguished . . . by the lateral lobes of the lip being about as broad as the middle lobe." This character most conveniently separates this species from *Oncidium nebulosum*, with which it is often confused.

From the closely allied *O. Suttoni* it differs in several characters which are pointed out under *O. Suttoni*. The specimen of Seler (no. 2454) in the Gray Herbarium, reported as *O. reflexum* by Kränzlin (Pflanzenr. 4. 50, pt. 2: 235. 1922), is in reality *O. Suttoni*. Kränzlin (p. 235) reported this species from Guatemala: "Bei Cordoba (Funck!)."

"Guatemala, cultivated in the Garfield Park conservatories," Chicago, Illinois, *Steyermark*.

Oncidium sphecelatum Lindl. Sert. Orch. sub t. 48. 1841 (type: Guatemala, *Skinner*, *Hartweg*; and Mexico, *Hartweg*).

Epiphytic on trees or on rocks, in thickets or forests, up to 800 meters alt. Common in Mexico, British Honduras, Guatemala, El Salvador, and Honduras.

Plant usually large, 5-15 dm. or more tall, often forming large colonies. Pseudobulbs ovoid-ellipsoid to ellipsoid-cylindrical, tapering to the bifoliate apex, ancipitous, up to 19 cm. long and 5.5 cm. wide, subtended and partly concealed by large scarios leaf-sheaths and non-leaf-bearing sheaths. Leaves two from apex of pseudobulb, also produced on the short rhizome, erect-spreading, linear-ligulate or ensiform, acute to acuminate, subcoriaceous, up to 1 meter or more long and 3.5 cm. wide. Peduncle from base of pseudobulb, stout, often purplish-tinged, provided at the nodes with fibrous-scarious bracts, up to 1.5 meters or more long including the much-branched showy inflorescence; bracts subtending the flowering branches cucullate-lanceolate, acuminate, scarios, up to 2.5 cm. long. Floral bracts cucullate-lanceolate, acuminate, scarios, up to 1 cm. long. Flowers numerous, small but showy, yellow with reddish brown spots and blotches, somewhat variable in size and in the shape of the floral segments, with slender pedicellate ovaries that are up to 2.5 cm. long. Dorsal sepal with a short claw, elliptic to elliptic-obovate, abruptly acuminate to acute-apiculate and recurved at the apex, with undulate margins 1-1.6 cm. long, 4-6.2 mm. wide above the middle. Lateral sepals with a short claw, linear-elliptic to oblanceolate, falcate, conduplicate and recurved at the obtuse to acute apex, with undulate and somewhat revolute margins, 1.1-1.9 cm. long, 3-5 mm. wide above the middle. Petals sometimes with a short claw, usually only tapering at the base, ovate-elliptic to elliptic, somewhat conduplicate at the obtuse to acute apex, with undulate margins, 1.1-1.7 cm. long, 4-6.5 mm. wide. Lip broadly panduriform, shallowly and unequally 3-lobed, 1.2-1.7 cm. long, with the isthmus between the small rounded lateral lobes and the large apical lobe up to 8 mm. wide at the narrowest point; mid-lobe semiorbicular to obliquely subquadrate, shallowly or deeply notched at the apex and often notched on each side, with undulate-wavy margins, 1-2 cm. wide. Callus on base of lip, fleshy, 5-7-tuberculate, with lateral basal divergent

tubercles and a pair of divergent tubercles at the apex, more or less pubescent, 4–5 mm. long. Column fleshy, somewhat clavate, 4–6 mm. long, with a narrow irregularly erose-crenate brown-bordered wing on each anterior margin that protrudes as an obliquely ovate or subquadrate auricle near the base of the column. Capsule obovoid-ellipsoid, brown, 4–5 cm. long.

Alta Verapaz: Cubilgüitz, *Türckheim* II 585. Near Tukurú, *Standley* 70726. Above Tamahú, "bought in market," *Standley* 70509. Vicinity of Cubilgüitz, 1½–2 miles south of Cubilgüitz, *Steyermark* 44358. Cerro Chinajá, between Finca Yalpemech and Sacacao, *Steyermark* 45694. Between Sachaj and Sacacao, *Steyermark* 45173.—Izabal: Virginia, *Spinden*.—Petén: Uaxactun, *Bartlett* 12344. La Libertad, *M. Aguilar* 331. Sabana San Francisco, La Libertad, *Lundell* 2134. Chicbul, La Libertad, *Lundell* 2639.—Santa Rosa: Santa Rosa, *Heyde & Lux* 3496. Near El Molino, *Standley* 78438.—"Guatemala," *Watson* 455. "Guatemala Market," *Johnston* 1782.—"Guatemala," *Bernoulli* 279.

Oncidium splendidum A. Rich. ex Duchartre, *Journ. Soc. Imp. Hort. Paris* 50. 1862 (type: Guatemala).

Apparently epiphytic and endemic to Guatemala.

Plant rather coarse and large, up to 1 meter or more tall when in flower. Pseudobulbs aggregated, suborbicular, ancipitous, unifoliate, 4–5 cm. long, 3–4.5 cm. wide, about 1.5 cm. thick, subtended by scarious-fibrous sheaths that are early fugaceous. Leaf solitary at the apex of the pseudobulbs, very fleshy-coriaceous, oblong-elliptic, obtuse-cuspidate, more or less tinged with purple, deeply sulcate, V-shaped in cross section, dorsally carinate, 1.4–2.7 dm. long, 3–4.5 cm. wide. Peduncle from the base of the pseudobulb, provided at the nodes with short scarious bracts, up to 1 meter or more long including the many-flowered panicle. Floral bracts and bracts subtending the floral branches similar, broadly ovate-lanceolate to narrowly lanceolate, acute to acuminate, scarious, up to 1.5 cm. long. Flowers large, showy, with slender pedicellate ovaries that are about 3 cm. long. Sepals and petals bright lemon-yellow, spotted and blotched with reddish brown, strongly spreading-recurved to nearly revolute at the apex. Sepals elliptic-lanceolate, acute and somewhat apiculate, about 2.5 cm. long and 1 cm. wide; lateral sepals oblique. Petals obliquely elliptic-oblong, obliquely dilated near the base, broadly obtuse, about 3 cm. long and 1 cm. wide at the widest point. Lip spreading, yellow, broadly panduriform, shallowly 3-lobed, about 4 cm. long and 1.8 cm. wide across the lateral lobes when spread out; lateral lobes obsolescent, rounded, reflexed, marked with lavender; mid-lobe large, separated from the inconspicuous lateral lobes by a short broad isthmus, broadly subquadrate, retuse, with somewhat repand-undulate margins, with the apical margin incurved, about 3.2 cm. long and 4 cm. wide; callus in center at base of lip, tricarinate, composed of short lateral keels and an elongated central keel, about 1 cm. long and 3 mm. wide. Column short, stout, deeply sulcate on the ventral surface, about 1 cm. long, provided on each side with a suborbicular rounded slightly divergent concave wing.

This species is the largest and showiest *Oncidium* found in Guatemala, where it is apparently endemic and extremely rare.

"Guatemala," *Porter*.

***Oncidium stelligerum* Reichb. f. Gard. Chron. 1398. 1873.**

Apparently epiphytic, in oak forests, up to 1,900 meters alt. Extremely rare in Mexico and Guatemala.

Plant stout, to 8 dm. or more tall. Pseudobulbs ovoid-ellipsoid, compressed, bifoliate, about 8 cm. long and 3.5 cm. wide, subtended by scarios-fibrous imbricated distichous leaf-sheaths. Leaves two at the apex of the pseudobulbs, also subtending the pseudobulbs, oblong-elliptic, subacute, somewhat conduplicate, coriaceous, 1.2-1.6 dm. long, 3-3.5 cm. wide. Peduncle from the base of a pseudobulb, subtended by a leaf, provided at the nodes with short scarios bracts, up to 7.5 dm. or more long including the several-branched panicle. Floral bracts ovate-lanceolate, acuminate, scarios, about 6 mm. long. Flowers rather large, with slender pedicellate ovaries that are about 2 cm. long. Sepals and petals similar, spreading, yellow, with numerous brown spots, elliptic-lanceolate, subacuminate, 2-2.5 cm. long, 6-8 mm. wide; sepals more or less dorsally carinate, the lateral sepals oblique. Lip yellowish white, with the callus dark yellow, spreading, panduriform, deeply 3-lobed, about 2 cm. long and 1.4 cm. wide across the lateral lobes; lateral lobes obliquely semiorbicular, broadly rounded, spreading-reflexed; mid-lobe separated from the lateral lobes by narrow sinuses, suborbicular-cordate, apiculate, undulate, about 1.3 cm. wide; callus on the basal half of the lip, consisting of a narrow central thickened keel that is terminated by a notched or bilobulate flap, the central keel flanked by narrow fleshy inconspicuous ridges. Column stout, about 1 cm. long, provided with a rounded semiquadrate wing on each side at the apex, sulcate on the ventral surface below the middle.

This species differs from nearly allied species in its subequally divided lip. The basal and apical halves of the lip are almost identical in shape and size. No specimens were seen from Guatemala. The species is included here on the basis of Schlechter's report in *Beih. Bot. Centralbl.* 36, Abt. 2: 514. 1918.

***Oncidium Suttoni* Batem. ex Lindl. Bot. Reg. 28: Misc. p. 4. 1842 (type: Guatemala, Medio Nonte, *Skinner*).**

Epiphytic on trees, up to 1,400 meters alt. Apparently endemic to Guatemala.

Plant small, usually growing in dense clumps, about 2.5 dm. tall. Pseudobulbs small, pyramidal, compressed, bifoliate, 2.5-5 cm. long, 1-2 cm. wide, subtended by scarios sheaths. Leaves two at apex of pseudobulbs, also subtending the peduncles and pseudobulbs, linear, acute, grass-like, more or less conduplicate, usually exceeding the inflorescences, up to 23 cm. long and 1.5 cm. wide. Peduncles 1-2 at base of pseudobulb, subtended by a leaf-sheath, provided with several scarios bracts, usually less than 15 cm. long including the lax raceme

of 5-10 flowers, occasionally up to 28 cm. long, usually shorter than the leaves; inflorescence pendent, rarely branched. Floral bracts rather large, ovate-lanceolate, acuminate, concave, scarious, 5-10 mm. long. Flowers showy, with slender arcuate pedicellate ovaries that are up to 2.5 cm. long. Sepals and petals spreading-reflexed, suffused or barred dull olive-brown or light brown, yellow at the apex, scarcely undulate. Sepals elliptic to elliptic-lanceolate, acute to shortly acuminate, provided with a short central keel on the inner surface at the base, 1.1-1.3 cm. long, 3.5-5 mm. wide; lateral sepals oblique, dorsally keeled. Petals obliquely ovate-elliptic to elliptic-lanceolate, subacute, 1-1.2 cm. long, 4.2-5 mm. wide. Lip yellowish, brownish on the lower half, arcuate with the lower margins reflexed in natural position, broadly subquadrate in outline when spread out, panduriform, 3-lobed, with the lower half broadly triangular, subtruncate at the base, 8-15 mm. long, 7-12 mm. wide across the lateral lobes; lateral lobes semitriangular when expanded, reflexed, rounded at base; mid-lobe separated from the lateral lobes by a narrow sinus, transversely oblong-elliptic, emarginate, bilobulate, with undulate margins, 1-1.6 cm. wide; callus fleshy, flecked with brown, 7-9-tuberculate, with the lateral apical tubercles divergent, the central apical tubercle often blunt or notched, 3-4 mm. long, 2-3 mm. wide. Column 5-6 mm. long, with a triangular wing-like auricle on each side at the apex.

This species is perhaps most closely allied, florally, to *O. pergameneum*. However, the broader sepals, differently shaped callus and entirely different habit are differentiating characters. The shape of the lip is almost identical in the two species, both lacking the distinctly auriculiform lateral lobes that are characteristic of such species as *O. reflexum*, *O. Wentworthianum*, and its variety *tenue*. The lip of *O. Suttoni* is marked with a narrow or broken band of olive-brown across the isthmus, whereas the lip of *O. pergameneum* has a large blotch of dark reddish brown on each side of the isthmus and is clear yellow in the center. The apical half of the lip is also slightly wider than the lower half, a condition that is the reverse of that found in *O. pergameneum*, *O. Wentworthianum*, and its variety *tenue*. *Oncidium Suttoni* is distinguished from *O. reflexum* in its longer floral bracts, simple and shorter inflorescence, differently shaped lateral lobes of the lip, and auriculate column-wings. The column-wings of *O. Suttoni* are similar to those of *O. pergameneum* and *O. Wentworthianum* var. *tenue*. Bateman wrote concerning *O. Suttoni*: "Flower-stem few-flowered, and usually both in native and cultivated specimens shorter than the leaves, and drooping . . ." This description applies to most of the specimens that we have examined.

Escuintla: Finca Java, *Seler* 2454 (reported as *O. reflexum* by Kränzlin in Engler, Pflanzenr. 4. 50, pt. 2 (Heft 80): 235. 1922).—Suchitepequez: Finca Mocá, *Skutch* 1265.—West Coast of Guatemala, *Lewis* 184.

Oncidium tenuipes Kränzl. in Engler, Bot. Jahrb. 54, Beibl. n. 117, 33. 1916 (type: Guatemala, Dept. Alta Verapaz, near Cobán, *H. von Türckheim* II 1344).

Pseudobulbs not seen. Leaf solitary, lanceolate, acuminate, 25 cm. long, 2 cm. wide, coriaceous. Scape elongate, lightly flexuous, provided with short sheaths that disintegrate into fibers, up to 1.7 meters long including the panicle; panicle laxly flowered, with short slender fractiflex branches. Floral bracts ovate, 5–10 mm. long. Flowers with slender pedicellate ovaries that are 1.5 cm. long. Sepals lanceolate, acuminate, with the lateral sepals free almost to the base, with the margins lightly undulate, 1 cm. long, 1.5 mm. wide. Petals oblong, obtuse, about equal to or a little shorter than the sepals, ringent, 3 mm. wide. Lip cordate at the base, shortly unguiculate, 1.7 cm. long, 7 mm. wide across the lateral lobes; lateral lobes short, triangular, rounded at the apex, auriculiform; mid-lobe separated from the lateral lobes by deep sinuses, transversely oblong, deeply sinuate at the apex, 1.8 cm. wide; callus small, umbonate, lightly sulcate above, minutely papillose. Column small, 5 mm. long, with subquadrate entire wings.

The above description is a free translation of the original description. No material of this species has been seen. It is closely allied to *O. nebulosum* and *O. ensatum* from which it differs mainly by having one leaf rather than two, and by having extremely narrow sepals, a differently shaped lip, and an apparent difference in the shape of the calli.

Oncidium Titania Schltr. Repert. Sp. Nov. Beih. 19: 67, 151, 262. 1923.

Epiphytic on trees in thickets, up to 900 meters alt. Rare in Guatemala and Costa Rica.

Plant small, compressed, fan-shaped, up to 5 cm. tall, pseudobulbous. Leaves produced on the short rhizome, strongly equitant and distichously arranged, somewhat ensiform, obtuse, fleshy, up to 2.5 cm. long and 4 mm. wide. Peduncles produced in the axils of the leaves, filiform, 1-flowered, up to 3.5 cm. long, provided with several minute ovate acute bracts. Floral bracts similar to those of the peduncle. Flowers yellow, small, with a slender pedicellate ovary that is about 7 mm. long. Dorsal sepal broadly elliptic, acute-apiculate, somewhat dorsally keeled along the solitary nerve, 2.2–3 mm. long, 1.5–1.8 mm. wide. Lateral sepals obliquely linear-elliptic, acute to acuminate, dorsally keeled along the solitary nerve, 2–2.5 mm. long, about 0.7 mm. wide. Petals broadly elliptic, oblique, obtuse or apiculate, 2.5–2.8 mm. long, about 1.5 mm. wide. Lip unguiculate, deeply 3-lobed about 2 mm. above the base, 5.5–11 mm. long; lateral lobes obliquely cuneate-obovate to flabellate, coarsely and irregularly crenate on the rounded apical margin, 2.5–3 mm. long, 2.5–3.5 mm. wide; mid-lobe large, more or less 4-lobulate, with subquadrate crenate lateral lobules and a pair of subquadrate to semiovate rounded crenulate apical lobules, 6.5–8.5 mm. wide across the lateral lobules; callus on basal half of lip, fleshy, the lower half cuneate-triangular and truncate with the margins sometimes erose, extended above the middle as a smaller cuneate bilobulate flap that is fimbriate on the apical margin.

Column short, fleshy, 1.5–2 mm. long, provided with a rather large fleshy subquadrate-flabellate wing on each side at the apex. Capsule obovoid, about 1 cm. long.

This is the smallest *Oncidium* found in Guatemala. It resembles *O. pusillum* very closely. However, it differs from that species not only in the smaller size of the plant and flowers but also in the shape of the callus.

Escuintla: Between Río Jute and Río Pantaleón, on road between Escuintla and Santa Lucía Cotz, *Standley* 63481.

Oncidium Wentworthianum Batem. ex Lindl. Bot. Reg. 26: Misc. p. 82. 1840 (type: Guatemala, mountains of Santa Rosa, *Skinner*).

Epiphytic on trees in humid forests, up to 1,500 meters alt. Rare in Mexico and Guatemala.

