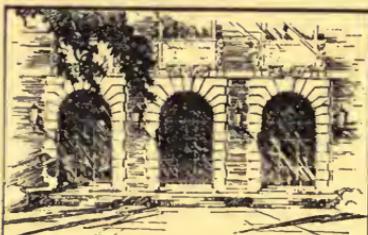


AUG 27 1962



LIBRARY
OF THE
UNIVERSITY
OF ILLINOIS

580.5

FB

v. 30

BIOLOGY.

Return this book on or before the
Latest Date stamped below.

University of Illinois Library

AUG 15 1962

DEC 27 1969

3)

ORCHIDS OF PERU



Photograph by Louis O. Williams

CHARLES SCHWEINFURTH

FIELDIANA: BOTANY

A Continuation of the

BOTANICAL SERIES

of

FIELD MUSEUM OF NATURAL HISTORY

VOLUME 30



CHICAGO, U.S.A.

1958-1961

Library of Congress Catalog Card Number: 58-10546

PRINTED IN THE UNITED STATES OF AMERICA
BY CHICAGO NATURAL HISTORY MUSEUM PRESS

ORCHIDS OF PERU

CHARLES SCHWEINFURTH

FIELDIANA: BOTANY

VOLUME 30, NUMBER 3

Published by

CHICAGO NATURAL HISTORY MUSEUM

JUNE 13, 1960

THE LIBRARY OF THE

JUL 13 1960



ORCHIDS OF PERU

ORCHIDS OF PERU

CHARLES SCHWEINFURTH

*Research Fellow, Ames Orchid Herbarium
Botanical Museum of Harvard University*

FIELDIANA: BOTANY

VOLUME 30, NUMBER 3

Published by

CHICAGO NATURAL HISTORY MUSEUM

JUNE 13, 1960

PRINTED WITH THE ASSISTANCE OF
The Frederick R. and Abby K. Babcock Fund

Library of Congress Catalog Card Number: 58-10546

PRINTED IN THE UNITED STATES OF AMERICA
BY CHICAGO NATURAL HISTORY MUSEUM PRESS

CONTENTS

Genera Included in Volume 30, Number 3

	PAGE		PAGE
Cattleya	533	Gongora	612
Laelia	536	Coryanthes	619
Brassavola	537	Xylobium	627
Scaphyglottis	541	Bifrenaria	638
Orleanesia	551	Lycaste	639
Isochilus	553	Anguloa	649
Polystachya	554	Koellensteinia	650
Galeandra	560	Aganisia	653
Bletia	562	Zygopetalum	654
Chysis	566	Batemannia	662
Bulbophyllum	567	Stenia	664
Buesiella	569	Chondrorhyncha	664
Eulophidium	571	Maxillaria	668
Eulophia	572	Pityphyllum	749
Cyrtopodium	574	Mormolyca	750
Warrea	576	Cyrtoglottis	752
Govenia	579	Trigonidium	754
Mormodes	581	Cryptocentrum	757
Catasetum	583	Trichocentrum	761
Cycnoches	592	Diadenium	766
Lueddemannia	594	Ionopsis	768
Eriopsis	595	Rodriguezia	770
Sievekingia	598	Neokoehleria	773
Lycomormium	600	Scelochilus	776
Peristeria	602	Comparettia	780
Houlletia	603	Sutrina	783
Polycynis	605	Trizeuxis	784
Stanhopea	606		

LIST OF ILLUSTRATIONS

TEXT FIGURES

PAGE

103.	Brassavola nodosa	539
104.	Brassavola ovaliformis	540
105.	Scaphyglottis propinqua	547
106.	Epidendrum vesicicaule, Scaphyglottis punctulata var. Summersii	549
107.	Orleanesia peruviana	552
108.	Polystachya foliosa	557
109.	Polystachya luteola	559
110.	Galeandra pubicentrum	563
111.	Buesiella pusilla	570
112.	Eulophia alta	573
113.	Cyrtopodium punctatum	577
114.	Catasetum coniforme	587
115.	Catasetum pusillum	589
116.	Sievekingia peruviana	599
117.	Lycomormium elatum	601
118.	Stanhopea Wardii	613
119.	Gongora maculata	616
120.	Coryanthes alborosea	621
121.	Coryanthes trifoliata	626
122.	Xylobium elongatum	630
123.	Xylobium latilabium	633
124.	Xylobium subintegrum	637
125.	Lycaste longisepala	647
126.	Zygopetalum acuminatum	657
127.	Zygopetalum Klugii	659
128.	Zygopetalum rhombilabium	661
129.	Chondrorhyncha pusilla	667
130.	Maxillaria angustibulbosa	679
131.	Maxillaria Camaridii	686
132.	Maxillaria cornuta	689
133.	Maxillaria cuzcoensis	691
134.	Maxillaria fasciculata	697
135.	Maxillaria funicaulis	701

	PAGE
136. <i>Maxillaria grandimentum</i>	703
137. <i>Maxillaria Klugii</i>	707
138. <i>Maxillaria linearis</i>	711
139. <i>Maxillaria loretoensis</i>	715
140. <i>Maxillaria parvibulbosa</i>	721
141. <i>Maxillaria rotundilabia</i>	729
142. <i>Maxillaria spathulata</i>	733
143. <i>Maxillaria tenuis</i>	736
144. <i>Maxillaria trigona</i>	737
145. <i>Maxillaria unicarinata</i>	741
146. <i>Maxillaria verrucifera</i>	743
147. <i>Maxillaria Woytkowskii</i>	747
148. <i>Mormolyca peruviana</i>	751
149. <i>Cyrtoglottis gracilipes</i>	753
150. <i>Cyrtoglottis peruviana</i>	755
151. <i>Cryptocentrum inaequisepalum</i>	758
152. <i>Cryptocentrum pseudobulbosum</i>	759
153. <i>Trichocentrum brevicaratum</i>	763
154. <i>Trichocentrum panduratum</i>	765
155. <i>Diadenium micranthum</i>	767
156. <i>Ionopsis utricularioides</i>	769
157. <i>Neokoehleria paniculata</i>	777
158. <i>Scelochilus latipetalus</i>	779
159. <i>Comparettia falcata</i>	782
160. <i>Stanhopea Wardii</i>	786

Orchids of Peru

CATTLEYA Lindl.

An American genus of showy epiphytic orchids with a more or less elongate creeping rhizome. Stems thick-cylindric or clavate to strongly pseudobulbous, covered by several evanescent, scarious sheaths, bearing 1 or 2 leaves at the summit. Leaves coriaceous or fleshy, oval to oblong. Inflorescences terminal, laxly racemose and few- to several-flowered above, with the peduncle more or less concealed by a conspicuous, conduplicate spathe. Flowers commonly large and showy, with spreading segments. Sepals free, subequal, the lateral ones lightly oblique. Petals commonly much broader than the sepals, rarely subequal to them. Lip free from the column but more or less surrounding it below and forming a tube, simple or more commonly 3-lobed. Column rather long, stout, arcuate; anther terminal, opercular, incumbent, 2-celled, with 4 waxy, compressed pollinia.

An important horticultural genus extending from Mexico to Brazil, Bolivia and Argentina.

- A1. Pseudobulb diphyllous; lip sharply 3-lobed *C. violacea* (*C. superba*)
- A2. Pseudobulb monophyllous; lip simple or obscurely 3-lobed I
 - Ia. Flowers relatively small, dorsal sepal 4.5 cm. or less long, petals subequal to the sepals *C. luteola*
 - Ib. Flowers large and showy, dorsal sepal 6.5 cm. or more long, petals 2 or 3 times wider than the sepals 1
 - 1a. Sepals and petals ivory-white or cream-color; lip with the lateral lobes yellow streaked with red *C. rex*
 - 1b. Sepals and petals lilac or rose; lip pale rose or purple-crimson with a narrow median yellow band *C. maxima*

Cattleya luteola Lindl. Gard. Chron. (1853) 774; Reichb. f. Xen. Orch. 1: 209, t. 83. 1856; Hook. Bot. Mag. 84: t. 5032. 1858. *Cattleya Meyeri* Regel, Gartenfl. 5: 116, text fig. (1856). *Cattleya flavida* Kl. Allg. Gartenz. 24: 73. 1856. *Epidendrum luteolum* Reichb. f. Walp. Ann. 6: 313. 1861. *Cattleya epidendroides* Hort. ex Reichb. f. Xen. Orch. 1: 209. 1856. *Cattleya luteola* Lindl. var. *Roezlii* Reichb. f. Gard. Chron. n.s. 15: 782. 1881. *Cattleya sulphurea* Hort. ex Gard. Chron. n.s. 24: 10. 1885.

Plant relatively small, with a creeping rhizome. Pseudobulbs more or less approximate, ellipsoid to clavate or clavate-cylindric (furrowed in age), lightly compressed, up to 15 cm. long, monophyllous at the apex. Leaf oblong to oblong-elliptic, obtuse and often bilobulate at the apex, clasping at the sessile or subsessile

base, up to 22.5 cm. long and 3.8 cm. wide, thickly coriaceous. Inflorescence terminal, shorter than the leaf, racemose and several-flowered above, the peduncle concealed by a large, scarious, evanescent, conduplicate spathe. Pedicellate ovary slender, up to 3.5 cm. long. Flowers very small for the genus, with spreading segments, green to yellow, with crimson spots or streaks on the lip. Dorsal sepal oblong or narrowly oblong, acute, about 4.5 cm. or less long. Lateral sepals distinctly shorter and broader than the dorsal sepal, obliquely elliptic-oblong, abruptly acute. Petals narrowly elliptic-oblong, lightly falcate, obtuse or subacute, about as wide as the dorsal sepal. Lip about as long as the lateral sepals, with the sides involute below in natural position, suborbicular when expanded, commonly retuse at the apex, simple or very obscurely trilobulate in front with the anterior margins crenulate-undulate, about 2.8 cm. long and broad; disc densely short-pubescent above the middle. Column short, about half as long as the lip, arcuate, bialate.

Peru: Habitat unknown, *Roezl s.n.* (type of *C. luteola* var. *Roezlii*).—Amazonas and Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 154. 1921.—Junín: Chanchamayo Valley, 1200 meters, *Schunke 537, 1140* (large flowers). La Merced, about 600 meters, *Macbride 5559*. Colonia Perene, about 680 meters, in dense forest, *Killip & Smith 25096*.—Loreto: Vicinity of Iquitos, 100 meters, *Klug 10103, 10104*.—San Martín: Chazuta, Río Huallaga, about 260 meters, in forest, *Klug 4070*. Also Brazil (type of *C. luteola*), Ecuador and Bolivia.

Cattleya maxima Lindl. Gen. & Sp. Orch. 116. 1831; Bot. Reg. 32: t. 1. 1846; Hook. Bot. Mag. 82: t. 4902. 1856; Cogn. & Goos. Dict. Ic. Orch. *Cattleya* t. 13. 1896. *Epidendrum maximum* Reichb. f. Walp. Ann. 6: 316. 1861. *Cattleya Malouana* Lind. & Rod. Ill. Hort. 33: 102. 1886, *nomen nudum*.

Pseudobulbs subapproximate, stout, clavate, furrowed in course of development, compressed, up to 30.5 cm. tall. Leaf solitary, oblong (often broadly so), obtuse to rounded and minutely bilobulate at the apex, sessile at the clasping base, up to 25.3 cm. long and 7.6 cm. wide, fleshy-coriaceous. Inflorescence terminal, loosely few- (up to 7-) flowered above, the peduncle mostly concealed by an oblong, scarious, compressed spathe which is about 12 cm. or less long. Flowers very large, with spreading segments; sepals and petals pale rose or lilac, lip pale pink veined with dark purple and with a central yellow band. Dorsal sepal narrowly elliptic-lanceolate, acute or acuminate, up to 8.5 cm. long. Lateral sepals a little shorter and broader than the dorsal sepal, elliptic-lanceolate, oblique. Petals oblong-elliptic, slightly oblique, about as long as the sepals but twice as broad or more, with undulate margins. Lip 5.5–7 cm. long, with the sides of the lower half involute and forming a tube in natural position, retuse at the apex, ovate-subquadrate and subcordate at the base when expanded, lightly 3-lobed above the middle, up to 4 cm. wide below the middle, with the anterior margins crisped-undulate. Column slender, arcuate, 3-toothed at the apex, about 2.5 cm. long.

Amazonas and Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 154. 1921. Also Ecuador (type) and Colombia.

Cattleya rex O'Brien, Gard. Chron. ser. 3, 8: 684. 1890; Cogn. & Goos. Dict. Ic. Orch. *Cattleya* t. 22. 1899; Rolfe, Bot. Mag. 137: t. 8377. 1911.

Plant very similar to *Cattleya maxima* but differing markedly in the color of the flowers. Pseudobulbs approximate, cylindric-clavate or fusiform-clavate, somewhat compressed, up to 35 cm. high, monophyllous at the apex. Leaf oblong or elliptic-oblong, obtuse, clasping at the base, up to 35 cm. or more long and 6 cm. wide, coriaceous. Inflorescence shorter than the leaf, up to 20.3 cm. high, loosely 3- to 8- (10-) flowered above, the peduncle being more or less concealed by a conspicuous, oblong, conduplicate spathe up to 12.7 cm. long. Flowers very large and showy, with spreading segments, the sepals and petals being cream-color or ivory-white and the lip parti-colored, with yellow lateral lobes and rose-colored anterior portion, the central part (entire throat) yellow lined with red. Dorsal sepal narrowly elliptic-lanceolate, subacute, up to 8 cm. long. Lateral sepals similar, sub-oblique, slightly shorter. Petals elliptic or rhomboid-elliptic, obtuse or subacute, as long as the sepals but nearly three times as wide, with strongly undulate margins. Lip about as long as the sepals, with the sides of the lower half involute to form a tube, when expanded subquadrate-oval or obovate and 4-5 cm. wide, retuse at the apex, cuneate-rounded at the base, entire or subtrilobed above the middle, with the anterior margins crenulate-undulate. Column stout, clavate, up to 3.5 (4) cm. long, slightly arcuate, 3-toothed above.

Loreto: Near Moyobamba?, *Bungeroth s.n.* (type). Also Colombia, probably.

Cattleya violacea (HBK.) Rolfe, Gard. Chron. ser. 3, 5: 802. 1889; Cogn. Martius Fl. Bras. 3, pt. 5: 216. 1901. *Cymbidium violaceum* HBK. Nov. Gen. et Sp. 1: 341. 1816. *Cattleya superba* Schomb. ex Lindl. Sert. Orch. t. 22. 1838. *Cattleya Schomburgkii* Lodd. ex Lindl. l.c. *Epidendrum violaceum* Reichb. f. Walp. Ann. 6: 318. 1861. *Epidendrum superbum* Reichb. f. Xen. Orch. 2: 32. 1862.

Rhizome creeping. Pseudobulbs approximate, clavate or clavate-cylindric, lightly compressed, furrowed in age, diphyllous at the apex, up to 30 cm. long. Leaves suborbicular-oval to oblong-elliptic, broadly rounded and sometimes bilobulate at the apex, clasping at the sessile or subsessile base, up to 16.5 cm. long and 8.6 cm. wide, coriaceous. Inflorescence stout, subequaling or more commonly exceeding the spreading leaves, usually loosely 2- to 6-flowered above, up to 25 cm. long, the peduncle more or less concealed by a stout, conduplicate spathe which is 10.5 cm. or less long. Flowers rather large, with spreading segments, rose-purple, the lip darker purple washed in the center with white and yellow, very fragrant. Dorsal sepal elliptic-lanceolate or elliptic-oblong, acute, up to 6.9 cm. long, fleshy. Lateral sepals similar, but noticeably shorter and slightly broader, oblique and falcate. Petals subequally long with the dorsal sepal but broader (often nearly twice as broad), rhombic to elliptic-lanceolate, acute or obtuse, more or less undulate on the margins, membranaceous. Lip nearly as long as the lateral sepals, 5-5.5 cm. long, 3-3.5 cm. wide, deeply 3-lobed above the middle, with the lateral lobes incurved and surrounding the column in natural position, fleshy; lateral lobes

semiovalate-aliform with the apical portion triangular, obtuse or subacute; mid-lobe subsessile, suborbicular-obovate to transversely oval or reniform, truncate or lightly retuse, with a minutely crenulate-undulate margin; disc finely multicostate. Column stout, arcuate, white, up to 3 cm. long.

Loreto: San Isidro, along the middle Marañon River at the mouth of the Pastazza, 135 meters, *Tessmann 3780*. Also Colombia, Venezuela (Colombian-Venezuelan boundary; type of *Cymbidium violaceum*), British Guiana (type of *Cattleya superba*) and Brazil.

LAELIA Lindl. (including *Schomburgkia* Lindl.)

Stout, epiphytic orchids of the American tropics, extending from Mexico through Central America to Brazil, Peru and Argentina.

Rhizome creeping. Stems fleshy-thickened to pseudobulbous (often myrmecophilous in the Central American species), concealed by evanescent, scarios sheaths, bearing 1 to 3 (rarely 4) leaves at or near the summit. Leaves coriaceous or fleshy, broadly oval to oblong, not plicate. Inflorescence terminal, commonly racemose (rarely paniculate) above, usually much surpassing the leaves. Floral bracts short and inconspicuous to narrow, elongate and subequaling the long pedicellate ovary. Flowers medium-sized to large, showy. Sepals subequal, the lateral ones oblique, sometimes undulate. Petals varying from much broader to narrower than the sepals, more or less undulate. Lip free from the column or slightly adnate to it at the very base, simple or commonly 3-lobed, sometimes much shorter than the other segments. Column much shorter than the lip, arcuate; anther incumbent, 2-celled; pollinia 8, in two series of 4, strongly flattened.

- A1. Dorsal sepal lanceolate-oblong, about 2.3 cm. long; petals acute; lip rose, 1.5 cm. long. *L. moyobambae* (*Schomburgkia moyobambae*)
 A2. Dorsal sepal oblong, about 2.8-3 cm. long; petals broadly obtuse; lip white, 2 cm. long. *L. Weberbaueriana* (*Schomburgkia Weberbaueriana*)

Laelia moyobambae (Schltr.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 180. 1944. *Schomburgkia moyobambae* Schltr. Fedde Repert. Beih. 9: 97. 1921; Mansf. Fedde Repert. Beih. 57: t. 123, nr. 482. 1929.

Plant epiphytic. Pseudobulbs and leaves not seen. Inflorescence erect, strict, with peduncle (more than 30 cm. long) entirely invested by close, pale, tubular sheaths. Raceme densely many-flowered, with the rachis up to 13 cm. long. Floral bracts spreading, linear, acute, rose-colored, equaling or slightly exceeding the pedicellate ovary. Flowers with slightly spreading segments. Sepals brown with yellow margins. Dorsal sepal "oblong" or lanceolate-oblong, obtuse, with undulate margins, about 2.3 cm. long. Lateral sepals similar, oblique. Petals "narrowly oblong" or elliptic-oblong, acute or "apiculate," with crisped-undulate margins, somewhat shorter than the sepals. Lip rose-colored, about 1.5 cm. long and 9 mm. wide when expanded, arcuate and longitudinally concave in natural position, "oblong" or ovate-oblong, shortly 3-lobed above the middle; lateral lobes very short and broad with abbreviated, obtusely triangular apex; mid-lobe short, ovate-suborbicular or

"broadly oval," obtuse to rounded at the apex; disc gibbous-convex at the base, finely 4-keeled, with 5 low, verrucose keels on the mid-lobe. Column arcuate, dilated above, about 1.3 cm. long.

Loreto: Near Moyobamba, *Filomeno s.n.*

This description was compiled from the original diagnosis and the subsequent floral analysis.

Laelia Weberbaueriana (Kränzl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 180. 1944. *Schomburgkia Weberbaueriana* Kränzl. Engler Bot. Jahrb. 37: 527. 1906.

Plant large and stout, up to 1 meter high. Pseudobulb apparently about 37 cm. or less high, cylindrical from a slightly thicker base, deeply sulcate in the dried specimen, entirely concealed by several close, whitish, acute, evanescent sheaths, bifoliate near the apex. Leaves oblong or elliptic-oblong, obtuse, clasping at the complicate base, thickly coriaceous, up to 26 cm. long and 6.5 cm. wide. Inflorescence terminal, up to 75 cm. tall including the raceme. Peduncle about 56 cm. or more long, almost entirely concealed by close, tubular, acuminate, whitish sheaths. Raceme densely several- to many-flowered, subcorymbose. Floral bracts linear-lanceolate, convolute, acuminate, nearly equaling the pedicellate ovary, up to 7 cm. long. Sepals and petals yellowish-brown streaked with darker lines. Sepals oblong, abruptly acute or apiculate, with undulate margins, about 2.8-3 cm. long. Petals similar but somewhat shorter, truncate-obtuse, with undulate margins. Lip white, much shorter than the sepals and petals, arcuate with upcurved sides in natural position, about 2 cm. long and 1.3 cm. wide near the base when expanded, broadly ovate in outline, obscurely 3-lobed near the middle, lightly retuse and apiculate at the apex, umbonate near the base; disc with 4 or 5 elevated lines which are undulate toward the front. Column short, arcuate, broadly winged, about 1-1.3 cm. long.

Cuzco: Prov. of Convención, below Hacienda Idma near Sta. Anna, 1300 meters, on boulder in a stream, *Weberbauer 5026* (type). Aobamba to Huadquiña, 1450-1800 meters, on rocks, *Vargas 8146*.

This description was prepared partly by means of a photograph of the type collection supplemented by the original diagnosis and partly from a collection referred to this concept.

BRASSAVOLA R. Br.

A small genus of American epiphytes with a branching rhizome bearing more or less approximate, thickened, cylindrical stems which are loosely sheathed and bear one or two leaves at the apex. Leaves very fleshy, subterete to narrowly oblong and channelled. Inflorescence a 1- to several-flowered raceme, at the summit of the stem, commonly shorter than the leaf. Flowers showy, 1 to several, long-pedicelled. Sepals and petals similar, spreading, linear or linear-lanceolate, sometimes setaceous-acuminate, free. Lip sessile at the base of the column, with the base shortly or long-narrowed and surrounding the column, then more or less abruptly expanded into an acute or acuminate, often large, more or less flat lamina.

Column small; clinandrium with 3 prominent, subequal lobes. Anther opercular, incumbent, 2-celled. Pollinia 8, compressed, 4 in each cell, superposed. Ovary sometimes with a long neck.

Extending from Mexico through Central America and the West Indies to Brazil and Argentina.

A1. Basal part of the lip a narrow, erose-margined tube *B. nodosa*

A2. Basal part of the lip a broad, entire-margined tube *B. ovaliformis*

Brassavola nodosa (L.) Lindl. Gen. & Sp. Orch. 114. 1831. *Epidendrum nodosum* L. Sp. Pl. ed. 1: 953. 1753. *Cymbidium nodosum* Sw. Nov. Act. Ups. 6: 73. 1799. *Brassavola* (as *Brasavola*) *grandiflora* Lindl. Bot. Reg. 25, Misc. 16, no. 14. 1839. *Brassavola* (as *Brasavola*) *venosa* Lindl. Bot. Reg. 26: t. 39. 1840. *Bletia nodosa* Reichb. f. Walp. Ann. 6: 437. 1862. *Bletia venosa* Reichb. f. Walp. Ann. 6: 438. 1862. Figure 103.

Plant low but stout and showy, with a stout nodose rhizome. Stems erect or ascending, more or less approximate, thick-cylindric, up to 14.5 cm. long (but usually much shorter), 1-leaved at the apex, entirely concealed by loose, tubular, scarious, evanescent sheaths. Leaf subterete and channelled to narrowly oblong, acute and apiculate, very fleshy, clasping at the sessile base, up to 23 (very rarely 32) cm. long and 2.3 cm. wide. Inflorescence terminal, shorter than or exceeding the leaf, rarely with one branch above, up to 23.7 cm. long, 1- to loosely several-flowered above. Floral bracts very small, triangular-ovate, concave. Flowers commonly large and showy, with spreading segments, long- and slender-pedicelled. Sepals and petals commonly green or greenish yellow, lip white. Sepals very similar, linear, long-acuminate, 4.5–10 cm. long. Petals similar but narrower. Lip more or less shorter than the sepals and petals, showy, 3.5–7.5 cm. long, with the basal part (about one half the entire length) convolute into an erose-margined narrow tube, then more or less abruptly dilated into an elliptic-ovate or deltoid-ovate lamina which is acute to long-acuminate, 1.6–5 cm. broad and more or less flat when expanded. Column very small, 3-lobed at the apex, surrounded by the tube of the lip.

Piura, fide Schlechter, Fedde Repert. Beih. 9: 155. 1921. A wide-spread and variable species extending from Mexico through Central America (type of *B. grandiflora* and *B. venosa*) to Panama, the West Indies (type of *Epidendrum nodosum*) and northern South America.

Brassavola ovaliformis C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 14: 60, t. 17. 1949. Figure 104.

Plant medium-sized, with showy flowers. Rhizome creeping, nodulose, consisting of the swollen bases of the stems. Stems approximate, up to 12.7 cm. or more long, several-jointed, entirely concealed by tubular, scarious, evanescent sheaths, 1-leaved at the apex. Leaves very slender, subterete, channelled, arcuate in the dried specimen, about 27–38 cm. long and 3 mm. in diameter, sessile at the base. Inflorescence terminal, exceeding 2.5 cm. in length (incomplete in the type),



FIG. 103. *Brassavola nodosa* (L.) Lindl. Flowering and fruiting plant; $\times \frac{1}{2}$.

BRASSAVOLA

ovaliformis

C. Schweinf.

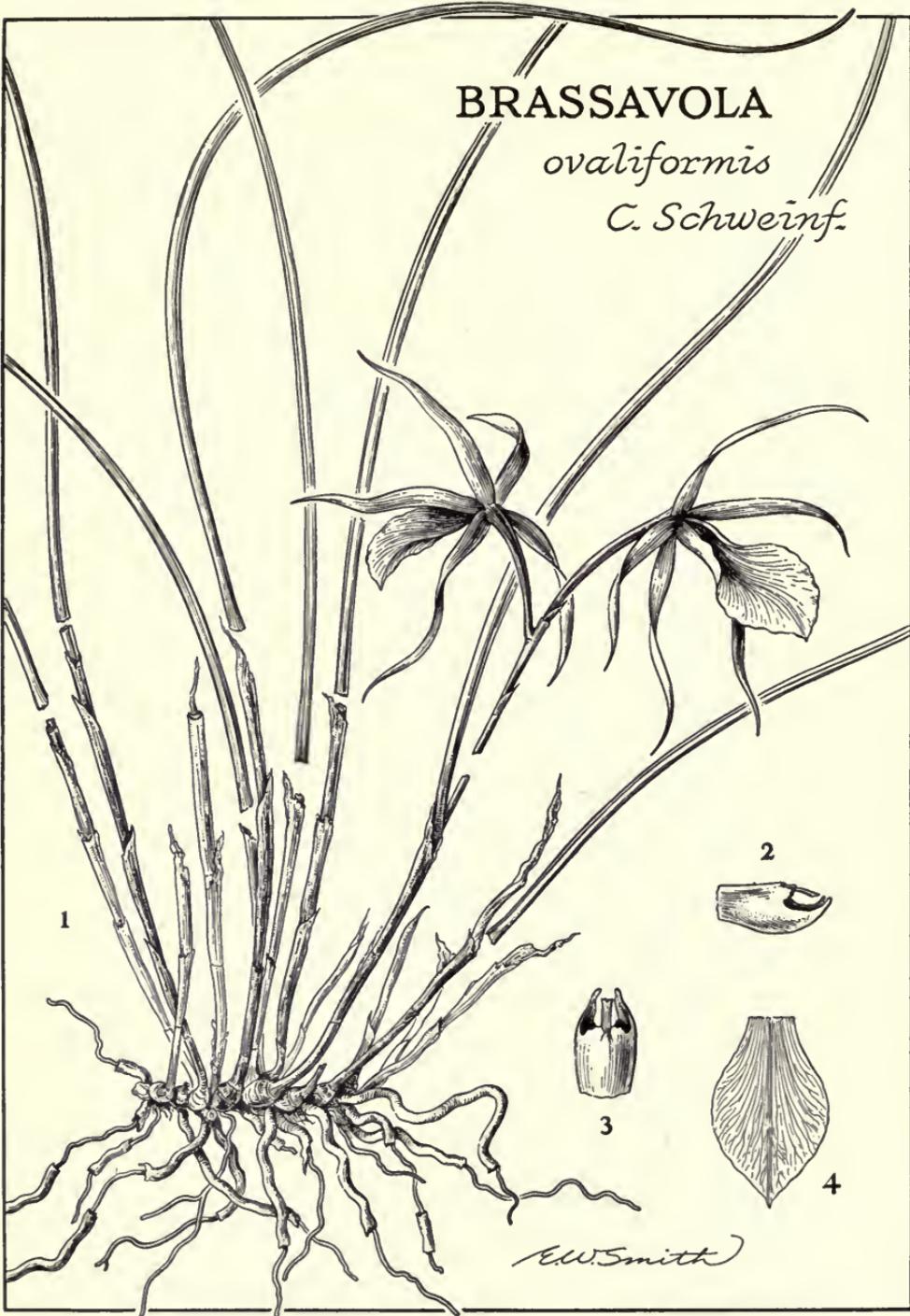


FIG. 104. *Brassavola ovaliformis* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, column from side; $\times 2$. 3, column from above; $\times 2$. 4, lip expanded, from the front; $\times \frac{1}{2}$.

with 2 approximate flowers at the apex. Floral bracts very small, lanceolate-ovate, many times shorter than the elongate pedicellate ovary. Flowers large, with wide-spreading segments which are white, and pale green within. Sepals very similar, lanceolate-linear, long-narrowed to an acute tip, up to 5.9 cm. long and 5.9 mm. wide. Petals very similar to the sepals, but slightly smaller. Lip much shorter than the other segments, ovate-oval when expanded, acute or short-acuminate, about 4.8 cm. long and 2.9 cm. wide in the middle, ecarinate, the lower half gradually inrolled about the column, with entire margins. Column minute, with an erect, 3-lobed wing at the apex.

Amazonas: La Peca, northeast of Jaën, 1000 meters, on dwarf trees in dry desert filled with cacti, *Woytkowski 37016*.

SCAPHYGLOTTIS Poepp. & Endl.

This complex American genus consists of small to large, inconspicuous epiphytic plants, now often regarded as including the concept *Hexadesmia*. Stems slender-cylindric or stem-like to fusiform (sometimes stipitate below), commonly superposed with the younger (shorter) members placed on the apex of the older members, each member commonly sheathed at the base or mostly throughout and often rooting at the nodes. Leaves fascicled and usually in subopposite pairs at the apex of each stem-member (often alternate on the stem-members also), narrow or linear, more or less spreading. Inflorescences (in the Peruvian species) abbreviated, 1- to few-flowered, axillary, single or several and fascicled. Flowers small or very small. Dorsal sepal ovate or oblong to elliptic-oblong. Lateral sepals similar but strongly oblique, forming with the column-foot a more or less prominent mentum. Petals commonly much narrower than the sepals (rarely broader), more or less oblique. Lip joined with the column-foot, usually contracted toward the base, either simple or obscurely to sharply 3-lobed, sometimes bilobed near the apex, commonly more or less arcuate or geniculate in natural position. Column short and stout, or elongate and slender, either winged or wingless, often with a pair of subapical teeth, produced into a more or less distinct foot. Pollinia 4 or 6.

- A1. Leaves several fascicled at the summit of the stem-members; lip ovate-cordate or oblong-ovate, distinctly broader near the base.
S. affinis (*Ponera affinis*)
- A2. Leaves solitary or in pairs at the summit of the stem-members and sometimes distichous on the stem-members also; lip not ovate-cordate. I
- Ia. Lip prominently callose below with the thickening extending into more or less distinct verruculose lines, geniculate near the base. 1
- Ib. Lip not prominently callose below, nor with verruculose lines above. 2
- 1a. Stems subsimple, distichously leafy; lip sessile, cuneate below; column 5-6.6 mm. long. *S. punctulata* (*Ponera punctulata*)
- 1b. Stems commonly much branched with the distichous leaves confined to the lower portions of the stems or stem-members; lip distinctly clawed, lamina rounded to subcordate at the base; column 4.9 mm. or less long.
S. punctulata var. *Summersii* (*S. Summersii*)
- 2a. Leaves commonly solitary; inflorescences 1- to 4-flowered; petals cuneate-obovate. *S. Reedii* (*Hexadesmia Reedii*)
- 2b. Leaves in pairs; inflorescences 1-flowered; petals not cuneate-obovate. 3

- 3a. Lip broadest near the middle. 4
 3b. Lip broadest above the middle or near the apex. 6
 4a. Column wingless on the sides; mentum short and inconspicuous.
S. propinqua
 4b. Column prominently winged on the sides; mentum conspicuous. 5
 5a. Lip prominently bilobulate at the apex. *S. Antonii** (*S. loretoensis*)
 5b. Lip abruptly acute or obtuse to lightly retuse at the apex.
S. violacea (*Ponera violacea*)
 6a. Leaves short, the lower blades 7.5 cm. or less long. 7
 6b. Leaves elongate, the lower blades 10 cm. or more long. 8
 7a. Plant large, stems 30–60 cm. long; lip simple, with strongly revolute margins.
S. conferta (*Ponera conferta*)
 7b. Plant small, stems up to 10.5 (rarely 20) cm. long; lip subsimple to trilobulate,
 without revolute margins. *S. cuneata* (*S. prolifera*)
 8a. Flowers sessile, 4–6; lip apparently ecallose, mid-lobe short, broad, retuse.
S. graminifolia
 8b. Flowers slender-pedicelled, commonly 1 or 2; lip with a pair of more or less
 distinct semiorbicular calli above, mid-lobe semiorbicular to broadly ovate,
 acute. *S. Huebneri*

Scaphyglottis affinis Poepp. & Endl. Nov. Gen. ac Sp. 1: 59, t. 99A. 1836; Cogn. Martius Fl. Bras. 3, pt. 5: 12. 1898. *Ponera affinis* Reichb. f. Bonpl. 2: 22. 1854.

Plant large, epiphytic, pendulous, up to 3 meters high. Stems numerous, forming dense mats, dichotomously branched, with stem-members long, slender, sheathed. Leaves several, clustered at the joints of the branches and articulated to short, congested, distichous petioles; lamina spreading, elliptic-linear, 8–10 cm. long, up to 5 mm. wide, long-attenuate above and below, with an acute entire apex. Inflorescences abbreviated, 1-flowered, 2–3 in the leaf axils. Flowers small, white, membranaceous, short-pedicelled. Dorsal sepal oblong or lanceolate-oblong, acute, concave, 4–5 mm. long. Lateral sepals oblong-deltoid, lightly oblique, subequally long and a little broader than the dorsal sepal. Petals subequalling the sepals, oblong-lanceolate, rather long-acuminate, lightly oblique. Lip a little shorter than the sepals, simple, from a distinct narrow claw abruptly oblong-ovate or cordate-ovate, acute, strongly concave with upcurved, finely crenulate margins, 3–3.5 mm. long. Column slender, about half as long as the sepals, thickened above, obscurely bidentate at the apex in front.

Peru: Habitat not recorded, *Pavón s.n.*—Huánuco: Near Cuchero (Cochero), on branches of trees in dense montane woods, *Poeppig 1726* (type).

No example of this species was available.

Scaphyglottis Antonii Schltr. Fedde Repert. Beih. 9: 78. 1921; Mansf. Fedde Repert. Beih. 57: t. 115, nr. 453. 1929. *Scaphyglottis*

* This species may prove to be referable to *S. violacea* Lindl.

loretoensis Schltr. Fedde Repert. Beih. 9: 79. 1921; Mansf. Fedde Repert. Beih. 57: t. 116, nr. 454. 1929.

Plant variable in size, caespitose, 8–40 cm. in height. Stems approximate, usually superposed and dichotomously branched, stout or slender, each member provided with several distichously imbricating, evanescent sheaths below, the longest (basal) member up to about 19.5 cm. long. Leaves subopposite in pairs, linear or lanceolate-linear, up to 12 cm. long and 7.5 mm. wide, slightly narrowed to an obtuse, minutely bilobulate apex, spreading. Inflorescences abbreviated, axillary, 1-flowered, solitary or commonly numerous and capitate; pedicels short, entirely concealed by imbricating bracts. Flowers very small, deep pink or deep blue, often paler at the base. Dorsal sepal obovate-oblong, acute or obtuse, concave, 3–3.5 mm. long. Lateral sepals shorter than the dorsal sepal, broadly oblong or obovate-oblong, very oblique, acute or obtuse, forming a prominent mentum with the column-foot. Petals obliquely oblong-spatulate to linear-oblancheolate, rounded and often acutish at the apex, more or less falcate, slightly shorter than the dorsal sepal. Lip a little shorter than the petals, arcuate and upcurved in natural position with the sides incurved, obscurely 3-lobed or subpandurate near the middle, up to 3.1 mm. long when expanded, from the base gradually dilated to a rounded central portion, anterior part subquadrate or obovate-subquadrate, bilobulate at the rounded or truncate apex. Column shorter than the lip, dilated upward, laterally winged, produced below into a prominent foot.

Ayacucho: Estrella, between Huanta and Río Apurimac, about 500 meters, epiphyte in dense woods, *Killip & Smith 23063*.—Junín: Chanchamayo Valley, *Köhler brothers s.n.* (type of *S. Antonii*). Same locality, 1500 meters, *Schunke 1663, 2060*. Río Paucartambo Valley, near Perene Bridge, 700 meters, epiphyte in dense forest, *Killip & Smith 25322*. Río Pinedo, north of La Merced, 700–900 meters, epiphyte in dense woods, *Killip & Smith 23591, 23635*.—Loreto: Near Moyobamba, *Filomeno s.n.* (type of *S. loretoensis*).

This species appears to be similar to *Scaphyglottis violacea* Lindl. and may be found to be identical.

Scaphyglottis conferta (Ruíz & Pav.) Poepp. & Endl. Nov. Gen. ac Sp. 1: 59, t. 100. 1836; Cogn. Martius Fl. Bras. 3, pt. 5: 12. 1898. ?*Fernandezia conferta* Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 241. 1798. *Ponera conferta* Reichb. f. Bonpl. 2: 22. 1854.

Plant large, straggling, from a short, woody rhizome. Stems numerous, slender, elongate, more or less flexuous, superposed with spreading or recurved branches at the nodes, 3–6 dm. tall, each member adorned below with several close, tubular sheaths. Leaves subopposite in pairs at the apex of each stem-member, lanceolate-linear, up to 7.5 cm. long and 6 mm. wide, long-attenuate to an acute or bifid apex, cuneate below, semiamplexicaul at the sheathing base. Inflorescences abbreviated, axillary, 1-flowered, solitary. Flowers small, white, membranaceous, subtended by several bracts. Dorsal sepal lanceolate or oblong-lanceolate, attenuate above, acute, 6–9 mm. long. Lateral sepals similar but somewhat broader, very oblique. Petals linear-lanceolate, very acute, slightly shorter than the sepals. Lip simple,

obovate-oblong, narrowed to a slender base, broadly obtuse above, with strongly revolute margins, slightly shorter than the petals, about 4 mm. long, purplish. Column slender, lightly dilated and thickened above, obscurely bidentate at the apex in front, as long as the lip.

Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cuchero), on trees, *Poeppig 1731*.

I have seen no example of this species.

Scaphyglottis cuneata Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 398. 1918; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 181. 1944. *Isochilus prolifer* R. Br. Ait. Hort. Kew. ed. 2, 5: 209. 1813, excl. synonym.; Lindl. Bot. Reg. 10: t. 825. 1824, not *Epidendrum proliferum* Sw. nor *Cymbidium proliferum* Sw. *Isochilus proliferum* R. Br. ex Lindl. Gen. & Sp. Orch. 113. 1831. *Scaphyglottis prolifera* Cogn. Martius Fl. Bras. 3, pt. 5: 15. 1898. *Tetragamestus gracilis* Schltr. Beih. Bot. Centralbl. 36, Abt. 2: 400. 1918. *Ponera mapiriensis* Kränzl. Fedde Repert. 25: 22. 1928.

Plant relatively small, very variable, up to 20.5 cm. high, with an abbreviated rhizome. Stems approximate, usually numerous, stout or slender, commonly superposed when mature, often dichotomously branched and sometimes rooting at the nodes, the lowest stem-member up to 10.5 (rarely 20) cm. long, each stem-member provided with several distichously imbricated, close, evanescent sheaths below. Leaves subopposite in pairs at the apex of the stem-members, linear to linear-oblong or lanceolate-linear, very slightly narrowed above to an obtusely bilobed apex, slightly cuneate below, sessile, spreading, up to 7 cm. long and 6 (rarely 7) mm. wide. Inflorescences abbreviated, axillary, 1-flowered, 1 to several in a cluster. Pedicellate ovary concealed by several distichously imbricated bracts. Flowers small, membranaceous, greenish white to white, pink or yellowish, often marked with deep pink or blue. Dorsal sepal oblong, lanceolate-oblong, elliptic-lanceolate or oblanceolate-oblong, 4–5.9 mm. long, acute. Lateral sepals similar, often a little broader, oblique, forming an indistinct mentum with the short column-foot. Petals oblanceolate-linear to linear, acute to obtuse, a little shorter than the dorsal sepal. Lip slightly exceeding the sepals, cuneate-spatulate, from a narrow base gradually dilated to near the apex, subsimple to distinctly 3-lobulate in front, broadly rounded to retuse at the apex, either smooth or with a more or less well-developed callus in the middle, 5–6.9 mm. long. Column large, straight, without auricles, slightly shorter than the sepals and petals.

Ayacucho: Río Apurímac Valley, near Kimpitiriki, 400 meters, epiphyte in dense forest, *Killip & Smith 22886*.—Junín: Chanchamayo Valley, 1200–1600 meters, *Schunke 532, 1312, 1682, 1706*. Colonia Perene, about 680 meters, epiphyte in thickets, *Killip & Smith 25059*. East of Quimiri Bridge, near La Merced, 800–1300 meters, epiphyte in dense forest, *Killip & Smith 23996*. Río Pinedo, north of La Merced, 700–900 meters, on rock in woods, *Killip & Smith 23589*. San Ramón, 900–1300 meters, epiphyte in woods,

Killip & Smith 24904.—San Martín: Zepelacio, near Moyobamba, 1200–1600 meters, epiphyte in mountain forest, *Klug 3542*. A widely distributed species occurring in Central America from Guatemala (type of *S. cuneata*) to Costa Rica (type of *Tetragamestus gracilis*) and Panama, in Grenada and Trinidad, as well as in Colombia, Venezuela, British Guiana, Surinam, Brazil and Bolivia (type of *Ponera mapiriensis*).

Scaphyglottis graminifolia (Ruíz & Pav.) Poepp. & Endl. Nov. Gen. ac Sp. 1: 59, t. 99 B. 1836; Cogn. Martius Fl. Bras. 3, pt. 5: 13. 1898. ?*Fernandezia graminifolia* Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 241. 1798. ?*Ponera graminifolia* Reichb. f. Bonpl. 2: 22. 1854.

Plant large, up to 6 dm. tall. Stems stout, elongate, fascicled, from an abbreviated rhizome, usually forking or few-branched at the nodes, provided through the lower portion with several imbricated, evanescent sheaths, the basal stem-member being up to 14 cm. long. Leaves subopposite in pairs at the summit of the stems or stem-members, linear or lanceolate-linear, up to 12 cm. long and 7 mm. wide, long-attenuate to an obtuse, minutely bidentate apex, slightly narrowed to a sessile base, erect-spreading. Inflorescences abbreviated, axillary, 1-flowered, 4–6. Flowers small, white, inconspicuous, sessile, membranaceous. Sepals similar, oblong or oblong-lanceolate, very acute, concave, 5–6 mm. long, the lateral ones being oblique. Petals narrowly linear, subobtuse, almost as long as the sepals. Lip a little shorter than the rest of the perianth, 4–5 mm. long, cuneate-obovate, long-attenuate below to above the middle, lightly 3-lobed in front with rounded lateral lobes and a short, broad, retuse mid-lobe. Column slender, about equaling the lip, obscurely bidentate at the apex in front.

Huánuco: Pillao near Chacahuassi, on trees and rocks in woods, *Pavón s.n.* (type of *Fernandezia graminifolia*), *Mathews s.n.* Near Cuchero (Cochoero), on branches of trees in dense woods, *Poeppig s.n.* (type of *S. graminifolia*).

I have examined a photograph of apparently typical material of this species from the Ruíz and Pavón Herbarium.

Scaphyglottis Huebneri Schltr. Beih. Bot. Centralbl. 42, Abt. 2: 95. 1925.

Plant variable, medium-sized to large, with an abbreviated rhizome. Stems fascicled, commonly numerous, slender, provided near the base with several loose, imbricating, evanescent sheaths, commonly superposed and more or less branched at the nodes, the lowest stem-member up to 20.5 cm. high. Leaves subopposite in pairs at the apex of the stems or stem-members, narrowly linear and grass-like, attenuate to a bidentate tip, up to 24 cm. long and 7 mm. wide, strict to spreading or arcuate. Inflorescences abbreviated, 1-flowered, axillary, commonly 1 or 2, with the short peduncle concealed by several distichously imbricating, evanescent sheaths; pedicel slender, conspicuously exerted. Flower rather small, greenish

or whitish to pale yellow often tinged with pink or lavender. Dorsal sepal oblong or oblong-elliptic, apiculate or complicate-acute, concave or navicular, 4–6 mm. long. Lateral sepals slightly shorter, very oblique, broadly oblong or ovate-oblong, complicate-acute. Petals narrower than the sepals, oblong, abruptly acute to sub-obtuse, lightly falcate, a little shorter than the dorsal sepal, sometimes slightly narrowed toward the base. Lip about equally long with the sepals, cuneate-obovate in outline, gradually dilated from the base to above the middle where more or less sharply 3-lobed, 4–6 mm. long; lateral lobes semiobovate-rounded; mid-lobe longer, porrect, semiorbicular to broadly ovate, acute; disc more or less thickened below, the thickening extended into a pair of parallel, semiorbicular, indistinct calli. Column a little shorter than the petals, prominently two-winged, the wing produced into a sharp tooth on each side near its apex.

Huánuco: Prov. of Huánuco, Tingo María, epiphyte on shore of river, *Asplund 12977*.—Junín: East of Quimiri Bridge, near La Merced, 800–1300 meters, epiphyte in dense forest, *Killip & Smith 23843, 23944, 23974*. Pichis Trail, Santa Rosa, 625–900 meters, epiphyte in dense forest, *Killip & Smith 26147*. Río Paucartambo Valley, near Perene Bridge, 700 meters, epiphyte in dense forest, *Killip & Smith 25321, 25391*.—Loreto: Gamitanacocha, Río Mazán, 100–125 meters, on river bank, *Schunke 222*. La Victoria, Amazon River, on tree trunk in forest, *Williams 2953*. Above Pongo de Manseriche, right bank of Río Santiago, 200 meters, on trunk of tall forest tree, *Mexia 6164*. Region of the Marañon River from Iquitos up to the mouth of the Santiago River at Pongo de Manseriche, about 77° 30' West, about 155 meters, *Tessmann 4846*. Vicinity of Iquitos, side of river, 100 meters, on living tree, *Klug 10011*. Brazil (type).

Scaphyglottis parviflora Poepp. & Endl. Nov. Gen. ac Sp. 1: 58, t. 97. 1836=*Maxillaria purpurea* (Spreng.) Ames & Correll, var. *parviflora* (Poepp. & Endl.) C. Schweinf.

Scaphyglottis pendula Poepp. & Endl. Nov. Gen. ac Sp. 1: 58, t. 98. 1836=*Maxillaria pendula* (Poepp. & Endl.) C. Schweinf.

Scaphyglottis propinqua C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 17: 46, t. 18. 1955. Figure 105.

Plant large, straggling, epiphytic. Stems fascicled, superposed, slenderly cylindrical, commonly dichotomously branching above, the lowest stem-member up to 18 cm. long. Leaves in subopposite pairs at the apex of the stem-members, linear-oblong or linear-lanceolate, obliquely bilobulate at the apex, sessile at the base, spreading, rarely up to 10 cm. long and 1 cm. wide. Inflorescences abbreviated, densely fascicled in the axils of the leaves, 1-flowered, numerous. Flowers small, membranaceous, white to pinkish white. Dorsal sepal oblong, subacute, deeply concave, about 3.7 mm. long. Lateral sepals similar but a little larger, forming an indistinct mentum with the short column-foot. Petals linear-oblong, apicu-

SCAPHYGLOTTIS
propinqua
 C. Schweinf.

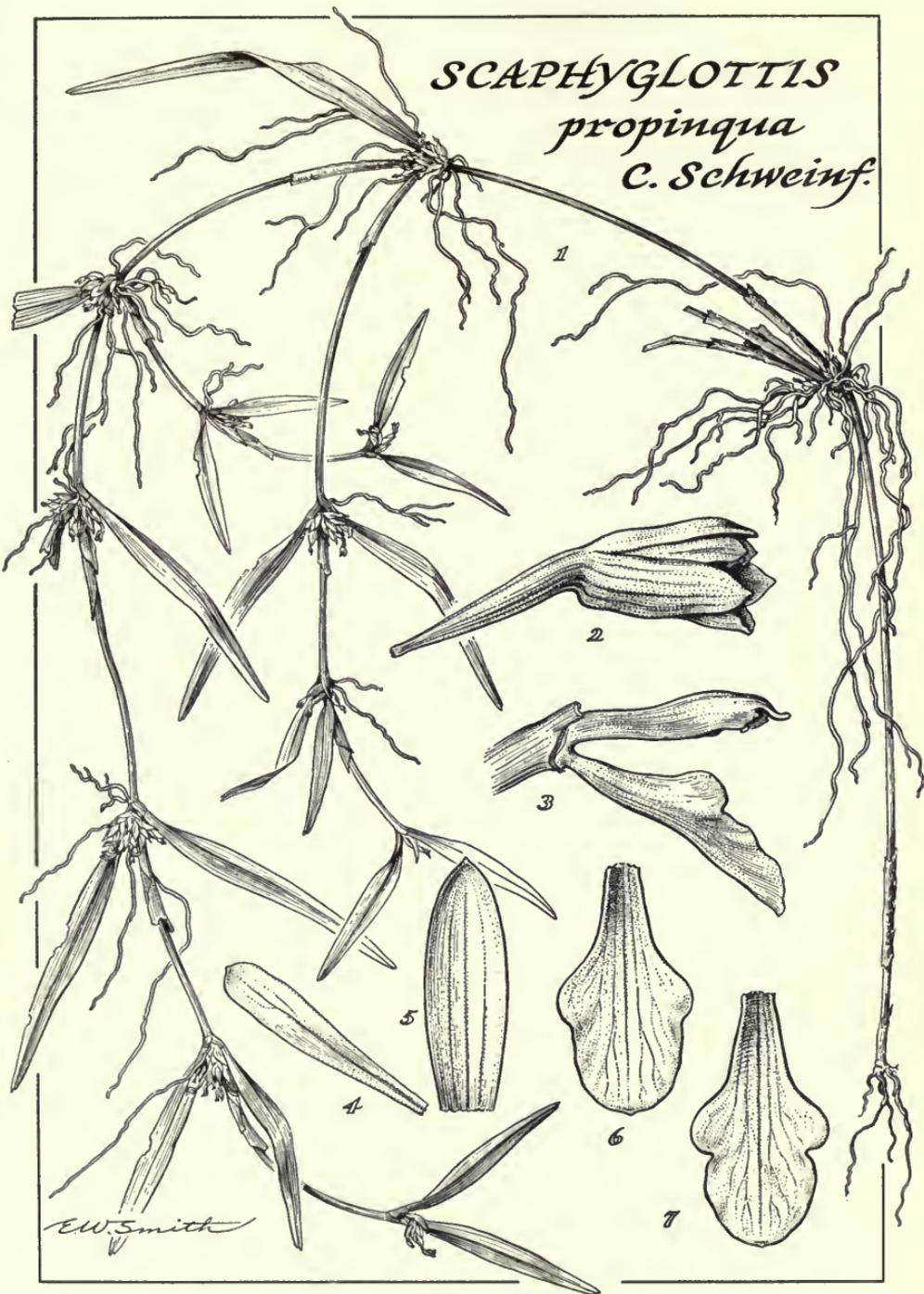


FIG. 105. *Scaphyglottis propinqua* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower from side, natural position; $\times 6$. 3, column and lip from side, natural position; about $\times 9$. 4, petal; about $\times 9$. 5, dorsal sepal; about $\times 9$. 6, 7, lips, expanded; about $\times 9$.

late at the rounded apex, slightly shorter than the dorsal sepal. Lip tubular-concave in natural position, rhombic-obovate when expanded, with small rounded lateral lobules at the middle, broadly rounded and apiculate in front, about 4 mm. long and 2 mm. wide across the middle when expanded. Column stout, straight, wingless, about 2.9 mm. long.

Junín: Pichis Trail, San Nicolas, about 1100 meters, epiphyte in dense forest, *Killip & Smith 26061*.

Scaphyglottis punctulata (Reichb. f.) C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 17: 47. 1955. *Ponera punctulata* Reichb. f. Bonpl. 3: 220. 1855.

Plant terrestrial or epiphytic, caespitose, up to 52 cm. high including the uppermost leaf. Stems distichously leafy, mostly concealed by imbricating leaf-sheaths, simple or with one or two short branches, the apical portion being short, naked and terminating in two subopposite leaves. Leaves erect-spreading, linear or linear-lanceolate, up to 12.9 cm. long and 9 mm. wide, obtuse or bilobulate at the apex, clasping at the base. Inflorescence terminal on the stem or branches, abbreviated, racemose, 1- or more commonly 2-flowered, issuing from a pair of erect, imbricating, evanescent spathes. Pedicellate ovary long and slender, 1.6 cm. or more in length. Flowers rather small, campanulate, lavender tinged with green, or green dotted with dark violet or pink with a greenish white lip. Dorsal sepal ovate-oblong, concave, acute or short-acuminate, about 7-9 mm. long and less than half as wide. Lateral sepals obliquely lanceolate-ovate, acute or short-acuminate, about as large as the dorsal sepal, decurrent on the column-foot. Petals lanceolate-oblong or elliptic-oblong, abruptly subacute to acute or apiculate, smaller than the sepals. Lip slightly exceeding the sepals, articulated to the column-foot without a claw, from a cuneate base obovate-pandurate in outline, truncate or very broadly rounded and apiculate or lightly retuse and apiculate in front, arcuate-recurved below with more or less incurved sides, about 7-8.5 mm. long when expanded and 3.4-6.3 mm. wide across the front; disc below with a more or less prominent, large, fleshy, sulcate callus which is extended into verruculose lines above. Column conspicuous, arcuate, prominently auriculate-dilated at the apex, about 5-6.6 mm. long, produced into a short foot.

Huánuco: Sierra Azul, on Pucallpa Road, 1077 meters, terrestrial in moss of road cut, *Seibert 2252*.—Junín: Pichis Trail, Eneñas, 1700 meters, epiphyte in open sphagnum swamp, *Killip & Smith 25675, 25690*. Also Puerto Rico and Venezuela (type of *Ponera punctulata*).

Scaphyglottis punctulata (Reichb. f.) C. Schweinf. var. **Summersii** (L. O. Wms.) C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 17: 50. 1955. *Scaphyglottis Summersii* L. O. Wms. Bot. Mus. Leaf. Harvard Univ. 9: 14, t. 3, figs. 4-7. 1940. Figure 106.

Plant terrestrial or epiphytic, commonly much branched with fasciculate, divaricate branches, up to 65 cm. tall. Stems or stem-members 2-leaved at the apex, commonly with only the lower portions concealed by close, tubular, imbricating leaf-bearing sheaths (sometimes the young growths are wholly concealed by

SCAPHYGLOTTIS

Summersii L. Wms.



EPIDENDRUM

vesicicaule L. Wms.

FIG. 106. *Epidendrum vesicicaule* L. O. Williams. 1, plant; $\times 1$. 2, flower, from front; $\times 1\frac{1}{2}$. 3, lip; $\times 2\frac{1}{2}$ (text in pt. 2, p. 527). *Scaphyglottis punctulata* (Reichb. f.) C. Schweinf. var. *Summersii* (L. O. Williams) C. Schweinf., as *S. Summersii*. 4, plant; $\times 1$. 5, flower, from front; $\times 1\frac{1}{2}$. 6, lip; $\times 3$. 7, lip and column, from side; $\times 1\frac{1}{2}$.

distichous leaves). Leaves linear or lanceolate-linear, similar to those of the species, bilobulate at the apex, up to 16 cm. long and 10 mm. wide. Inflorescences abbreviated, apparently 1-flowered. Flowers rather small, white, rosy white, gray with rosy lip, pale violet or brownish tan. Sepals and petals similar to those of the species. Lip distinctly clawed; lamina obovate-pandurate or pandurate-subquadrate, rounded or subcordate at the base, broadly retuse in front, similar to that of the species, 6.7–9 mm. long, 4–6.8 mm. wide near the apex. Column shorter than in the species, about 3.2–4.9 mm. long.

Cuzco: Prov. of Paucartambo, between Tanamayo and Tambomayo, 2000 meters, epiphyte, *Vargas 5122*.—Huánuco: Prov. of Huánuco, Carpish, between Huánuco and Tingo María, 2500–2900 meters, in dense evergreen woods, *Ferreyra 1754*. Carpish, about 2750 meters, on steep gravelly slope, *Asplund 12675*. Abra Gasca, between Exito and Pte. Durand, 2500 meters, epiphyte, *Vargas 5376*. A widespread and variable species, extending from Colombia and Ecuador (type) to Peru and Bolivia.

Scaphyglottis Reedii (Reichb. f.) Ames, Am. Orch. Soc. Bull. 10, no. 2: 49. 1941. *Hexadesmia Reedii* Reichb. f. Saund. Refug. Bot. 2, t. 113. 1878; Cogn. Martius Fl. Bras. 3, pt. 5: 18. 1898.

Plant slender, up to 7 dm. tall. Stems caespitose on a short creeping rhizome, from a decumbent base fusiform, distinctly long-stipitate below, 7.5–20.2 cm. long, the basal and swollen portions covered with close evanescent sheaths, commonly unifoliate, sometimes superposed. Leaf narrowly linear, minutely tridentate at the apex, 7–50.6 cm. long, 3–4 mm. wide. Inflorescences axillary, short, fascicled, loosely 1- to 6-flowered, erect, arcuate or nodding, the pedicellate ovary long and slender. Flowers small, light green often more or less tinged with brownish, finally becoming yellowish white. Dorsal sepal broadly ovate, deeply concave, acute, about 3.2 mm. long. Lateral sepals longer, obliquely triangular-ovate, acute, forming a conspicuous mentum with the column-foot. Petals longer than the sepals, cuneate-obovate, acute or apiculate at the abruptly rounded apex. Lip distinctly exceeding the other segments, geniculate near the broadly rounded base, pandurate-subquadrate when expanded, deeply bilobed in front with somewhat overlapping, obliquely rounded lobules, when expanded about 8–10 mm. in greatest length and 4.5–6 mm. wide below and above. Column very short and stout, produced into a long foot.

Huánuco: Prov. of Huánuco, Tingo María, epiphyte in forest, *Asplund 12984*. Also Brazil (type) and Mexico (fide L. O. Williams).

Scaphyglottis violacea Lindl. Bot. Reg. 22: t. 1901. 1836; Hook. Bot. Mag. 70: t. 4071. 1844. *Ponera violacea* Reichb. f. Bonpl. 2: 22. 1854.

Plant small to medium-sized. Stems caespitose, cylindric or fusiform-cylindric, superposed, more or less branched at the nodes, rather slender, the lowest stem-member up to 15 cm. long, each member concealed below by several close imbric-

cating sheaths. Leaves in subopposite pairs at the apex of the stem-members, linear or linear-lanceolate, slightly narrowed to an abruptly obtuse, bilobulate apex, sessile, up to 16.7 cm. long and 6 mm. wide, spreading or lightly recurved. Inflorescences abbreviated, 1-flowered, fascicled in the leaf-axils, usually in pairs. Flowers very small, pink or carmine to violet-purple. Dorsal sepal oblong or oblanceolate-oblong, longitudinally concave or cymbiform, about 3.2-4 mm. long. Lateral sepals obliquely and broadly oblong, decurved, acute, distinctly shorter and often broader than the dorsal sepal, forming a prominent semiglobose mentum with the column-foot. Petals obliquely linear-oblanceolate, subacute, long-narrowed below, slightly narrowed on each side above the middle, somewhat shorter than the dorsal sepal. Lip erect, parallel to the column and arcuate-recurved, with sides incurved in natural position, slightly longer than the lateral sepals, oblong-obovate, obtuse and apiculate to broadly rounded or lightly retuse at the apex, somewhat dilated on each side and thus lightly lobulate near the middle, about 3.3 mm. long; disc more or less thickened through the center of the lower half. Column stout, arcuate, clavate, prominently winged especially above, about 2.2 mm. long.

Loreto: Region of the Marañon River from Iquitos to the mouth of the Santiago River at Pongo de Manseriche, about 77° 30' West, 160 meters, epiphyte in rain-forest, *Tessmann 4539*. Also British Guiana (type) and Brazil.

ORLEANESIA B. Rodr.

Inconspicuous epiphytic medium-sized to large orchids of northern South America. Stems thick-cylindric to fusiform (but not pseudobulbous), distichously 4- to several-leaved. Leaves linear or elliptic-linear to oblong or narrowly lanceolate, spreading. Inflorescence terminal, subumbellate or more commonly loosely paniculate. Flowers numerous, rather small, greenish yellow, green, green and purple-red or purple. Sepals oblong to oblong-ovate, acute, the lateral ones often broader and somewhat oblique. Petals narrower than the sepals. Lip free from the column but attached to the column-foot, simple, elliptic-ovate or broadly obovate, rounded to subtruncate in front, more or less lightly retuse and apiculate at the apex. Column somewhat dilated above, more or less 3-toothed at the apex, extended into a short but distinct foot. Pollinia 4, in one series of 2 unequal pairs.

A small genus, occurring in Colombia, Venezuela, Peru and Brazil.

Orleanesia peruviana C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 148, t. 46. 1952. Figure 107.

Plant medium-sized for the genus, stout. Stem about 18 cm. tall, entirely concealed by about 11 tubular, imbricating sheaths which are largest in the middle and mostly leaf-bearing. Leaves loosely distichous, narrow, widely spreading, lightly decurved and conduplicate in the dried specimen, oblong-lanceolate to linear-lanceolate when expanded, abruptly bilobulate at the apex, up to 13.3 cm. long and 1 cm. wide when viewed from the side, rigid. Peduncle about 27 cm. long, bearing about 15 close, tubular, scarious sheaths which are longer and imbricating below and more distant above. Inflorescence nodding, loosely paniculate with 3 or 4 short, few-flowered branches. Bracts clasping, broadly ovate, concave, acute.

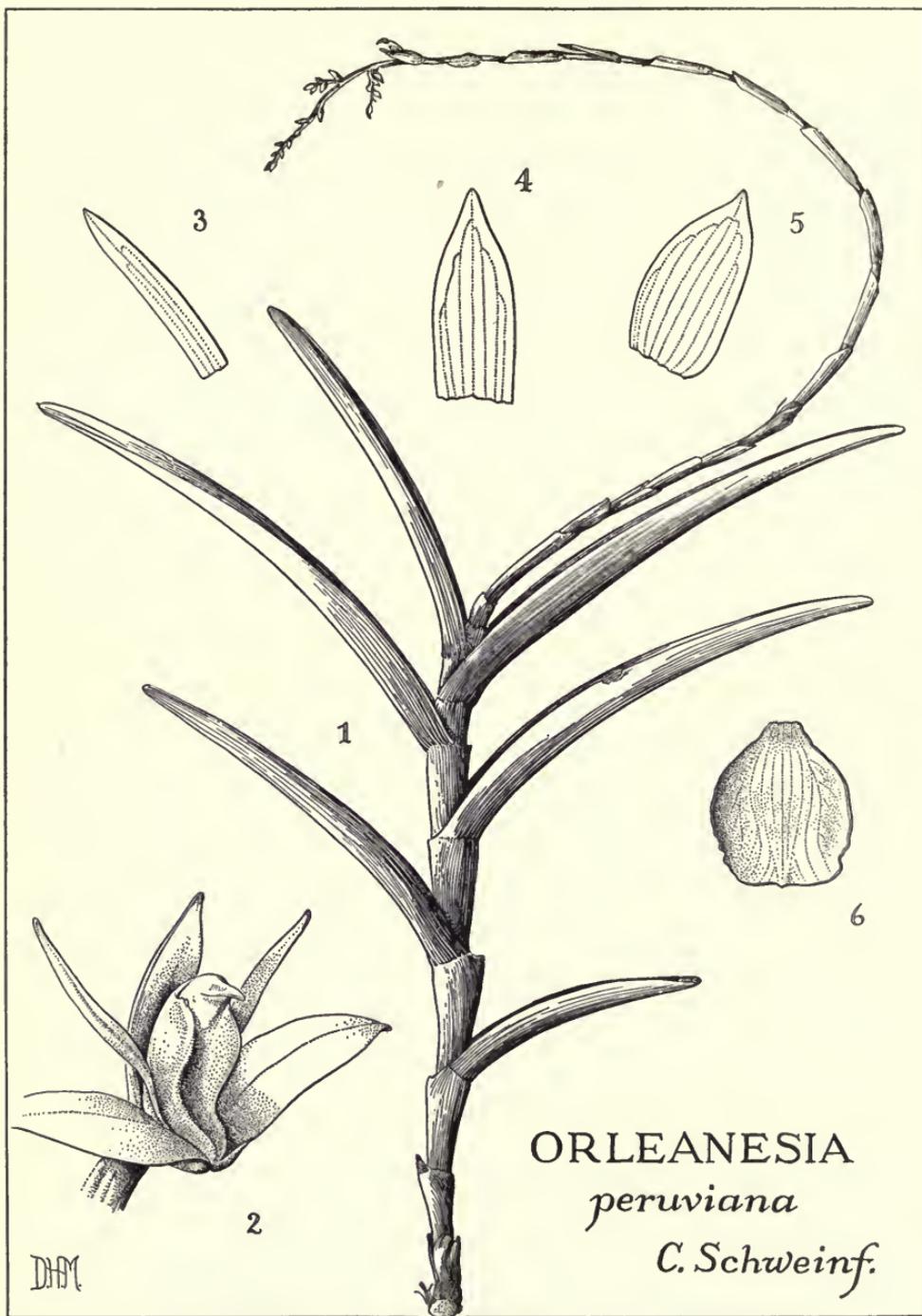


FIG. 107. *Orleanesia peruviana* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower, without lip, three quarters view; $\times 5$. 3, petal; $\times 4$. 4, dorsal sepal; $\times 4$. 5, lateral sepal; $\times 4$. 6, lip; $\times 3$.

Flowers small, "mignonette and dark violet." Dorsal sepal ovate-lanceolate or oblong-ovate, short-acuminate, up to 7 mm. long, with revolute or recurved sides. Lateral sepals shorter and broader than the dorsal sepal, obliquely oblong-ovate, acute and apiculate. Petals obliquely linear, acute, about as long as the lateral sepals. Lip adnate to the column-foot, broadly obovate, lightly retuse and apiculate at the subtruncate apex, cuneate at the base, ecallose, up to 6.9 mm. long in the middle and 5.8 mm. wide. Column short, stout, broadly winged, concave, lightly 3-toothed at the apex, produced into a short, stout foot.