Plant rather large, up to 1 meter or more tall. Pseudobulbs ovoid-ellipsoid, compressed, dark green, often mottled with brown, bifoliate, 7.5–10 cm. long, up to 4.5 cm. wide, subtended by fibrous-scarious sheaths. Leaves two at apex of pseudobulbs, also subtending the peduncle, linear-ligulate to lanceolate, acute, conduplicate at base, subcoriaceous, 1.3–3.5 dm. long, 1.5–2.8 cm. wide. Peduncle from base of pseudobulb, subtended by a leaf-sheath, provided at the nodes with short closely appressed scarious bracts, up to 1 meter or more long including the many-flowered pendent panicle; branches of the panicle short or rather elongated and 3–10-flowered. Floral bracts ovate-lanceolate, acute, concave, amplexicaul, scarious, up to 1 cm. long. Flowers large, colorful, with pedicellate ovaries that are up to 3.5 cm. long. Sepals and petals spreading-reflexed, deep yellow, irregularly blotched with reddish brown, with undulate margins. Sepals elliptic to elliptic-obovate, rarely elliptic-lanceolate, tapering at the base, rounded to subtruncate or acute, and often apiculate at the apex, dorsally carinate, 1.4–2.2 cm. long, 5–9 mm. wide; lateral sepals oblique. Petals obliquely ovate-elliptic, tapering at the base, rounded to subtruncate and sometimes retuse at the apex, dorsally carinate and provided with a subterminal decurved apicule, 1.2–1.9 cm. long, 6–10 mm. wide below the middle. Lip 3-lobed, deflexed, deeply emarginate at the apex with an apicule in the sinus, 1.5–2.3 cm. long, 1.4–2.3 cm. wide across the lateral lobes when spread out; lateral lobes obliquely suborbicular-obovate, auriculiform, more or less curved forward, crenate on the rounded margin, yellow, 4–7 mm. long, 6–10 mm. wide; mid-lobe separated from the lateral lobes by a long broadly triangular reddish brown blotched or barred isthmus, obcordate to obreniform, deeply bilobulate, with the margins somewhat undulate, yellow, 1.1–1.7 cm. wide; callus fleshy, mottled with reddish brown, 5–6 mm. long and wide, provided with two tuberculate teeth on each side and a usually longer tuberculate tooth in front, which is flanked by short thickened keels. Column stout, 6–7 mm. long, provided with a dolabriform or more or less triangular-auriculate wing on each side at the apex; wings more or less crenulate, often margined or spotted with reddish brown.

The large lip, characteristic callus, and usually blunt sepals and petals distinguish this species from others found in Guatemala.

Santa Rosa: Zamorora, *Heyde & Lux* 4610.

Oncidium Wentworthianum Batem. ex Lindl. var. **tenu**e (Lindl.) Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 11: 20. 1943. *O. tenue* Lindl. Journ. Hort. Soc. 3: 76. fig. 1848 (type: Guatemala, *Hartweg*).

Epiphytic on trees in humid forests, up to 1,000 meters alt. Rare in Mexico and Guatemala.

Variety *tenu*e differs from the typical form mainly in the usually smaller and differently colored flowers. The strongly undulate sepals and petals are commonly shorter and narrower, with an acutish-apiculate apex. They are solidly reddish brown with the apical fourth yellow, whereas the sepals and petals of the typical form are lemon yellow with dark brown irregular blotches or stains on the lower half. The lip is adorned with a broad solid wine-colored band across the broad isthmus. The callus of the lip and the column-wings are essentially alike in the two segregates. The inflorescence is occasionally as much as three meters in length and the branches are usually short and few-flowered. Floral measurements are as follows: sepals 1.1–1.5 cm. long, 3.5–6 mm. wide; petals 1–1.3 cm. long, 4–6 mm. wide; lip 1.3–1.8 cm. long, 1.1–1.4 cm. wide across the auriculiform lateral lobes, 9–11 mm. wide across the bilobulate mid-lobe.

There is little doubt that this variety has been confused with *O. ansiferum* and other species in the *O. reflexum* complex. It is easily distinguished from *O. ansiferum* by the differently shaped callus of the lip and the column-wings. An examination of Lindley's illustration of *O. tenue* shows the short-branched inflorescence that is characteristic of this variety.

Alta Verapaz: Cubilgüitz, *Türkheim* 7995. Chamá, *Johnson* 453. —Quiché: Epiphytic in the forest, "Zona Reyna," *Skutch* 1815.

EXCLUDED SPECIES

Oncidium altissimum (Jacq.) Sw. Kränzlin (in Engler, Pflanzenreich 4: 255. 1922) cited the West Indian *O. altissimum* from Guatemala (*Bernoulli* 279). We have not seen his collection. However, since this species (founded on *Epidendrum altissimum* Jacq., the plate of which resembles *O. oblongatum*) is in confusion and cannot be placed accurately, it is excluded from this work. Table 1851 in the Botanical Register, 22. 1836 (cited by Kränzlin) is florally similar to *O. sphacelatum*.

Oncidium barbatum Lindl. Schlechter (Beih. Bot. Centralbl. 36, Abt. 2: 509. 1918) included this species as doubtfully from Guate-

mala, based on Reichenbach's questionable report (in Walp. Ann. 6: 723. 1863). It is most improbable that this rare Brazilian species occurs in Guatemala.

Oncidium bracteatum Reichb. f. Kränzlin (in Engler, Pflanzenreich 4: 242. 1922) erroneously reported this species from Guatemala, based on Warszewicz's collection from Panama. We have seen no material from Guatemala.

Oncidium Donianum Batem. ex Loud., *nomen*.

×*Oncidium Lowii* Rolfe in Orch. Rev. 13: 116, 126. 1905. It has been impossible accurately to place this putative hybrid of *O. Caven-dishianum* and *O. carthagenense*. The flower spike is said to be 1.5–1.8 meters in length, with fifteen side branches and approximately 150 flowers.

81. LEOCHILUS Knowles & Westcott

Small epiphytic herbs with short creeping rhizomes that give rise to small pseudobulbs and leaves. Pseudobulbs ovoid to ellipsoid, more or less ancipitous, unifoliate or rarely bifoliate, subtended by one or more leaves. Leaves ligulate, coriaceous. Inflorescence lateral from base of pseudobulb, subtended by a leaf, abbreviated or elongated, usually slender, a raceme or panicle, laxly few-flowered. Flowers small, inconspicuous. Sepals subequal, spreading, free or with lateral ones more or less united at the base. Petals similar to the sepals, usually projecting forward. Lip attached to the base of the column, simple or 3-lobed, spreading, usually exceeding the sepals and petals, provided with a fleshy callus at the base. Column short, erect, without a foot, provided with (or without) a projecting arm on each side about the middle, rostellum elongated; anther terminal, operculate, incumbent, 1-celled, somewhat produced in front; pollinia 2, waxy, globose. Capsule suborbicular-triangular or ellipsoid, strongly beaked or beakless, with or without prominent wings.

This genus consists of about fifteen closely allied species, which are limited to tropical America. It is extremely close to *Oncidium*.

1. Lip distinctly 3-lobed; lateral lobes of lip united and erect to form a fleshy saddle-shaped callus; column without lateral appendages; capsule beakless.
 1. Lip simple, not 3-lobed; column with an arm-like projection on each side about the middle; capsule beakless or strongly beaked.
 2. Pseudobulbs extremely small or obsolescent, rarely more than 1 cm. long.
 3. Inflorescence exceeding the leaves; lateral sepals united to about the middle; capsule long-beaked, wingless. *L. labiatus*.
 3. Inflorescence shorter than the leaves; lateral sepals free; capsule beakless, prominently 3-winged. *L. Johnstonii*.
2. Pseudobulbs prominent, rarely less than 1.5 cm. long; capsule always beaked.
 4. Peduncle filiform, spreading-pendent, purplish-tinged; lateral sepals united for about one-third their length; the shallowly concave bimamillate callus at base of lip glabrous within. *L. oncidoides*.

4. Peduncle stout, rigidly erect, straw-colored; lateral sepals free; the cup-like callus at base of lip silky-pubescent within.....*L. scriptus*.

Leochilus Johnstonii Ames & Correll, Bot. Mus. Leafl. Harv. Univ. 11: 21, t. 3, figs. 1-3. 1943 (type: Guatemala, Alta Verapaz, Tactic, *J. R. Johnston* 1864). Figure 188.

Epiphytic on trees in dense wet forests, up to 1,650 meters alt. Guatemala, rare.

Plant small, glabrous, usually growing in clumps, up to 11 cm. tall. Pseudobulbs obsolescent, suborbicular, less than 6 mm. long, about 3 mm. wide, unifoliate, completely concealed by leaf-sheaths. Leaf solitary at apex of pseudobulb, also several distichously arranged at base of pseudobulb, linear-ligulate, obtuse, coriaceous, articulate, 2.5-6.5 cm. long, 5-10 mm. wide; sheaths thick, strongly conduplicate, with hyaline margins, 8-15 mm. long. Inflorescence from axil of leaf at base of pseudobulb, much shorter than the leaves, erect-ascending or spreading-pendent, several-flowered, up to 4 cm. long; peduncle and rachis angular. Floral bracts triangular-ovate to triangular-lanceolate, acute, concave, scarious, 3-5 mm. long. Flowers small, with stout sigmoid-arcuate 3-winged pedicellate ovaries that are about 8 mm. long, with the wings of the ovary continuous into the sepals. Sepals free, elliptic to elliptic-lanceolate, acute, dorsally carinate, longitudinally concave, 6.5-7 mm. long, 2-2.3 mm. wide; dorsal sepal erect-arcuate to form a hood over the column; lateral sepals spreading, oblique. Petals elliptic to oblong-elliptic, obtuse to subacute, slightly concave, somewhat directed forward, 5.5-6 mm. long, 2.2-2.8 mm. wide. Lip spreading, elliptic, lightly retuse at the apex, with the slightly recurved margins minutely undulate, prominently 3-nerved with the nerves branched, about 6 mm. long and 3.5 mm. wide at the middle; disk provided at the extreme base with a deeply concave glabrous callus with very fleshy margins that are open in front, with a subquadrate slightly sulcate puberulent callus in front of the concave base, the entire callus about 3 mm. long and 1 mm. wide. Column fleshy, clavate, about 3 mm. long, provided on each side about the middle with a small obliquely triangular obtuse arm that projects forward. Capsule on a slender pedicel, obovoid-ellipsoid to broadly ellipsoid, beakless, triangular in cross section with the three angles prominently winged, about 1.5 cm. long.

Superficially, *L. Johnstonii* is most closely allied to *L. tricuspoidatus* (Reichb. f.) Kränzl., of Costa Rica. However, it differs from that species in the short inflorescences, which are always exceeded by the leaves; the elliptic, instead of obovate, lip, which is not strongly deflexed at the base and is only slightly retuse instead of being bilobulate at the apex; the difference in the shape of the callus at the extreme base of the lip. The two species are similar in their capsules, which are beakless and strongly 3-winged. The flowers, except for being smaller, are almost identical in appearance with those of *L. oncidiodes*. However, the lateral sepals are entirely free at the base, whereas those of *L. oncidiodes* are united for about one-third their length. Vegetatively, these two species are very different.

LEOCHILUS

Johnstonii Ames & Correll

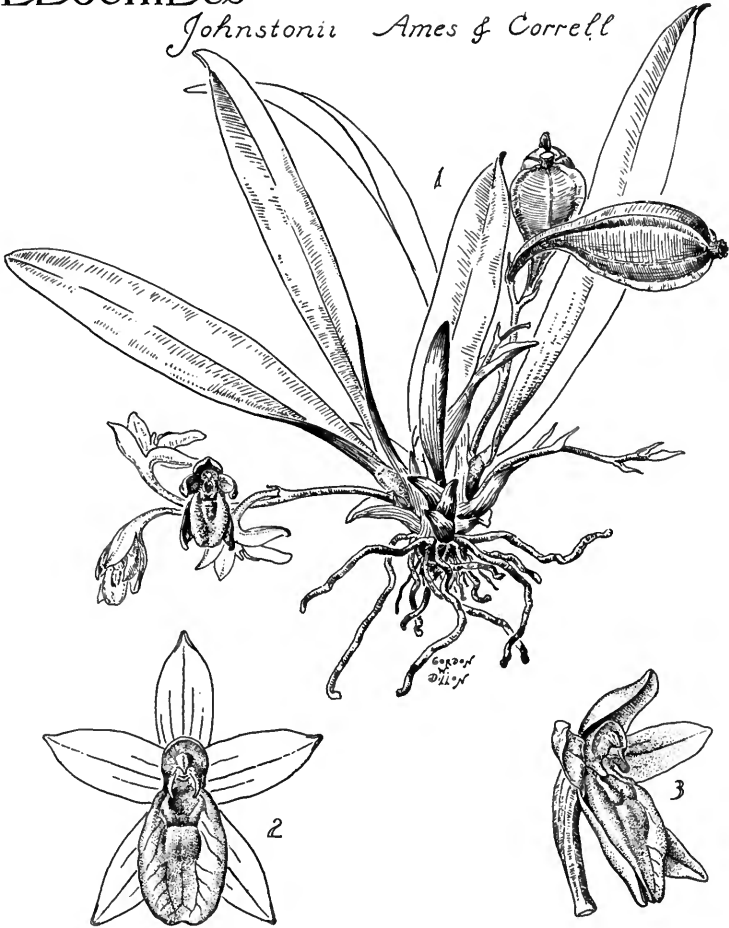


FIG. 188. *Leochilus Johnstonii*. 1, plant ($\times 1\frac{1}{6}$); 2, flower, front view, spread open ($\times 3$); 3, flower, front-side view, partly spread open ($\times 3$). Drawn by G. W. Dillon.

The obsolescent pseudobulbs, short and stubby inflorescences, and beakless, strongly 3-winged capsule of *L. Johnstonii* immediately separate it from *L. oncidioides*.

Alta Verapaz: Mountains east of Tactic, on road to Tamahú, *Standley* 71432. Mountains along road between Tactic and the divide on road to Tamahú, *Standley* 91374.

Leochilus labiatus (Sw.) O. Ktze. Rev. Gen. Pl. 656. 1891, as *Leiochilus*. *Epidendrum labiatum* Sw. Prodr. 124. 1788. *Leiochilus gracilis* Schltr. Repert. Sp. Nov. Beih. 19: 152. 1923.

Epiphytic on trees in moist valley regions or open mountain forests, also on citrus and coffee trees in plantations, usually at low elevations, up to 1,200 meters alt. Widespread but not common from Guatemala, Honduras, and Costa Rica to Panama and throughout the West Indies.

Plant small, erect, slender, 4–25 cm. tall, the entire plant often tinged with dark red. Pseudobulbs clustered, globose to ovoid, compressed, unifoliate, vernicose, 6–20 mm. long, 5–12 mm. wide, subtended by scarious leaf-sheaths. Leaf solitary at apex of pseudobulbs, also subtending the pseudobulbs, erect-spreading, broadly elliptic to ligulate, obtuse to acute, subcoriaceous, 1.5–7 cm. long, 5–20 mm. wide. Peduncle from base of pseudobulb, slender, exceeding the leaves, provided at the nodes with lanceolate acuminate keeled bracts that are 5–9 mm. long, 2.5–25 cm. long including the erect few-flowered raceme or panicle. Floral bracts triangular to lanceolate, acute to acuminate, 2–4 mm. long. Flowers small, translucent, yellow or pale green, striped, spotted, or suffused with reddish brown, with slender pedicellate ovaries that are 5–10 mm. long. Dorsal sepal elliptic to ovate-elliptic, obtuse to subacute, concave-arcuate over the column in natural position, 3.5–6.5 mm. long, 1.5–3 mm. wide. Lateral sepals deflexed, obliquely elliptic, united to about the middle, obtuse, dorsally carinate, 4–6.5 mm. long, 1.3–1.5 mm. wide above the point of union; united basal half deeply concave. Petals projecting forward, elliptic-oblong, slightly oblique, obtuse to shortly acute at the somewhat conduplicate apex, dorsally carinate, 3.3–6 mm. long, 1.5–2.8 mm. wide. Lip strongly arcuate to form a right angle just above the base, spreading above, from a fleshy globose base that is appressed against the column and is somewhat sulcate and pubescent, elliptic-obovate, often slightly constricted about the middle, rounded and somewhat retuse at the apex, 5–8 mm. long, 2.5–4.5 mm. wide; disk fleshy-thickened with the thickened portion elevated near the base of the disk, the globose base of the lip provided above with a minute callosity on each side. Column thick, semiterete, 1.5–3 mm. long, with a denticulate membrane at the apex and a slender linear arm on each side about the middle. Capsule ellipsoid, beaked, 9–15 mm. long, about 7 mm. in diameter.

This species may be determined by its small vernicose pseudobulbs and the unique position of the lip, which forms a right angle near the base.

Alta Verapaz: Near Pancajché, *Standley* 70762.

Leochilus oncioides Knowl. & Westc. Fl. Cab. 2: 143. 1838.

Epiphytic on trees and shrubs in humid forests, often on hedges and in coffee plantations, from 450 to 1,260 meters alt. Rather common in Mexico, British Honduras, and Guatemala.

Plant small, usually growing in dense clumps, 8–18 cm. tall. Pseudobulbs suborbicular-ovoid to ellipsoid, compressed, 1.5–4 cm. long, 1–2.5 cm. wide, subtended by scarious sheaths. Leaves one or two at apex of pseudobulbs, also subtending the pseudobulbs, elliptic-ligulate to elliptic-lanceolate or linear-lanceolate, obtuse to subacuminate, bright green, coriaceous, 3.5–15 cm. long, 7–28 mm. wide. Peduncle from base of pseudobulb, subtended by a leaf, weak, filiform, spreading-pendent, often fractiflex, tinged with reddish brown to purple, provided at the nodes with scarious ovate to elliptic-lanceolate and acuminate bracts that are 5–10 mm. long, 4–15 cm. long including the few-flowered simple or rarely branched raceme. Floral bracts elliptic-lanceolate, acute, scarious, 3–5 mm. long. Flowers transparent gray-green, yellow-green or creamy white, stained with pale purple, with pedicellate ovaries that are about 5 mm. long. Dorsal sepal somewhat concave-arcuate over the column, elliptic to elliptic-oblancoate, obtuse, somewhat dorsally carinate, 7–9 mm. long, 2.5–4.5 mm. wide. Lateral sepals spreading, united for about one-third their length, linear-elliptic, obtuse, dorsally carinate, 7–9 mm. long, 2–3 mm. wide. Petals projecting forward and slightly incurved, obliquely elliptic to ovate-elliptic, obtuse, dorsally carinate, 6.5–9 mm. long, 2.8–4.5 mm. wide. Lip spreading, broadly elliptic to elliptic-obovate, subtruncate and lightly retuse at the apex, with the margins somewhat reflexed, 7.5–10 mm. long, 4.2–5.5 mm. wide; disk with a fleshy shallowly concave glabrous callus at the base which is adorned with a nipple-like (occasionally bifid) process on each side in front, provided just in front of the basal callus with a thicker subquadrate sulcate slightly puberulent callus, the entire callus 3–4.5 mm. long and 1.5–2 mm. wide. Column short, fleshy, about 3 mm. long, provided on each side about the middle with a small triangular-linear arm. Capsule suborbicular to ellipsoid, beaked, 1.5–2 cm. long.

This species is closely allied to *L. scriptus*.

Escuintla: Between Río Jute and Río Pantaleón, on road between Escuintla and Santa Lucía Cotz, *Standley* 63571. Finca Monterrey, south slope of Volcán de Fuego, *Standley* 64522.—Guatemala: F. N. "La Aurora," *Aguilar* 153. Guatemala City, Aurora Park, *Lewis* 69.—Santa Rosa: Santa Rosa, *Heyde & Lux* 4277. Near El Molino, *Standley* 78439. Near Cuilapilla, *Standley* 78046. Along road south-east of Barberena, *Standley* 77829.—Suchitepequez: Southern lower slopes of Volcán Zunil, vicinity of Finca Las Nubes, east of Pueblo Nuevo, *Steyermark* 35379.—Osuna, *Johnston* 1410.

Leochilus pygmaeus (Lindl.) Benth. & Hook. ex Jackson, Ind. Kew. 2: 1290. 1895. *Odontoglossum pygmaeum* Lindl. in Benth. Pl. Hartw. 82. 1841 (type: Guatemala, Quezaltenango, at the foot of the active volcano Xetuch, *Hartweg*). *Rhynchostele pygmaea* (Lindl.)

Reichb. f. Bot. Zeit. 10: 770. 1852. *Oncidium pygmaeum* (Lindl.) Beer, Prakt. Stud. Orch. 292. 1854.

Epiphytic on trees in mountain forests, at high elevations, up to 4,000 meters alt. Rare in Mexico; rather widespread in Guatemala.

Plant small, growing in dense clumps, 6–15 cm. tall. Pseudobulbs arising at frequent intervals from a short rhizome, often aggregated, ellipsoid-fusiform to ovoid-ellipsoid, oblique, biconvex, compressed, unifoliolate, 1–3 cm. long, 5–10 mm. wide, more or less concealed by rather large scarios whitish sheaths that are up to 3 cm. long. Leaf solitary at apex of pseudobulbs, erect-spreading, linear to linear-elliptic or linear-lanceolate, acute-cuspidate to acuminate at the apex, narrowed and conduplicate below the middle, subcoriaceous, flexible, dull green, strongly dorsally carinate, 2–11.5 cm. long, 5–10 mm. wide. Peduncle from base of pseudobulb, stout, much shorter than the leaves, up to 5 cm. long including the few-flowered raceme. Floral bracts elliptic-lanceolate, acute, scarios, 5–7 mm. long. Flowers small, greenish and yellow-white, marked or tinged with brown, with rather stout 3-angled pedicellate ovaries that are about 5 mm. long. Sepals and petals spreading, with more or less revolute margins, 1-nerved. Dorsal sepal elliptic, obtuse, cymbiform, dorsally carinate, 5–5.5 mm. long, 2.5–3 mm. wide. Lateral sepals free to the base, ovate-elliptic, acute, oblique, dorsally carinate, concave, 5–5.5 mm. long, 2.2–2.5 mm. wide. Petals broadly elliptic, subacute, sometimes revolute, 4.2–5 mm. long, 2–2.5 mm. wide. Lip 3-lobed, spreading, panduriform in outline, 5–6 mm. long, about 2.5 mm. wide across the lateral lobes in natural position; lateral lobes fleshy, suborbicular, united and suberect to form a saddle with a small grooved callus in the center; mid-lobe thin, rhombic-ovate, obtuse, with crenulate-ciliate margins, about 4 mm. long and 3.5–4 mm. wide below the middle. Column fleshy, clavate, 2.5–3 mm. long, without lateral appendages. Capsule broadly ellipsoid, beakless, somewhat 3-winged, about 1 cm. long and 6 mm. in diameter.

The fleshy lateral lobes of the lip, which are united and suberect to form a saddle, and the lack of lateral appendages on the column easily separate this species from the other species of *Leochilus* found in Guatemala.

Amatitlán: Pacayá, *Johnston* 1408; 1979.—Chimaltenango: Chichavac, *Skutch* 249.—Quiché: Nebaj, *Mann* (*Johnston* 1566).—San Marcos: Between San Sebastián and top of ridge of Volcán Tajumulco, *Steyermark* 35793.—Sololá: Volcán Tolimán (side facing Volcán Atitlán to summit), *Steyermark* 47565.

Leochilus scriptus (Scheidw.) Reichb. f. Xen. Orch. 1: 15, t. 6. 1854. *Cryptosanus scriptus* Scheidw. in Otto & Deitr. Allg. Gartenz. 11: 101. 1843. *Leochilus major* Schltr. Repert. Sp. Nov. 15: 209. 1918 (type: Guatemala, Retalhuleu, *Bernoulli* & *Cario* 607).

Epiphytic on trees in wet or open pine forests, from sea level up to 900 meters alt. Widespread but not common from Mexico(?), Guatemala, Honduras, and Costa Rica to Panama; also Cuba(?).

Plant small, usually growing in dense clumps, 4-24 cm. tall. Pseudobulbs ovoid, compressed, sulcate, unifoliate, green and often vernicose, 1-5 cm. long, 1-2.5 cm. wide, subtended by scarious sheaths. Leaf solitary at apex of pseudobulb, two subtending the pseudobulbs, elliptic-ligulate to elliptic-lanceolate, obliquely tridentate at the somewhat conduplicate obtuse apex, conduplicate at base, dorsally carinate, coriaceous, 3-14.5 cm. long, 1-3 cm. wide. Peduncle from base of pseudobulb, subtended by a leaf, stout, rigidly erect-ascending, straw-colored, somewhat ancipitous, 4-23 cm. long including the few-flowered simple or several-branched raceme, provided at the nodes with scarious bracts; bracts triangular-lanceolate, acuminate, 4-18 mm. long. Floral bracts ovate-lanceolate, acute to acuminate, scarious, 3-6 mm. long. Flowers pale greenish yellow, with brownish purple spots or stripes, with pedicellate ovaries that are about 1.2 cm. long. Dorsal sepal concave-arcuate to form a hood over the column, elliptic to suboblanceolate, obtuse to acute, somewhat dorsally carinate, 8-12 mm. long, 3.5-6 mm. wide. Lateral sepals spreading-decurved, free, elliptic to elliptic-lanceolate, obtuse-apiculate to acuminate, oblique, with somewhat reflexed margins, dorsally carinate, 9-13 mm. long, 3.8-5 mm. wide. Petals ovate-elliptic to elliptic-lanceolate, obtuse to subacuminate, oblique, projecting forward and incurved, dorsally carinate, 8-11 mm. long, 4-4.2 mm. wide below the middle. Lip arcuate at the base, spreading above, obovate-cuneate to obovate-obcordate, lightly retuse to bilobulate at the apex, 1-1.3 cm. long, 5.5-9 mm. wide above the middle; disk with a basal cup-like callus that is silky-pubescent within and on the margins, provided just in front of the basal cup with a fleshy subquadrate sulcate puberulent bimammillate callus, the entire callus about 5 mm. long and 2 mm. wide. Column short, thick, about 4 mm. long, with a slender projecting arm on each side about the middle. Capsule ellipsoid, 6-angled, prominently beaked, 2-2.5 cm. long, sometimes as much as 4.5 cm. long.

This species is often confused with *L. oncidoides*. However, the rigidly erect, stout, straw-colored peduncle conveniently separates it from that species, which has a weak, filiform, often fractiflex, spreading-pendent, purplish-tinged peduncle. The usually larger flowers, free lateral sepals, and the deep cup-like hairy callus at the base of the lip separate it, florally, from *L. oncidoides*. *Leochilus scriptus* is also usually found at lower elevations than *L. oncidoides*.

Izabal: Near Quiriguá Hotel in crotons, *Lewis* 48.—Retalhuleu: Vicinity of Las Delicias, south of Retalhuleu, *Standley* 88124.

82. SIGMATOSTALIX Reichb. f.

Small epiphytic herbs with short rhizomes giving rise to small pseudobulbs. Pseudobulbs ancipitous, 1-2-leaved, usually subtended by two or more leaves. Leaves subcoriaceous to coriaceous. Inflorescence lateral, from base of pseudobulb, subtended by a leaf, racemose, usually exceeding the leaves. Flowers small, often on short fasciculate branches that are concealed by several bracts. Sepals and petals similar, subequal, spreading or reflexed, free or with the lateral sepals somewhat united at the base. Lip sessile or with a long claw, entire or variously lobed, often complex. Column slender, elongated, somewhat dilated at the apex;

anther terminal, operculate, incumbent; pollinia 2, waxy. Capsule broadly ellipsoid.

This genus is confined to the American tropics. The twenty-odd species comprising the genus have rather complicated flowers.

Sigmatostalix guatemalensis Schltr. Repert. Sp. Nov. 10: 253. 1911 (type: Guatemala, Dept. Alta Verapaz, epiphytic near Cobán, *H. von Türckheim* II 2103). Figure 189.

Epiphytic on trees in humid forests, up to 1,700 meters alt. Uncommon in Mexico, Guatemala, Costa Rica, and Panama.

Plant small, often growing in clumps, 1-3.4 dm. tall. Pseudobulbs ovoid to shortly ellipsoid, compressed, unifoliate, subtended by leaf-sheaths, 1.5-4 cm. long, 7-18 mm. wide. Leaf solitary at apex of pseudobulbs, also subtending the pseudobulbs, erect-spreading, oblong-ligulate to elliptic-lanceolate, obtuse to subacuminate, conduplicate at the base, subcoriaceous, flexible, up to 13 cm. long, 8-17 mm. wide. Peduncle from base of pseudobulb, subtended by a leaf, slender, erect-spreading, provided at the nodes with short scarious bracts, up to 3.4 dm. long including the fasciculate-flowered slender raceme. Floral bracts elliptic, involute, fibrous-scarious, 4-5 mm. long. Flowers yellow with reddish brown markings, rarely plain yellow, borne on short fasciculate branches with only one flower of each fascicle developing (the others aborted); the short branches subtended by several short fibrous-scarious bracts. Sepals and petals similar, strongly reflexed, usually greenish yellow with a wide band of reddish brown, lanceolate, obtuse to subacuminate, 6.5-9 mm. long, 1.5-2.3 mm. wide; lateral sepals slightly oblique, united for about 2 mm. at the base. Lip with a slender fleshy claw, spreading, 6-9 mm. long including the claw; claw 2-3 mm. long, minutely cupped on each side at the apex; lamina suborbicular-ovate, truncate to subobtusate and occasionally apiculate at the apex, sagittate-auriculate at the base with the auricles falcate-apiculate and incurved, thickened at the base with the margin somewhat involute, 4-6 mm. long and wide; callus minute, at base of lamina, suberect, blunt or notched at the apex, about 1 mm. long. Column slender-clavellate, arcuate, wingless, spotted with reddish brown, 6-7 mm. long. Capsule ellipsoid-ovoid, about 1 cm. long.

The strongly reflexed, somewhat clustered sepals and petals and slender-clawed lip distinguish this species.

Represented from Guatemala only by the type collection.

83. LOCKHARTIA Hook.

Epiphytic caespitose plants without pseudobulbs and with slender compressed stems that are concealed throughout by small leaves. Leaves usually numerous, equitant, more or less imbricated, short, erect or spreading, not articulated. Inflorescence from the axils of the uppermost leaves, simple or paniculate, 1-several-flowered; peduncle provided with amplexicaul bracts. Flowers small. Sepals subequal, free, spreading or reflexed. Petals similar to the sepals but usually larger. Lip often very complex, simple to as much as 6-lobed; disk adorned with



FIG. 189. *Sigmatostalix guatemalensis*. Plant (about $\times 1$); bottom, lip (about $\times 3$). Drawn by G. W. Dillon.

a callus. Column short, winged or auricled, footless; anther terminal, operculate, incumbent; pollinia 2, waxy. Capsule suborbicular to ellipsoid.

This is a small genus of nearly thirty species, many of which are complex and obscurely understood, distributed in the tropics of this hemisphere.

The lip of the flowers of the species in this genus is usually extremely complex. However, vegetatively, the various species are easily separated from those of other genera.

Lip simple, suborbicular *L. hercodonta*.
Lip complex, 5-lobed *L. Oerstedii*.

Lockhartia hercodonta Reichb. f. ex Kränzl. in Engler, Pflanzenz., Pseudomonopodiales 4: 50, 8. fig. 2 A, a-d. 1928.

Epiphytic on trees in forests, up to 2,000 meters alt. Uncommon in Guatemala and Costa Rica.

Plant caespitose, up to 4.5 dm. tall. Stems ancipitous, concealed by the base of the leaves. Leaves distichously arranged, equitant, scarcely imbricated, clasping the stem below, erect-spreading above, acute at the slightly incurved apex, up to 5 cm. long. Inflorescence several-flowered, scarcely protruding from the base of the uppermost leaves. Floral bracts scarious-fibrous, triangular-lanceolate, acuminate, 3-4 mm. long. Flowers white or pale greenish yellow, with pedicellate ovaries that are about 4 mm. long. Sepals broadly elliptic-obovate, rounded at the apex, 3-nerved, 4-5.5 mm. long, 2.5-3.5 mm. wide; lateral sepals oblique. Petals obliquely ovate-elliptic, obtuse-apiculate, concave, 3-5-nerved, about 4 mm. long and 2-2.8 mm. wide. Lip suborbicular to suborbicular-flabellate, crenulate on the margins, 4.8-5 mm. long, 5.5-7.5 mm. wide; disk covered for two-thirds its length through the center with a large fleshy concave callus; callus yellow, terminated in front by a pair of fleshy erect nipples, with the lateral flap-like borders terminated above by a thin triangular acuminate porrect lobe. Column short, fleshy, ventrally sulcate, about 2 mm. long. Capsule suborbicular, 6-8 mm. long.

Sololá: Along Río Bravo below Aposento, virgin-forested slopes (south-facing) of Volcán Atitlán, above Finca Mocá, *Steyermark* 48039.

Lockhartia Oerstedii Reichb. f. Bot. Zeit. 10: 767. 1852. *Fernandezia robusta* Batem. Bot. Mag. 22: t. 5592. 1866 (Guatemala, Skinner). *Lockhartia verrucosa* Reichb. f. Hamb. Gartenz. 15: 53. 1859. *L. robusta* (Batem.) Schltr. Repert. Sp. Nov. 3: 82. 1906. Figure 190.

Epiphytic on trees in dense tropical forests, up to 2,650 meters alt. Rather common in Mexico, Guatemala, Honduras, Costa Rica, and Panama.

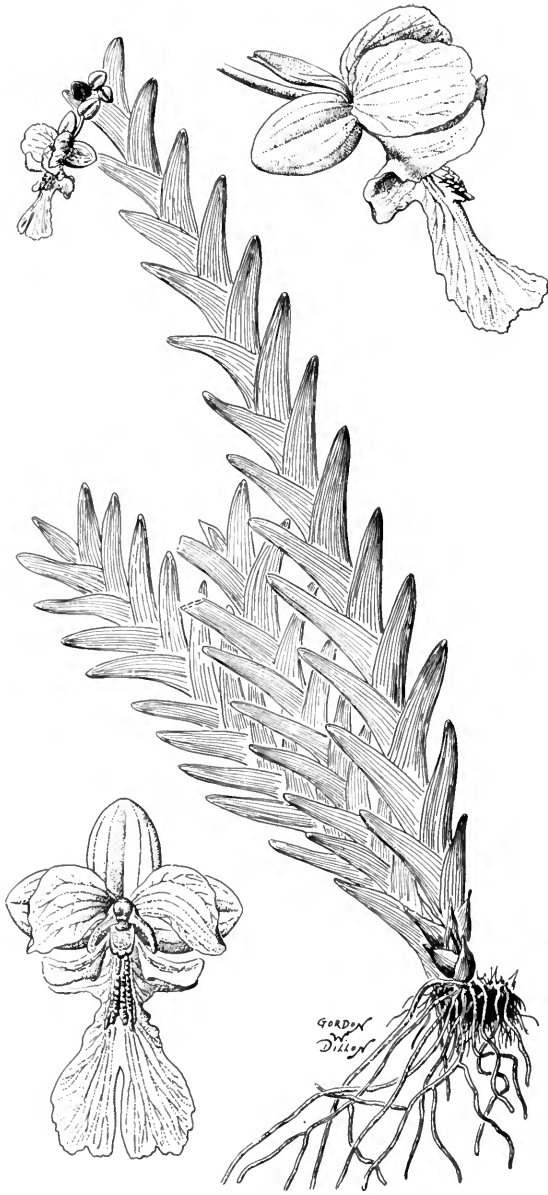


FIG. 190. *Lockhartia Oerstedii*. Plant (about $\times 1$); top, flower, side view ($\times 3$); bottom, flower, front view ($\times 3$). Drawn by G. W. Dillon.