Loreto: Vicinity of Iquitos, 100 meters, on a dead tree in clearing, *Klug 10021*.

ISOCHILUS R. Br.

A small but perplexing genus of tropical American epiphytes consisting of numerous concepts apparently referable to a very few species (cf. Correll, Bot. Mus. Leafl. Harvard Univ. 10: 1. 1941).

Plants small to medium-sized, with a creeping rhizome, terrestrial or epiphytic. Stems more or less approximate, numerous, slender, leafy throughout (with the lower leaves often deciduous). Leaves numerous, distichous, linear, linear-lanceolate or oblong, erect or erect-spreading, obtuse or minutely bilobed at the apex. Inflorescence a short terminal raceme which is loose or dense, few- to many-flowered and distichous or unilateral, often arcuate. Flowers rather small, campanulate, varying from white to reddish or rose-purple or rarely orange. Sepals subequal, erect or recurved above, free or coherent almost to the apex, the lateral ones gibbous at the base under the lip, more or less dorsally keeled, with the free portion elliptic to lanceolate. Petals slightly shorter than the sepals, more or less clawed, oblique. Lip subequal to the petals but narrower, from a short claw linear to linear-oblancheolate, commonly sigmoid-flexed at the base and often above also, sometimes constricted near the middle. Column slender, toothed at the apex, footless or nearly so.

Isochilus linearis (Jacq.) R. Br. Ait. Hort. Kew. ed. 2, 5: 209. 1813; Cogn. Martius Fl. Bras. 3, pt. 5: 3, t. 1. 1898; C. Schweinf. Bot. Mus. Leafl. Harvard Univ. 8: 44. 1940. *Epidendrum lineare* Jacq. Select. Stirp. Amer. 221, t. 131, fig. 1. 1763. *Isochilus peruvianus* Schltr. Fedde Repert. Beih. 9: 79. 1921; Mansf. Fedde Repert. Beih. 57: t. 116, nr. 455. 1929. *Isochilus brasiliensis* Schltr. Fedde Repert. Beih. 9: 80. 1921; Mansf. Fedde Repert. Beih. 58: t. 39, nr. 155. 1930.

Plant variable, 7-70 cm. tall, with a creeping (sometimes indistinct) rhizome. Stems numerous, more or less approximate, slender, distichously many-leaved. Leaves linear or linear-lanceolate to narrowly oblong, obtuse or minutely bilobed at the apex, up to 6.5 cm. long and 5 mm. wide, strict or spreading. Inflorescence terminal, racemose, 1- to many-flowered, loose or dense. Flowers rather small, campanulate, white to rose-purple or orange. Dorsal sepal elliptic-lanceolate or oblong-lanceolate to (rarely) ovate-oblong or oblanceolate-oblong, acute, concave, 6-11.5 mm. long. Lateral sepals lanceolate or oblong-lanceolate (rarely oblong-ovate), connate below the middle, about as long as the dorsal sepal or slightly

longer, with the free portions lanceolate or triangular-lanceolate to elliptic. Petals elliptic or elliptic-oblong to linear-oblong, sometimes shortly clawed, lightly oblique, a little shorter than the sepals and either narrower or broader. Lip about as long as the sepals but much narrower, linear-lanceolate to linear-oblong, acute, commonly sigmoid-flexed at the base and often above the middle also, sometimes lightly constricted near or above the middle, up to 11.7 mm. long. Column small, toothed at the summit on each side, footless or with an abbreviated foot.

Cajamarca: Valley of Río Tabaconas, 950 meters, in thickets of evergreens, *Weberbauer 6159* (type of *I. peruvianus* Schltr.).—San Martín: San Roque, 1350–1500 meters, on trunk of petrified tree, *Williams 7385* (plant in fruit).

A widespread and variable species extending from Mexico to Costa Rica, the West Indies (type of *Epidendrum lineare*) and through South America to Brazil (type of *Isochilus brasiliensis*), Paraguay and Argentina.

POLYSTACHYA Hook.

Inconspicuous epiphytes of cosmopolitan distribution in the tropical regions of America, Africa and Asia.

Rhizome abbreviated. Stems approximate, short, concealed by imbricating leaf-sheaths, more or less pseudobulbous-thickened at the base. Leaves 2 to several, distichous, oblong to linear (rarely oblong-elliptic, oblong or obovate), many-nerved but not plicate, articulated to imbricating sheaths. Inflorescence terminal, bearing above a simple, few- to many-flowered raceme or a panicle consisting of few to several, distant racemes. Flowers small (in the American species), rather dense. Floral segments connivent or little spreading. Dorsal sepal free. Lateral sepals broader, often very broad, adnate to the more or less elongate column-foot. Petals narrower than the sepals. Lip uppermost, arcuate-recurved in natural position, articulated to the column foot, subsimple to distinctly 3-lobed. Column short or very short, produced into a more or less prominent foot. Anther terminal, opercular, incumbent, 1-celled or imperfectly 2-celled. Pollinia 4, in pairs.

- A1. Mentum (formed by the lateral sepals and the column-foot) conspicuous and elongate; callus at the base of the lip elongate, linear or oblong. . . . *P. luteola*
 A2. Mentum (if present) inconspicuous, short and rounded; callus at the base of the lip short, conical or rounded, sometimes indistinct. I
 Ia. Lateral lobes of the lip relatively abbreviated and more or less distinct.
 P. foliosa (*P. cerea*, *P. caracasana*, *P. minor*, etc.)
 Ib. Lateral lobes of the lip relatively long and distinct, more or less oblong-spatulate. *P. boliviensis*

Polystachya boliviensis Schltr. Fedde Repert. 12: 483. 1913; Mansf. Fedde Repert. Beih. 58: t. 47, nr. 187. 1930.

Plant small, epiphytic, up to 15 cm. high. Rhizome abbreviated. Stems approximate, short, up to 3 cm. long, bulbous-thickened at the base, entirely con-

cealed by imbricating sheaths which are leaf-bearing above. Leaves distichous, subapproximate, 2-4, linear or linear-oblong, recurved and commonly conduplicate in the dried specimen, up to 7.5 cm. long and 1 cm. wide when expanded, minutely bilobulate and apiculate (rarely acute) at the apex. Inflorescence surpassing the leaves or more rarely subequaling them, up to 12.5 cm. long, above racemose or more rarely paniculate with short branches; peduncle concealed below by 1 or 2 complanate, elongate, scarious sheaths; raceme several- to many-flowered, dense above, nodding when young. Floral bracts minute, acuminate. Flowers very small, yellow or pinkish-brown, rather fleshy. Dorsal sepal suborbicular-ovate or "oval," obtuse, concave, about 3 mm. or less long. Lateral sepals similar but markedly broader, oblique, obtuse or minutely apiculate, forming a short mentum with the column-foot. Petals linear-oblong, subobtusate to rounded at the oblique apex, shorter than the sepals. Lip connate with the column-foot, deeply 3-lobed near the base with the lateral lobes erect and the mid-lobe recurved in natural position, about 2.5 mm. long in the middle and 3-4 mm. broad across the widely spreading lateral lobes when expanded, cuneate at the very base; lateral lobes spatulate-oblong, oblique at the rounded apex, lightly incurved; mid-lobe much larger, suborbicular-ovate, round-obovate or "quadrate," retuse; disc with the very base callose-thickened as a continuation of the column-foot. Column abbreviated, very stout.

Ayacucho: Aina, between Huanta and Río Apurimac, 750-1000 meters, epiphyte in open woods, "segments pinkish-brown (withered)," *Killip & Smith 23162*. Bolivia (type).

Polystachya foliosa (Lindl.) Reichb. f. Walp. Ann. 6: 640. 1863; Cogn. Martius Fl. Bras. 3, pt. 4: 316. 1895. *Encyclia nana* Poepp. & Endl. Nov. Gen. ac Sp. 2: 10, t. 113A. 1837-38. *Encyclia polystachya* Poepp. & Endl. Nov. Gen. ac Sp. 2: 10, t. 113B. 1837-38. *Stelis foliosa* Lindl. Ann. Nat. Hist. 2: 330, t. 17. 1839. *Polystachya cerea* Lindl. Bot. Reg. 26, Misc. 86, no. 208. 1840. *Polystachya caracasana* Reichb. f. Bonpl. 2: 15. 1854. *Polystachya nana* (Poepp. & Endl.) Reichb. f. Walp. Ann. 6: 638. 1863; Cogn. Martius Fl. Bras. 3, pt. 4: 319. 1896, not Kl. 1853. *Polystachya minor* Fawc. & Rendle, Journ. Bot. 48: 106. 1910; Fl. Jam. 1: 49, t. 7, figs. 6-7. 1910. *Polystachya altilamellata* Schltr. Fedde Repert. 10: 385. 1912. *Polystachya ecua-dorensis* Schltr. Fedde Repert. Beih. 8: 90. May 1921; Mansf. Fedde Repert. Beih. 57: t. 95, nr. 370. 1929. *Polystachya Poeppigii* Schltr. Fedde Repert. Beih. 9: 155. Sept. 1921. *Polystachya amazonica* Schltr. Beih. Bot. Centralbl. 42, Abt. 2: 77. 1925; Mansf. Fedde Repert. Beih. 58: t. 47, nr. 186. 1930. *Polystachya Huebneri* Schltr. Beih. Bot. Centralbl. 42, Abt. 2: 112. 1925. *Polystachya stenophylla* Schltr. l.c., 113. Figure 108.

Plant very variable, epiphytic, 7-60 cm. high. Rhizome abbreviated. Stems approximate, often in dense clumps, short, more or less bulbous-thickened at the base, up to about 12 cm. long, entirely concealed by imbricating sheaths which are

leaf-bearing above. Leaves distichous, more or less clustered near the base of the plant, 2 to several, erect-spreading, narrowly linear to oblong-linear or oblanceolate (rarely elliptic), obtuse to subacute and usually obliquely bilobed at the apex, 4–33 cm. long, 2.5 mm.–3 cm. wide, often recurved. Inflorescence much shorter, or more commonly more or less surpassing the leaves, either a short, densely flowered raceme or a panicle consisting of few to several, densely or subaxly few-to many-flowered racemes, the peduncle being lightly compressed and concealed by long, imbricating, scarious sheaths. Flowers small to minute, more or less fleshy, greenish to pale yellow or yellowish white (rarely orange), sometimes tinged with purple, with slightly spreading segments. Dorsal sepal suborbicular or broadly ovate to oblong-ovate, acute or obtuse, about 1.5–5 mm. long, concave. Lateral sepals commonly more or less larger (especially broader), suborbicular-ovate to triangular-ovate, forming an abbreviated mentum with the short column-foot. Petals linear, oblong-linear or linear-spatulate, obtuse to acute or apiculate, subequaling or a little shorter than the sepals. Lip erect and parallel to the column in natural position, tubular-concave, often recurved above, distinctly 3-lobed about at the middle (often somewhat below or above the middle), usually more or less fleshy, suborbicular or broadly obovate to oblong-subquadrate in outline when expanded, more or less cuneate below, about 1.25–4 mm. long and subequally wide when expanded; lateral lobes small, obliquely ovate, subacute to obtuse or rounded at the apex; mid-lobe more or less larger (commonly distinctly so), suborbicular to elliptic-subquadrate or quadrate-oblong, broadly rounded to distinctly retuse in front; disc with a rather prominent conical callus at the base, and with the central longitudinal portion more or less covered with papillose or mealy hairs. Column very short and fleshy.

Peru: Habitat unrecorded, *Vargas 1817*.—Ayacucho: Estrella, between Huanta and Río Apurimac, about 500 meters, in dense woods, *Killip & Smith 23067*.—Huánuco: Between Huánuco and Pampayaco (Pampayacu), *Kanehira 335*. Cueva Grande, near Pozuzo, about 1700 meters, on tree trunk, *Macbride 4782*.—Junín: Chanchamayo Valley, 1800 meters, *Schunke s.n.* Same locality, 1500 meters, *Schunke 553, 1087*. Same locality, 1200 meters, *Schunke 1236*. Chanchamayo, Río Blanco, about 1400 meters, on coffee trees of the Hacienda Sta. Teresa, *Köhler s.n.* (type of *Polystachya altilamellata* Schltr.). La Merced, about 700 meters, epiphyte in wooded valley, *Killip & Smith 23749*. Río Paucartambo Valley near Perene Bridge, 700 meters, epiphyte in dense forest, *Killip & Smith 25357*. Río Pinedo, north of La Merced, 700–900 meters, on rock in woods, *Killip & Smith 23590*. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A68*.—Loreto: Balsapuerto (lower Río Huallaga basin), 150–350 meters, epiphyte in dense forest, *Killip & Smith 28605*. Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1178*. Same locality and altitude, *Klug 1445*. Peña Blanca, on Río Itaya, about 110 meters, epiphyte in dense forest, *Killip & Smith 29650*. Puerto Meléndez, below Pongo de Manseriche, 455 meters, *Tessmann 4751*. San Isidro, at



FIG. 108. *Polystachya foliosa* (Lindl.) Reichb. f. Plant; $\times \frac{2}{3}$. 1, flower, spread out; about $\times 4$. 2, flower from side; about $\times 4$. 3, column and lip from side; about $\times 6$.

the mouth of Río Pastazza, 135 meters, on *Crescentia cujete*, *Tessmann 4954*.

An extremely polymorphic plant extending from Mexico (*Polystachya cerea*) through Central America (*P. clavata*), the West Indies (*P. minor*) to South America: Venezuela (*P. caracasana*), British Guiana (*Stelis foliosa*), Ecuador (*P. ecuadorensis*), Peru (*Encyclia nana*, *E. polystachya*, and *Polystachya altilamellata*) and Amazonian Brazil (*P. amazonica*, *P. Huebneri*, and *P. stenophylla*).

Polystachya luteola (Sw.) Hook. Exot. Fl. 2: 103. 1824; Cogn. Martius Fl. Bras. 3, pt. 4: 312. 1895; Ames and Correll, Orch. Guatem. 469, t. 127. 1953. *Cranichis luteola* Sw. Fl. Ind. Occ. 3: 1433. 1804. Figure 109.

Plant small to large and stout, epiphytic, variable, often growing in large masses, up to 60 cm. high. Rhizome abbreviated. Stems pseudobulbous-thickened at the base, tapering upward, entirely concealed by imbricating, scarios sheaths, up to about 10 cm. long. Leaves 2 to several, oblong-elliptic, linear-lanceolate or oblanceolate (sometimes oblong), obtuse to acute, up to 31 cm. long and 4 cm. wide. Inflorescence commonly more or less surpassing the leaves, few-flowered and simple or many-flowered and branched, with the branches often unilateral, up to 55 cm. long, with the peduncle compressed and more or less concealed by long, tubular, scarios sheaths, the latter being glaucous and semi-translucent when fresh. Flowers small, yellowish green, fragrant, with arcuate pedicellate ovaries. Dorsal sepal ovate to ovate-oblong, acute or apiculate, shallowly concave, 2.5–5 mm. long. Lateral sepals distinctly larger, obliquely and broadly triangular, acute or apiculate, adnate to the column-foot and forming a conspicuous mentum about 3–6 mm. long. Petals linear-spatulate, more or less obtuse and apiculate, shorter than the dorsal sepal. Lip erect and parallel to the column, recurved and tubular-concave in natural position, obovate to broadly cuneate when expanded, deeply 3-lobed above the middle, about 3–4.5 mm. long, up to 4 mm. wide across the lobes; lateral lobes porrect and incurved, relatively small, obliquely semiovate or narrowly triangular-oblong; mid-lobe oblong-quadrate to suborbicular, often slightly dilated above, truncate or lightly retuse with irregular undulate margins; disc with a prominent oblong-linear callus in the center of the lower half, entirely covered with inconspicuous glandular hairs within. Column very short and stout, with an elongate foot.

Amazonas: Prov. of Chachapoyas, near Sesuga, *Mathews 3193*. La Peca, northeast of Jaën, 1100 meters, common on trees in "small forest," *Woytkowski 37017*.—Junín: Along Río Perene, near "Hacienda 3," Colonia Perene, about 600 meters, epiphyte in forest, *Killip & Smith 25107* (fruiting). A very widespread and rather variable

FIG. 109. *Polystachya luteola* (Sw.) Hook. Flowering plant; almost $\times 1$. Fruiting inflorescence; $\times 1$. 1, flower from side; 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; $\times 5$.



B. Ames 1905.

species extending from Florida (U.S.A.), through the West Indies (type of *Cranichis luteola*), Central and South America to Brazil and Peru. It also occurs in Madagascar, Mauritius, Ceylon, India, Indonesia and the Philippine Islands.

GALEANDRA Lindl.

Medium-sized to large epiphytic or terrestrial orchids of tropical American regions extending from Mexico to Brazil, Paraguay and Argentina.

Stems elongate, either fusiform-thickened or abruptly contracted at the base into a short tuber-like pseudobulb. Leaves distichous, narrow and more or less elongate, plicate, articulated to scarious sheaths, more or less deciduous. Inflorescence terminal, racemose or paniculate above, few- to several-flowered, the short or elongate peduncle invested by one or more elongate, scarious sheaths. Rachis loosely flowered. Flowers commonly rather large and showy (more rarely small), with spreading segments. Sepals subequal, free, usually slightly narrowed toward the base, with the lateral sepals somewhat oblique. Petals similar to the sepals or a little larger. Lip produced at the base into a spur which is commonly elongate and infundibuliform or more rarely shortly conical; lamina broad, subsimple or more or less distinctly 3-lobed, adorned with swollen lines, keels or tufts of hairs. Column short to elongate, often produced into a short foot, glabrous to villous in front. Anther terminal, opercular, incumbent. Pollinia 4, or 2 and deeply sulcate.

- A1. Pseudobulbs small or minute, tuberiform-conic or ovoid; flowers small. *G. juncea*
 A2. Pseudobulbs or swollen stems slender and elongate, commonly fusiform; flowers medium-sized to large. I
 Ia. Disc of the lip mostly glabrous, with a pair of small but conspicuous more or less arcuate keels in the middle. *G. Baueri* var. *piloso-columna*
 Ib. Disc of the lip more or less pubescent with a conspicuous median band of hairs and 3 inconspicuous keels below. *G. pubicentrum*

Galeandra Baueri Lindl. var. **piloso-columna** C. Schweinf.
 Bot. Mus. Leafl. Harvard Univ. 11: 187. 1944.

Plant epiphytic. Stem slender-fusiform, about 19.4 cm. or less high, entirely concealed by scarious, imbricating, leaf-bearing sheaths. Leaves deciduous (often not present), distichous, lanceolate-linear, acute, plicate but more or less conduplicate, 14.4 cm. or less long, up to 1 cm. wide. Inflorescence paniculate with short branches (often congested above) which are slightly arcuate. Racemes loosely about 4-flowered or less, with a fractiflex rachis. Flowers rather large with spreading segments, yellowish-brown with the inner parts (petals) lighter and the outer parts (sepals) darker. Dorsal sepal oblanceolate-oblong, acute, 1.5–1.8 cm. long, up to 5 mm. wide above. Lateral sepals similar but with a broader base, lightly oblique, a little larger than the dorsal sepal. Petals very similar to the dorsal sepal, often slightly larger. Lip much larger than the other segments, long-spurred at the base; lamina tubular-concave, broadly rhombic-ovate or suborbicular-rhombic

when expanded, obscurely 3-lobed, deeply retuse in front, 2.2–2.5 cm. long (on each side of the retuse apex) and about 3.4 cm. wide when expanded; disc with a pair of semiobovate, more or less arcuate keels in the middle; spur prominent, about 2.8 cm. or less long, broadly infundibuliform below, very slender-cylindric above. Column about 8 mm. long at the back, glabrous or pubescent, produced into a short foot at the base, terminating above in an abrupt, pubescent, recurved tooth, with the sulcate anterior surface more or less long-pilose, unlike the species.

Junín: Chanchamayo Valley, *Schunke 534* (type). Same locality, 1800 meters, *Schunke s.n.* La Merced, Hacienda Schunke, about 1200 meters, *Macbride 5599*.

Galeandra juncea Lindl. Sert. Orch. (1840) sub t. 37; Reichb. f. Walp. Ann. 6: 649. 1863; Cogn. Martius Fl. Bras. 3, pt. 4: 306. 1895.

Plant terrestrial, slender, up to 90 cm. tall. Pseudobulb small, ovoid, up to 2.5 cm. high. Stem terminal, slender, strict, terete, concealed by the long-sheathing leaf-bases. Leaves several, distichous, with the free portion narrowly linear, strict or slightly arcuate, acuminate, commonly conduplicate in the dried specimen, up to 36.5 cm. long and 7 mm. wide, the uppermost blade surpassing the inflorescence. Inflorescence simple to trifurcate and loosely 2- to 7-flowered above, up to 10 cm. long. Flowers small, membranaceous, pinkish white with purple-margined lip. Dorsal sepal elliptic-lanceolate to oblanceolate-oblong, acute, 1.2–1.4 cm. long, 4.2 mm. or less wide. Lateral sepals similarly large, oblong-lanceolate, acute or short-acuminate, lightly oblique. Petals similar to the dorsal sepal but commonly broader, elliptic-lanceolate, oblong-oblanceolate or oblong-cuneate, acute. Lip spurred; lamina tubular-concave in natural position, broadly ovate or suborbicular in outline, more or less obscurely 3-lobed, lightly retuse in front, 1.3–1.6 cm. long in the middle, 1.6–1.8 cm. wide when expanded, with the undulate margins subcrenulate; disc wholly minute-papillose, with 4 small, semielliptic, pilose keels in the middle and with a tuft of numerous hairs arranged in 4 lines near the front; spur rather short, variable, infundibuliform, rather abruptly narrowed above, 8.2–15 mm. long. Column small, glabrous, 6–8 mm. long, produced into a short foot.

Cuzco: Habitat not recorded, *Bues s.n.* (Herb. Field Mus. No. 659999). Also Panama, Venezuela, British Guiana (type), Surinam, Brazil and Bolivia.

Galeandra pubicentrum C. Schweinf. Am. Orch. Soc. Bull. 11: 429, t. 12. 1943. Figure 110.

Plant epiphytic, medium-sized, up to 29 cm. high. Stem slender-fusiform, about 15 cm. high, entirely invested by scarious, imbricating sheaths which are leaf-bearing except near the base. Leaves 6–8, distichous, erect-ascending, narrowly linear to oblong-linear, acute, sessile, up to 16 cm. long and 1 cm. wide. Inflorescence terminal, a little shorter than the leaves, paniced above with 3 short, loosely flowered, mostly erect branches. Flowers few (up to 7) to a branch, rather large, membranaceous, brownish green, with a cream-colored lip tipped with lilac. Dorsal sepal oblanceolate or oblong-oblanceolate, acute or apiculate, about 1.85 cm. long and 5 mm. wide. Lateral sepals oblong-lanceolate or oblanceolate-oblong, lightly falcate, acute, apiculate, somewhat longer than the dorsal sepal. Petals

oblanceolate, acute, very similar to the dorsal sepal but somewhat larger. Lip much larger than the other segments, prominently spurred; lamina tubular-concave in natural position, broadly subquadrate-obovate when expanded, very broadly rounded above with a lightly retuse apex, rounded on each side above the middle, then contracted to a cuneate-subquadrate base, about 2.3 cm. long in the middle, up to 2.9 cm. wide when expanded; disc with 3 narrow, more or less conspicuous, smooth keels at the base and a central pilose band in front; spur up to 2.7 cm. long, from an infundibuliform base slender-cylindric. Column short, terminating in an abrupt, linear tooth, about 6.3 mm. long at the back, biauriculate in front near the apex. Pollinia sessile on a semilunate viscid disc.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10095* (type). Mishuyacu, near Iquitos, 100 meters, in forest, "fls. yellow and red-brown," *Klug 882*.

BLETIA Ruiz & Pav.

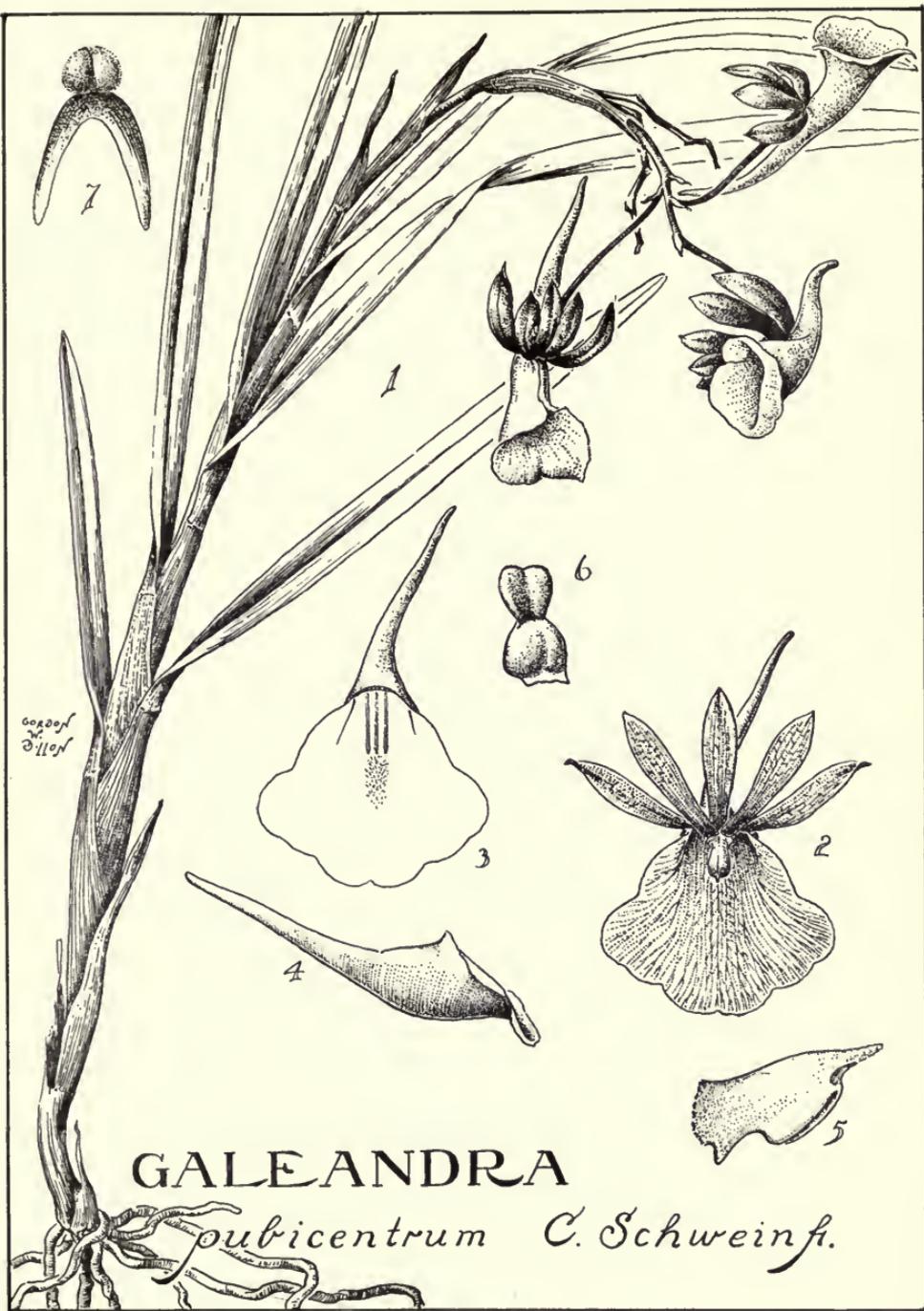
A small genus of tropical American, erect, terrestrial or epiphytic orchids.

Plants rather tall, with abbreviated, subglobose or ovoid pseudobulbs or corms which bear several elongate, elliptic-lanceolate or linear-elliptic, plicate leaves (sometimes early deciduous). Inflorescence lateral, erect, shorter or longer than the leaves, simple or loosely paniculate above. Flowers rather small to medium-sized, showy, commonly red to purple, with more or less spreading segments. Sepals similar, free, the lateral being often broader at the base. Petals similar to the sepals or much broader. Lip attached to the base of the column, free, commonly 3-lobed, narrowed to rounded or subcordate at the base; lateral lobes incurved; mid-lobe obtuse to bilobed; disc adorned with thickened lines or high, thin, entire or crenulate keels. Column elongate, commonly arcuate, often bialate throughout and shortly biauriculate at the footless base. Anther opercular, incumbent, 2-celled. Pollinia 8, 4 superposed in each cell.

- A1. Petals much broader than the sepals, rounded or rarely shortly acute at the apex; disc of the lip traversed by 3-5 thickened nerves. *B. catenulata* (*B. sanguinea*)
 A2. Petals slightly broader than the sepals, sharply acute or acuminate; disc of the lip traversed by 5-7 high thin keels. *B. Mandonii*

Bletia catenulata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 229. 1798; Cogn. Martius Fl. Bras. 3, pt. 5: 350. 1901. *Bletia sanguinea* Poepp. & Endl. Nov. Gen. ac Sp. 1: 56, t. 95. 1836. *Bletia Sherrattiana* Batem. ex Hook. f. Bot. Mag. 93: t. 5646. 1867. *Regnellia purpurea* Barb. Rodr. Gen. et Sp. Orch. Nov. 1: 82. 1877. *Bletia Watsoni* Hort. ex Orch. Rev. 2: 298. 1894. *Bletia Rodriguesii* Cogn. Martius Fl. Bras. 3, pt. 5: 351, t. 74. 1901.

Plant large, terrestrial, variable. Pseudobulbs ovoid to depressed-subglobose, up to 6 cm. long, bearing 1 to several leaves above. Leaves elliptic-lanceolate to linear-elliptic, acuminate at both ends, 20-90 cm. long, 0.5-8 cm. wide, plicate,



GALEANDRA

pubicentrum C. Schweinf.

FIG. 110. *Galeandra pubicentrum* C. Schweinf. 1, plant; $\times \frac{1}{5}$. 2, flower, with parts spread out; $\times 1$. 3, lip, spread out to show keels, pubescent band and spur; $\times 1$. 4, lip from side, natural position; $\times 1$. 5, column from side, with anther removed; $\times 3$. 6, anther, oblique view; $\times 5$. 7, pollinia, showing viscid disc; $\times 5$.

distichous, deciduous. Inflorescence lateral, erect, simple (rarely once branched), more or less longer than the leaves, 60–192.5 cm. high, more or less stout, below with mostly remote, close, short, tubular sheaths and above loosely several- to many-flowered. Flowers rather large and showy, membranaceous, with spreading segments, blood-red to pink or purple, commonly with a central streak of whitish or yellow on the lip. Dorsal sepal ovate-oblong or oblong-elliptic, commonly acute or subacute, about 3.4 cm. or less long and 7–12 mm. wide. Lateral sepals similar, sometimes smaller. Petals round-ovate, rounded to abruptly short-acute at the tip, about twice as wide as the dorsal sepal or more, suboblique, thinly membranaceous, sometimes with irregular or lobulate margins. Lip about as long as the rest of the flower or slightly surpassing it, suborbicular in outline, deeply 3-lobed near the middle, concave below with incurved lateral lobes which are separated from the anterior portion by a deep, narrow sinus; lateral lobes broadly and obliquely deltoid-ovate or suborbicular-ovate, broadly obtuse to rounded at the apex; mid-lobe shortly and transversely rhombic-suborbicular or obovate-reniform, distinctly emarginate, narrower than the expanded basal portion; disc with 3–5 approximate, thickened nerves extending through the center (sometimes only through the lower half) and with angulate lateral nerves. Column lightly clavate, arcuate, narrowly bialate, up to 2 cm. long.

Ayacucho: Aina, between Huanta and Río Apurimac, 750–1000 meters, on open hillside, *Killip & Smith 23109*. Ccarrapa, between Huanta and Río Apurimac, 1000 meters, on wooded hillside, *Killip & Smith 22469*.—Cuzco: Below Machu-Picchu, 2300 meters, in “joints of steep granite slopes, in humus and silty soil,” *West 6470*. Prov. of Convención, Quellomayo, 1300 meters, “steep clay banks, open brush, and among rocks,” *West 8018*. Santa Ana, about 900 meters, *Cook & Gilbert 1631*.—Huánuco: Near Cuchero (Cohero) in subandine woods, *Poeppig s.n.* (type of *B. sanguinea*). Along the Marañon River (this station may be in Loreto), *Warszewicz s.n.* El Boquerón, 1600 meters, in reddish clay loam, *Seibert 2071*. Same locality as the last, about 460 meters, common on rocky, sunny slopes, *Horn s.n.* Prov. of Huánuco, Chinchao, 1850 meters, *Scolnik 1078*. Above Chinchao, about 2400 meters, on open rocky and grassy slopes, *Hodge 6275*. Puente Durand, north of Huánuco, Valley of Río Chinchao, 1100 meters, in open spaces at edge of jungle in rich black loam, *Stork & Horton 9436*. Same locality as the last, 1050 meters, *Scolnik 1105*. Piedra Grande, near Río Santo Domingo, about 1500 meters, on steep grassy hillsides, *Macbride 3681*. Pozuzo and Chaclla, toward S. Domingo and Llamapañauí, in woods and clearings, *Pavón s.n.* (type of *B. catenulata*).—Junín: Chanchamayo Valley, 1000 meters, *Schunke s.n.* Colonia Perene, about 680 meters, in thickets, *Killip & Smith 25038*. Colonia Perene, along Río Perene, near “Hacienda 3,” about 600 meters, in clearing in forest, *Killip & Smith 25131*. East of Quimiri Bridge, near La Merced, 800–1300 meters, thickets in dense forest, *Killip & Smith 23935*. La Merced, Hacienda Schunke,

about 1200 meters, on open grassy slopes, *Macbride 5663*. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A67*. Near Pariahuanca, *Mathews 1077*. Prov. of Tarma, Utcuyacu, 1800 meters, on the slope of mountain covered with grass-steppe, *Woytkowski 37001*. Vitoc (13 km. from San Ramón), *Soukup 2480*. Also Colombia (type of *B. Sherrattiana*), Brazil (type of *Regnellia purpurea* and *Bletia Rodriguesii*), Ecuador and Bolivia.

Bletia ensiformis Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 230. 1798.

Huánuco: Pozuzo, on trees and rocks in open woods, toward Cheniço and Tramo, *Pavón s.n.*

This concept appears to be referable to *Epidendrum*.

Bletia Mandonii Schltr. Fedde Repert. Beih. 10: 48. 1922; Mansf. Fedde Repert. Beih. 57: t. 139, nr. 546. 1929.

Plant terrestrial, stout, up to 54 cm. high. Pseudobulbs obliquely depressed-globose, up to 1.7 cm. high and somewhat wider, subterranean, moniliform, producing 2 (rarely 1) erect leaves at the summit on a slender stem. Leaves very unequal in size, lanceolate-elliptic or linear-elliptic, acuminate at both ends, up to 41 cm. long and 3.8 cm. wide, plicate. Scape lateral, shorter than or surpassing the leaves, simple or rarely with a short, strict, lateral branch above, loosely few-to several- (rarely 10-) flowered in the upper portion, provided below with few remote, short, close, tubular sheaths. Flowers rather large, campanulate, membranaceous. Dorsal sepal lanceolate-elliptic ("oblong"), acute or short-acuminate, about 3.3 cm. or less long and 1.2 cm. wide. Lateral sepals similar, lightly oblique, shortly acuminate, carinate especially toward the apex. Petals similar to the sepals but slightly broader, subacuminate, somewhat oblique especially at the apex. Lip much broader than the other segments, suborbicular-obovate ("cuneate-oboval") when expanded, deeply 3-lobed above the middle, about 3 cm. or less long and 2.8 cm. or less wide across the lateral lobes when expanded; lateral lobes semi-obovate ("semioblong") with a broadly rounded, irregular free apex; mid-lobe suborbicular or round-obovate from a very short isthmus, obtuse to retuse with a more or less prominently apiculate apex; disc adorned with about 5 approximate central keels which are dilated in the center and on the mid-lobe, often with an additional slender or enlarged lateral keel. Column elongate, arcuate, narrowly clavate, thinly bialate, about 2.2 cm. long.

This species is altogether rather variable and is apparently closely allied to *Bletia Wageri* Reichb. f., with which it was confused by Reichenbach.

Cuzco: Prov. of Quispicanchis, Marcapata Valley near Chilechile, 2200 meters, "grassy places between shrub woods," flowers purple, *Weberbauer 7860*. Machu-Picchu, on dry slope, *Hunnewell s.n.* Prov. of Urubamba, Tuncapata, Santa Rita, 2400–2800 meters, on open grassy slope, *Vargas 2669*. Bolivia (type) and perhaps Ecuador.

Bletia parviflora Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 231. 1798.=obscure species.

Peru: Near the fortress of Palca, on mountains, *Pavón s.n.*

Bletia repanda Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 229. 1798.=obscure species; the terminal inflorescence indicates that the concept is not a *Bletia*.

Junín: Prov. of Tarma, near the town of Vitoc, at the margin of the Maraynioc River, in sandy and rocky places, *Pavón s.n.*

Bletia uniflora Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 230. 1798.=obscure species.

Junín: Prov. of Tarma, near Vitoc, on trees in woods, *Pavón s.n.*

CHYSIS Lindl.

A small group of tropical American, showy epiphytes.

Stems fusiform-thickened or subclavate (rarely ellipsoid), often loosely branched, entirely concealed by evanescent sheaths which are scarious below and leaf-bearing toward the apex. Leaves several, distichous, usually crowded near the apex, lanceolate-elliptic or elliptic-oblong, plicate, acuminate at the apex and base. Inflorescence lateral, racemose, loosely few- (up to 12-) flowered. Flowers showy, white, yellow or rose-colored. Sepals free, spreading, about equally long, but the lateral sepals broader, oblique and forming a mentum with the column-foot. Petals similar to the dorsal sepal or a little longer, oblique, commonly more or less oblong-spatulate. Lip affixed to the column-foot, recurved and tubular-involute in natural position, 3-lobed near the middle; lateral lobes erect in natural position, incurved; mid-lobe spreading or reflexed, entire or lightly bilobed in front; disc with callose veins or calli. Column stout, arcuate, bialate, produced into a short foot. Anther opercular, incumbent, 2-celled. Pollinia 8, 4 in each cell.

Chysis Bruennowiana Reichb. f. & Warsc. Bot. Zeit. 15: 157. 1857.

Vegetative parts not described. Peduncle loosely several- (about 8-) flowered. Floral bracts ovate, acute, concave, equaling the pedicelled ovary. Perianth probably rose-dotted. Dorsal sepal broadly oblong or ovate-oblong. Lateral sepals broadly falcate-ovate, oblique. Petals slightly longer than the sepals, obliquely oblong-spatulate. Lip 3-lobed near the middle, strongly recurved in natural position, with the basal portion ("claw") forming an angle with the column-foot and with the anterior portion of the lip; lateral lobes broadly semiovate ("semifalcate"), porrect, about equaling the mid-lobe, erect in natural position; mid-lobe ovate, obtuse (cochleate?); disc with 3 keels before the mid-lobe. Column very short and stout, produced into a subequally long foot.

Peru: Habitat not given, *Warscewicz s.n.*

This description was compiled from the original citation, amplified by a rather obscure floral analysis from the Reichenbach Herbarium on which the attributed origin is Costa Rica.

BULBOPHYLLUM Thou.

A very large cosmopolitan genus centered in the tropics of the Old World, but represented also in the tropical regions of America.

Plants very small to large and showy, with a creeping, often elongate rhizome producing numerous sessile, crowded or distant pseudobulbs. Pseudobulbs subglobose to elongate-pyriform (sometimes abbreviated), bearing 1-3 leaves at the summit. Leaves linear to suborbicular, generally coriaceous or fleshy. Inflorescence lateral, simple, either at the base of the scape or on the rhizome between the pseudobulbs, 1-flowered, racemose or subumbellate above. Flowers minute to large, loose or dense. Dorsal sepal free. Lateral sepals subequal or longer, more or less dilated at the base, which is adnate to the column-foot to form a distinct mentum, free or more rarely connate. Petals commonly much shorter than the sepals, often pubescent or fimbriate. Lip movably articulated to the column-foot, arcuate-recurved with the basal part erect in natural position, simple or 3-lobed, often callose-thickened or bilamellate. Column rather small, with a pair of porrect arms or wings above, produced into a distinct foot. Anther opercular, incumbent, more or less distinctly 2-celled. Pollinia commonly 4.

- A1. Plant small; scape 10 cm. or less tall; raceme erect, loosely few- (10- or less-) flowered; lateral sepals connate nearly to the apex. . . . *B. Weberbauerianum*
 A2. Plant larger; scape about 21 cm. or more long; raceme nodding to arcuate, densely or subdensely many- (20- or more-) flowered; lateral sepals free. . . I
 Ia. All sepals ovate-lanceolate, aristate; petals ciliate; lip about half as long as the sepals. . . . *B. meridense*
 Ib. All sepals linear-lanceolate or linear-oblong, acute to acuminate; petals not ciliate; lip nearly as long as the sepals. . . . *B. incarum*

Bulbophyllum incarum Kränzl. Fedde Repert. 1: 86. 1905.

Plant large. Rhizome stout, long-creeping, branching, producing many roots. Pseudobulbs ovoid, rugose-sulcate in the dried specimen, up to 2 cm. high, 2.5 cm. or less distant, monophyllous at the apex. Leaf broadly oblong or elliptic-oblong ("ligulate"), obtuse and short-apiculate, sessile with a rounded-cuneate, complicate base, up to 6 cm. long and 1.8 cm. wide. Scape arising from the base of the pseudobulb, tall; peduncle up to 24 cm. long, suberect, with about 6 remote, short, tubular sheaths; raceme abruptly reflexed at the base, densely many- (about 20- or more-) flowered, about 7 cm. long (including the upper flowers). Floral bracts large, ovate, acute, about half as long as the flowers. Flowers white with rose-colored spots. Dorsal sepal linear-lanceolate, gradually acuminate ("acute"), about 1.5 cm. long. Lateral sepals free, about equally long, linear-oblong, acute. Petals much smaller than the sepals (about one fifth as long), triangular-linear, neither fimbriate nor pilose. Lip about 1.3 cm. long, up to 4 mm. wide above, 3-lobed; lateral lobes short, rounded, basal, setose without and on the margin; mid-lobe oblanceolate-oblong, rounded at the apex, gradually much narrowed toward the base; disc sul-

cate and thickened between the lobes. Column very short, angled in the middle, furnished above with a pair of linear arms.

Puno: Sandía, 2200 meters, *Weberbauer 951*.

The description was prepared from an excellent photograph of the type, supplemented by the type description.

Bulbophyllum (as *Bolbophyllum*) **meridense** Reichb. f. *Linnaea* 22: 836. 1849; *Walp. Ann.* 6: 251. 1861. *Didactyle meridensis* Lindl. *Fol. Orch. Didactyle* 3. 1852.

Plant large, epiphytic. Rhizome long-creeping, stout, producing numerous roots. Pseudobulbs ovoid or pyriform (sometimes thick-cylindric), 4-cornered and striate-sulcate in the dried specimen, up to 2.7 cm. high, unifoliate at the apex. Leaf elliptic-oblong or broadly oblong, apiculate at the obtuse apex, cuneate at the sessile, complicate base, up to 12 cm. long and 3.1 cm. wide, coriaceous. Scape arising from the base of the pseudobulb, much surpassing the leaf; peduncle sub-erect, up to 39 cm. high, provided with 6-9 remote, short, tubular-cylindric, acute sheaths; raceme abruptly reflexed or sigmoid-arcuate, more or less densely many-flowered, up to 15 cm. long. Floral bracts small, ovate, acute, equaling less than half of the flower. Flower small, campanulate, reddish bordered with violet or green, purple-mottled inside, with a purplish black lip. Dorsal sepal ovate-lanceolate, acuminate with a caudate or aristate apex which is recurved in natural position, concave below, about 1-1.2 cm. long. Lateral sepals very similar but slightly larger, free, oblique, navicular. Petals much smaller (about a third as long), ovate-oblong, subacuminate, shortly but densely ciliate. Lip slightly longer than the petals, in natural position oblong-pandurate with erect basal auricles or lateral lobes, rounded at the apex, very fleshy, entirely pubescent, almost 5 mm. long; lateral lobes small, semiovate-rounded; mid-lobe much larger, slightly narrowed toward the base, long-fimbriate; disc mostly occupied by a relatively large, oblong-ellipsoid callus which is sulcate toward the base. Column stout, shorter than the petals, produced into a subequally long foot, bearing at the apex a pair of porrect, elongate-linear stelidia and below them a pair of short decurved horns.

Junín: East of Quimiri Bridge, near La Merced, 800-1300 meters, in dense forest, *Killip & Smith 24009*. Also Venezuela (type).

Bulbophyllum Weberbauerianum Kränzl. *Fedde Repert.* 1: 85. 1905.

Plant small, growing on cliffs. Rhizome creeping, producing numerous roots. Pseudobulbs apparently crowded, mostly suborbicular, laterally compressed, up to 1.5 cm. high, rugose in the dried specimen, unifoliate at the apex. Leaf elliptic-oblong ("lanceolate or oblong"), acute, cuneate at the sessile, complicate base, up to 4 cm. long and 1 cm. wide, coriaceous. Scape arising from the base of the pseudobulb, about twice as long as the leaf, slender, erect or arcuate, up to 10 cm. long, adorned with a few close, tubular sheaths through the lower half, racemose above; raceme up to 3.5 cm. long, loosely few- (up to 10-) flowered, with the flowers often secund. Floral bracts small, ovate, acute, concave, scarious, slightly surpassing the ovary. Flowers large for the plant, brownish yellow, with slightly spreading

sepals. Dorsal sepal lanceolate-linear from a somewhat broader base, obtuse, about 1.4 cm. long. Lateral sepals similar but somewhat larger, linear, entirely connate up to the biapiculate tip. Petals much smaller than the sepals, linear-lanceolate, acuminate, up to 5 mm. long, sparingly long-fimbriate. Lip nearly as long as the sepals, up to 1.3 cm. long including the very short claw and about 0.25 mm. wide above, biauriculate at the base (lateral lobes reduced to minute rounded auricles), with the anterior portion linear-narrowed and longitudinally keeled (triangular in cross section); disc fimbriate near the base. Column with a pair of short median arms and with 2 slender, linear, biapiculate stelia.

Puno: Sandía, 2100–2300 meters, on cliffs, *Weberbauer 540*.

Description compiled from the original diagnosis supplemented by a photograph of the type.

BUESIELLA C. Schweinf.

Small, inconspicuous epiphytes, at present recorded only from Peru.

Plants slender, with a creeping rhizome and relatively stout roots. Pseudobulbs approximate, very slender, unifoliate. Leaves very narrow. Inflorescences lateral, basal, loosely racemose and few-flowered above. Sepals oblong or elliptic-oblong, cymbiform. Petals oval-ovate. Lip not fleshy, simple, pandurate, rigidly attached to the column, bicarinate in the middle. Column conspicuous, clavate, not winged, footless. Anther incumbent, galeate, 1-celled. Pollinia 2.

Buesiella pusilla C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 153, t. 48. 1952. Figure 111.

Plant small, slender, epiphytic, with an ascending, sheathed rhizome. Pseudobulbs numerous, approximate, very slender, unifoliate, about 2–3.3 cm. long, subparallel to the rhizome. Leaves narrowly linear, more or less conduplicate, acute or subacute, gradually long-narrowed below, gently recurved in the dried specimen, up to 19 cm. long and 4.5 mm. wide above the middle. Inflorescences lateral at the base of the pseudobulbs, filiform, suberect, short, clothed with several imbricating, foliaceous sheaths below, loosely few- (3–9-) flowered above. Flowers minute, membranaceous, apparently campanulate. Sepals free, cymbiform, 1-nerved, dorsally carinate. Dorsal sepal elliptic-oblong when expanded, subacute, about 3 mm. long and half as broad. Lateral sepals oblong, subacute, somewhat longer and narrower than the dorsal sepal. Petals oval-ovate, acute, about equally long with the sepals but broader. Lip subparallel to the column and adnate to it at the base, longitudinally concave, simple, pandurate, with the anterior half triangular-ovate and acute, and the slightly narrower lower portion rounded at the base, about 2.7 mm. long and 1.4 mm. wide across the ovate portion; disc with a pair of semirhombic keels in the middle. Column stout, clavate, wingless, footless, about 1.6 mm. high at the back.

Cuzco: Ccochapampa, summit of Ccochayoc, 100 meters, *Bues s.n.*

BUESIELLA *pusilla*
C. Schweinfurth



FIG. 111. *Buesiella pusilla* C. Schweinf. 1, plants; $\times \frac{2}{3}$. 2, flower bud from side; $\times 8$. 3, flower, partially expanded, from side; $\times 6$. 4, petal; $\times 6$. 5, lip expanded; $\times 12$. 6, anther with pollinia, from below; $\times 20$.

EULOPHIDIUM Pfitz.

A small group of terrestrial or epiphytic plants centering in tropical Africa and represented in the New World by the single following species.

Plants medium-sized to large. Stems reduced to ovoid or ovoid-oblong pseudobulbs which are often numerous and densely congested, monophyllous (very rarely diphyllous) at the apex, concealed by several large evanescent sheaths. Leaf large, elongate, commonly oblong or oblong-elliptic, coriaceous. Scape lateral at the base of the pseudobulb, erect, simple, longer than the leaf, loosely racemose above. Racemes few- to many-flowered. Flowers small, pedicellate, with narrow, membranaceous floral bracts. Sepals subequal, free, with the lateral ones oblique and adnate to the short column-foot. Petals similar to the sepals, but often broader. Lip produced into a short spur at the base, distinctly 3-lobed in front, with the lateral lobes erect in natural position and the mid-lobe truncate to bilobed; disc commonly bilamellate. Column short, stout. Anther terminal, opercular, incumbent, usually 1-celled. Pollinia 2, unappendaged.

This generic description was prepared without reference to some of the African species.

Eulophidium maculatum (Lindl.) Pfitz. Entwurf. Natürl. Anord. Orch. 88. 1887; Engler & Prantl, Natürl. Pflanzenf. 2, 6: 188. 1888; Cogn. Martius Fl. Bras. 3, pt. 6: 105, t. 36. 1904. *Angraecum maculatum* Lindl. Collect. Bot. t. 15. 1821; Bot. Reg. 8: t. 618. 1822. *Limodorum maculatum* Lodd. Bot. Cab. 5: t. 496. 1822. *Eulophia maculata* Reichb. f. Walp. Ann. 6: 647. 1863, in part.

Plant rather large, terrestrial or epiphytic, with robust, fibrous, verruculose roots. Pseudobulbs (often congested) ovoid to ovoid-oblong or thick-cylindric, up to 4 cm. long, unifoliate at the apex, concealed and surpassed by several large imbricated, evanescent sheaths. Leaf large, narrowly oblong to oblong-elliptic, acute, long-narrowed to a complicate base, duplicative, coriaceous, up to 32 cm. long and 5.5 cm. wide (usually about half as large or more), with darker green transverse mottling. Scape lateral and arising from the base of the pseudobulb, erect, surpassing the leaf, up to 50 cm. tall, racemose above; peduncle provided with few remote, scarious, tubular, acute or acuminate sheaths; raceme (very rarely with a short lateral branch) loosely few- to many-flowered. Flowers small, white, pink and yellow, brownish, or wine-color, commonly with white markings, rather membranaceous, in the axils of inconspicuous lanceolate bracts. Dorsal sepal linear-oblong or linear-elliptic, acute, longitudinally concave and incurved in natural position, about 9–12 mm. long. Lateral sepals falcate, narrowly oblanceolate-oblong, slightly shorter than the dorsal sepal. Petals obliquely elliptic-oblong, acute, distinctly broader than the sepals. Lip shorter but much broader than the other segments, spurred; lamina deeply 3-lobed, with the lower sides incurved in natural position, subquadrate in outline, about 8 mm. or less long and subequally wide across the lateral lobes when expanded; lateral lobes semiobovate, with a broadly rounded apex; mid-lobe larger, broadly obovate or reniform, with an abrupt, short, broad basal portion or claw, lightly retuse or broadly truncate in

front; disc with a pair of approximate, obliquely semiobovate, spreading lamellae at the base; spur short and stout, oblong-clavate, 3–4.5 mm. long, broadly and rather abruptly rounded at the apex. Column short, stout, with a very oblique base or short foot, 4–5 mm. long.

Cuzco: Prov. of Convención, Hda. Potrero, Sapan-Sachayocc, 2200 meters, epiphyte in forest, *Vargas 2525*. Same locality as the last, Potrero, Garabito, 1300 meters, in open shady woods, *Vargas 7103*. Also Brazil (type) and Paraguay.

EULOPHIA R. Br.

A large, cosmopolitan genus centering in the Old World (especially Africa and Asia) with very few species in the American tropics and subtropics and but one in South America.

Plants terrestrial or rarely epiphytic, tall. Stems thickened below into a pseudobulbous base, elongate and leafy above. Leaves several, distichous, imbricating below, elongate, plicate-nerved. Scapes lateral at the base or lower part of the pseudobulbous stems, elongate, several- to many-sheathed, racemose or less commonly loosely paniculate above, loosely several- to many-flowered. Flowers small or medium-sized. Sepals free, subequal, the lateral ones lightly oblique and sometimes adnate to a short column-foot. Petals similar to the dorsal sepal but sometimes a little shorter and broader. Lip erect, shorter than the sepals, commonly 3-lobed, concave, saccate or spurred at the base. Column rather short, bialate, often with a short foot. Anther terminal, opercular, incumbent, bicornute or with 2 prominent appendages, imperfectly 2-celled. Pollinia 4.

Eulophia alta (L.) Fawc. & Rendl. Fl. Jam. 1: 112, t. 22, figs. 4–8. 1910. *Limodorum altum* L. Syst. Nat. ed. 12, 2: 594. 1767. *Cyrtopodium Woodfordii* Sims, Bot. Mag. 43: t. 1814. April, 1816. *Dendrobium longifolium* HBK. Nov. Gen. et Sp. 1: 360. August, 1816. *Cyrtopera Woodfordii* Lindl. Gen. & Sp. Orch. 189. 1833. *Govenia barbata* Poepp. & Endl. Nov. Gen. ac Sp. 2: 5, t. 107, figs. a–d. 1837–38. *Cyrtopera longifolia* Reichb. f. Walp. Ann. 6: 668. 1863; Cogn. Martius Fl. Bras. 3, pt. 5: 354, t. 76. 1901. *Eulophia Woodfordii* Rolfe, Thistleton-Dyer Fl. Trop. Afr. 7: 68. 1897. *Eulophia longifolia* Schltr. Die Orchideen ed. 1: 347. 1914. Figure 112.

Plant tall, coarse, terrestrial or very rarely epiphytic, up to 1.7 meters high. Stems leafy, arising from a pseudobulbous or corm-like base, above concealed by the imbricating, long-sheathing base of the leaves. Leaves several, distichous, elongate, elliptic-lanceolate or elliptic-linear, acuminate toward both ends, plicate, up to 1.2 meters long and 10 cm. wide (often much less). Scape strict, much exceeding the leaves, up to 3 meters high (often much less), robust, provided below with several remote, tubular, often evanescent sheaths, laxly racemose above; raceme elongate, loosely or subdensely many-flowered. Floral bracts inconspicu-



FIG. 112. *Eulophia alta* (L.) Fawc. & Rendl. 1, plant; $\times \frac{1}{6}$. 2, inflorescence; $\times \frac{3}{4}$. 3, lip and column from front, with lip spread out; $\times 1\frac{1}{2}$.

ous, linear-lanceolate. Flowers medium-sized, yellowish green to red-brown or purplish. Dorsal sepal elliptic-oblong, linear-oblong to oblanceolate-oblong, acute, up to 20 mm. long and 5 mm. wide. Lateral sepals similar but somewhat larger, slightly oblique and decurrent on the short column-foot, acute. Petals oblong, elliptic-oblong or obovate-oblong, obtuse or rounded (rarely acute), shorter and broader than the sepals. Lip much broader than the other segments, deeply concave near the base, lightly but distinctly 3-lobed above, about 18 (rarely 25) mm. or less long and somewhat narrower when expanded; lateral lobes with short, rounded free apex; mid-lobe semiorbicular or rounded-ovate with undulate, incurved margins; disc with a pair of short, fleshy keels near the middle and with lines of scattered papillae on the mid-lobe. Column rather short, produced into a short foot, lightly clavate, arcuate, bialate, terminating in an acute point, up to 10 mm. long. Anther with a conspicuous, abrupt, oblong, usually emarginate appendage.

Eastern Peru: Near Tocache Mission, in low woods, *Poeppig 2064* (type of *Govenia barbata*).—Loreto: Mishuyacu, near Iquitos, "Agua-jal," 100 meters, epiphyte in forest, flowers red-brown, *Klug 143*. Vicinity of Iquitos, 100 meters, terrestrial, "flowers brownish, green-yellow, and garnet-violet," *Klug 10091*. A very widespread and variable species extending from Florida and the West Indies (type of *Limodorum altum*) through Mexico and Central America to most of northern South America (type of *Dendrobium longifolium*) and Brazil (type of *Cyrtopodium Woodfordii*). Also in West Africa (perhaps introduced).

CYRTOPODIUM R. Br.

Terrestrial or epiphytic plants confined to the American tropics, extending from Florida (U. S. A.), Mexico and Central America through the West Indies and South America to Argentina.

Stems commonly approximate, few- to several-leaved, developing into ovoid to fusiform-cylindric, eventually naked pseudobulbs. Leaves commonly crowded, distichous, elliptic-lanceolate or elliptic-linear, acuminate at both ends, plicate. Scape lateral, arising from the base of the pseudobulbous stem, tall, distantly few-sheathed below, either simply racemose or loosely and broadly paniculate above. Floral bracts linear to broadly ovate or elliptic, often large, conspicuous, and undulate-crested. Flowers small to medium-sized, often showy, with spreading segments. Floral segments free. Sepals similar, the lateral ones being lightly oblique and adnate to the column-foot, often with the margins more or less undulate. Petals similar to the dorsal sepal but often shorter and broader. Lip attached to the column-foot, 3-lobed, commonly shorter but much broader than the sepals and petals; lateral lobes erect or spreading; mid-lobe simple to bilobed; disc tuberculate, crested or callose in the middle or near the margin. Column stout, short or somewhat elongate, lightly clavate, produced into a distinct foot. Anther terminal, opercular, incumbent, imperfectly 2-celled, often with an abrupt horn on the back. Pollinia 2 or 4.

- A1. Mid-lobe of the lip scarcely or not at all protruding beyond the lateral lobes, strongly transverse (i.e., much broader than long), densely verruculose on the anterior margins. *C. punctatum*
- A2. Mid-lobe of the lip much protruding beyond the lateral lobes, more or less broader than long, not densely verruculose on the margin. . . . *C. Buchtienii*

***Cyrtopodium Buchtienii* Schltr. Fedde Repert. 27: 64. 1929.**

Plant terrestrial or epiphytic, tall and stout, 1 meter or more high. Stems short, stout, leafy, developing into a stout, oblong-ovoid pseudobulb which is striate-rugose or deeply plurisulcate and concealed by the fibres of sheaths in course of development, up to 20 cm. long. Leaves several, imbricated below, distichous, elliptic-linear or elliptic-lanceolate, acuminate above, long-narrowed below with a conduplicate base, up to about 79 cm. long and 4 cm. wide, plicate. Scape lateral, arising from the base of the pseudobulbous stem, very stout and tall, apparently much surpassing the leaves, about 1 cm. in diameter near the base, provided with few, close, remote, tubular sheaths, loosely paniculate above; panicle large, spreading, loosely branched. Bracts of the inflorescence large, conspicuous, ovate or elliptic-ovate to broadly lanceolate, commonly undulate on the margins; floral bracts similar, smaller, petaloid and maculate. Flowers medium-sized, with spreading segments, yellow or cream-color, spotted with brown or purple. Dorsal sepal oblong-elliptic ("suborbicular-oval"), acute or obtuse, strongly undulate on the margins, 1.5–1.9 cm. long. Lateral sepals similar but slightly narrower, elliptic-lanceolate, acute or acuminate, lightly oblique. Petals distinctly shorter and a little broader than the sepals, round-obovate or oval, broadly rounded (and sometimes apiculate) at the apex, lightly oblique. Lip erect and parallel to the column in natural position with the lateral lobes incurved, long-clawed, up to about 1.3 cm. long and equally wide or slightly wider across the lateral lobes when expanded; claw cuneate-oblong, fleshy; lamina lightly cordate at the base; lateral lobes very obliquely oblong-obovate, with the margins (except the anterior margin) minutely undulate; mid-lobe broadly obovate or flabellate with an abrupt oblong-cuneate base, more or less broader than long (sometimes nearly twice as broad), with a very broadly rounded, minutely retuse anterior margin which is lightly undulate; disc with a fleshy, suborbicular, plurisulcate callus between the lateral lobes. Column small, clavate, about 6.5 mm. or less long.

Peru: Cuchiccha, Quebrada Versalles, *Diehl 2416*.—Cuzco: Valley of the Urubamba, Machu-Picchu, 2400 meters, *Herrera 3306*.—San Martín: Zepelacio, near Moyobamba, about 1100 meters, terrestrial in mountain forest, "leaves absent at flowering time," *Klug 3683*. Also Bolivia (type).

The type of *Cyrtopodium Buchtienii*, which came from Bolivia, was described from a vegetatively incomplete specimen, and the above description is therefore much more detailed than the original diagnosis.

***Cyrtopodium punctatum* (L.) Lindl. Gen. & Sp. Orch. 188. 1833; Hook. Bot. Mag. 63: t. 3507. 1836; Ames, Orch. 1: 55, t. 15.**

1905; Cogn. Martius Fl. Bras. 3, pt. 5: 358. 1901. *Epidendrum punctatum* L. Syst. Nat. ed. 10, 2: 1246. 1760. Figure 113.

Plant large and stout, epiphytic or terrestrial. Pseudobulbs clustered, rigid, elongate-fusiform, with numerous articulations, when young concealed by distichously imbricated sheaths, leafy above, rarely up to 10 dm. high. Leaves crowded, distichous, linear to elliptic-lanceolate, acute to long-acuminate, long-narrowed to a conduplicate base, plicate, erect-spreading, recurved above, up to 65 cm. long and 5.1 cm. wide. Scape lateral and arising from the base of the pseudobulb, about equaling the leaves, paniculate above; peduncle stout, provided with several large, loose, tubular, scarious sheaths which are imbricated at the base; panicle ample, loose, many-flowered. Bracts subtending the branches and the flowers large, oblong-ovate or elliptic-ovate to oblong-lanceolate, acute to acuminate, commonly with strongly undulate margins, up to 12 cm. long, the floral bracts smaller, and spotted and colored like the flowers. Flowers loose, numerous, variable, with spreading perianth-parts, greenish yellow with irregular brownish spots. Sepals strongly undulate, membranaceous. Dorsal sepal lanceolate-elliptic (rarely oval), acute, or obtuse and apiculate, up to 28 mm. long and 14 mm. wide. Lateral sepals very similar but a little smaller. Petals elliptic-ovate to round-ovate, broadly rounded above and sometimes minutely apiculate, commonly shorter and less undulate than the sepals. Lip much shorter and broader than the other segments, deeply 3-lobed, erect and parallel to the column, with inflexed lateral lobes in natural position, cordate at the base, articulated to the free column-foot by a narrow cuneate-oblong claw, about 14 mm. or less long and nearly twice as wide across the expanded lateral lobes; lateral lobes suborbicular-oval or aliform-ovate, lightly falcate, broadly rounded above; mid-lobe scarcely or not at all protuberant beyond the lateral lobes, broadly flabellate-reniform, with the broad anterior margin strongly undulate and verrucose within near the margin; disc between the lateral lobes with a large, fleshy, verruculose callus which passes into the abrupt claw. Column short, stout, clavate, up to 7 mm. long with a subequally long, mostly free claw.

Peru: Habitat not recorded, *Pavón s.n.*, *Haenke s.n.* Source of the Marañon River, *Warszewicz s.n.*—Cuzco: Prov. of Paruro, epiphyte on rocky slopes of Arabito on the right bank of the Apurimac River, 2400 meters, *Vargas 421*.—Junín: Chanchamayo Valley, 1200 meters, *Schunke 538*. La Merced, Hacienda Schunke, 1200 meters, *Macbride 5668* (unusually broad sepals).—Loreto: Iquitos, about 100 meters, on palm tree in clearing in woods, *Killip & Smith 29833* (fruit only). Mishuyacu, near Iquitos, 100 meters, in clearing in forest, *Klug 766*. A very widespread species extending from southern Florida (U.S.A.) and Mexico, through most of Central America and the West Indies (type of *Epidendrum punctatum*) and in South America to Argentina.

WARREA Lindl.

A very small genus of terrestrial plants restricted to Central America and northern South America.



FIG. 113. *Cyrtopodium punctatum* (L.) Lindl. 1, plant $\times \frac{1}{4}$. 2, inflorescence $\times \frac{1}{2}$. 3, lip and column spread out, $\times 1\frac{1}{2}$. 4, column, front-side view, $\times 4$. 5, pollinia, much enlarged.

Stems short, leafy, at length thickened into short, ovoid or ellipsoid pseudobulbs. Leaves few, distichous, approximate, elongate, commonly lanceolate-elliptic, plicate. Scapes lateral, arising from the base of the immature pseudobulb, tall, simple, with several remote sheaths, often surpassing the leaves, racemose above; racemes more or less elongate, loosely few- to several-flowered. Flowers rather large, showy. Sepals subequal, broad, concave, with the lateral sepals lightly oblique below and adnate to the short column-foot. Petals similar to the sepals, but a little smaller. Lip attached to the column-foot, simple or subtrilobed, concave, rounded or bilobed at the apex; disc provided below in the middle with keels or fleshy elevated lines. Column rather long, stout, clavate, wingless. Anther terminal, opercular, incumbent, 2-celled. Pollinia 4.

- A1. Flowers reddish purple; sepals oblong; disc of the lip with 2 very short keels near the base..... *W. Hookeriana*
 A2. Flowers white or yellowish white, with a large purple spot on the lip; sepals broadly ovate or elliptic-ovate; disc of the lip with 3 fleshy-thickened median lines below and verrucose lines in front.

W. Warreana (*W. tricolor*, *W. speciosa*)

Warrea Hookeriana (Reichb. f.) Rolfe, *Orch. Rev.* 18: 360. 1910.

Phajus Hookerianus Reichb. f. *Bonpl.* 4: 328. 1856.

Leaves oblong, acute. Scapes erect, racemose above. Bracts cymbiform. Flowers subglobose, reddish purple. Sepals and petals oblong, obtusely acute. Lip cuneate and subsaccate at the base, then quadrate with obtuse angles; disc with 2 very short keels near the base.

Peru: Pangoa, in moist shade, *Mathews(?)* 1021.

This description was compiled from the two sources cited above, and without having seen any specimens referable to this species.

Warrea Warreana (Lodd. ex Lindl.) C. Schweinf. *Bot. Mus. Leafl. Harvard Univ.* 17: 55. 1955. *Maxillaria Warreana* Lodd. ex Lindl. *Gen. & Sp. Orch.* 148. 1832; Lodd. *Bot. Cab.* t. 1884. 1833; Hook. *Bot. Mag.* 72: t. 4235. 1846. *Warrea tricolor* Lindl. *Bot. Reg.* 29, Misc. 14. 1843; Cogn. *Martius Fl. Bras.* 3, pt. 5: 376, t. 81. 1901. *Warrea speciosa* Schltr. *Fedde Repert. Beih.* 9: 98. 1921; Mansf. *Fedde Repert. Beih.* 57: t. 123, nr. 483. 1929.