Plant caespitose, consisting of erect leafy clustered stems that give rise to inflorescences in the axils of the uppermost leaves, 1–4.5 dm. tall. Stems completely concealed throughout by small equitant leaves, ancipitous, 1–2.5 cm. wide across the stem and leaves. Leaves sessile, equitant, distichous, imbricated, strongly keeled, suberect, semitriangular in outline, obtuse to acute and somewhat mucronate at the apex, 2–4 cm. long. Peduncles from axil of uppermost leaves, slender, pendent, exerted beyond the leaves, bracteate, 1–several-flowered, up to 3.5 cm. long; bracts several, cordate-suborbicular, apiculate, amplexicaul, dorsally carinate, glaucous, 4–8 mm. long, about 6 mm. wide, reduced at base of peduncle to short imbricated conduplicate sheaths. Flowers small, bright yellow, with the column and lower half of the lip barred and spotted with dark red, usually slightly fragrant, with filiform pedicellate ovaries that are about 1 cm. long. Sepals strongly reflexed, suborbicular-ovate, rounded and minutely apiculate at the apex, concave, 6–8 mm. long, 4.5–5.2 mm. wide. Petals deflexed, broadly elliptic-quadrate, truncate and minutely apiculate at the apex, with strongly reflexed subconduplicate lateral margins, 6.5–9 mm. long, 5–5.5 mm. wide. Lip complex, 5-lobed with the apical lobe deeply bilobulate, 1–1.4 cm. long; basal lobes elliptic to linear-elliptic, rounded to subtruncate and somewhat denticulate at the apex, antrorsely falcate, with revolute undulate margins, projected downward and incurved, yellow, spotted with dark red, 6–7 mm. long, 2–3.3 mm. wide when spread out; central lobes obliquely triangular-ovate, broadly obtuse, yellow, mottled with dark red, erect so as to lie flat against one another, 3.5–4 mm. long, about 4 mm. wide at base; apical lobe deeply bilobulate, undulate, yellow, blotched with reddish brown at base, 7–10 mm. long, 1.1–1.4 cm. wide, with the lobules obliquely suborbicular-obovate; disk adorned with a quadrate fleshy puberulent light brown callus at the base, provided in the central portion with about four light brown papillose-corrugated fleshy ridges, the entire callus about 7 mm. long and 4 mm. wide at the widest point. Column short, fleshy, 3–4 mm. long, provided on each side with a subquadrate divergent somewhat denticulate red-spotted wing. Capsule suborbicular, about 1 cm. long, on a long pedicel.

Alta Verapaz: Chamá to Cobán, *Johnson* 556. Cobán, *Johnson* 727; *Lewis* 225; *Dodge* 1980.—Guatemala: Garden of Don Mariano Pacheco H., said to have come originally from Volcán de Agua, *Steyermark* 46397.—Huehuetenango: Between Las Palmas and Chaculá, Sierra de los Cuchumatanes, *Steyermark* 51744.—San Marcos: Above Finca El Porvenir, up Loma Bandera Shac, lower south-facing slopes of Volcán Tajumulco, *Steyermark* 37333.—Suchitepequez: Volcán Santa Clara, between Finca El Naranjo and upper slopes, *Steyermark* 46596.—“Guatemala,” *Bernoulli* 316.

COMMENTS

A collection of *Lockhartia* from Zamorora in Department Santa Rosa (*Heyde & Lux* 4616) apparently represents a new species. However, no mature flowers could be found on the three specimen sheets examined. A dissected flower bud shows an entire, oblong-subquadrate, concave-cymbiform lip. It is hoped that future collections may include sufficiently adequate material of this plant.

84. ORNITHOCEPHALUS Hook.

Small epiphytic pseudobulbous herbs. Leaves flabellately disposed, fleshy-coriaceous, distichous, imbricated, articulate; sheaths thickened, strongly conduplicate, congested. Inflorescence racemose, from axil of leaves, several-many-flowered. Floral bracts usually cordate and amplexicaul. Flowers small. Sepals subequal, free, spreading, navicular. Petals with a short claw, larger than the sepals, broadly cuneate to flabellate or semiorbicular, rarely similar to the sepals. Lip subsessile, simple or 3-lobed, the lower half or third callose, the upper portion thin and more or less inflexed. Column short, wingless, footless; rostellum much elongated and slender; anther terminal, operculate, incumbent; pollinia 4, waxy. Capsule broadly ellipsoid to obovoid.

This is a small genus of perhaps twenty-five species found in the American tropics. The species are, for the most part, very closely allied, and some of them are extremely difficult to define.

1. Lip distinctly 3-lobed.
 2. Lobes of the lip unequal; lateral lobes slender, inconspicuous; inflorescence densely lanuginose.....*O. bicornis*.
 2. Lobes of the lip subequal; lateral lobes suborbicular, conspicuous; inflorescence glabrous or only slightly serrulate.....*O. iridifolius*.
1. Lip entire, at most somewhat dilated at the base.
 3. Lip linguiform, ovate-elliptic, with an orbicular concave callus covering most of the lower half, not constricted.....*O. tripteris*.
 3. Lip somewhat dilated and fleshy-cordate on the lower third, constricted in front of callus and linear-lanceolate or ligulate above.....*O. inflexus*.

Ornithocephalus bicornis Lindl. in Benth. Voy. Sulph. 172. 1843. Figure 191.

Epiphytic on trees in jungle forests, usually at low elevations, from sea level up to 1,100 meters alt. Uncommon in Guatemala, Honduras, Costa Rica, and Panama.

Plant small, acaulescent, grayish green, 3.5–10 cm. tall. Leaves flabellately disposed, equitant, rigid, erect and spreading, lanceolate to oblong-lanceolate, acute-apiculate, articulate, 1.5–7 mm. long, 4–12 mm. wide; sheaths densely congested, imbricated, conduplicate, with hyaline margins, 1–3 cm. long. Inflorescence racemose, from the axil of the leaf-sheaths, slender-flexuous, few-many-flowered, densely lanuginose throughout, about as long as or shorter than the leaves. Floral bracts and bracts of the peduncle similar, broadly ovate to orbicular, acute-apiculate, amplexicaul, reflexed, dorsally carinate, ciliate, 2–5 mm. long. Flowers small, greenish yellow or greenish white, with short hispid pedicellate ovaries. Sepals free, somewhat spreading, suborbicular, 1-nerved, dorsally carinate with the keel excurrent as an apicule, concave, hispid on the outer surface, 1.5–2 mm. long and wide. Petals obliquely suborbicular to suborbicular-flabellate, broadly cuneate at the base, erose, dorsally carinate, concave, 1.5–2 mm. long and wide. Lip 3-lobed, green at the fleshy base, 4–5 mm. long; lateral lobes inconspicuous, somewhat linear-spatulate, recurved, 1–1.4 mm. long; mid-lobe narrowly linear, acute, dorsally carinate, antrorsely curved in natural position. Column small, slender, weak, about 0.5 mm. long, with the rostellum produced into a long curved beak. Capsule suborbicular, hispid, about 5–6 mm. long.



FIG. 191. *Ornithocephalus bicornis*. Plant (about $\times 1$); bottom, flower (about $\times 5$). Drawn by Blanche Ames.

This species is readily distinguished from all other species of *Ornithocephalus* found in Guatemala by the lanuginose inflorescence, long leaf-sheaths and slender lateral lobes of the lip.

Alta Verapaz: Chamá, *Johnson* 455.—Izabal: Between Virginia and Lago Izabal, *Montaña del Mico*, *Steyrmark* 38888.

Ornithocephalus inflexus Lindl. *Ann. Mag. Nat. Hist.* 4: 384. 1840. *O. elephas* Reichb. f. in *Walp. Ann. Bot.* 6: 493. 1861 (type: Guatemala, am Fluss Torre, *Friedrichsthal*). *O. Pottsiae* S. Wats. in *T. Brigh. Guatem. Append.* 429. 1887 (type: Guatemala, Yzabal).

Epiphytic on trees in forests and pasturelands, up to 1,100 meters alt. Rather rare in Mexico, British Honduras, Guatemala, Honduras, and Costa Rica.

Plant small, acaulescent, 6–12 cm. tall. Leaves flabellately disposed, equitant, erect and spreading, linear-ensiform, acute to long-acuminate, articulate, fleshy, 3.5–10 cm. long, 3–5 mm. wide; sheaths densely congested, imbricated, conduplicate, with hyaline margins, 1–1.5 cm. long. Inflorescence racemose, from the axil of the leaf-sheaths, slender, often fractiflex, spreading, glabrous, laxly many-flowered from the base upward, 5–12 mm. long. Floral bracts ovate to lanceolate, auriculate-cordate at the base, acute to cuspidate at the apex, dorsally carinate, ciliate, 3–7 mm. long. Flowers small, white-green or greenish, with slender glabrous pedicellate ovaries that are 3–5 mm. long. Sepals somewhat spreading, suborbicular, 1-nerved, dorsally carinate with the keel excurrent as an apicule, glabrous, with the margin often minutely erose, about 2 mm. long and 1.5–2 mm. wide; lateral sepals oblique. Petals cuneate-flabellate to broadly flabellate-dolabriform, oblique, rounded and irregularly crenulate at the apex, 2–3.2 mm. long, 2.8–4 mm. wide. Lip with a slightly dilated fleshy base that is triangular-cordate to suborbicular-cordate and concave with the thickened margins upcurved, slightly constricted in front of the thickened base and extended above into a thin linear-lanceolate to ligulate obtuse to subacuminate lamina, with the lamina longitudinally concave and incurved, 4.5–6 mm. long, 2–2.6 mm. wide across the thickened base. Column short, slightly dilated at the apex, about 1.5 mm. long, with the rostellum produced into a long beak that is up to 5 mm. long. Capsule suborbicular, rather broadly 6-winged, 8–10 mm. long.

This species is most closely allied to *O. tripterus*.

Alta Verapaz: Chamá, *Johnson* 242.—Izabal: Near Puerto Barrios, Virginia, *Lewis* 1.—Petén: Near Carmelita, *Egler* 42–179.

Ornithocephalus iridifolius Reichb. f. in Walp. Ann. Bot. 6: 494. 1863.

Epiphytic on trees and shrubs in open forests and coffee plantations, up to 900 meters alt. Rare in Mexico and Guatemala.

Plant small, acaulescent, 3.5–8 cm. tall. Leaves flabellately disposed, equitant, erect and spreading, linear-ensiform, acute to acuminate, articulate, fleshy, 2.5–7.5 cm. long, 3–6 mm. wide; sheaths densely congested, imbricated, conduplicate, with hyaline margins, 5–10 mm. long. Inflorescence racemose, from the axil of the leaf-sheaths, slender, often fractiflex, spreading, laxly many-flowered from the base upward, 4–8 cm. long; peduncle and rachis winged, with the wings irregularly serrulate. Floral bracts suborbicular-cordate, dorsally carinate with the keel excurrent as an apicule, erose-ciliate on the margins, 3–5 mm. long. Flowers small, white, with filiform pedicellate ovaries that are 2–3 mm. long. Sepals spreading, suborbicular to broadly elliptic, dorsally carinate with the keel excurrent as a long apicule, concave, ciliate, about 2.3 mm. long and 1.8 mm. wide; lateral sepals oblique. Petals broadly flabellate, cuneate at the base, erose-ciliate on the broadly rounded apex, 3–3.5 mm. long, 3.5–4.2 mm. wide. Lip spreading, deeply 3-lobed, 4–5 mm. long, 4–5.2 mm. wide across the lateral lobes when spread out; lateral lobes very fleshy-thickened, subquadrate to suborbicu-

lar, rounded at the apex, 1.5–2 mm. long and wide; mid-lobe thin, triangular-ovate to suborbicular-ovate, obtuse, concave, about 2.5 mm. long and 2 mm. wide. Column short, fleshy, about 3 mm. long including the elongated rostellum.

The subequally and broadly 3-lobed lip readily distinguishes this species from the other species of *Ornithocephalus* that have been found in Guatemala.

“Guatemala market,” *Johnston* 1572.

Ornithocephalus tripterus Schltr. *Repert. Sp. Nov.* 15: 209. 1918 (type: Guatemala, Caracatal de Chilion, Mazetenango, *Bernoulli & Cario* 487).

Epiphytic on trees and shrubs in humid forests, up to 1,200 meters alt. Rare in Mexico and Guatemala.

Plant small, acaulescent, 6–15 cm. tall. Leaves flabellately disposed, equitant, erect and spreading, linear-lanceolate, ensiform, acute to acuminate, fleshy, articulate, 4–11.5 cm. long, 4–8 mm. wide; sheaths densely congested, imbricated, conduplicate, with hyaline margins, up to 1.5 cm. long. Inflorescence racemose, from the axil of the leaf-sheaths, slender, somewhat fractiflex, erect-spreading, laxly many-flowered, 6–15 cm. long; peduncle and rachis winged, with the wings irregularly serrulate. Floral bracts cordate-ovate to cordate-lanceolate, obtuse to acuminate, ciliate, amplexicaul, dorsally carinate, 2–8 mm. long. Flowers small, white-green, with filiform pedicellate ovaries that are about 4 mm. long. Sepals spreading, suborbicular to broadly elliptic, dorsally carinate with the keel excurrent as an apicule, deeply concave, ciliate, 1.5–3.5 mm. long, 1.5–2 mm. wide; lateral sepals oblique. Petals spreading, with a short cuneate claw, dolabriform-flabellate to semiorbicular, crenulate-ciliate on the broad rounded apex, 2–4 mm. long including the claw, 2.5–4.8 mm. wide. Lip spreading, linguiform, ovate-elliptic, obtuse to subacute, often somewhat cordate at the base, 3.3–6 mm. long, 2.5–3 mm. wide below the middle, with a fleshy-thickened concave suborbicular callus covering most of the lower half, the upper half thin and concave. Column short, fleshy, 3–5 mm. long including the elongated rostellum. Capsule obovoid, oblique, about 1 cm. long.

This species is closely allied to *O. inflexus*. However, the broader lip has a more or less orbicular concave callus that covers most of the lower half of the lip.

Alta Verapaz: Pansamalá, *Türkheim* 696. Cobán, *Johnson* 929.

EXCLUDED SPECIES

Ornithocephalus Salvinii Reichb. f. ex Hemsl. *Biol. Centr.-Amer.* 3: 291. 1885, *nomen nudum*.

Hemsley referred the following collection to the above name: “Guatemala, Barranca Honda at 3600 ft., Salvin (Hb. Kew).”

85. NOTYLIA Lindl.

Small epiphytic herbs with or without pseudobulbs. Pseudobulbs (when present) small. Leaves distichous, imbricated or equitant, coriaceous or fleshy-rigid, erect and spreading. Peduncles from base of pseudobulbs or in axils of leaves, simple or branched; inflorescence racemose or rarely paniculate, few-many-flowered. Sepals similar, free or with the lateral ones more or less united, erect or spreading, sometimes revolute at the apex. Petals similar to the sepals but usually smaller. Lip simple or variously lobed, attached to base of column, usually provided with a slender claw. Column erect, slender, terete or angular-sulcate, recurved at the apex, wingless, footless; anther erect, oblong, imperfectly 2-celled; rostellum erect, more or less elongated; pollinia 2, waxy. Capsule ellipsoid or suborbicular, usually beaked.

This is a small tropical American genus of about twenty rather poorly defined species.

Sepals and petals setaceous-attenuate; lip abruptly dilated about the middle, auriculate at the base; leaves equitant, falcate. *N. bicolor*.
 Sepals and petals at most acute; lamina of lip ovate-trulliform to triangular-lanceolate, without auricles; leaves not equitant or falcate. *N. Barkeri*.

Notylia Barkeri Lindl. Bot. Reg. 24: Misc. p. 90. 1838. *N. trisejala* Lindl. & Paxt. in Paxt. Fl. Gard. 3: 45. 1852-53. *N. bipartita* Reichb. f. Xen. Orch. 1: 47. 1854. *N. albida* Kl. Gard. Chron. 2: 987. 1870. *N. guatemalensis* S. Wats. Proc. Am. Acad. Arts & Sci. 22: 477. 1887 (type: Guatemala, eastern part, *S. Watson*). *N. guatemalensis* Schltr. Repert. Sp. Nov. 15: 208. 1918 (type: Guatemala, Retalhuleu, *Bernoulli & Cario* 649). *N. Bernoullii* Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 502. 1918, *nomen*.

Epiphytic on trees and shrubs in dense humid forests and swamps, also on coffee trees, usually at low elevations, up to 1,600 meters alt. Rather common and widespread from Mexico through Central America to Panama.

Plant large for the genus, erect, glabrous, rather stout and coarse, often growing in clumps, up to 3.3 dm. tall. Pseudobulbs small, ellipsoid, compressed, unifoliate, 1-3.5 cm. long, 6-16 mm. wide, subtended by scarios leaf-bearing and non-leaf-bearing sheaths. Leaf solitary at apex of pseudobulb, also subtending the pseudobulb, erect-spreading, oblong-ligulate to broadly elliptic or oblanceolate-ligulate, more or less obliquely tridentate at the broadly rounded to subacute apex, conduplicate at the base, coriaceous, pale green, 3.5-20 cm. long, 1.5-4.5 cm. wide. Peduncle short, from base of pseudobulb, subtended by a leaf, occasionally branched, provided at the nodes with rather long scarios bracts, 5-32 cm. long including the elongated pendent raceme; raceme laxly many-flowered, cylindrical, 1.2-2 cm. in diameter. Floral bracts small, scarios, narrowly triangular-lanceolate, acuminate-attenuate, 1-2.5 mm. long. Flowers small, variable, white-green, faintly fragrant, with a filiform pedicellate ovary that is 3-7 mm. long. Sepals greenish, oblong-ligulate to elliptic-lanceolate, often revolute at the obtuse to acute apex, 3-7 mm. long, 1.5-3 mm. wide below the middle; dorsal

sepal erect, cymbiform; lateral sepals spreading and somewhat deflexed, essentially free to united well above the middle, oblique. Petals white, often dotted or mottled with yellow, elliptic-oblong to elliptic-lanceolate, oblique, obtuse to subacute, 3-6 mm. long, 1-2 mm. wide below the middle. Lip white, variable, with a short convex-conduplicate claw that is 1 mm. or less long; lamina ovate-trulliform to narrowly triangular-lanceolate or subhastate-lanceolate, subobtuse to acuminate-attenuate, rounded to truncate or broadly cuneate at the base, with the dilated base somewhat reflexed, concave above, ecallose, 3-6 mm. long, 1-2 mm. wide across the dilated base. Column terete, glabrous, recurved at apex, greenish, 2-3 mm. long. Capsule obliquely ellipsoid, beaked, 1-1.5 cm. long.