Plant large, terrestrial, up to 1 meter high. Rhizome abbreviated. Stems short, leafy, at length enlarged to form an ovoid to ellipsoid pseudobulb which is 4-12 cm. long and at length naked. Leaves 3-5, distichous, approximate and imbricating below, lanceolate-elliptic, acuminate, long-narrowed below, up to 60 cm. long and 10 cm. wide, plicate. Scape lateral, arising from the base of the pseudobulb, erect, stout, longer than the leaves, up to 1 meter high, adorned below with several remote, close, short, tubular sheaths, loosely racemose above; raceme 6- to 10-flowered, up to 15 cm. long. Flowers large, subglobose, fleshy, with concave segments, white or yellowish white with a large purple spot on the lip. Dorsal sepal broadly ovate or elliptic-ovate, acute or obtuse and apiculate, up to 3.5 cm. long and 2.5 cm. wide (commonly smaller). Lateral sepals similar but very oblique

at the base. Petals similar to the dorsal sepal but slightly smaller. Lip subsessile, simple or nearly so, with incurved sides in natural position, broadly obovate-rhombic to suborbicular when expanded, obtuse or lightly emarginate at the apex, cuneate below, 2.2–3.5 cm. long and 1.8–3.2 cm. wide when expanded; disc with 3 fleshy-thickened, median lines (the middle one a little longer) through the basal half, with verrucose lines in front. Column rather long, stout, subclavate, up to 2.5 cm. long, with a short, stout foot.

Loreto: South of Moyobamba, 800–900 meters, between clusters of bushes on the mountains, *Weberbauer 4676* (type of *W. speciosa*).—San Martín: San Roque, “Coto-Sisa,” 1350–1500 meters, in forest, *Williams 7338*. Also Brazil (type of *Maxillaria Warreana* and *Warrea tricolor*) and Colombia.

GOVENIA Lindl.

A small genus of tropical American, terrestrial plants of most perplexing similarity.

Rhizome abbreviated, often producing tuber-like pseudobulbs. Stems erect, 1- or 2-leaved, concealed by several imbricating sheaths, one of which is often tubular-inflated. Leaves ample, elliptic or lanceolate-elliptic, acute or acuminate, gradually narrowed to a petioled base, plicate. Inflorescence terminal, racemose above; peduncle with one or several remote, close, tubular sheaths; raceme few- to many-flowered, usually lax in course of development. Floral bracts small and inconspicuous. Flowers medium-sized. Sepals free, subequal. Dorsal sepal erect-incurved. Lateral sepals decurved-falcate, adnate to the column-foot, forming a mentum. Petals similar to the lateral sepals but often broader. Lip much shorter than the other flower-parts, attached to the column-foot, erect and recurved in natural position, simple or nearly so. Column arcuate, bialate (especially above), with a short foot. Anther terminal, opercular, incumbent, 1-celled. Pollinia 4.

Govenia tingens Poepp. & Endl. Nov. Gen. ac Sp. 2: 5, t. 107. 1837–38; Reichb. f. Bot. Zeit. 10: 835. 1852; Cogn. Martius Fl. Bras. 3, pt. 5: 380. 1901; Rolfe, Bot. Mag. 144: t. 8768. 1918.

Plant stout, up to about 90 cm. tall. Stem thickened at the base into a corm-like pseudobulb, produced above into an elongate continuation which is enveloped by a loose, tubular sheath, up to about 32 cm. long to the point where the leaves are borne. Leaves usually 2, subopposite, oblong-elliptic to oval (rarely elliptic-obovate), articulated, acute or acuminate, gradually narrowed into a shortly petioled base, up to 47 cm. long (including the petiole) and 10 cm. or more wide, plicate. Inflorescence terminal, subequaling or longer than the spreading leaves, up to 60 cm. long, loosely racemose above; peduncle with 1–3 remote, close, tubular sheaths; raceme several- to many-flowered, loose in course of development. Flowers medium-sized for the genus, membranaceous, whitish or cream-color to pale yellow or rose-brownish, often with spots or transverse broken bars of reddish or purple. Dorsal sepal oblong or elliptic-oblong, obtuse or subacute, longitudinally concave, 15–19 mm. long. Lateral sepals much shorter, but slightly wider, strongly in-

curved-falcate, obovate-oblong or semielliptic, obtuse to acute. Petals obliquely oblong-obovate, arcuate, subacute, shorter than the dorsal sepal but longer than the lateral sepals, broader than either sepal. Lip much shorter than the sepals and petals, arcuate-recurved with erect sides near the base in natural position, very shortly clawed, simple, triangular-ovate or ovate-oblong when expanded, rounded or subcordate at the base, abruptly acute or apiculate in front, up to 9 mm. long (including the abbreviated claw) and 5 mm. wide below; lamina often with a pair of short longitudinal folds near the middle. Column short, arcuate, bialate, about 7.7 mm. or less long at the back, extended into a short foot.

Peru: Habitat not cited, *Pavón s.n.*—Amazonas: Near Chachapoyas, *Mathews 3188*.—Cuzco: Prov. of Calca, Hacienda Vilcabamba, 2600 meters, in humus on wooded slopes, *Vargas 4000*. Prov. of Quispicanchis, Marcapata Valley near Chilechile, 2200–2300 meters, “shrubwood in the shadow,” *Weberbauer 7855*. Prov. of Quispicanchis, Hacienda Ttío, Marcapata, 2000 meters, in humid forest, *Vargas 3117*.—Huánuco: Near Cuchero (Cochero) and Pampayaco (Pampayacu), in dense woods, *Poeppig 1621* (type).—Junín: Chanchamayo Valley, 1500 meters, *Schunke 1686*. Prov. of Litoral de Moquegua, Churuhuasi, *Soukup 479*. The following collections, which are in fruiting state, are doubtless referable to this species: Huánuco: Muña, about 2100 meters, in dry rocky woods, *Macbride 4042*.—Junín: Huacapistana, 1800–2400 meters, terrestrial on open hillside, *Killip & Smith 24224*. Perhaps Venezuela, Bolivia and Argentina.

The original description of this concept (especially of the lip) is faulty, but inasmuch as Cogniaux had seen the Poeppig type and thus furnished an adequate diagnosis (l.c.), I have decided to recognize this entity. It is my opinion, however, coinciding with that of Dr. Correll (in *Lloydia* 10, no. 4 (1947) 228), that this concept may be referable to the variable and widespread *G. utriculata* (Sw.) Lindl. This conclusion is strengthened by the fact that the color in most of the recent collections cited is given as white or reddish white or rose-brownish, for Dr. Correll describes (in *Lloydia* 10, no. 4 (1947) 220) the flowers of *G. utriculata* as “basically white, light cream-color or tinged with lavender.”

It must be reiterated, as the incomparable Lindley stated (in *Bot. Reg.* 31 (1845) t. 67), that “Among the genera of Orchids there is not one whose species are so difficult to distinguish as those of *Govenia*; a most natural group, with most of its members extremely similar in habit. In a dried state they are so much alike, or they vary so much in the appearance of their flowers, in consequence of the manner in which they shrink, that it is hardly possible to recognise them.”

MORMODES Lindl.

A genus of tropical American epiphytes extending from Mexico through Central America to Brazil and Peru.

Rhizome abbreviated. Stems short, several-leaved, soon thickened into oblong-ovoid, oblong-ellipsoid or fusiform pseudobulbs which are concealed by several distichous, imbricating, evanescent sheaths. Leaves several to numerous, approximate, distichous, elliptic-lanceolate or elliptic-linear, acute or acuminate, gradually narrowed below, plicate. Scapes lateral, arising from the base or lower part of the pseudobulbs, racemose above; peduncle with several short, remote, infundibuliform sheaths; racemes loosely few- to many-flowered. Flowers more or less large with spreading segments. Sepals free, subequal, commonly narrow, with the lateral sepals lightly oblique. Petals similar to the sepals, often somewhat broader. Lip adnate to the base of the column, arcuate-upcurved, commonly narrowed into a more or less clawed base, reduplicate above or rarely concave, simple to distinctly 3-lobed. Column short, rather stout, obliquely twisted, footless. Anther terminal, opercular, incumbent. Pollinia 2 and sulcate, or 4.

A1. Petals very broad, elliptic-oblong or orbicular-obovate; lip simple.

M. Rolfeanum

A2. Petals narrow, lanceolate or ovate-lanceolate; lip 3-lobed. I

Ia. Sepals narrower than the petals; disc of the lip glabrous; lateral lobes of the lip obtuse to rounded. *M. revolutum*

Ib. Sepals slightly wider than the petals; disc of the lip sparingly pilose; lateral lobes of the lip acute. *M. Wolterianum*

Mormodes revolutum Rolfe, Kew Bull. (1909) 367; Rolfe, Bot. Mag. 137: t. 8390. 1911.

Plant epiphytic, medium-sized, variable. Stems leafy, thickened into an ovoid to ellipsoid or fusiform pseudobulb which is invested by several scarios, distichous, imbricating, mostly leaf-bearing sheaths, up to 13 cm. long (commonly much smaller). Leaves several (up to 8), elliptic-lanceolate to linear-elliptic, acute or acuminate, gradually narrowed to a subpetiolate, channelled base, plicate, 14-30 cm. long, up to 3.5 cm. wide. Scape issuing from the lower part of the pseudobulb ("axillary"), variable, 3-17 cm. long, laxly racemose above, with a 4- to many-flowered raceme. Flowers rather large and showy, with spreading segments, red to brown or buff-yellow with a cream-colored, yellow, pink or brown lip. Dorsal sepal oblong-lanceolate, acute or acuminate, 2.5-3.5 cm. long, up to 1 cm. wide, with a lightly recurved apex and revolute margins. Lateral sepals similar but slightly broader, lightly oblique, reflexed. Petals similar to the sepals, oblong-lanceolate or ovate-lanceolate, acuminate, slightly wider than the lateral sepals. Lip upcurved and arcuate in natural position, 3-lobed near or above the middle, reduplicate with the lateral lobes and the apex recurved, gradually narrowed below to a thickened claw, when expanded rhombic in outline and about 3.5 cm. or less long and 2 cm. or less wide, glabrous; lateral lobes small, with a short, semiorbicular-ovate or oblong-ovate, obtuse, free portion; mid-lobe much larger, triangular-ovate, with an abruptly reflexed, acute or mucronate tip. Column small, incurved, once twisted, about 2 cm. or less long, terminating in an abrupt, acute or acuminate point.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in dense forest, column greenish white, *Killip & Smith 22543*.—Junín: Chanchamayo Valley, 1200 meters, *Schunke 1705*. San Ramón, 900–1300 meters, at edge of woods, column deep purple at the base, greenish white at the apex, *Killip & Smith 24886*.—Loreto: Moyobamba, *Forget s.n.* (type).

Mormodes Rolfeanum Linden, *Lindenia* 7: 5, t. 289. 1891; Hook. f. Bot. Mag. 121: t. 7438. 1895.

Plant showy. Pseudobulbs approximate, fusiform or ovoid-fusiform, up to 10.2 cm. long, invested by scarious evanescent sheaths, leafy toward the apex. Leaves about 5, approximate, distichous, petioled; lamina lanceolate or elliptic-lanceolate, acuminate, up to 25.4 cm. long and 5 cm. wide, pale green speckled with dark green beneath; petiole stout, up to 12.7 cm. long, channelled. Scape lateral, arising from the lower part of the pseudobulb, stout, erect, racemose above, about 15.2 cm. high; peduncle with 2 or 3 short, close, tubular sheaths; raceme loosely few- (3- to 5-) flowered. Flowers large, erect, with reflexed sepals and erect petals and lip, about 10 cm. long from the tip of the reflexed sepals to the tip of the erect lip. Sepals, petals and back of the lip pale green or golden yellow streaked with red or dark green. Sepals broadly ovate or lanceolate, acuminate to an obtuse tip, up to 4.5 cm. long, the lateral ones lightly oblique. Petals orbicular-obovate or elliptic-oblong, obtuse or apiculate, broader than the sepals. Lip about equaling the sepals, simple, arcuate-incurved in natural position with revolute sides and recurved apiculate or acute tip, broadly elliptic or obovate-oblong when spread out, narrowed to a shortly clawed base, dark red-chestnut within. Column stout, twisted, with an acuminate apex, white clouded with red, about 2.5 cm. long.

Peru: Habitat and collector not recorded, ex Hort. Linden.

No specimens of this species were available.

Mormodes Wolterianum Kränzl. Gard. Chron. ser. 3, 48: 229. 1910.

Vegetative parts not described. Raceme 12 cm. long, up to 10-flowered. Pedicellate ovary 6-sulcate, up to 4 cm. long, about 4 times surpassing the small, triangular bracts. Sepals ovate-lanceolate, acuminate, about 3.3 cm. long and 1 cm. wide at the base, with revolute margins, orange-brown. Petals very similar to the sepals but slightly longer and narrower. Lip rhombic in outline with a cuneate or shortly clawed base and an acuminate apex, 3-lobed, up to 3 cm. long and 2 cm. wide (the lip of the upper flowers much smaller); lateral lobes shorter than the mid-lobe, triangular, acute; mid-lobe larger, acuminate; disc obtusely keeled in the middle, very sparingly pilose. Column usually curved to the left, densely velvety.

Peru: Habitat and collector not recorded, imp. P. Wolter, Magdeburg (type).—Junín, fide Schlechter, Fedde Repert. Beih. 9:156. 1921.

This species, described only from the original citation, appears to be closely allied to *M. revolutum* Rolfe, but differs in the details cited in the key.

CATASETUM L. C. Rich.

A large genus of American terrestrial or epiphytic orchids extending from Mexico through Central America to Brazil and Argentina.

Stems short, developing into slender-ovoid or fusiform pseudobulbs, concealed when young by imbricating sheaths which are leaf-bearing above. Leaves several, distichous, commonly elliptic-lanceolate or oblanceolate, ample, plicate. Scape arising from the base of the pseudobulb, erect or pendent, racemose above, few- to many-flowered. Flowers monomorphic, dimorphic or trimorphic, monoecious, dioecious or rarely perfect. Sepals and petals free, subequal or the petals broader, subglobose-connivent or spreading. Lip pendent or uppermost, very diverse, deeply saccate to almost flat, sessile, narrow or very broad, with entire, dentate, or deeply fimbriate margins. Column erect, stout, footless; in the male flowers often elongate, with a pair of reflexed antennae or tendrils surrounding the stigma; in the female flowers often very short, without antennae. Anther terminal, opercular, incumbent. Pollinia 4, or 2 and deeply sulcate.

Wherever a single type of flower is described in the following species of *Catasetum*, it should be understood to represent the male form, which is characterized by the presence of antennae (rarely reduced to horns) on the column.

- A1. Lip of the male flowers flat to more or less convex, commonly with a distinct, usually small sac in the middle or near the base. I
 A2. Lip of the male flowers deeply saccate, saccate-conic or semiglobose. 4
 Ia. Margins of the lip deeply lacerate or fringed. 1
 Ib. Margins of the lip not lacerate nor fringed, at most dentate. 2
 1a. Lamina of the lip narrow, linear in outline; antennae or setae of the column symmetrical and parallel. *C. barbatum*
 1b. Lamina of the lip broad, suborbicular-ovate to oboval; antennae or setae of column asymmetrical.
 C. saccatum var. *incurvum* (*C. incurvum*, *C. stupendum*)
 2a. Sepals and petals elliptic-oblong; lip cordate-triangular, about equally long and broad. *C. tenebrosum*
 2b. Sepals and petals narrowly oblong-lanceolate or linear-lanceolate; lip much longer than broad. 3
 3a. Lip simple or subsimple, mostly flat, cordate at the base.
 C. callosum var. *carunculatum*
 3b. Lip distinctly 3-lobed, with erect, broadly rounded basal lobes.
 *C. violascens*¹
 4a. Column without antennae or setae but shortly bicornute; leaves very narrow, linear or oblanceolate-linear. *C. pusillum*
 4b. Column with a pair of antennae or setae; leaves broader. 5

¹ The scanty description and the analysis from the Reichenbach Herbarium (in the Ames Herbarium) do not indicate the sex of the plant. In fact, the description is so incomplete that Mansfeld relegates the concept to the category of obscure species in his monograph of *Catasetum* (Fedde Repert. 31: 122. 1932). However, in view of the aforesaid record, the species appears to be distinct and to be worthy of recognition.

- 5a. Lip abruptly 3-lobed; terminal lobe consisting of an oblong or finger-like process; lateral lobes fimbriate.....*C. naso* Lindl. var. *Charlesworthii*
- 5b. Lip without an abrupt terminal lobe; sides not fimbriate.....6
- 6a. Scape more than twice as long as the leaves; sepals widely spreading; inner surface of the lip provided with numerous toothed crests....*C. microglossum*
- 6b. Scape shorter than or a little exceeding the leaves; sepals connivent; inner surface of the lip destitute of crests.....7
- 7a. Lip saccate-conical; antennae of the column short, about reaching its base.
C. coniforme
- 7b. Lip rounded-saccate or semiglobose; antennae of the column elongate, extending well into the sac.....*C. planiceps*

Catasetum barbatum (Lindl.) Lindl. Bot. Reg. 30, Misc. 38, no. 26. 1844; Cogn. Martius Fl. Bras. 3, pt. 5: 425. 1902. *Myanthus barbatus* Lindl. Bot. Reg. 21: t. 1778. 1836.

Plant epiphytic, large, with 2 forms (male and female) known. Pseudobulbs robust, fusiform or ovoid-fusiform, up to 13 cm. long, at first concealed by several distichous, mostly leaf-bearing sheaths, finally naked. Leaves several, distichous, elliptic-lanceolate or elliptic-oblancheolate, acute or acuminate, long-attenuate below into a channelled base, up to 40 cm. long and 6 cm. wide, prominently 3-nerved. Male and female inflorescences on the same or different plants. Male inflorescence basal, stout, nodding (more or less arcuate), usually somewhat surpassing the leaves, below adorned with few remote, small, tubular sheaths and above subdensely many-flowered. Flowers rather large, membranaceous, with spreading segments, dark green barred with transverse brownish spots, with a rose-colored lip. Dorsal sepal narrowly elliptic-lanceolate, acuminate, about 2.5 cm. or more long and 6 mm. wide. Lateral sepals similar but a little larger, somewhat oblique. Petals narrowly lanceolate, long-acuminate, connivent with the dorsal sepal and a little smaller. Lip distinctly shorter than the sepals, mostly flat, linear, about 1.5 cm. long and 4 mm. wide, near the middle abruptly inflexed with a conical sac on the back, the margin lacerate or broken into very numerous, long, finger-like appendages; disc provided at the base with a large, stout, conical (above subulate) tooth. Column rather long and stout, uncinete-rostrate at the apex, about 2 cm. or less long, with a pair of rather long, slender, parallel antennae. Female flowers smaller, fleshy, green. Sepals and petals similar, reflexed, oblong-lanceolate, acute or short-acuminate, up to 2.4 cm. long and 7 mm. wide. Lip deeply saccate with a subrotund sac and a contracted mouth, abruptly acute, with revolute margins, about 2 cm. long and 1.2 cm. wide and deep. Column thickly fleshy, acutely short-rostrate, without bristles, about 1.3 cm. long.

E. Peru: El Encanto,¹ *Fox 70* (fide Mansfeld). Also British Guiana (type) and Brazil.

Catasetum callosum Lindl. var. **carunculatum** (Reichb. f. & Warsc.) Mansf. Fedde Repert. 31: 114. 1932. *Catasetum carunculatum* Reichb. f. & Warsc. Allg. Gartenz. 22: 274. 1854.

¹ Dr. R. E. Schultes refers this locality to Colombia, Río Karaparana.

Plant large, probably epiphytic. Pseudobulbs stout, oblong-cylindric, up to 8 cm. or more long, entirely concealed by broad, distichously imbricating, leaf-bearing sheaths. Leaves several, elliptic-lanceolate or oblanceolate, acute or acuminate, 15-30 cm. long, up to 7.6 cm. wide. Scape basal, up to 30 cm. or more long, pendent, loosely several- to many-flowered. Flowers rather large, with spreading segments. Dorsal sepal narrowly oblong-lanceolate, acuminate, brownish red, nearly 4 cm. long. Lateral sepals very similar, slightly oblique. Petals applied to the dorsal sepal and similar to it but slightly smaller. Lip distinctly shorter and broader than the other segments, ovate-oblong, with a cordate base, more or less contracted in the middle of each side, subacute, flat except for a small conical spur near the base, up to 2.9 cm. long and 1.8 cm. wide at the base, with crenate or dentate margins, dark green through the lower half, yellow above; disc with a prominent, orbicular, yellow callus at the base, and with numerous rounded warts above. Column rather short and stout, about 1.5 cm. long, acuminate above, with a pair of subparallel, deflexed antennae protruding over the base of the lip.

Peru: Without locality, (type of *C. carunculatum*). Also British Guiana, fide Mansf. Fedde Repert. 31: 114. 1932.

This description was compiled from a drawing of a flowering raceme of *C. carunculatum* from the Reichenbach Herbarium, supplemented by the original citation. Since neither of these records includes a diagnosis of the vegetative portions, the above description of the plant was supplied from a description of *C. callosum* (Hook. f. Bot. Mag. 108: t. 6648. 1882) and of *C. callosum* var. *grandiflorum* (Hook. Bot. Mag. 72: t. 4219. 1846).

The inflorescence and flower described are undoubtedly male organs; the female organs, unknown for the species, are described for certain concepts regarded as synonymous with *C. callosum* var. *carunculatum*; they are said to have a short, few-flowered raceme with green, purple-spotted flowers, having oblong, acute sepals and petals and a fleshy, hood-shaped lip.

Catasetum coniforme C. Schweinf. Am. Orch. Soc. Bull. 12: 18, t. 1. 1943. Figure 114.

Plant epiphytic, stout. Stem thickened into an oblong-ovoid pseudobulb about 9 cm. high, wholly concealed by distichous, broad, imbricating sheaths of which the upper ones are leaf-bearing. Leaves 6, crowded, oblong-elliptic, acuminate, gradually narrowed below into a subpetioled, conduplicate base, up to 33 cm. long and 6.6 cm. wide, plicate with 5 conspicuous nerves. Inflorescence lateral, subbasal, diffuse-arcuate, considerably shorter than the leaves, racemose above, about 25 cm. long; raceme subdensely about 15-flowered. Flowers rather small for the genus, with subglobose-connivent segments, greenish gray tinged with red-violet, the inner surface orange spotted with red-brown. Sepals concave and incurved. Dorsal sepal elliptic-oblong or obovate-oblong, acute to short-acuminate, about 2.5 cm. long and 9 mm. wide. Lateral sepals similar but slightly wider, elliptic-lanceolate, somewhat oblique. Petals lanceolate-elliptic, acuminate,

apiculate, a little broader than the sepals. Lip saccate-conical, with the deepest part near the front, about 1.3 cm. long and subequally deep, triangular-acute with a minute, recurved apex, broadly rounded below with erect, irregularly serrate lateral margins; disc with a broad callose thickening at the base. Column about as long as the lip, arcuate, uncinately-rostrate above, with a pair of short, appressed, parallel, decurved antennae below the stigmatic cavity.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10096*.

Catasetum microglossum Rolfe, Bot. Mag. 139: t. 8514. 1913; Mansf. Fedde Repert. 31: 111. 1932.

Plant epiphytic, large. Pseudobulbs ellipsoid-fusiform, entirely concealed by distichously imbricating sheaths when young, naked when old, leaf-bearing above, up to 10 cm. long. Leaves 5-6, oblong-elliptic or oblanceolate, acute or abruptly acuminate, up to 28 cm. long and 6.5 cm. wide, plicate. Inflorescence lateral, subbasal, tall, arcuate, up to 65 cm. long, racemose above, the peduncle bearing numerous tubular, spathaceous sheaths; raceme loosely many-flowered. Pedicellate ovary slender, up to 3.5 cm. long, much exceeding the subtending bract. Flowers medium-sized, with spreading segments, dull purple with a yellow lip. Dorsal sepal narrowly oblong-lanceolate, acute, convex, up to 2.5 cm. long, about 6 mm. or more wide. Lateral sepals similar but apparently somewhat broader, oblong-lanceolate. Petals erect and connivent with the dorsal sepal, similar to the dorsal sepal but a little shorter, flat. Lip small, reflexed, saccate with erect sides, 5-8 mm. long, subentire; disc covered with numerous lacerate crests. Column clavate, apically rostrate, about 1.7 cm. long, with a pair of subparallel, incurved antennae.

Peru: On Río Igaraparaná, tributary of Río Putumayo, *Fox s.n.*
No example of this species was available.

Catasetum naso Lindl. var. **Charlesworthii** (Hort. ex Gard. Chron.) Mansf. Fedde Repert. 31: 120. 1932. *Catasetum Charlesworthii* Hort. ex Gard. Chron. ser. 3, 84: 358, 371, fig. 174. 1928, *nomen tantum*.

Plant apparently large. Leaf elliptic-lanceolate. Scape densely several-flowered above. Flowers rather large. Sepals and petals lanceolate-ovate, acuminate, green with dark wine-purple flecks. Lip semiglobose, abruptly 3-lobed, very dark wine-purple; lateral lobes "pointed"; mid-lobe long, narrow, with an abrupt termination, provided at the base with a median crest and on each side with a short, filiform tooth.

Peru: Without locality or collector. (Exhibited by Messrs. Charlesworth & Co. in Roy. Hort. Soc. 1928.)

Description of the vegetative parts lacking, but the accompanying diagnosis prepared from the sources mentioned above.

Catasetum planiceps Lindl. Bot. Reg. 29: t. 9. 1843; Cogn. Martius Fl. Bras. 3, pt. 5: 400. 1902 (sub *C. fuliginosum* Lindl.);

CATASETUM

coniforme

C. Schweinf.



FIG. 114. *Catasetum coniforme* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, dorsal sepal; $\times 1$. 3, lateral sepal; $\times 1$. 4, petal; $\times 1$. 5, lip and column, from side; $\times 1$. 6, lip and column, from front; $\times 1$. 7, anther, from below; $\times 2\frac{1}{2}$. 8, pollinia and stipe; $\times 2\frac{1}{2}$.

Mansf. Fedde Repert. 31: 102. 1932. *Catasetum recurvatum* Link, Kl. & Otto. Icon. Pl. Rar. Hort. Berol. 2: 105, t. 42. 1844 (as *Catachaetum recurvatum*). *Catasetum chloranthum* Cogn. Journ. Orch. 5: 251. 1894.

Plant large. Pseudobulbs oblong-ovoid or ovoid-cylindric to fusiform-cylindric, entirely concealed by broad, distichously imbricating, evanescent sheaths which are mostly leaf-bearing, naked in the course of development, up to 25 cm. tall. Leaves 6-9, approximate, elliptic-lanceolate, acute or short-acuminate, long-attenuate below into a sulcate base, up to 37.5 cm. long and 8 cm. wide, plicate with 3 prominent nerves. Scape lateral, basal, much shorter than to somewhat surpassing the leaves, robust, suberect, up to 45 cm. long, with few short, mostly remote, tubular-infundibuliform sheaths; raceme up to 12.7 cm. long, rather loosely several-flowered. Flowers medium-sized, with subglobose-connivent segments, green becoming yellowish, sometimes with more or less conspicuous rose-colored or brownish spots. Sepals ovate, acute, membranaceous, the lateral ones oblique and slightly broader than the dorsal sepal, up to 3.6 cm. long and 1.5 cm. wide. Petals similar to the sepals but a little larger, abruptly acute. Lip fleshy, deeply subglobose-saccate and not laterally compressed, somewhat shorter than the sepals, with upright denticulate sides and a recurved, triangular-acute apex, green or brown-orange. Column clavate, arcuate, apically rostrate with a blunt tip, about 2.3 cm. long, with a pair of parallel elongate, decurved antennae having an upcurved apex.

Peru: Habitat not recorded (type of *C. chloranthum*). Also Venezuela (type of *C. planiceps* and *C. recurvatum*), British Guiana, Dutch Guiana and Brazil.

This description was compiled from the several records cited above, and from two Venezuelan collections.

Catasetum pusillum C. Schweinf. Am. Orch. Soc. Bull. 12: 100, t. 4. 1943. Figure 115.

Plant slender for the genus, epiphytic. Stem consisting of a fusiform-cylindric pseudobulb about 4 cm. long, entirely concealed by distichous, scarious sheaths. Leaves congested on the upper half of the pseudobulb, about 7, oblanceolate-linear, acute or acuminate, gradually narrowed into a conduplicate, petiolate base, up to 38.2 cm. long and 12.5 mm. wide, plicate with 3 conspicuous nerves. Scape lateral, basal, much shorter than the leaves, arcuate, about 12 cm. long, racemose above; peduncle about 4.5 cm. long, provided at the base with several imbricating, tubular sheaths and above with 2 remote sheaths; raceme loosely few- (about 7-) flowered. Pedicellate ovary filiform, up to 2 cm. long, much surpassing the floral bracts. Flowers very small for the genus, "cream and flesh red." Sepals strongly concave. Dorsal sepal oblong or elliptic-oblong, acute, about 11 mm. long and 4 mm. wide, membranaceous. Lateral sepals similar, slightly oblique, obtuse to acute, dorsally mucronate at the apex. Petals elliptic-lanceolate, acute, oblique, a little larger than the sepals, membranaceous. Lip subfleshy, much broader than the other segments, laterally compressed, almost hemispherical, about 12.5 mm. long and subequally deep when expanded, broadly triangular-acute at the recurved apex, broadly rounded below with recurved, irregularly

CATASETUM

pusillum

C. Schweinf.

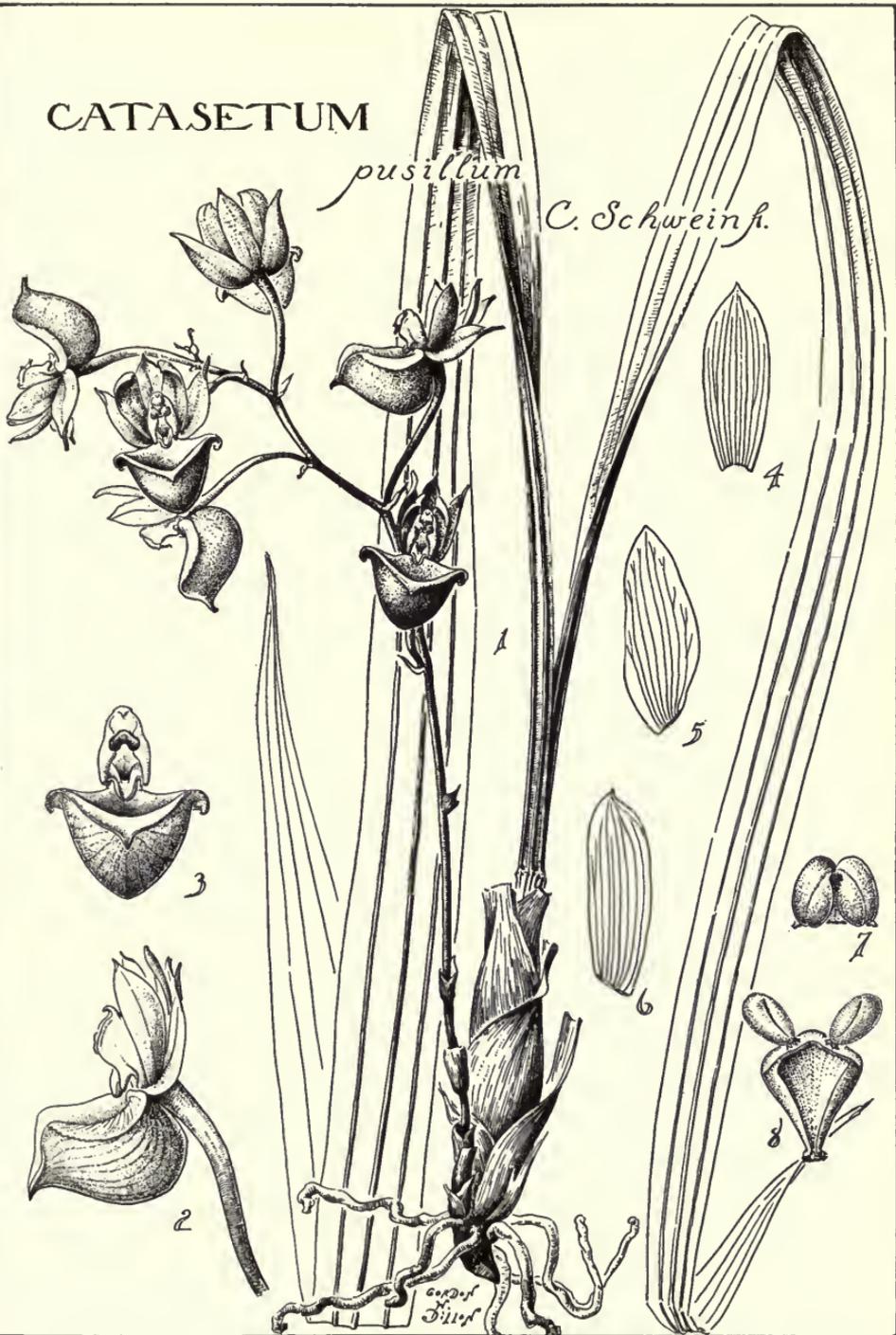


FIG. 115. *Catasetum pusillum* C. Schweinf. 1, plant; $\times 1$. 2, flower, from side; $\times 1\frac{1}{2}$. 3, column and lip, from front; $\times 1\frac{1}{2}$. 4, dorsal sepal; $\times 2$. 5, petal; $\times 2$. 6, lateral sepal; $\times 2$. 7, anther, from below; $\times 3$. 8, pollinia and stipe; $\times 3$.

crenate-serrate outer margins. Column short, stout, about 6.9 mm. long to the tip of the broadly ovate, incurved apex, without antennae but with the fleshy-thickened sides extended in front into a pair of short horns surrounding a concave, semiorbicular membrane with a fold on each side.

Loreto: Vicinity of Iquitos, 100 meters, on a living tree in dense forest, *Klug 10015*.

Catasetum saccatum Lindl. var. **incurvum** (Kl.) Mansf. Fedde Repert. 30: 272. 1932. *Catasetum incurvum* Kl. Allg. Gartenz. 22: 178. 1854; Gard. Chron. (1854) 4 and fig. *Catasetum stupendum* Cogn. Journ. Orch. 6: 13. 1895; *Lindenia* 11: t. 487. 1895. *Catasetum cruciatum* Schltr. Orchis 9: 29. 1915; 10: 183, fig. 43, 1-7. 1916.

Plant large, variable, epiphytic. Pseudobulbs fusiform or ovoid-fusiform, at first altogether concealed by distichously imbricating, mostly leaf-bearing sheaths, later naked, 5-25 cm. long, with 5-10 articulations. Leaves 4-6, on the upper part of the pseudobulb, elliptic-lanceolate or oblanceolate, acuminate or acute, gradually narrowed below into a petioled base, up to 46 cm. long and 8.4 cm. wide, plicate. Scape lateral, basal, erect or spreading, racemose above, up to 40 cm. high; peduncle with a few remote, close sheaths; raceme loosely few- to many-flowered. Male flowers large, with widely spreading segments, dull green spotted and suffused with purplish brown. Sepals narrowly elliptic-lanceolate, acuminate, concave, 4.5-6.3 cm. long, up to 9 mm. wide, the lateral ones slightly oblique. Petals similar but a little smaller, oblique, connivent with the dorsal sepal. Lip variable, oval or ovate to suborbicular (rarely oboval-rounded), not distinctly lobed in the middle, but with a more or less distinct, apical, ovate-quadrate or oblong lobule, with the margins long-lacerate-fimbriate, distinctly shorter than the other segments; disc convex, below the middle with a small or medium-sized conical sac having a reniform, callus-bordered mouth. Column stout, subclavate, long-rostrate at the apex, 4-5.5 cm. long, with a pair of long, decurved, asymmetrical antennae below.

Female flowers yellow-green, sometimes dotted with brown-red. Sepals and petals much smaller than in the male flower, but the lip often much enlarged in the course of development. Dorsal sepal elliptic-lanceolate, acute, about 2.9 cm. long and 7.5 mm. wide. Lateral sepals similar, oblong-lanceolate, oblique, acute and dorsally mucronate. Petals equally long but distinctly broader than the dorsal sepal, obliquely lanceolate-elliptic, acuminate. Lip deeply saccate, about as long as the sepals, somewhat laterally compressed, when seen from the side obliquely ovoid, with a decurved fimbriate margin which appears to be mostly evanescent in the course of development. Column short and very stout, rostrate at the apex, commonly without antennae, about 1 cm. long (exclusive of the abruptly rostrate apex).

Peru: Without locality or collector (*C. cruciatum*, *C. incurvum* and *C. stupendum*).—Amazonas: La Peca, northeast of Jaën, 1000 meters, on tree in forest, *Woytkowski 37022*.—Junín: Chanchamayo Valley, 1000 meters, *Schunke s.n.* (male flowers). Same locality, 1200 meters, *Schunke 1688* (male flowers). *Schunke* Hacienda, above

San Ramón, 1300–1700 meters, in dense forest, *Schunke A 62* (male flowers).—Loreto: Mishuyacu, near Iquitos, 100 meters, epiphyte in forest, *Klug 1114* (male flowers). Same locality, *Klug 1283, 1476* (female flowers). Vicinity of Iquitos, 100 meters, on a dead tree in clearing, *Klug 10001* (male flowers), *10066* (male and female flowers). Same locality, on a living tree in dense forest, *Klug 10067* (male and female flowers). Same locality, on a living tree in clearing, *Klug 10074* (female flowers). Same locality, *Klug 10080, 10081* (male flowers).

Catasetum tenebrosum Kränzl. Gard. Chron. ser. 3, 48: 229. 1910; Stapf, Bot. Mag. 151: t. 9086. 1925; Mansf. Fedde Repert. 31: 113. 1932.

Plant epiphytic, medium-sized to large. Stems when young entirely invested by distichously imbricating, scarios sheaths which are leaf-bearing above, at length thickened into an oblong-ovoid pseudobulb up to 12 cm. long. Leaves 6–8, congested, oblanceolate to obovate-oblong, acute, often cuspidate, gradually narrowed below, up to 23.5 cm. long and 5.5 cm. wide, plicate. Scape lateral, basal, up to 28 cm. long but often shorter than the leaves, racemose above, erect-spreading or arcuate; peduncle up to 12 cm. long, stout, with 3–6 short, close, tubular-infundibuliform sheaths; raceme 6–15 cm. long, loosely several- (up to 12-) flowered. Flowers small for the genus, with spreading segments, chocolate-color to dark brownish purple with a honey-colored, greenish-tinged lip. Dorsal sepal elliptic-oblong, acute or short-acuminate, 3–3.5 cm. long, up to 1.4 cm. wide (sometimes much smaller). Lateral sepals similar, slightly oblique. Petals very similar to the dorsal sepal and connivent with it, obliquely oblong-elliptic. Lip flat, broadly triangular-ovate, entire, obtuse, lightly cordate at the base, fleshy, about 2.2 cm. long and broad at the base, with the margins crenulate to dentate; disc lightly convex, with a conspicuous knob-like thickening in the center of the base and at the obtuse apex. Column stout, abruptly incurved-rostrate at the apex, up to 2 cm. long, with a pair of small, decurved, parallel antennae below the stigmatic orifice.

Peru: Habitat not recorded (plant introduced by P. Wolter of Magdeburg; type).—Arequipa?, fide Stapf (l.c.).—Junín: Chanchamayo Valley, 1500 meters, *Schunke 548*. Same locality, 1200 meters, *Schunke 1121*. La Merced, Hacienda Schunke, about 1200 meters, on coffee bush, *Macbride 5659*.

Catasetum violascens Reichb. f. & Warsc. Bonpl. 2: 97. 1854.

Plant apparently small, allied to *C. Russellianum* Hook. Stems clustered, entirely invested by distichously imbricating sheaths, in the course of development produced into a cylindric-ovoid pseudobulb. Raceme secund, arcuate, loosely few- (7–9-) flowered. Flowers light violet or lilac, the lip yellow within. Sepals and petals similar, oblong-lanceolate, acute, subparallel. Lip longer than broad, 3-lobed, with a prominent conic-ovoid sac at the base, a little shorter than the

other segments, with the total margin serrate or "denticulate"; lateral lobes basal, broadly rounded or semiorbicular, erect; mid-lobe larger, apparently oblong-ovate or "ligulate" with upcurved sides, acute or acuminate.

Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 157. 1921.—
Piura: Near Huancabamba, Cordillera, *Warszewicz s.n.* (type).

This diagnosis was compiled from the original description, amplified by a drawing with an enlarged flower from the Reichenbach Herbarium.

CYCNOCHES Lindl.

A small, but little understood genus of tropical American epiphytes extending from Mexico through Central America and northern South America to Brazil, Bolivia and Peru.

Stems concealed by several distichously imbricating, leaf-bearing sheaths, at length thickened into oblong-cylindric or subfusiform pseudobulbs. Leaves several, ample, elliptic-lanceolate or elliptic-ob lanceolate, plicate. Scape lateral, in the axil of sheaths, erect to nodding, simple, racemose above, several- to many-flowered. Flowers medium-sized to large and showy, of two forms, unisexual. Sepals subequal, free, spreading or recurved, fleshy or membranaceous. Petals similar to the sepals or somewhat broader. Lip continuous with the base of the column, fleshy or subfleshy, at the base sessile or more or less contracted into a prominent claw, above lanceolate to elliptic or orbicular, entire or variously lobed, crested or fimbriate. Column of the male flowers slender, elongate, arcuate, wingless, clavate above; column of the female flowers short, stout, arcuate, with fleshy, deflexed, ovate-triangular wings. Anther (of the male flowers) terminal, opercular, incumbent, 1-celled. Pollinia 2, ovoid to globose, sulcate.

- A1. Lip sessile, simple, bituberculate near the base or the middle. *C. Haagii*
 A2. Lip prominently long-clawed, either 5-lobed or with the margin produced into finger-like processes. I
 Ia. Pseudobulb about 30 cm. long; flowers relatively large, with the sepals 3.5–4 cm. long; lip 5-lobed. *C. Cooperi*
 Ib. Pseudobulb 15 cm. or less long; flowers relatively small, with the sepals about 2.5 cm. long; lip with 9 or more linear-clavate marginal processes.

C. peruviana

Cycnoches Cooperi Rolfe, Kew Bull. (1913) 143.

Plant large. Pseudobulbs oblong-fusiform, leafy, about 30 cm. long. Leaves elliptic-lanceolate, short-acuminate, 20–35 cm. long, up to 7 cm. wide, plicate, arcuate in natural position. Racemes arcuate, 15–20 cm. long, densely many-flowered, provided at the base with spathaceous sheaths. Pedicellate ovary 4 cm. long, about twice as long as the lanceolate, concave bracts. Flowers (male only) rather large, showy, fragrant, light mahogany-brown with whitish lateral lobes of the lip and a dull purple column. Dorsal sepal oblong-lanceolate, subacute, concave, incurved, 4 cm. long. Lateral sepals subfalcate-oblong, acute, distinctly shorter than the dorsal sepal. Petals falcate-oblong, acute, equally long with the lateral sepals. Lip clawed; claw 1.5 cm. long, provided below the middle with an oblong incurved tooth; lamina equally long with the claw, 1 cm. wide, 5-lobed,

concave at the base; basal lobes rounded-oblong, obtuse, with an obliquely incurved tip; intermediate lobes very short, linear, acute, incurved, 2 mm. long; mid-lobe lanceolate-linear, acuminate, about 1 cm. long. Column slender, arcuate, clavate above, 3.5 cm. long.

S. Peru: Without locality, *Forget s.n.* (type). Loreto, fide Schlechter, Fedde Repert. Beih. 9: 157. 1921.

No specimen seen; description from the type diagnosis.

Cycnoches Haagii Barb. Rodr. Gen. et Sp. Orch. Nov. 2: 221. 1882; Hook. f. Bot. Mag. 122: t. 7502. 1896; Cogn. Martius Fl. Bras. 3, pt. 5: 450, t. 91. 1902.

Plant large, stout. Pseudobulb fusiform-cylindric or narrowly oblong-conic, many-jointed, 11–40 cm. long, at first mostly concealed by broad, distichous, commonly leaf-bearing sheaths, later naked. Leaves several, distichous, narrowly to broadly elliptic-lanceolate or oblanceolate, acute or acuminate, gradually narrowed into a channelled, subpetiolate base, up to 35 cm. long and 8 cm. wide, plicate, recurved in natural position. Inflorescence lateral in axils of the leaf-sheaths, stout or slender, erect to subnodding, up to 18 cm. or more long, commonly shorter than the leaves, racemose above; peduncle short, provided with several remote, short, tubular, membranaceous sheaths; raceme mostly loosely several- to many-flowered. Pedicellate ovary up to 2.5 cm. long, much surpassing the short concave bracts. Flowers medium-sized, rather fleshy, with widely spreading segments, dull yellowish green with a white lip having minute brown or orange spots. Dorsal sepal elliptic-lanceolate or ovate-oblong, obtuse to short-acuminate, concave, up to 3 cm. long and 9 mm. wide. Lateral sepals similar but a little broader, oblique, decurved. Petals oblong-obovate or sub-elliptic, acute, oblique, as long as the sepals but broader than even the lateral sepals. Lip distinctly shorter than the other segments, simple, sessile, round-ovate or elliptic-ovate, subacute or abruptly short-acuminate, broadly cuneate or cordate at the base, up to 2.5 cm. long and 2 cm. wide, thickly fleshy, convex, with a shallow sac near the base or middle surrounded by a pair of short, connivent tubercles. Column rather short, very slender, strongly arcuate, clavate above, up to 2 cm. long.

Loreto: Near Iquitos, lower Itaya River, about 100 meters, *Tessmann 3653*. Vicinity of Iquitos, 100 meters, on a dead tree in old clearing, *Klug 10041*. Also Brazil (type).

Cycnoches peruviana (as *C. peruvianum*) Rolfe, Lindenia 7: t. 301. 1891.

Plant large. Pseudobulbs fusiform, entirely concealed by broad, distichous, leaf-bearing sheaths, up to 15 cm. long. Leaves elliptic-lanceolate, acute, gradually narrowed below, up to 17.5 cm. long and more than 2 cm. wide, plicate, recurved in natural position. Inflorescence lateral in the axil of a leaf-sheath, racemose, pendent, laxly many-flowered, about 22.8 cm. long, slender with a reddish rachis. Bracts lanceolate, acuminate, up to 2.5 cm. long, equaling or slightly surpassing the pedicellate ovary. Flowers medium-sized, with widely spreading and recurved

segments. Sepals and petals bright green thickly spotted with brown. Sepals lanceolate or elliptic-lanceolate, acute, about 2.5 cm. long and 5 mm. wide. Petals similar to the sepals but slightly shorter and broader, lightly falcate. Lip white, long-clawed; claw about 6 mm. long; lamina orbicular, with the margin bearing 9 or more slender, clavate processes about 5 mm. long; disc at the base with a pair of rather shorter, linear-oblong processes. Column very slender, strongly arcuate, about 2.5 cm. long.

Peru: Habitat not recorded (introduced by Mm. Linden) (type).
—Loreto, fide Schlechter, Fedde Repert. Beih. 9: 157. 1921.

No specimens of this concept were seen.

LUEDDEMANNIA Lindl. & Reichb. f.

Large stout plants of the American tropics, apparently confined to Colombia and Peru.

Pseudobulbs ovoid or ovoid-oblong, leaf-bearing at the summit. Leaves lanceolate to elliptic, large, plicate. Scape lateral, basal, pendent, many-flowered above. Flowers commonly rather large, with spreading or subspreading floral parts. Sepals oblong or oblong-elliptic, the lateral sepals usually a little broader and more or less oblique. Petals oblanceolate or spatulate-elliptic to spatulate-obovate. Lip 3-lobed above the middle, with erect lateral lobes and a triangular mid-lobe; disc crested or provided with tubercles in the center. Column shorter than the sepals, clavate, arcuate, rather slender. Pollinia 2.

- A1. Flowers relatively small, sepals 2.1 cm. or less long; lateral lobes of the lip rounded, obtuse.....*L. triloba*
A2. Flowers relatively large, sepals about 2.7 cm. long; lateral lobes of the lip obliquely triangular, acute.....*L. Vyvereanae*

Lueddemannia triloba Rolfe, Kew Bull. (1895) 283; Gard. Chron. ser. 3, 18: 713, t. 118. 1895.

Pseudobulbs oblong-ovoid, about 6.4 cm. long. Leaves lanceolate, acute, about 30 cm. long. Scapes pendent, short, up to 18 (rarely 30) cm. long, racemose above, black-puberulent; peduncle provided with several short, loose, infundibuliform sheaths; raceme subdensely many-flowered. Dorsal sepal oblong-elliptic, concave, obtuse, up to 2.1 cm. long, light yellow suffused with madder-brown. Lateral sepals obliquely elliptic-oblong or ovate-oblong, about as long as the dorsal sepal but slightly wider. Petals oblanceolate or oblong-oblanceolate, sub-obtuse, about as long as the sepals but narrower than the dorsal sepal. Lip 3-lobed above, with a cuneate, concave base, about 2.1 cm. long and 1.9 cm. wide, orange-yellow with a few madder-brown marks at the base; lateral lobes rounded, obtuse; mid-lobe triangular, acute; disc unidentate at the base and in the middle. Column arcuate, slender-clavate, with small, rounded, fleshy wings above, about 1.9 cm. long.

“Peru,” fide Schlechter, Fedde Repert. Beih. 9: 157. 1921. Andes of South America, habitat and collector not recorded (type).

This description was prepared from the original diagnosis, supplemented by a photograph of the type specimen (consisting of two inflorescences).

Lueddemannia Vyverreana Schltr. Orchis 6: 113, t. 25, figs. 7-13. 1912.

Plant stout, erect. Pseudobulbs ovoid, large. Leaves elliptic, large, erect-spreading. Scape pendent, racemose above, up to 50 cm. long, with a subclax, about 30-flowered raceme. Flowers rather large, with lightly spreading segments, sparingly scaly-puberulent without. Sepals "oblong" or ovate-oblong, obtuse, about 2.7 cm. long, lateral sepals similar, oblique. Petals narrowly "elliptic-spatulate" or lanceolate-elliptic, acute, with irregular margins, about as long as the sepals but narrower. Lip from a narrowly cuneate claw, obovate in outline, 3-lobed in front, about 2.6 cm. long and nearly 1.1 cm. wide when expanded; lateral lobes erect in natural position, obliquely "triangular" or ovate-triangular, subacute; mid-lobe lanceolate-triangular, obtusely acuminate, distinctly longer than the lateral lobes; disc at the base on the claw with a small, conical, laterally compressed callus and with an obscure, oblong, sulcate thickening in the middle; column arcuate, clavate, about 1.9 cm. long, glabrous.

Peru: Habitat and collector not recorded (imported by F. Sander & Sons).

Description compiled from the original diagnosis, together with the accompanying figures.

ERIOPSIS Lindl.

A small group of tropical American epiphytes, extending from Costa Rica and northern South America to Brazil and Peru.

Stems congested, at first concealed by imbricating sheaths which are leaf-bearing in the upper part, at length produced into more or less elongate, conical or cylindric pseudobulbs. Leaves 2 or 3, oblong-elliptic to oblong, plicate-veined. Scapes lateral, basal, distantly few-sheathed below, racemose and loosely or subdensely several- to many-flowered above, commonly exceeding the leaves. Flowers medium-sized, showy, with spreading segments, slender-pedicelled. Sepals subequal, the lateral ones lightly oblique. Petals similar to the sepals but slightly smaller, sometimes much narrower. Lip distinctly 3-lobed, a little shorter but much broader than the other segments; lateral lobes large, erect or incurved; mid-lobe commonly small, entire or bilobed; disc longitudinally lamellate with toothed or entire crests, or with a pair of flattened, horn-like calli. Column arcuate, subclavate above, with a short foot. Anther opercular, incumbent. Pollinia 2 bipartite, or 4.

- A1. Calli on the lip consisting of a pair of divaricate, flattened, triangular or horn-like lamellae. *E. sceptrum* (*E. Helenae*)
- A2. Calli on the lip consisting of a pair of broad, undulate or serrate lamellae, with a pair of more or less separate, small, anterior teeth in front. I

- Ia. Leaves oblong-ligulate to elliptic-oblong; mid-lobe of the lip retuse or bilobed.
E. biloba (*E. Wercklei*)
- Ib. Leaves elliptic; mid-lobe of the lip neither retuse nor bilobed, either truncate or bluntly subacute.....*E. colombiana*

Eriopsis biloba Lindl. Bot. Reg. 33: sub t. 9 & t. 18. 1847; Cogn. Martius Fl. Bras. 3, pt. 5: 588. 1902. *Pseuderriopsis Schomburgkii* Reichb. f. Linnaea 22: 853. 1849. *Eriopsis Schomburgkii* Reichb. f. Bonpl. 3: 67. 1855. *Eriopsis Wercklei* Schltr. Fedde Repert. 16: 447. 1920.

Pseudobulbs congested, robust, oblong-conic, 5-16 cm. high, 2- to 3-leaved near the apex. Leaves oblong-ligulate to elliptic-oblong, acute, long-attenuate below, coriaceous, plicate, up to 48 cm. long and 7.6 cm. wide. Scape lateral from the base of the pseudobulb, erect or nearly so, shorter than or more commonly exceeding the leaves, up to 60 cm. long; peduncle provided with several remote, short, close sheaths; raceme up to 30 cm. long, rather loosely or subdensely many-flowered. Flowers medium-sized, with spreading segments, on slender pedicels, yellow or orange with brownish- or purplish-margined sepals and petals. Dorsal sepal elliptic-oblong or ovate-oblong, concave, obtuse, about 1.5 cm. long and 7 mm. wide. Lateral sepals similar to the dorsal sepal but a little shorter and broader, ovate-oblong, slightly oblique. Petals similar to the dorsal sepal but slightly smaller, oblong, oblique. Lip suborbicular-ovate or reniform-ovate in outline, deeply 3-lobed near the apex, concave, about 1.2 cm. long and 1.6 cm. wide near the base when expanded, subcordate-truncate at the nearly sessile base; lateral lobes ample, broadly semiovate; mid-lobe very small, reniform, retuse or bilobed; disc at the base provided with a large callus consisting of a pair of extrorse, broad, semirhombic lamellae within which is a pair of narrow, fleshy, serrulate lamellae and with a pair of more or less separate, smaller, verrucose-dentiform calli in front. Column arcuate, clavate, about 9 mm. or less long, extended into a short foot.

San Martín: Zepelacio, near Moyobamba, about 1100 meters, epiphyte in mountain forest, *Klug 3678*. Also British Guiana (type of *Pseuderriopsis Schomburgkii*), Venezuela, and Costa Rica (type of *E. Wercklei*).

Eriopsis colombiana Schltr. Fedde Repert. Beih. 27: 172. 1924.

Plant stout, epiphytic. Pseudobulbs congested, cylindric or cylindric-ovoid, 2- to 3-leaved near the apex, up to 8 cm. high. Leaves elliptical, acute or short-acuminate, narrowed below to a subpetiolate, channelled base, 30 cm. or less long, up to 6.6 cm. wide, thickly coriaceous, plicate. Scape lateral, arising from the base of the pseudobulb, slightly exceeding the leaves, about 50 cm. or less high, racemose above; peduncle stout, about 24 cm. long, provided with several sheaths which are broad and loose below and very narrow above; rachis about 15 cm. long, rather loosely several- to many- (about 20-) flowered. Flowers rather fleshy, with spreading segments. Dorsal sepal elliptic-oblong, obtuse, concave, 1.8-2 cm. long, about 9.5 mm. wide when expanded. Lateral sepals similar, ovate-oblong, as long as the dorsal sepal and a little wider, subacute, lightly oblique, somewhat

concave. Petals similar to the dorsal sepal but somewhat smaller, broadly obtuse or rounded at the apex. Lip suborbicular-ovate in outline, deeply 3-lobed near the apex, concave, subsessile at the broad, subtruncate-cordate base, about 1.5 cm. long and subequally wide near the base; lateral lobes ample, subquadrate-semiorbicular; mid-lobe very small, from a very short, broad claw abruptly dilated into a transversely elliptic-oblong lamina which is truncate in front with a more or less noticeable blunt apicule; disc with a pair of extrorse, sinuate-semiquadrate lamellae at the base surrounding a pair of narrow, serrulate calli and with a pair of small verrucose, dentiform calli in front of these. Column lightly arcuate, clavate, 9–11 mm. high, produced into a short foot.

Libertad: Prov. of Pataz, valley of Río Mixiollo, 1800–2000 meters, *Weberbauer 7050*. Also Colombia (type).

Eriopsis sceptrum Reichb. f. & Warsc. Bonpl. 2: 98. 1854; Cogn. Martius Fl. Bras. 3, pt. 5: 588. 1902. *Eriopsis Helenae* Kränzl. Gard. Chron. ser. 3, 22: 98. 1897; Rolfe, Bot. Mag. 138: t. 8462. 1912.

Plant large, epiphytic, variable, up to 60 cm. or more tall. Stems entirely enveloped by imbricating sheaths, later developing into elongate, conic-cylindric pseudobulbs up to 25 cm. long, bearing 2–4 leaves near the apex. Leaves elliptic-oblong to elongate-oblong, acute, slightly narrowed below, up to 55 cm. long and 6 cm. wide. Scape lateral, arising from the base of the pseudobulb, with a relatively short, distantly few-sheathed peduncle and an elongate, loosely several- to many-flowered raceme, about 60 cm. or more long. Flowers medium-sized, with spreading segments. Sepals dull yellow with brown or purplish margins. Dorsal sepal elliptic-oblong, obtuse, 1.5–2 cm. long, up to 8 mm. wide. Lateral sepals similar, ovate-oblong, oblique, a little shorter and broader than the dorsal sepal. Petals similar to the dorsal sepal but a little smaller, oblique. Lip very shortly clawed, broadly triangular-ovate in outline, deeply 3-lobed, 1–1.5 cm. long, slightly wider near the cordate-subtruncate base; lateral lobes ample, broadly semiovate or subquadrate; mid-lobe smaller, from a more or less distinct claw obovate or transversely elliptic, broadly obtuse to distinctly retuse at the apex; disc near the base with a pair of divaricate, triangular lamellae which are sometimes somewhat recurved. Column arcuate, lightly clavate, about 1 cm. long, produced into a short foot.

Peru: Habitat not recorded; introduced by F. Sander & Sons (type of *E. Helenae*). Eastern Peru: Near the source of the Río Marañon, *Warscewicz s.n.* (type of *E. sceptrum*).—Cuzco: Prov. of Convención, Valle Lucumayo, Amaibamba, on open slope, 1700 meters, *Vargas 4200*.—Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1351*.

Eriopsis Sprucei Reichb. f. Walp. Ann. 6: 663. 1863; Cogn. Martius Fl. Bras. 3, pt. 5: 587, t. 109. 1902.

This species has been recorded from Peru by Hoehne (Fl. Brasil. 12, pt. 7: 68. 1953) without citation of specimens, and I have seen

no Peruvian collection referable to it. It appears that the concept differs from *E. sceptrum* chiefly in having a sessile or very shortly clawed mid-lobe of the lip, instead of a distinctly clawed mid-lobe. Consequently, its specific status appears to be questionable, and I have omitted it in the key.

SIEVEKINGIA Reichb. f.

A small genus of tropical American epiphytes, extending from Costa Rica and Panama through British Guiana to Colombia, Ecuador, Bolivia, and Peru.

Plant small to medium-sized, with commonly clustered, ovoid or subcylindric pseudobulbs which are unifoliate (rarely bifoliate) at the apex. Leaf elliptic or lanceolate-elliptic, acute or acuminate, more or less long-petioled, plicate. Scapes lateral at the base of the pseudobulb, short, racemose, commonly pendent, few- to several-flowered. Flowers often congested, medium-sized, commonly membranaceous. Sepals free, similar, the lateral ones often broader and lightly oblique. Petals similar to the sepals or narrower, often fimbriate. Lip simple or three-lobed, more or less concave, commonly sessile and rigidly attached to the column; disc with calli, teeth, or lamellae. Column rather large, bialate above. Anther terminal, opercular, incumbent. Pollinia 2.

Sievekingia peruviana Rolfe ex C. Schweinf. Am. Orch. Soc. Bull. 12: 176, t., 1943. *Sievkingia peruviana* Rolfe, Orch. Rev. 19: 310. 1911, *nomen nudum*. Figure 116.

Plant medium-sized. Pseudobulbs ovoid, up to 3.5 cm. high, unifoliate at the apex. Leaf erect, long-petioled; lamina elliptic or oblong-elliptic, acute, broadly cuneate at the base, 12–21 cm. long, 4–6 cm. wide, plicate; petiole slender, channelled, up to 6 cm. long. Scape lateral, pendent from the base of the pseudobulb, about 4.5 cm. or less long; peduncle with several loose, broadly ovate, concave sheaths; raceme congested, abbreviated, several-flowered. Flowers rather small, campanulate, membranaceous, long-pedicelled. Sepals lepidote. Dorsal sepal oblong-lanceolate, short-acuminate, about 2 cm. long and 4.7 mm. wide. Lateral sepals elliptic-lanceolate, slightly oblique, a little shorter and much wider than the dorsal sepal. Petals linear-oblong or oblanceolate-oblong, acute, about as long as the lateral sepals and narrower than the dorsal sepal. Lip simple, sessile, concave, ovate-triangular, sharply acute, with a subtruncate base and rounded, lightly retuse basal (outer) angles, about 1.4 cm. long and broad when expanded; disc with a row of about 8 slender, linear-triangular teeth at the base and in the middle a large adnate, flat plate which is sharply bidentate at the free apical part. Column prominent, with a pair of semirhombic wings above, about 1.2 cm. long.

Junín: Chanchamayo Valley, 1200 meters, *Schunke 554* (type). Same locality, 1500 meters, *Schunke 1235*.



SIEVEKINGIA

peruviana

Rolfe ex Schweinf.

FIG. 116. *Sievekingia peruviana* Rolfe. 1, plant; $\times \frac{1}{8}$. 2, flower, expanded; $\times 1\frac{1}{2}$. 3, column and lip, from side; $\times 3$. 4, lip, spread out; $\times 3$.

LYCOMORMIUM Reichb. f.

A very small genus of coarse epiphytes, apparently confined to Peru and Brazil.

Stems short, clustered, soon developing into a fleshy, few-leaved pseudobulb. Leaves ample, plicate, commonly elliptic-oblong or oblong-lanceolate, gradually narrowed to a petioled base. Scape lateral, springing from the base of the pseudobulb, commonly recurved or pendulous at least above, loosely and remotely several-sheathed below, with a subdensely several-flowered raceme above. Flowers rather large, fleshy, with subconnivent floral segments. Dorsal sepal free or very shortly connate with the lateral sepals. Lateral sepals much broader than the dorsal sepal, strongly connate below, forming a saccate mentum with the column-foot. Petals similar to the dorsal sepal but narrower. Lip erect and rigidly attached to the column-foot, concave, simple or 3-lobed with erect lateral lobes. Column very short, fleshy, produced into a long foot. Anther opercular, incumbent, 2-celled. Pollinia 2, sulcate.

- A1. Roots glabrous; leaves about 17–20 cm. long; lateral lobes of the lip ovate-triangular.....*L. squalidum*
 A2. Roots densely tomentose; leaves 65–117 cm. long; lateral lobes of the lip ovate-subquadrate.....*L. elatum*

Lycomormium elatum C. Schweinf. Am. Orch. Soc. Bull. 12: 134, t., 1943. Figure 117.

Plant large and stout. Roots fibrous, densely tomentose. Stems when immature enveloped by distichous, imbricating sheaths, developing into an elongate, conic-subcylindric pseudobulb about 10.5 cm. high, 3-foliolate at the apex. Leaves elliptic-oblong, short-acuminate, gradually narrowed below into an elongate, channelled petiole, 65–117 cm. long, up to 13.5 cm. wide, plicate, prominently 5-nerved. Scape lateral from the base of the pseudobulb, about 55 cm. long; peduncle suberect, about 36 cm. long, provided with about 10 ventricose, infundibuliform, subremote sheaths; raceme apparently nodding, subdensely 12-flowered. Flowers rather large, with subconnivent fleshy segments. Sepals connate at the base, with a recurved apex. Dorsal sepal (free portion) ovate or elliptic-ovate, subacute, concave, about 3.2 cm. long and 2.2 cm. wide. Lateral sepals (free portion) much shorter and broader than the dorsal sepal, suborbicular-ovate, obtuse, lightly oblique, long-connate in front and decurrent along the column-foot. Petals obliquely oblong-obovate, abruptly acute at the fleshy-thickened apex, much smaller than the sepals. Lip about equaling the lateral sepals and enclosed by them, deeply saccate, erect and parallel to the column-foot, sharply 3-lobed in front; lateral lobes erect, porrect, with an ovate-subquadrate free portion which is obliquely rounded-truncate at the apex; mid-lobe much smaller, very fleshy, trilobulate with a recurved terminal lobule; disc of the mid-lobe with a pair of relatively high keels extending inward from the lateral lobules and with a short, low central keel. Column very short and stout, about 9 mm. long, concave in front, extended into a prominent, concave-sulcate foot.

Peru: Habitat not recorded, 1100–1200 meters, *Weberbauer* 6808.



LYCOMORMIUM
elatum C. Schweinf.

FIG. 117. *Lycomormium elatum* C. Schweinf. 1, plant; $\times \frac{1}{4}$. 2, flower, natural position; $\times 1$. 3, dorsal sepal; $\times 1$. 4, petal; $\times 1$. 5, lateral sepal; $\times 1$. 6, lip and column from side, natural position; $\times 1$. 7, lip from front, natural position; $\times 1$.

Lycomormium squalidum (Poepp. & Endl.) Reichb. f. Bot. Zeit. 10: 833. 1852; Xen. Orch. 1: 181, t. 64. 1856; Cogn. Martius Fl. Bras. 3, pt. 5: 506. 1902. *Anguloa squalida* Poepp. & Endl. Nov. Gen. ac Sp. 1: 43, t. 74. 1836. *Peristeria fuscata* Hort. ex Reichb. f. Xen. Orch. 1: 181. 1856.

Plant large, epiphytic. Roots slender, glabrous. Pseudobulb subglobose to ovoid, up to 7 cm. long, 1- or more-leaved at the summit. Leaves oblong or elliptic-oblong, subacute, long-attenuate to a subpetiolate base, plicate, up to 20 cm. long and 6 cm. wide, 7-nerved. Scape suberect or deflexed, subequaling the leaves or longer, racemose above, up to 30 cm. long; peduncle provided with several short, loose, remote sheaths; raceme rather densely several- (up to 13-) flowered. Flowers rather large, fleshy, with subconnivent segments, dull rose and spotted within. Sepals more or less connate at the base. Dorsal sepal broadly elliptic-oblong, obtuse, deeply concave, up to 2.5 cm. long and 1.4 cm. wide. Lateral sepals broadly ovate-subrotund, obtuse, oblique, deeply connate at the base, a little shorter than the dorsal sepal but much broader. Petals obliquely elliptic-oblong, subobtuse, rather shorter than the sepals and much narrower than the lateral sepals. Lip erect and rigidly attached to the column-foot, deeply saccate, 3-lobed in front, somewhat shorter than the lateral sepals; lateral lobes erect, porrect, ovate-triangular, obtuse; mid-lobe minute, very fleshy, trilobulate, with the terminal lobule recurved; disc of the mid-lobe with 3 keels, of which the lateral ones are the larger. Column very short and stout, about 8 mm. long, deeply concave in front, extended into a long foot.

Huánuco: Near Cuchero (Cochero) and Pampayaco (Pampayacu), on trees, *Poeppig 1346* (type of *Anguloa squalida*).—Loreto(?): Source of the Marañón River, *Warszewicz s.n.*

No specimen of this species was available.

PERISTERIA Hook.

Large epiphytic plants confined to the American tropics from Panama to Colombia, Venezuela, the Guianas and Brazil, with an outlying occurrence in Peru.

Stems short and enveloped by imbricating sheaths, produced into fleshy pseudobulbs which bear one or several leaves at the summit. Leaves ample, often very long, contracted into a petiole, plicate. Scape lateral, basal, racemose above, erect or nodding; racemes short or elongate. Flowers showy. Sepals connivent into a sphere, broad, subequally long and broad. Dorsal sepal free. Lateral sepals broader than the dorsal sepal, connate near the base. Petals similar to the sepals but smaller. Lip rather fleshy, 3-lobed, continuous with the column; lateral lobes erect and often surrounding the column; mid-lobe continuous or articulated, simple; disc often callose. Column very short and stout, footless or nearly so, 2-auricled in front near the apex, or naked. Anther terminal, opercular, incumbent. Pollinia 2, often sulcate or subdivided.

Peristeria pendula Hook. Bot. Mag. 63: t. 3479. 1836; Cogn. Martius Fl. Bras. 3, pt. 5: 500. 1902. *Peristeria maculata* Hort. ex Lindl. Bot. Reg. 29, Misc. 67. 1843, in synon.

Plant large, epiphytic, with tomentose roots. Stems or pseudobulbs prominent, approximate, ovoid-conic to oblong-subconic, narrowed above, rather deeply many-sulcate, 3- to 4-leaved at the summit, 8-15 cm. long. Leaves ample, lanceolate-elliptic or oblong-lanceolate, acute or acuminate, gradually narrowed to a long, slender, channelled petiole, plicate, up to 79 cm. long (including the petiole) and 12 cm. wide, lighter beneath. Scape short, pendent, a little longer than the pseudobulb, up to 18 cm. long; peduncle provided with several short, remote, infundibuliform sheaths; raceme rather densely 4- to 8-flowered. Flowers rather large, subglobose, long-pedicelled, fleshy, whitish green without and reddish or purple within spotted with purple and with a yellowish, dark-spotted lip. Dorsal sepal ovate-subrounded, deeply concave, very broadly obtuse, 2.8-3.5 cm. long when expanded, 1.5-2 cm. wide. Lateral sepals a little shorter and wider, deeply connate below. Petals very similar to the dorsal sepal but a little shorter and narrower, lightly oblique. Lip enclosed by the lateral sepals and shorter than they, continuous with the abbreviated column-foot, deeply 3-lobed; lateral lobes erect, basal, obliquely oblong-ovate or rounded-quadrate, separated by a lunate or deeply sulcate callus; hypochile oblong, attenuated above, upcurved; epichile ovate-rhombic or ovate-ligulate, often broader than long, obtuse, traversed by a large V-shaped, sulcate callus, recurved when viewed from the side. Column short and stout, with a pair of relatively large, porrect, oblong auricles near the summit.

San Martín: Zepelacio, near Moyobamba, 1200-1600 meters, epiphyte in mountain forest, *Klug 3549*. Also Venezuela, British Guiana (type) and Surinam.

HOULLETIA A. Brongn.

A small genus of large, stout epiphytes extending from Costa Rica to Colombia, Brazil, Bolivia and Peru.

Stems very short, concealed by imbricating sheaths, soon developed into a fleshy pseudobulb. Pseudobulb ovoid to narrowly ovoid, generally 1-leaved at the summit. Leaf ample, elliptic to lanceolate, prominently petioled, plicate. Scape erect or pendent, simple, the peduncle provided with several short sheaths, racemose above. Raceme loose, 1- to 12-flowered. Flowers rather large. Sepals subequal, spreading, free or with the lateral sepals somewhat connate. Petals about as long as the sepals, but often narrower, sometimes much narrowed toward the base. Lip narrow or broad, continuous with the base of the column, 3-lobed; lateral lobes on the basal half of the lip very narrowly lanceolate-falcate or broad; mid-lobe jointed, often separated from the basal part by an oblong portion or mesochile, simple or subsimple, ovate, oblong-obovate or ligulate, commonly with a truncate, hastate-auriculate base. Column arcuate, rather stout, clavate, footless or produced into a very short foot. Anther terminal, opercular, incumbent, 1-celled. Pollinia 2, oblong-cylindric.

A1. Lateral lobes of the lip narrowly lanceolate-falcate; mid-lobe of the lip ovate in outline, verrucose within; petals oblong-obovate or spatulate.

H. odoratissima

A2. Lateral lobes of the lip round-obovate or obovate-spatulate; mid-lobe of the lip oblong or oblong-obovate, smooth within; petals suborbicular. . *H. Sanderi*

Houlletia odoratissima Lind. ex Lindl. & Paxt. Flow. Gard. 3: 172. 1852-53; Rolfe, *Lindenia* 7: t. 324. 1892; Cogn. & Goos. Dict. Icon. des Orch. *Houlletia* t. 1 (1903); Schltr. *Orchis* 9: 128, t. 8 (in part). 1915; E. Cooper, *Orch. Rev.* 39: 14. 1931.

Plant variable. Pseudobulb oval to ovoid-oblong, 6-8 cm. long, bearing one leaf at the summit. Leaf long-petioled; lamina lanceolate-elliptic, acute or acuminate, up to 60 cm. long and 10 cm. wide, plicate; petiole narrow, channelled, up to 20 cm. or more long. Scape lateral, basal, erect, up to 94 cm. high, below provided with short, close, remote, tubular sheaths, above loosely racemose and 5- to 16-flowered. Flowers large, with wide-spreading segments. Dorsal sepal ovate-oblong or elliptic-oblong, obtuse to acute, purple-green, reddish flesh-color or brown without and reddish within, about 4 cm. long and 1.3 cm. or more wide. Lateral sepals similar but slightly broader, connate through the lower half. Petals cuneate-spatulate, shorter and much narrower than the sepals. Lip narrow, 3-lobed, nearly as long as the petals, white often marked with red or yellow; hypochile oblong with a pair of narrowly lanceolate-falcate lateral lobes; epichile or mid-lobe jointed, clawed, hastate-ovate in outline, abruptly acute, with prominent triangular-lanceolate basal angles or auricles, finely verrucose within. Column lightly arcuate, clavate, rather slender, about 2.5 cm. long, greenish.

Junín: East of Quimiri Bridge, near La Merced, 800-1300 meters, epiphyte in dense forest, *Killip & Smith 23849*. Prov. of Tarma, Agua Dulce, 1900 meters, in humus, on steep eastern slope of hill, *Woytkowski 35418*. Also Colombia (type) and Venezuela.

Houlletia Sanderi Rolfe, Gard. Chron. ser. 3, 47: 206. 1910, and Bot. Mag. 136: t. 8346. 1910; Schltr. *Orchis* 9: 133, t. 8 (in part). 1915.

Plant stout, epiphytic. Pseudobulbs crowded, oblong-ovoid to slender-pyriform, sulcate, unifoliate at the summit, 5-7 cm. long. Leaf "oblong-lanceolate" or elliptic-lanceolate, acute, gradually narrowed to a more or less distinct petiole, subplicate, up to 30 cm. long and 4.5 cm. wide. Scape lateral, basal, erect, below provided with several remote, short, acute sheaths, above loosely 2- to 4-flowered, up to 30 cm. high. Floral bracts and pedicels black-punctate. Flowers large, creamy white to bright yellow, with subconnivent segments. Sepals strongly concave, apiculate. Dorsal sepal oval, about 3 cm. long and 2 cm. wide. Lateral sepals round-ovate, connate near the base, slightly longer and broader than the dorsal sepal. Petals "suborbicular" or very broadly obovate, acute, shorter than the sepals. Lip deeply 3-lobed, nearly 3 cm. long when expanded; lateral lobes near the base, "broadly falcate-oblong" to obovate-spatulate or very broadly and obliquely obovate, having broadly rounded and irregular apical margins, with an obtuse tooth in front; mesochile ovate-oblong, truncate-obtuse, fleshy; mid-lobe or epichile "obovate-oblong" or subquadrate-oblong, coarsely denticulate at the

truncate apex, membranaceous, about 1.7 cm. long. Column stout, arcuate, lightly clavate, about 1.8 cm. or more long, produced into a short foot.

Peru: Habitat and collector unrecorded (imported by Messrs. Sander & Sons, Bruges) (type). Also Bolivia.

This description was compiled from the above-cited diagnoses, supplemented by a flower of apparently authentic material from the Royal Botanic Gardens at Kew, together with a single Bolivian collection.

POLYCYCNIS Reichb. f.

A small genus of American epiphytes extending from Costa Rica to Colombia, British Guiana and Peru.

Stems very short, sheathed, unifoliate, soon developed into a fleshy pseudobulb. Leaf ample, lanceolate-elliptic, contracted into a channelled petiole, plicate. Scape lateral, basal, erect, distantly few-sheathed below, loosely racemose and several- to many-flowered above. Flowers rather large. Sepals subequal, free, spreading. Petals similar to the sepals but rather smaller. Lip affixed to the base of the column, spreading, 3-lobed; lateral lobes narrow; mid-lobe rhombic-ovate to lanceolate, acute or acuminate, entire or almost 3-lobed. Column elongate, slender, arcuate, somewhat clavate above, footless. Anther terminal, opercular, incumbent, 1-celled. Pollinia 2, cylindrical.

- A1. Peduncle, rachis, pedicels, and back of sepals dark-pubescent; lateral lobes of the lip triangular or lanceolate, erect; mid-lobe or epichile of the lip bearded. *P. muscifera*
- A2. Peduncle, rachis, and back of sepals glabrous; lateral lobes of the lip ovate-oblong, cucullate and incurved; mid-lobe of the lip smooth. *P. vittata*

Polycychnis muscifera (Lindl. & Paxt.) Reichb. f. Bonpl. 3: 218. 1855; Walp. Ann. 6: 618. 1863; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 192. 1944. *Cynoches muscifera* (as *C. musciferum*) Lindl. & Paxt. Paxton's Flow. Gard. 3: 28, fig. 248. 1852-53.

Plant rather large. Pseudobulbs pyriform-cylindric, unifoliate at the apex, clothed with evanescent sheaths, densely rugose when dry, 5 to over 6 cm. long. Leaf distinctly petioled; lamina elliptic, acute, cuneate below, up to 37 cm. long and 12 cm. wide, plicate; petiole up to 11.5 cm. long, slender, channelled. Scape lateral, basal, suberect to arcuate, subaxillary to densely racemose above; peduncle provided with several remote, close, short sheaths, densely pubescent, up to 28.2 cm. long; raceme many-flowered, straight or more commonly arcuate or flexuous, rachis 34 cm. or less long. Flowers rather small for the genus, with spreading or reflexed, membranaceous segments, pale bistre thickly spotted with brown flecks. Sepals pubescent without. Dorsal sepal refracted, deeply cucullate, oblong-lanceolate, acute, up to 2 cm. long and 5 mm. wide when expanded. Lateral sepals broadly oblong-lanceolate, oblique, complicate-acute, a little shorter and broader than the dorsal sepal. Petals oblanceolate-linear, somewhat sigmoid, acute, slightly longer than the dorsal sepal but much narrower. Lip up to 1.7 cm. long, deeply 3-lobed, sharply divided into a hypochile and epichile; hypochile

with a pair of linear-falcate, erect-spreading horns at the base, above rather abruptly dilated into a pair of erect, obliquely lanceolate or lanceolate-triangular, acuminate lateral lobes, pubescent through the middle where dilated above into a relatively high, fleshy, pubescent, semielliptic keel; mid-lobe or epichile relatively large, hastate-ovate or triangular-ovate, simple or subtrilobed with more or less conspicuous, rounded subbasal angles, acuminate to a complicate-acute apex, densely bearded except near the apex. Column very slender, arcuate, abruptly bilobate at the apex, about 2 cm. or less long.

Junín: Chanchamayo Valley, 1500 meters, *Schunke 1122, 1290*. Same locality, 1200 meters, *Schunke s.n.* Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A 69*. Also Colombia (type of *Cycnoches muscifera*).

Polycynis vittata (Lindl.) Reichb. f. Walp. Ann. 6: 618. 1863; Cogn. Martius Fl. Bras. 3, pt. 5: 539. 1902. *Houlletia vittata* Lindl. Bot. Reg. 27, Misc. 47, no. 100: t. 69. 1841.

Pseudobulbs ovoid-conic to subcylindric, clothed with evanescent sheaths, up to 7 cm. long, 1-leaved at the apex. Leaf petioled; lamina oblong-lanceolate to elliptic, acute, cuneate below, plicate, up to 54 cm. long and 15 cm. wide; petiole 9 cm. or less long, slender, channelled. Scape lateral, basal, erect or ascending, racemose above; peduncle about 10 cm. or more long, glabrous, provided with a few short sheaths which are imbricating at the base and remote above; raceme loosely many-flowered, 14–26.5 cm. long. Flowers medium-sized, with spreading segments, glabrous, yellow or whitish with deep red or brown stripes. Dorsal sepal oblong-lanceolate, acute or acuminate, up to 3 cm. long and 5 mm. wide. Lateral sepals obliquely lanceolate, acuminate, a little shorter and broader than the dorsal sepal. Petals elliptic-lanceolate, acuminate, twisted at the base, shorter and narrower than both sepals. Lip complex, clawed, up to 1.8 cm. long, 3-lobed; claw linear, with a small porrect, linear-oblong, pubescent horn at the base and with a high fleshy keel terminating in an upcurved horn between the lateral lobes; lateral lobes short, cucullate, ovate-oblong, porrect, obtuse or truncate at the apex; mid-lobe flat, short-clawed, rhombic-ovate, acute to subobtuse, with a triangular spreading auricle or lobule in the middle of each side, glabrous, traversed through the center by a low, fleshy, sulcate keel. Column slender, arcuate, lightly clavate, about 1.5 cm. long.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 529*. Same data, "odor of vanilla," *Klug 10045*. Same data, *Killip & Smith 29982*. La Victoria, on the Amazon River, *Williams 3019*. Also Venezuela, British Guiana (type of *Houlletia vittata*) and French Guiana.

STANHOPEA Frost ex Hook.

A striking genus of American epiphytes extending from Mexico through Central America to Brazil and Bolivia.

Stems very short, thickened into a fleshy pseudobulb which is unifoliate at the apex and clothed with evanescent sheaths at the base. Leaf ample, plicate-veined,

contracted into a petiole; lamina more or less elliptic. Scapes deflexed or pendent from the base of the pseudobulbs, simple, commonly short, clothed with loose, spathaceous sheaths below, loosely few-flowered above. Flowers commonly large and showy, the pedicels more or less concealed by the large, spathaceous floral bracts. Parts of the perianth free, spreading. Dorsal sepal oblong or ovate-oblong, fleshy. Lateral sepals similar but usually larger, oblique. Petals narrower and thinner than the sepals, often undulate on the margins. Lip adnate to or continuous with the base of the column, thickly fleshy, more or less complex, commonly divided into a subglobose or calceiform hypochile and a commonly flat, simple or 3-lobulate epichile, the two members often separated by a short mesochile usually adorned with a pair of narrow, arcuate, fleshy horns. Column elongate, erect or arcuate, clavate and more or less bialate above, footless. Anther terminal, opercular, incumbent, 1-celled. Pollinia 2.

- A1. Mesochile or middle portion of the lip entirely without horns; hypochile with a pair of small, porrect or uncinat horns at the base; epichile convex.
S. Randii
- A2. Mesochile or middle portion of the lip with a pair of conspicuous horns; hypochile without horns. I
- Ia. Epichile of the lip oblong or linear-oblong, broadly obtuse to truncate, concave; petals ovate or rhombic. *S. tricornis* (*S. convoluta*)
- Ib. Epichile of the lip broadly ovate or suborbicular to rhombic, not conspicuously concave; petals commonly oblong. 1
- 1a. Hypochile of the lip very short, apparently distinctly shorter than the epichile 2
- 1b. Hypochile of the lip not noticeably short, nearly equal to the epichile in length or longer. 3
- 2a. Side view of the hypochile subtriangular; epichile with a swelling at the base and a prominent apicule at the apex; column bialate above the middle.
S. xytriophora
- 2b. Side view of the hypochile saccate-semiglobose; epichile acute; column wingless. *S. connata*
- 3a. Flowers very large, sepals 7 cm. or more long. 4
- 3b. Flowers medium-sized, sepals 6.5 cm. or less long. 5
- 4a. Mesochile with a clawed base; lower part of the lip therefore sigmoid-flexuous when viewed from the side; anterior part of the hypochile fimbriate or papillose within. *S. Haseloviana*
- 4b. Mesochile without a clawed base; lower part of the lip not sigmoid-flexuous.
S. Moliiana
- 5a. Hypochile of the lip with a very narrow channel between the apical teeth, basal portion commonly angled or prominently rounded on each side above.
S. Wardii (*S. anfracta*, *S. peruviana*)
- 5b. Hypochile of the lip with a broad channel or opening between the apical teeth, basal portion not angled nor prominently rounded on each side above.
S. graveolens

Stanhopea connata Kl. Allg. Gartenz. 22: 226. 1854; Reichb. f. Xen. Orch. 1: 118. 1855; Kränzl. Xen. Orch. 3: 136, t. 277. 1894. *Stanhopea graveolens* Kl. ex Reichb. f. Xen. Orch. 1: 118. 1855, non Lindl.

Pseudobulb globose-ovoid, lightly striate, unifoliate, about 5 cm. long. Leaf petioled; lamina oval, acute, very shortly recurved, about 20.4 cm. long and 12.8 cm. wide; petiole semisulcate, shorter than the blade, about 15 cm. long. Inflorescence short, 1- or 2-flowered above, entirely concealed by distichous, imbricating sheaths below. Bracts loose, about half as long as the ovary which is 10 cm. long. Flowers apparently rather large (about 10 cm. across), yellowish, purple-spotted, with recurved margins, lip deep yellow or orange, with purple spots and streaks. Sepals and petals reflexed. Dorsal sepal ovate-oblong, acute, about 6.4 cm. long. Lateral sepals about as long but wider, very broadly ovate, acute, oblique, connate at the base and about 5 cm. wide. Petals shorter than the sepals, broadly oblong, acute, undulate-plicate at the tip, purple and orange at the base. Lip adnate to the column, shorter than the sepals, about 3.8 cm. long, divided into a hypochile, mesochile, and epichile; hypochile very short, broad, semiglobose, bicarinate on each side (with the keels converging toward the base); mesochile abbreviated, with a pair of broad, falcate-lanceolate, acuminate, porrect horns; epichile very broadly rhombic-ovate, acute or retuse and apiculate, recurved, about equally long with the horns. Column short, stout, white, wingless but terminated by a pair of large, falcate-incurved teeth.

Northern Peru: Habitat not recorded, *Warscewicz s.n.* (type).—Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 158. 1921. Also Ecuador.

No example of this species was available.

Stanhopea graveolens Lindl. Bot. Reg. 26, Misc. 59, no. 125. 1840; Lem. Fl. des Serres 2, Livr. 8: t. 1-2. 1846; Lindl. Fol. Orch. Stanhopea 4, no. 8, 1852; Cogn. Martius Fl. Bras. 3, pt. 5: 531. 1902. *Stanhopea aurata* Beer, Prakt. Stud. Orch. 310. 1854. *Stanhopea inodora* Reichb. f. Xen. Orch. 2: 157, t. 165. 1870, non Lodd.

Plant large. Pseudobulbs aggregated, ovoid-conic or pyriform, longitudinally plurisulcate, clothed with several large evanescent sheaths, up to 8 cm. long, unifoliate at the apex. Leaf petioled; lamina elliptic or oblong-elliptic, acute, cuneate at the base, up to 50 cm. long and 10.6 cm. wide, plicate-nerved; petiole stout, channelled, up to 15 cm. long. Inflorescence lateral, basal, straight, ascending or pendulous, below entirely invested by several loosely imbricating, distichous, scarios sheaths (successively larger upward) and above loosely racemose, the peduncle and rachis up to 25 cm. long. Raceme laxly 2- to 6-flowered. Pedicellate ovary slender, spreading or ascending, commonly shorter than the large, loose bract, up to 10 cm. long. Flowers large, greenish-white to straw-color with orange at the base of the segments and often purple-spotted (sometimes apricot-colored throughout), very fragrant. Sepals and petals spreading-reflexed. Dorsal sepal oblong or elliptic-oblong, abruptly acute or apiculate, up to 6 cm. long and 2.2 cm. or more wide. Lateral sepals obliquely elliptic-ovate, subacute, slightly longer and much wider than the dorsal sepal. Petals oblong-lanceolate, sharply acute or short-acuminate, finely crisped-undulate on the margins, considerably shorter and slightly narrower than the dorsal sepal. Lip fleshy, about 5 cm. long when expanded, divided into a hypochile, mesochile, and epichile; hypochile semilunate when viewed from the side, laterally compressed, lacking a basal angle, with 1 curved

keel on each side without, bidentate in front; mesochile abbreviated, with a pair of prominent, linear, incurved horns; epichile suborbicular-elliptic, abruptly acute. Column slender, arcuate, prominently bialate above to near the middle with semi-elliptic wings, about 5 cm. long.

Peru: Habitat unrecorded (imported by Mr. Tate) (type).—Cuzco: Prov. of Quispicanchis, Marcapata Valley, 1700–1800 meters, “ever-green hard-leaved bushwood consisting of shrubs and trees,” *Weberbauer* 7841.—Junín: Chanchamayo Valley, 1200 meters, *Schunke* 1278. Also Brazil.

Stanhopea Haseloviana Reichb. f. *Allg. Gartenz.* 23: 322. 1855, (as “Haseloffiana”); Reichb. f. *Xen. Orch.* 1: 123, 196, t. 72. 1856. Hook. f. *Bot. Mag.* 122: t. 7452. 1896.

Plant large, epiphytic. Pseudobulbs ovoid or flask-shaped, plurisulcate, unifoliate at the apex, surrounded by the fibres of evanescent sheaths, up to 6.4 cm. high. Leaf petioled; lamina elliptic-oblong to elliptic, acuminate, cuneate below, plicate, prominently 5- to 7-ribbed, up to 50 cm. long and 12 cm. wide; petiole stout, channelled, up to 17.4 cm. long. Inflorescence lateral, basal, about 12 cm. long, apparently pendulous, below entirely invested by several (about 10) distichously imbricating, loose, scarios, evanescent sheaths (progressively larger upward) and above loosely 2- to 5-flowered. Sheaths, bracts, pedicellate ovary, and back of sepals covered with minute black dots. Pedicellate ovary slender, about 9 cm. long, commonly exceeding the large, loose bract. Flowers very large, with reflexed sepals and petals, white or pale gray (yellowish within) with pale and deep red-violet rings or spots. Dorsal sepal elliptic-lanceolate (“oblong-lanceolate”), subacute, concave, membranaceous, nearly 8 cm. long and 3 cm. wide. Lateral sepals obliquely elliptic-ovate to suborbicular, slightly longer and considerably wider than the dorsal sepal, acute. Petals oblong-lanceolate (“broadly ligulate”), sometimes obovate-oblong, short-acuminate, a little shorter and much narrower than the dorsal sepal, undulate on the margins. Lip fleshy, nearly 8 cm. long when expanded, divided into a hypochile, mesochile, and epichile; hypochile sessile, broadly semilunate when viewed from the side, complanate, with one long and one short keel on each side without, fimbriate or papillose within; mesochile short but with a distinct claw, provided above with a pair of conspicuous, incurved, fleshy, linear or linear-semielliptic horns; epichile oval-ovate, subacute to acuminate, about 3.5 cm. long. Column stout, arcuate, prominently bialate above the middle, 7–8 cm. long, bidentate at the apex.

North Peru: Habitat not recorded, *Warszewicz* s.n. (type).—Cajamarca, fide Schlechter, *Fedde Repert. Beih.* 9: 158. 1921.—San Martín: Zepelacio, near Moyobamba, 1100–1200 meters, in forest, *Klug* 0.23.

Stanhopea Moliana Rolfe, *Lindenia* 7: t. 331. 1892.

Plant large. Pseudobulbs ovoid, aggregated, surrounded by sheaths, unifoliate at the apex. Leaf long-petioled; lamina lanceolate-elliptic, acuminate, plicate, with 5 or more conspicuous nerves. Inflorescence lateral, basal, pendulous, below

few-sheathed, above loosely racemose with about 4 flowers. Bracts and the slender pedicellate ovary minutely punctate. Pedicellate ovary 7 cm. long, much surpassing the bracts. Flowers very large, fragrant, with spreading-reflexed sepals and petals. Sepals cream-color, irregularly spotted with reddish purple; petals white with larger and more deeply colored spots; lip white with a mass of tiny red-purple spots. Dorsal sepal "oblong" or ovate-oblong, obtuse, about 7 cm. long and 4 cm. wide. Lateral sepals "ovate" or oblong-ovate, oblique, about as long as the dorsal sepal but broader. Petals "narrowly oblong" or oblong-lanceolate, gradually narrowed above to a subobtuse tip, undulate on the margins, shorter and much narrower than the sepals. Lip fleshy, about 6 cm. long, divided into a hypochile, mesochile, and epichile; hypochile sessile, deeply saccate, obovate-oblong in outline, uncarinate on each side without, rounded and not angled at the base; mesochile short, sessile, with a pair of conspicuous, stout, linear, incurved horns; epichile very broadly ovate, acute. Column stout, arcuate, broadly bialate above the middle, about equaling the sepals.

Peru: Habitat and collector not recorded (introduced by Horticulture Internationale).

No specimen was available.

Stanhopea Randii Rolfe, Kew Bull. (1894) 363.

Plant epiphytic, variable in size. Pseudobulb ovoid-conic, more or less tetragonous, plurisulcate, unifoliate at the apex, clothed with several large evanescent sheaths, up to 5 cm. long. Leaf petioled; lamina elliptic or oblong-elliptic, acute or short-acuminate, cuneate below, 21.5–38 cm. long, up to 9 cm. wide, conspicuously 5- to 7-nerved; petiole stout, channelled, 2–11 cm. long. Inflorescence short, lateral and basal, spreading or pendulous, stout, the peduncle more or less concealed by several (up to 7) distichous, loosely spreading, scarious sheaths, loosely few-(2- to 4-) flowered above, the rachis being 5 cm. or less long. Floral bracts similar to the upper sheaths but larger, much shorter than the slender pedicellate ovaries which reach a length of 10.5 cm. Flowers variable in size, snow-white to ivory-white or yellowish, with the lip more or less purple-spotted, very fragrant, with spreading or reflexed segments. Dorsal sepal ovate-oblong or elliptic-oblong, complicate-acute, concave, membranaceous, about 4–4.5 cm. long and 1.5 cm. wide when expanded. Lateral sepals oval-ovate, complicate-acute, oblique, concave, usually a little longer and markedly broader than the dorsal sepal. Petals elliptic-ovate to lanceolate-oblong, oblique, acute or short-acuminate, a little shorter than the dorsal sepal but sometimes nearly as wide. Lip commonly shorter than the other segments, fleshy, lanceolate or oblong-lanceolate in outline, 3–4 cm. long, divided into a hypochile, mesochile, and epichile; hypochile ovate, deeply concave, with a pair of porrect or uncinat, short, stout, marginal horns near the base, surrounding a minute transverse cavity, the sides extended in front into a pair of fleshy, approximate teeth; mesochile abbreviated, very fleshy, without horns, truncate or broadly retuse at the apex; epichile triangular, lightly convex, acuminate. Column slender, arcuate, with a pair of semioblanceolate wings above, about 4–4.5 cm. long.

Huánuco: Tingo María, 670 meters, *Carpenter 122*.—Loreto: San Isidro, at mouth of the Pastazza River, 135 meters, epiphyte in rain-

forest, *Tessmann 4984*. Vicinity of Iquitos, 100 meters, *Klug 10034, 10084, 10110*.—San Martín: Near Huallaga River near Tingo María, 625–1100 meters, *Allard 22256d*. Brazil (type).

Stanhopea tricornis Lindl. Journ. Hort. Soc. 4: 263. 1849; Reichb. f. Xen. Orch. 1: 117. 1855; Kränzl. Xen. Orch. 3: 140, tt. 275, fig. IV, 280. 1894. *Stanhopea convoluta* Rolfe, Kew Bull. (1909) 366; Bot. Mag. 139: t. 8507. 1913.

Plant epiphytic, large. Pseudobulbs aggregated, ovoid or elongate-ovoid, obscurely 5-angled, about 5 cm. high, unifoliate at the summit. Leaf petioled; lamina elliptic or oblong-elliptic, shortly and abruptly acuminate, plicate with 5 to 7 conspicuous nerves, up to 35 cm. long and 14 cm. wide; petiole stout, about 8 cm. long. Inflorescences short, lateral, basal, below provided with several ovate, imbricated sheaths, above 2-flowered. Pedicels about 7 cm. long, exceeding the loose, scarios, convolute bracts. Flowers large, with spreading sepals; sepals white or cream-colored; petals similar with buff or orange tips, or pinkish; lip buff-yellow with the interior of the sac orange. Dorsal sepal elliptic-oblong or ovate-oblong, concave, subacute at the recurved apex, about 6.5 cm. long and 3.5 cm. wide. Lateral sepals similar to the dorsal sepal but markedly larger, oblique. Petals connivent over the column, obliquely ovate, more or less fleshy, concave, abruptly subacute, slightly smaller than the dorsal sepal. Lip very fleshy, about 4 cm. long, divided into a hypochile, an indistinct mesochile, and an epichile; hypochile subglobose, with an erect angle on each side near the base, about 2.2 cm. long; mesochile scarcely distinct, provided with a pair of prominent, short, obliquely oblong, incurved horns and with a small porrect horn in the middle; epichile oblong, concave, subtrilobulate at the truncate, inflexed apex, about 2 cm. long and 1 cm. wide. Column arcuate, abruptly bialate above the middle, 4 cm. long.

Western (coastal) Peru: Habitat not recorded, *Warszewicz s.n.* (type of *S. tricornis*). Also Colombia (type of *S. convoluta*) and Ecuador.

No example of this concept was accessible.

Stanhopea Wardii Lodd. ex Lindl. Sert. Orch. t. 20. 1838. *Stanhopea Wardii* Lodd. ex Lindl. var. *venusta* Rolfe, *Lindenia* 7: t. 315. 1892. *Stanhopea anfracta* Rolfe, *Orch. Rev.* 12: 357. 1904. *Stanhopea peruviana* Rolfe, *Bot. Mag.* 138: t. 8417. 1912. Figure 118; Figure 160 (see p. 786).

Plant large, variable. Pseudobulbs aggregated, ovoid-conical, longitudinally sulcate, surrounded by fibrous evanescent sheaths, up to 7 cm. high. Leaf petioled; lamina elliptic-lanceolate to broadly elliptic or obovate-elliptic, obtuse to abruptly acute, up to 50 cm. long and 17 cm. wide; petiole relatively slender, sulcate, up to 15 cm. long. Inflorescence lateral, basal, pendent, below invested by several inflated, scarios, mostly imbricating sheaths, above loosely 3- to 9-flowered. Pedicellate ovaries rather stout, about twice as long as the convolute, scarios floral bracts. Flowers large, fragrant, greenish white to yellow, more or less marked with reddish purple dots. Dorsal sepal elliptic-ovate, rounded

and somewhat apiculate at the apex, about 4.4–6.3 cm. long, up to 3.5 cm. wide. Lateral sepals broadly oblong-ovate, oblique, obtuse to acute, rather larger than the dorsal sepal, reflexed. Petals elliptic-lanceolate or linear-oblong, acute or acuminate, recurved, with the margins crisped-undulate, shorter and much narrower than the sepals. Lip fleshy, 3.7–5 cm. long, divided into a hypochile, mesochile and epichile; hypochile deeply saccate and semiglobose, somewhat semilunate when viewed from the side, with a curved keel on each side without, more or less angled on the upper edge near the base, up to 2.3 cm. long, with a more or less conspicuous purple blotch on each side; mesochile short, with a pair of erect, arcuate, linear or semielliptic, acuminate horns up to 3.5 cm. long; epichile rounded-ovate, abruptly acute and reflexed at the tip, up to 3.3 cm. long. Column slender, arcuate, broadly winged above, up to 5 cm. long.

Peru: Habitat not recorded (perhaps north Peru, collected by Hennis), (type of *S. anfracta*). Peru: Habitat not recorded, *Forget s.n.* (type of *S. peruviana*).—San Martín: Zepelacio, near Moyobamba, about 1100 meters, in mountain forest, *Klug 3617, 3684*. Also Mexico through Central America to Panama, Venezuela (type of *S. Wardii*) and perhaps Ecuador.

Stanhopea xytriophora Reichb. f. Gard. Chron. (1868) 842.

Vegetative portions and all floral parts except the lip apparently lacking. Lip divided into a hypochile, mesochile, and epichile, probably pale straw-color with purple on the base of the lip and purplish dots on the epichile; hypochile very short, angulate-saccate, subtriangular when viewed laterally, with 2 keels on each side, one a half as long as the other; mesochile provided with a pair of falcate horns; epichile rhombic-ovate, obtuse-angled, prominently apiculate, with a swelling or tumor at the base. Column winged above the middle.

Peru: Habitat not recorded (imported by Veitch & Sons).

No specimen of this species was seen.

GONGORA Ruíz & Pavón

A rather small but very perplexing genus of American epiphytes extending from Mexico and the West Indies to Brazil and Peru.

Stems very short, sheathed at the base, soon developing into a fleshy pseudobulb which is leaf-bearing at the summit. Leaves commonly two, elliptic or elliptic-oblong to broadly obovate, acute or acuminate, contracted below, ample, plicate. Scapes lateral, basal, simple, usually arcuate or reflexed, with a loose, commonly elongate raceme. Flowers medium-sized to large, long-pedicelled. Dorsal sepal more or less adnate to the column, erect-spreading. Lateral sepals broader, oblique, spreading or reflexed, with the base adnate to the column-foot. Petals much smaller than the sepals, oblique, strongly adnate to the column. Lip continuous with the column-foot, spreading or ascending, narrow, fleshy, complex, 3-lobed; lateral lobes (forming the hypochile) erect, bearing horns or bristles; mid-lobe (epichile) complicate-saccate or laterally compressed. Column slender, erect or



FIG. 118. *Stanhopea Wardii* Lodd. In background, flowering plant; $\times \frac{1}{2}$. Inflorescence; about $\times 1$.

3, pt. 5: 544. 1902. *Gongora fulva* Lindl. Bot. Reg. 25: t. 51. 1839. *Gongora fulva* var. *vitellina* Lindl. Bot. Reg. 27, Misc. 1, no. 4. 1841. *Gongora maculata* var. *tricolor* Lindl. Bot. Reg. 30, Misc. 26, no. 30. 1844; Bot. Reg. 33: t. 69. 1847. *Gongora leucochila* Lem. Fl. des Serres 1: 87, t. 37. 1845. *Gongora retrorsa* Reichb. f. Bonpl. 2: 19. 1854; Xen. Orch. 1: t. 20, fig. 3. 1854. *Gongora histrionica* Reichb. f. Bonpl. 2: 92. 1854; Xen. Orch. 1: 53. 1854. *Gongora tricolor* Reichb. f. Bonpl. 2: 93. 1854; Xen. Orch. 1: 53. 1854. *Gongora quinquevulneris* Beer, Prakt. Stud. Orch. 252. 1854. Figure 119.

Plant epiphytic, very variable. Pseudobulbs aggregated, oblong-ovoid, plurisulcate, at first clothed with large membranaceous sheaths, later naked, bifoliate at the apex, up to 12 cm. long. Leaves large, elliptic-lanceolate or elliptic-oblong to elliptic or oblanceolate, acute to acuminate, gradually narrowed below to a more or less distinct, channelled petiole, up to 60 cm. long (including the petiole) and 15 cm. wide, plicate. Scape lateral, basal, arcuate or pendulous, shorter or longer than the leaves, slender, provided with several short, remote sheaths below the middle, loosely racemose above, several- to many-flowered, up to 90 cm. long. Flowers medium-sized, long-pedicelled, commonly yellow to greenish spotted with dark brown (rarely red-violet or brown and yellow). Dorsal sepal strongly adnate to the column, lanceolate or ovate-lanceolate, acute or acuminate, concave, up to 24 mm. long and 9 mm. wide. Lateral sepals triangular-lanceolate or ovate-lanceolate, oblique, acuminate, adnate to the column-foot, reflexed, convex, longer and much broader than the dorsal sepal. Petals much smaller than the sepals, adnate to the lower half of the column, abruptly long-decurrent, the free part linear, sigmoid-flexuous, aristate-acuminate, up to 9 mm. long. Lip fleshy, rigid, subsessile to short-clawed, sharply divided into a hypochile and epichile, up to 30 mm. long; hypochile consisting of a pair of erect, obliquely subquadrate lobes which are slightly broader at the angled front, provided near the middle on the lower edge with a pair of more or less prominent (often clavate) tubercles which are erect or spreading and in front (separated by a deep cleft) with a pair of conspicuous, erect, subulate antennae; epichile triangular-lanceolate, ancipitous, long-acuminate and decurved at the apex, with a short high keel at the base. Column slender, arcuate, subclavate, up to 17 mm. long, produced into a distinct foot.

Huánuco: Pozuzo, in woods, on trees, *Pavón s.n.* (type of *G. quinquenervis*). Tingo María, along Huallaga River, 5 miles southeast of Tingo María, 670 meters, on *Pithecellobium*, *Seibert 1824*.—Junín: Chanchamayo Valley, 1200 meters, *Schunke 557*.—Loreto: Near Tarpoto and on Río Tocache, *Spruce s.n.* Vicinity of Iquitos, 100 meters, in dense forest or clearing, *Klug 10009, 10010, 10016, 10019, 10042, 10048, 10054, 10055, 10057*.—San Martín: Juan Jui, Alto Río Huallaga, 400–800 meters, *Klug 4225*.

Also from Mexico (type of *G. fulva* var. *vitellina*), British Honduras and Guatemala (type of *G. leucochila*) to Panama, Colombia, Venezuela (type of *G. retrorsa*), the Guianas, Brazil and Peru (type of *G. quinquenervis* and *G. quinquevulneris*).



FIG. 119. *Gongora maculata* Lindl. Plant; about $\times \frac{1}{2}$.

Gongora maculata Lindl. var. **leucochila** (Lindl.) C. Schweinf. comb. nov. *Gongora bufonia* Lindl. Bot. Reg. 27: t. 2. 1841; Cogn. Martius Fl. Bras. 3, pt. 5: 542. 1902. *Gongora bufonia* Lindl. var. *leucochila* Lindl. Bot. Reg. 33: t. 17. 1847. *Gongora maculata* var. *bufonia* (Lindl.) C. Schweinf. Bot. Mus. Leafl. Harvard Univ. 11: 193. 1944.

This variant differs from *G. maculata* in lacking the prominent basal horns on the hypochile or in having them represented only by conical swellings or protuberances. Often the flowers are somewhat larger than in the type, with duller reddish-purple segments sometimes suffused with whitish.

Loreto: Vicinity of Iquitos, 100 meters, in clearing or dense forest, *Klug* 10008, 10032, 10053, 10056, 10062, 10063, 10064.—San Martín: Juan Jui, Alto Río Huallaga, about 400 meters, *Klug* 3860. Also Brazil (type of *G. bufonia*).

Gongora nigropunctata Schltr. Fedde Repert. Beih. 9: 99. 1921; Mansf. Fedde Repert. Beih. 57: t. 123, nr. 484. 1929.

Pseudobulbs and leaves not yet seen. Inflorescence arcuate-pendulous, loosely 15- to 20-flowered, about 30 cm. long. Flowers medium-sized, dark purple or dark violet with black spots. Dorsal sepal broadly "elliptic" or elliptic-lanceolate, short-acuminate, concave, strongly adnate to the column, about 2 cm. long and nearly 1 cm. wide. Lateral sepals broadly ovate, short-acuminate, somewhat longer and wider than the dorsal sepal, lightly oblique. Petals much smaller than the sepals, sigmoid-ligulate, aristate-acuminate, strongly adnate to and decurrent on the column, about 1.5 cm. long. Lip shortly clawed, about 2.6 cm. long, sharply divided into a hypochile and epichile; hypochile oblong-quadrate in outline, deeply saccate, cuneate-narrowed below, provided near the base with a pair of large, straight, subterete, obtuse horns about 5 mm. long (protruding far above the hypochile), terminating in front in a pair of suberect, triangular-setaceous bristles about 9 mm. high; epichile triangular-lanceolate, aciculate, acuminate, with a short high keel at the base, about 1 cm. long. Column arcuate, subclavate, about 2.3 cm. long, with a foot about 6 mm. long.

Loreto: Near Moyobamba, *Filomeno s.n.*

Description compiled from the original diagnosis, supplemented by the analysis of the flower cited.

Gongora Sanderiana Kränzl. Gard. Chron. ser. 3, 20: 456. 1896.

Pseudobulbs large, narrowly conical or pyriform-cylindric, up to 12 cm. high, bifoliate at the apex. Leaves abruptly narrowed to a short petiole; lamina oblong-elliptic ("broadly oblong"), acute, plicate, 5-nerved, about 25 cm. long (including the petiole) and 11 cm. wide; petiole slender, channelled, about 6 cm. long. Inflorescences usually 5 or 6, long, pendulous, exceeding 30 cm. in length, loosely racemose and few-flowered above. Flowers medium-sized, yellowish or brownish with whitish yellow petals and column, having numerous rose-colored spots. Dorsal sepal "broadly ovate" or ovate-elliptic, acute, concave, about 2.2 cm. long. Lateral

sepals larger, very broadly ovate, equally long and broad, acute, oblique, sinuate above. Petals linear, aristate at the apex, fleshy. Lip clawed, sharply divided into a hypochile and epichile; hypochile (? "mesochile") linear, straight, low below, with infolded contiguous margins, then dilated into a pair of erect, quadrate lobes of which the posterior angle (toward the base) is produced into a long tendril circinate at the apex, with a fleshy tubercle in the crack between the lobes; epichile linear, half as long, very thin. Column clavate, shorter than the dorsal sepal, produced into a foot.

Peru: Without locality, (introduced by F. Sander, St. Albans).

This description was prepared from the original diagnosis, supplemented by a photograph of the type collection. The Latin description of the lip appears to be somewhat obscure.

Gongora scaphephorus Reichb. f. & Warscz. Bonpl. 2: 98. 1854; Reichb. f. Xen. Orch. 1: 52. 1854; Reichb. f. Bonpl. 3: 218. 1855. *Gongora Incarum* Kränzl. Engler Bot. Jahrb. 37: 388. 1906.

Pseudobulbs large, subcylindric or ovoid, lightly 4-angled, shining, up to 10 cm. long. Leaves petioled; lamina broadly oblong or elliptic-oblong, acute, gradually narrowed below, plicate, 5-nerved, up to 45 cm. long and 10 cm. wide; petiole stout, sulcate, up to 13 cm. long. Inflorescences pendulous, very long, loosely many-flowered, more than 70 cm. long. Flowers medium-sized, yellowish white, yellow or reddish brown, marked with dull purple spots. Dorsal sepal elliptic-ovate to "oblong," acute, concave, adnate to the middle of the back of the column, about 1.5 cm. long, scarcely 1 cm. wide. Lateral sepals much larger, semiorbicular, obtusely acute, concave, about 2 cm. long. Petals dwarf, adnate to the column below the dorsal sepal, long-decurrent on the column, obliquely triangular, acute or uncinately-setaceous, angled on the dorsal margin. Lip incurved, slender-clawed, sharply divided into a hypochile and epichile, about 2.5 cm. long; hypochile strongly complanate, about 1.5 cm. long, almost semiorbicular when viewed from the side, extended at the base above into a pair of oblong, erect lobules which are rounded at the apex, in front with a pair of low, semiovate lobules terminating in a short seta; epichile complicate-ovate or navicular, acuminate, about 1 cm. long, with a quadrate, erect keel at the base. Column arcuate, winged above as in *Stanhopea*, together with the foot about 1.5 cm. long.

Peru: Habitat unknown, *Warszewicz s.n.* (type of *G. scaphephorus*). —Loreto: Mountains north of Moyobamba, 900–1000 meters, in woods with scattered bushes, *Weberbauer 4626* (type of *G. Incarum*).

No material of this species was available, the description being amplified by sketches of the flowers from the Reichenbach Herbarium.

Gongora Tracyana Rolfe, Kew Bull. (1912) 133; Schltr. Orchis 9: 8, t. 2, figs. 8–13. 1915.

Pseudobulbs ovoid, angled or sulcate, clothed with ample, ovate sheaths, bifoliate at the apex, up to 5 cm. long. Leaves elliptic-lanceolate, subacute, attenuate below into a short petiole, plicate, 3-nerved, subcoriaceous and shining, up to 25 cm.

long and 6 cm. wide. Scapes pendulous, slender, up to 45 cm. long; racemes 35 cm. long, laxly many-flowered. Pedicels elongate, up to 3.5 cm. long. Flowers small for the genus, greenish-yellow barred with red-brown, lip ivory-white with a few brown lines on the basal half. Dorsal sepal "lanceolate" or elliptic-lanceolate, acute, concave, about 1.3 cm. long. Lateral sepals obliquely "oblong-lanceolate" or elliptic-lanceolate, acute, reflexed, a little larger than the dorsal sepal. Petals dwarf, obliquely triangular-oblong, adnate to and decurrent on the lower part of the column, acute, about 2 mm. long. Lip incurved, clawed, 3-lobed, divided into a hypochile and epichile, about 9 mm. long; hypochile or lateral lobes erect, broad and subquadrate below, in front bearing a falcate seta about 4 mm. long; epichile or mid-lobe complanate-ovate, subobtusate, about 4 mm. long, with an obovate-oblong, truncate, compressed callus. Column clavate, about 1 cm. long, produced into a foot.

Peru: Habitat not recorded, *Kromer s.n.* (introduced by Mr. H. A. Tracy, of Twickenham).

No material of this species was seen.

CORYANTHES Hook.

A small genus of showy epiphytes of the American tropics extending from British Honduras and Guatemala through Central America to Brazil and Peru.

Stems abbreviated, thickened into fleshy pseudobulbs bearing commonly 2 leaves at the summit. Leaves ample, plicate, acute or acuminate, narrowed into a more or less distinct petiole. Inflorescence lateral, basal, simple, spreading to pendent, loosely racemose above, 1- to few-flowered. Flowers medium-sized to very large, with spreading or reflexed segments. Sepals free or adnate to the column, membranaceous, more or less undulate. Dorsal sepal relatively small. Lateral sepals much larger, very oblique, commonly semilunate-ovate. Petals much narrower than the sepals, commonly longer than the dorsal sepal but shorter than the lateral sepals. Lip mostly fleshy, divided into a very short- or long-clawed hypochile, which is commonly deeply concave and more or less semiglobose, a relatively narrow, semicylindric mesochile, and a much larger, galeate epichile which is commonly abruptly 3-lobulate in front. Column dilated upward, abruptly reflexed near the apex, with a pair of more or less fleshy horns, auricles or glands at the base. Anther terminal, opercular, incumbent, 2-celled. Pollinia 2.

- A1. Outer surface of the mesochile smooth, without transverse lamellae. I
 A2. Outer surface of the mesochile corrugated or provided with transverse lamellae. 2
 1a. Hypochile conic-subglobose; mesochile stout, short, 2 cm. or less long.
C. punctata
 1b. Hypochile not conic-subglobose; mesochile slender, elongate, about 4 cm. or more long. 1
 1a. Dorsal sepal oblong or oblong-lanceolate, acuminate; petals short-acuminate; column about 4.7 cm. long. *C. bicalcarata*
 1b. Dorsal sepal suborbicular-oval, acute or subacute; petals obtuse or subacute; column about 5.2 cm. or more long. *C. macrocorys*

- 2a. Flowers large, dorsal sepal 4 cm. or more long, lateral sepals 8–10 cm. long. 3
 2b. Flowers relatively small, dorsal sepal 2.4 cm. or less long, lateral sepals about 5.7 cm. or less long. 4
 3a. Mesochile short, concealed by the white hypochile. *C. leucocorys*
 3b. Mesochile distinctly protuberant between the hypochile and epichile; hypochile commonly orange-red, usually spotted. *C. macrantha*
 4a. Pseudobulb 3-leaved; hypochile semiglobose or conic-semiglobose; mesochile short, free portion about 8 mm. long, concealed by 2 conspicuous, decurved, transverse lamellae. *C. trifoliata*
 4b. Pseudobulb 2-leaved; hypochile shallowly concave (semiovoid when viewed from the side); mesochile prominent, free portion about 1.5 cm. long.
C. alborosea

Coryanthes alborosea C. Schweinf. Am. Orch. Soc. Bull. 12: 242, t., 1943. Figure 120.

Plant epiphytic, rather small for the genus. Pseudobulbs narrowly ovoid or cylindrical-pyriform, bifoliate at the apex, deeply channelled in the dried specimen, up to 6.7 cm. long. Leaves about 22 cm. long including the short, sulcate petiole; lamina oblong-elliptic, short-acuminate, cuneate-narrowed below, about 3.5 cm. wide, plicate, chartaceous. Inflorescence lateral (broken off in the type specimen), loosely 2-flowered at the apex; peduncle slender, about 17 cm. long, with 3 or more short, remote, tubular-infundibuliform sheaths. Pedicellate ovary elongate, slender, up to 7.5 cm. long, nearly three times as long as the concave subtending bract. Flowers small for the genus, "white, light and dark lilac-rose, black violet." Dorsal sepal suborbicular-ovate, obtuse, adnate to the column, about 2.4 cm. long and 2 cm. wide. Lateral sepals obliquely oblong-ovate, semilunate, acute, about 5.5 cm. long from the apex to the tip of the anterior dilated portion and somewhat broader than the dorsal sepal. Petals narrowly oblong, falcate, more or less lobulate-dilated near the subtruncate apex and similarly broadened near the base, slightly longer than the dorsal sepal. Lip divided, as in the genus, into a clawed, concave hypochile, a relatively narrow mesochile, and a much larger, bucket-like epichile; claw short, narrow, sulcate, about 7 mm. long; hypochile shallowly concave, semiovoid when viewed from the side, about 2.2 cm. long to the rounded and recurved apex, densely bearded on the apical portion on both inner and outer surfaces; mesochile (free portion) about 1.5 cm. long, semitubular in cross section, with 3 or 4 small lobulate, transverse ridges on the outer surface; epichile much larger, abrupt, apparently rhombic-quadrate and strongly complanate when viewed from the side, about 3.6 cm. long from the base to the apex and 2.5 cm. deep, abruptly 3-lobulate in front, the lateral lobules ovate-triangular and uncinatate, the middle lobule broadly oblong, straight, concave, with a broadly rounded, fleshy tip. Column gradually dilated upward, abruptly recurved near the apex, bialate, about 1.4 cm. long, provided at the base with a pair of short, ovate-uncinate glands or horns.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10092*.

Coryanthes bicalcarata Schltr. Fedde Repert. Beih. 9: 99. 1921; Mansf. Fedde Repert. Beih. 57: t. 124, nr. 485. 1929.

Plant epiphytic, erect. Pseudobulbs and leaves lacking. Inflorescence apparently spreading, 2-flowered above; peduncle few-sheathed, about 15–18 cm. long.

CORYANTHES

alborosea C. Schweinf.



FIG. 120. *Coryanthes alborosea* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, column and lip from side; $\times 1$. 3, dorsal sepal, spread out; $\times 1$. 4, petal, spread out; $\times 1$.

Pedicellate ovary slender, up to 7.5 cm. long, 4 or 5 times longer than the subtending bract. Flower rather large. Dorsal sepal oblong or oblong-lanceolate, acuminate, about 5.5 cm. long. Lateral sepals reflexed, very obliquely ovate with the anterior margin much dilated near the base, long-acuminate, longer and much wider than the dorsal sepal. Petals obliquely oblong-ligulate, slightly broader above, abruptly short-acuminate, a little shorter than the dorsal sepal. Lip divided, as in the genus, into a concave, clawed hypochile, a narrow, semitubular mesochile and a large, bucket-like epichile; claw short, small; hypochile oblong in outline, deeply galeate, truncate in front, recurved toward the ovary, about 2.5 cm. long and 8 mm. wide, glabrous; mesochile slender-subcylindric, elongate, deeply channelled, smooth, 4.5 cm. long; epichile much larger, subglobose, abruptly 3-lobulate in front, about 3.2 cm. long and 3.5 cm. deep, with the sides of the basal portion erect and obliquely semioval, the lateral lobules at the apex small, erect, obliquely ovate-oblong ("semi-oblong") and falcate; middle lobule incurved, slightly longer than the lateral lobules, narrowly oblong ("semi-oblong") with an obtuse tip. Column of the genus, slender, slightly dilated upward, abruptly recurved at the apex, 4.7 cm. long, at the base with a pair of linear-oblong, fleshy, falcate glands or horns about 2.2 cm. long, which about equal the hypochile and have a dilated base and an oblique apex.

Loreto: Near Moyobamba, *Filomeno s.n.*

No example of this species was available.

Coryanthes leucocorys Rolfe, *Lindenia* 7: 13, t. 293. 1891; *Schltr. Orchis* 10: 76, fig. 17. 1916.

Pseudobulbs aggregated, ovoid or oblong-ovoid, deeply channelled, bifoliate at the apex, up to 6.5 cm. tall. Leaves lanceolate-elliptic, acute, cuneate-narrowed to an indistinct petiole, about 25 cm. long and 8 cm. wide, plicate, with 3 to 5 conspicuous nerves beneath. Inflorescence lateral, 1- or very loosely 2-flowered above. Pedicellate ovary about 11 cm. long, slender, nearly 3 times as long as the broadly ovate, concave subtending bract. Flowers large. Sepals yellowish-green, spotted or streaked with brown-purple. Dorsal sepal suborbicular, about 4.4 cm. long and subequally wide. Lateral sepals obliquely ovate-oblong, falcate, subobtuse, about 10 cm. long and slightly wider than the dorsal sepal, twisted. Petals linear-oblong, falcate, obtuse, much longer than the dorsal sepal but much shorter than the lateral sepals, white. Lip divided, as in the genus, into a clawed hypochile, a slender, channelled mesochile, and a much larger, abrupt, bucket-like epichile; claw stout, arcuate, about 4 cm. long; hypochile subglobose, ivory-white, about 4.4 cm. long and little narrower, with a V-shaped, satiny-pubescent band without; mesochile short and entirely concealed by the hypochile, deeply channelled, about 2 cm. long, the outer surface on each side transversely corrugated or with 3 transverse folds, ivory-white; epichile quadrate-subglobose, 3-lobulate in front, rose-purple, about 5 cm. long and nearly as deep, the lateral lobules ovate-triangular, falcate, and acute, the middle lobule broadly oblong and obtuse. Column of the genus, whitish-green, 5 cm. long, with a pair of uncinat glands or horns at the base.

Peru: Habitat not recorded, introduced by Mm. Linden, Brussels (type).—Loreto, fide Schlechter, *Fedde Repert. Beih.* 9: 159. 1921.

No material of this species was available.

Coryanthes macrantha (Hook.) Hook. Bot. Mag. 58: sub t. 3102. 1831; Lindl. Bot. Reg. 22: t. 1841. 1836; Hook. f. Bot. Mag. 126: t. 7692. 1900; Cogn. Martius Fl. Bras. 3, pt. 5: 514. 1902. *Gongora macrantha* Hook. Bot. Misc. 2: 151, t. 80. 1831.

Plant epiphytic. Pseudobulbs more or less approximate, narrowly ovoid to pyriform-cylindric, bifoliate at the apex, deeply plurisulcate in the dried specimen, up to 9 cm. or more tall. Leaves erect-spreading, with a more or less distinct channelled petiole, up to 43 cm. long including the petioled base; lamina elliptic to oblong-elliptic, gradually narrowed toward both ends, up to 8 cm. wide, plicate, chartaceous, with 3-5 prominent nerves beneath. Inflorescence lateral, basal, spreading or pendent, shorter or longer than the leaves, 1- to 3- (commonly 2-) flowered above; peduncle about 23 cm. or less long, with few (up to 7), mostly remote, infundibuliform sheaths; raceme very loose, with remote flowers on divergent pedicels. Floral bracts large, concave, scarious. Pedicellate ovary very slender, twice or more longer than the subtending bract, up to 15 cm. long. Flowers large, yellow to orange or red (rarely cream-rose) with red-violet spots on the sepals, petals, and epichile of the lip (very rarely unspotted according to the collector's notes). Sepals and petals thinly membranaceous. Dorsal sepal broadly ovate or oblong-lanceolate, obtuse, up to 5 cm. long and often nearly as wide. Lateral sepals reflexed, obliquely ovate-semilunate, acute or short-acuminate, up to 10 cm. or more long from the tip to the anterior dilated portion and 5 cm. wide where broadest. Petals linear-oblong, falcate, twisted, obtuse or acute, slightly exceeding the dorsal sepal. Lip divided, as in the genus, into a clawed, concave hypochile, a semitubular mesochile, and a large, bucket-like epichile; claw stout or slender, channelled, up to 2.5 cm. long; hypochile semiglobose, 2.5-3.8 cm. wide and nearly as deep, pubescent in front, commonly orange-red: mesochile stout, semicylindric, protuberant between the hypochile and epichile, with 3-6 transverse, lobulate, fleshy lamellae without (occasionally these are obscure in dried specimens), the free portion about 2.5 cm. long; epichile much larger, abrupt, subglobose-quadrate, more or less laterally complanate, about 5 cm. long and subequally deep, abruptly 3-lobulate in front with a pair of semiorbicular lobes posteriorly, the lateral lobules ovate-triangular and uncinata above, the middle lobule triangular-ovate with a broadly rounded apex. Column stout, about 4.5 cm. long, dilated upward especially at the apex, abruptly reflexed near the summit, bialate, with a pair of porrect, short, obliquely ovate-triangular glands or horns at the base.

Loreto: Vicinity of Iquitos, 100 meters, in dense forest, *Klug* 10035, 10036, 10040, 10046, 10058, 10071, 10079, 10093, 10127. Mishuyacu, near Iquitos, 100 meters, in forest, *Klug* 1048. Also British Guiana and Venezuela (type).

Coryanthes macrocorys Rolfe, *Lindenia* 8: 15, t. 342. 1892; *Schltr. Orchis* 10: 72, fig. 15. 1916.

Plant epiphytic, rather large. Pseudobulbs approximate, oblong-ovoid, 6-10 cm. long, bifoliate at the apex, deeply plurisulcate in the dried specimen. Leaves elliptic-lanceolate, acute or acuminate, long-narrowed to a more or less distinct, channelled petiole, up to 53 cm. long and 6 cm. wide, plicate, chartaceous, with 3-5 prominent nerves beneath. Inflorescence lateral, basal, spreading or pendent,

very loosely 2-flowered at the summit; peduncle stout, shorter than the leaves, about 26 cm. long, bearing several short, mostly remote, tubular sheaths; rachis strongly fractiflex. Floral bracts deeply concave, scarious, up to 4 cm. long, about half as long as the pedicellate ovary. Flowers large, greenish yellow copiously dotted with reddish brown or "cream-green, flesh-rose, light brown dotted with red-violet spots." Sepals and petals membranaceous. Dorsal sepal suborbicular-oval, acute or subacute, adnate to the column with the sides decurrent at the base, about 3.5 cm. long and slightly narrower. Lateral sepals obliquely oblong-ovate, lightly falcate or semilunate, long-adnate to the column, acute, about 8.7 cm. long from the apex to the tip of the anterior dilated portion and 4 cm. broad. Petals obliquely adnate to the column, narrowly oblong-lanceolate, falcate, obtuse or subacute, slightly longer than the dorsal sepal. Lip divided, as in the genus, into a clawed hypochile, a narrow, semitubular mesochile, and a much larger, abrupt epichile; claw very short, stout, lightly dilated upward, about 5 mm. long; hypochile very fleshy, elongate, oblong or ovate-oblong in outline, concave-sulcate in the center of the lower half, rounded-truncate at the apex, about 2.7 cm. long and 1.4 cm. wide near the base; mesochile very slender, elongate, recurved, semicylindric in cross section, smooth, about 4 cm. long; epichile much larger, subglobose in outline, more or less complanate, broadly rounded with somewhat spreading sides below, about 3.5 cm. long and subequally deep, abruptly 3-lobulate above, with the lateral lobules triangular-ovate and uncinata and the middle lobule slightly longer, oblong, straight, with an incurved, broadly rounded or truncate apex. Column slender, about 5.2 cm. or more long, with an abruptly recurved apex, thinly bialate, provided at the base with a pair of linear-falcate, fleshy glands or horns, which have an enlarged base and are about 2 cm. long.

Peru: Habitat not recorded (type).—Loreto, fide Schlechter, Fedde Repert. Beih. 9: 159. 1921.—San Martín: Moyobamba, 1100–1600 meters, in forest, *Klug 10098*.

Coryanthes punctata Beer, Prakt. Stud. Orch. 222. 1854; Schltr. Orchis 10: 72, fig. 14C. 1916; Hoehne, Fl. Brasil. 12, no. 6: 178, t. 123. 1942. *C. maculata* Lindl. Bot. Reg. 21: t. 1793. 1835, non Hook. *C. maculata* Hook. var. *punctata* Lindl. Fol. Orch. Coryanthes 2. 1852; Warner & Williams, Orch. Alb. 3: t. 98. 1884.

Plant epiphytic, rather large. Pseudobulbs aggregated, narrowly pyriform-cylindric and deeply plurisulcate in the dried specimen, bifoliate at the apex, up to 11 (rarely 15) cm. long. Leaves petioled; lamina oblong-elliptic to narrowly lanceolate-elliptic, up to 40 cm. or more long, 3.3–5 cm. wide, acuminate, more or less long-narrowed below, plicate, membranaceous, with 3 conspicuous nerves; petiole about 7 cm. or less long. Inflorescence lateral, basal, pendent or recurved, apically racemose, up to 51 cm. long including the rachis; peduncle with 6–7 small, loose, tubular-infundibuliform sheaths which are remote except at the base. Raceme very loosely 1- to 6-flowered, with a more or less fractiflex rachis. Pedicellate ovary slender, arcuate, about twice as long as the clasping floral bract. Flowers medium-sized for the genus, cream- to bright-yellow (rarely grayish-white) spotted with rose or dark garnet. Sepals and petals membranaceous. Dorsal sepal broadly ovate or rhomboid-elliptic, adnate to the column, subacute, 2.8–3.5 cm. long and 3.8 cm. wide. Lateral sepals obliquely semilunate-ovate, acute or short-acuminate,

up to 7.5 cm. long from the tip to the anterior dilated portion and 4 cm. wide where broadest. Petals narrowly falcate-oblong, adnate to the column, obtuse, about 3 cm. long. Lip, as in the genus, divided into a clawed hypochile, a semitubular mesochile, and an abrupt, bucket-like epichile; claw slender, fleshy, about 1.2 cm. long; hypochile conic-subglobose, about 2.5 cm. deep; mesochile stout, laterally complanate, smooth, the free (exposed) portion about 1.8 cm. long; epichile complanate-suborbicular, about 3.5 cm. long and almost as deep, contracted near the apex with 3 small lobules of which the lateral ones are uncinata and the larger middle one is ovate-oblong, straight, with an incurved, obtuse apex. Column stout, dilated upward, with an abruptly recurved apical portion, bialate, about 2.5 cm. long, extended at the base into a pair of short, porrect, oblong-obovate glands or horns.

Loreto: Vicinity of Iquitos, 100 meters, on living tree in dense forest, *Klug 10052, 10094*. At junction of "Rio Napo and Amazonas," 100 meters, *Klug 10099*. Also British Guiana (type) and Brazil.

Coryanthes trifoliata C. Schweinf. Am. Orch. Soc. Bull. 12: 276, t., 1944. Figure 121.

Plant epiphytic, medium-sized for the genus. Pseudobulb narrowly pyriform-cylindric, trifoliolate at the apex, deeply plurisulcate in the dried specimen, about 6.5 cm. long. Leaves spreading, up to 42 cm. long including the long, slender, channelled petiole; lamina narrowly elliptic-lanceolate, acuminate, gradually narrowed below, up to 32.3 cm. long, about 4.4 cm. wide, plicate, thinly chartaceous. Inflorescence (broken off in the type specimen) lightly arcuate, very loosely 2-flowered at the apex; peduncle about 33 cm. long, with 6 small, tubular, mostly remote sheaths; rachis fractiflex, about 3 cm. long. Floral bracts concave, surrounding the pedicel, up to 3 cm. long. Pedicellate ovary slender, arcuate, about 3 times as long as the subtending bract. Flowers small for the genus, "gray-rose, red-violet, canary-yellow, with a black-violet round spot." Dorsal sepal rhombic-suborbicular, about 2.3 cm. long and slightly wider, bluntly mucronate at the rounded apex. Lateral sepals obliquely semilunate-ovate, acute or short-acuminate, larger than the dorsal sepal, about 5.7 cm. long and 3.4 cm. wide. Petals linear, falcate, longer than the dorsal sepal but much shorter than the lateral sepals. Lip divided, as in the genus, into a clawed hypochile, a narrow mesochile, and a much larger, bucket-like epichile; claw slender, fleshy, about 1.3 cm. long; hypochile semiglobose, fleshy, about 1 cm. long and almost as deep, finely cellular-pubescent in front; mesochile short, semicylindric in section, about 8 mm. long (free portion), outer surface concealed by 2 fleshy, bilobed, transverse plates, of which the upper one is much smaller with an apicule in the sinus between the lobules; epichile much larger than the other parts, abrupt, complanate-subglobose or broadly subconic (in the fresh plant), abruptly 3-lobulate in front, the lateral lobules obliquely ovate-uncinate and the middle lobule longer, ovate-oblong, rounded at the apex, incurved above, with a small tooth on each side of the middle. Column stout, dilated upward, abruptly recurved near the apex, about 2.4 cm. long, bialate, with a pair of small, obliquely round-ovate, porrect glands or horns at the base.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10097*.



FIG. 121. *Coryanthes trifoliata* C. Schweinf. 1, plant with inflorescence; $\times \frac{2}{3}$. 2, column and lip, from side; $\times 1$. 3, dorsal sepal, spread out; $\times 1$. 4, petal, spread out; $\times 1$.

- 5a. Lip when expanded much longer than broad, ovate-oblong or elliptic-oblong in outline.....*X. squalens* (*X. scabrilingue*)
- 5b. Lip when expanded about equally long and broad, or broader than long, suborbicular in outline.....*X. latilabium*
- 6a. Leaf 8-10 cm. wide, petiole 20 cm. long; scape about 90 cm. high, raceme many-flowered; floral bracts about equaling the pedicellate ovary. .*X. elatum*
- 6b. Leaf up to nearly 6 cm. wide, petiole short and indistinct; scape about 45 cm. long, raceme few- (5- to 7-) flowered, very loose; floral bracts surpassing the flower.....*X. bractescens*

Xylobium bractescens (Lindl.) Kränzl. Orchis 7: 22. 1913.

Maxillaria bractescens Lindl. Bot. Reg. 28, Misc. 84, no. 92. 1842.