The flowers of this species are extremely variable, with the result that a large number of synonyms have been made.

Alta Verapaz: Cubilgüitz, *Türckheim* 7987; II 293. Chamá, *Johnson* 241. Cerro de Agua Tortuga (Sahacoc), vicinity of Cubilgüitz, *Steyermark* 44641.—Escuintla: Along or near Río Michatoya, southeast of Escuintla, *Standley* 89065. Escuintla, *J. D. Smith* 2637.—Izabal: Virginia, *Lewis* 41; 37. Shores of Lago Izabal, opposite San Felipe, between San Felipe and mouth of Río Juan Vicente, *Steyermark* 39679. Río Dulce, 2-4 miles west of Livingston, *Steyermark* 39568. Valley of Motagua River, between Los Amates and Quiriguá, *Steyermark* 38338. Swamps of Salomón Creek, $\frac{1}{2}$ -1 mile south of Bananera, *Steyermark* 38960. Near Quiriguá, *Standley* 72434.—Petén: Occupied clearing, La Libertad, *Lundell* 2146; 2275. Lake Yaxha, *Lundell* 3899.—Santa Rosa: Near El Molino, *Standley* 78435.

Notylia bicolor Lindl. in Benth. Pl. Hartw. 93. 1842 (type: In montibus Comalapan, in Quercubus, *Hartweg*). Figure 192.

Epiphytic on trees in forests, up to 1,460 meters alt. Rare in Mexico, Guatemala, and Costa Rica.

Plant small, glabrous, often growing in clumps, 3.5-10 cm. tall. Pseudobulbs small, ovoid, compressed, unifoliate, 5-10 mm. long, about 5 mm. wide, completely concealed by leaf-sheaths. Leaf solitary at apex of pseudobulb and several equitantly disposed at base of pseudobulb, elliptic-lanceolate to linear-lanceolate, acute to acuminate, falcate, rigid, fleshy, articulate, 1.5-5 cm. long, 4-10 mm. wide; sheaths densely congested, thick, conduplicate, with conspicuous hyaline margins, up to 2.5 cm. long. Peduncle from base of pseudobulb, filiform, pendent to erect-ascending, provided at the nodes with scarious tubular acuminate bracts, 2.5-9.5 cm. long including the few- to many-flowered lax raceme. Floral bracts lanceolate-setaceous, attenuate, scarious, spreading, 2-6 mm. long. Flowers small, with filiform pedicellate ovaries that are about 8 mm. long. Sepals white, slightly spreading, lanceolate-setaceous to linear-setaceous, attenuate, 1-3-nerved, dorsally carinate, 9-15 mm. long, 1-2 mm. wide below the middle; dorsal sepal longitudinally concave; lateral sepals united for about 1 mm. at the base, falcate. Petals purple-lavender, obliquely lanceolate-setaceous, attenuate, 3-nerved, 8-13 mm. long, 1.3-1.5 mm. wide near the base. Lip purple-lavender, attached to base

of column, with a slender convex-concuplicate claw that is 1–1.5 mm. long; lamina spreading, minutely sagittate at the base with a small somewhat sulcate callus between the auricles, linear to about the middle where it is abruptly dilated and then terminated by a setaceous awn-like apex with the dilated portion erose and somewhat upcurved, 5.5–9 mm. long, about 2 mm. wide across the dilated portion when spread out. Column erect, subterete below, slightly dilated near the apex, glabrous, 4–5 mm. long; anther large, overhanging about one-half of the column. Capsule suborbicular, about 8 mm. long.

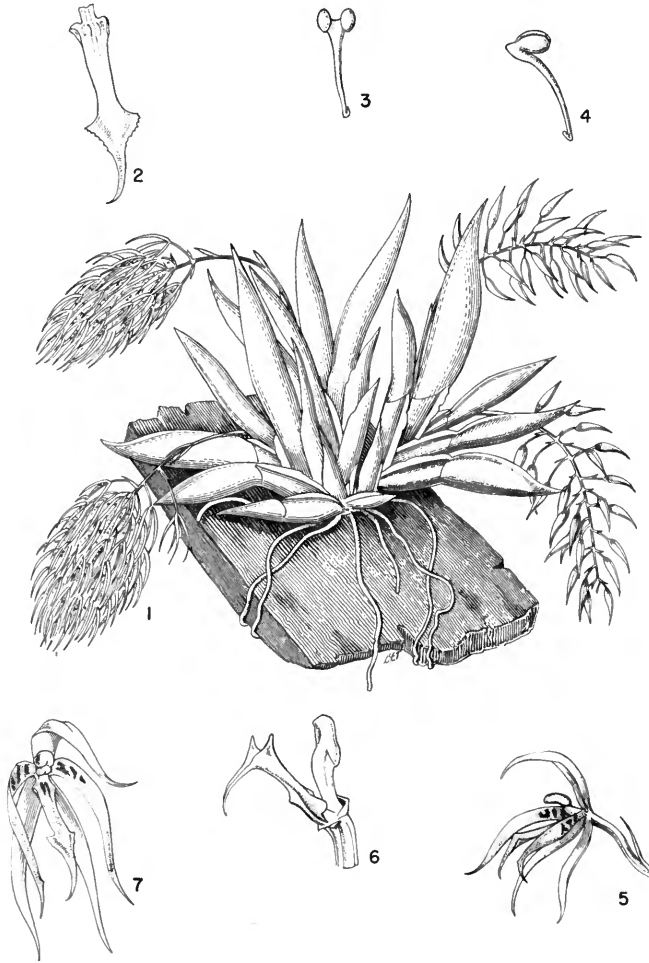


FIG. 192. *Notylia bicolor*. 1, plant ($\times \frac{1}{2}$); 2, lip ($\times 3$); 3, pollinia and gland, front view (much enlarged); 4, pollinia and gland, side view (much enlarged); 5, flower, side view (about $\times 2$); 6, column and lip, side view (about $\times 2$); 7, flower, front view ($\times 2$). Drawn by D. E. Tibbitts. Adapted in part from Curtis's Botanical Magazine 92: t. 5609. 1866.

The abruptly dilated lip easily distinguishes this species from *N. Barkeri*.

Guatemala: Cypress trees, Pamplona Golf Course, Guatemala City, *Lewis* 66. Near Guatemala, *Tonduz* 833.—Sacatepéquez: Near Antigua, *Standley* 63066. Antigua, *Johnston* 9 (in part).—Alameda, *Johnston* 9 (in part).—On conifers on hills back of Manchén, *Porter* 33.

86. CRYPTARRHENA R. Br.

Small epiphytic plant with short leafy stems or with small ancipitous 1-2-leaved pseudobulbs. Leaves distichous, imbricated, coriaceous. Peduncles from axil of leaves or from base of pseudobulbs, racemose. Sepals similar, free, spreading, more or less concave. Petals usually similar to the sepals but smaller. Lip with a distinct fleshy claw; claw carinate-thickened above; lamina 4-lobed, with the lobes linear or triangular-ovate. Column short, dilated above, wingless, footless; clinandrium with a prominent erose margin that entirely covers the anther; anther operculate, erect at the apex of the column; pollinia 4, in pairs, waxy.

This is a small genus comprising two or three rare and widely dispersed species in tropical America.

Plant with a pseudobulb; apical pair of lobes of lip linear *C. guatemalensis*.

Plant without a pseudobulb; apical pair of lobes of lip triangular-ovate to subquadrate *C. lunata*.

Cryptarrhena guatemalensis Schltr. Repert. Sp. Nov. 10: 253. 1911 (type: Guatemala, Dept. Alta Verapaz, epiphytic near Cubilgüitz, *H. von Türckheim* II 1047).

Epiphytic on trees in forests, up to 900 meters alt. Rare in Guatemala, Costa Rica, Colombia, and British Guiana.

Plant small, erect, often growing in dense clumps, 8-15 cm. tall. Pseudobulbs small, crowded, ovoid, compressed, 1-2-leaved, vernicose, subtended and nearly concealed by leaf-sheaths, 1.2-1.5 cm. long, 5-8 mm. wide. Leaves one or two at apex of pseudobulb, also distichously placed at base of pseudobulb, linear-ligulate to linear-oblanceolate, obliquely acute to acuminate, articulate, erect-spreading to suberect, conduplicate at base, 5-8.5 cm. long, 4-8 mm. wide. Peduncle slender, from axil of leaf at base of pseudobulb, arcuate-ascending, provided at the nodes with scarios amplexicaul acuminate bracts, 8-15 cm. long including the laxly few- to many-flowered raceme. Floral bracts lanceolate, long-acuminate, scarios, spreading, 6-8 mm. long. Flowers small, pale green, with slender pedicellate ovaries that are about 2 mm. long. Sepals elliptic-lanceolate to narrowly lanceolate, acuminate-attenuate, 1-nerved, spreading, 4-6.5 mm. long, 1.2-1.5 mm. wide; lateral sepals oblique. Petals ovate-lanceolate to elliptic-lanceolate, acuminate-attenuate, oblique, spreading, 4-6 mm. long, up to 2 mm. wide below the middle. Lip with a short narrowly cuneate claw, 3-nerved, 4-lobed, shortly triangular-apiculate at the apex, 4-6 mm. long including the claw; claw about 1.5 mm. long, adorned longitudinally with a semielliptic erect flap-like callus; lower pair of lobes linear-falcate, acuminate, retrorsely divaricate, 2.5-4



FIG. 193. *Cryptarrhena lunata*. 1, plant ($\times \frac{1}{2}$); 2, flower, front-side view ($\times 3$); 3, lip, side view ($\times 4$). Drawn by D. E. Tibbitts. Adapted in part from Fawcett and Rendle, *Flora of Jamaica* 1: pl. 30. 1910.

mm. long; upper pair of lobes linear, tapering to the acute slightly recurved apex, 2-3 mm. long, somewhat erect; isthmus between the two pairs of lobes subquadrate, 1-1.5 mm. long and wide. Column short, dilated and minutely crenulate at the apex, about 1.5 mm. long. Capsule obovoid-ellipsoid, about 1 cm. long.

The presence of pseudobulbs and the four slender divergent lobes of the lip readily distinguish this species from *C. lunata*.

Represented from Guatemala only by the type collection.

Cryptarrhena lunata R. Br. Bot. Reg. 2: t. 153. 1816. Figure 193.

Epiphytic on trees in dense tropical forests, up to 640 meters alt. Rare but widely distributed from Mexico to Costa Rica, Jamaica, Trinidad, and northern South America.

Plant rather small, from a short creeping rhizome, without pseudobulbs, usually growing in clumps, up to 32 cm. tall. Leaves distichous, erect and spreading, linear, linear-elliptic, linear-lanceolate or narrowly oblanceolate, oblique, acute to acuminate, coriaceous, articulate, 5-22 cm. long, 8-20 mm. wide; sheaths congested, imbricated, conduplicate, 1.5-2 cm. long. Peduncle from axil of leaf, slender, provided at the nodes with inflated scarious amplexicaul bracts that are up to 1.5 cm. long, up to 30 cm. long including the raceme; raceme slender, cylindrical, laxly many-flowered, 1.5-2.5 cm. in diameter. Floral bracts reflexed, subulate to narrowly triangular-lanceolate, acuminate-attenuate, scarious, 3-7 mm. long. Flowers small, fleshy, green-yellow, with slender reflexed pedicellate ovaries that are 3-8 mm. long. Sepals green, elliptic to elliptic-lanceolate, obtuse-apiculate to shortly acuminate, more or less dorsally carinate, concave, 1-2-nerved, 4-5.2 mm. long, 1.5-2 mm. wide; lateral sepals very oblique. Petals green, obliquely cuneate-obovate, acute-apiculate to broadly rounded and apiculate at the apex, 1-nerved, erose on the upper margins, 3.5-4 mm. long, about 2 mm. wide above the middle. Lip yellow, 4-lobed, with a prominent fleshy claw, about 5 mm. long including the claw, several-nerved; claw subterete, provided with an erect flap-like broadly triangular callus, 1.5-2.5 mm. long; lamina subquadrate, with two pairs of divergent lobes, about 2 mm. wide; lower pair of lobes linear to narrowly lanceolate, antrorsely recurved, entire to erose on the upper margin, 3-3.5 mm. long; upper pair of lobes short, subquadrate to triangular-ovate, obtuse, erose, more or less divergent, 1-1.5 mm. long. Column fleshy, subterete, sulcate on ventral surface, erose on apical margin, about 3 mm. long. Capsule ellipsoid-obovoid, oblique, about 8 mm. long, on a pedicel that is about 5 mm. long.

Alta Verapaz: Cerro de Agua Tortuga (Sahacoc), vicinity of Cubilgüitz, *Steyermark* 44640.—Izabal: Los Andes District, Entre Ríos, *Lewis* 139.

87. MACRADENIA R. Br.

Inconspicuous epiphytic plants that consist of a slender cylindrical pseudobulb bearing a single leaf at the apex and a short pendent inflorescence at the base. Leaves fleshy or coriaceous. Inflorescence a lax raceme of small or fairly large



FIG. 194. *Macradenia Brassavolae*. Plant ($\times \frac{1}{2}$); lower right, lip ($\times 2$).
Drawn by D. E. Tibbitts.

flowers. Sepals and petals free and somewhat spreading. Lip continuous with the base of the column, 3-lobed; lateral lobes broad, erect, and embracing the column in natural position. Column footless, terete, more or less sulcate on the ventral surface; anther erect, imperfectly 2-celled; pollinia 2, waxy, attached to the viscid disk or gland by a long membranaceous linear-spatulate stipe that is filamentous below. Capsule ellipsoid, more or less 3-angled.

This is a small genus of about a dozen species, which are confined to the American tropics and subtropics.

Macradenia Brassavolae Reichb. f. Bot. Zeit. 10: 734. 1852 (type: Guatemala). Figure 194.

Epiphytic on trees in low wet forests, usually at or near sea level. Rare, from Guatemala through Central America to Panama and northern South America.

Plant small, usually in dense clumps, up to 25 cm. tall. Pseudobulbs cylindrical, slender, curved, unifoliate, 1.5–4.5 cm. long, up to 1 cm. in diameter, subtended by several scarios sheaths. Leaf solitary at apex of pseudobulb, linear-elliptic, somewhat oblique, obtuse to acute, erect, subcoriaceous, 6.5–17 cm. long, 1–2.3 cm. wide. Peduncle from base of pseudobulb, slender, pendent, provided at the nodes with triangular-lanceolate acuminate scarios bracts, 7–25 cm. long including the laxly few- to many-flowered raceme; raceme up to 6 cm. in diameter. Floral bracts triangular-lanceolate, acuminate, scarios, 5–7 mm. long. Flowers chestnut brown- and white-striped, the sepals and petals usually margined with translucent green, with slender pedicellate ovaries that are 7–9 mm. long. Sepals and petals similar, somewhat spreading, linear-lanceolate, long-acuminate, somewhat concave, 1.8–2.3 cm. long, 3–4.5 mm. wide below the middle; lateral sepals and petals oblique, more or less recurved at the apex. Lip sessile at base of column, broadly cuneate at the base, 3-lobed above, 1.3–1.9 cm. long, 6.5–8 mm. wide across the lateral lobes when spread out; lateral lobes short, obliquely suborbicular-obovate to semiorbicular, somewhat porrect and incurved to embrace the column, 2–3 mm. wide and long; mid-lobe filiform-setaceous, 9–14 mm. long; disk with a narrow sulcate keel at base of mid-lobe. Column fleshy, terete, 6–7 mm. long, with an obliquely subquadrate auricle on each side at the apex. Capsule ellipsoid, strongly 3-angled, about 1.5 cm. long.

The flowers of this species superficially resemble those of a small *Brassia* or *Brassavola*.

Alta Verapaz: Jocoló, *Johnson* 1126.

88. DICHAEA Lindl.

Epseudobulbous epiphytic or rock-inhabiting plants, often growing in large clumps or mats. Stems leafy elongated, erect or pendent, concealed by the imbricated leaf-sheaths. Leaves distichous, ascending to spreading or reflexed, coriaceous to membranaceous. Peduncles in the axil of the upper leaves, one-flowered. Flower small, fleshy, subtended by a more or less orbicular bract and a smaller linear bracteole. Sepals subequal, free, spreading or almost connivent;

lateral sepals oblique, often forming an obscure mentum with the short column-foot. Petals similar to the sepals, often smaller and narrower. Lip very fleshy, with or without a claw, simple or lobed, continuous with the base of the column. Column erect, semiterete, stout, wingless or with a fleshy keel on each side at the base, often with an obsolescent foot, with or without a glabrous or pubescent stigmatic ligule on the ventral surface; anther terminal, operculate, incumbent; pollinia 4, waxy. Capsule ellipsoid to obovoid, smooth or densely muricate.

This genus is composed of about thirty-five species, which are usually found at high elevations in tropical and subtropical America. Many of the collections obtained in the field are without flowers, and this sterility increases the difficulty of trying to define many of the so-called species comprising the genus. According to Steyermark, plants of this genus are called "pashte de palo" in Guatemala.