Plant large. Pseudobulb oblong-conical, about 3.3 cm. long, apparently 1-leaved at the apex, concealed by sheaths. Leaf with an indistinct petiole; lamina oblong-elliptic, acute, gradually narrowed below, about 27 cm. long and 5.7 cm. wide, plicate, with 3 conspicuous nerves beneath. Scape elongate and exceeding the leaf in length, stout, about 45 cm. long, arcuate-flexuous; peduncle with 3 close, remote, tubular sheaths; raceme (rachis) about 11 cm. long, very loosely 5- to 7-flowered. Pedicellate ovary short. Floral bracts elongate, linear, acuminate, scarious, exceeding the flower. Flowers rather large for the genus, dull yellow with a reddish brown lip. Dorsal sepal oblong-lanceolate, acute, with revolute margins, about 2 cm. long and 5 mm. wide. Lateral sepals triangular-lanceolate, falcate, adnate to the column-foot forming a short, rounded mentum, about as long as the dorsal sepal but twice as broad at the base. Petals similar to the dorsal sepal but smaller. Lip oblong-elliptic in outline, sharply 3-lobed above the middle, recurved at the obtuse apex, apparently about as long as the petals when expanded; lateral lobes with a short, triangular-ovate, recurved free portion; mid-lobe much larger, ovate; disc with a stout, median, oblong callus (subtrilobed at the apex) through the lower half and otherwise covered with verrucose or "sinuate-rugose elevated" lines over the veins. Column very short and stout, concave in front, extended into a slightly longer foot.

Amazonas, Junín, fide Schlechter, Fedde Repert Beih. 9: 160. 1921. Also Ecuador (type).

The above description was amplified by a photograph of the type.

Xylobium elatum Rolfe, Kew Bull. (1913) 341.

Pseudobulbs oblong-ovoid, 5-7.5 cm. long, bifoliate. Leaves long-petioled; lamina lanceolate or elliptic-lanceolate, acute, up to 50 cm. long and 10 cm. wide, plicate; petiole 20 cm. long. Scape about 90 cm. high, concealed below by a few spathaceous sheaths; raceme many-flowered, about 18 cm. long. Floral bracts linear-lanceolate, acuminate, up to 2 cm. long, equaling or almost equaling the pedicellate ovary. Flowers dull pale green, heavily mottled with brown on the back. Dorsal sepal oblong, subobtuse or apiculate, up to 1.8 cm. long. Lateral sepals similar, subfalcate, forming with the column-foot an obtuse mentum which is 3-4 mm. long. Petals oblong, subobtuse, a little shorter than the sepals. Lip 3-lobed, almost entirely conspicuously tubercular-papillose, about 1.2 cm. wide ("latum"); lateral lobes erect, obtuse or truncate; mid-lobe elliptic-oblong, very

fleshy, obtuse; disc provided with a smooth, oblong callus. Column broad, 6–7 mm. long, with angled margins.

Peru: Habitat not recorded, *Forget s.n.* (introduced by Messrs. Sander & Sons from Belgium) (type).—Junín, Loreto, fide Schlechter, Fedde Repert. Beih. 9: 160. 1921.

No example of this species was seen.

Xylobium elongatum (Lindl. & Paxt.) Hemsl. Godm. & Salv. Biol. Centr.-Am. 3: 252. 1883. *Maxillaria elongata* Lindl. & Paxt. Paxt. Fl. Gard. 3: 69. 1852–53. Figure 122.

Plant large, epiphytic or terrestrial. Stems short, concealed by imbricating sheaths, developing into an elongate pseudobulb. Pseudobulbs often clustered, fleshy-cylindric or stem-like in the dried specimen, 2-leaved at the apex, up to 27 cm. high. Leaves short- or long-petioled; lamina elliptic to elliptic-oblong (often slightly broader above the middle), acute or acuminate, cuneate below, up to 40 cm. long and 10.3 cm. wide, plicate, with 3 to 5 conspicuous nerves beneath; petiole channelled, about 7 cm. or less long. Scape variable in length, much shorter or somewhat longer than the pseudobulb, racemose above; peduncle up to 20 cm. long, provided with 3–6 loose, often imbricating sheaths; raceme (rachis) up to 10 cm. long, loose or dense, several- to many-flowered. Floral bracts narrow, commonly more or less exceeding the pedicellate ovary. Flowers large for the genus, rather fleshy, whitish to yellow or pinkish marked with dull red, brown, or violet. Dorsal sepal oblong-lanceolate, acuminate, up to 2.5 cm. long and 6 mm. wide. Lateral sepals falcate-lanceolate, prominently keeled especially toward the apex, adnate to the column-foot forming a prominent, conical, obtuse mentum, almost as long as the dorsal sepal but about twice as wide below. Petals oblong-lanceolate, acuminate with involute margins, slightly oblique, smaller than the dorsal sepal. Lip erect and arcuate-recurved with upcurved lower sides in natural position, ovate-lanceolate when expanded, 3-lobed just above the middle, up to 1.9 cm. long and 9.2 mm. wide across the lateral lobes; lateral lobes erect, with a small triangular-ovate free portion; mid-lobe much larger, lanceolate, obtuse, very fleshy with upcurved sides; disc almost entirely covered with papillose ridges above the veins, the lower median portion with an oblong, 3-carinate ridge, the mid-lobe above and beneath thickly studded with papillae or short tubercles. Column very short and stout; concave in front, about 3.5 mm. high, extended into a long, broad foot which is about twice as long.

Junín(?) ex Kränzlin, fide Schlechter, Fedde Repert. Beih. 9: 160. 1921. Chiefly in Central America (Guatemala [type], Costa Rica, and Panama).

Xylobium foveatum (Lindl.) Nichols. Dict. Gard. 4: 225. 1887; Cogn. Martius Fl. Bras. 3, pt. 5: 469. 1902. *Maxillaria foveata* Lindl. Bot. Reg. 25, Misc. 2, no. 2. 1839. *Maxillaria concava* Lindl. Bot. Reg. 30, Misc. 4, no. 12. 1844. *Maxillaria Stachyobiorum* Reichb. f. Bot. Zeit. 10: 735. 1852. *Xylobium concavum* Hemsl. Godm. & Salv.

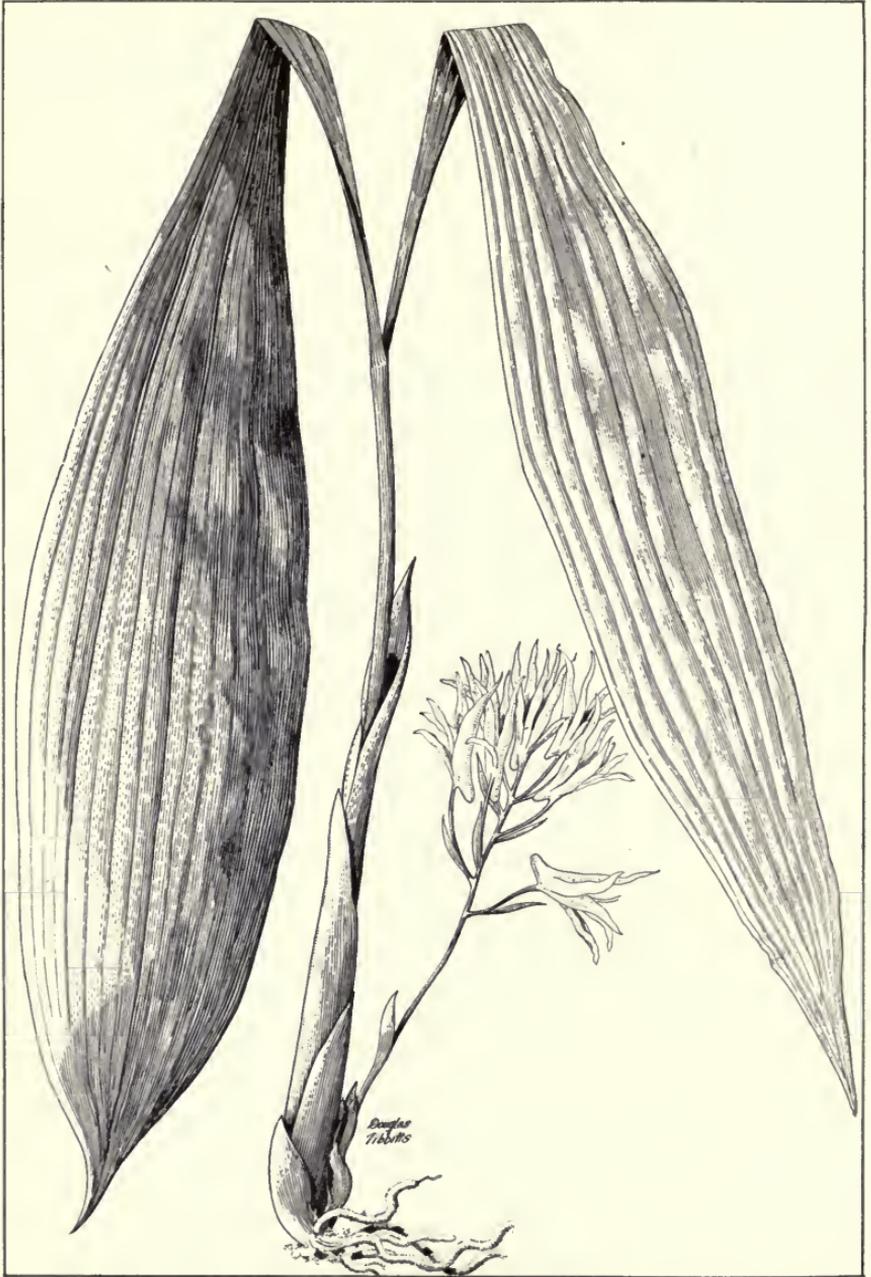


FIG. 122. *Xylobium elongatum* (Lindl. & Paxt.) Hemsl. Plant; $\times \frac{1}{2}$.

Biol. Centr.-Am. 3: 252. 1883. *Xylobium stachyobiorum* Hemsl.
 Godm. & Salv. Biol. Centr.-Am. 3: 252. 1883. *Xylobium Filomenoi*
 Schltr. Fedde Repert. Beih. 9: 100. 1921; Mansf. Fedde Repert. Beih.
 57: t. 124, nr. 487. 1929.

Plant epiphytic, variable, medium-sized to large. Pseudobulbs ovoid to narrowly pyriform, 2- or 3-leaved at the apex, up to 9 cm. high, often clustered. Leaves petioled; lamina elliptic or elliptic-oblong to obovate-oblong (rarely oblong), acute or acuminate, cuneate below, up to 38 cm. long and 9 cm. wide, plicate, with 3 conspicuous nerves beneath; petiole sulcate, up to 15 cm. long. Scape short or elongate, 15-32 cm. high, suberect to arcuate; peduncle provided with several (up to 6) loose, tubular-infundibuliform sheaths; raceme about 15 cm. or less long, usually subdensely many-flowered. Floral bracts linear-setaceous, shorter than or surpassing the pedicellate ovary. Flowers rather small, yellowish (rarely white), sometimes with a white lip which is rarely red-striped. Dorsal sepal oblong-lanceolate, subacute, up to 1.4 cm. long and 5 mm. wide. Lateral sepals falcate-lanceolate, prominently keeled especially above the middle, adnate to the column-foot to form a conspicuous conical mentum, about as long as the dorsal sepal but much broader near the base. Petals lanceolate or oblong-lanceolate, similar to the dorsal sepal but more or less smaller, slightly oblique. Lip erect with upcurved lower sides in natural position, 3-lobed near the apex, when expanded obovate-oblong, elliptic-obovate or oval in outline and up to 1.2 cm. long and 8 mm. wide; lateral lobes erect, with short, rounded or truncate, irregular free portion; mid-lobe semiorbicular-quadrate, retuse, with a conspicuous conical thickening beneath; disc with 3 or 5 thickened median lines which are generally confluent and more conspicuous in the middle. Column very short and stout, concave in front, about 4 mm. or less high, extending into a foot which is nearly twice as long.

Junín: Chanchamayo Valley, 1200 meters, *Schunke s.n.* East of Quimiri Bridge, near La Merced, 800-1300 meters, in dense forest, *Killip & Smith 23869*.—San Martín: Near Moyobamba, *Mathews 1874*, *Filomeno s.n.* (type of *X. Filomenoi*). Moyobamba, 1100-1600 meters, in forest, *Klug 10113*. Also from Mexico, Guatemala (type of *Maxillaria concava*) to Panama (type of *Maxillaria Stachyobiorum*) and in South America from British Guiana (type of *Maxillaria foveata*) to Venezuela and Colombia.

Xylobium latilabium C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 155, t. 49. 1952. Figure 123.

Plant large, apparently epiphytic. Pseudobulb oblong-pyriform or cylindric, unifoliate, about 6.5 cm. high, striate-sulcate in the dried specimen. Leaf conspicuously petioled; lamina oblanceolate-oblong, rather abruptly acute, long-cuneate below, with 3 nerves very prominent beneath, about 43 cm. long and 7.8 cm. wide above the middle; petiole slender, deeply channelled, subterete below, about 10 cm. long. Scape short, stout, erect, about 15 cm. high (separated and incomplete in the type collection); peduncle mostly concealed by 3 or more imbricating sheaths which are loose, scarious and finely maculate; raceme rather densely many- (20-) flowered, about 8.5 cm. long. Floral bracts narrowly lanceolate, scarious, about

equaling the pedicellate ovary. Flowers vivid yellow, waxy, with spreading segments, rather large for the genus. Sepals with revolute margins. Dorsal sepal narrowly lanceolate-oblong, obtuse or subacute, about 1.9 cm. long and 6 mm. wide. Lateral sepals much wider than the dorsal sepal, very obliquely triangular-ovate and falcate-decurved, acute, forming a prominent mentum with the column-foot, dorsally carinate above the middle. Petals oblong-lanceolate, obtuse or abruptly acute, lightly oblique, somewhat shorter and much narrower than the sepals. Lip attached to the column-foot near its apex, 3-lobed near the front, tubular-concave with erect-incurved lateral lobes in natural position, suborbicular in outline when expanded, about 1.8 cm. long in the middle and subequally wide or wider; lateral lobes semiobovate (including the basal portion), terminating in a truncate, crenulate apex (without a free portion); mid-lobe porrect, subquadrate or ovate-subquadrate, broader than long, retuse to rounded in front, about 5 mm. long and 8 mm. wide; disc adorned with a broad, central, oblong, apically lobulate callus and with numerous, verrucose, fleshy lines above the nerves. Column very short and stout, about 6 mm. high, produced into an elongate foot about 1 cm. or more in length.

Junín: Prov. of Tarma, Vitoc, "eyebrow of the jungle," 1800 meters, lip within bearing 8 purple lines on each side, *Woytkowski 10* (type).—East Peru: Region of the Río Marañón from Iquitos to the mouth of the Río Santiago, 160 meters, *Tessmann 4516*. This latter collection, which is represented by a photograph of a flowering specimen accompanied by floral notes and drawings, appears to be referable to this species.

Xylobium ornatum (Kl.) Rolfe, *Orch. Rev.* 20: 43. 1912. *Maxillaria ornata* Kl. *Allg. Gartenz.* 23: 257. 1855.

Plant apparently large. Pseudobulbs oblong-ovoid, with 5–8 grooves, 1- or rarely 2-leaved at the apex. Leaves petioled; lamina oblong, acute, gradually cuneate below, plicate with 3 conspicuous nerves beneath, up to 42.5 cm. long and 7 cm. wide; petiole about 5 cm. long, sulcate. Scape erect, robust, about 15 cm. high, terminated by a densely 20- to 24-flowered raceme. Floral bracts lanceolate, long-acuminate, black-punctate. Flowers rather large for the genus, pale sulphur-yellow. Dorsal sepal spatulate, obtusely apiculate, about 19 mm. long and 6 mm. wide. Lateral sepals falcate, produced at the base into an emarginate lamina, short-cuspidate, markedly longer than the dorsal sepal and twice as wide at the base. Petals oblong, obtuse, with a subdeflexed apex, shorter and narrower than the dorsal sepal. Lip 3-lobed above the middle, yellow with purple lines, about 19 mm. long; lateral lobes erect, rather short, with a truncate apex; mid-lobe semi-orbicular, emarginate, obscurely crenulate; disc with a median, oblong, pubescent callus extending to slightly above the middle. Column arcuate, smooth, about 19 mm. long including the foot.

Peru: Habitat and collector not recorded.

Description compiled from the diagnosis of the type; no example was seen.

XYLOBIUM
latilabium
C. Schweinf.



FIG. 123. *Xylobium latilabium* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, inflorescence; $\times \frac{1}{2}$. 3, flower, expanded; $\times 1$.

Xylobium pallidiflorum (Hook.) Nichols. Dict. Gard. 4: 225. 1887; Cogn. Urb. Symb. Antill. 6: 588. 1910. *Maxillaria pallidiflora* Hook. Bot. Mag. 55: t. 2806. 1828. *Maxillaria stenobulbon* Kl. Ind. Sem. Hort. Berol. Appendix Spec. Nov. (1853) 1. *Xylobium latifolium* Schltr. Fedde Repert. 27: 66. 1929.

Plant rather large, variable, epiphytic or terrestrial. Pseudobulbs clustered, elongate-cylindrical or stem-like, bearing 1 leaf (very rarely a second small leaf) at the summit, up to 18.5 cm. long, 5 mm. or less in diameter in the dried state. Leaf prominently petioled; lamina elliptic to oblong-elliptic or oblanceolate, acute or short-acuminate, cuneate below, 10–31 cm. long, 3.6–8.4 cm. wide, plicate with 3 conspicuous nerves beneath; petiole 2–10 cm. long, slender, channelled. Scapes erect to arcuate, stout or slender, 10–18.5 cm. long; peduncle provided with few (3 to 5) loose, tubular, evanescent sheaths; raceme loosely few- (3- to 9-) flowered. Floral bracts slender, nearly equal to the pedicellate ovary. Flowers rather small, white, yellowish green and orange, or yellow. Dorsal sepal oblong-lanceolate, acute, about 16 mm. or less long and 5.6 mm. wide. Lateral sepals falcate-lanceolate, acute or subacute, more or less keeled near the apex, adnate to the column-foot forming a conical, obtuse mentum, as long as the dorsal sepal but about twice as wide at the base. Petals similar to the dorsal sepal but markedly smaller, subacute to obtuse. Lip erect, arcuate-recurved and with erect lower sides in natural position, when expanded oval or oblong-elliptic in outline, cuneate below, broadly rounded in front, lightly constricted or lobulate on each side two-thirds the distance from the base, about 13.5 mm. or less long, 7 mm. or less wide near the middle; disc with 3 (rarely 5) approximate, median, thickened lines (prominent in the middle) and with the flat anterior portion marked with warts or verrucose ridges. Column very short and stout, concave in front, up to 4 mm. long, extended into a foot which is about twice as long.

San Martín: Zepelacio, near Moyobamba, about 1100 meters, terrestrial in mountain forest, *Klug 3619*. The following two collections, bearing only floral remnants on the summit of enlarged fruits, doubtless belong to this species. The data are: Huánuco: Muña, about 2100 meters, epiphyte, *Macbride 4047*.—Junín: Pichis Trail, Eneñas, 1600–1900 meters, epiphyte in dense forest, *Killip & Smith 25664*. Also West Indies (type of *Maxillaria pallidiflora*), Venezuela, Ecuador probably, and Bolivia (type of *Xylobium latifolium*).

Xylobium squalens (Lindl.) Lindl. Bot. Reg. 11: sub t. 897. 1825; Cogn. Martius Fl. Bras. 3, pt. 5: 468. 1902. *Dendrobium squalens* Lindl. Bot. Reg. 9: t. 732. 1823. *Maxillaria squalens* Hook. Bot. Mag. 56: t. 2955. 1829. *Dendrobium carnosum* Presl, Symb. Bot. 35: t. 24. 1832. *Cyrtopera scabrilinguis* Lindl. Gen. & Sp. Orch. 189. 1833. *Maxillaria supina* Poepp. & Endl. Nov. Gen. ac Sp. 1: 39, t. 67. 1836. *Xylobium Houtei* Makoi ex Mutel, Mém. sur Plus. Orch. (Mém. Strasb. Soc. Hist. Nat. 3) 1: 16. 1840. *Maxillaria scabrilinguis* Lindl. Bot. Reg. 30, Misc. 71, no. 66. 1844.

Xylobium scabrilingue Schltr. Orchis 7: 23. 1913. *Xylobium supinum* Schltr. Orchis 7: 24. 1913. *Xylobium carnosum* Schltr. Fedde Repert. Beih. 9: 160. 1921.

Plant terrestrial or epiphytic, large, variable. Pseudobulbs ovoid to pyriform-cylindric, 2- to 3-leaved at the summit, concealed by evanescent sheaths, up to 9 cm. long, often clustered. Leaves commonly long-petioled; lamina lanceolate-oblong or oblong-ob lanceolate to (rarely) elliptic-oblong, acute, long-attenuate below, up to 69 cm. long and 9.9 cm. wide, plicate, conspicuously 5-nerved beneath; petiole slender, sulcate, up to 25 cm. long. Scape erect or arcuate, slender or stout, usually much shorter than the leaves, commonly up to 20 cm. long (rarely reaching 34 cm. or more in length); peduncle more or less concealed by several loose or ventricose sheaths; raceme rather loose to dense, 7- to many-flowered, 6-15 cm. long. Floral bracts narrowly lanceolate to linear-lanceolate, variable, a little shorter than the pedicellate ovary to longer than the flower. Flowers medium-sized to rather large, more or less fleshy, white to pale yellowish or flesh-color, more or less striped with dull purple and the lip dark violet-tipped. Dorsal sepal ovate-oblong to oblong-lanceolate, acute, concave, about 1.8 to 2.2 cm. long and 8 mm. wide. Lateral sepals obliquely triangular-ovate to lanceolate, sharply acute to acuminate, keeled toward the apex, adnate to the column-foot forming a conspicuous, rounded-conical mentum, about as long as the dorsal sepal but markedly wider (sometimes nearly twice as wide) at the base. Petals obliquely lanceolate or ovate-lanceolate, acute or acuminate, slightly shorter and commonly narrower than the dorsal sepal. Lip erect and arcuate-recurved with the lower sides up-curved in natural position, ovate-oblong or elliptic-oblong when expanded, sharply 3-lobed about two-thirds the distance from the base, 1.1-1.9 cm. long, 4-11 mm. wide when expanded; lateral lobes erect, semielliptic or semiobovate, with a more or less distinct, rounded apex; mid-lobe broadly ovate to suborbicular or round-obovate, very fleshy, densely covered with warts or verrucose lines on both surfaces (especially on the inner surface); disc with a median oblong, more or less distinctly 3-carinate callus and with carinate-thickened veins. Column very short and stout, concave in front, up to 4.5 mm. long, produced into a foot which is about twice as long.

Peru: Habitat not recorded, *Ruiz & Pavón s.n.* (type of *Cyrtopera scabrilinguis*).—Ayacucho: Aina, between Huanta and Río Apurímac, 750-1000 meters, terrestrial in open woods, *Killip & Smith 22591, 23165*.—Cajamarca, ex Kränzl. fide Schlechter, Fedde Repert. Beih. 9: 160. 1921.—Huánuco: On mountains, *Haenke s.n.* (type of *Dendrobium carnosum*). Prov. of Huánuco, Tingo María, on gravelly bank of Río Huallaga, *Asplund 12355*. Same locality, in forest, *Asplund 12649*. Pampayaco (Pampayacu), *Poeppig s.n.* (type of *Maxillaria supina*).—Junín, fide Schlechter, Fedde Repert. Beih. 9: 160. 1921.—Loreto: Mouth of Santiago River on the Marañón River, about 160 meters, epiphyte in rain-forest, *Tessmann 4206, 4388*.—Puno: Prov. of Carabaya, near Ollachea, 3100 meters, in the shade, *Vargas 6989*.—San Martín: San Roque, 1350-1500 meters, *Williams*

7399. Moyobamba, 1100–1600 meters, epiphyte in forest, *Klug 10123*. Tingo María, 625–1100 meters, *Allard 22588*. Zepelacio, near Moyobamba, 1200–1600 meters, epiphyte in mountain forest, *Klug 0.21*. Also Venezuela, Colombia, Ecuador, Bolivia and Brazil (type of *Dendrobium squalens*), as well as Costa Rica.

Xylobium subintegrum C. Schweinf. Am. Orch. Soc. Bull. 12: 350, t., 1944. Figure 124.

Plant very variable, inconspicuous. Pseudobulbs short-cylindric to oblong-pyriform, unifoliate at the apex, up to 4.6 cm. long, often clustered. Leaf erect, petioled; lamina elliptic-oblong to oblong, acute or short-acuminate, cuneate-narrowed below, up to 35 cm. long and 4.4 cm. wide, plicate, with 3 conspicuous nerves beneath; petiole short or long, 2–25.4 cm. long. Scape lateral, much shorter than the mature leaf, 11–26 cm. long, stout or slender, racemose above; peduncle about 22 cm. or less long, with 4–6 loose, tubular sheaths which are imbricating below; raceme short, loosely 3- to 7-flowered, the rachis 3–6.5 cm. long. Floral bracts conspicuous, lanceolate-linear, the basal ones slightly exceeding the flowers, up to 3 cm. long. Flowers rather small, submembranaceous, white and purple or pale greenish yellow with a white and purple lip. Dorsal sepal lanceolate-oblong, acute, about 1.3 cm. long and 4 mm. wide. Lateral sepals obliquely triangular-lanceolate, commonly lightly falcate, acute, dorsally keeled toward the apex, adnate to the column-foot forming a conspicuous, spur-like mentum, a little longer than the dorsal sepal and about twice as wide at the base. Petals oblong-lanceolate or linear-lanceolate, acute or subacute, slightly shorter and narrower than the dorsal sepal. Lip in natural position erect and gently recurved with incurved sides, when expanded elliptic-oblong, subentire to very lightly 3-lobulate near the apex, broadly rounded or subtruncate, crenulate and often lightly retuse in front, about 1.38–1.5 cm. long, 6–8 mm. wide; disc with a longitudinal thickening which is more prominent above and terminates in a semiorbicular, 5-lobulate apex, the anterior part of the disc marked with verrucose ridges above the veins. Column short, stout, incurved, nearly 5 mm. long at the back, produced into a foot which is about twice as long.

Cuzco: Prov. of Quispicanchis, Hda. Ttío, Marcapata, about 2000 meters, in humid dark places in forest, *Vargas 3120* (type).—Huánuco: Pampayaco (Pampayacu), *Kanehira 310*.—Junín: Chanchamayo Valley, 1200–1500 meters, *Schunke 525, 1089, 1302*. Prov. of Tarma, Utcuyacu, 1900 meters, on tree in forest, *Woytkowski 35380*.

Xylobium undulatum (Ruíz & Pav.) Rolfe, Orch. Rev. 20: 43. 1912. *Maxillaria undulata* Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 221. 1798. *Dendrobium undulatum* Pers. Syn. Pl. 524. 1807.

Huánuco: Near Chinchao and Muña, on trees and rocks in woods, *Pavón s.n.*



FIG. 124. *Xylobium subintegrum* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower, natural position; $\times 1\frac{1}{2}$. 3, flower from above, spread out; $\times 1$. 4, lip, spread out; $\times 2\frac{1}{2}$.

This is an obscure species, which, judged from the photographic record of the type in the Ames Herbarium, suggests *X. squalens* (Lindl.) Lindl.

BIFRENARIA Lindl. (including *Lindleyella* Schltr.)

A polymorphic genus of terrestrial or epiphytic orchids extending from Panama through South America to Brazil, and only recently recorded from Peru.

Primary stems or rhizomes often elongate. Secondary stems very short, soon developing into fleshy pseudobulbs which bear 1 or 2 leaves at the summit. Leaves oblong-elliptic (rarely oblanceolate or obovate), acute or acuminate, cuneate below, plicate, with a more or less elongate, sulcate petiole. Inflorescence lateral, basal, more or less erect to arcuate, 1- to many-flowered. Flowers small to rather large, membranaceous to subfleshy, in a loose terminal raceme. Sepals subequal, spreading, the lateral ones slightly oblique and adnate to the column-foot forming a short to elongate and spur-like mentum. Petals similar to the dorsal sepal but commonly smaller. Lip joined to the column-foot, with a short or elongate and narrow claw, more or less deeply 3-lobed; lateral lobes erect, abrupt to cuneate at the base; mid-lobe spreading, often much larger, entire to retuse or bifid. Column stout, arcuate, wingless, produced into a prominent foot. Anther terminal, opercular, incumbent. Pollinia 4, or 2 and sulcate, on 2 very short or elongate, separate stipes.

- A1. Pseudobulbs oblong-cylindric to very narrowly ellipsoid or pyriform; flowers with a conspicuous, elongate, narrow and spur-like mentum; lip with a long, slender claw *B. longicornis* (*B. sabulosa*)
- A2. Pseudobulbs more or less broadly ovoid; flowers with a short, broad mentum; lip with a very short claw *B. saxicola*

Bifrenaria longicornis Lindl. Bot. Reg. 24, Misc. 93, no. 177. 1838; Cogn. Martius Fl. Bras. 3, pt. 5: 492. 1902. *Bifrenaria sabulosa* Barb. Rodr. Gen. et Sp. Orch. Nov. 1: 111. 1877; Cogn. Martius Fl. Bras. 3, pt. 5: 491, t. 95. 1902. *Stenocoryne longicornis* Lindl. Bot. Reg. 29, Misc. 53, no. 68. 1843; Hoehne, Fl. Brasil. 12, pt. 7: 14. 1953.

Plant epiphytic. Primary stem or rhizome elongate, provided with short, close, tubular, remote to imbricating sheaths. Secondary stems very short, concealed by imbricating sheaths, developing into fleshy pseudobulbs. Pseudobulbs remote, oblong-cylindric to narrowly ellipsoid or pyriform, obtusely 4-angled, 1-leaved at the summit, up to 8 cm. long, when young concealed by close, scarious sheaths. Leaf shortly or very shortly petioled; lamina narrowly elliptic-oblong to elliptic, up to 24 cm. long and nearly 7 cm. wide, acute, shortly cuneate below, plicate; petiole obscure, up to 2.5 cm. long, channelled. Inflorescence relatively short, suberect to arcuate, up to 19 cm. long, slender, with a few remote, tubular-infundibuliform sheaths below, terminating in a rather loosely several- to many-flowered raceme. Flowers small, cream-color to yellow, usually spotted with red-violet. Dorsal sepal oblong to elliptic-oblong, sharply acute, about 10.2 mm. long and 4.2 mm. wide. Lateral sepals long-adnate to the column-foot, forming a spur-like, obtuse mentum about 9.2-10 mm. long; free portion ovate-oblong, sharply

acute and dorsally keeled at the tip, slightly exceeding the dorsal sepal in size. Petals obliquely elliptic-lanceolate, acute, somewhat smaller than the dorsal sepal. Lip slightly longer than the lateral sepals, white with purple lines, about 16–19 mm. long from the articulation with the tip of the column-foot to the apex, from a long slender claw (which is cuneate-dilated above) abruptly expanded into a 3-lobed lamina which is semiorbicular-ovate in outline and about 11 mm. wide when expanded; lateral lobes erect, semiorbicular; mid-lobe larger, subquadrate, subtruncate to lightly retuse in front; disc with an ovate, fleshy callus between the lateral lobes. Column short, lightly arcuate, about 5.5 mm. long at the back, extended into a foot which is nearly twice as long.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10125*. Also British Guiana (type of *B. longicornis*), Colombia and Brazil (type of *B. sabulosa*).

Bifrenaria saxicola (Schltr.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 246. 1944. *Lindleyella saxicola* Schltr. Fedde Repert. Beih. 27: 143. 1924.

Plant rather large, either growing on rocks or epiphytic, vegetatively variable. Pseudobulbs ovoid or broadly ovoid, said to be approximate, 1-leaved at the apex, somewhat oblique, 2–4.5 cm. long, plurisulcate in the dried specimen. Leaf petioled; lamina oblong-elliptic to elliptic, often slightly broader above the middle, 15–31 cm. long, up to 6.6 cm. wide, acute or acuminate, cuneate below, plicate, coriaceous; petiole sulcate, 3–17 cm. long. Inflorescence lateral, basal, spreading and commonly arcuate above, 30–58 cm. or less long; peduncle provided with a few (4 or 5) short, remote, tubular-infundibuliform sheaths; raceme up to 23 cm. long, loosely 8- to 26-flowered. Flowers rather small, spreading, sulphur-colored or yellow green, spotted with brown. Dorsal sepal oblong or elliptic-oblong, obtuse to acute, 16–19 mm. long, 7–8.5 mm. wide. Lateral sepals obliquely ovate-elliptic, acute, a little wider than the dorsal sepal, forming a short mentum. Petals oblong-elliptic or “elliptic-subspatulate,” rounded to subacute, shorter than the dorsal sepal. Lip a little shorter than the lateral sepals, up to 14 mm. long and nearly as wide when expanded, suborbicular in outline, deeply 3-lobed near the middle, from a very short, linear claw abruptly cuneate-dilated at the base; lateral lobes relatively small, retrorse, oblong-obovate, with irregularly erose to dentate outer margins; mid-lobe relatively large, semiorbicular, retuse, with crenate-dentate, undulate margins; disc at the base (just in front of the claw) with an ellipsoid, verrucose callus often surrounded by smaller warts and in front of this callus (near the middle) with a high, subquadrate, retuse callus. Column short, stout, lightly arcuate, about 9 mm. or less long, extended into a short foot.

Loreto: Pumayacu, between Balsapuerto and Moyobamba, 600–1200 meters, epiphyte in forest, *Klug 0.3*. Also Colombia (type).

LYCASTE Lindl.

Terrestrial or epiphytic, more or less showy orchids of the American tropics, extending from Mexico to Bolivia.

- 9a. Plant pendent; pseudobulbs orbicular-ovoid, about 3.8 cm. long; leaves oblong-lanceolate, glaucous; lateral lobes of the lip rounded at the apex. *L. Dyeriana*
- 9b. Plant apparently erect; pseudobulbs ovoid or oblong-ovoid to ellipsoid, 6-10 cm. long; leaves oblong-elliptic, not glaucous; lateral lobes of the lip acute to obtuse. *L. locusta*

***Lycaste barbifrons* Lindl. Ann. & Mag. Nat. Hist. 15: 383. 1845.**

Pseudobulbs and number of leaves not recorded. Leaf abruptly long-petioled; lamina elliptic-oblong, acute, cuneate at the base, about 29 cm. long, nearly 6 cm. wide, plicate, with 3 to 5 nerves conspicuous beneath; petiole slender, channelled, about 13 cm. long. Scape elongate, stout, 1-flowered above; peduncle 28.5 cm. or more long, with several remote, tubular-infundibuliform sheaths; floral bract slightly surpassing the ovary. Flower large. Dorsal sepal narrowly elliptic-lanceolate, about 10 cm. long, less than 1 cm. wide, acute. Lateral sepals lanceolate-elliptic, falcate-decurved, apparently nearly as long as the dorsal sepal but twice as broad, forming a conical mentum with the column-foot. Petals obliquely lanceolate-elliptic or oblanceolate-elliptic, acute, shorter than the sepals but otherwise similar to the lateral sepals. Lip about half as long as the petals, "oblong," rounded at the apex, 3-lobed, fimbriate at the base; lateral lobes rounded; disc 5-lined at the concave base, with a broad emarginate appendage. Column arcuate, about 3 cm. long, very villous in front, with a pair of falcate auricles at the apex, extended into a prominent foot.

Peru: Habitat not recorded, *Hartweg s.n.* (type).—Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 159. 1921. Also Ecuador, fide Schlechter, Fedde Repert. Beih. 8: 145. 1921.

Description from the original diagnosis and a photograph of the type.

***Lycaste cinnabarina* Rolfe, Lindenia 9: 23, t. 394. 1893; Orch. Rev. 1: 303. 1893; Cogn. Martius Fl. Bras. 3, pt. 5: 458. 1902. *Maxillaria cinnabarina* Lindl. ex Rolfe, Orch. Rev. 1: 303. 1893.**

Pseudobulbs ovoid to oblong-ovoid, approximate, rather compressed, up to 9 cm. long, diphyllous at the apex. Leaves spreading, lanceolate-oblong to oblong-elliptic, subacute, attenuate at the base, about 70 cm. long, 13 cm. wide, plicate, with several conspicuous nerves beneath. Scapes lateral, basal, relatively short, stout, up to 16 cm. long, provided with several remote, tubular-infundibuliform sheaths, 1-flowered at the apex. Flower large, with spreading segments. Sepals and petals cream-color or greenish yellow, lip deep apricot or orange. Dorsal sepal broadly lanceolate-oblong, subobtuse, 6-8 cm. long, 2 cm. wide. Lateral sepals falcate-decurved, similar to the dorsal sepal, forming with the column-foot an obtuse mentum about 1 cm. long. Petals obliquely elliptic-oblong or elliptic-oblanceolate, subobtuse, attenuate below, a little shorter than the dorsal sepal. Lip broadly elliptic-oblong, 4 cm. long, obscurely 3-lobed just above the middle, narrowed at the base; lateral lobes small, rounded, obtuse; mid-lobe suborbicular-ovate ("orbicular-oblong"), obtuse or emarginate at the recurved apex, irregularly denticulate; disc between the lateral lobes with a large, fleshy, obovate, unicostate callus which is truncate in front. Column arcuate, clavate, 2-2.5 cm. long.

Peru: Sources of the Marañon River, *Warscewicz s.n.* (type of *Maxillaria cinnabarina*).—Huánuco, fide Schlechter, Fedde Repert. Beih. 9: 159. 1921.

No material of this species was available.

Lycaste Dyeriana Sander ex Rolfe, Kew Bull. (1898) 195; Rolfe, Bot. Mag. 132: t. 8103. 1906.

Plant epiphytic, pendent. Pseudobulbs orbicular-ovoid, subcompressed, obscurely angled, aggregated, about 3.8 cm. long and wide, bifoliate at the apex. Leaves oblong-lanceolate, acuminate, narrowed to the base, glaucous, up to 28 cm. long and 3.8 cm. wide. Scapes lateral, basal, pendent, 7.6–12.7 cm. long; peduncle provided at the base and in the middle with a spathaceous, infundibuliform sheath. Floral bract similar to the sheaths, slightly surpassing the ovary. Flower rather large, pale green. Dorsal sepal lanceolate-oblong, subobtuse, up to 5 cm. long and 1.9 cm. wide, concave. Lateral sepals obliquely oblong or lanceolate-oblong, subobtuse, about as long as the dorsal sepal but slightly broader, forming with the column-foot a broadly conical mentum 9 mm. long. Petals oblong or elliptic-lanceolate, subobtuse, distinctly smaller than the sepals. Lip up to 3.2 cm. long, recurved, obscurely 3-lobed; lateral lobes semiobovate from a narrow base, broadly obtuse; mid-lobe ovate-elliptic, dentate, obtuse, convex, with a reflexed apex; disc channelled below, with an oblong sulcate callus which is apically bilobed on each side. Column arcuate, clavate, 1.7 cm. long, with a pair of porrect auricles.

Peru: Habitat not recorded, (introduced by Messrs. Sander & Sons, St. Albans).

No example of this species was available.

Lycaste fimbriata (Poepp. & Endl.) Cogn. Martius Fl. Bras. 3, pt. 5: 455. 1902. ?*Maxillaria ciliata* Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 221. 1798. *Maxillaria fimbriata* Poepp. & Endl. Nov. Gen. ac Sp. 1: 38, t. 62, fig. 3. 1836. *Maxillaria costata* Lindl. Bot. Reg. 24, Misc. 93, no. 175. 1838. *Lycaste lanipes* Lindl. Bot. Reg. 29, Misc. 15, no. 4. 1843. *Lycaste costata* Lindl. Bot. Reg. 29, Misc. 15, no. 3, 1843; Regel Gartenfl. 18: 195, t. 620. 1869; Cogn. and Goos. Dict. Ic. Orch. *Lycaste* t. 10. 1905. *Lycaste mesochlaena* Reichb. f. Bonpl. 2: 98. 1854. *Lycaste Barringtoniae* Lindl. var. *grandiflora* Hook. f. Bot. Mag. 94: t. 5706. 1868. *Lycaste Cobbiana* Hort. ex Veitch Man. Orch. Pl. 9: 89. 1893, in synonym. (sub *L. lanipes*); Williams, Orch. Grow. Man. ed. 7: 472. 1894 (sub *L. costata*).

Plant large and stout, terrestrial, variable. Stem short, concealed by several imbricating, evanescent sheaths, developing into an oblong-ovoid or oblong-cylindrical, complanate pseudobulb which is more or less furrowed, 2- to 3-leaved at the summit, 15 cm. or less long. Leaves spreading, petioled at maturity; lamina oblong-elliptic, acute or acuminate, cuneate toward the base, up to 70 cm. long and 13.5 cm. wide, plicate, with 5–7 conspicuous nerves beneath; petiole channelled, up to 25 cm. long. Scapes lateral, basal, 1-flowered; peduncle up to 25 cm. long,

provided with several remote to approximate sheaths. Floral bract more or less surpassing the ovary. Flower rather large, with spreading segments, white, cream-colored or pale greenish throughout, subcoriaceous. Dorsal sepal elliptic-lanceolate or oblong-elliptic, obtuse to acute, 4.6–7.5 cm. long, up to 2 cm. wide. Lateral sepals falcate-decurved, oblong-lanceolate, acute to obtuse, a little shorter and broader than the dorsal sepal, forming with the column-foot a narrow, conical mentum nearly or quite equaling the ovary. Petals oblanceolate to elliptic-oblanceolate, acute to obtuse, oblique, distinctly shorter and a little narrower than the dorsal sepal. Lip recurved, distinctly 3-lobed at about the middle, elliptic-obovate in outline, long-cuneate below, broadly rounded (sometimes retuse and apiculate) in front, up to 4.6 cm. long when extended; lateral lobes semiobovate, obtuse to minutely fimbriate in front; mid-lobe much larger, oblong-ovate, denticulate to fimbriate; disc with 5 approximate central lines or keels extending into a broad, retuse, adnate callus in the middle. Column arcuate, up to 2.5 cm. long, produced into a subequally long, more or less lanate foot.

Peru: Andes, *Mathews 1026*. Source of the Marañon River, *Warszewicz s.n.*—Cuzco: Prov. of Quispicanchis, Ttío to Murayaca-Marcapata, 2000 meters, on open rocks and in forest, *Vargas 3133*. Prov. of Urubamba, Machu-Picchu, 2040 meters, on rocks, *Vargas 3300*.—Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cuchero), terrestrial in woods, *Poeppig 1732* (type of *Maxillaria fimbriata*).—Junín: Chanchamayo Valley, 1500–1600 meters, *Schunke 1280, 1329*.—San Martín: Zepelacio near Moyobamba, about 1100 meters, terrestrial in mountain forest, *Klug 3621*. Also Ecuador (type of *L. lanipes*), and Bolivia fide Schlechter, Fedde Repert. Beih. 10: 74. 1922.

Lycaste fimbriata (Poepp. & Endl.) Cogn. var. *peruviana* (Rolfe) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 199. 1944. *Lycaste peruviana* Rolfe, Kew Bull (1910) 160.

Differs from the type in smaller, 3-nerved leaves (about 23 cm. long and 7 cm. wide) and somewhat smaller, less fleshy flowers with light tawny brown sepals and petals. Sepals and petals with a more distinctly narrowed apex. Sepals 4.4 cm. or more long. Lip similar to that of the type but smaller, about 2.5 cm. long.

Peru: Habitat not recorded, *Forget s.n.* (introduced by Messrs. Sander & Sons, St. Albans).

Lycaste gigantea Lindl. Bot. Reg. 29, Misc. 15, no. 5. 1843; Benth. Pl. Hartw. 153. 1845; Bot. Reg. 31: t. 34. 1845; J. B. Bot. Mag. 92: t. 5616. 1866; Cogn. and Goos. Dict. Ic. Orch. *Lycaste* t. 7. 1899.

Plant very large and showy, terrestrial, variable. Stems short, concealed by imbricating, evanescent sheaths, developing into a conspicuous pseudobulb. Pseudobulbs large, oblong-ovoid to broadly cylindrical, complanate, 2- to 3-leaved at the summit, plurisulcate or rugose in the dried specimen, 7–15 cm. long. Leaves long-

petioled; lamina elliptic-oblong or oblong-lanceolate, sharply acute to long-acuminate, gradually narrowed below, up to 80 cm. long and 9.5 cm. wide, plicate, with about 5 conspicuous nerves beneath; petiole channelled, commonly stout, up to 25 cm. long. Scape lateral, basal, robust, 1-flowered above; peduncle up to 60 cm. or more long, adorned with several large, loose, tubular-infundibuliform, remote sheaths. Floral bract similar to the cauline sheaths, more or less surpassing the ovary. Flower very large, with spreading segments, fleshy. Sepals and petals yellowish or greenish, more or less tinted with brown or pink; lip red, brown, or purple. Dorsal sepal narrowly elliptic-oblong or lanceolate-oblong, acute to obtuse, about 10 cm. long, up to 2.5 cm. wide. Lateral sepals falcate-decurved, slightly shorter and wider than the dorsal sepal, oblong-lanceolate, forming with the column-foot a narrowly conical mentum about 1.6 cm. long. Petals obliquely elliptic-oblong, distinctly shorter than the sepals. Lip about half as long as the sepals, recurved with a sharply reflexed apex, cuneate below, broadly rounded in front, elliptic-obovate in outline and about 5.5 cm. long when expanded, sharply 3-lobed near the middle; lateral lobes small, semiobovate, subacute to obtuse; mid-lobe much larger, oblong-ovate, with the margins irregularly denticulate or fringed; disc through the lower half with a pair of fleshy lines which merge into a broad, retuse plate. Column stout, arcuate, whitish, about 2.5 cm. long, long-pilose below, extended into a stout foot.

Ayacucho: Ccarrapa, between Huanta and Río Apurimac, 1200 meters, terrestrial on wooded hillside, *Killip & Smith 23235*.—Cuzco: Prov. of Calca, Lares Valley above Huallhuayoj, 2200–2300 meters, *Weberbauer 7911*. Lares Valley above Mantoc, 2600 meters, on rocks, *Weberbauer 7911a*.—Huánuco: Yanano, about 1800 meters, “floor of dense montaña,” *Macbride 3836*. Also Ecuador (type), Colombia, and Venezuela.

Lycaste lata Rolfe, Kew Bull. (1910) 370.

Pseudobulbs oblong-ellipsoid, slightly compressed, 6-angled, 2-leaved, about 6.5 cm. long. Leaves petioled, elliptic-lanceolate, shortly acuminate, about 21 cm. long, 6 cm. wide, plicate, conspicuously 3-nerved; petiole channelled, about 6 cm. long. Scape short, about 3 cm. long, provided at the base with membranaceous sheaths. Floral bract ovate, acuminate, 3.5 cm. long, surpassing the pedicellate ovary. Flower rather large, with the sepals and apex of the petals green but otherwise white. Dorsal sepal obovate-oblong, subobtuse, incurved, 4 cm. long, nearly 2 cm. wide. Lateral sepals subfalcate, elliptic-oblong, subobtuse, rather shorter than the dorsal sepal, forming with the column-foot a conical mentum about 1.5 cm. long. Petals subspatulate, with a suborbicular-ovate limb from a cuneate base, subobtuse, distinctly shorter than the sepals but about equally broad. Lip recurved, obscurely 3-lobed, when expanded elliptic-oblong, 4 cm. long and 1.5 cm. wide, long-fimbriate above; disc with a callus which is obovate-oblong, truncate and 5-keeled. Column arcuate, about 2 cm. long, terminating in a pair of shortly triangular, subacute wings, extended at the base into a prominent foot.

Peru: Habitat not recorded, *Forget s.n.* (flowered with Messrs. Sander & Sons, St. Albans).

No material of this species was accessible.

Lycaste linguella Reichb. f. Gard. Chron. (1871) 738; Hook f. Bot. Mag. 103: t. 6303. 1877.

Plant large. Pseudobulbs aggregated, narrowly ovoid or flask-shaped, compressed, 2- or 3-leaved at the apex, deeply sulcate, about 7.6 cm. long. Leaves spreading, lanceolate-elliptic, acute or acuminate, gradually narrowed below, up to 35 cm. long and 10 cm. wide, plicate. Scapes lateral, basal, strict, 1-flowered above, up to 10 cm. long, provided below with several approximate, tubular-infundibuliform sheaths which are larger upward. Floral bract exceeding the ovary. Flower large, pale yellowish green with a nearly white lip. Dorsal sepal obovate-oblong, acute or apiculate, about 5 cm. long and nearly 2.5 cm. wide. Lateral sepals falcate-decurved, similar to the dorsal sepal but larger, forming with the column-foot a narrowly conical mentum. Petals smaller than the sepals, broadly obovate or rhombic. Lip much smaller than the sepals, deeply 3-lobed above the middle, with the lower half tubular-concave, cuneate below; lateral lobes small, with a round-ovate free portion; mid-lobe much larger, reflexed, broadly ovate, obtuse, erose-dentate; disc between the lateral lobes with a broad, fleshy, truncate or retuse, protruding callus and with 3 elevated lines below. Column stout, lightly arcuate, wingless, extended into a subequally long, pubescent foot.

Peru (probably): Habitat unrecorded, (furnished by Messrs. Veitch).

No example of this species was available.

Lycaste locusta Reichb. f. Gard. Chron. n. ser. 11: 524. 1879; Rolfe, Bot. Mag. 131: t. 8020. 1905. *Lycaste locusta* Sanders var. Cooper, Orch. Rev. 38: 168. 1930.

Plant terrestrial or epiphytic, apparently variable. Pseudobulbs aggregated, ovoid or oblong-ovoid to ellipsoid, complanate, deeply plurisulcate when dry, 1- to 3-leaved at the summit, 6-10 cm. long. Leaves spreading, more or less distinctly petioled; lamina oblong-elliptic (often narrowly so), acuminate, cuneate below, up to 55 cm. long and 6.6 cm. wide, plicate, with 3 to 7 conspicuous nerves beneath; petiole channelled, up to 8 cm. long. Scapes lateral, basal, 1-flowered above, up to 29 cm. long, provided with several (up to 7) mostly remote, tubular-infundibuliform sheaths. Floral bract similar to the cauline sheaths, surpassing the ovary. Flowers rather fleshy, green often with a white column and margin to the mid-lobe of the lip. Dorsal sepal ovate-elliptic or lanceolate-elliptic, acute, concave, up to 5 cm. long and 2.3 cm. wide. Lateral sepals obliquely ovate or ovate-oblong, acute, about equaling the dorsal sepal, forming with the column-foot a narrowly conical mentum about 1.6 cm. long. Petals obliquely oblong-oblancheolate or elliptic-oblancheolate, acute or subacute, shorter and much narrower than the sepals. Lip curved, sharply 3-lobed above the middle, with the lower portion tubular-concave, cuneate below, when expanded elliptic-obovate in outline, up to 5 cm. long and 2.2 cm. wide; lateral lobes (free portion) small, obliquely ovate, acute or obtuse; mid-lobe much larger, oblong-ovate, rounded to truncate and minutely retuse in front, fimbriate; disc with a pair of fleshy lines extending from the base to about the middle, where they merge into a broad, retuse callus between the lateral lobes. Column stout, arcuate, about 2 cm. long, more or less pilose in front (especially below), with a pair of porrect, apical auricles, extending into a subequally long foot.

Peru: Habitat not recorded, *Davis s.n.* (type).—Apurimac: Prov. of Abancay, “quebrada Matará,” 2600 meters, petals yellow-brownish, *Vargas 2810*. Apurimac Valley, near Mollepata, “caña-caña,” 2750 meters, *Herrera 1455*.—Cuzco: Prov. of Urubamba, Santa Rita, along road on open dry rocks, 2000 meters, *Vargas 2945*. Two km. below Santa Rita, 3000 meters, upon rock wall in full sun, *Metcalf 30778*.—Huánuco: Muña, about 2100 meters, *Macbride 4342*.—Junín, fide Schlechter, *Fedde Repert. Beih. 9: 159. 1921*.

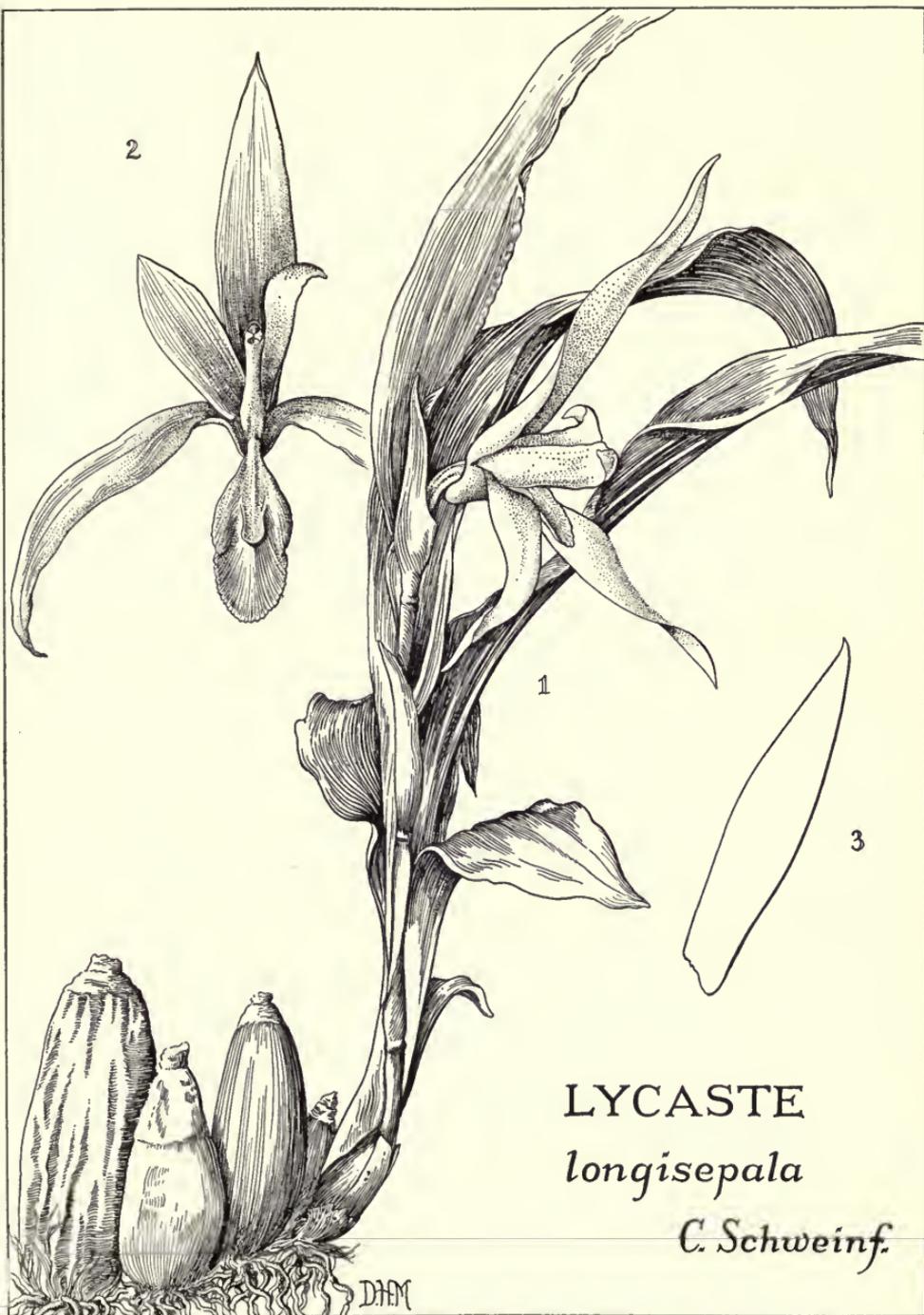
Lycaste longisepala C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 15: 157, t. 50. 1952. Figure 125.

Plant large, with a creeping rhizome. Pseudobulbs closely approximate, oblong-ovoid to narrowly ellipsoid, 3- or 4-leaved at the apex, longitudinally sulcate in age, up to 10.8 cm. long. Leaves elliptic to narrowly lanceolate-elliptic, acute to acuminate, gradually narrowed into an indistinct, deeply channelled petiole (up to 7.6 cm. long), plicate, up to about 46.3 cm. long including the petiole and 8.9 cm. wide. Scape lateral, basal, erect, 1-flowered, clothed with 3 remote, tubular sheaths, about 20.6 cm. high. Pedicellate ovary plurisulcate, shorter than the erect, tubular-infundibuliform bract which is similar to the upper sheath. Flower very large, with spreading segments. Sepals “bronze-tan” on the inner surface. Dorsal sepal elliptic-lanceolate, subacuminate, about 9–10 cm. long and 2.15 cm. wide. Lateral sepals similar, elliptic-lanceolate or oblong-lanceolate, acuminate, oblique at the base where forming a spur-like mentum with the column-foot, about as large as the dorsal sepal. Petals about half as long as the sepals, elliptic-oblong, acute, pale cream-yellow shading to white at the apex, slightly narrower than the sepals. Lip gently recurved with the sides of the lower half incurved in natural position, golden-yellow at the base shading to maroon with a white tip; lamina when expanded oblong-elliptic, sharply but not deeply 3-lobed in the middle, cuneate below, about 4.6–5 cm. long and 1.9 cm. wide; lateral lobes narrowly semiobovate, with a short rounded and crenulate free apex; mid-lobe round-ovate to oblong-ovate, rounded in front, with erose-crenulate margins, about 2.1–2.4 cm. long and 1.8 cm. wide; disc with a narrow, central callose line below and with a broad, oblong-ovate callus between the lateral lobes. Column slender, finely velutinous, about 1.8 cm. high, produced into a short, somewhat broader foot.

Peru: Sariapampa(?), *Woytkowski 289*.

Lycaste macrophylla (Poepp. & Endl.) Lindl. Bot. Reg. 29, Misc. 14, no. 1. 1843; Ch. Morren, Ann. Soc. Bot. Gand. 4: 373, t. 221. 1848; Cogn. Martius Fl. Bras. 3, pt. 5: 457. 1902. *Maxillaria macrophylla* Poepp. & Endl. Nov. Gen. ac Sp. 1: 37, t. 64. 1836. *Lycaste plana* Lindl. Bot. Reg. 28, Misc. 85, no. 96. 1842; Bot. Reg. 29: t. 35. 1843. *Lycaste Filomenoi* Schltr. Fedde Repert. Beih. 9: 100. 1921; Mansf. Fedde Repert. Beih. 57: t. 124, nr. 486. 1929.

Plant large and stout, variable, terrestrial or epiphytic. Stems short, concealed by imbricating sheaths, developing into a pseudobulb. Pseudobulbs large, com-



LYCASTE
longisepala
C. Schweinf.

FIG. 125. *Lycaste longisepala* C. Schweinf. 1, plant; $\times \frac{2}{5}$. 2, flower, partially expanded; $\times \frac{1}{2}$. 3, lateral sepal, expanded; $\times \frac{1}{2}$.

planate, ovoid (rarely subglobose) to oblong-cylindric, 2- to 3-leaved at the apex, more or less plurisulcate in the dried specimen, up to 10 cm. long. Leaves large, spreading, plicate, oval or elliptic-oblong to elliptic-ob lanceolate, acute or acuminate, gradually tapering below into a stout petiole, up to 80 cm. long and 22.5 cm. wide, with 5 to 9 conspicuous nerves beneath. Scapes lateral, basal, stout, 1-flowered at the apex; peduncles up to 45 cm. long, provided with several (up to 6) remote, loose, tubular-infundibuliform sheaths. Floral bract similar to the sheaths, commonly longer than the ovary. Flowers medium-sized to large, variable in color but commonly with the outer surface of the sepals brownish green and the inner surface brownish purple, with the white or cream-colored petals and lip more or less dotted with rose-color. Dorsal sepal lanceolate-oblong or elliptic-lanceolate, acute, 4.5 to almost 7 cm. long, about 1.9 cm. or less wide. Lateral sepals similar but a little larger, oblique, forming with the column-foot a narrowly conical mentum about 1.3 cm. long. Petals elliptic-oblong, narrowed below, obtuse to acute, distinctly shorter and often wider than the sepals. Lip elliptic-oblong in outline when expanded, 3.1–5 cm. long, 1.3–2 cm. wide, sharply 3-lobed above the middle, cuneate at the base, broadly rounded at the apex; lateral lobes semiobovate with a rounded to triangular-ovate free part; mid-lobe much larger, suborbicular to oblong-ovate, crenulate; disc with a central, linear-oblong, concave callus rounded in front and terminating between the lateral lobes. Column erect and slightly incurved, up to 2.5 cm. long, densely puberulent, extended into a prominent, dilated foot.

Amazonas: Near Chachapoyas, *Mathews 3190*.—Cuzco: Prov. of Convención, Idma, 1400–1600 meters, on rocks, *Vargas 8536*. Prov. of Quispicanchis, Marcapata Valley between Chaupichaca and Ttío, 1700 meters, on “evergreen sub-xerophilous bushwood, trees, and shrubs,” *Weberbauer 7844*. Province of Quispicanchis, Marcapata Valley, near Chilechile, 2300–2400 meters, “grass steppe with shrubs and shrubwoods,” *Weberbauer 7844a*. Marcapata, Hda. Ttío, 2000 meters, in sunny, rocky, and humid dark places, *Vargas 3119*.—Huánuco: Chihuamccala near Cuchero (Cohero), in rather dry thickets, *Poeppig 1590* (type of *Maxillaria macrophylla*). Prov. of Huánuco, Tingo María, epiphyte in forest, *Asplund 12128*.—Loreto: Near Moyobamba, *Filomeno s.n.* (type of *L. Filomenoi*).—San Martín: Near Tingo María, 625–1100 meters, *Allard 21683, 21684*. Also Venezuela, Colombia, Bolivia (type of *L. plana*) and Central America.

Lycaste Reichenbachii Gireoud ex Reichb. f. Bonpl. 4: 324. 1856.

Plant said to be allied to *L. gigantea* Lindl.

Vegetative parts not described. Flowers olive-green with a yellow-brown lip. Sepals shorter than those of *L. gigantea*. Petals ovate, acute. Lip from a ligulate claw, rhombic, retuse, many-lobulate in front with the lobules bearded; disc with a 5-ribbed callus above the claw terminating in an emarginate plate.

Peru: Habitat not recorded, *Warscewicz s.n.*

There were no available examples of this concept.

ANGULOA Ruíz & Pav.

Epiphytic or terrestrial plants forming a small genus of showy, tropical American orchids. It is apparently confined to Venezuela, Colombia, Ecuador, and Peru, which latter country has but one species, the type of the genus.

Stems short, sheathed at the base, few-leaved above, developing into fleshy pseudobulbs. Leaves few, imbricated, ample, plicate. Scapes lateral, basal, erect, 1-flowered, clothed with several loose sheaths. Flower large, rather fleshy, often nodding. Sepals imbricated in the bud, broad, subequal, more or less globose-connivent, the lateral sepals oblique and cucullate-rounded near the base. Petals similar to the dorsal sepal but often smaller. Lip 3-lobed, erect and parallel with the column, concave with the sides involute; lateral lobes relatively large, often rounded in front; mid-lobe small, narrowly lanceolate to rounded in outline; disc with a central, longitudinal callus. Column erect, stout, wingless, produced into a stout foot; clinandrium truncate or with a pair of triangular-lanceolate appendages in front. Anther terminal, opercular, incumbent. Pollinia 4.

Anguloa uniflora Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 228. 1798; Lindl. Bot. Reg. 30: t. 60. 1844; Hook. Bot. Mag. 80: t. 4807. 1854; Schltr. Orchis 10: 126, fig. 29. 1916. *Anguloa eburnea* B. S. Will. Orch. Grow. Man. ed. 3: 67. 1868, *nomen tantum*; Warn. & Will. Orch. Alb. 3: t. 133. 1884. *Anguloa virginialis* Lindl. Gard. Chron. (1851) 392, *nomen*; Schltr. Orchideen ed. 1: 404. 1914; Orchis 10: 128, fig. 30. 1916.

Plant epiphytic, rather variable in contour and color of the flower and in the shape of the mid-lobe of the lip. Stem short, concealed below by several distichous, imbricated sheaths, leafy above, soon thickened into a stout pseudobulb which is oblong-ovoid, up to 18 cm. long, leaf-bearing at the summit, leafless and furrowed in age. Leaves 2-4, imbricating, broadly elliptic, narrowed above to an acute or acuminate apex and below to a cuneate base, up to 50 cm. long and 15 cm. wide, plicate, convolute. Scapes stout, lateral, basal, up to 30 cm. tall, distinctly shorter than the leaves or nearly as long, 1-flowered at the apex, mostly concealed by several (up to 5) loose, imbricating, concave sheaths. Flower large, showy, rather fleshy, with more or less globular-connivent segments, ivory-white, often more or less flushed with pink outside, sometimes spotted with red and often marked with yellow inside. Dorsal sepal oval-ovate, acute, deeply concave, recurved at the tip, 5.5-7.5 cm. long, up to 4 cm. wide. Lateral sepals similarly large, very broadly ovate, lightly oblique and long-adnate to the column-foot, deeply concave, with a recurved, acute apex. Petals broadly oblong-obovate or elliptic-rhombic, acute, concave, shorter and narrower than the sepals. Lip erect and parallel to the column, tubular-concave, 3-lobed near the apex, about 3.5 cm. long, about equally wide above the middle when expanded; lateral lobes semiobovate with a broadly

narrowly ovoid to oblong-cylindric, bearing 1 or 2 leaves at the apex, about 1–4 cm. high, produced into a long slender beak or neck up to 13.5 cm. long, concealed (together with the base of the leaves) by several imbricating, evanescent sheaths. Leaves erect, linear-elliptic to lanceolate-elliptic or oblong-elliptic, a acute or acuminate, gradually narrowed below to a conduplicate, more or less petioled base, up to 45 cm. long, 1.4–6.5 cm. wide, with 3–5 conspicuous nerves beneath. Scapes lateral, basal, erect or suberect, stout or slender, more or less exceeding the leaves, up to 67 cm. or more tall, racemose above; peduncle elongate, adorned with several remote, short, close, tubular sheaths; raceme loosely 7- to many-flowered, up to 18.5 cm. long. Floral bracts small and inconspicuous, much shorter than the pedicellate ovary. Flowers erect or spreading, rather small, with spreading segments, ivory-white to lilac. Dorsal sepal ovate-oblong or oblong-elliptic, acute to obtuse, up to 1.4 cm. long, 4.7–7 mm. wide. Lateral sepals ovate to ovate-elliptic, lightly oblique, about as long as the dorsal sepal but wider. Petals variable, obovate-oblong to elliptic or ovate-elliptic, obtuse or acute, lightly oblique, a little shorter than the sepals. Lip much shorter and broader than the other segments, sessile or subsessile, articulated to the free portion of the column-foot, deeply 3-lobed, lightly cordate at the base, up to 7 mm. long and 10 mm. wide; lateral lobes erect, broadly semiovate or suborbicular-ovate, lightly oblique, rounded at the apex; mid-lobe much larger, sessile, transversely flabellate-semiorbicular, very broadly rounded and sometimes lightly retuse in front; disc between the lateral lobes with a fleshy, retrorse, bilobed callus. Column very short and stout, clavate or wing-dilated upward, about 4 mm. long, with a subequally long foot.

Cuzco: Prov. of Convención, Sahuayaco, 1450 meters, on slope and grassland in straw, *Vargas 6294*. Same province, Choquellohuanca, Lucumayo, 1800 meters, *Vargas 7567*.—Huánuco: Pampayaco (Pampayacu), *Kanehira 324*.—Loreto: Canela Usiah, 1000 meters, *Ule 6691* (type of *K. peruviana*).—Puno: Prov. of Sandía, Sto. Domingo area, 1550 meters, *McCarroll 84*.—San Martín: Zepelacio, near Moyobamba, 1200–1600 meters, in mountain forest, “fls. pale lilac and dark lilac,” *Klug 3397*. Also Brazil (type of *Cyrtopodium eburneum*), British Guiana and Venezuela.

Koellensteinia graminea (Lindl.) Reichb. f. Bonpl. 4: 323. 1856; Hook. f. Bot. Mag. 104: t. 6338. 1878; Cogn. Martius Fl. Bras. 3, pt. 5: 558, t. 103, fig. 2. 1902; Schltr. Orchis 12: 26. 1918. *Maxillaria graminea* Lindl. Bot. Reg. 21: sub t. 1802. 1836. *Proomenaea graminea* Lindl. Bot. Reg. 29, Misc. 13. 1843. *Aganisia graminea* Benth. ex Hook. f. Bot. Mag. 118: sub t. 7270. 1892.

Plant rather small to medium-sized. Rhizome creeping, slender, bearing numerous roots. Stems very short, more or less approximate, non-pseudobulbous, concealed by several distichous, imbricating sheaths which are leaf-bearing above. Leaves spreading and more or less recurved, narrowly linear to lanceolate-linear, acute or short-acuminate, gradually narrowed below, up to 26 cm. long and 9 mm. wide (commonly much shorter and narrower), with 3 conspicuous nerves beneath. Scapes lateral, axillary, very slender, more or less shorter than the longer leaves,

lax (rarely suberect), above racemose or loosely paniculate with several strict, commonly short branches, 6–25 cm. long, the peduncle bearing 1 to several small, remote, tubular-infundibuliform sheaths; raceme or panicle very loosely 1- to several-flowered. Floral bracts very small, spreading, ovate or oblong-ovate, much shorter than the pedicellate ovary. Flowers rather small, with spreading segments, cream-color and rose, white or greenish white and violet, or white and red-brown. Dorsal sepal oblong-ovate or elliptic-ovate, acute or subacute, up to 10.4 mm. long and 5.8 mm. wide. Lateral sepals ovate or elliptic-ovate, acute, slightly oblique, often dorsally carinate above, slightly wider than the dorsal sepal and often shorter also. Petals oblong-lanceolate, subacute or obtuse, a little shorter and much narrower than the sepals, more or less oblique. Lip shorter and much wider than the other segments, deeply concave, sharply 3-lobed, subcordate-truncate at the base, articulated to the free, subquadrate portion of the column-foot, up to 4.9 mm. long and often nearly twice as wide across the base when expanded; lateral lobes erect in natural position, obliquely ovate or ovate-oblong, obtuse to broadly rounded above; mid-lobe much wider, broadly flabellate-reniform (rarely flabellate-obovate), in front retuse and usually with a minute apicule; disc with a fleshy, subquadrate, retrorse callus which is divaricately bilobed above. Column very short and stout, wing-dilated above, up to 2.8 mm. long, extended into a much longer foot.

Loreto: Gamitanacocha, Río Mazán, 100–125 meters, on river bank, *Schunke 145*. Mishuyacu, near Iquitos, 100 meters, epiphyte in forest, *Klug 1193*. Vicinity of Iquitos, 100 meters, epiphyte by river, *Klug 10085*.—San Martín: Boquerón Pass, 92 km. from Tingo María on highway to Pucallpa, about 400 meters, on wet rocks, *Allard 22076*. Zepelacio, near Moyobamba, about 1100 meters, epiphyte in mountain forest, *Klug 3622*. Also British Guiana (type of *Maxillaria graminea*), French Guiana, Brazil, Venezuela and Trinidad.

Koellensteinia ionoptera Linden & Reichb. f. Gard. Chron. (1871) 1451; Schltr. Orchis 12: 26. 1918. *Aganisia ionoptera* Nichols. Dict. Gard. 1: 35. 1885; Rolfe, *Lindenia* 6: 97, t. 287. 1891; Hook. f. Bot. Mag. 118: t. 7270. 1892.

Plant rather large. Rhizome apparently abbreviated. Stems short, leafy, at length thickened into a pseudobulb. Pseudobulbs narrowly ovoid, 2–3.5 cm. high, prolonged into a slender, cauliform neck which is monophyllous at the apex. Leaf lanceolate-elliptic, acute or acuminate, narrowed below, up to 25 cm. long, 2–3 cm. wide, with 3 conspicuous nerves beneath. Scape lateral, basal, erect, relatively stout, up to 45 cm. high, racemose above; peduncle with few, remote, small, close, tubular sheaths; raceme loosely 9- to 15-flowered. Floral bracts small and inconspicuous, much shorter than the pedicellate ovary. Flowers medium-sized, nodding, with widely spreading segments, yellowish without, bright violet with whitish or yellowish tips to the sepals and petals and a whitish or yellowish, red-streaked lip. Sepals subequal, ovate to oblong-elliptic or “oblong,” subacute, the lateral sepals somewhat oblique, about 1.4 cm. long. Petals very similar but smaller. Lip much shorter and broader than the other segments, sharply 3-lobed, sessile and articulated to the column-foot, about 1 cm. long; lateral lobes erect

in natural position, auriculiform or obliquely round-ovate; mid-lobe sessile, transversely oblong or reniform, rounded or retuse at the apex; disc between the lateral lobes with a fleshy retrorse callus divided into 2 divergent lobes or horns. Column very short and stout, wing-dilated upward, extended into a subequally long foot.

Peru: Habitat not recorded, *Wallis s.n.* (introduced by Mm. Linden).

No specimen of this species was available.

AGANISIA Lindl. (including *Acacallis* Lindl.)

A small group of American epiphytes or terrestrials apparently limited to Trinidad and the northern half of South America.

Primary stems or rhizomes long-creeping, jointed, sheathed. Pseudobulbs distant, slender, sheathed, cylindric-ellipsoid or fusiform, 1- to (rarely) 3-leaved at the summit. Leaves elliptic to oblong-lanceolate, acute or acuminate, petioled, plicate. Scapes lateral, arising from the base of the pseudobulb, distantly few-sheathed below, loosely racemose and few-flowered above. Parts of the perianth spreading. Sepals free, subequal. Petals similar to the sepals. Lip with a short or rather long claw, 3-lobed or sometimes simple; lateral lobes very small, broadly triangular to dentiform; mid-lobe large, ovate to semiorbicular, deeply concave or saccate, subentire to deeply fimbriate; disc with a lobulate callus between the lateral lobes. Column rather short, broadly winged, biauriculate at the apex. Anther terminal, opercular, incumbent, 1-celled. Pollinia 4, complanate-obovoid.

Aganisia fimbriata Reichb. f. Gard. Chron. n. ser. 2: 452. 1874.
Aganisia coerulea Reichb. f. Gard. Chron. n. ser. 6: 226. 1876; Cogn.
 Martius Fl. Bras. 3, pt. 5: 522. 1902. *Acacallis coerulea* Schltr.
 Orchis 12: 14. 1918.

Primary stem or rhizome long-creeping, jointed, concealed by distichous, imbricating, evanescent sheaths. Pseudobulbs distant, slender, fusiform or ellipsoid-cylindric, extended into a slender beak, unifoliate at the apex, about 7 cm. or less long, concealed by elongate, membranaceous sheaths. Leaf prominently petioled; lamina elliptic to elliptic-oblong, sharply acute to acuminate, cuneate below, plicate, with 5 to 7 prominent nerves beneath, 18-29.5 cm. long, up to 7.3 cm. wide; petiole channelled, 2-8 cm. long. Inflorescence lateral, basal, lax, equaling about one half of the lamina of the leaf or less, up to 22 cm. long (excluding the terminal flowers). Raceme loosely few- (2- to 9-) flowered, often secund. Flowers medium-sized, with spreading segments, blue or lilac usually with darker markings, rarely white and violet. Dorsal sepal elliptic or oval ("cuneate-oblong"), subacute, cuneate at the base, up to 2.3 cm. long and 1.4 cm. wide. Lateral sepals similar, lightly oblique. Petals obovate or suborbicular-obovate, subacute to broadly rounded at the apex, commonly slightly smaller than the sepals but sometimes broader. Lip 3-lobed, clawed, up to about 1.6 cm. long; claw oblong, concave in front; lateral lobes relatively minute, triangular-dentiform, obtuse or subacute, erect-spreading; mid-lobe much larger, deeply concave or saccate, transversely semiorbicular or muscle-shaped when expanded, subtruncate near the

base, very lightly retuse in front, with the sides deeply fimbriate, up to nearly 2 cm. wide when expanded; disc with a fleshy, triangular-subquadrate, high, lobulate callus between the lateral lobes. Column very short and stout, 5-7 mm. high, broadly winged with the wing abruptly dilated above into a pair of spreading, triangular or triangular-oblong, apically rounded auricles.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 530, 1239, 1257*. Same locality and altitude, epiphyte in dense forest, *Killip & Smith 29984*. Near Iquitos, 100 meters, in virgin forest, *Tessmann 5156*.—San Martín: Chazuta, Río Huallaga, about 260 meters, in forest, *Klug 3985*. Also Brazil (type of *Aganisia coerulea*), Colombia and British Guiana (type of *Aganisia fimbriata*).

The type of *Aganisia fimbriata*, borrowed from Vienna, consists only of a single, few-flowered scape, accompanied by floral sketches. An examination of a flower from this collection proves conclusively that the concept is identical with the well-known *Aganisia coerulea*. This flower shows insignificant differences from the usual form of *A. coerulea* in its somewhat smaller size and more saccate lip with slightly larger lateral lobes.

ZYGOPETALUM Hook. (including *Warscewiczella* Reichb. f.)

A large and variable genus of American epiphytic or terrestrial orchids occurring from Mexico through Central America to Panama and the West Indies, but centered in South America, where extending southward to Brazil and Argentina.

Stems short, leafy, either without pseudobulbs or developing into fleshy pseudobulbs which bear 2 to several leaves at the apex. Leaves more or less elongate, plicate or subplicate, with elevated nerves beneath. Scapes lateral, basal, leafless; 1-flowered or racemose above, with a peduncle bearing few or several sheaths. Flowers mostly large and showy, with spreading segments. Sepals subequal, the lateral sepals being more or less oblique and adnate to the short column-foot. Petals similar to the sepals but often smaller. Lip simple, pandurate or usually 3- or more-lobed; lateral lobes spreading or incurved, often small; mid-lobe usually broad and spreading, entire or bilobed; disc at the base with a polymorphic, simple, lobed or toothed, commonly transverse callus. Column stout, usually short, incurved, wingless or bialate, produced into a short or very short foot. Anther terminal, opercular, incumbent, 2-celled. Pollinia 4, in 2 pairs.

- A1. Scapes several-flowered, racemose; complete mature plant producing pseudobulbs. I
 A2. Scapes 1-flowered; plant entirely without pseudobulbs (§. *Warscewiczella*). 2
 Ia. Terminal portion of the lip emarginate, very large.
 Z. intermedium (*Z. bolivianum*)
 Ib. Terminal portion of the lip subacute to acuminate. 1

- 1a. Sepals subacute, dusky brown, about 2.5 cm. long; basal callus of the lip multidentate and plurituberculate.....*Z. Prainianum*
- 1b. Sepals acuminate, not dusky, about 3.5 cm. long; basal callus of the lip 3-divided.....*Z. acuminatum*
- 2a. Lip much larger than the sepals and petals, prominently retuse or bilobed in front.....*Z. amazonicum*
- 2b. Lip subequal to the sepals or shorter, sharply acute to acuminate in front... 3
- 3a. Basal portion of the lip plurilamellate, minutely lobulate but not fimbriate; mid-lobe of the lip broad, rhombic-ovate.....*Z. rhombilabium*
- 3b. Basal portion of the lip smooth and not plurilamellate, fimbriate; mid-lobe of the lip narrow, elliptic-lanceolate.....*Z. Klugii*

Zygopetalum acuminatum C. Schweinf. Am. Orch. Soc. Bull.

12: 314, t., 1944. Figure 126.

Plant large, terrestrial or epiphytic, variable. Pseudobulb not seen, but noted as present by the collector. Leaves 2 or 3, on a short leafy shoot; lamina oblanceolate to cuneate-obovate, acute, narrowed to a more or less distinct petiole, up to 28 cm. long, 4.4–6.9 cm. wide, plicate, with about 5 conspicuous nerves beneath; petiole conduplicate, up to 4.5 cm. long. Scapes suberect, slightly shorter than the leaves, up to 33 cm. long; peduncle stout, with 2 remote, close sheaths; raceme very loosely 4- to 6-flowered. Floral bracts conspicuous, ovate, deeply concave, more than half as long as the pedicellate ovary. Flowers large, with spreading segments, either pink and yellow or green and reddish green. Dorsal sepal lanceolate, acuminate, 3.4–3.7 cm. long, 1.1–1.4 cm. wide. Lateral sepals very obliquely lanceolate, long-acuminate, as long as the dorsal sepal but slightly wider. Petals oblong-lanceolate, acute or short-acuminate, shorter and narrower than the sepals. Lip shorter than the sepals, fleshy, clawed, 3-lobed with a reflexed anterior part in natural position; lateral lobes relatively small, erect, oblong, nearly obscured by the prominent basal callus; mid-lobe rhombic-oval when expanded, cuneate below, abruptly short-acuminate or sharply acute, about 2 cm. long and 1.7 cm. wide; disc at the base with a deeply concave, 3-lobed callus, the lateral lobules broad and truncate at the undulate apex and the middle lobule strongly compressed, narrowly nasiform and porrect. Column short and stout, with a pair of porrect, oblong-ovate wings, about 1.1 cm. long at the back, produced below into a foot which is longer than the column and terminates in a stout, fleshy horn.

Cuzco: Prov. of Convención, Hda. Potrero, Sapan-Sachayocc, 2200 meters, epiphyte in forest, *Vargas 2550*. Prov. of Convención, "alturas de Pintollamba [?Pintobamba] en humus tenía," 2400 meters, *Vargas 3285* (type).

Zygopetalum amazonicum (Reichb. f. & Warsc.) Reichb. f. Walp. Ann. 6: 655. 1863. *Warscewiczella amazonica* Reichb. f. & Warsc. Bonpl. 2: 97. 1854; Reichb. f. Xen. Orch. 1: 222, t. 93, fig. II, 8–9. 1858; Cogn. Martius Fl. Bras. 3, pt. 6: 474. 1906. *Zygopetalum Lindenii* Rolfe, *Lindenia* 8: 5, t. 337. 1892.

Plant rather large, caespitose, without pseudobulbs. Leaves several, approximate, spreading, distichous, articulated to long, conduplicate sheaths; lamina

oblong-obovate to narrowly oblong-oblancoate, acute or short-acuminate, long-narrowed below, plicate or subconduplicate, with several conspicuous nerves beneath, up to 32 cm. long and 5 cm. wide, the outer blades successively shorter; sheaths up to 6 cm. long. Scape lateral, slender, much shorter than the leaves, 1-flowered at the apex; peduncle about 11.5 cm. or less long, provided below the middle and at the base with several close, tubular sheaths which are imbricating near the base. Flower large for the genus, with spreading segments, snow-white with red or purplish veins on the lip. Dorsal sepal lanceolate, acute or acuminate, 3-3.5 cm. long, about 1.2 cm. wide. Lateral sepals oblong-lanceolate, a little longer than the dorsal sepal, lightly oblique. Petals elliptic-oblong or lanceolate, similar to the dorsal sepal but slightly wider. Lip much larger, very shortly clawed, lightly 3-lobulate near the base with incurved lateral lobes, obcordate in outline, conspicuously emarginate or 3-lobed in front, 5.5 cm. or less long on either side of the middle and about 4.5 cm. wide; lateral lobules broadly triangular and obtuse; mid-lobe much larger, reniform-semiorbicular; disc at the base with a broad, transversely subrhombic callus which is 3- to 7-toothed at the truncate apex. Column small, clavate, alate-dilated above, 1.5-1.8 cm. long, with a very short foot.

Peru: Upper Amazon River, *Warscewicz 15* (type of *Warscewiczella amazonica*). Near source of Marañon River, *Warscewicz s.n.*—Loreto: Along Río Itaya, in forest, *Williams 228*. Also Brazil.

Zygopetalum intermedium Lodd. ex Lindl. Bot. Reg. 30, Misc. 9, no. 2. 1844; Cogn. Martius Fl. Bras. 3, pt. 5: 566. 1902. *Eulophia Mackaiana* Lindl. Bot. Reg. 17: t. 1433. 1831, excl. synonym. *Zygopetalon Mackaii* Paxt. Mag. Bot. 3: 97, cum ic. 1836, non Hook. *Zygopetalum Mackayi* Paxt. var. *intermedium* Mutel. Mém. Plus. Orch. Nouv. pt. 2: 9. 1842. *Zygopetalum intermedium* Lodd. ex Lindl. var. *peruvianum* Rolfe, Lindsia 9: 71, t. 418. 1893. *Zygopetalum bolivianum* Schltr. Fedde Repert. Beih. 10: 50. 1922; Mansf. Fedde Repert. Beih. 57: t. 140, nr. 549. 1929.

Plant large, terrestrial. Pseudobulbs ovoid-conic or globose-ovoid (not noted in var. *peruvianum*), 3- to 5-leaved at the apex, 4-8 cm. long, commonly aggregated. Leaves elliptic-lanceolate to lanceolate-oblong, acute to acuminate, narrowed to the base, plicate, with 5 to 9 prominent nerves beneath, 17-50 cm. long, 2-6 cm. wide. Scapes lateral, stout, racemose above, exceeding the leaves, up to 40 cm. long; peduncle 29 cm. or more long, with a few remote, tubular-infundibuliform sheaths; raceme very loosely 3- to 5-flowered, with the rachis 13.5-21.5 cm. long. Floral bracts prominent, subequaling the pedicellate ovary. Flowers large, variable, with widely spreading segments. Dorsal sepal elliptic-oblong or oblong-lanceolate, acute to subobtuse, 3-3.5 cm. long and 1 cm. wide, green, heavily blotched with crimson. Lateral sepals similar, oblique, short-acuminate. Petals similar to the dorsal sepal, acute. Lip slightly longer and much broader than the sepals, white heavily lined with purple, broadly obovate in outline, 3-lobed at the base, about 3.5 cm. long and 3 cm. or more wide above; lateral lobes very small, auriculate; mid-lobe relatively large, cuneate-obovate, flabellate or obcordate, broadly rounded in front, retuse at the apex, with strongly undulate

ZYGOPETALUM

acuminatum

C. Schweinf.



FIG. 126. *Zygopetalum acuminatum* C. Schweinf. 1, basal portion of plant, and inflorescence; $\times \frac{2}{3}$. 2, plant; $\times \frac{1}{5}$. 3, column and lip, somewhat spread out, from above; $\times 1$. 4, column and lip from side, natural position; $\times 1$. 5, pollinia and stipe; $\times 4$.

margins; disc at the base with a fleshy, bilobed, plurisulcate callus. Column short and stout, alate-dilated above, about 1.3 cm. long.

Peru: Habitat not recorded, *Mathews 1896* (var. *peruvianum*, with smaller flowers than type).—Puno, fide Schlechter, Fedde Repert. Beih. 9: 161. 1921. Also Brazil (type of *Z. intermedium*, *Eulophia Mackaiana* and *Z. Mackaii*) and Bolivia (type of *Z. bolivianum*).

Zygopetalum Klugii C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 159, t. 51. 1952. Figure 127.

Plant epiphytic, medium-sized for the genus, without pseudobulbs or apparent stems. Leaves several, in a flabelliform cluster, articulated to conduplicate, basally imbricating sheaths of which the outer members are much smaller and with or without abbreviated blades; lamina oblong-obovate to oblong-oblancheolate, abruptly acute, long-narrowed below, membranaceous, with 3–7 conspicuous nerves beneath, up to 26 cm. long and 5.5 cm. wide (the uppermost and innermost blade longest and narrowest). Inflorescences several, lateral in the axil of sheaths, relatively short, 1-flowered; peduncles filiform, with several loose, scarios sheaths below, up to 5.5 cm. long. Flower rather small for the genus, with spreading segments, white or whitish green. Dorsal sepal oblong-lanceolate, acuminate, about 2.24 cm. long and 7.6 mm. wide. Lateral sepals very obliquely lanceolate with the dorsal margin nearly straight and the anterior margin broadly rounded, acuminate, larger than the dorsal sepal. Petals elliptic-lanceolate, lightly oblique, acuminate, slightly smaller than the dorsal sepal. Lip shortly clawed, about 2.4 cm. long in natural position, sharply divided into a hypochile and epichile; claw short, broad, sulcate, about 2 mm. long; hypochile conduplicate-concave, with the broadly rounded anterior margin irregularly digitiform-fimbriate, the center having a low fleshy keel within; epichile attached to the back of the hypochile in the middle, elliptic-lanceolate, acuminate with a complicate apex, lightly concave, about 1.8 cm. long and 7 mm. wide. Column conspicuous, about 1.6 cm. long, broadly winged on each side through the lower half, extended into a broad, indistinct fleshy foot.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10109*.

Zygopetalum Prainianum Rolfe, Kew Bull. (1914) 376; Bot. Mag. 141: t. 8610. 1915.

Plant large, terrestrial. Pseudobulbs clustered, oblong-cylindrical, slightly thickened below, longitudinally sulcate, 2- to 3-leaved at the apex, 3–10 cm. long. Leaves elongate, oblong-lanceolate or linear-elliptic, acute to subobtuse, narrowed below, 25–35 cm. long, 1.5–3 cm. wide, plicate, with prominent nerves beneath. Scapes lateral, erect, about 60 cm. long, racemose above; peduncle with several remote, close, tubular-infundibuliform sheaths; raceme loosely 4- to 5-flowered. Floral bracts close, concave, about half as long as the pedicellate ovary. Flowers rather large, showy, with widely spreading or reflexed segments. Dorsal sepal lanceolate-oblong, subacute, about 2.5 cm. long and 1 cm. wide, dusky brown with a green margin. Lateral sepals similar, lightly oblique. Petals similar to

ZYGOPETALUM

Klugii

C. Schweinf.

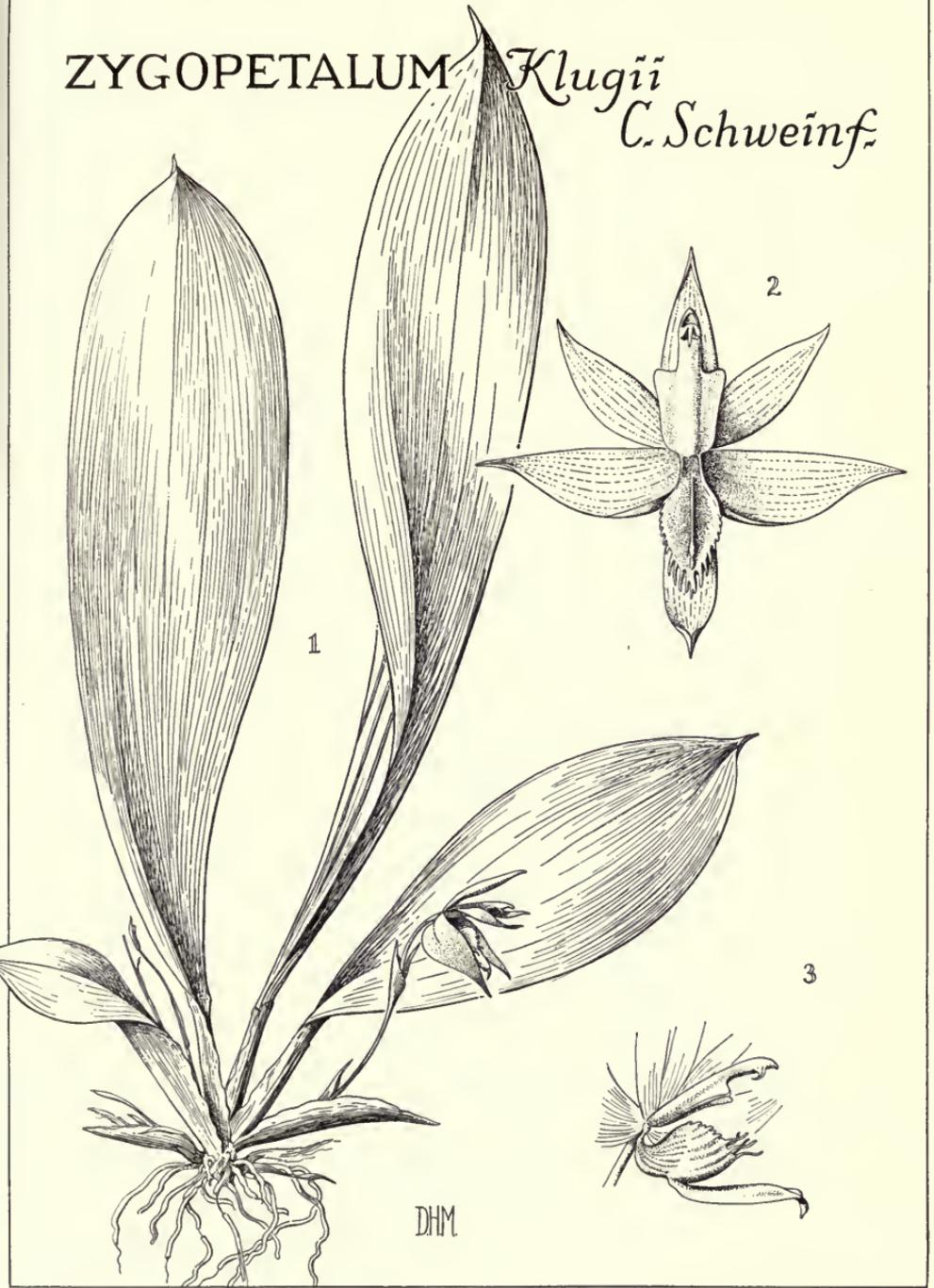


FIG. 127. *Zygopetalum Klugii* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower expanded; $\times 1$. 3, column and lip from side; $\times 1$.

the sepals, acute or apiculate, dusky brown with obscure green stripes. Lip oblong-pandurate, subacute, about 2 cm. long and 1.5 cm. wide, white; basal portion with spreading, semiorbicular sides; anterior portion larger, apparently suborbicular-ovate with incurved and crenulate sides; disc at the base with a fleshy multidentate callus having rose-purple teeth. Column arcuate, stout, clavate, with a pair of conspicuous, triangular-oblong, porrect teeth above, about 1.5 cm. long.

Peru: Habitat unrecorded, *Forget s.n.* (imported by Messrs. Sander & Sons, St. Albans).

The above diagnosis was based on the descriptions and plate cited.

Zygopetalum rhombilabium C. Schweinf. Am. Orch. Soc. Bull. 12: 422, t., 1944. Figure 128.

Plant rather large, epiphytic, caespitose, without pseudobulbs, variable. Leaves several, approximate, distichous, spreading, articulated to elongate, conduplicate sheaths; lamina oblanceolate or oblanceolate-oblong, sharply acute or short-acuminate, gradually narrowed below, plicate, with 3 to 5 conspicuous nerves beneath, up to 44 cm. long and 6.5 cm. wide, the outer leaves much smaller. Scapes lateral, basal, several, in the axil of conduplicate sheaths, slender, 1-flowered at the apex; peduncle 7–13 cm. long, with several tubular-infundibuliform sheaths which are imbricating below. Flower rather large, with widely spreading segments. Dorsal sepal lanceolate or narrowly lanceolate, acuminate, 2.7–3.9 cm. long, 8–9 mm. wide. Lateral sepals obliquely lanceolate or oblong-lanceolate, acuminate, about as large as the dorsal sepal. Petals oblong-lanceolate or linear-lanceolate, oblique and more or less incurved, acuminate, smaller (especially shorter) than the sepals. Lip subsessile, 3-lobed, about 2.2–2.4 cm. long and 1.35–1.5 cm. wide across the mid-lobe; lateral lobes small, erect in natural position, lanceolate-triangular, horizontally spreading when expanded, almost entirely concealed by the basal callus; mid-lobe relatively large, rhombic-ovate, acuminate (often abruptly so) with an inflexed tip, about 1.6 cm. long; disc below with a concave, semiorbicular, plurilamellate callus. Column relatively short and stout, with a pair of porrect, semiorbicular wings, densely tomentose in front, up to 1.3 cm. long, extended into a short foot about half as long.

Junín: Chanchamayo Valley, 1200–1500 meters, *Schunke s.n.*, 1189.—San Martín: Near Tingo María, 625–1100 meters, *Allard 21985*. San Roque, 1350–1500 meters, in forest, *Williams 7796* (type).

On the basis of the illustration (l.c.), this species was considered by Dr. F. C. Hoehne (Arquiv. Bot. Estad. S. Paulo, Nov. Ser. Form. Maior 2, Fasc. 6: 126. 1952) to be synonymous with his *Warscewiczella heteroclita*, based on *Maxillaria heteroclita* Poepp. & Endl. Nov. Gen. ac Sp. 1: 37, t. 63. 1836. However, as pointed out (C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 276. 1945), the Poeppig & Endlicher drawing, which was said to have been made from the

ZYGOPETALUM

rhombilabium C. Schweinf.



FIG. 128. *Zygopetalum rhombilabium* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, flower, expanded; $\times 1$. 3, lip, spread out; $\times 2$. 4, column and lip from side, natural position; $\times 2$. 5, anther from above; $\times 4$. 6, anther from below; $\times 4$. 7, pollinia, showing two unequal pairs; $\times 6$.

living plant, shows an orchid bearing a pseudobulb and thus it appears to be very different from our plant. The two flowers illustrated, however, are very similar to those of *Zygopetalum rhombilabium*. After considering the evidence, the concept, *Maxillaria heteroclita*, with the habit of a *Maxillaria* and the flower of a *Zygopetalum*, was regarded as a *nomen confusum* and was not considered as potentially a name-bringing synonym.

BATEMANNIA Lindl.

A small genus of epiphytic orchids extending throughout most of northern South America.

Stems abbreviated, concealed by several imbricating leaves, developing into pseudobulbs. Pseudobulbs fleshy, often 4-angled, ovoid to oblong-cylindric, 1- to 3-leaved at the apex. Leaves ample, acute or acuminate, narrowed into a more or less distinctly petioled base, plicate. Inflorescence lateral, basal, shorter than the leaves, 1- to few-flowered, erect or more often deflexed; raceme loose. Dorsal sepal free, erect, concave, oblong or elliptic-oblong. Lateral sepals spreading, commonly longer and narrower than the dorsal sepal. Petals long-adnate to the column-foot at the base, commonly distinctly wider than the sepals. Lip concave-involute through the basal portion, 3-lobed above the middle; lateral lobes erect with a small, ovate or rounded free portion; mid-lobe often much larger, spreading, commonly obovate to oblong or ovate-oblong; disc often with a transverse or more or less elongate, central callus which is toothed above. Column rather long, stout, wingless, produced into a conspicuous foot. Anther opercular, incumbent, 2-celled. Pollinia 2, sulcate or bilobed.

A1. Scape deflexed or nodding; mid-lobe of the lip obovate or obovate-oblong, apiculate, 2 or 3 times longer than the lateral lobes.

B. Colleyi (*B. peruviana*)

A2. Scape suberect; mid-lobe of the lip oblong or ovate-oblong, obtuse, 5 or 6 times longer than the lateral lobes. *B. Wolteriana*

Batemannia Colleyi Lindl. Bot. Reg. 20: t. 1714. 1835; Hook. Bot. Mag. 67: t. 3818. 1841; Cogn. Martius Fl. Bras. 3, pt. 5: 473, t. 94, fig. 1. 1902. *Batemanian peruviana* Rolfe, Kew Bull. (1895) 193.

Plant medium-sized, epiphytic, very variable. Pseudobulbs commonly aggregated, oblong-ovoid to oblong-cylindric, 1- or 2- (rarely 3-) leaved at the apex, more or less markedly 4-angled in section, 3-7 cm. high, shining. Leaves oblanceolate to narrowly obovate-elliptic, sharply acute, narrowed below into a more or less distinct petiole, up to 25 cm. long and 7 cm. wide, plicate, with 5 to 7 conspicuous nerves beneath. Inflorescence lateral, basal, short, lax or nodding, loosely 2- to 3- (rarely 5- or more-) flowered, with a fractiflex rachis. Floral bracts broad, concave, much exceeded by the slender, pedicellate ovary. Flowers medium-sized, red-brown or dark red (rarely green) with more or less prominent green markings or tips to the sepals and petals, commonly with a white or green lip

and column. Dorsal sepal oblong or elliptic-oblong, concave, up to 26 mm. long and 12.5 mm. wide, rounded at the apex and often with a minute apicule. Lateral sepals oblong, with a more or less concave base and subconduplicate lower sides (producing an oblong-spatulate appearance), longer and somewhat narrower than the dorsal sepal. Petals long-adenate to the column-foot at the base, obliquely ovate to ovate-oblong, rounded above with a minute apicule, shorter and broader than the sepals. Lip strongly concave-involute through the lower two-thirds or more, with erect sides and a recurved apical portion, sharply 3-lobed above, elliptic or oblong-elliptic when flattened out and about as long as the lateral sepals, 17.5–30 mm. long, up to 16.5 mm. wide when expanded; lateral lobes semiobovate, with a small, triangular-ovate or oblong-ovate, denticulate free portion; mid-lobe twice or more exceeding the lateral lobes, broadly obovate or oblong-obovate, broadly rounded and apiculate above; disc with a short, transverse, denticulate callus (more or less prominently bilobed) in the middle between the lateral lobes. Column stout, arcuate, with a denticulate or crenulate apex, up to 18 mm. long, extended into a subequally long foot.

Peru: Habitat not recorded (introduced by Messrs. F. Sander & Co.) (type of *B. peruviana*).—Junín: Chanchamayo Valley, 1500 meters, *Schunke s.n.* East of Quimiri Bridge, near La Merced, 800–1300 meters, in dense forest, *Killip & Smith 23840*.—Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1441*. Vicinity of Iquitos, 100 meters, *Klug 10116*. Also British Guiana (type of *B. Colleyi*), Trinidad, Colombia and Brazil.

Batemannia Wolteriana Schltr. *Orchis* 9: 52, t. 5, figs. 7–14. 1915.

Plant epiphytic, with an abbreviated rhizome. Pseudobulbs ovoid, more or less tetragonous, 2-leaved at the apex, 5–6 cm. high. Leaves lanceolate-elliptic, acute or short-acuminate, narrowed into a short petiole at the base, about 20 cm. long and 4 cm. wide, erect-spreading. Inflorescence suberect, 1- to probably few-flowered, shorter than the leaves. Flowers rather large for the genus, glabrous. Dorsal sepal elliptic-oblong (“narrowly oblong”), subobtuse, about 2.5 cm. long. Lateral sepals deflexed, obliquely oblong-ligulate, acute, considerably longer and narrower than the dorsal sepal. Petals oblong-ovate, falcate, a little longer and much wider than the dorsal sepal, decurrent on the column-foot at the base. Lip narrowly elliptic in outline, sharply 3-lobed above the middle, cuneate at the base, about 3 cm. long, almost 1.3 cm. wide in the middle; lateral lobes semi-obovate with a short, obliquely triangular, acute free apex; mid-lobe oblong, sub-obtuse, about 6 times longer than the free apex of the lateral lobes; disc from the base to the middle with a linear callus which is dilated and tridentate at the free apex. Column short, stout, about 1.75 cm. high, produced into a subequally long foot; clinandrium dilated, 3-lobed, with the mid-lobe bilobed.

Peru(?): Brought in by P. Wolter in Magdeburg-West (type).—Junín, fide Schlechter, *Fedde Repert. Beih.* 9: 160. 1921.

No example of this species was accessible.

STENIA Lindl.

A very small genus of epiphytes occurring in Trinidad and northern South America.

Plants epiphytic, with abbreviated, crowded stems or pseudobulbs which bear 1 to 3 leaves. Leaves oblong-obovate to oblong, with a prominent central vein. Scapes lateral, basal in the axil of the sheaths, very short, recurved, 1-flowered. Flower rather large. Sepals free, spreading, about equally long, the lateral sepals somewhat broader below, oblique, with the base adnate to the column-foot. Petals similar to the dorsal sepal. Lip continuous with the column-foot, deeply concave or saccate, fleshy, more or less distinctly 3-lobed; lateral lobes small, obtuse-angled or semiorbicular; mid-lobe often much larger and undivided; disc with a transverse, multidentate crest. Column stout, arcuate-erect, produced into a short but conspicuous foot. Anther terminal, opercular, incumbent, convex, 2-celled. Pollinia 4, in 2 pairs.

Stenia guttata Reichb. f. Gard. Chron. n. ser. 14: 134. 1880.

Pseudobulbs minute, crowded, apparently 1- to 3-leaved at the apex, clothed with spathaceous sheaths. Leaves obovate to oblong or elliptic, acute, cuneate below, with 5 to 7 nerves, of which the middle one is more prominent, reaching about 13 cm. long and 3.5 cm. wide. Scapes lateral, at the base of the abbreviated stems, very short, recurved or prostrate, 1-flowered. Flower rather large, membranaceous, straw-colored with Indian-purple spots. Sepals shorter and blunter than in *S. pallida* Lindl. Dorsal sepal oblong-ovate, subacute (not acute or acuminate), about 20–26 mm. long. Lateral sepals obliquely lanceolate-ovate, subacute, somewhat larger than the dorsal sepal. Petals similar to the dorsal sepal. Lip deeply concave or saccate (especially at the base), fleshy, lightly 3-lobed; lateral lobes indistinct, shallowly semiorbicular; mid-lobe larger, ovate-triangular; disc with a transverse crest consisting of but 7 teeth. Column obscurely angled on each side. Pollinia depressed-pyriform (not linear-cylindric as in *S. pallida* Lindl.).

Peru: Habitat not recorded, *Davis s.n.*

It was impossible to secure any record of the type from the Reichenbach Herbarium in Vienna. However, since the very brief description (l.c.) states that this species is closely allied to *S. pallida* Lindl., I have taken over the vegetative description of the latter species and made the description of the flower fit the characteristics which are cited to distinguish this concept from *S. pallida*.

CHONDRORHYNCHA Lindl.

A genus of small to medium-sized epiphytes (including the concept *Kefersteinia*) extending from Mexico through Central America to Panama, and widespread in South America as far as Peru and Bolivia.

Stems very short, caespitose, without pseudobulbs, but with distichous, narrow leaves articulated to conduplicate, imbricating leaf-sheaths; blades oblong or oblanceolate, acute or acuminate, narrowed to a more or less distinct petiole, plicate, spreading. Scapes lateral, axillary, 1-flowered, more or less shorter than the leaves. Flowers small to rather large, with spreading segments. Sepals subequal, the lateral ones oblique, often with a concave base, commonly a little longer than the dorsal sepal. Petals usually broader than the sepals, very oblique at the base. Lip sessile or subsessile, simple or subsimple, bilobed to broadly rounded in front; disc at the base with a prominent, simple or lobulate callus. Column more or less dilated near the apex, produced into a very short foot. Anther terminal, opercular, incumbent. Pollinia 4, in 2 pairs of unequal masses.

- A1. Flower large, sepals and petals about 3.5 cm. or more long; lip fimbriate, with a double callus at the base.....*C. fimbriata*
- A2. Flowers small, sepals and petals about 1.6 cm. or less long; lip crenate-dentate to erose-denticulate, with a single callus at the base.....*I*
- Ia. Lip rhombic-ovate, bilobed in front; column abruptly dilated near the middle.
C. lojæ
- Ib. Lip suborbicular-ovate, broadly rounded in front; column very slightly dilated above.....*C. pusilla*

Chondrorhyncha fimbriata (Linden & Reichb. f.) Reichb. f. Saund. Refug. Bot. 2: t. 107. 1878. *Stenia fimbriata* Linden & Reichb. f. Gard. Chron. (1868) 1313.

Plant medium-sized, without pseudobulbs, caespitose. Stems very short, approximate, concealed by several distichous, leaf-bearing sheaths. Leaves several, erect-spreading, articulated to prominent, conduplicate sheaths; blades oblanceolate, acute, apparently about 15 cm. or less long and 2.8 cm. or less wide, conduplicate below. Scapes much shorter than the leaves, 1-flowered, more or less erect, about 5.5 cm. long, with 3 remote, small sheaths. Flower large, pale yellowish green or sulphur-colored, with widely spreading, membranaceous segments. Dorsal sepal oblong or "ligulate," acute or "acuminate," recurved, about 4.5 cm. long and 10 mm. wide. Lateral sepals similar, slightly oblique, a little longer and narrower than the dorsal sepal. Petals broadly oblong, conspicuously apiculate, apparently much wider and a little shorter than the sepals, undulate, with denticulate margins. Lip much larger than the other segments, triangular-ovate with a prominent cuneate base having incurved margins, deeply bilobed in front, with undulate-lobulate and fimbriate margins; disc at the base with an oblong, median callus surrounded by a lobulate, apically retuse callose wall and an outer ring of numerous calli. Column stout, clavate, about half as long as the lip.

Peru: Habitat unrecorded (sent by Mm. Linden of Brussels), fide Reichenbach f. (l.c.). Colombia (type).

Chondrorhyncha lojæ (Schltr.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 216. 1944. *Kefersteinia lojæ* Schltr. Fedde Re-

pert. Beih. 8: 93. 1921; Mansf. Fedde Repert. Beih. 57: t. 95, nr. 373. 1929.

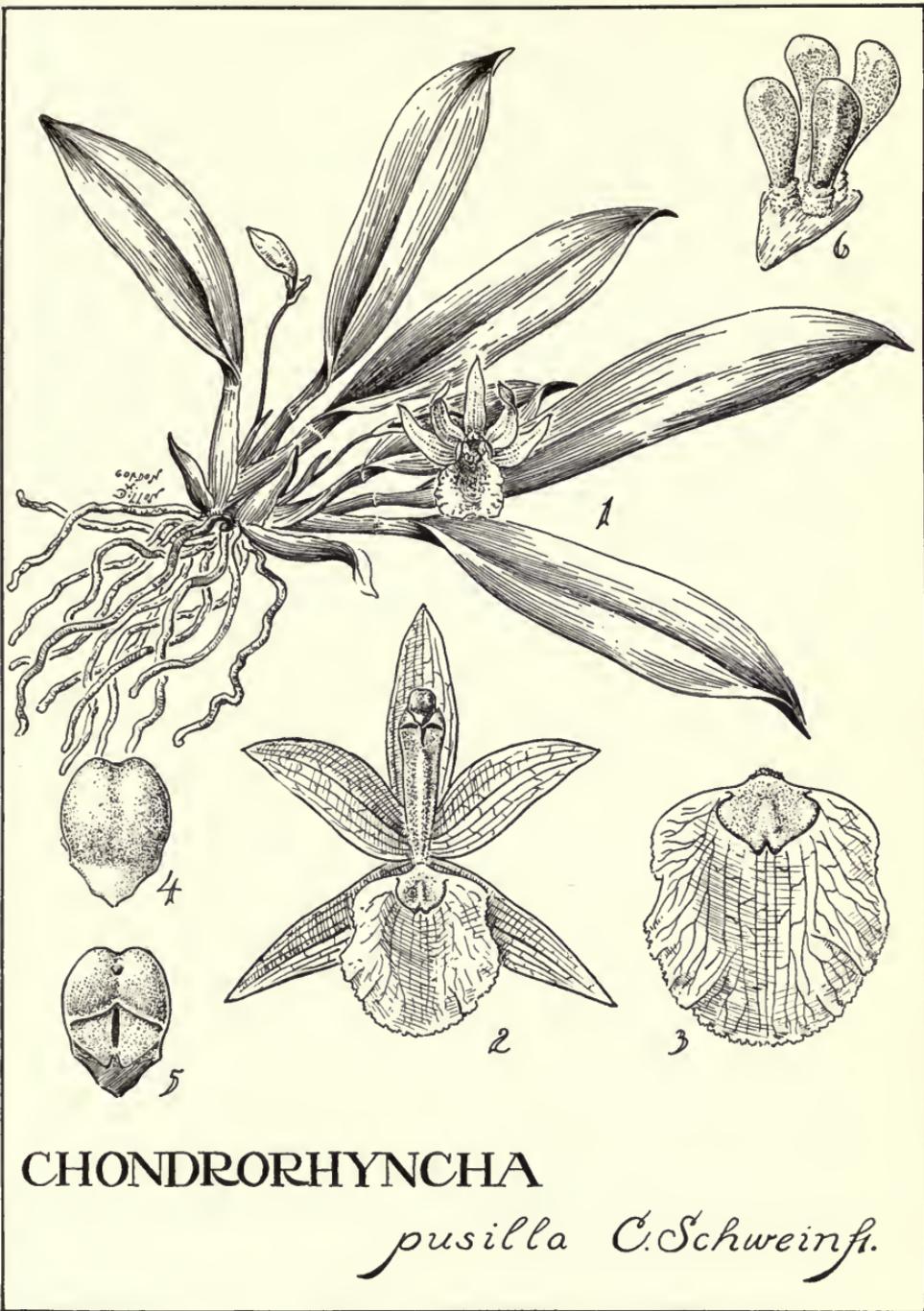
Plant small, epiphytic, 25 cm. or less tall, caespitose. Stems abbreviated, approximate, clothed with 4 or 5 imbricating, distichous leaf-sheaths. Leaves articulated to conduplicate sheaths, oblanceolate or oblanceolate-linear ("lanceolate-ligulate"), subacute, gradually narrowed below, 20 cm. or much less in length, 8-20 mm. wide. Scapes 2 or 3 to a plant, lateral, basal (or axillary), very short, 1-flowered, spreading or ascending, the filiform peduncle with 3 sheaths in the lower half, 4-5 cm. high. Flower small or medium-sized, with spreading, membranaceous segments. Dorsal sepal oblong-lanceolate or "oblong," acute, about 1.4 cm. long and 5.6 mm. wide, adnate to the column at the base. Lateral sepals obliquely oblong-lanceolate, subacute, a little longer than the dorsal sepal, concave at the base. Petals slightly shorter than the dorsal sepal but broader, very oblique at the base, subacute or apiculate, slightly crenulate. Lip simple, very shortly clawed, rhombic-ovate, lightly retuse or bilobed at the apex, cuneate at the base, denticulate-erose or "crenate-dentate," about 1.35 cm. long and nearly 1.2 cm. wide; disc at the base with a suborbicular-rhombic, deeply bilobed callus. Column very short and stout, extended into a short foot below, abruptly wing-dilated on each side near the middle.

Junín: La Merced, Hacienda Schunke, about 1200 meters, "flowers white except for densely red-dotted central part," *Macbride 5782*. Chanchamayo Valley, 1200 meters, *Schunke 528* (vegetatively very small). Also Ecuador (type).

Chondrorhyncha pusilla C. Schweinf. Am. Orch. Soc. Bull. 12: 384, t., 1944. Figure 129.

Plant small, caespitose, without pseudobulbs. Stems very short, bearing a few distichous, imbricating leaf-sheaths. Leaves few, oblong-elliptic to narrowly oblanceolate, acute or short-acuminate, narrowed below, up to 7.3 cm. long and 1.2 cm. wide, subplicate. Scapes 1-flowered, lateral, axillary, short but conspicuously exceeding the leaf-sheaths, about 2 cm. long, the peduncle with 2-3 loose, tubular sheaths which are approximate below. Flower small with spreading, membranaceous segments. Dorsal sepal elliptic-lanceolate, complicate-acute, about 1.27 cm. long and 4.5 mm. wide. Lateral sepals obliquely oblong-lanceolate, acuminate, dorsally keeled near the apex, a little longer and narrower than the dorsal sepal. Petals obliquely ovate-lanceolate, acute or short-acuminate, very oblique at the base, somewhat shorter and broader than the dorsal sepal. Lip simple, sessile, round-ovate, slightly constricted on each side near the concave base, broadly rounded in front with a minute apicule, about 1.1 cm. long and nearly 1 cm. wide, denticulate-erose with the anterior margins plicate-undulate; disc at the base with a fleshy, transversely rhombic-ovate callus which is abruptly bidentate in front. Column lightly clavate, without noticeable wing-dilation, about 8.5 mm. long, produced into a short foot.

Junín: Chanchamayo Valley, 1200 meters, *Schunke s.n.* (type in Herb. Chicago Nat. Hist. Mus. 571649). Same locality, 1500 meters, *Schunke 1251* (flower imperfect).



CHONDRORHYNCHA

pusilla C. Schweinf.

FIG. 129. *Chondrorhyncha pusilla* C. Schweinf. 1, plant; $\times 1$. 2, flower, expanded; $\times 2$. 3, lip, expanded; $\times 3$. 4, anther from above; $\times 6$. 5, anther from below; $\times 6$. 6, pollinia; $\times 10$.

- 6a. Leaves oblong-lanceolate to linear-lanceolate, 1–1.8 cm. wide; flowers relatively small; sepals lanceolate or oblong-lanceolate, usually about 1.7 cm. or less long; lip about 1.3 cm. long. *M. exaltata* (*Camaridium exaltatum*)
- 6b. Leaves narrowly linear, about 5 mm. wide; flowers relatively large; sepals linear, about 2.6 cm. long; lip short, about 1 cm. long. *M. linearis*
- 7a. Apex of the leaves prominently bilobed. 8
- 7b. Apex of the leaves obtuse to acuminate (rarely obscurely emarginate). . . 10
- 8a. Column relatively elongate, almost equaling the dorsal sepal; petals broader than the sepals; lip apparently ecallose, with a blood-red spot.
M. sanguineomaculata (*Dichaea arbuscula*)
- 8b. Column distinctly shorter than the dorsal sepal; petals nearly as broad as the sepals; lip with a more or less prominent median callus. 9
- 9a. Leaves elliptic-oblong to oblong, 7–12 mm. wide; lip subrounded at the base; column very short and stout. *M. infausta*
- 9b. Leaves linear or oblong-linear, 6 mm. or less wide; lip cuneate at the base; column relatively elongate, marginate and ciliolate at the apex.
M. arbuscula
- 10a. Lip with a definite callus below the middle (though sometimes the callus is deciduous or the whole axis of the lip is described as thickened). 11
- 10b. Lip without a definite callus below the middle (though sometimes the entire axis of the lip is described as thickened); leaf-bearing stems commonly robust. 15
- 11a. Stems (sheathed) very stout, about 2 cm. wide; leaves 10–40 (usually 25) cm. long. *M. densifolia* (*Camaridium densifolium*)
- 11b. Stems (sheathed) slender, 8 mm. or less wide; leaves about 9 cm. or less long. 12
- 12a. Flowers relatively small, sepals about 8.2 mm. or less long, long-acuminate.
M. graminifolia (*Camaridium graminifolium*)
- 12b. Flowers relatively large, sepals 1.2 cm. or more (rarely about 1 cm.) long, acute to long-acuminate. 13
- 13a. Leaves broadly oblong, elliptic-oblong or ovate-oblong, mostly 1.2–2 cm. wide; upper bract subequaling the pedicellate ovary.
M. longibracteata (*Camaridium longibracteatum*)
- 13b. Leaves narrowly oblong-lanceolate to linear-lanceolate, commonly 9 mm. or less wide. 14
- 14a. Upper bract much shorter than the pedicellate ovary; petals a little shorter than the sepals. *M. longibracteata* var. *luteorubra*
(*Camaridium luteorubrum*, *Maxillaria luteorubra*)
- 14b. Upper bract extending to one-half of the dorsal sepal; petals about half as long as the sepals. *M. longibracteata* var. *grandiflora*¹
(*Isorchilus grandiflorus*, *Camaridium grandiflorum*)
- 15a. Rhizome elongate, with distinct, short (rarely elongate) branches.
M. disticha (*Ornithidium distichum*)
- 15b. Rhizome apparently absent or abbreviated, stems elongate, erect. 16

¹ The disc of the lip of *Isorchilus grandiflorus* (as *I. grandiflorum*) is described as naked; but since Reichenbach, after examining the type, referred this concept to *Maxillaria luteorubra* (which is distinctly callose through the lower half), it is reasonable to assume either that *Isorchilus grandiflorus* bears a similar callus which was overlooked by Lindley or that it was caducous, as sometimes happens in lips of this group.

- 16a. Stems branching; ovary triquetrous; lip strongly sigmoid when viewed from the side. *M. alticola* (*Ornithidium serrulatum*)
- 16b. Stems simple; ovary not triquetrous. 17
- 17a. Leaves rather short, ovate-lanceolate to oblong-lanceolate, up to 8 cm. long; flowers blue. *M. crassicaulis* (*Ornithidium Weberbauerianum*)
- 17b. Leaves elongate, narrowly oblong to ligulate, 10 cm. or more long; flowers yellow or greenish yellow. *M. aurea* var. *gigantea* (*Ornithidium giganteum*)
- 18a. Pseudobulbs (sometimes obscure) at more or less remote intervals. 19
- 18b. Pseudobulbs approximate or apparently approximate (sometimes but one pseudobulb is present in the dried specimen). 52
- 19a. Apex of the pseudobulbs bearing 2 leaves. 20
- 19b. Apex of the pseudobulbs bearing 1 leaf. 32
- 20a. Lip distinctly 3-lobed. 21
- 20b. Lip entire or obscurely 3-lobed or minutely auricled at the base. 23
- 21a. Flowers relatively large, sepals and petals 1.6 cm. or more long. 22
- 21b. Flowers very small, sepals about 4 mm. long; disc of the lip naked below. *M. purpurea* var. *parviflora* (*Ornithidium parviflorum*)
- 22a. Disc of the lip adorned with numerous tuberculate papillae near the base. *M. Camaridii* (*Camaridium ochroleucum*)
- 22b. Disc of the lip without numerous tuberculate papillae. *M. nanegalensis*
- 23a. Lamina of the lip cucullate throughout, with upcurved sides and more or less developed, dentiform auricles at the base. 24
- 23b. Lamina of the lip not cucullate throughout, flat above. 25
- 24a. Leaves elliptic or oblong-elliptic, 6-9 mm. wide; flowers golden to orange-yellow; column about 2.7 mm. long at the back. *M. huancabambae*
- 24b. Leaves linear-oblong to narrowly elliptic-oblong, 4-5 mm. wide; flowers white; column minute, about 1.5 mm. long at the back. *M. huancabambae* var. *cuzcoensis*
- 25a. Sepals obovate. *M. xanthorhoda*
- 25b. Sepals not obovate. 26
- 26a. Petals narrow, about half as wide as the sepals or less; lip prominently clawed; scapes conspicuously exerted. 27
- 26b. Petals relatively broad, nearly as wide as the sepals or wider; lip apparently sessile or subsessile. 29
- 27a. Lip broad above, with a rounded and lightly retuse apex. *M. ramosissima*
- 27b. Lip narrowed above, with an obtuse or acuminate apex. 28
- 28a. Flowers small, lateral sepals 1.5 cm. (rarely) or less long; lip lanceolate or ovate-triangular, subcordate at the base. *M. divaricata* (*M. nervosa*)
- 28b. Flowers relatively large, lateral sepals about 1.6 cm. or more long; lip elliptic-oblong or subpandurate-oblong, cuneate at the base. *M. acuminata*
- 29a. Leaves narrowly linear or subterete, about 6 mm. or less wide; petals retuse and apiculate; lip long-cuneate toward the base. *M. christobalensis*
- 29b. Leaves narrowly ligulate to oblong-elliptic; petals not retuse; lip not cuneate below. 30
- 30a. Leaf-blades 2.3 cm. or more wide; petals abruptly rounded above, slightly narrower than the sepals. *M. funicaulis*
- 30b. Leaf-blades about 1.3 cm. or less wide; petals not abruptly rounded above, usually a little wider than the sepals. 31

- 31a. Leaves (except at the apex of the stems) mostly 10 cm. or more long; petals sharply acute; lip oblong-subquadrate or ligulate. *M. saxatilis*
- 31b. Leaves 7.2 cm. or less long; petals obtuse to rounded at the apex; lip broadly ovate-oblong. *M. infausta*
- 32a. Flowers large, sepals about 3.5 cm. (rarely) or more long; disc of the lip never with a band of tubercles. 33
- 32b. Flowers relatively mostly small, sepals 3.5 cm. or less long; disc of the lip sometimes with a band of tubercles. 35
- 33a. Petals spatulate-oblong, much shorter than the sepals; sepals oblong or oblong-lanceolate. *M. brachypetala*
- 33b. Petals linear or linear-lanceolate, narrower above, a little shorter than the sepals; sepals linear-lanceolate or linear-oblong. 34
- 34a. Leaves oblong to elliptic-oblong, 8.5–20 cm. long and 2.5–4 cm. wide; flower large, sepals 6.4–7.5 cm. long *M. floribunda*
- 34b. Leaves ligulate, 5–7 cm. long and 1.4–1.7 cm. wide; flower smaller, sepals about 4 cm. long. *M. platyloba*
- 35a. Disc of the lip ecallose on the upper surface. 36
- 35b. Disc of the lip with a median callus or carinate lines (sometimes consisting of numerous tubercles) on the upper surface, not sharply reflexed in the middle, but sometimes strongly recurved above. 37
- 36a. Lip entire, sharply reflexed in the middle.
M. multicaulis (Ornithidium multicaule)
- 36b. Lip sharply 3-lobed near the apex. *M. crocea*
- 37a. Base of the lip with a band of setose tubercles or papillae.
M. Camaridii (Camaridium ochroleucum)
- 37b. Base of the lip without tubercles or papillae. 38
- 38a. Dorsal sepal strongly carinate on the back, especially above; ovary sharply trigonous. 39
- 38b. Dorsal sepal ecarinate or chiefly so; ovary not sharply trigonous. 41
- 39a. Pseudobulbs slender, cylindrical, ascending and subparallel to the rhizome; lip sharply 3-lobed near the apex. *M. unicarinata*
- 39b. Pseudobulbs pyriform, spreading; lip lightly or obscurely 3-lobed near the middle. 40
- 40a. Lip distinctly 3-lobed with the shallow lateral lobes having an abbreviated free apex; disc with a tricarinate callus below. . *M. xantholeuca* var. *peruviana*
- 40b. Lip subtrilobed, without distinct lobes; disc with a sulcate or bicarinate callus below. *M. trigona*¹
- 41a. Lip simple or obscurely 3-lobed. 42
- 41b. Lip commonly distinctly or sharply 3-lobed. 44
- 42a. Leaves narrowly linear, commonly subterete and channelled; column at the apex with a pair of abrupt, uncinat auricles. *M. uncala (M. Macleei)*
- 42b. Leaves narrowly oblong to elliptic-oblong, flat; column without terminal auricles. 43
- 43a. Pseudobulbs oval-ovoid; peduncles abbreviated or none; flowers white.
M. pendula (Ornithidium pendulum)
- 43b. Pseudobulbs very narrowly cylindrical; peduncles conspicuous and relatively elongate; flowers yellow. *M. angustibulbosa*

¹ When more material of this concept is available, it may prove to be only another variety of *M. xantholeuca* Schltr.

- 44a. Peduncles indistinct, abbreviated; sepals small, about 11 mm. or less long; rhizome well developed, elongate, stem-like, more or less branched. 45
- 44b. Peduncles distinct, often elongate; sepals relatively large, 12-22 (rarely 9) mm. long; rhizome usually simple, often very short. 49
- 45a. Lateral lobes of the lip erect-spreading, not overlapping the mid-lobe; mid-lobe obtuse to acuminate. 46
- 45b. Lateral lobes of the lip porrect, more or less overlapping the mid-lobe; mid-lobe retuse or bilobulate. 47
- 46a. Pseudobulbs unifoliate; mid-lobe of the lip ovate or triangular-ovate, distinctly larger than the lateral lobes.
M. purpurea (Ornithidium vestitum, in part)
- 46b. Pseudobulbs more commonly bifoliate; mid-lobe of the lip oblong, smaller than the lateral lobes.
M. purpurea var. parviflora (Ornithidium vestitum, in part)
- 47a. Sepals acuminate, about 8.8 mm. or more long; mid-lobe of the lip cuneate at the base. *M. spathulata*
- 47b. Sepals obtuse to acute, about 6 mm. or less long. 48
- 48a. Petals markedly narrower than the sepals; leaves mostly elliptic-oblong.
M. Tafallae (Ornithidium Tafallae, O. dichotomum)
- 48b. Petals slightly broader than the sepals; leaves narrowly linear. *M. fasciculata*
- 49a. Lateral sepals ovate-triangular; lip lightly 3-lobed. *M. angustibulbosa*
- 49b. Lateral sepals elliptic-oblong, ovate-oblong, broadly ligulate or triangular-lanceolate; lip sharply 3-lobed. 50
- 50a. Lip 3-lobed near the middle; mid-lobe oblong-subquadrate or subquadrate-ovate. *M. rufescens*
- 50b. Lip 3-lobed at or near the apex. 51
- 51a. Petals narrowly obovate, obtuse to rounded at the apex; mid-lobe of the lip much larger than the lateral lobes. *M. crocea*¹
- 51b. Petals linear-lanceolate or linear-ob lanceolate, acute; mid-lobe of the lip relatively small. *M. meridensis*
- 52a. Leaves acicular or filiform to very narrowly linear and channelled. 53
- 52b. Leaves neither acicular nor filiform, flat even if very narrow. 54
- 53a. Pseudobulbs bearing 3 to 4 leaves at the apex; mentum short; apical column-wings spreading and rounded. *M. nardoides*
- 53b. Pseudobulbs bearing 1 leaf at the apex; mentum elongate; apical column-wings uncinately-decurved. *M. uncata (M. Macleei)*
- 54a. Leaf-blade 9 cm. wide; scape about 35 cm. long. *M. insignis*
- 54b. Leaf-blade 6.8 cm. or less wide; scape usually much shorter than above. . . 55
- 55a. Pseudobulbs 2-leaved at the apex. 56
- 55b. Pseudobulbs 1-leaved at the apex. 57
- 56a. Leaf-blades about 35 cm. long; scapes 12 cm. or less long; petals much shorter than the sepals; disc of the lip with an oblong callus. *M. parviloba*
- 56b. Leaf-blades 50-70 cm. long; scapes 15 cm. or more long; petals little shorter than the sepals; disc of the lip naked. *M. Batemanni*

¹ Although there is no mention of a basal callus in the original description of this concept, it is entirely reasonable to assume the presence of this feature; and, furthermore, it appears to be quite probable that this species is referable to the variable *M. rufescens* Lindl.

- 57a. Rhizome well developed and elongate, with usually a well-marked axis; petals linear, much shorter than the sepals; lip oval, sharply 3-lobed near the apex; ovary conspicuously trigonous. *M. unicarinata*
- 57b. Rhizome abbreviated, or at least not shown in the dried specimens; sometimes a creeping rhizome is present but is concealed by the approximate pseudobulbs (cf. *M. cornuta* C. Schweinf. & *M. Weberbaueri* Schltr.) 58
- 58a. Lip simple or obscurely or lightly 3-lobed. 59
- 58b. Lip prominently 3-lobed. 72
- 59a. Flowers relatively small, sepals 2.8 cm. (rarely) or less long. 60
- 59b. Flowers relatively large, sepals commonly about 3 cm. or more long. 65
- 60a. Leaves sharply acute or acuminate, with relatively slender, subterete petioles; sepals submembranaceous. 61
- 60b. Leaves obtuse, obliquely bilobed, with broad (often indistinct), ancipitous petioles; sepals more or less fleshy. 64
- 61a. Pseudobulbs minute, 1 cm. or less long. 62
- 61b. Pseudobulbs larger, 2.5–5 cm. long. 63
- 62a. Flower relatively small, sepals about 14 mm. or less long, obtuse; mid-lobe of the lip ovate-semiorbicular, denticulate. *M. breviscapa*
- 62b. Flower relatively large, sepals 18–26 mm. long, long-acuminate; mid-lobe of the lip triangular-lanceolate or ovate-lanceolate, long-acuminate.
M. attenuata
- 63a. Dorsal sepal narrow, up to 3 mm. wide; lateral sepals nearly twice as wide; lip entire, emarginate, ecallose. *M. argyrophylla*
- 63b. Dorsal sepal about 8 mm. wide; lateral sepals slightly narrower; lip lightly but distinctly 3-lobed, rounded at the apex, with a prominent median callus.
M. Woytkowskii
- 64a. Petals linear; callus of the lip smooth. *M. longifolia*
- 64b. Petals elliptic-lanceolate or oblong-oblancheolate; callus of the lip pubescent.
M. villosa
- 65a. Lateral sepals lanceolate or broadly oblong-lanceolate when expanded; mentum relatively short, 1.5 cm. or less long. 66
- 65b. Lateral sepals triangular-ovate or ovate-lanceolate; mentum conspicuous, commonly 1.8 cm. or more long. 67
- 66a. Leaves lorate, obtuse or very abruptly acute with a bilobed tip; sepals narrow, acuminate, about 1 cm. wide. *M. nasuta*
- 66b. Leaves elliptic-oblong or broadly oblong, acute and not bilobed at the apex; sepals broad, acute or rarely obtuse. *M. elegantula*
- 67a. Lip with entire lateral margins, emarginate on each side. 68
- 67b. Lip with prominently undulate-crenulate or crispate margins (at least above). 69
- 68a. Peduncle about 30 cm. long; sepals about 3 cm. long; disc of the lip with an emarginate tubercle. *M. nutans*¹
- 68b. Peduncle about 50 cm. long; sepals about 5 cm. long; disc of the lip with a ligulate, obtuse tubercle. *M. macropoda*
- 69a. Sepals greenish to yellow closely striped with red; lateral sepals gradually narrowed above. *M. striata*
- 69b. Sepals white or milk-white, often with purple lines or blotches; lateral sepals obtuse or acute. 70

¹ The brief description of this species fails to specify whether the margins of the lip are entire; but there is no contrary indication, and the emarginate tubercle on the disc is diagnostic of this concept.