1. Leaves persistent, not jointed with the leaf-sheaths, rarely more than 2 cm. long, usually less than 8 mm. apart; ovary and capsule densely muricate (except in *D. Tuerckheimii*).
2. Ovary and capsule smooth; lip entire, with a small callus at the base on each side of the lamina *D. Tuerckheimii*.
2. Ovary and capsule densely muricate; lip produced into a prominent angle or lobe on each side above, rarely almost entire, without calli at the base.
3. Leaves produced less than 4 mm. apart on the stem, with the margins denticulate-ciliate throughout *D. hystricina*.
3. Leaves produced more than 4 mm. apart on the stem, with the margins entire or ciliate only at the apex.
4. Lamina of the leaf decurrent on the leaf-sheath so as to clasp the stem noticeably, typically linear-elliptic, usually more than 4 mm. wide; lateral lobes of lip prominently developed.
5. Leaves usually much less than 1 cm. long; leaf-sheaths densely spotted with dark green *D. muricata* var. *neglecta*.
5. Leaves rarely less than 1 cm. long; leaf-sheaths sparsely if at all spotted with green *D. muricata*.
4. Lamina of the leaf produced at the apex of the leaf-sheaths, not decurrent on the leaf-sheaths to clasp the stem noticeably, typically linear or linear-lanceolate, 3 mm. or less wide; lateral lobes of lip small or obsolescent.
6. Leaves linear, bluntly obtuse-apiculate; floral bract minutely apiculate; lip broadly cuneate at the base, rarely less than 7 mm. long; column 4 mm. or more long, with an elongated pendent or projecting hairy ligule *D. squarrosa*.
6. Leaves usually linear-lanceolate, more or less tapering to the long-apiculate to subacuminate apex; floral bract usually short-acuminate and strongly recurved at the apex; lip with a broadly rounded concave base, 7 mm. or less long; column 4 mm. or less long, elgulate or with a minute ligule present.
7. Column 2.5-3 mm. long, without a ligule; lip suborbicular in outline, concave-cymbiform, with small lateral lobes which are sometimes obsolescent, 4.5-6 mm. long *D. trichocarpa*.
7. Column 3-4 mm. long, provided with a small erect nearly glabrous to ciliate ligule; lip broadly oblong-quadrate in outline, concave, with the lateral lobes always present, 6-7 mm. long.
 × *D. intermedia*.
1. Leaves deciduous, jointed with the leaf-sheaths, rarely less than 2 cm. long, usually more than 8 mm. apart; ovary and capsule smooth.

8. Lip sessile, panduriform, cordate at base, with a linear callus on the lower half, 4.5–6 mm. long; leaves grass-green, not glaucous; plant straggly, repent.....*D. graminoides*.
8. Lip with a cuneate claw, ecallose, 6.5 mm. or more long; leaves glaucous; plant caespitose.
 9. Leaves about 7 mm. apart, less than 6 mm. wide.....*D. panamensis*.
 9. Leaves 1 cm. or more apart, more than 7 mm. wide.....*D. glauca*.

Dichaea glauca (Sw.) Lindl. Gen. & Sp. Orch. Pl. 209. 1833.
Epidendrum glaucum Sw. Prodr. 124. 1788. *Dichaeopsis glauca* (Sw.)
 Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 519. 1918.

Epiphytic on trees in wet forests, occasionally terrestrial and on rocks, up to 2,400 meters alt. Uncommon in Mexico, Guatemala, Honduras, and the West Indies.

Plant large for the genus, ascending-erect or pendent, caespitose, more or less glaucous throughout, up to 6 dm. or more tall. Stems rather stout, slightly compressed, simple, concealed by the leaf-sheaths, 3–4 mm. in diameter. Leaves 2-ranked, alternate, thin, 1–1.5 cm. apart, ascending, articulate with the imbricated leaf-sheaths, deciduous, linear-oblong to oblong-elliptic, cuspidate at the rounded apex, dorsally carinate along the mid-nerve, more or less overlapping, usually very glaucous especially on the under surface, 3–7 cm. long, 8–13 mm. wide. Peduncles from axil of upper leaves, slender, erect, 2.5–3.5 cm. long including the solitary flower. Floral bract suborbicular-ovate, acute, amplexicaul, about 2 mm. long. Flower white or gray-white, more or less spotted with lavender and yellow, with short smooth ovaries, fragrant. Sepals somewhat spreading-recurved, concave below the middle, broadly elliptic to ovate-lanceolate or elliptic-lanceolate, subacute to acuminate, 3-nerved, 7.5–11 mm. long, 3.3–4.5 mm. wide; lateral sepals oblique. Petals elliptic to elliptic-lanceolate, subobtusely acuminate, slightly oblique, 3-nerved, 7–10 mm. long, 2–3.5 mm. wide. Lip fleshy, from a broadly cuneate fleshy-thickened base, dilated on each side above the middle, with the dilated portions extended into short spreading ligulate lobules that are more or less retrorsely curved and upcurved in natural position, the entire lip concave and incurved in natural position, retuse to acute and sometimes slightly conduplicate at the broadly rounded apex, often minutely papillose-ciliolate, 7–8 mm. long, 7.5–10 mm. wide across the lateral lobules when spread out. Column short, thick, 4–5.5 mm. long, provided with a small erect entire or notched flap on the ventral surface. Capsule ellipsoid, smooth, 1.5–2 cm. long.

The large, glaucous leaves distinguish this species from other species of *Dichaea* found in Guatemala.

Izabal: Cerro San Gil, uppermost ridges and summit, *Steyermark* 41946.—Zacapa: Sierra de las Minas, upper slopes, along Río Repolal to summit of mountain, *Steyermark* 42518. Sierra de las Minas, middle and upper south-facing slopes of Volcán Gemelos, *Steyermark* 43253.

Dichaea graminoides (Sw.) Lindl. Gen. & Sp. Orch. Pl. 209. 1833. *Epidendrum graminoides* Sw. Prodr. 125. 1788. *Dichaeopsis*

graminoides (Sw.) Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 519. 1918.

Epiphytic on trees and on rocks in damp forests, up to 1,500 meters alt. Widespread but not common from Mexico through Central America to Nicaragua, the West Indies, and northern South America.

Plant up to 3 dm. or more tall, straggly, long-repent, spreading. Stems simple or branched, slightly compressed, concealed by the leaf-sheaths, about 2 mm. in diameter. Leaves 2-ranked, alternate, about 1 cm. apart, spreading, articulate with the imbricated leaf-sheaths, deciduous, linear-oblong to linear-elliptic, acute to shortly cuspidate, ciliate on the apical margins, more or less irregular in length, grass-green, not glaucous, firmly membranaceous, 2-4.5 cm. long, 3-6 mm. wide. Peduncles from axil of upper leaves, filiform, flexuous, 2-3.5 cm. long including the solitary flower. Floral bract suborbicular-ovate, acute-apiculate, about 2.5 mm. long; bracteole lanceolate, suberect. Flower white, with a short smooth ovary. Sepals and petals slightly spreading. Sepals elliptic to elliptic-lanceolate, usually minutely verrucose at the acute to shortly acuminate apex, 6-8.5 mm. long, 2.3-3.5 mm. wide; lateral sepals slightly oblique. Petals oblong-elliptic, acute, 5-8 mm. long, 2.2-3 mm. wide. Lip sessile, fleshy, panduriform, shallowly 3-lobed, cordate at the base, 4.5-6 mm. long; lateral lobes small, semi-cordate, rounded, incurved; mid-lobe much larger than the lateral lobes, suborbicular-deltoid, apiculate, somewhat concave, 3.2-4.8 mm. wide; disk with a central linear keel on the lower half. Column short, fleshy, 2-4 mm. long. Capsule smooth, ellipsoid, about 8 mm. long.

This is one of the few Guatemalan species whose leaves are deciduous. The panduriform lip, with a linear callus on the lower half, is distinctive.

Alta Verapaz: Cobán, *Türckheim* 2445.

The following collections are undoubtedly referable to this species. However, since they are sterile, their identity is questionable.—Alta Verapaz: Between Tactic and the divide on road to Tamahú, *Standley* 91426a.—San Marcos: Finca El Porvenir along Río Chopal, south-facing slopes of Volcán Tajumulco, *Steyermark* 37463.

Dichaea hystericina Reichb. f. *Flora* 48: 279. 1865.

Epiphytic on trees in dense forests, up to 1,500 meters alt. Uncommon in Guatemala, Honduras, Costa Rica, and the West Indies.

Plant small, densely caespitose, often growing in large clumps, pendent or erect-spreading, up to 1.5 dm. or more tall. Stems simple or branched, concealed by the leaf-sheaths, slightly compressed, about 1 mm. in diameter. Leaves 2-ranked, alternate, 2-3 mm. apart, spreading, thin, prominently nerved, elliptic to elliptic-lanceolate, recurved at the acute to subacuminate apex, conspicuously denticulate-ciliate on the entire margins, continuous with the imbricated leaf-

sheaths, persistent, 7–12 mm. long, 2–3 mm. wide. Peduncles from axil of upper leaves, filiform, erect, about 1.5 cm. long including the solitary flower. Floral bract minute, suborbicular, amplexicaul, apiculate, about 1 mm. long; bracteole linear, erect, small. Flower greenish or yellowish, sometimes with purple marks, with a short densely muricate ovary. Sepals elliptic, obtuse, concave, 3-nerved, 5–6.5 mm. long, 2–2.5 mm. wide; lateral sepals oblique. Petals elliptic-oblancoate, obtuse to subacute, oblique, 3-nerved, 5–5.3 mm. long, about 2 mm. wide. Lip incurved in natural position, with a short subterete claw that is about 1 mm. long; lamina broadly sagittate, cuneate at the base, triangular-ovate above and acute at the apex, about 4.5 mm. long; lateral arms linear-lanceolate, falcate, acute, retrorsely curved and upcurved in natural position, 2–2.5 mm. long; disk 3-nerved with the lateral nerves 3-branched, provided at the extreme base with a fleshy more or less 3-toothed callus, with the small rounded teeth (when present) directed back toward the column. Column long for the flower, 3.5–4 mm. long, provided on the ventral surface below the middle with a small broadly triangular suberect flap. Capsule broadly ellipsoid, about 8 mm. long, densely muricate with reddish brown excrescences.

This species is distinctive among Guatemalan species of *Dichaea* in that the leaves are densely toothed-ciliate along the entire margins.

Alta Verapaz: Near Cobán, *Türkheim* 164 (fide Kränzlin). Region of Cocolá, northeast of Carchá, *Standley* 70323.

× *Dichaea intermedia* Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 11: 72, t. 5, figs. 2a, 2b. 1943. Figure 195.

This natural hybrid is, vegetatively, similar to *D. trichocarpa*. However, florally, it is more or less intermediate between the above species and *D. squarrosa*. Its fleshy-thickened leaves are typically linear to linear-lanceolate and acuminate or tapering and long-spiculate as in *D. trichocarpa*. They are, however, sometimes obtuse-apiculate as in *D. squarrosa*. The lip and column are distinctly intermediate between those of the putative parents. The lip, which is 6–7 mm. long and 3–4 mm. wide across the middle, is fleshy and concave, broadly oblong-quadrate in outline, with a small angular lobule on each side near the apex. The broad, concave basal half of the lip resembles the condition found in *D. trichocarpa*, whereas the somewhat spreading, not strongly conduplicate, apical half resembles the typical lip of *D. squarrosa*. The column is short and fleshy, being 3–4 mm. long, and is provided with a small, erect, nearly glabrous to ciliate-hairy ligule on the ventral surface. The sepals, which are 8–10 mm. long and 3.2–5 mm. wide, are ovate-elliptic to elliptic-lanceolate, and obtuse to subacuminate. The petals, which are 7–9 mm. long and 2.5–4 mm. wide, are oblong-elliptic to elliptic-oblancoate and acute to apiculate.

Such a distinctive natural hybrid is seldom found in the Orchidaceae. × *Dichaea intermedia* has been found only in Mexico (Vera Cruz, Chiapas, Oaxaca) and Guatemala, where it is epiphytic on trees in humid forests, up to 1,500 meters alt.

Alta Verapaz: Pansamalá, *Türkheim* 1247. Cobán, *Türkheim* II 1798. Samác, *Johnson* 297. Cobán, *Muenschler* 12531.

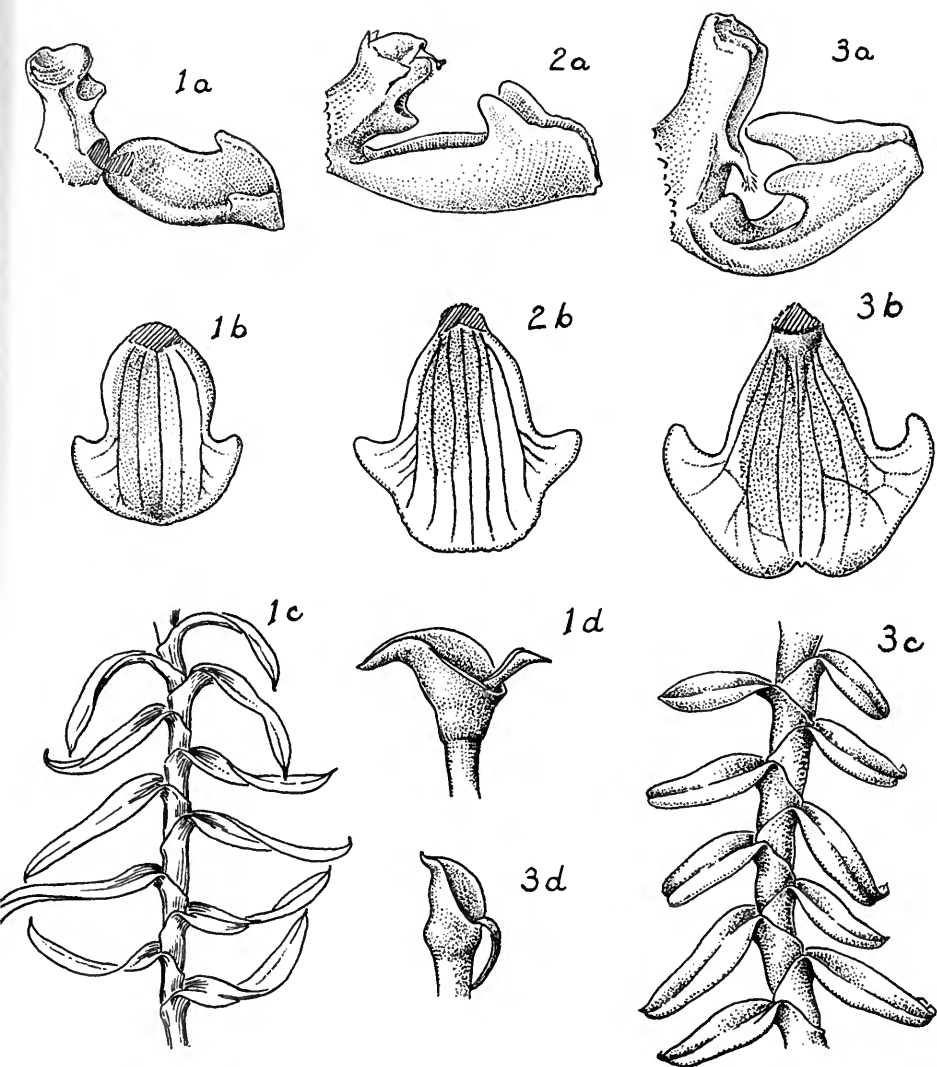


FIG. 195. *Dichaea trichocarpa*. 1a, lip and column, side view ($\times 5$); 1b, lip, spread out, front view ($\times 5$); 1c, section of stem showing leaves ($\times 2$); 1d, floral bract and bractlet ($\times 5$). $\times D. intermedia$. 2a, lip and column, side view ($\times 5$); 2b, lip, spread out, front view ($\times 5$). *D. squarrosa*. 3a, lip and column, side view ($\times 5$); 3b, lip, spread out, front view ($\times 5$); 3c, section of stem showing leaves ($\times 2$); 3d, floral bract and bractlet ($\times 5$). Drawn by G. W. Dillon.

Dichaea muricata (Sw.) Lindl. Gen. & Sp. Orch. Pl. 209. 1833.
Cymbidium muricatum Sw. Nov. Act. Soc. Sci. Ups. 6: 71. 1759.
Dichaea Tuerckheimii Kränzl. in Engler, Das Pflanzenr. 4, 50: Heft 83: 39. 1923 (type: Guatemala, *H. von Tuerckheim*).

Epiphytic on trees in wet forests, up to 1,800 meters alt. Widespread and rather common from Mexico, through Central America to Costa Rica, the West Indies, and northern South America.

Plant densely caespitose, often growing in large clumps, pendent, up to 5 dm. or more tall. Stems simple or branched, somewhat compressed, concealed by the leaf-sheaths, 1–2 mm. in diameter. Leaves 2-ranked, alternate, about 7 mm. apart, spreading-recurved, continuous with the imbricated leaf-sheaths, persistent, firmly membranaceous, flexible, olive-green, linear-elliptic to broadly elliptic or rarely elliptic-lanceolate, dorsally carinate along the central nerve, rounded to obtuse at the apex with the dorsal keel excurrent as a cusp, with the base of the broad lamina somewhat clasping the stem, 8–19 mm. long, 3–7.5 mm. wide; sheaths sometimes spotted dark green. Peduncles from axil of upper leaves, filiform, spreading, 2–3 cm. long including the solitary flower. Floral bract ovate-suborbicular, amplexicaul, acute, 2.5–3.5 mm. long; bracteole linear, erect. Flower tan-colored or orange and purple or blue-lavender, with a short muricate ovary. Sepals somewhat spreading, usually orange-colored, elliptic-lanceolate, acute to acuminate, concave-cymbiform, often verrucose on the outer surface, barred and spotted with reddish purple, 7.5–14 mm. long, 2.5–4.5 mm. wide; lateral sepals falcate. Petals spotted with blue-lavender, elliptic-lanceolate to linear-oblong, shortly acuminate, oblique, concave, 7–12 mm. long, 2.1–4 mm. wide. Lip blue-purple, incurved and concave in natural position, rhombic-obovate and sagittate in outline, broadly cuneate and fleshy-thickened below, broadly triangular-ovate above and more or less conduplicate at the acute-apiculate apex, somewhat cellular-papillose throughout, often pubescent on the margins especially below the middle, 6–8 mm. long, 3.3–5 mm. wide across the disk; lateral arms arising about the middle of the lip, narrowly triangular-lanceolate, acute, retrorsely curved and upcurved in natural position, about 3 mm. long. Column short, fleshy, 2.5–3.5 mm. long, provided on the ventral surface just below the middle with a linear hairy projecting ligule. Capsule ellipsoid-obovoid, densely muricate with long excrescences that are only slightly swollen at the base, 1–1.7 cm. long, about 5 mm. in diameter.