- 70a. Sepals white and unmarked, 4.5 cm. or less long; disc of the lip 3-callose below. *M. grandiflora*
- 70b. Sepals white or yellowish-white lined or blotched with purple or dark brown; disc of the lip uncallose. 71
- 71a. Scapes elongate, about equaling the leaves; sepals 4.5 cm. or less long, lined with purple. *M. Fletcheriana*
- 71b. Scapes relatively short, much shorter than the leaves; sepals 6 cm. or more long, blotched with purple or dark brown. *M. Sanderiana*
- 72a. Mid-lobe of the lip triangular or triangular-ovate, commonly strongly acuminate. 73
- 72b. Mid-lobe of the lip not triangular nor strongly acuminate when expanded. . 76
- 73a. Leaves acute. 74
- 73b. Leaves obtuse, or rounded and bilobed at the apex; sepals ligulate, oblong or triangular, 6-12 mm. wide. 75
- 74a. Leaf-blade linear, 8 mm. or less wide; lip short, about 9.5 mm. long. *M. tenuis*
- 74b. Leaf-blade elliptic to elliptic-oblong, 11 mm. or more wide; lip longer than above, about 15 mm. or more long. *M. attenuata*
- 75a. Lamina of the leaf short, 8 cm. or less long; lateral sepals triangular. *M. Johniana*
- 75b. Lamina of the leaf elongate, 41 cm. or more long to the obliquely bilobed tip; lateral sepals oblong. *M. violaceo punctata*
- 76a. Sepals and petals of the large flowers semicircular-recurved and subparallel. . 77
- 76b. Sepals and petals not semicircular-recurved and subparallel. 78
- 77a. Disc of the lip with an abrupt, semiquadrate callus below the mid-lobe; flowers yellow with purple spots on the lip. *M. colorata*¹
- 77b. Disc of the lip with a broad, central groove which appears to be plurisulcate. *M. longipes*
- 78a. Lip when viewed from the side strongly sigmoid with a concave basal portion; disc with the fleshy central callus flanked on each side by a thickened line. *M. cuzcoensis*
- 78b. Lip when viewed from the side not strongly sigmoid; disc uncallose or naked, without thickened lateral lines. 79
- 79a. Dorsal sepal conspicuously carinate. 80
- 79b. Dorsal sepal not conspicuously carinate. 82
- 80a. Leaf about 30 cm. long and 4 cm. wide; sepals 4 cm. long; mid-lobe of the lip narrow, oblong. *M. Fuerstenbergiana*
- 80b. Leaf 11.6 cm. or less long and 1.8 cm. or less wide; sepals about 2.5 cm. or less long; mid-lobe of the lip broad. 81
- 81a. Mentum formed by the lateral sepals short, about 3 mm. long; petals not constricted on each side near the apex. *M. Koehleri*
- 81b. Mentum formed by the lateral sepals prominent, about 9 mm. long; petals lightly constricted on each side near the apex. *M. cornuta*
- 82a. Mid-lobe of the lip more or less retuse at the tip, subquadrate or subquadrate-ovate in outline; lateral lobes small, dentiform, median. *M. rufescens*
- 82b. Mid-lobe of the lip not prominently retuse, varying from rounded or ovate to linear-oblong in outline. 83

¹The only definite character which separates this concept from *M. longipes* is apparently the callus on the disc of the lip. Otherwise, judged from records of the types of both concepts, they appear to be synonymous.

- 83a. Leaves linear, up to 6 mm. wide; plant relatively small. . . . *M. xylobiiiflora*
- 83b. Leaves broader, elliptic-oblong to lorate, those on the pseudobulb 1 cm. or more wide.84
- 84a. Leaf sessile; disc of the lip smooth; scapes subequalling the leaf.
M. laevilabris
- 84b. Leaf petioled or with a petiole-like base in the dried specimen; disc of the lip (except in *M. Batemanii*) unicallose; scapes commonly shorter than the leaf.85
- 85a. Lateral lobes of the lip, if distinct, separated from the mid-lobe by shallow or rounded sinuses; petioles very stout, conduplicate; flowers commonly fleshy.86
- 85b. Lateral lobes of the lip very distinct, separated from the mid-lobe by a re-entrant angle; petioles commonly relatively slender and more or less semiterete in cross section; flowers membranaceous (rarely subfleshy) . . . 87
- 86a. Flower relatively large, sepals 3.5 cm. or more long, acuminate. . *M. nasuta*
- 86b. Flower notably smaller, sepals 1.9 cm. or less long, abruptly acute.
M. villosa
- 87a. Lateral sepals noticeably broadest near the middle and narrowed below and above (i.e., elliptic-lanceolate) *M. calantha*
- 87b. Lateral sepals not noticeably broader near the middle; leaves commonly oblong or lorate.88
- 88a. Mid-lobe of the lip semiorbicular or suborbicular to rotundate-obovate. . .89
- 88b. Mid-lobe of the lip ovate to narrowly oblong or linear-lanceolate (if suborbicular-ovate, very small)91
- 89a. Lip short (about half as long as the sepals), about 1 cm. long, 3-lobed in the middle. *M. rotnudilabia*
- 89b. Lip relatively large (somewhat shorter than the sepals), about 1.9 cm. or more long, 3-lobed above the middle.90
- 90a. Lamina of the leaf narrow, 3.2 cm. or less wide; petals lanceolate or narrowly lanceolate, acuminate. *M. loretoensis*
- 90b. Lamina of the leaf broader, about 5.8 cm. wide; petals oblong-obovate, abruptly subacute. *M. verrucifera*
- 91a. Sepals broad, lateral ones 1.4-1.5 cm. wide at the base; disc of the lip naked.
M. Batemanii
- 91b. Sepals narrower, lateral ones 1 cm. or less wide at the base; disc unicallose below or in the middle.92
- 92a. Petals broadly lanceolate or ovate-lanceolate; flower small, sepals 1.7 cm. or less long. *M. grandimentum*
- 92b. Petals oblong to linear-lanceolate or triangular-lanceolate; flower larger (often much so), sepals 1.8 cm. or much longer; plant commonly large. . .93
- 93a. Mid-lobe of the lip about equally long and wide, little exceeding the apex of the lateral lobes. *M. ringens*
- 93b. Mid-lobe of the lip ovate to linear, distinctly longer than wide, much exceeding the lateral lobes.94
- 94a. Mentum formed by the lateral sepals conspicuous, conical, about 10 mm. long; pseudobulbs small, about 2 cm. or less long. *M. parribulbosa*
- 94b. Mentum formed by the lateral sepals short, more or less rounded, about 6.5 mm. or less long; pseudobulbs generally much larger than above. . . .95

- 95a. Leaves sharply acute at the entire apex; sheaths surrounding the pseudobulb non-leaf-bearing; mid-lobe of the lip linear-lanceolate. *M. Weberbaueri*
- 95b. Leaves (when well developed) subacute to obtuse at the unequally bilobed apex; sheaths surrounding the pseudobulbs leaf-bearing. 96
- 96a. Lateral lobes of the lip semiobovate; mid-lobe linear-oblong; disc callose in the middle. *M. Klugii*
- 96b. Lateral lobes of the lip semielliptic (at most very slightly narrowed below); mid-lobe ovate; disc callose through the lower half. 97
- 97a. Flowers large, sepals 3.5 (rarely) -7.3 cm. long; clinandrium ciliate or ciliate-late. *M. splendens*
- 97b. Flowers relatively small, sepals 2.6 cm. or less long. *M. Mathewsii*

Maxillaria acuminata Lindl. Benth. Pl. Hartw. 155. 1845.

Lycaste acuminata Reichb. f. Bonpl. 3: 216. 1855.

Plant small, with a stout, creeping rhizome. Pseudobulbs ellipsoid to slenderly ovoid or cylindrical, diphylous at the apex, about 3 cm. or less long, 3-6 cm. distant. Leaves oblong or linear-oblong, minutely bilobed at the rounded apex, gradually narrowed to a rather short petiole, up to 10 cm. long and 1 cm. wide. Scapes lateral, 2 to 5 at the base of the pseudobulbs, slender, 1-flowered, a little shorter than the leaves to distinctly surpassing them, flexuous, entirely concealed by several small, tubular sheaths. Flower rather small but large for the plant. Sepals ringent, nervose. Dorsal sepal linear-lanceolate, acuminate, about 1.8-2.3 cm. long and 3.8 mm. wide, navicular. Lateral sepals similar, obliquely linear-lanceolate, acuminate, a little shorter and narrower than the dorsal sepal. Petals obliquely elliptic-linear, acute or short-acuminate, distinctly shorter than the sepals and about half as wide. Lip erect and parallel to the column in natural position, simple, fleshy, elliptic-oblong or subpandurate-oblong from a distinct cuneate claw, acute or obtuse, with the sides near the base erect, about 10.7 mm. long and 3.9 mm. wide above the middle; disc near the base with a prominent, ovate, sulcate or bilobed callus. Column much shorter than the lip, about 6 mm. long at the back, arcuate, abruptly clavate near the apex when viewed from the side, with a fimbriate clinandrium.

Amazonas, Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 161. 1921.—Junín: Palca, 2700 meters, flower imperfect, *Soukup 3501a*. Ecuador (type).

Maxillaria alata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 223. 1798. *Dendrobium alatum* Pers. Syn. Pl. 2: 524. 1807.=obscure species, probably *Xylobium* sp.

Junín: Near Huassa-huassi, in steep and very hot places, on rocks, *Pavón s.n.*

Maxillaria alticola C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 261. 1945. *Ornithidium serrulatum* Lindl. Benth. Pl. Hartw. 153. 1845, not *Maxillaria serrulata* Ames & Correll.

Plant stout but small for its alliance, caulescent. Stem robust, up to 47 cm. high, loosely forked with erect-ascending branches, entirely concealed by distichous, imbricating sheaths of which the upper ones on each branch are leaf-bearing. Leaves elliptic-oblong to narrowly oblong (rarely oblong-ovate), acute to subacute, amplexicaul at the slightly narrowed base, up to 12 cm. long and 2.2 cm. wide (but commonly smaller), with the upper margins minutely serrulate. Inflorescences abbreviated, numerous, 1-flowered. Flowers small, axillary, cupuliform, deep yellow. Sepals connate near the base. Dorsal sepal ovate, acute, concave, about 9 mm. long and 5.8 mm. wide. Lateral sepals oblong-ovate, very slightly oblique, a little longer and narrower than the dorsal sepal. Petals oblanceolate-oblong to cuneate-elliptic, abruptly acute or apiculate, distinctly shorter and narrower than the dorsal sepal. Lip sigmoid when viewed from the side, fleshy, distinctly shorter than the sepals; lower portion broadly cuneate, concave; median portion consisting of a pair of erect semiorbicular lobes separated by a fleshy callus; anterior portion subquadrate-ovate, apparently retuse, with a short, prominent, conical boss beneath. Column small, incurved and dilated above, with a short foot. Ovary trigonous.

Huánuco: Between Huánuco and Pampayaco (Pampayacu), *Kanehira* 317a, 332. Playapampa, about 2700 meters, "wet rocky montaña edge," *Macbride* 4886. Same locality and altitude as the last, "sphagnum bank," *Macbride* 4896. Also Ecuador (type) and Venezuela.

Maxillaria angustibulbosa C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 161, t. 52. 1952. Figure 130.

Plant medium-sized, epiphytic, with an ascending, creeping rhizome. Rhizome entirely invested by close, imbricating, scariosus sheaths. Pseudobulbs obliquely inserted on the rhizome and subparallel to it, apparently about 4 cm. apart, linear-cylindric, strongly complanate, unifoliate at the apex, about 4 cm. long, the lower part on each side concealed by 1 or 2 conduplicate, leaf-bearing sheaths. Leaves more or less petioled; lamina elliptic-oblong to narrowly lanceolate-oblong, acute, cuneate-narrowed at the base, up to 16 cm. long and 1.8 cm. wide, the blade on the pseudobulb longer and narrower than those on the surrounding sheaths; petiole slender, channelled, up to 2.2 cm. long. Inflorescences solitary, lateral, at the base of a leaf-bearing sheath below the pseudobulb, ascending, 1-flowered, more or less shorter than the leaf, almost wholly concealed by several, ventricose, imbricating sheaths. Flower rather small, yellow, with slightly spreading segments. Dorsal sepal oblong-ovate, strongly concave, acute and complicate-mucronate at the apex, about 1.3 cm. long and 6.4 mm. wide. Lateral sepals very obliquely ovate-triangular, acute and dorsally carinate at the apex, about as long as the dorsal sepal, with the basilar portion forming a conspicuous mentum with the column-foot about 8.6 mm. long. Petals similar to the dorsal sepal but somewhat smaller, oblong-ovate, shortly acuminate, long adherent to the column at the oblique base. Lip erect, parallel to the column and lightly recurved in natural position, oblong-elliptic when expanded, more or less 3-lobulate above the middle, about 1.1 cm. long and 4.6 mm. wide; lateral lobes erect, narrow, broadly rounded above; mid-lobe oblong-ovate, broadly obtuse, fleshy-thickened with the mid-nerve carinate beneath, about 3 mm. long and

equally wide; disc with a central longitudinal thickening which passes into a prominent, linear-oblong, sulcate callus. Column short, stout, clavate, sulcate in front, about 5 mm. high at the back, extended into a much longer, apically upcurved foot.

Cuzco: Prov. of Paucartambo, Sta. Isabel, Cosñipata, 1800 meters, *Vargas 5533*.

Maxillaria arbuscula Reichb. f. Bonpl. 4: 213. 1856; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 262. 1945. *Fernandezia punctata* Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 239. 1798.

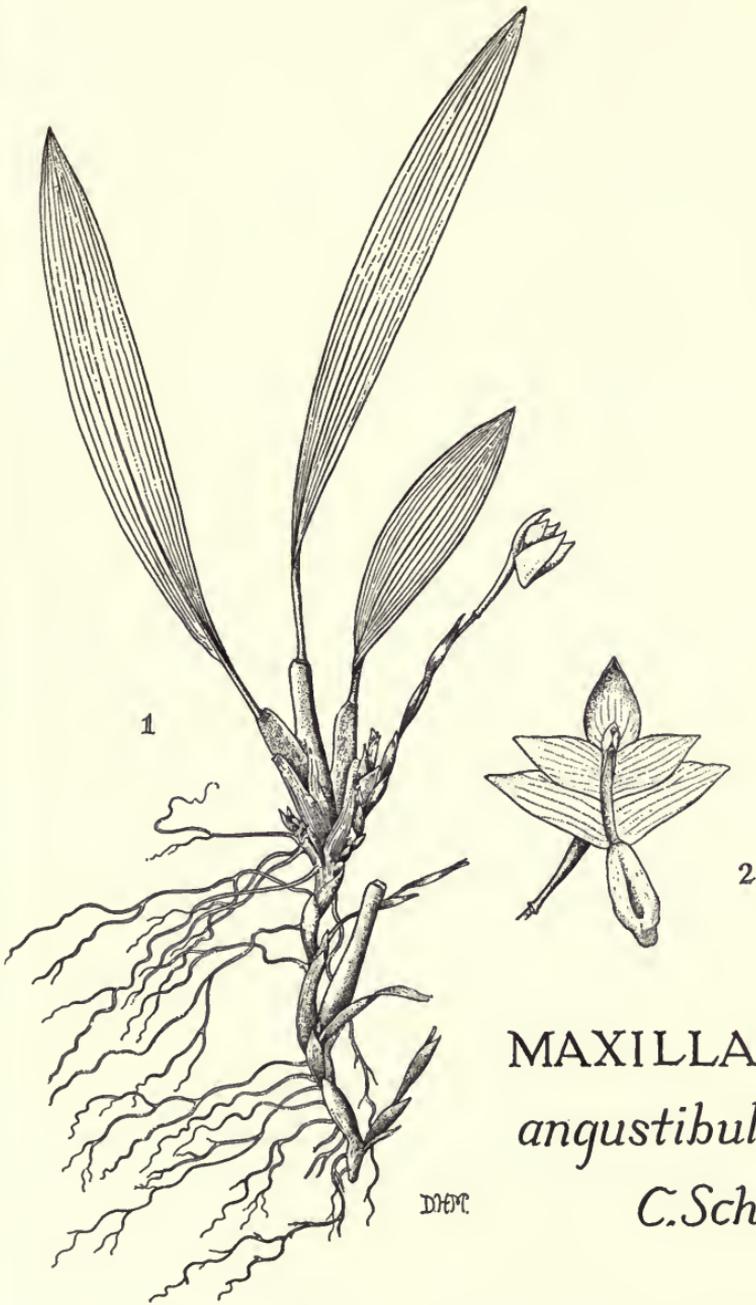
Plant apparently tall, slender, loosely branching above. Stem up to 60 cm. tall, entirely destitute of pseudobulbs, wholly concealed by leaf-bearing sheaths. Leaves numerous, distichous, rather dense, linear or oblong-linear, unequally bilobed at the abruptly rounded apex, slightly narrowed at the sessile base, widely spreading, caducous below, 7.6 cm. or less long, 6 mm. or less wide. Inflorescences abbreviated, axillary, 1-flowered. Flowers small, campanulate. Dorsal sepal broadly oblong ("ligulate"), broadly rounded at the apex, concave, about 11 mm. long and 4.8 mm. wide. Lateral sepals similar, obliquely elliptic-oblong, a little shorter and broader than the dorsal sepal. Petals similar to the sepals but slightly smaller, oblong, somewhat oblique, acute at the rounded apex. Lip erect and parallel to the column in natural position with upcurved sides below, elliptic-obovate in outline, broadly rounded and lightly retuse at the apex, cuneate below, sessile, lightly constricted on each side near the apex, about 8.8 mm. long and 5 mm. wide when expanded; disc with an oblong callus (rounded and fleshy in front) through the lower half. Column arcuate, about 7 mm. long at the back, extended into a prominent foot; clinandrium ciliolate.

Amazonas, fide Schlechter, Fedde Repert. Beih. 9: 162. 1921.—Huánuco: Muña, on trees and rocks, (type of *Fernandezia punctata*).

This description was chiefly based on a specimen of the type of *Fernandezia punctata*.

Maxillaria argyrophylla Poepp. & Endl. Nov. Gen. ac Sp. 1: 36. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 30. 1904.

Plant small to medium-sized, caespitose. Pseudobulbs crowded, polymorphic according to age, varying from oblong-cylindric in youth to rounded, strongly compressed, unifoliate at the emarginate apex, 3–5 cm. long. Leaf erect, petioled; lamina elliptic-oblong or narrowly oblong, acute or short-acuminate, cuneate below, 12–20 cm. long, 2.5–4.5 cm. wide; petiole rather long, semiterete, channelled, 3–6 cm. long. Scapes rather numerous, erect, nearly five times shorter than the leaves, 1-flowered, up to 5 cm. high, the peduncles provided with several loose, tubular, acute sheaths. Flower white. Sepals submembranaceous, rigid-nervose. Dorsal sepal narrowly lanceolate, acute, 18–20 mm. long, up to 3 mm. wide. Lateral sepals as long as the dorsal sepal but nearly twice as wide, triangular-lanceolate, spreading-reflexed, forming a long, acute mentum. Petals linear-lanceolate, acute, nearly as long as the dorsal sepal but commonly narrower. Lip erect, recurved and strongly concave in natural position, purple, distinctly



MAXILLARIA
angustibulbosa
C. Schweinf.

FIG. 130. *Maxillaria angustibulbosa* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower, expanded; $\times 1$.

shorter than the other segments, oblong, entire, narrowed on each side near the apex, with a subquadrate, emarginate tip, up to 15 mm. long and 6 mm. wide; disc ecallose, but with a dense mealy pubescence within. Column long, slender, lightly arcuate, up to 11 mm. long.

Huánuco: Cuchero (Cohero), epiphyte in forest, *Poeppig 1672*.

No examples of this concept were available.

Maxillaria attenuata A. & S. Sched. Orch. 10: 89. 1930; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 17: 55. 1955.

Plant small, caespitose, up to 10 cm. high. Pseudobulbs ovoid, ellipsoid or cylindrical, complanate, about 1 cm. or less high, unifoliate at the apex, clothed at the base by usually 2 pairs of sheaths, the upper being larger and leaf-bearing. Leaves with more or less conspicuous petioles, up to 9.4 cm. long; lamina elliptic to oblong, acute, cuneate below, up to 8 cm. long and 1.4 cm. wide; petiole deeply channelled or conduplicate, up to 1.4 cm. long. Inflorescence subequaling or surpassing the leaves, issuing from the base of the pseudobulb, spreading, 1-flowered; peduncle mostly concealed by several loose, tubular sheaths of which the lower are successively smaller and imbricated. Flower large for the plant, membranaceous and nervose. Dorsal sepal linear-lanceolate or linear-triangular, long-acuminate, 1.8–2.6 cm. long, 4–4.6 mm. wide across the concave base. Lateral sepals linear-triangular to narrowly triangular-lanceolate, strongly oblique or subfalcate, slightly longer and noticeably wider than the dorsal sepal, forming a conspicuous mentum at the base. Petals very similar to the lateral sepals but markedly smaller. Lip erect, parallel to the column and lightly recurved in natural position with the sides of the basal half incurved, more or less 3-lobed near the middle, elliptic-lanceolate to ovate-lanceolate when expanded, about 1.5–1.8 cm. long, 5–9 mm. wide; mid-lobe triangular-lanceolate to ovate-lanceolate, long-acuminate, dorsally keeled and mucronate at the apex; disc with a more or less pronounced median, longitudinal callus. Column short and stout, 4–5 mm. high at the back, produced into a slightly longer foot.

Cuzco: Prov. of Paucartambo, Sta. Isabel to Asunción, 1800 meters, epiphyte, *Vargas 5536*. Also Costa Rica (type), Venezuela and Ecuador.

Maxillaria aurea (Poepp. & Endl.) L. O. Wms. Caldasia, no. 3 (1941) 14. *Ornithidium aureum* Poepp. & Endl. Nov. Gen. ac Sp. 1: 57, t. 96. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 89. 1904. *Camaridium aureum* Hoehne, Arquiv. Bot. Estad. S. Paulo n.s. 2, pt. 6: 127. 1952.

Plant very robust. Stems very long, stout, simple, decumbent at the base, ascending above, up to 15 dm. long, destitute of pseudobulbs, entirely concealed by numerous, distichous, imbricated leaf-sheaths that waste into fibres below. Leaves numerous, distichous, oblong-linear or linear-ligulate, acute or acuminate, sessile at the slightly narrower, concave or conduplicate base, up to 35 cm. long and 2.5 cm. wide, erect or spreading, more or less shining. Peduncles numerous, clustered in the axils of the leaves, 1-flowered, spreading, 5–9 cm. long, with 2–3

small, remote sheaths. Flowers small, fleshy, globose-campanulate, golden yellow. Dorsal sepal ovate, obtuse, minutely apiculate, strongly concave, 8–9 mm. long, about 5–5.5 mm. wide. Lateral sepals similar, lightly oblique, forming a short, rounded mentum. Petals obovate or oblong-obovate, rounded and minutely apiculate at the apex, nearly as long and broad as the sepals. Lip fleshy, deeply concave, equally long with the sepals when spread out, from a long, broad claw expanded into a triangular-ovate, deeply 3-lobed lamina; lateral lobes relatively large, semioval, entire; mid-lobe relatively small, round-ovate, obscurely apiculate; disc callose-thickened in the middle and near the apex. Column short, stout, recurved above, about 5 mm. long, bialate in front at the apex with triangular, acute wings.

Peru: Habitat not recorded, *Mathews 1870*.—Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cochoero), epiphyte in mountain woods, *Poeppig 1742* (type of *Ornithidium aureum*).

No specimens of this species were seen.

Maxillaria aurea (Poepp. & Endl.) L. O. Wms. var. **gigantea** (Lindl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 263. 1945. *Ornithidium giganteum* Lindl. Benth. Pl. Hartw. 153. 1845. *Ornithidium bolivianum* Schltr. Fedde Repert. 27: 78. 1929. *Camaridium aureum* Hoehne var. *giganteum* Hoehne, Arquiv. Bot. Estad. S. Paulo n.s. 2, pt. 6: 127. 1952.

This variety is apparently the common form in Peru. It differs from the species chiefly in having the lip only obscurely (not deeply) 3-lobed, with the lobules not entire but consistently more or less markedly erose-denticulate. The apical portion of the lip varies from being relatively small (as in *Ornithidium aureum*) to being subequal to the lateral lobules.

In one collection referable to this variety, the leaves are short, broad and mostly conduplicate, being up to 19.8 cm. long and 3.4 cm. wide. Another collection has a leaf up to 39 cm. long; and the petals are sometimes oblong-elliptic. Still another collection has leaves up to 45 cm. long.

Cuzco: Prov. of Calca, Lares Valley between Huallhuayo and Calca, 1900 meters, "shrubwood," *Weberbauer 7923*. Prov. of Convección, "alturas de Pintobamba," 2650 meters, *Vargas 3273*. "Pillahuata," Cerro de Cusilluyoc, 3000–3300 meters, epiphyte in thicket in valley of paramo, *Pennell 14119*.—Huánuco: Pampayaco (Pampayacu), *Kanehira 302*.—Junín: La Merced, Hacienda Schunke, about 1200 meters, common terrestrial, *Macbride 5751*. Pichis Trail, Eneñas, 1700 meters, terrestrial in open sphagnum swamp, *Killip & Smith 25667*. Prov. of Tarma, Agua Dulce, 1900 meters, in thick patches in low highland forest, *Woytkowski 35440*.—Puno: Prov. of Sandía, Sto. Domingo area, 1550 meters, *McCarroll 101*. Also Colombia, Ecuador (type of *Ornithidium giganteum*) and Bolivia (type of *Ornithidium bolivianum*).

Maxillaria Batemanii Poepp. & Endl. Nov. Gen. ac Sp. 1: 38, t. 65. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 20. 1904.

Plant large, stout. Pseudobulbs aggregated, oblong-ovoid, unifoliate (rarely bifoliate) at the apex, 5–6 cm. long, at first surrounded by triangular, acute, imbricated sheaths. Leaves elongate-ligulate or lorate, long-petioled; lamina subobtusate and commonly obliquely bilobulate at the apex, gradually narrowed below, 50–70 cm. long, 3–5 cm. wide; petiole stout, semicylindric and channelled, 5–25 cm. long. Peduncles few to several, lateral, basal, 1-flowered, stout, up to 20 cm. long, concealed by numerous ventricose, imbricating, membranaceous sheaths. Flowers large, sulphur-yellow. Sepals subfleshy, equally long, with revolute margins. Dorsal sepal oblong-lanceolate, rather abruptly acute, up to 6 cm. long and 1 cm. wide. Lateral sepals obliquely oblong or oblong-ligulate, distinctly broader than the dorsal sepal, forming a short, rounded mentum. Petals ligulate-lanceolate, acute, a little shorter and much narrower than the sepals. Lip erect, strongly concave and somewhat recurved in natural position, much shorter than the sepals, about 2 cm. long and 1.3 cm. or less wide, thickly fleshy, ovate-subquadrate in outline, deeply 3-lobed in front; lateral lobes rather large, round-ovate, erect, entire; mid-lobe somewhat larger and slightly exerted, ovate, subacute, undulate-denticulate; disc naked. Column rather large, arcuate, clavate, 2 cm. long, produced into a prominent foot.

Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cuchero), on tree trunks, *Poeppig 1516* (type). Also Ecuador.

No examples of this species were seen.

Maxillaria bicolor Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 224. 1798. *Dendrobium bicolor* Pers. Syn. Pl. 2: 524. 1807. *Dicrypta bicolor* Batem. ex Loud. Hort. Brit. Suppl. 2: 630. 1839.=obscure species, probably *Xylobium*.

Junín: Huassa-huassi, in rocky places, *Pavón s.n.*

Maxillaria brachypetala Schltr. Fedde Repert. Beih. 9: 102. 1921; Mansf. Fedde Repert. Beih. 57: t. 125, nr. 489. 1929; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 264. 1945.

Plant robust, epiphytic, with a stout, compressed, creeping rhizome that is often branching, and provided with short, separated, infundibuliform sheaths. Pseudobulbs remote, suborbicular to oval, strongly compressed, 2.5 cm. or less long, unifoliate at the tip. Leaf apparently sessile, ligulate to elliptic-oblong, subobtusate, gradually narrowed below, 28 cm. or less long, 4.5 cm. or less wide, coriaceous. Scapes short, solitary, lateral at the base of the pseudobulb or from the axil of a sheath on the rhizome, 1-flowered, about 7.5 cm. or less long, more or less concealed by several short, ventricose, infundibuliform sheaths. Flower rather large, yellowish brown. Dorsal sepal oblong or elliptic-oblong, acute, dorsally keeled near the apex, about 3.7 cm. long and 9 mm. wide. Lateral sepals broadly and obliquely oblong-lanceolate, lightly falcate, acute, slightly shorter than the dorsal sepal, forming a short conical mentum. Petals obliquely and narrowly spatulate ("ligulate"), rounded at the apex, about 2.3 cm. long and half as wide

as the sepals. Lip erect, strongly recurved and deeply concave in natural position, 3-lobed in the middle, 2-2.3 cm. long, ovate-oblong when expanded, cuneate below; lateral lobes erect, semiovate, with lightly carinate veins above, the forward margin broadly rounded and denticulate; mid-lobe much exerted, ovate-oblong, broadly rounded and retuse above, erose; disc through the lower part with a median, tricarinate callus. Column stout, clavate, about 1.4 cm. or less long at the back, produced into a prominent foot about 6 mm. long.

Cuzco: Prov. of Convención, Hda. Amaibamba, 2000 meters, epiphyte, *Vargas 3418*. Prov. of Convención, Sahuayaco, 1600 meters, *Vargas 6300*.—Junín: On the mountains west of Huacapistana, 2000 meters, *Weberbauer 2160* (type).

Maxillaria breviscapa Poepp. & Endl. Nov. Gen. ac Sp. 1: 36, t. 62, fig. I. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 11. 1904.

Plant small, epiphytic, with a short creeping rhizome. Pseudobulbs numerous, crowded, minute, ovoid or oblong-cylindric, 6-10 mm. long, unifoliate at the apex, at first surrounded by several short, acute sheaths, later naked. Leaf rather small, long-petioled; lamina narrowly elliptic-lanceolate or "linear-lanceolate," acute, long-cuneate below, 4-7 cm. long, up to 1 cm. wide, fleshy-coriaceous, shining; petiole slender, subterete in section, 4 cm. or less long. Peduncle much surpassing the pseudobulbs, lateral, basal, solitary, 1-flowered, slender, densely clothed with small, ventricose, imbricated sheaths, up to 4 cm. high. Flower small, pale saffron-yellow. Sepals about equally long, obtuse, submembranaceous. Dorsal sepal linear-oblong or oblong-ligulate, about 14 mm. or less long, 3 mm. wide. Lateral sepals obliquely triangular-oblong, forming a prominent obtuse mentum, noticeably wider than the dorsal sepal at the base. Petals triangular-linear or linear-ligulate, subacute, nearly as large as the dorsal sepal. Lip erect, strongly concave and apically recurved in natural position, rather fleshy, broadly oblong from a prominent cuneate claw, broadly rounded in front, very lightly 3-lobed near the apex, about 11 mm. long and 4 mm. wide; lateral lobules erect, oblong, rounded at the apex, entire; mid-lobe ovate-semiorbicular, denticulate; disc through the lower half with an elevated crest concealed by small dense hairs. Column rather long and slender, clavate, arcuate, 7 mm. or less long.

Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cuchero), frequent in high places, *Poeppig 1517* (type). Near Cassapi, *Mathews 1908*. Also Ecuador.

No authentic collections of this species were available.

Maxillaria caespitosa C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 264. 1945. *Ornithidium dolichophyllum* Schltr. Fedde Repert. Beih. 9: 106. 1921; Mansf. Fedde Repert. Beih. 57: t. 126, nr. 495. 1929, not *Maxillaria dolichophylla* Schltr. 1912.

Plant large, caespitose, without apparent pseudobulbs. Leaves congested, numerous, distichous, forming flabelliform clusters, articulated to equitant, scarious-margined sheaths which are 5-8 cm. long; lamina linear, acute or short-acuminate, conduplicate below, up to 46.2 ("60") cm. long and 1.7 cm. wide,

rather thin in texture. Inflorescences relatively short, issuing from the axils of the leaves, 1-flowered, very slender, the peduncle with the pedicellate ovary about 8 cm. or less long and concealed below by several loose, imbricating sheaths. Flowers small, brownish-red or purple, membranaceous. Dorsal sepal elliptic-lanceolate, sharply acute or mucronate, about 13 mm. long, 4.5–5 mm. wide. Lateral sepals similar, complicate-acute and mucronate, lightly oblique, forming a short, rounded mentum. Petals broadly oblong, acute, distinctly smaller than the sepals. Lip erect and parallel to the column with the sides of the lower portion erect in natural position, ovate-oblong in outline, lightly constricted on each side near the apex, very broadly rounded or subtruncate and lightly retuse in front, about 9 mm. long and 5 mm. wide; disc with a linear, fleshy callus extending from the base to above the middle, callose-thickened in front. Column rather stout, lightly arcuate, subclavate, concave in front, about 7.5 mm. long at the back, extended into a short foot.

Cuzco: Prov. of Paucartambo, Cosñipata, 700–800 meters, *Weberbauer 6950* (type of *Ornithidium dolichophyllum* Schltr.).—Huánuco: 6 km. south of Tingo María, about 1600 meters, epiphytic in moist, shaded forest near highway, *Seibert 2260*.

Maxillaria calantha Schltr. Fedde Repert. Beih. 9: 102. 1921; Mansf. Fedde Repert. Beih. 57: t. 125, nr. 490. 1929; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 265. 1945.

Plant large, robust, epiphytic, with an apparently abbreviated, woody rhizome. Pseudobulbs approximate (often appearing solitary in the specimen), thick-cylindric to ovoid in the dried plant, unifoliate at the apex, 5–6 cm. tall. Leaf prominently petioled; lamina elliptic-oblong to narrowly elliptic, subacute to broadly obtuse, broadly cuneate to subrounded at the base, thickly coriaceous, up to 26 cm. long and 6.8 cm. wide; petiole more or less stout, channelled, up to 8.5 cm. long. Scapes lateral, basal, 1-flowered, several, erect to arcuate-ascending, mostly concealed by several loose, tubular-infundibuliform sheaths, up to 23 cm. long to the base of the flower. Flower large, purple-brown, with the segments ringent. Dorsal sepal oblong, complicate-acute, navicular below, up to 6 cm. long and about 1.3 cm. wide. Lateral sepals obliquely elliptic-lanceolate, lightly falcate, subacute, a little shorter than the dorsal sepal but almost as wide, forming a short mentum. Petals obliquely linear-lanceolate, subacute, subfalcate, markedly shorter than the sepals and about half as wide. Lip much smaller than the other segments, erect, parallel to the column and tubular-concave in natural position, lightly recurved above, about 1.5 cm. long, deeply 3-lobed near the apex; lateral lobes erect, narrowly oblong, with a broadly rounded free apex; mid-lobe ovate, very fleshy, obtuse, navicular; disc in the middle with a triangular callus. Column very short and stout, clavate, about 8.5 mm. long at the back, produced into a short foot.

Junín: Prov. of Huancayo, Pariahuanca, between Panti and Rocchac, 2500 meters, *Weberbauer 6588*.

Maxillaria Camaridii Reichb. f. Hamb. Gartenz. 19: 547. 1863; Ames, Am. Orch. Soc. Bull. 9: 305, t. 11. 1941. *Camaridium ochro-*

leucum Lindl. Bot. Reg. 10: t. 844. 1824, not *Maxillaria ochroleuca* Lodd. ex Lindl. 1832. *Cymbidium ochroleucum* Lindl. Gen. & Sp. Orch. 168. 1833; Hook. Bot. Mag. 71: t. 4141. 1845. *Ornithidium album* Hook. Bot. Mag. 61: t. 3306. 1834, not *Maxillaria alba* (Hook.) Lindl. 1832. *Camaridium affine* Schltr. Fedde Repert. Beih. 17: 72. 1922. Figure 131.

Plant medium-sized to large, caulescent, epiphytic. Stems ascending or arcuate, loosely more or less branched, clothed with distichous, densely imbricating and evanescent leaf-sheaths from which the lower leaves have mostly fallen, provided with more or less remote pseudobulbs. Pseudobulbs ellipsoid to oblong-cylindric, more or less strongly compressed, bearing 1 or 2 leaves at the summit, 3-7 cm. long. Leaves sessile, very variable in size, the younger (small) blades elliptic-oblong, the adult (larger) blades linear-ligulate, 10-40 cm. long, 1-1.5 cm. wide, unequally bilobed at the obtuse or abruptly rounded apex, conduplicate at the base. Flowers more or less numerous, solitary in the axils of young leaves, on short, bracted peduncles, yellowish white or white with a yellow lip which is sometimes barred with lilac. Dorsal sepal elliptic-lanceolate, acute, up to 3.5 cm. long and 9.5 mm. wide (but usually smaller). Lateral sepals similar, obliquely elliptic-lanceolate, acute, slightly shorter and wider than the dorsal sepal, forming a short mentum. Petals obliquely oblanceolate-oblong, acute, a little smaller than the sepals. Lip distinctly shorter than the other segments, erect and parallel to the column in natural position, suborbicular in outline, deeply 3-lobed near the middle, up to 1.8 cm. long and about equally broad when expanded; lateral lobes erect, semi-ovate with a rounded or obliquely obtuse free portion; mid-lobe suborbicular to obovate-semiorbicular, broadly rounded in front; disc with a central band of dense, tuberculate papillae through the lower half, terminating in a transverse, plurilobulate callus. Column small, lightly arcuate, subclavate, up to 1.2 cm. long at the back, produced into a very short foot.

Loreto: Mishuyacu, near Iquitos, 100 meters, on river side, *Klug 1407*. Pebas on the Amazon River, *Williams 1953* (sterile). Vicinity of Iquitos, 100 meters, in old clearing, *Klug 10017*. Same locality as the last, in dense forest, *Klug 10073*. Also Guatemala to Panama (type of *Camaridium affine*), the West Indies (type of *Camaridium ochroleucum* and *Ornithidium album*), Venezuela, British Guiana, Surinam and Brazil.

***Maxillaria christobalensis* Reichb. f. Bot. Zeit. 10: 857. 1852; Cogn. Martius Fl. Bras. 3, pt. 6: 75. 1904.**

Stems stout, with a strict branch below, entirely concealed by distichous, closely imbricating leaf-sheaths, from which all but the upper leaves have fallen. Pseudobulbs remote, sessile, apparently narrowly ellipsoid, about 3 cm. long, bifoliate at the apex. Leaves narrowly linear, semiterete, with an oblique, obtuse apex, ascending, apparently 3.5-6.5 cm. long and 1-2 mm. wide in a drawing of the type. Inflorescence solitary in some of the upper leaf-axils; peduncle bearing 1 or 2 sheaths below, and, inclusive of the pedicelled ovary, about 3.5 cm. long. Flower rather small, apparently brown. Dorsal sepal oblong or oblong-lanceolate,



FIG. 131. *Maxillaria Camaridii* Reichb. f.

acute, about 1 cm. long, 3-3.5 mm. wide, concave. Lateral sepals similar to the dorsal sepal, obliquely oblong-lanceolate, acute, forming a conic-rounded mentum. Petals oblong or ligulate, abruptly acute or truncate-retuse and apiculate at the apex, slightly shorter but scarcely narrower than the sepals. Lip narrowly obovate-pandurate in outline, more or less obscurely 3-lobulate above the middle, abruptly truncate-retuse at the apex, long-cuneate at the base, about 8 mm. long and 4 mm. wide; disc with an oblong callus between the lateral lobules. Column rather short and slender, clavate, about 6 mm. long, with the clinandrium ciliolate-denticulate at the back.

Huánuco: Cerro de San Cristóbal near Cuchero (Cochero), *Poepig* 1359.

No example of this concept was available, and the description was made partly from a drawing of the type in the Ames Herbarium.

Maxillaria colorata Reichb. f. Walp. Ann. 6: 523. 1863.

Plant caespitose. Pseudobulbs crowded, rounded, apparently unifoliate at the apex. Leaf petioled, "oblong" or (judged from a drawing of the type) narrowly elliptic and obtuse. Peduncles several, lateral, basal, 1-flowered, provided with several separated, close, subacute sheaths. Flower rather large, yellow tinged with vermilion outside. Sepals and petals strongly arcuate-recurved and subparallel. Dorsal sepal ligulate, acute, apparently about 5.5 cm. long and 7 mm. wide. Lateral sepals subequal, acute, oblique, forming a small rounded mentum. Petals linear-ligulate, acute, shorter and narrower than the sepals. Lip very short, oblong in outline, 3-lobed near the apex, vermilion spotted and bordered with purple; lateral lobes obtusely angled, erect; mid-lobe fleshy, papillose, obtuse; disc with an abrupt, semiquadrate callus on the anterior portion in front of the mid-lobe. Column a little shorter [? than the lip]. Anther keeled on the back.

Peru: Habitat not recorded, *Warszewicz* s.n.

No specimens referable to this species have been seen, but there is available a colored drawing of this concept from the Reichenbach Herbarium.

Maxillaria cornuta C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 265, t. 14. 1945. Figure 132.

Plant small but with relatively large flowers. Rhizome creeping, slender, with more or less crowded pseudobulbs. Pseudobulbs complanate-ovoid, unifoliate at the summit, up to 1.2 cm. long. Leaves variable, oblanceolate-oblong or oblanceolate-linear, rounded at the apex with a somewhat unequally bilobed tip, gradually narrowed to a conduplicate, scarcely petioled base, coriaceous, up to 11.6 cm. long and 1.4 cm. wide, prominently sulcate above. Scapes 1-flowered, lateral, basal, short, much shorter than the mature leaves, the peduncles entirely concealed by several imbricating, ventricose sheaths which are keeled on the back. Sepals and petals spreading, fleshy-thickened above. Dorsal sepal oblong-lanceolate, acute and apiculate, navicular, dorsally keeled, about 1.85 cm. long and 6 mm. wide. Lateral sepals obliquely oblong-lanceolate, acute, ecarinate, lightly decurved, tri-

angular-dilated at the base forming a conspicuous cornute mentum, slightly shorter than the dorsal sepal, but markedly wider. Petals linear-lanceolate, broadly obtuse and minutely apiculate, lightly constricted on each side near the thickened apex, markedly shorter than the dorsal sepal and about half as wide. Lip erect, recurved and about equaling the lateral sepals in natural position, conspicuously 3-lobed above the middle; lateral lobes erect, semiobovate with a minute, broadly rounded, denticulate free portion; mid-lobe subquadrate, subtruncate and lightly retuse in front, about 7.5 mm. long and 6 mm. wide; disc through the lower half with an oblong-linear, tricarinate callus. Column lightly arcuate, abruptly clavate above, about 1 cm. long at the back, extended into a long foot.

Junín: Chanchamayo Valley, *Schunke s.n.* (type). Same locality as the last, 1800 meters, *Schunke s.n.*, 558. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A 70*.

Maxillaria crassicaulis C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 267. 1945. *Ornithidium Weberbauerianum* Kränzl. Fedde Repert. 1: 91. 1905, not *Maxillaria Weberbaueri* Schltr. 1921.

Plant robust. Stems very stout, 8 mm. or more in diameter, up to 35 cm. tall, straight or somewhat arcuate, simple, entirely concealed by distichous, closely imbricating leaf-sheaths from which the lower leaf-blades (and sometimes all the blades in the dried specimen) have fallen. Leaves distichous, numerous, widely spreading, rather short, ovate-lanceolate to oblong-lanceolate (more rarely oblong-ovate), acute, clasping at the base, coriaceous, up to 8 cm. long and 2.6 cm. wide. Inflorescences numerous, arising from all but the upper leaf-axils, 1-flowered, very short; peduncles filiform and abbreviated; pedicellate ovary much exserted, about 1.5 cm. long. Flowers small, lavender-blue, with ringent, fleshy segments. Dorsal sepal lanceolate, acuminate, concave, up to 1.4 cm. long and 4.4 mm. wide. Lateral sepals similar, oblong-lanceolate, acuminate, slightly longer and somewhat narrower than the dorsal sepal, lightly oblique, forming a very short mentum. Petals obliquely elliptic-lanceolate, sharply acute or apiculate, distinctly smaller than the sepals. Lip erect and strongly recurved with erect sides in natural position, much shorter than the sepals, from a short, cuneate claw gradually dilated into an ovate-pandurate lamina (thus subtrilobed when expanded), broadly truncate above, with the short dorsal, subapical keel forming a stout mucro, margins more or less undulate, denticulate above; disc with a prominent, transverse thickening in the broadest part just above the middle. Column short, stout, arcuate, lightly clavate, about 5 mm. long at the back, produced into a scarcely distinct foot.

Cuzco: Habitat not recorded, *Herrera 2166* (*Bues* coll.). Valle de la Convención, "alturas del Chaco," *Herrera 2111* (*Bues* coll.). Prov. of Paucartambo, above Cosñipata, "between the tambos Tres Cruces and Tambomayo," 3200–3300 meters, epiphytic, *Weberbauer 6936*.—Huánuco: Between Huánuco and Pampayaco (Pampayacu), *Kanehira 317*.—Junín: Prov. of Tacna, mountains west of Huacapistana, 2600–3000 meters, in open damp woods mingled with shrubs, *Weberbauer 2056* (type of *Ornithidium Weberbauerianum*).

MAXILLARIA

cornuta C. Schweinf.



FIG. 132. *Maxillaria cornuta* C. Schweinf. 1, plant; $\times 1$. 2, flower, without lip, expanded; $\times 2$. 3, lip from above, natural position; $\times 2$. 4, lip and column from side, natural position; $\times 3$.

Maxillaria crocea Poepp. & Endl. Nov. Gen. ac Sp. 1: 37, t. 62, fig. 2. 1836. *Maxillaria Poeppigiana* Steud. Nomencl. Bot. ed. 2, 2: 107. 1841; Cogn. Martius Fl. Bras. 3, pt. 6: 54. 1904.

Plant rather large, epiphytic. Rhizome elongate, creeping, dilated at the nodes. Pseudobulbs remote, narrowly angled-cylindric, compressed, 3–5 cm. long, unifoliate at the apex, at first clothed with few, rather large, triangular sheaths, finally naked. Leaves large, petioled; lamina linear-oblong or ligulate, acute or subacute, cuneate below, thinly chartaceous, up to 30 cm. long and 4.5 cm. wide; petiole stout, channelled, up to 2.5 cm. long. Scapes 1 or 2, lateral, basal, 1-flowered, up to 9 cm. long, ascending, the peduncle partially concealed by a few remote, lightly ventricose sheaths. Flower rather small, saffron-yellow, with ringent segments. Dorsal sepal elliptic-oblong, subacute, concave, membranaceous, about 21.5 mm. long and 9 mm. wide. Lateral sepals ovate-oblong, subacute, lightly oblique, forming a very short, broadly rounded mentum, about equaling the dorsal sepal. Petals narrowly obovate, rounded at the apex, lightly oblique, nearly as large as the sepals. Lip erect and parallel to the column with erect sides in natural position, rather fleshy, sharply 3-lobed near the apex, obovate-oblong in outline, shortly and narrowly clawed, up to 15 mm. long and 7 mm. wide; lateral lobes small, erect, triangular-dentiform, acute; mid-lobe much larger but slightly produced, quadrate, truncate and lightly undulate in front; disc naked. Column slender, arcuate, clavate, about 10 mm. long.

Huánuco: Toward Pampayaco (Pampayacu) and Cuchero (Cuchero), *Poeppig 1606*.

No specimen of this species was available.

Maxillaria cuneiformis Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 223. 1798.=obscure species, perhaps *Xylobium*.

Junín: Prov. of Tarma, toward the villages of Acobamba and Picoy, in steep places, *Pavón s.n.*

Maxillaria cuzcoensis C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 268, t. 15. 1945. Figure 133.

Plant variable, medium-sized to large. Rhizome apparently abbreviated. Pseudobulbs approximate, cylindric, strongly complanate, unifoliate at the very oblique apex, up to 6.4 cm. high, surrounded and (in youth) entirely concealed by several distichous, imbricating sheaths of which the apical pair is often leaf-bearing. Leaf petioled; lamina elliptic-oblong to narrowly lanceolate-oblong, acute, cuneate below, 10 to over 32 cm. long, 1.6–4.1 cm. wide; petiole conduplicate, about 1.7 cm. long. Scapes lateral, basal, 1-flowered, numerous, usually much shorter than the leaves, suberect to lax; peduncle filiform, about 18.5 cm. or less long, mostly concealed by several ventricose, tubular sheaths. Flower medium-sized, white, often with rose or violet at the base of the lip. Dorsal sepal narrowly lanceolate-oblong, acute, concave at the base, dorsally keeled above the middle, up to 2.7 cm. long and 8 mm. wide below. Lateral sepals obliquely oblong-lanceolate or triangular-oblong, acute or apiculate, dorsally keeled near the apex, subequally



MAXILLARIA
cuzcoensis
 C. Schweinf.

FIG. 133. *Maxillaria cuzcoensis* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower without lip, expanded; $\times 1\frac{1}{2}$. 3, lip from side, natural position; $\times 1\frac{1}{2}$. 4, lip from above, natural position; $\times 2$.

long with the dorsal sepal but wider at the base, forming a prominent mentum. Petals similar to the lateral sepals but markedly smaller, obliquely oblong-lanceolate, acute. Lip erect and parallel to the column in natural position, up to 1.4 cm. long, lightly sigmoid when viewed from the side, 3-lobed above the middle; lower portion deeply concave with erect sides, about 1 cm. long; terminal portion or mid-lobe much smaller, very fleshy, ovate to oblong, acute, more or less sulcate above and carinate beneath; disc with a short, median, oblong callus flanked on each side by a thickened line, pubescent at the base. Column short and stout, lightly arcuate, subclavate, 6.5 mm. or less long at the back; clinandrium erose-margined, 3-dentate at its apex.

Cuzco: Habitat not recorded, *Bues s.n.* Prov. of Quispicanchis, Chaupichaca, Marcapata Valley, 1800–1900 meters, “mixed formation of shrubwoods and grass steppe on stony places,” *Weberbauer 7834* (type). Hda. Ttío, Marcapata, 2000 meters, in open rocky places, *Vargas 3126*. Prov. of Convención, Hda. Potrero, Sapan-Sachayoc, 2200 meters, epiphyte in deep forest, *Vargas 2527*.

Maxillaria densifolia (Poepp. & Endl.) Reichb. f. Bonpl. 2: 16. 1854. *Dicrypta densifolia* Poepp. & Endl. Nov. Gen. ac Sp. 1: 39, t. 68. 1836. *Camaridium densifolium* Benth. Benth. & Hook. f. Gen. Pl. 3: 556. 1883; Cogn. Martius Fl. Bras. 3, pt. 6: 86. 1904.

Plant large, stout, epiphytic. Stems caespitose, very robust, simple or rarely forking near the base, elongate, wholly destitute of pseudobulbs, entirely concealed by distichous, closely imbricating leaf-sheaths, subcompressed and densely many-leaved above, up to 90 cm. long, ascending to arcuate. Leaves distichous, erect-spreading, narrowly ligulate, obtuse to rounded, apiculate and sometimes obliquely emarginate at the tip, lightly narrowed to a conduplicate base, 10–40 cm. long, up to 3.5 cm. wide (sometimes much larger), subcoriaceous. Peduncles axillary, solitary, erect, a little shorter or longer than the leaf-sheaths, 1-flowered, clothed with several, laxly imbricating, acuminate sheaths, up to 8 cm. long. Flower medium-sized, dull saffron-yellow or yellow-green, subcoriaceous to fleshy. Ovary slenderly clavate-cylindric, obtusely trigonous, up to 5 cm. long. Dorsal sepal oblong-lanceolate, short-acuminate, 17–20 mm. long, up to 10 mm. wide, lightly keeled without. Lateral sepals similar but a little wider below, lightly oblique, forming a short, obtuse mentum. Petals oblong or oblong-elliptic, acute, sub-oblique, somewhat shorter than the dorsal sepal but nearly as broad. Lip ascending, longitudinally concave, recurved near the apex in natural position, shorter than the lateral sepals, oblong to oblong-lanceolate, abruptly subacute, cuneate at the base, lightly constricted on each side above the middle, up to 14.2 mm. long and 7.2 mm. wide; disc through the lower half with a linear, obtuse, fleshy callus. Column short, stout, clavate, lightly arcuate, 9–10 mm. long, produced into a short foot.

Peru: Habitat not recorded, *Haenke s.n.*—Huánuco: Near Cuchero (Cocho), on trees, *Poeppig 1725* (type of *Dicrypta densifolia*). Tingo María, 670 meters, on trees, *Carpenter 107*.

Maxillaria disticha (Lindl.) C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 270. 1945. *Ornithidium distichum* Lindl. Benth. Pl. Hartw. 153. 1845.

Plant more or less stout, epiphytic. Rhizome elongate, relatively slender, sparingly branched, bearing stems at intervals of 6–13 cm. Stems stout or slender, simple, suberect to arcuate, wholly destitute of pseudobulbs, entirely concealed by distichous, densely imbricating leaf-sheaths (the blades deciduous below), up to 22 cm. long. Leaves distichous, spreading, elliptic-oblong or lanceolate-oblong (“linear-oblong”), obtuse to subacute, sessile at the conduplicate base, fleshy, up to 5 cm. long and 10 mm. wide. Inflorescences abbreviated, axillary, 1-flowered. Flowers very small, whitish-rose. Dorsal sepal lanceolate or linear-lanceolate, concave, up to 12.8 mm. long and 3.8 mm. wide. Lateral sepals apparently subequally large, oblong-lanceolate or triangular-lanceolate, oblique, forming a short, rounded mentum. Petals (not described in the type) linear-lanceolate, complicate-acute, similar to the dorsal sepal but smaller. Lip about 5 mm. long, sharply divided near the middle into a hypochile and epichile (“clawed”); hypochile suborbicular-ovate, concave; epichile reflexed, subquadrate, retuse and apiculate, undulate-denticulate on each side. Column small, slender, arcuate, clavate, produced into a short foot.

Peru(?), fide Schlechter, Fedde Repert. Beih. 9: 166. 1921.—Cuzco Prov. of Paucartambo, Pillahuata to Tambomayo, 2000 meters, *Vargas 5113*. Also Ecuador (type of *Ornithidium distichum*).

Maxillaria divaricata (Barb. Rodr.) Cogn. Martius Fl. Bras. 3, pt. 6: 49, t. 4, fig. 1. 1904. *Ornithidium divaricatum* Barb. Rodr. Gen. et Sp. Orch. Nov. 2: 209. 1882. *Maxillaria nervosa* Rolfe, Mem. Torr. Bot. Club 4: 263. 1895. *Maxillaria fallax* Schltr. Fedde Repert. 27: 70. 1929.

Plant small, rhizomatose, epiphytic. Rhizome elongate, commonly freely branching, closely invested by distichous, imbricating sheaths, bearing numerous pseudobulbs. Pseudobulbs 1–2.5 cm. distant, cylindrical to narrowly ellipsoid, lightly compressed, up to 2.7 cm. long (rarely), bifoliate at the apex, when young invested below by several pairs of distichous, imbricating sheaths. Leaves spreading, linear to linear-oblong, abruptly rounded with a bilobed tip, commonly gradually narrowed to a conduplicate base, up to 8.8 cm. long and 7 (rarely 11) mm. wide. Inflorescences 1–2, lateral at the base of the pseudobulb, 1-flowered, surpassing the pseudobulb but shorter than the leaves; peduncle 3–6 cm. long, entirely concealed by several distichous, imbricating, tubular sheaths. Flowers small, with ringent segments, yellowish green, light green or dark brown, sometimes with a white lip. Dorsal sepal deeply concave or navicular, oblong-lanceolate, acute, mucronate, 11.5–15 mm. long, up to 4.8 mm. wide. Lateral sepals similar, obliquely lanceolate-oblong, acute, mucronate, as long as the dorsal sepal but narrower, forming a short mentum at the base. Petals variable, obliquely lanceolate, elliptic-lanceolate or oblanceolate, acute or acuminate and mucronate, distinctly shorter than the dorsal sepal and about half as wide. Lip shorter than the other segments, suberect at the base, abruptly geniculate below the middle and up to 9.5 mm. long in natural position; claw short but conspicuous, cuneate-subquadrate; lamina cor-

date or subcordate at the base, with erect semiorbicular lobules (thus obscurely 3-lobulate), then reflexed with an ovate-triangular or lanceolate-triangular anterior portion, acute or obtuse; disc between the erect lateral lobules with a fleshy suborbicular or round-ovate callus. Column small, arcuate, abruptly clavate above, about 7.3 mm. or less long, extended into a short foot.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 23153, 22610* (this collection lacks a lip).—Cuzco: Prov. of Paucartambo, from Sta. Isabel to Asunción, 1800 meters, *Vargas 5540*. Prov. of Quispicanchis, Hda. Ttío, Marcapata, in open rocky places, 2000 meters, *Vargas 3123*. Also Brazil (type of *Ornithidium divaricatum*), Venezuela, Colombia, and Bolivia (type of *M. nervosa* and *M. fallax*).

Maxillaria elegantula Rolfe, Kew Bull. (1898) 196; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 271. 1945. *Maxillaria dichroma* Rolfe, Kew Bull. (1898) 197.

Plant rather large, with a stout, creeping rhizome (often not seen in the specimens). Pseudobulbs narrowly complanate-ellipsoid, sometimes with an abruptly narrowed neck above (in the dried specimen), up to 5.7 cm. long, unifoliate at the apex, partially concealed and surpassed by several large, distichous, conduplicate, imbricating sheaths of which the upper sheath is often broadly scarious-margined and leaf-bearing. Leaves petioled, the largest being on the pseudobulb; lamina oblong-elliptic or "oblong-lanceolate," acute, cuneate below, up to 30 cm. long and 5.6 cm. wide, chartaceous; petiole laterally compressed, channelled, up to 20 cm. long. Scapes lateral, basal, 1-flowered, erect or suberect; peduncles up to 25 cm. long (often much shorter), more or less concealed by several (up to 9) tubular sheaths. Flower large and showy, white, more or less suffused with brownish purple or dark blue. Segments spreading, with revolute margins. Dorsal sepal elliptic-oblong, concave, subacute, 2.5–4.1 cm. long, up to 1.6 cm. wide. Lateral sepals obliquely oblong-lanceolate, forming a prominent, conical mentum at the base, a little longer than the dorsal sepal and equally wide. Petals obliquely lanceolate, acute or short-acuminate, shorter than the dorsal sepal and slightly narrower. Lip short, arcuate-recurved with the lower sides erect in natural position, oval in outline when expanded, obtuse at the recurved tip, lobulate-denticulate in front, about 1.7 cm. long and 1.2 cm. wide; disc centrally thickened below, the thickening terminating abruptly above the middle. Column very short and stout, arcuate, about 1 cm. long at the back, with the clinandrium short-fimbriate, produced into a foot about 1.2–1.7 cm. long.

Peru or Ecuador (introduced by Messrs. F. Sander & Co.) (type of *M. dichroma* and *M. elegantula*).—Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, epiphyte in open woods, *Killip & Smith 22586, 22588* (flower withered and smaller than typical).—Cuzco: Prov. of Convención, "alturas de Pintobamba," 2400 meters, in humus of open forest, *Vargas 3287*. Prov. of Paucartambo, Sta. Isabel, 1320 meters, *Vargas 6760*. Valle Mar-

capata, "Camino Hacienda Cadena a Quincimil," about 1100 meters, *Scolnick 941*.

Maxillaria exaltata (Kränzl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 272. 1945. *Camaridium exaltatum* Kränzl. Engler Bot. Jahrb. 37: 386. 1906.

Plant medium-sized to large, caulescent, destitute of pseudobulbs. Stems up to 2 meters high, with a few strict branches, entirely concealed by close, tubular, imbricating leaf-sheaths which bear leaves except at the base of the stem and branches and are closely pustulose or rugulose on their upper portions. Leaves numerous, distichous, oblong-lanceolate to linear-lanceolate, much smaller and deciduous on the lower part of the stem, abruptly acute and mucronate, about 13 cm. or less long, 1.8 cm. or less wide, sessile at the slightly narrower, clasping base, spreading. Inflorescences numerous, fascicled in the upper leaf-axils, 1-flowered, much shorter than the leaves; peduncles filiform, arcuate or flexuous, entirely concealed by several loose, imbricating, tubular, membranaceous sheaths. Flowers small, yellowish white, the lip purple- or red-tinged. Dorsal sepal lanceolate-oblong, abruptly acute, concave, 15-17 mm. long, up to 5.5 mm. wide. Lateral sepals obliquely oblong-lanceolate, acute, about as long as the dorsal sepal, forming a conspicuous mentum about 7 mm. long. Petals very obliquely lanceolate, subacute, markedly shorter and narrower than the dorsal sepal. Lip erect, parallel to the column and tubular-concave in natural position with the apical portion lightly recurved, about 12.5 mm. long and 6.8 mm. wide when expanded, 3-lobed near the apex; lateral lobes erect, semioblong-obovate, with a short, rounded, irregular free portion; mid-lobe broadly ovate or ovate-triangular, obtuse, very fleshy; disc with an oblong, sulcate callus near the base of the mid-lobe. Column short, stout, lightly arcuate, clavate, about 4.6 mm. long at the back, produced into a foot about 8 mm. long.

Loreto: Mountains east of Moyobamba, 1100 meters, in open savanna woods, *Weberbauer 4620* (type of *Camaridium exaltatum*).—Puno: Prov. of Sandía, Sto. Domingo area, 1550 meters, *McCarroll 123*.

Maxillaria fasciculata C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 162, t. 53. 1952. Figure 134.

Plant epiphytic, sprawling. Stems slender, terete, arcuate, consisting of distinct segments separated by pseudobulbs (each segment about 5.5 cm. long), with 6-7 internodes concealed by evanescent sheaths. Pseudobulbs narrowly ellipsoid, subtetragonous in cross section, unifoliate at the apex, about 2.8 cm. long, remote, concealed below by about 2 pairs of distichous, imbricating, evanescent, leaf-bearing sheaths, with a young shoot (about 3.5 cm. high) issuing from the base of the pseudobulb. Leaves very fleshy in the living plant, linear, more or less conduplicate (especially below), subacute to rounded at the somewhat unequally bilobed apex, up to 9.3 cm. long and 1 cm. wide when expanded. Flowers very small, apparently emerging in pairs from the axils of the sheaths on the young shoot, with the sepals and the anterior half of the lip recurved. Dorsal sepal lanceolate-

oblong, acute, about 5.5 mm. long and 1.5 mm. wide. Lateral sepals oblong-lanceolate, slightly larger than the dorsal sepal, with a very oblique, saccate and dilated base. Petals elliptic-oblong, subacute, slightly shorter than the dorsal sepal and as wide as the basal part of the lateral sepals. Lip strongly arcuate-recurved in natural position with the lower half erect and parallel to the column, sharply 3-lobed near the middle, nearly 7.2 mm. long when expanded; lateral lobes small, triangular-dentiform, obtuse or acute; mid-lobe much larger, subquadrate, bilobed in front; disc much thickened below, the thickening developed into a transverse, lobulate callus between the lateral lobes. Column rather slender, dilated above, about 3 mm. high at the back, produced into a subequally long foot.

Junín: Prov. of Tarma, Utcuyacu, *Woytkowski 21* (culture no. of liquid material 50.1844).

Maxillaria Fletcheriana Rolfe, Gard. Chron. ser. 3, 53: 258. 1913 and Kew Bull. (1914) 213; O. Stapf, Bot. Mag. 148: t. 8949. 1922.

Plant large, robust, with a stout rhizome. Pseudobulbs oblong-ovoid, sub-compressed, unifoliate at the apex, 3-5 cm. long, nearly approximate, surrounded by a pair of distichous, leaf-bearing sheaths. Leaves variable, more or less petioled; lamina oblong to elliptic-oblong, acute or subacute, 15-24 cm. long, up to 5.5 cm. wide, coriaceous, cuneate below; petiole stout, channelled, 5-12 cm. long. Scapes lateral, basal, 1-flowered, robust, erect, 25-35 cm. high; peduncle more or less concealed by several loose, conduplicate, tubular-infundibuliform sheaths. Flower showy, sepals white or yellow, purple-lined, recurved-spreading. Dorsal sepal ovate, acute or subacute, up to 4.5 cm. long and 2.5 cm. wide, concave. Lateral sepals obliquely ovate-triangular, subacute, about as long as the dorsal sepal, forming a prominent conical mentum about 3 cm. or more long. Petals obliquely elliptic-ovate or ovate-lanceolate, short-acuminate, porrect and forming a galea, markedly shorter and narrower than the dorsal sepal. Lip erect, parallel to the column, strongly recurved and tubular-concave in natural position, elliptic-obovate or oblong-obovate in outline when expanded, lightly or indistinctly 3-lobed in front, up to 5 cm. long and 3 cm. wide; lateral lobes erect, semiobovate, with a short, crisped-undulate free part; mid-lobe suborbicular or broadly cordate, obtuse, undulate, trilobulate; disc with an obovate-oblong, fleshy callus above the middle. Column short, very stout, arcuate, subclavate, about 1.5 cm. long, extended into a prominent foot about 4 cm. long.

S. Peru: Habitat not recorded, *Forget s.n.* (introduced by Messrs. F. Sander & Co., of St. Albans).

No specimens of this species were available.

Maxillaria floribunda Lindl. Benth. Pl. Hartw. 154. 1845; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 273. 1945.

Plant large, epiphytic. Stems robust, entirely enveloped by closely imbricating sheaths of which the upper ones bear leaves, more or less loosely branching, producing distant pseudobulbs. Pseudobulbs ellipsoid, complanate, about 3.5 cm. long, unifoliate at the apex, remote, surrounded by several distichous, conduplicate,

MAXILLARIA *fasciculata*
C. Schweinf.



FIG. 134. *Maxillaria fasciculata* C. Schweinf. 1, plant; $\times \frac{7}{8}$. 2, lateral sepal; $\times 5$. 3, petal; $\times 5$. 4, dorsal sepal; $\times 5$. 5, column and lip, three quarters view; $\times 5$. 6, flower, natural position; $\times 5$.

leaf-bearing sheaths. Leaves variable, more or less petioled; lamina elliptic to oblong, sharply acute or cuspidate, broadly cuneate below, about 20 cm. or less long, 4 cm. or less wide, coriaceous; petiole conduplicate, up to nearly half as long as the lamina. Scapes several, lateral, apparently clustered near or around the pseudobulb, 1-flowered; peduncle suberect, about 19.5 cm. or less long, entirely or nearly concealed by 5 to 8 close, tubular sheaths. Flower large, white. Sepals and petals with revolute margins, all more or less decurved in the dried specimen. Dorsal sepal linear-oblong, short-acuminate, about 6.4 cm. long and 8 mm. wide, concave at the base, curved forward. Lateral sepals obliquely linear-lanceolate, short-acuminate, forming a short, broad mentum at the base, slightly longer and broader than the dorsal sepal. Petals linear-lanceolate, oblique, much smaller than the sepals. Lip relatively small, sessile, subquadrate-oval in outline ("oblong"), 3-lobed near the apex, about 1.4 cm. long; lateral lobes erect, semiovate with a short, rounded-triangular free portion; mid-lobe short, apparently transversely broad-oblong or reniform, lightly retuse, much thickened through the middle; disc thickened below in the center, the thickening extending from the base into an oblong, sulcate callus in the middle. Column short, stout, lightly clavate, about 7 mm. long at the back, produced into a short, bisulcate foot.

Peru: Chuquirabamba (? Chuquibamba), on mountains, *Hartweg 851* (type).—Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 162. 1921.—Cuzco: Prov. of Urubamba, Tuncapata-Santa Rita, 2800 meters, epiphyte in forest, *Vargas 2650*.

Maxillaria Fuerstenbergiana Schltr. Orchis 6: 116, t. 26, figs. 1-9. 1912.

Plant large, epiphytic, caespitose, up to 40 cm. high, with an abbreviated rhizome. Pseudobulbs complanate-subglobose, unifoliate, 3-4 cm. tall. Leaf lorate-ligulate, subobtuse and unequally bilobulate, more or less erect, about 30 cm. long, nearly 4 cm. wide, coriaceous. Inflorescences 4-5, lateral, basal, short, 1-flowered, nearly equaling the pseudobulb. Peduncles concealed by 2-3 clasping sheaths. Flowers rather large, showy, with subparallel segments. Dorsal sepal linear-oblong ("ligulate"), acute and apiculate, dorsally carinate, about 4 cm. long and 7.7 mm. wide. Lateral sepals similar, oblique, dilated at the base and forming a short, obtuse mentum. Petals obliquely lanceolate-linear ("ligulate-lanceolate"), short-acuminate or "acute," a little shorter than the sepals. Lip erect, parallel to the column and arcuate-recurved with erect sides in natural position, deeply 3-lobed above the middle, narrowly elliptic ("oblong") in outline, about 1.5 cm. long and nearly 6 mm. wide when expanded, cuneate below; lateral lobes narrowly semi-obovate, with a short, porrect, ovate free portion; mid-lobe larger, ovate-oblong, obtuse, with undulate margins, thickened through the middle; disc with a linear-oblong, obtuse callus extending from the base to above the middle. Column semiterete, arcuate, about 1 cm. high, with an apiculate and denticulate clinandrium, produced into a short foot.