This species is somewhat variable in the length and size of the leaves and in the size of the flowers. It is closely allied to several other Central American species. A poultice, used as a treatment for snake-bites, is said to be made by crushing and macerating the plant.

Alta Verapaz: Cubilgüitz, *Türckheim* II 99 (7676). Chamá, *Johnson* 219. Between Tactic and the divide on road to Tamahú, *Standley* 91452.—Izabal: Cerro San Gil, along Río Tameja, *Steyermark* 41764.—Sololá: Wooded slopes along Río Bravo, below Finca Mocá, *Steyermark* 48048.—Suchitepequez: Finca Mocá, *Bequaert* 47; *Skutch* 2074.

The following collections are probably referable to this species. However, since they are sterile some doubt must be placed upon their identity.—Alta Verapaz: Cobán, *Muenschner* 12543. Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 90101. Along the Petén highway, between Campur and Socoyó, *Standley* 91938. Along Río Polochic below Tamahú, *Standley* 91998.—Escuintla: Finca Monterrey, south slope of Volcán de Fuego, *Standley* 64531.—Izabal: Between Virginia and Lago Izabal, Montaña del Mico, *Steyermark* 38723.—Quezaltenango; Finca Pirineos, below Santa María de Jesús, *Standley* 68440.—Retalhuleu: Near Chivolandia (Dept. Quezaltenango), along road to San Felipe, *Standley* 87170.—San Marcos: Finca El Porvenir along Río Chopal, south-facing slopes of Volcán Tajumulco, *Steyermark* 37472.—Suchitepequez: Southwestern lower slopes of Volcán Zunil, in vicinity of Finca Montecristo, southeast of Santa María de Jesús, *Steyermark* 35268.

Dichaea muricata* var. *neglecta (Schltr.) Kränzl. in Engler, *Das Pflanzenr.* 4, 50: Heft 83: 38. 1923. *Dichaea neglecta* Schltr. *Beih. Bot. Centralbl.* 36, Abt. 2: 420. 1918.

This variety is found in Mexico and Guatemala, where it occurs on trees and rocks in dense, humid forests, up to 2,000 meters altitude.

Variety *neglecta* is usually, but not always, a smaller, more regularly branched plant than the typical form. The leaves are typically smaller, being usually much less than 1 cm. long, and the flowers are often smaller than those of typical *D. muricata*. The densely green-spotted leaf-sheath is perhaps the most obvious character that separates var. *neglecta* from the typical form.

“Valley about 1 mile from Puerta Parada; also Cerro de las Nubes,” *Lewis* 83.

The following collections are probably referable to var. *neglecta*. However, since they are sterile their identity is questionable.—Chi-quimula: Volcán Ipala, near Amatillo, *Steyermark* 30510.—Jutiapa: Volcán Suchitán, northwest of Asunción Mita, *Steyermark* 31892.—Quezaltenango: Montaña Chicharro, on lower southeast-facing slopes of Volcán Santa María, 2–4 miles south of Santa María de Jesús, “pashte de montaña,” *Steyermark* 34269. Between Finca Pirineos and Patzulín, *Standley* 86878; 86907. Above Santa María de Jesús, *Standley* 87162a.—Zacapa: Sierra de las Minas, San Lorenzo, *Steyermark* 43168.

Dichaea panamensis Lindl. *Gen. & Sp. Orch. Pl.* 208. 1833. Figure 196.

Epiphytic on trees in damp forests, usually at low elevations, from sea level up to 1,100 meters alt. Mexico, through Central America to Panama and northern South America; rather common.

Plant densely caespitose, erect-spreading, up to 2 dm. or more tall. Stems simple, slightly compressed, concealed by the leaf-sheaths, about 2 mm. in diameter. Leaves 2-ranked, alternate, about 7 mm. apart, spreading, articulate with the imbricated leaf-sheaths, deciduous, linear to linear-elliptic, subobtuse to shortly acuminate, irregular in length, usually somewhat glaucous, firmly membranaceous, 1.5-4.5 cm. long, 3-5 mm. wide. Peduncles from axil of upper leaves, filiform, flexuous, 2-2.5 cm. long including the solitary flower. Floral bract suborbicular, acute-apiculate, cucullate, about 2 mm. long; bracteole linear-lanceolate, erect. Flower greenish or whitish, flecked with purple or dark red, with a short smooth ovary. Sepals spreading-recurved, slightly concave below the middle; dorsal sepal narrowly triangular-lanceolate to elliptic-lanceolate, tapering to the acute to acuminate apex, 5-8 mm. long, 2-2.5 mm. wide; lateral sepals lanceolate, falcate, tapering to the acute to acuminate apex, 6-10 mm. long, 2.7-3 mm. wide below the middle. Petals broadly ovate-elliptic, acute, oblique, 5-7.5 mm. long, 3-4 mm. wide. Lip sagittate, with a fleshy claw, upcurved in natural position, 6.5-10 mm. long including the claw; lamina sagittate-ovate, somewhat recurved at the broadly obtuse to acute apex, 4-6.5 mm. long, 5-6.5 mm. wide at the base; claw sometimes with a small thickened dilation on each side near the base. Column short, fleshy, concave on the ventral surface, with a small glabrous ligule pendent from the base of the concave portion, 3.5-5 mm. long. Capsule ellipsoid, smooth, about 1 cm. long.

This species is distinguished from *D. graminoides*, which it superficially resembles, by its ecallose, sagittate (not panduriform) lip. The leaves of this species are glaucous, and, as is sometimes the case with those of *D. graminoides*, are irregular in length; that is, short leaves are often found interspersed with the longer leaves. Due to annual growth, the two species are perhaps most conveniently distinguished in the field by their habit. *Dichaea panamensis* is a distinctly caespitose plant, bearing its stems in a dense, suberect-spreading cluster, whereas *D. graminoides* is a straggly, repent plant that apparently never assumes a caespitose habit.

Alta Verapaz: Cubilgüitz, *Türkheim* 4076. Chamá, *Johnson* 218. Jocoló, along Lago Izabal, *Johnson* 1156. At Dolores, between Cubilgüitz and Samanzana, *Steyermark* 45097.—Huehuetenango: Wooded slopes bordering Río Lacandón, between Ixcán and Río Ixcán, Sierra de los Cuchumatanes, *Steyermark* 49355.—Izabal: Along railroad, between Puerto Barrios and Milla 7, *Steyermark* 42056. Oneida-Chickasaw connection, *Lewis* 12. Between Milla 49.5 and

FIG. 196. *Dichaea panamensis*. Plant ($\times 1$); 1, flower, spread open, side view ($\times 3$); 2, lateral sepal ($\times 3$); 3, dorsal sepal ($\times 3$); 4, petal ($\times 3$); 5, column, side view ($\times 3$); 6, pollinia and stipe (much enlarged). Drawn by Blanche Ames.



Cristina, *Steyermark* 38681.—“Eastern portions of Vera Paz and Chiquimula,” *Watson* 118b.

Dichaea squarrosa Lindl. *Ann. Nat. Hist.* 4: 384. 1840. *D. suaveolens* Kränzl. in Engler, *Das Pflanzenr.* 4, 50: Heft 83: 39. 1923 (type: Guatemala, near Aguarce, *Lehmann* 1642). Figure 195.

Epiphytic on trees in humid forests, usually at high elevations, up to 3,800 meters alt. Rather common in Mexico and Guatemala; rare in El Salvador and Costa Rica.

Plant straggly, often growing in entangled clumps, pendent, up to 4 dm. or more tall. Stems simple or branched, concealed by the leaf-sheaths, about 2 mm. in diameter. Leaves 2-ranked, alternate, 5–7 mm. apart, deflexed, continuous with the imbricated leaf-sheaths, persistent, fleshy-coriaceous, linear, stubby, obtuse and usually sharply apiculate at the recurved and twisted apex, not clasping the stem (as in *D. muricata*), dark green, 3–15 mm. long, 1–3 mm. wide. Peduncles from axil of upper leaves, filiform, spreading, 1–2 cm. long including the solitary flower. Floral bract suborbicular, minutely apiculate, infundibuliform, amplexicaul, about 2.5 mm. long. Flower fleshy, yellowish or greenish, often flecked with purple, with the lip white and marked or stained with purple, with a short muricate ovary. Sepals and petals more or less verrucose on the outer surface. Dorsal sepal broadly elliptic to elliptic-obovate, obtuse-apiculate, deeply concave, 7.5–10 mm. long, 4–5 mm. wide. Lateral sepals broadly elliptic to ovate-elliptic, obtuse to obtuse-apiculate, concave, oblique, 7–10 mm. long, 4.8–6 mm. wide. Petals broadly cuneate-obovate to cuneate-elliptic, truncate to broadly rounded and more or less apiculate at the apex, usually lightly concave, oblique, 7–9 mm. long, 3.2–4.5 mm. wide above the middle. Lip strongly incurved and concave in natural position, broadly cuneate-obovate to flabellate in outline, from a fleshy-thickened base, broadly rounded to subtruncate and notched at the apex with a small apicule in the notch, produced on each side at the apex into a triangular erect lobule, 6.5–8 mm. long, 4–5.5 mm. wide just below the lateral lobules, more or less fleshy-thickened and papillose-ciliate on the apical portion; lateral lobules retrorsely curved, 1.5–2.5 mm. long. Column subterete, fleshy, 4–6 mm. long, provided with a slender hairy pendent or projecting ligule on the ventral surface and a lateral more or less ciliate keel on each side below the middle. Capsule broadly ellipsoid, densely muricate, about 1 cm. long.

This species is distinguished from *D. trichocarpa* and $\times D.$ *intermedia* by the following characters: typically linear, obtuse, stubby leaves; shortly apiculate floral bracts; long column with a pendent or projecting, hairy, ventrally placed ligule; cuneate, more or less truncate petals; fleshy, cuneate-flabellate lip.

Amatitlán: Pacaya, *Johnston*.—Guatemala: Volcán de Pacaya, *Johnston & Porter* (comm. *Lewis* 200). Base of Volcán de Pacaya, *Porter*.—Huehuetenango: Cerro Pixpíx, above San Ildefonso Ixtahuacán, *Steyermark* 50582.—Jalapa: Potrero Carrillo, 13 miles north-east of Jalapa, near Minas de Croma, *Steyermark* 33112.—Sololá:

Volcán Atitlán, south-facing slopes, *Steyermark* 47423.—Suchitepequez: Volcán Zunil, *Skutch* 943.

The following collections are probably referable to this species. However, since they are sterile some doubt must be placed upon their identity.—Amatitlán: Volcán de Pacaya, above Las Calderas, *Standley* 58500. Slopes of Volcán de Pacaya, between San Francisco Sales and the base of the active cone, *Standley* 80746; 80758. Near Finca La Aurora, *Aguilar* 262.—Quezaltenango: Montaña Chicharro, southeast-facing slopes of Volcán Santa María, 2–4 miles south of Santa María de Jesús, *Steyermark* 34261.—San Marcos: Above Finca El Porvenir, between “Todos Santos Chiquitos” and “Loma de la Paloma,” south-facing slopes of Volcán Tajumulco, *Steyermark* 37256. Barranca Eminencia, road between San Marcos and San Rafael Pie de la Cuesta, in upper part of barranca between Finca La Lucha and Buena Vista, *Standley* 86540.

Dichaea trichocarpa (Sw.) Lindl. Gen. & Sp. Orch. Pl. 209. 1833. *Epidendrum trichocarpon* Sw. Prodr. 124. 1788. Figure 195.

Epiphytic on trees and on rocks in humid forests and on brushy banks, usually at high elevations, up to 1,850 meters alt. Widespread; rare in Mexico, Guatemala, and Costa Rica; rather common in the West Indies.

Plant straggly, often growing in entangled clumps, pendent, up to 6 dm. or more tall. Stems usually much-branched, concealed by the leaf-sheaths, terete, about 1.5 mm. in diameter. Leaves 2-ranked, alternate, 5–7 mm. apart, deflexed, continuous with the imbricated leaf-sheaths, persistent, fleshy-thickened, linear to somewhat linear-lanceolate, acute to obtuse-apiculate or subacuminate, more or less denticulate at the apex, grass-green, not clasping the stem (as in *D. muricata*), 7–16 mm. long, 1.5–3 mm. wide. Peduncles from axil of upper leaves, slender, 1–1.5 cm. long including the solitary flower. Floral bracts suborbicular, infundibuliform, amplexicaul, with the shortly acuminate-apiculate apex strongly conduplicate and reflexed, about 3.5 mm. long; bracteole falcate, conduplicate, recurved. Flowers fleshy, white, with the lip barred and suffused with bluish purple, with a densely muricate ovary, fragrant. Sepals and petals often verrucose on the outer surface, more or less dorsally carinate. Dorsal sepal ovate-elliptic to elliptic-lanceolate or oblong-elliptic, obtuse to acute, cymbiform-concave, 6–7.5 mm. long, 2.5–3 mm. wide. Lateral sepals ovate-elliptic to elliptic-lanceolate, acute to acute-apiculate, concave, somewhat oblique, 6.8–8 mm. long, 2.7–4 mm. wide below the middle. Petals linear-oblong to elliptic or elliptic-ob lanceolate, more or less conduplicate at the obtuse and obliquely apiculate apex, somewhat ciliate on the margins, 5.5–7 mm. long, 1.8–2.8 mm. wide. Lip very fleshy, concave, sessile, erect and parallel with the column, 4.5–6 mm. long, 3–3.5 mm. wide across the middle, with the lower half broadly elliptic to suborbicular, more or less dilated at the apex on each side to form a short triangular erect or retrorsely curved lobule or angle (rarely with the lobule obsolescent),

usually strongly conduplicate at the rounded to truncate and somewhat apiculate apex. Column short, fleshy, 2.5–3 mm. long, about 2 mm. thick, without a ligule on the ventral surface or with the erect stigmatic margin only slightly dilated and ciliate. Capsule ellipsoid-globose, densely muricate, 8–10 mm. long, about 4 mm. in diameter.

The acuminate, prominently recurved apex of the floral bracts, small suborbicular lip with its usually strongly conduplicate apex, and the short, eligulate column, as well as the somewhat tapering, more or less acuminate leaves, distinguish this species from *D. squarrosa*.

Alta Verapaz: Cobán, *Türckheim* 2450. Wet forest near Tactic, above the bridge across Río Frío, *Standley* 90473.

Dichaea Tuerckheimii Schltr. *Orchis* 10: 188, abb. 44, 17–24. 1916 (type: Guatemala, *H. von Türckheim*). *D. guatemalensis* Schltr. *Orchis* 10: 190. 1916, *sphalm.*

Closely appressed to the bark of trees among mosses in damp forests, up to 1,200 meters alt. Rare in British Honduras, Guatemala, and Costa Rica.

Plant repent, mottled, forming mats of 6 dm. or more across. Stem often much-branched, elongated, densely leaved, concealed by the leaf-sheaths, slightly compressed, about 1 mm. in diameter. Leaves 2-ranked, alternate, about 3 mm. apart, spreading at right angles to the stem, continuous with the imbricated leaf-sheaths, persistent, ovate-elliptic to elliptic, acute to shortly acuminate, oblique, membranaceous, 3.5–6.5 mm. long, 2–3 mm. wide. Peduncles from axil of upper leaves, filiform, suberect, glabrous, about 1.5 cm. long including the solitary flower. Floral bract suborbicular, apiculate, cucullate, about 2 mm. long; bracteole linear, reflexed. Flower small, with a short smooth ovary, pale green or whitish, sparsely violet-spotted. Sepals and petals similar, slightly spreading, ovate-elliptic to lanceolate, acute to subacuminate, smooth or slightly verrucose on the outer surface of the sepals, 4.8–6.5 mm. long, 1.6–2 mm. wide below the middle; lateral sepals and petals slightly oblique. Lip with a short linear fleshy claw, 4–5 mm. long including the claw; lamina suborbicular-triangular to subcordate-orbicular, subacute to apiculate, lightly concave, provided on each side at the base with a small mammillate callus, 2.8–3.5 mm. wide. Column semiterete, fleshy, glabrous, 2–2.5 mm. long. Capsule ellipsoid, smooth, about 6 mm. long.

This species is distinctive in being, vegetatively, the smallest *Dichaea* found in Guatemala. *D. hystricina* approaches it in size but the leaves of that species are bristly ciliate. The entire lip, with its pair of basal lateral calli, is also a distinctive feature of this species.

Alta Verapaz: Chamá, *Johnson* 417.

EXCLUDED SPECIES

Schlechter (in Beih. Bot. Centralbl. 36, Abt. 2: 518. 1918) reported *Dichaea pendula* (Aubl.) Cogn. from Guatemala. At the same time he included *D. echinocarpa* (Sw.) Lindl. as a synonym of *D. pendula*. Since *D. pendula* is considered to be a *nomen confusum*, it is invalidated. However, *D. echinocarpa* is an accepted, valid species and, although it is primarily a West Indian species, it has been found in Costa Rica and may eventually be collected in Guatemala. It is excluded from this work because we consider the plant which in the past has been treated as the invalid *D. pendula* to be referable to *D. muricata*, and it is our opinion that Schlechter, being confused as to the true status of *D. echinocarpa*, considered narrow-leaved specimens of *D. muricata* as *D. pendula* (*D. echinocarpa*).

89. **CAMPYLOCENTRUM** Benth.

Epiphytic herbs with leafy stems or with an obsolescent stem and leafless, with clustered roots that are often chlorophyllous. Stem abbreviated or elongated, when present leafy and concealed by the leaf-sheaths. Leaves (when present) in two ranks, elliptic to linear, fleshy, deciduous, articulated with the leaf-sheaths. Inflorescences spicate, radical or axillary. Floral bracts small, persistent. Flowers minute, in two ranks, crowded, with the floral segments more or less connivent. Sepals free, subequal. Petals similar to the sepals but usually shorter. Lip uppermost, sessile at base of column, about as long as the sepals, simple or 3-lobed, concave, produced at the base into a cylindrical or clavate more or less curved-porrect spur. Column short, footless; anther terminal, operculate, incumbent; pollinia 2, waxy, globose, with filiform stalks. Capsule small, obliquely ellipsoid, dehiscent in the middle by three valves.

This is a small genus of less than forty species, which are confined to the American tropics and subtropics.

- 1. Plant leafless; stem obsolescent. *C. fasciola*.
- 1. Plant with leaves; stem elongated, slender.
 - 2. Plant small; leaves less than 2.5 cm. long.
 - 3. Lip rhombic-ovate, simple; spur 2 mm. long; leaves 1.4 cm. or more long. *C. microphyllum*.
 - 3. Lip 3-lobed; spur about 1.5 mm. long; leaves 1.3 cm. or less long. *C. Brenesii*.
 - 2. Plant rather large; leaves more than 2.5 cm. long.
 - 4. Lip lanceolate in outline, 3 mm. or more long; spur cylindrical, 2 mm. or more long. *C. micranthum*.
 - 4. Lip ovate-subrhombic in outline, less than 2.5 mm. long; spur saccate-clavate, less than 2 mm. long. *C. Schiedei*.

Campylocentrum Brenesii Schltr. Repert. Sp. Nov. Beih. 19: 268. 1923.

Epiphytic on trees in pastures and forests, up to 2,000 meters alt. Rare in Guatemala and Costa Rica.

Plant small, erect-spreading or pendent. Stems simple, concealed by the leaf-sheaths, up to 12 cm. or more long, about 2 mm. in diameter. Leaves small, distichous, spreading, ovate-elliptic to elliptic, rounded to subacute and denticulate at the apex, coriaceous, articulate with the leaf-sheaths, 8–13 mm. long, 3–5 mm. wide. Leaf-sheaths with a hyaline margin at the apex. Inflorescences arising along the stems, short, slender, many-flowered, spreading, 1–2 cm. long. Floral bracts ovate, acute to acuminate, concave, ciliate on the margins, about 1 mm. long. Flowers minute, white, glabrous, with the floral segments connivent. Sepals linear to linear-lanceolate, acute, dorsally carinate, 1.8–2.8 mm. long, 0.6–0.8 mm. wide; lateral sepals oblique. Petals elliptic to lanceolate or elliptic-ob lanceolate, acute, oblique, 1.5–2.3 mm. long, 0.5–0.7 mm. wide about the middle. Lip semioval below the middle, 3-lobed about the middle, 1.8–2.2 mm. long, 1–1.5 mm. wide across the lateral lobes when spread out; lateral lobes short, obtuse to subacute, semicuneate, upcurved in natural position to clasp the column; mid-lobe triangular-lanceolate, acute to subacuminate. Spur short, saccate, laterally compressed, 1–1.8 mm. long. Capsule obliquely ellipsoid, hispid, 5–6 mm. long.

This is the smallest *Campylocentrum* found in Guatemala.

Alta Verapaz: Cubilgüitz, *Türkckheim* 8590.

Campylocentrum fasciola (Lindl.) Cogn. in Mart. Fl. Bras. 3, pt. 6: 520. t. 106, fig. 1. 1906. *Angraecum fasciola* Lindl. Bot. Reg. 26: sub t. 68. 1840. *Campylocentrum Sullivani* Fawc. & Rendle, Journ. Bot. 47: 128. 1909.

Epiphytic on trees and shrubs in dense tropical forests, also on citrus trees in groves, at low elevations. Uncommon in British Honduras, Guatemala, Nicaragua, Costa Rica, and the West Indies.

Plant leafless, with conspicuous elongated roots; roots green, becoming grayish white when dry, about 2 mm. thick, clasping bark or hanging free. Stem reduced to a knob, which produces the roots and inflorescences. Inflorescences several to many clustered on the abbreviated stem, erect to suberect, slender, densely many-flowered; rachis filiform. Floral bracts triangular-ovate, acute, concave, clasping, 1–1.7 mm. long. Flowers minute, brownish white, cream-colored or green-white, with the floral segments connivent below the middle. Sepals elliptic to ovate-elliptic or oblong, obtuse to acute, apiculate, 1-nerved, 1.5–2 mm. long, 0.7–1 mm. wide; lateral sepals oblique. Petals elliptic to ovate-elliptic, obtuse to subacute, 1-nerved, 1.3–1.8 mm. long, 0.6–0.8 mm. wide. Lip trulliform, 3-lobed about the middle, semioval on the lower half when spread out, about 7-nerved, 1.3–2 mm. long, 1.3–1.6 mm. wide across the lateral lobes when expanded; lateral lobes rounded, obtuse, mid-lobe triangular, obtuse to acute, apiculate. Spur cylindrical, slightly clavate, 1.1–2 mm. long. Capsule obliquely ellipsoid, 4–5 mm. long.

The leafless habit of this species immediately distinguishes it from other species of *Campylocentrum* found in Guatemala.

Izabal: Virginia, *Lewis* 27.

Campylocentrum micranthum (Lindl.) Rolfe, *Orch. Rev.* 11: 245. 1903. *Angraecum micranthum* Lindl. *Bot. Reg.* 21: t. 1772. 1835. *Campylocentrum stenanthum* Schltr. *Repert. Sp. Nov.* 10: 486. 1912 (type: Guatemala, Dept. Alta Verapaz, near Cobán, *H. von Türckheim* 835a). Figure 197.

Epiphytic on trees and shrubs in humid forests usually at low elevations, up to 1,350 meters alt. Widespread and common from Mexico through Central America to Panama, the West Indies, and northern South America.

Plant repent, pendent, straggly. Stems simple, lightly flexuous, concealed by the leaf-sheaths, 7.5 dm. or more long, about 3 mm. in diameter. Leaves distichous, spreading, linear to oblong-elliptic, obliquely retuse at the rounded to obtuse apex, coriaceous, articulate with the leaf-sheaths, 4-13 cm. long, up to 2.5 cm. wide. Leaf-sheaths lacerate-toothed at the apex. Inflorescence usually short and stubby, arising along the stem, rigidly suberect or spreading, many-flowered, rarely more than 3 cm. long; rachis usually stout. Floral bracts ovate, obtuse, glabrous, denticulate on the margins, 1-2 mm. long, shorter than the ovary. Flowers distichous, white or greenish, with the floral segments connivent. Sepals and petals scarcely spreading above the middle, linear-lanceolate to narrowly oblanceolate, acute, with the margins somewhat involute, 3-5 mm. long, with the sepals about 1 mm. longer than the petals, about 1 mm. wide; lateral sepals and petals slightly oblique. Lip lanceolate in outline, acute to acuminate, more or less lobed on each side below the middle, with the shallow lobes upcurved to clasp the column, 3-4.8 mm. long, 1.3-2 mm. wide across the lower third when spread out. Spur cylindrical to slightly clavate, curved-porrect, 2-5 mm. long. Column small, about 1 mm. long. Capsule obliquely ellipsoid, 8-12 mm. long.

This species is somewhat variable in the size of the leaves and floral segments. Schlechter described the smaller-flowered *C. stenanthum* as having an entire lip. However, an examination of flowers from an isotype reveals that, although the flowers are smaller than in the typical form, the lip is shallowly lobed on each side as in typical *C. micranthum*.

Alta Verapaz: Cubilgüitz, *Türckheim* 7671; 4021. Chamá, *Johnson* 235. Cerro de Agua Tortuga (Sahacoc), vicinity of Cubilgüitz, *Steyermark* 44632; 44654. South of Cubilgüitz, *Steyermark* 44568.—Escuintla: Hacienda Velásquez, *Salas* 384. Between Río Jute and Río Pantaleón, on road between Escuintla and Santa Lucía Cotz, *Standley* 63484; 63532. Along or near Río Michatoya, southeast of Escuintla, *Standley* 89064.—Izabal: Vicinity of Quiriguá, *Standley* 24464. Along river between York and Virginia, *Lewis* 44.—Petén: Occupied clearing, La Libertad, *Lundell* 2164. La Libertad, *Lundell* 2127.—Retalhuleu: Río Coyote, along road 4 km. west of Retalhuleu, *Standley* 87498. Between Retalhuleu and Nueva Linda, *Standley* 88476. Vicinity of Retalhuleu, *Standley* 88737.—Santa Rosa:

Chiapas, *Heyde & Lux* 4622.—Suchitepequez: Vicinity of Tiquisate, *Steyermark* 47691.—Chocón Plantation, Vera Paz and Chiquimula, *Watson* 362.

Campylocentrum microphyllum Ames & Correll, Bot. Mus. Leaf. Harv. Univ. 10: 88. t. 11. 1942 (type: Guatemala, Dept. San Marcos, above Finca El Porvenir, Cerro de Mono, south-facing slopes of Volcán Tajumulco, *J. A. Steyermark* 37376). Figure 198.

Epiphytic on trees in forests, up to 1,700 meters alt. Rare in Mexico and Guatemala.

Plant creeping, sending out pendent or ascending stems up to 15 cm. long; stems occasionally branching, less than 2 mm. in diameter, concealed by the leaf-sheaths. Roots grayish, fibrous, flexuous. Leaves small, distichous, articulate to the leaf-sheaths, linear to linear-lanceolate, very obliquely retuse at the apex, fleshy-coriaceous, grass-green, sulcate along the midrib, usually minutely serrulate on the margins near the apex, 1.4–2.2 cm. long, 3–5.5 mm. wide; leaf-sheaths tubular, compressed, bony-toothed on the apical margin. Inflorescence composed of short racemes arising solitarily or in pairs in the axils of the upper leaves; rachis and short peduncle filiform, 1.5–2.5 cm. long. Floral bracts ovate, acute, concave, ciliate on the margins, 0.5–1 mm. long. Flowers distichously placed along the rachis, as many as 15. Dorsal sepal ovate-oblong, narrowly obtuse, concave, 1-nerved, 1.2 mm. long, about 0.5 mm. wide below the middle. Lateral sepals narrowly triangular-lanceolate, acute, concave, 1-nerved, 1.8 mm. long, 0.5 mm. wide near the base. Petals lanceolate, narrowly obtuse to acute, 1-nerved, 1.1 mm. long, 0.4 mm. wide. Lip rhombic-ovate, narrowed above to the subacute apex, concave below, with a central nerve, 1.5 mm. long, 1 mm. across the widest point, produced below into a prominent spur. Spur clavate, exceeding the lip, abruptly decurved near the base, 2 mm. long. Column short, sessile. Capsule ellipsoidal, about 4 mm. long and 2 mm. in diameter.

This species is most closely allied to *C. Brenesii* Schltr. and *C. longicalcaratum* Ames & Schweinfurth. It differs from *C. Brenesii* in the longer leaves, slenderer rachis, longer spur, and simple, not 3-lobed, lip. It differs from *C. longicalcaratum* in the longer leaves, shorter spur, and simple, not 3-lobed, lip.

Represented from Guatemala only by the type collection.

Campylocentrum Schiedeii (Reichb. f.) Benth. ex Hemsl. in Godm. & Salvin, Biol. Centr.-Am. Bot. 3: 292. 1885. *C. Tuerckheimii* Schltr. Repert. Sp. Nov. 10: 363. 1912 (type: Guatemala, Dept. Alta Verapaz, near Cobán, August, 1886, 1907, *H. von Türckheim* 835, II 1921).

FIG. 197. *Campylocentrum micranthum*. Plant ($\times 1$); 1, inflorescence ($\times 4$); 2, lip and column, from above (about $\times 10$); 3, column, side view (about $\times 10$). Drawn by Blanche Ames.



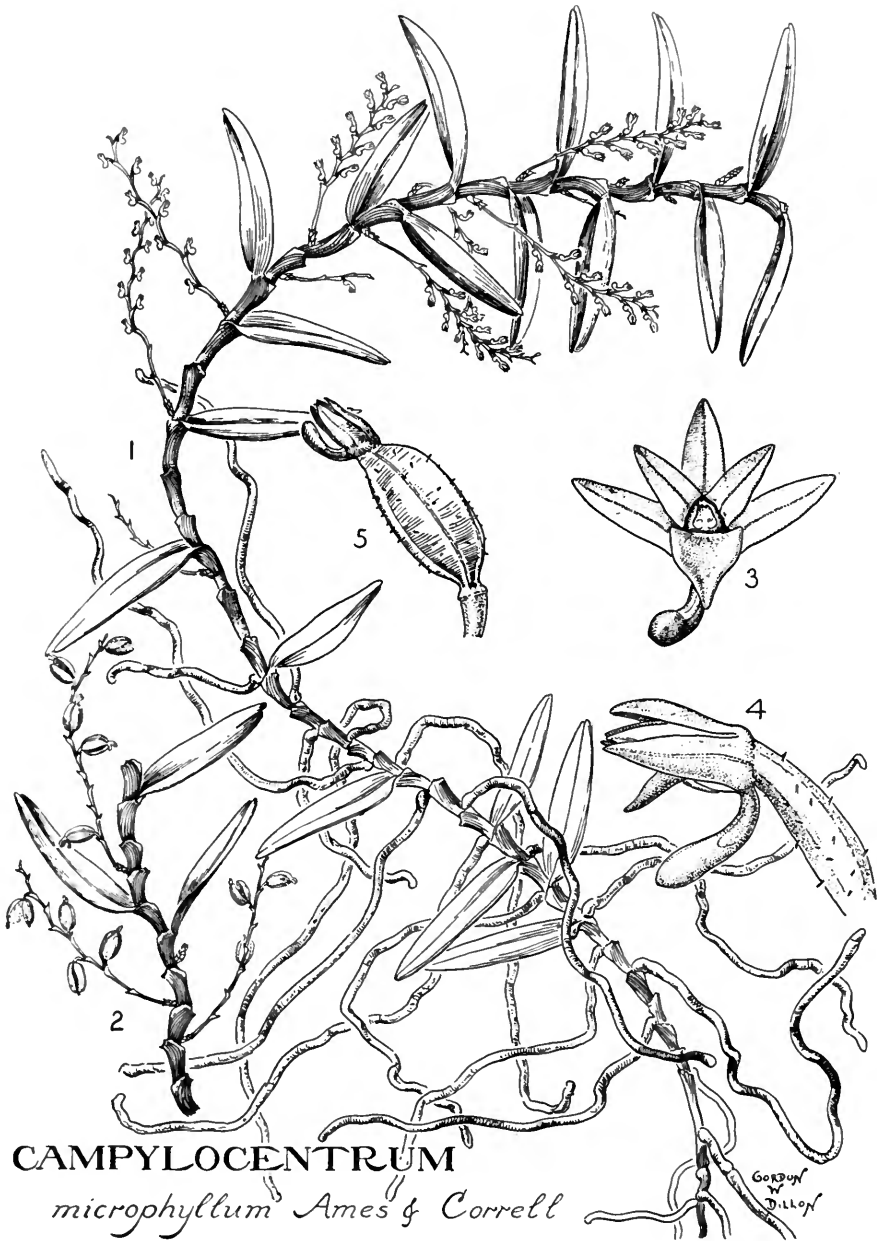


FIG. 198. *Campylocentrum microphyllum*. 1, flowering plant ($\times 1$); 2, portion of plant showing fruiting racemes ($\times 1$); 3, flower, spread out ($\times 10$); 4, flower, side view ($\times 10$); 5, capsule with remains of flower ($\times 5$). Drawn by G. W. Dillon.

Epiphytic on trees and shrubs in humid forests, up to 1,350 meters alt. Uncommon in Mexico, Guatemala, and Costa Rica.

Plant repent, pendent, often growing in mats. Stems simple, concealed by the leaf-sheaths, somewhat flexuous, up to 3 dm. or more long, 2-3 mm. in diameter. Leaves distichous, elliptic to oblong-elliptic, somewhat falcate, obliquely retuse and denticulate at the obtuse to subacute apex, subcoriaceous, 3-7 cm. long, 7-15 mm. wide, articulate with the leaf-sheaths. Leaf-sheaths compressed, more or less lacerate at the apex. Inflorescences several to many, arising along the stem, erect-spreading, laxly and distichously many-flowered, glabrous, about equal in length to the leaves; rachis slender or stout, 4-angled. Floral bracts spreading, ovate, obtuse to acute, concave, with the margins slightly toothed, 1-2 mm. long, subequal to the ovary. Flowers spreading, white. Sepals and petals connivent, oblong to elliptic-ligulate, obtuse to subacute, somewhat dorsally carinate, 1-nerved, 1.7-2.5 mm. long, 0.5-1 mm. wide; lateral sepals and petals slightly oblique. Lip variable, ovate-subrhombic in outline, obtuse to acute at the apex, concave, broadly rounded to broadly cuneate at the base, more or less 3-lobed about the middle with the lateral lobes broadly rounded to angular and subacute, with the apical lobe triangular, 1.8-2.3 mm. long, 1-1.7 mm. wide across the lateral lobes or margins when spread out. Spur saccate-clavate, porrect-incurved, 1-1.8 mm. long. Column minute, less than 1 mm. long. Capsule obliquely ellipsoid, glabrous, strongly ribbed, 4-7 mm. long.

This species is variable in the shape of the lip, which ranges from a strongly 3-lobed condition to broadly ovate and essentially entire.

Alta Verapaz: Cobán, *Türckheim* 3848. Río Cobán, between Cobán and San Pedro, *Johnson* 650. Along Río Carchá, between Cobán and San Pedro Carchá, *Standley* 89990.—San Marcos: Finca El Porvenir, on Potrero Matasán along Río Cabús, Volcán Tajumulco, *Steyermark* 37571.

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