Peru(?): Imported by Herr K. John of Andernach, Germany, and bloomed in the collection of Baron von Fuerstenberg.

No example of this species was available.

Maxillaria funicaulis C. Schweinf. Bot. Mus. Leafl. Harvard Univ. 11: 273, t. 16. 1945. Figure 135.

Plant large, growing on rocks, caulescent, bearing distant pseudobulbs. Stems entirely concealed by a series of distichous, densely imbricated, conduplicate sheaths which become gradually larger and articulated above to small, immature leaf-blades. Pseudobulbs complanate-cylindric, somewhat clavate in the dried specimen, bifoliate at the apex, about 6 cm. long, partially concealed on each side by 1 or more conduplicate sheaths of which the uppermost bear conduplicate blades. Leaves oblong to ligulate, the larger ones sessile to short-petioled; lamina obtuse to rounded and more or less unequally bilobed at the apex, somewhat narrowed below, up to 26 cm. long and 2.9 cm. wide, subcoriaceous; petiole (if present) up to 3.4 cm. long, channelled. Inflorescences numerous, short, erect, in the axils of the cauline sheaths, 1-flowered; peduncle appressed, entirely concealed by several scarious, imbricating sheaths; pedicellate ovary conspicuously exerted, slender-cylindric, about 3.5 cm. long. Flower small, yellow, campanulate. Dorsal sepal ovate-oblong, concave, subacute with incurved apical margins, about 14 mm. long and 6.4 mm. wide. Lateral sepals oblong or ovate-oblong, obtuse, slightly oblique, a little smaller than the dorsal sepal. Petals obliquely ovate-oblong, abruptly rounded with a minute, conical, dorsal thickening in the center of the apex, distinctly smaller than the sepals. Lip erect, arcuate-recurved with the sides of the lower part erect in natural position, simple, ovate-oblong, lightly narrowed on each side above the middle, broadly rounded in front, rounded at the base, about 8.7 mm. long and 4 mm. wide when expanded; disc through the lower half with an obscure central thickening which terminates in a prominent, rounded callus in the center. Column very short and stout, clavate, about 6 mm. high at the back, extending into a conspicuous foot.

Cuzco: Prov. of Quispicanchis, Marcapata, Ttío to Murayaca, 1960 meters, *Vargas 3137*.

Maxillaria graminifolia (HBK.) Reichb. f. Walp. Ann. 6: 538. 1863; C. Schweinf. Bot. Mus. Leafl. Harvard Univ. 11: 275. 1945. *Isochilus graminifolius* HBK. Nov. Gen. et Sp. 1: 340, t. 78. 1816; Lindl. Bot. Reg. 27: sub t. 1. 1841, as *I. graminifolium*. *Camaridium graminifolium* Reichb. f. Linnaea 22: 857. 1849. *Maxillaria Matthewsii* Reichb. f. Walp. Ann. 6: 539. 1863, not Lindl. 1845.

Plant terrestrial or epiphytic, medium-sized to large, about 60 cm. or less tall. Stems slender, usually more or less branched and often bushy, destitute of pseudobulbs, entirely concealed by close, densely imbricating sheaths of which those on the lowermost portions waste into fibres. Leaves very numerous, distichous, widely spreading, linear, oblong-linear or linear-lanceolate, acute, apiculate, about 6.8 cm. or less long, up to 6 mm. wide, with more or less revolute margins when dry, deciduous on the lower portions of the stem. Inflorescences numerous, axillary, short, 1-flowered; peduncle slender, strict, clothed by about 2 imbricating sheaths and concealed by the close cauline sheaths; pedicellate ovary more or less exerted. Flowers small, white to yellowish tinged with brownish, dark purple or black; segments spreading. Dorsal sepal lanceolate or triangular-lanceolate, long-acuminate with involute margins, concave below, up to 8.1 mm. long and 2.4 mm. wide.

Lateral sepals similar, apparently slightly longer and narrower than the dorsal sepal, very slightly oblique, forming a very short mentum at the base. Petals much smaller than the sepals, linear-lanceolate to narrowly lanceolate, long-acuminate. Lip variable, short, up to 5.2 mm. long, broadly oblong or oblong-oval in outline, with the sides of the lower half upcurved, more or less deeply narrowed or constricted in the middle of each side, triangular-acute to rounded at the apex, about 3.5 mm. or less wide when expanded; disc with a stout, fleshy, oblong callus through the middle of the lower half, the callus apparently easily detached and often apparently absent. Column very short and stout, up to 2.2 mm. long at the back, produced into an abbreviated foot.

Peru: Habitat unrecorded, *Mathews 1064*.—Ayacucho: Ccarrapa, between Huanta and Río Apurimac, 1500 meters, terrestrial on wooded hillside, *Killip & Smith 22367* (this collection bears only mature fruit).—Cuzco: Prov. of Quispicanchis, Hda. Ttío, Marcapata, 2000 meters, in rocky places, *Vargas 3118*.—Huánuco: Vilcabamba, Hacienda on Río Chinchao, about 1800 meters, epiphyte in "montaña," *Macbride 5181*. Yanano, about 1800 meters, on mossy tree, *Macbride 3846*.—Junín: Chanchamayo Valley, 1800 meters, *Schunke 517, 519*. Pichis Trail, Eneñas, 1700 meters, terrestrial in open sphagnum swamp, *Killip & Smith 25691*. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A 54*. Also Colombia (type of *Isochilus graminifolius*), Venezuela and Ecuador.

Maxillaria grandiflora (HBK.) Lindl. Gen. & Sp. Orch. 147. 1832; Cogn. Martius Fl. Bras. 3, pt. 6: 28. 1904. *Dendrobium grandiflorum* HBK. Nov. Gen. et Sp. 1: 359, t. 88. 1816. *Broughtonia grandiflora* Spreng. Syst. Veg. 3: 735. 1826. *Lycaste grandiflora* Beer, Prakt. Stud. Orch. 265. 1854. *Maxillaria eburnea* Lindl. Sert. Orch. t. 40, no. 2. 1840. *Maxillaria Lehmannii* Reichb. f. Gard. Chron. n.s. 25: 648. 1886.

Plant large and showy. Pseudobulbs approximate, oblong-ovoid, strongly compressed, up to 6 cm. high, unifoliate at the apex, at first clasped by several distichous, imbricating sheaths of which the inner are leaf-bearing, at length naked. Leaf petioled; lamina elliptic-oblong to ligulate, acute, cuneate below, 11–28 cm. long, up to 5 cm. wide, coriaceous; petiole stout, strongly laterally compressed, 3–10 cm. long. Scapes 1 or 2, lateral, basal, 1-flowered, stout, with the peduncles 12–25 cm. long, clothed with several separated, loose, tubular sheaths. Flower large, showy, fleshy, milk-white. Dorsal sepal ovate-oblong, concave, acute, 3.5–

FIG. 135. *Maxillaria funicaulis* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower from side, natural position; $\times 2\frac{1}{2}$. 3, dorsal sepal, expanded; $\times 2$. 4, petal; $\times 2$. 5, lateral sepal; $\times 2$. 6, column and lip from side, natural position; $\times 2\frac{1}{2}$. 7, lip from above, partially expanded; $\times 4$.



MAXILLARIA

funicaulis

C. Schweinf.

4.5 cm. long, up to 2 cm. wide. Lateral sepals triangular-ovate, acute, oblique, widely spreading, a little longer and broader than the dorsal sepal, forming a prominent conical mentum. Petals elliptic-lanceolate, subacute, lightly oblique, shorter and narrower than the dorsal sepal. Lip erect, parallel to the column and lightly recurved with the sides erect in natural position, relatively short, about 2.5 cm. long and 1.5 cm. wide when expanded, ovate, obtuse, with the lower margins entire and the upper ones lightly undulate-crenulate and obscurely 3-lobed; disc densely furfuraceous, adorned in the middle with 3 calli of which the central one is broadly ligulate and conspicuous and the lateral ones are small and obscure below. Column short and stout, arcuate, lightly clavate, 12-13 mm. long, extended into an elongate foot.

Peru: Habitat unrecorded, *Pavón s.n.*, 1700-2200 meters, *Wallis s.n.* Also Colombia, Venezuela, British Guiana, Ecuador and probably Bolivia.

Maxillaria grandimentum C. Schweinf. Am. Orch. Soc. Bull. 13: 22, t., 1944. Figure 136.

Plant small, about 13 cm. tall, apparently caespitose. Pseudobulb ovoid-cylindric, compressed, unifoliate at the apex, about 1.7 cm. high, surrounded and surpassed by a pair of distichous, oblong-triangular sheaths. Leaf petioled; lamina elliptic-oblong, acute or short-acuminate, cuneate below, about 9.7 cm. long and 1.8 cm. wide, coriaceous; petiole short, conduplicate, about 1.5 cm. long. Scape abbreviated, lateral, basal, 1-flowered, wide-spreading, about 1.5 cm. long, concealed by 4-5 ventricose, imbricating sheaths. Flower rather small, subfleshy. Dorsal sepal broadly oblong, navicular, subacute, about 1.6 cm. long and 6 mm. wide when expanded. Lateral sepals obliquely oblong-lanceolate, abruptly acute and apiculate, forming a prominent mentum at the base, a little longer and considerably broader below than the dorsal sepal. Petals obliquely lanceolate, short-acuminate, a little smaller than the dorsal sepal. Lip erect, parallel to the column, arcuate-recurved and about 1.4 cm. long in natural position, oblong-obovate in outline when expanded; lateral lobes erect, narrowly semiobovate, with a short, rounded free apex; mid-lobe relatively small, narrowly subquadrate-oblong, very fleshy through the middle, subtruncate and recurved in front; disc in the middle of the lower half with a linear-oblong, fleshy callus. Column small, stout, clavate and lightly arcuate when viewed from the side, about 7.2 mm. long at the back, produced into a long foot.

Junín: Chanchamayo Valley, 1800 meters, *Schunke 563*.

Maxillaria hastata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 222. 1798. *Dendrobium hastatum* Pers. Syn. Pl. 2: 524. 1807.= obscure species, perhaps *Oncidium*.

Peru: Pillao, on rocks in woods, *Pavón s.n.*

Maxillaria heteroclita Poepp. & Endl. Nov. Gen. ac Sp. 1: 37, t. 63. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 27. 1904; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 276. 1945.

MAXILLARIA

grandimentum

C. Schweinf.

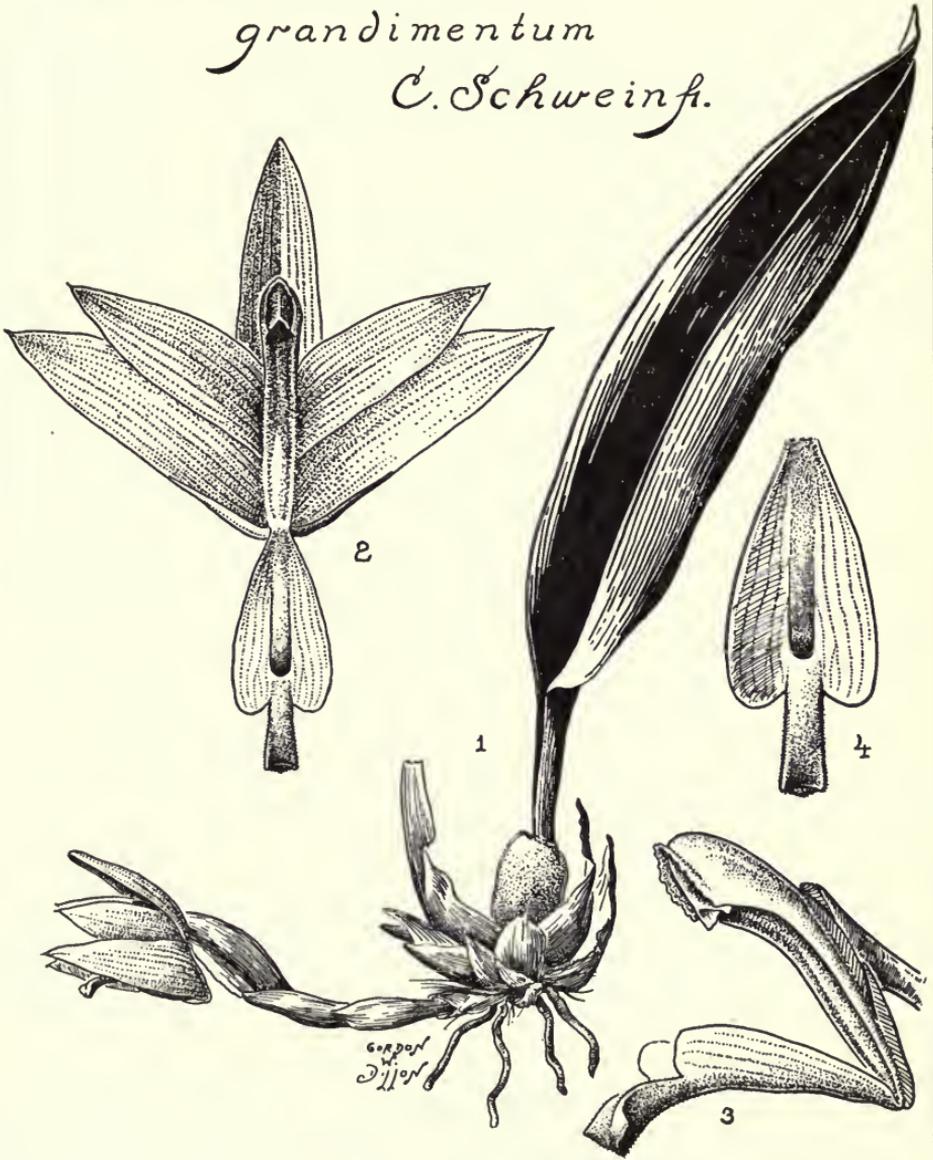


FIG. 136. *Maxillaria grandimentum* C. Schweinf. 1, plant; $\times 1$. 2, flower, spread out; $\times 2$. 3, lip and column from side; $\times 3$. 4, lip, spread out, from above; $\times 3$.

This is an extraordinary concept, described without habitat; it cannot, therefore, be definitely attributed to Peru. A real doubt as to the status of this name is posed by the apparently nearly identical agreement of its flower with that of the recently described *Zygopetalum rhombilabium* C. Schweinf. (cf. Am. Orch. Soc. Bull. 12: 422, t., 1944), a concept which lacks the pseudobulbs of *Maxillaria heteroclita* and appears to belong unquestionably to the section *Warscewiczella* of the variable genus *Zygopetalum*.

Maxillaria huancabambae (Kränzl.) C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 277. 1945. *Ornithidium Huancabambae* Kränzl. Engler Bot. Jahrb. 54, Beibl. 117: 29. 1916.

Plant small. Rhizome stout, arcuate or flexuous, commonly loosely branched, entirely concealed by close, imbricating, distichous sheaths, bearing remote pseudobulbs (about 2 cm. apart). Pseudobulbs pyriform-cylindric, usually obliquely curved and plurisulcate in the dried specimen, closely invested and surpassed by a membranaceous sheath, about 2 cm. or less long, bifoliate (rarely trifoliate) at the apex, with the lower part concealed by a few distichous sheaths. Leaves small, elliptic to elliptic-oblong, complicate-acute and mucronate, cuneate below, sessile or nearly so, apparently fleshy, commonly navicular or conduplicate in the dried specimen, about 3 cm. or less long and 9 mm. or less wide. Peduncles short, 1-flowered, concealed by several imbricating sheaths, in the axils of, and hidden by, the upper sheaths of the rhizome. Pedicellate ovary conspicuously exerted. Flower small, yellow, campanulate. Dorsal sepal oblong-ovate, acute, concave, about 7.9 mm. long and 4 mm. wide. Lateral sepals very similar, equally long but slightly wider, oblique. Petals oblong or linear-oblong, abruptly acute, distinctly shorter than the sepals and about half as wide as the dorsal sepal. Lip strongly concave, ovate-elliptic, complicate-acute, with a pair of horizontally spreading, small, triangular-ovate auricles (near the base) which are held erect by a transverse callus, about 6 mm. long and 4 mm. wide when expanded. Column very short, strongly wing-dilated on each side above, about 2.7 mm. long at the back.

Cajamarca: Prov. of Jaën, on the east side of the Cordillera, east of Huancabamba (5° 10' - 5° 20' S. Br.), 2600-2700 meters, in sclerophyllous vegetation consisting of shrubs and occasional small trees, *Weberbauer 6098*.

Maxillaria huancabambae (Kränzl.) C. Schweinf. var. **cuzcoensis** C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 278. 1945.

This variety differs from the species in having relatively slender leaves which are linear-oblong to narrowly elliptic-oblong, up to 3.8 cm. long and 4-5 mm. wide; white flowers; rather narrower sepals; lip with indistinct dilations near the base (rather than distinct, triangular-ovate auricles); and a very short column, about 1.5 mm. long at the back.

Cuzco: Prov. of Convención, Hda. Potrero, Sapan-Sachayocce, epiphyte in dense forest, *Vargas 2553*.

Maxillaria infausta Reichb. f. Bonpl. 3: 216. 1855.

Plant medium-sized, caulescent. Stem rather slender, loosely branched, entirely concealed by loose, distichous, leaf-bearing and rugose sheaths. Pseudobulbs absent or scattering, oblong-ellipsoid, bifoliate, up to 3 cm. long. Leaves numerous, distichous, spreading-ascending, oblong to elliptic-oblong, obliquely bilobed at the rounded apex, slightly narrowed at the sessile or subsessile base, up to 7.2 cm. long and 12 mm. wide. Inflorescences solitary in the upper (but not uppermost) axils, strict, 1-flowered, with a very short peduncle and a long-exserted, slender, pedicellate ovary. Flower small. Dorsal sepal ovate-oblong to elliptic-ovate, abruptly acute or apiculate at the rounded apex, up to 9.2 mm. long and 4.2 mm. wide. Lateral sepals similar, obliquely ovate-oblong, complicate-acute and apiculate, very slightly shorter and narrower than the dorsal sepal. Petals broadly oblong or ovate-elliptic, obtuse, distinctly shorter than the sepals but subequally wide. Lip ovate-oblong in outline, constricted above the middle on each side (and thus lobulate), rounded-truncate or lightly retuse in front, cuneate-rounded below, about 7 mm. or less long and 4.4 mm. wide below the middle; disc with a small "tricarinate" (often obscure) callus in the middle just below the sinus. Column very short and stout, about 2.8 mm. long at the back, produced into a very short foot.

Amazonas: Chachapoyas, *Mathews 1862* (type).—Puno: Prov. of Carabaya, below Ollachea, 2500 meters, on rocks *Vargas 6944*.

Maxillaria insignis Rolfe, Kew Bull. (1922) 25.

Plant large and showy. Pseudobulbs oblong-cylindric, compressed, about 9 cm. long. Leaf petioled; lamina elliptic-oblong, subobtuse, about 30 cm. long, 9 cm. wide; petiole conduplicate, about 12 cm. long. Peduncles 1-flowered, about 35 cm. long, with many conduplicate, subimbricated sheaths. Pedicellate ovary 6 cm. long, somewhat exceeding the subtending bract. Flower large. Dorsal sepal elliptic-ovate, acute, concave, 4.5 cm. long, ivory-white striped with red-purple. Lateral sepals obliquely triangular-ovate, acute, 3 cm. wide, forming an oblong mentum about 3.5 cm. long. Petals narrowly ovate, acute, distinctly shorter than the dorsal sepal, more strongly purple-lined. Lip obovate in outline, yellow with brown markings, obscurely 3-lobed, 4 cm. long; lateral lobes obtuse; mid-lobe semi-orbicular, 1.7 cm. wide, crenulate and crisped-undulate; disc with an oblong, yellow callus 1.4 [?] cm. wide. Column stout, 1.5 cm. long.

Peru: Habitat unrecorded, *Forget s.n.*

No specimen of this species was available.

Maxillaria Johniana Kränzl. Gard. Chron. ser. 3, 47: 66. 1910; Fedde, Fedde Repert. 11: 97. 1912.

Plant medium-sized. Pseudobulbs small, oblong-cylindric, unifoliate at the oblique apex, surrounded by 1 or 2 sheaths that bear a sessile leaf. Leaf (of the pseudobulb) petioled; lamina oblong, obtuse, compressed below, 5.5–8 cm. long,

up to 2.8 cm. wide. Scape 1-flowered, 4-4.5 cm. high, provided with 2 or 3 separated sheaths. Flowers ringent, up to 3 cm. long. Sepals and petals white tinged above with lilac, lip yellow with a broad lilac margin. Dorsal sepal ligulate, acuminate, with lightly revolute margins, about 2 cm. long, 6-7 mm. wide. Lateral sepals triangular, acuminate, distinctly longer and slightly wider than the dorsal sepal, forming a prominent obtuse mentum about 1.2 cm. long. Petals lanceolate, acuminate, oblique at the base, as long as the dorsal sepal but about half as wide. Lip lightly recurved, oblong in outline, 3-lobed in front; lateral lobes small, rounded; mid-lobe triangular, obtuse, with undulate margins; disc provided throughout with a white mealiness and with an indistinct retuse callus at the base of the mid-lobe. Column slender, with a white carinate anther.

Huánuco: Andes near Pozuzo (introduced by K. W. John of Andernach on the Rhine).

No example of this species was seen.

Maxillaria Klugii C. Schweinf. Am. Orch. Soc. Bull. 13: 130, t., 1944. Figure 137.

Plant medium-sized to large, caespitose, with an apparently abbreviated rhizome. Pseudobulb obovoid-cylindric, strongly complanate above, unifoliate at the apex, 4-5 cm. long, surrounded (and concealed in youth) by 3 or 4 pairs of distichous, commonly imbricating sheaths which are successively larger and leaf-bearing upward. Leaves variable, all but the smallest petioled; lamina linear-oblong, up to over 28 cm. long and 2 cm. wide, acute to obtuse at the obliquely bilobed apex, cuneate at the base; petiole slender, channelled, up to 12 cm. long. Scapes rather short, commonly numerous, lateral, basal, 1-flowered, slender, entirely invested by several tubular, imbricating sheaths, about 12 cm. or less high (including the pedicellate ovary). Flower rather large, brown-red. Dorsal sepal linear-lanceolate, acuminate, concave-involute, about 3.2 cm. long and 7 mm. wide when expanded. Lateral sepals obliquely linear-lanceolate, acuminate, equally long with the dorsal sepal but somewhat narrower, forming a short mentum at the base. Petals similar to the lateral sepals, but somewhat smaller. Lip erect, parallel to the column, recurved and about 1.4 cm. long in natural position, deeply 3-lobed near the middle, cuneate below; lateral lobes erect, semiobovate, with a short, broadly rounded free portion; mid-lobe oblong-linear, very fleshy beyond the base, obtuse at the recurved apex; disc with a small, oblong, fleshy callus in the middle. Column small, lightly arcuate, about 9 mm. high at the back, extended below into a short, sulcate foot.

San Martín: Zepelacio near Moyobamba, 1200-1600 meters, in mountain forest, *Klug 3413*.

Maxillaria Koehleri Schltr. Fedde Repert. Beih. 9: 103. 1921; Mansf. Fedde Repert. Beih. 57: t. 125, nr. 491. 1929.

Plant epiphytic, rather small, 13-15 cm. tall, the short thickish rhizome concealed by imbricating sheaths. Pseudobulbs approximate, suborbicular-quadrate, ancipitous, unifoliate at the apex, 1.5-2 cm. long. Leaf sessile, ligulate, obtuse, erect or spreading, up to 11 cm. long, nearly 1.8 cm. wide in the middle. Scapes

MAXILLARIA

Klugii C. Schweinf.

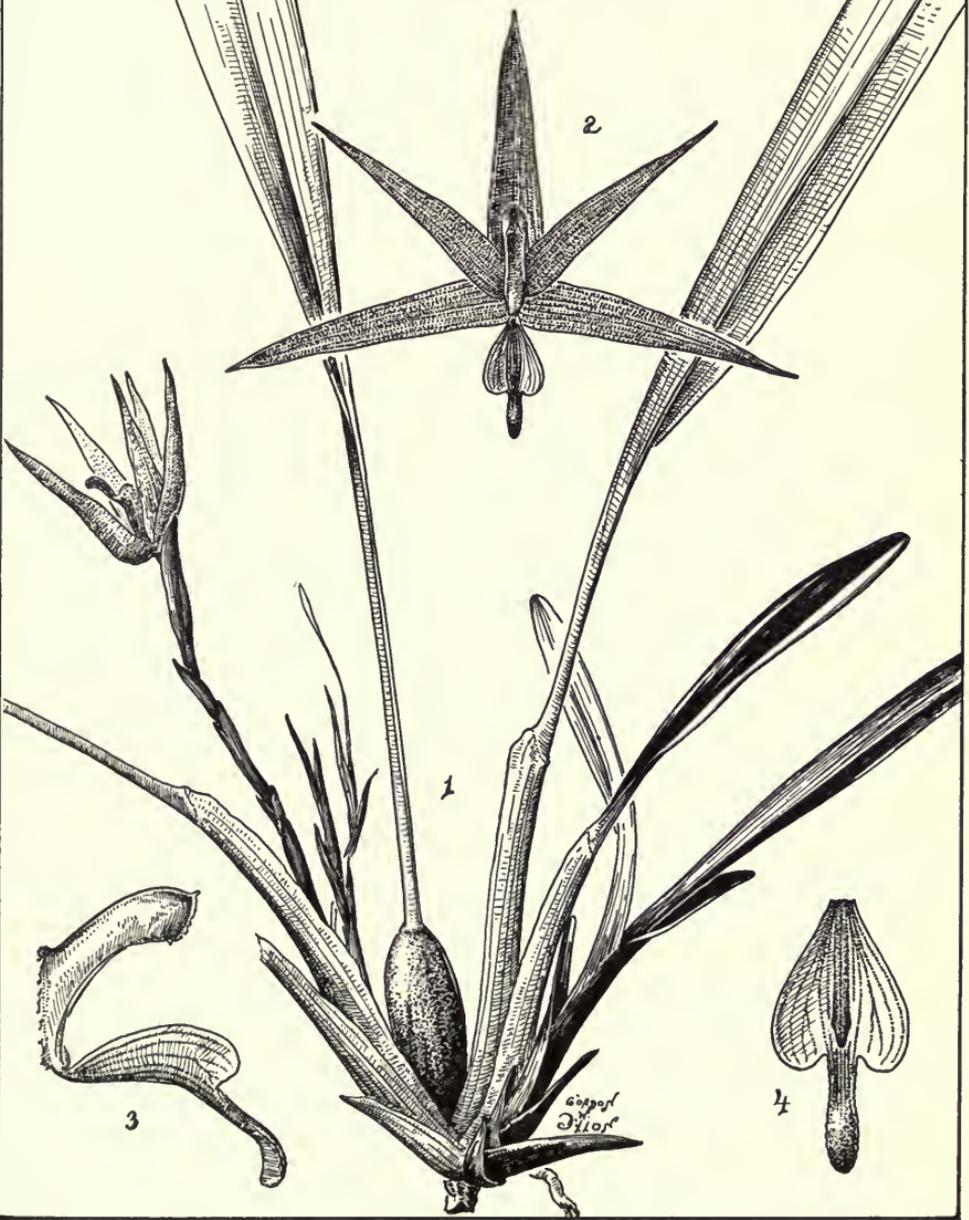


FIG. 137. *Maxillaria Klugii* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, flower, expanded; $\times 1$. 3, lip and column from side; $\times 2$. 4, lip, spread out, from above; $\times 2$.

3-5, lateral, basal, 1-flowered, erect or ascending, up to 7.5 cm. long, the peduncle entirely concealed by 8-9 dorsally carinate sheaths. Flowers medium-sized, rather fleshy. Dorsal sepal oblong or ligulate, acute and apiculate, sharply carinate dorsally, 2.5 cm. long and 0.54 cm. wide. Lateral sepals obliquely lanceolate-oblong, acute or subacute, slightly longer than the dorsal sepal and wider below, forming a short, obtuse mentum about 3 mm. long. Petals obliquely linear ("linear-ligulate"), subobtusate, distinctly shorter than the dorsal sepal and about half as wide. Lip oblong-oval in outline, sharply 3-lobed just below the middle, broadly obtuse, about 2 cm. long and 1.2 cm. wide when expanded; lateral lobes semielliptic with a short, falcate-triangular, obtuse free portion; mid-lobe obovate-oblong, about 1 cm. long and 7 mm. wide; disc with an obscure linear band extending through the lower third, and above with scattering sessile glands. Column arcuate, lightly clavate, about 1.4 cm. long, extended into a short foot. Ovary triquetrous.

Junín: Near La Merced in the Chanchamayo Valley, A. & C. Köhler *s.n.*

No specimen of this species was available.

Maxillaria laevilabris Lindl. Benth. Pl. Hartw. 155. 1845, in note; Reichb. f. Bonpl. 4: 213. 1856.

Plant rather small, with a short, creeping rhizome. Pseudobulbs ovoid, approximate, compressed, unifoliate at the apex. Leaf elliptic-oblong or ligulate, subacute or mucronulate, cuneate at the sessile base. Scapes numerous, lateral, basal, 1-flowered, flexuous, about 12.7 cm. long, equaling or shorter than the leaves; peduncle concealed by several loose, imbricating, carinate sheaths. Dorsal sepal ovate-lanceolate ("ligulate"), acute. Lateral sepals obliquely elliptic-lanceolate, acute. Petals linear or oblanceolate-linear, acute, conspicuously smaller than the sepals. Lip suborbicular-oval in outline when expanded, sharply 3-lobed near the middle; lateral lobes semiobovate with a short, obliquely triangular, acute free apex; mid-lobe ovate-suborbicular, rounded and subemarginate in front; disc apparently smooth. Column clavate.

"Peru": Habitat unrecorded (type).—"Vitoc 94," fide Reichb. f. Bonpl. 4: 213. 1856.

Description made by examining a drawing of the type from the Lindley Herbarium.

Maxillaria ligulata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 222: 1798. *Dendrobium ligulatum* Pers. Syn. Pl. 2: 524. 1807.= obscure species, probably *Oncidium*.

Huánuco: Near Pillao and Acomayo, in open woods, Pavón *s.n.*

Maxillaria Lindeniae Cogn. Journ. Orch. 4: 362. 1894.

Vegetative portions not described and thus presumably lacking. Flowers very large. Sepals milk-white, subfleshy. Dorsal sepal lanceolate, acuminate, 7 cm. long. Lateral sepals equally long, narrowly triangular. Petals triangular-lanceolate, long-acuminate, shorter than the sepals, milk-white with 2 or 3 pale rose-

colored lines. Lip much shorter than the other segments, about 3 cm. long, oboval in outline, fleshy, strongly concave, lightly plicate and crisped near the rounded apex, very pale yellow with 5 or 6 reddish stripes on the lateral lobes and lemon-yellow through the center; disc with a thickened, central, tomentose band in the lower half, which terminates, a little above the middle, in a broadly rounded, fleshy tongue.

"Peru," fide Schltr. Fedde Repert. Beih. 9: 163. 1921.

This species, of which no example was seen, was too inadequately described to place in the key.

Maxillaria linearis C. Schweinf. Am. Orch. Soc. Bull. 13: 60, t., 1944. Figure 138.

Plant tall, slender, only the upper portion available. Stem terete, entirely concealed by close, tubular, imbricating, verruculose sheaths, about 5 mm. in diameter, bearing at remote intervals short, appressed, leaf-concealed branches. Leaves apparently 4-6 in a group, subapproximate at the apex of the stem and on the branches, articulated to imbricating sheaths; lamina grass-like, narrowly linear, acuminate, slightly narrowed to a conduplicate base, 13.5-40 cm. long, about 5 mm. wide, the margins revolute in the dried specimen. Inflorescences numerous, short, from the axils of leaf-bearing sheaths near the summit of the stem and on the branches; peduncles lax, spreading, filiform, about 7 cm. long including the pedicellate ovary, more or less concealed by elongate, tubular sheaths. Flowers medium-sized, with spreading, nervose segments. Dorsal sepal linear, sharply acute and mucronate, about 2.6 cm. long and 3.5 mm. wide near the base. Lateral sepals obliquely linear, falcate, complicate-acute, about as long as the dorsal sepal but somewhat wider, forming a short but conspicuous mentum with the column-foot. Petals similar to the lateral sepals but markedly smaller, narrowly linear, lightly falcate, acute. Lip very short, erect, parallel to the column, gently arcuate-recurved and about 1 cm. long in natural position, oblong-elliptic when expanded, deeply 3-lobed at the apex, sessile with a minutely auriculate base; lateral lobes erect, narrowly semielliptic with a short, rounded free portion; mid-lobe very small, narrowly triangular, very thick and fleshy, about 2 mm. long, only slightly surpassing the apices of the lateral lobes; disc through the lower two-thirds with a linear thickening that merges into a prominent, sulcate callus. Column small, abruptly clavate when viewed from the side, about 5 mm. long at the back, produced into a subequally long, sulcate foot.

Junín: Chanchamayo Valley, 1800 meters, *Schunke* 519.

Maxillaria longibracteata (Lindl.) Reichb. f. Walp. Ann. 6: 540. 1863. *Camaridium longibracteatum* Lindl. Benth. Pl. Hartw. 154. 1845.

Plant tall, stout, epiphytic or terrestrial, caulescent. Stems entirely destitute of pseudobulbs, simple or more or less forking with strongly ascending branches, entirely concealed by densely imbricating leaf-sheaths which are evanescent on the lower portions, up to 110 cm. or more long, more or less arcuate to flexuous. Leaves numerous, distichous, widely spreading, broadly oblong, ovate-oblong, elliptic-

oblong or lanceolate-oblong, apiculate at the abruptly acute apex, sessile, clasping at the base, up to 7.6 cm. long and 2 cm. wide (smaller on the specimens seen), deciduous on the lower portions of the plant. Inflorescences numerous, short, solitary in the upper (but not uppermost) leaf-axils, 1-flowered, strictly ascending, about 4 cm. long including the long, slender, pedicellate ovary, concealed by several loose, tubular-infundibuliform sheaths; pedicellate ovary exerted, about 2.5 cm. long, about equaling the long-acuminate, slender bract. Flowers small, with spreading segments, yellow with a brownish or purplish lip. Dorsal sepal lanceolate or elliptic-lanceolate, long-acuminate, the involute margins forming an aristate tip, about 1.5 cm. long and 5 mm. wide, concave. Lateral sepals triangular-lanceolate, aristate-acuminate, oblique, about as large as the dorsal sepal, forming a short but prominent mentum at the base. Petals lanceolate, acuminate, lightly oblique, distinctly shorter and narrower than the sepals, recurved above. Lip shorter than the sepals and petals, erect, parallel to the column and lightly recurved in natural position, broadly pandurate-oblong, about 9–12 mm. long and 5 mm. wide near the middle when expanded, shallowly constricted slightly above the middle, sessile, broadly rounded and minutely retuse in front, with the sides (or lateral lobules) of the basal half erect and the flat anterior portion rotund-obovate; disc through the lower half with a stout, linear-oblong callus. Column short and stout, arcuate, clavate when viewed from the side, about 5–7 mm. long at the back, produced into a subequally long foot.

Ayacucho: Ccarrapa, between Huanta and Río Apurimac, 1500 meters, terrestrial on wooded hillside, *Killip & Smith 22366* (fls. very old).—Cajamarca, fide Schltr. Fedde Repert. Beih. 9: 165. 1921, sub *Camaridium longibracteatum*.—Junín: Huacapistana, 1800–2400 meters, epiphyte in thickets and open woods, *Killip & Smith 24313* (fls. very old).—Puno: Prov. of Sandía, Sto. Domingo area, 1550 meters, *McCarroll 114*. Also Ecuador (type of *Camaridium longibracteatum*).

Maxillaria longibracteata (Lindl.) Reichb. f. var. **grandiflora** (Lindl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 279. 1945. *Isochilus grandiflorum* Lindl. Bot. Reg. 27: sub t. 1. 1841. *Camaridium grandiflorum* Schltr. Fedde Repert. Beih. 9: 165. 1921.

Differs from *M. longibracteata* in having narrower, linear-lanceolate leaves, longer floral bract (reaching to one half of the dorsal sepal) and petals only half as long as the sepals. The base of the lip is noted as naked, but the callus in species of this group appears to be easily detached and thus deciduous.

Peru: Habitat not recorded, *Haenke s.n.* (type of *Isochilus grandiflorum*).—Huánuco, fide Schlechter, Fedde Repert. Beih. 9: 165. 1921 (sub *Camaridium grandiflorum*).

No example of this concept was seen.

Maxillaria longibracteata (Lindl.) Reichb. f. var. **luteorubra** (Lindl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 280. 1945.

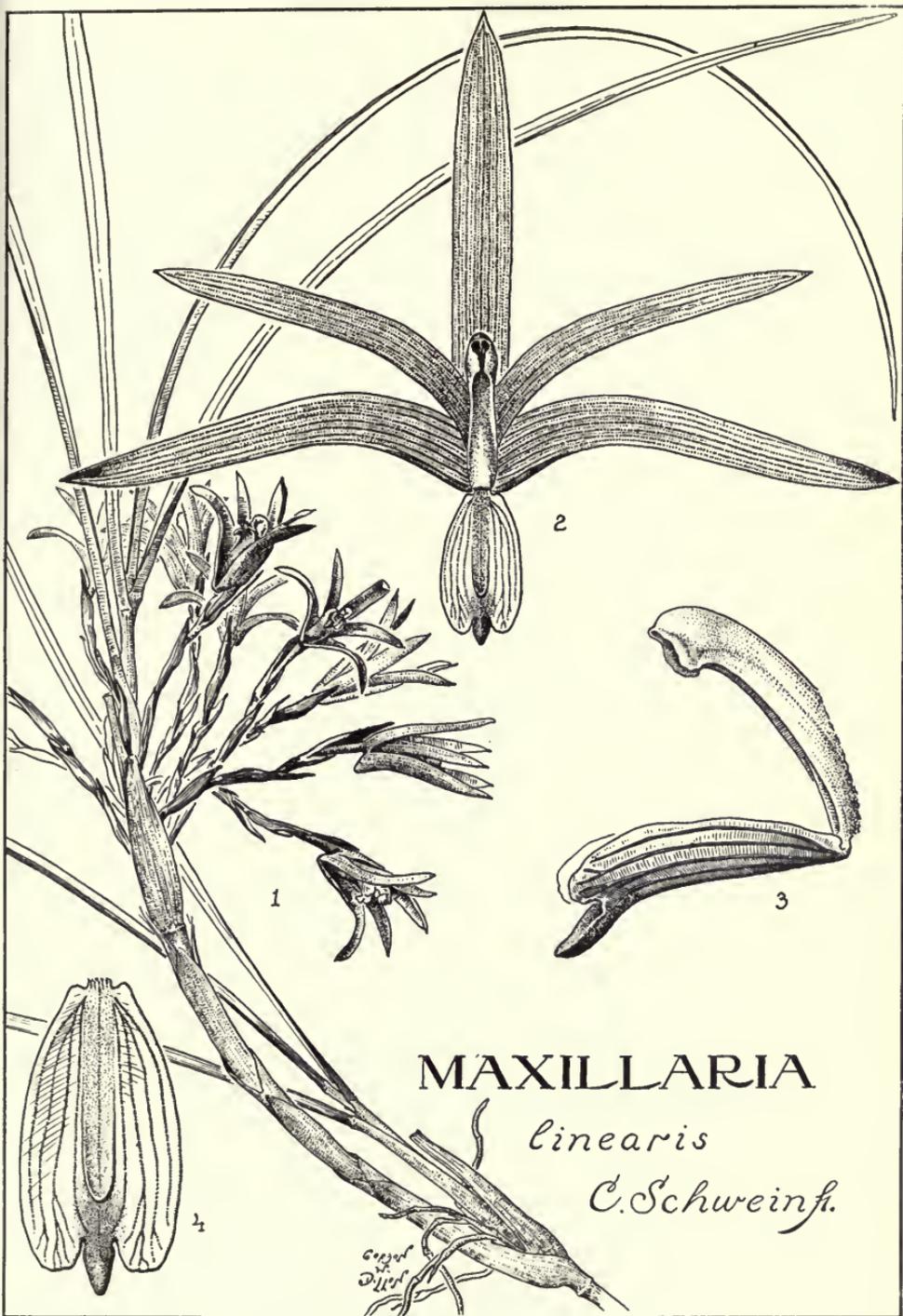


FIG. 138. *Maxillaria linearis* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, flower, spread out; $\times 2$. 3, lip and column from side, natural position; $\times 4$. 4, lip, spread out, from above; $\times 4$.

Camaridium luteo-rubrum Lindl. Orch. Linden. 22, no. 114. 1846. *Maxillaria cassapensis* Reichb. f. Walp. Ann. 6: 539. 1863; Cogn. Martius Fl. Bras. 3, pt. 6: 76. 1904. *Maxillaria luteorubra* Reichb. f. Walp. Ann. 6: 539. 1863. *Camaridium cassapense* Schltr. Fedde Repert. Beih. 9: 165. 1921.

Differs from *M. longibracteata* in having narrower (narrowly oblong-lanceolate to linear-oblong) leaves which are about 1 cm. or less wide, shorter floral bract (much shorter than the pedicellate ovary) and petals little shorter than the sepals. In addition, the flowers are often somewhat smaller than those of *M. longibracteata*.

Huánuco: Near Cuchero (Cohero), in fissures of rocks called Cassapille, *Poeppig 1387* (type of *Maxillaria cassapensis*). Also Venezuela (type of *Camaridium luteo-rubrum*).

Maxillaria longifolia (Barb. Rodr.) Cogn. Martius Fl. Bras. 3, pt. 6: 33, t. 11. 1904. *Dicrypta longifolia* Barb. Rodr. Gen. et Sp. Orch. Nov. 1: 125. 1877.

Plant rather large, epiphytic. Rhizome apparently short, stout, woody. Pseudobulbs aggregated (often appearing solitary in the dried specimen), obovoid-cylindric, strongly compressed, unifoliate at the apex, about 4 cm. or less long, surrounded and more or less concealed by several pairs of distichous, imbricating sheaths of which the upper ones are leaf-bearing. Leaves linear-ligulate or lorate, very abruptly acute to rounded with an obliquely bilobulate apex, gradually narrowed to a conduplicate, scarcely petioled base, up to 27 cm. long and 2.3 cm. wide, thickly coriaceous or fleshy. Inflorescences 1-3, lateral, basal, 1-flowered, very short, about equaling the pseudobulbs, the flexuous peduncle concealed by several loose, imbricating sheaths. Flowers rather small, subfleshy, bright yellow, with a lilac or purple lip. Dorsal sepal oblong or lanceolate-oblong, acute with a thickened apex, up to 1.7 cm. long and 5.5 mm. wide, concave. Lateral sepals similar, obliquely lanceolate-oblong, acute, forming a short mentum. Petals oblong-linear or oblanceolate-linear, subacute, lightly oblique, a little shorter than the sepals and often half as wide. Lip erect, subparallel to the column and lightly recurved, with the sides of the lower portion erect in natural position, ovate-oblong in outline when expanded, obtuse, lightly 3-lobed above the middle, up to 1.48 cm. long and 6 mm. wide below the middle when flattened, much thickened near the apex; disc with a more or less distinct, linear-oblong, smooth thickening through the center of the lower half. Column rather slender, lightly arcuate, subclavate when viewed from the side, 8-9 mm. long at the back, produced into a short foot.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1409*. Vicinity of Iquitos, 100 meters, epiphyte, *Klug 10012*. At mouth of the Santiago River (upper Marañon River), *Tessmann 4371*. Also Brazil (type of *Dicrypta longifolia*) and British Guiana.

Maxillaria longipes Lindl. Benth. Pl. Hartw. 154. 1845; Kränzl. Xen. Orch. 3: 109, t. 262. 1893.

Plant large, apparently caespitose. Pseudobulbs cylindrical-ovoid, compressed, unifoliate at the apex, about 4 cm. tall, surrounded by several pairs of distichous, imbricating sheaths which waste into fibres in age. Leaf petioled; lamina elliptic-oblong, acute, cuneate below, about 24 cm. long and 4.8 cm. wide; petiole prominent, channelled, about 8.5 cm. long. Scapes several (5-6), lateral, basal, 1-flowered, suberect to spreading, about 18 cm. long including the pedicellate ovary, invested by 7-8 narrowly tubular, subapproximate sheaths. Flower rather large, dark purple, with ringent segments. Sepals narrowly oblong, sharply acute or acuminate, the lateral ones oblique and forming a short mentum, 3-4.5 cm. long. Petals apparently similar to the sepals but rather smaller. Lip obovate-oblong in outline, sharply 3-lobed in front; lateral lobes erect, oblong, with a short, round-ovate free portion; mid-lobe subquadrate-ovate, truncate-obtuse; disc with a broad median groove (apparently plurisulcate) extending from the base nearly to the sinus between the lobes. Column short, stout, lightly arcuate, clavate when viewed from the side, produced into a foot.

Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 163. 1921. Ecuador (type).

I have seen a photograph of the type with floral analysis in the Ames Herbarium.

Maxillaria longipetala Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 220. 1798. *Dendrobium longipetalum* Pers. Syn. Pl. 2: 523. 1807.=obscure species, probably *Lycaste*.

Huánuco: Near Pillao, Acomayo and Pati, epiphyte in open woods, on rocks and trees, *Pavón s.n.*

Maxillaria loretoensis C. Schweinf. Am. Orch. Soc. Bull. 13: 92, t., 1944. Figure 139.

Plant large, epiphytic. Pseudobulbs round-ovoid to ovoid-cylindric, complanate at the apex, often congested, up to 4.5 cm. high, surrounded by 2 or 3 pairs of distichous, finely punctate or maculate sheaths (of which the inner pair are very unequal), triangular-lanceolate, concave and up to 10 cm. long. Leaf petioled; lamina narrowly oblong or ligulate (rarely elliptic-oblong), narrowed to an acute apex, cuneate below, up to 45.5 cm. long and 3.2 cm. wide; petiole 1.5-8 cm. long, channelled. Scapes short, lateral, in the axil of an outer sheath, 1-flowered, variable in length; peduncle including the pedicellate ovary up to 13 cm. long, ascending or arcuate, entirely concealed by 4-11 ventricose, distichous, imbricating sheaths. Flower rather large, white or cream-color to golden yellow striped with lilac, brown or violet. Sepals with revolute margins. Dorsal sepal elliptic-oblong or lanceolate-oblong, rounded and apiculate to abruptly acute, 2.6-3.7 cm. long, 7-11 mm. wide. Lateral sepals similar, obliquely lanceolate-oblong, abruptly subacute, as long as the dorsal sepal but slightly narrower, forming a prominent mentum at the base. Petals variable, obliquely lanceolate or narrowly lanceolate, narrowed above with an acute apex, somewhat shorter than the dorsal sepal and about half as wide. Lip erect, parallel to the column and

gently recurved in natural position, about 2.1–2.4 cm. long, oblong-elliptic in outline when expanded; lateral lobes erect, semiobovate, rounded or abruptly truncate in front; mid-lobe round-ovate, obtuse, much thickened in the middle, with denticulate-erose margins; disc through the lower half with a central, linear thickening which terminates in a fleshy sulcate callus. Column small, lightly arcuate, about 1.2 cm. long at the back, produced into a prominent foot.

Loreto: Aguaitia, 1 km. west of Río Aguaitia, 430 meters, epiphyte, along road, *Seibert 2237*. Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1567*. Vicinity of Iquitos, 100 meters, *Klug 10088* (type). Also Venezuela.

Maxillaria macropoda Schltr. Fedde Repert. Beih. 9: 103. 1921; Mansf. Fedde Repert. Beih. 57: t. 126, nr. 492. 1929.

Plant tall, epiphytic, with an abbreviated rhizome, about 60 cm. high. Pseudobulbs ellipsoid, strongly compressed, unifoliate at the apex, about 4 cm. long, surrounded by a distichous pair of large, leaf-bearing sheaths. Leaves erect, petioled; lamina ligulate, acute, gradually cuneate below, up to 35 cm. long and almost 4.5 cm. wide in the middle; petiole about 10 cm. long. Scape solitary, 1-flowered, erect; peduncle subflexuose, about 50 cm. long, concealed by about 8 clasping, acuminate sheaths. Flower very large, subfleshy, whitish becoming yellowish toward the apex, brown-spotted. Dorsal sepal lanceolate ("oblong-lanceolate"), narrowed to subobtuse at the apex, lightly undulate on the margin, about 5 cm. long and 1.6 cm. wide. Lateral sepals similar, oblique, slightly longer and wider across the dilated base, forming an obtuse mentum. Petals obliquely lanceolate-oblong ("oblong"), subobtuse at the triangular apex, with the margins lightly undulate above, much shorter than the dorsal sepal. Lip ovate-oblong ("rhombic-oblong") in outline when expanded, obscurely 3-lobed above the middle, about 2.2 cm. long and 8 mm. wide when expanded; lateral lobes shallowly semielliptic; mid-lobe ovate-oblong ("oblong"), round-obtuse at the apex, fleshy and densely verruculose; disc through the lower half with a central, depressed, oblong-linear callus. Column very short and stout, arcuate, with a crenulate clinandrium, produced into a long foot.

Loreto: Moyobamba, *Filomeno s.n.*

No example of this species was seen.

Maxillaria maculata (HBK.) Lindl. Gen. & Sp. Orch. 149. 1832. *Dendrobium maculatum* HBK. Nov. Gen. et Sp. 1: 359. 1816. *Broughtonia maculata* Spreng. Syst. Veg. 3: 735. 1826.= obscure species, perhaps *Xylobium*.

Amazonas: Prov. of Jaën de Bracamoros, near the city of Jaën and the towns of Sagique and Pucara, in wooded places, and near the cataract of Rentema on the Amazon River, about 1200–4000 meters, *Humboldt & Bonpland s.n.*

MAXILLARIA

loretoensis C. Schweinf.

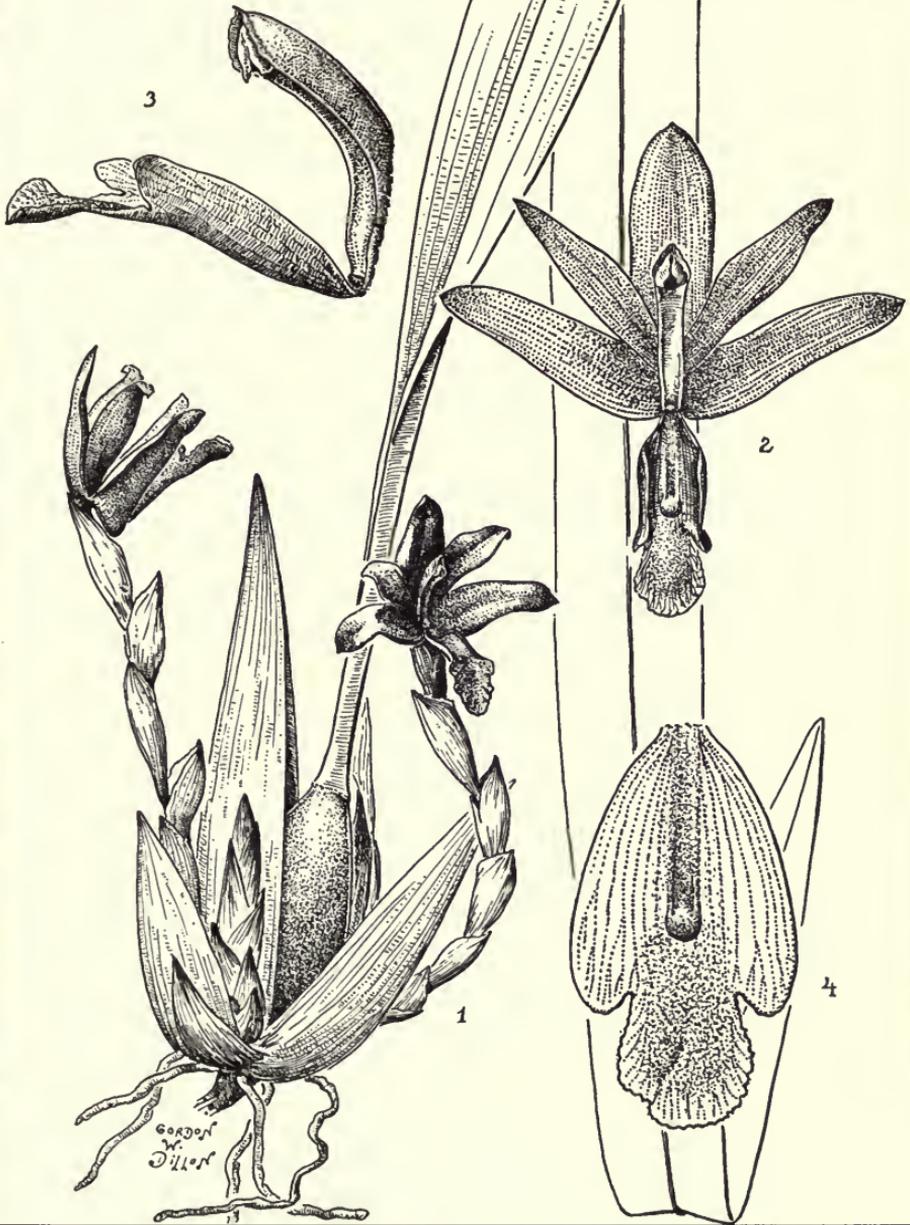


FIG. 139. *Maxillaria loretoensis* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, flower, spread out; $\times 1$. 3, lip and column from side; $\times 2$. 4, lip, expanded; $\times 2$.

Maxillaria Mathewsii Lindl. Benth. Pl. Hartw. 155. 1845, in note.

Plant rather large, with an abbreviated rhizome. Pseudobulb obovoid, strongly complanate, unifoliate at the apex, about 6 cm. or less long, surrounded below by 3 or 4 pairs of distichous, imbricating, conduplicate sheaths which are leaf-bearing above. Leaves petioled; lamina linear-oblong, obtuse with a very unequally bilobed apex, cuneate below, very variable in length, up to 36.5 cm. long and 2.1 cm. wide; petiole relatively short, conduplicate, apparently up to 6 cm. long. Scapes numerous, lateral, in the axils of the sheaths surrounding the pseudobulb, 1-flowered, suberect and flexuous, about 10 cm. or less long including the pedicellate ovary, entirely or mostly concealed by slender, tubular sheaths. Flowers rather small, white. Dorsal sepal linear or linear-lanceolate, complicate-acute or subobtuse, concave below, up to 2.7 cm. long and 5 mm. wide. Lateral sepals similar, lightly oblique, forming a short mentum at the base. Petals linear-lanceolate, acuminate, oblique and slightly sigmoid, distinctly shorter and narrower than the sepals. Lip much smaller than the other segments, erect, parallel to the column and lightly recurved in natural position, about 10.5 mm. long, conspicuously 3-lobed just above the middle, elliptic in outline, up to 7 mm. wide across the lateral lobes when expanded; lateral lobes erect, narrowly semiobovate with a short, rounded, free portion; mid-lobe ovate-oblong, very fleshy, with an obtuse, recurved apex; disc with an oblong, fleshy, more or less sulcate callus extending from the base to above the middle. Column short and stout, concave in front, lightly arcuate, about 6.2 mm. long at the back, produced into a short foot.

Peru: Habitat unrecorded, *Mathews 1872* (type).—Junín: Chanchamayo Valley, 1500 meters, *Schunke 1806*. Same locality, 1800 meters, "fls. white," *Schunke 1862*.

Maxillaria meridensis Lindl. Orch. Linden. 19, no. 100. 1846.

Plant tall, epiphytic (rarely terrestrial), caulescent, without pseudobulbs or with very inconspicuous, remote, linear-cylindric, unifoliate pseudobulbs. Stems slender, arcuate to suberect, often forking with abbreviated subparallel branches, entirely concealed by close, distichous, imbricating sheaths which are densely verrucose or pustulose. Leaves often mostly deciduous on the lower portions of the plant, linear-lanceolate to linear, narrowed to an acute or apiculate apex, very variable in length, up to 28.7 cm. long and 10 mm. wide, more or less narrowed and conduplicate below, spreading. Inflorescence solitary in the axils of the leaves, 1-flowered, with short peduncles which are entirely concealed by several narrow, tubular, imbricating sheaths. Flower medium-sized, yellow, yellow-brown to orange or "warm buff." Dorsal sepal oblong-lanceolate, complicate-acute and apiculate, concave below, up to 22 mm. long, about 5 mm. wide. Lateral sepals obliquely triangular-lanceolate, acute or acuminate, about equaling the dorsal sepal, forming a short, conical mentum at the base. Petals obliquely linear-lanceolate, narrowly lanceolate or oblanceolate, acute or acuminate, a little shorter than the sepals and about half as wide. Lip much shorter than the other segments, erect, parallel to the column and recurved in natural position, up to 12 mm. long and 6.4 mm. wide, sharply 3-lobed near the apex, oblong-elliptic in outline; lateral lobes erect, oblong with a short, semiorbicular free apex; mid-lobe ovate or triangular-ovate, obtuse, very fleshy, recurved, distinctly surpassing the lateral lobes;

disc with a more or less conspicuously sulcate, semiorbicular or round-ovate, fleshy thickening in the middle. Column small, arcuate, clavate, about 5 mm. long at the back, produced into a subequally long foot.

Cuzco: Prov. of Convención, Hda. Potrero, Sapan-Sachayoc, 2200 meters, in dense forest, *Vargas 2554*. Near Río Yanamayo, below "Pillahuata," 2000–2300 meters, *Pennell 14079*. Prov. of Paucartambo, from Sta. Isabel to Asunción, 1800 meters, *Vargas 5526*.—Puno: Prov. of Sandía, Sto. Domingo area, 1550 meters, *McCarroll 100*. Also Venezuela (type) and Guadeloupe.

Maxillaria multicaulis (Poepp. & Endl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 281. 1945. *Siagonanthus multicaulis* Poepp. & Endl. Nov. Gen. ac Sp. 1: 40, t. 69. 1836. *Ornithidium multicaule* Reichb. f. Bonpl. 2: 18. 1854; Cogn. Martius Fl. Bras. 3, pt. 6: 94. 1904.

Plant large, epiphytic, with a creeping rhizome. Stems 6–10, distant, from a prostrate or ascending base strict, simple or divided, very stout, clothed with elongate, tubular sheaths, provided at the apex with a thickened mass of distichous, densely imbricating leaf-sheaths surrounding a pseudobulb. Pseudobulb ovoid, compressed but not ancipitous, unifoliate at the apex, 3.5–4.5 cm. high. Leaves indistinctly petioled, up to 32 cm. long; lamina linear-oblong, 1.5–2.5 cm. wide, slightly narrowed to an obtuse and mucronate or bilobed apex, cuneate below; petiole conduplicate or deeply channelled. Inflorescences numerous, axillary, 1-flowered, in clusters among the sheaths subtending the pseudobulbs, shorter than the pseudobulb, up to 3 cm. long, invested by alternate, tubular sheaths below. Flowers rather small, dirty white with a rose-colored lip. Dorsal sepal linear-lanceolate, acute or acuminate, concave, about 11.5 mm. long, 2.5–3 mm. wide. Lateral sepals apparently similar, obliquely linear-lanceolate or triangular-lanceolate, acuminate, reflexed, forming a short mentum at the base. Petals obliquely ligulate or narrowly oblanceolate, apparently slightly sigmoid, acute or short-acuminate, erect and subconnivent with the dorsal sepal, distinctly shorter than the sepals and about half as wide. Lip obovate-oblong, entire, sharply geniculate-reflexed near the middle, retuse in front, cuneate and concave below, with denticulate and ciliate margins, 13–14 mm. long, 6–7 mm. wide; disc naked above. Column slender, arcuate, clavate, 3.5–4 mm. long, produced into a short foot.

Huáunco: Near Cuchero (Cocho), *Poeppig 1730*.

No specimen of this species was seen.

Maxillaria nanegalensis Reichb. f. Linnaea 41: 34. 1876.

Plant large and stout, caulescent. Stem entirely enveloped by imbricating, verruculose, evanescent, mostly leaf-bearing sheaths. Pseudobulbs very remote and inconspicuous, linear-cylindric in the dried specimen, bearing 2 leaves at the summit. Leaves numerous, distichous, lorate to linear-oblong, acute or subacute ("acuminate"), sessile at the slightly narrowed, conduplicate base, up to about 19 cm. long and 1.8 cm. wide (in the specimen seen). Inflorescences numerous, congested in the upper leaf-axils; peduncle very slender, up to about 8.5 cm. long

including the ovary, entirely enveloped by several close, tubular sheaths. Flower medium-sized, yellow with darker maroon areas, campanulate. Dorsal sepal linear-oblong, acute, mucronate, longitudinally concave, about 24 mm. long and 5 mm. wide. Lateral sepals obliquely oblong-lanceolate, about equaling the dorsal sepal but a little wider, forming a prominent mentum at the base. Petals obliquely linear-oblong, acute or subacuminate, slightly shorter than the sepals and much narrower. Lip much shorter than the other segments, tubular-involute in natural position, deeply 3-lobed at the apex, oval in outline when expanded, about 10 mm. long and 8.5 mm. wide; lateral lobes erect, semielliptic, with a short, broadly rounded free portion; mid-lobe very small, apparently round-ovate when expanded, very fleshy, scarcely protruding beyond the lateral lobes; disc with a median, linear thickening extending from the base and becoming an oblong, sulcate, fleshy callus. Column short, stout, arcuate, about 5 mm. long at the back, extended into a subequally long foot.

Huánuco: Prov. of Huánuco, Chinchao, Carpish Pass, about 2700 meters, among summit vegetation, *Hodge 6282*. Also Ecuador (type).

Maxillaria nardoides Kränzl. Fedde Repert. 1: 90. 1905.

Plant small, rhizomatose. Rhizome creeping, with short branches, concealed by short, densely imbricating, distichous sheaths and by numerous, approximate pseudobulbs. Pseudobulbs narrowly ovoid to pyriform-cylindric, up to 2 cm. long, deeply furrowed in the dried specimen, 3- or 4-leaved at the apex. Leaves acicular, subterete and channelled in the dried specimen, rigid or arcuate, up to 9 cm. long, less than 1 mm. wide. Inflorescences abbreviated, lateral, basal, 1-flowered; peduncle including the pedicellate ovary shorter than the pseudobulb, clothed with several ventricose, imbricated sheaths. Flowers small, brown or reddish brown, with little spreading segments. Dorsal sepal broadly oblong or "oblong-lanceolate," complicate-acute, concave, about 10 mm. long, 3-3.6 mm. wide. Lateral sepals obliquely oblong, acute, commonly subequaling the dorsal sepal, forming a short mentum at the base. Petals obliquely oblong to oblanceolate-oblong, rounded at the apex with a minute apicule, slightly shorter and narrower than the dorsal sepal. Lip erect and parallel to the column in natural position, with the sides of the lower portion erect and the apical part recurved, about as long as the lateral sepals and oblong-obovate when expanded, subtrilobed with the margins irregular above the middle, about 10.4-11 mm. long, 4.8-5.3 mm. wide, rounded-truncate and lightly retuse in front; disc with an oblanceolate-linear thickening in the lower central part, which is more prominent and dilated above. Column slender, about 7.5 mm. long, with a pair of abrupt, rounded arms at the apex, extended into a short foot.

Huánuco: Tingo María, 670 meters, on trees, *Carpenter 105*.—Junín: Near La Merced, in the Chanchamayo Valley, 1000 meters, in open woods, *Weberbauer 1422* (type). Chanchamayo Valley, 1800 meters, *Schunke 561*. Schunke Hacienda, above San Ramón, 1300-1700 meters, in dense forest, *Schunke A 59*.—San Martín: Tarapoto, 750 meters, on a petrified tree trunk in forest, *Williams 6006* (the lip is missing).

Maxillaria nasuta Reichb. f. Beitr. Orch. Centr.-Am. 104. 1866.
Maxillaria brevipedunculata A. & S. Sched. Orch. 10: 91. 1930.

Plant large, robust, on trees or rocks. Rhizome stout, apparently abbreviated. Pseudobulbs complanate-ovoid to complanate-cylindric, unifoliate at the apex, about 8 cm. or less long, surrounded and mostly concealed by several pairs of distichous, conduplicate sheaths of which all but the outer ones are leaf-bearing. Leaves elongate-oblong to lorate, abruptly subacute with an obliquely bilobed tip, slightly narrowed below with a more or less elongate, conduplicate basal portion, about 90 cm. or much less long, 2.6–5 cm. wide. Inflorescences 1–4, lateral, basal, 1-flowered, relatively short; peduncles entirely concealed by about 6 or less loose, tubular, imbricating, distichous sheaths. Flowers large, with spreading segments, fleshy, lemon-yellow to ochre or deep orange, often with a purple or carmine lip. Dorsal sepal lanceolate, acuminate with involute margins, concave, about 4 cm. or less long and 1.1 cm. wide. Lateral sepals similar, lanceolate, long-acuminate with involute margins, lightly oblique, longer and slightly narrower than the dorsal sepal, forming a short mentum. Petals obliquely elliptic-lanceolate, acuminate, distinctly shorter than the dorsal sepal and about half as wide. Lip erect, parallel to the column and arcuate-recurved in natural position, when expanded ovate-oblong or lanceolate, about 2.2 cm. long, lightly 3-lobed or lobulate above the middle with erect sides, obtuse or subacute at the sharply recurved tip; disc with a more or less distinct, central, fleshy thickening below the middle. Column short, stout, lightly arcuate, about 1.6 cm. or less long at the back, produced into a very short foot.

Cuzco: Prov. of Quispicanchis, Marcapata, from Murayaca to S. Pedro, 1200–1600 meters, *Vargas 5209*. Prov. of Urubamba, Machu-Picchu, 2100 meters, on rocks, *Vargas 3333*. Also Colombia and Costa Rica (type of *M. nasuta* and *M. brevipedunculata*).

Maxillaria nubigena (Reichb. f.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 282. 1945. *Ornithidium nubigenum* Reichb. f. Walp. Ann. 6: 488. 1863; *Linnaea* 41: 35. 1876.

Plant large, epiphytic, caulescent, ascending. Stem stout, loosely branching, mostly concealed by tubular, rugulose sheaths of which all but the lower ones are more or less separated and leaf-bearing. Branches short, stout, strobiliform, up to 6 cm. long, concealed by several pairs of closely imbricating, distichous sheaths which are leaf-bearing and have broad scarious margins, at intervals of 11 to 20 cm. (often in the angle formed by the branches of the stem). Leaves linear, long-acuminate, more or less falcate, slightly narrowed toward the base, rigid, more or less convolute in the dried specimen, very variable in size, up to 30 cm. long and 1.1 cm. wide. Inflorescences numerous, abbreviated, 1-flowered, in the axils of the leaf-sheaths on the short, strobiliform branches. Flowers small, deep pink to dark red, campanulate, with fleshy segments. Dorsal sepal oblong-ovate, acute, concave, up to 7.5 mm. long, 3–3.7 mm. wide. Lateral sepals obliquely oblong-ovate, slightly smaller than the dorsal sepal. Petals oblong-elliptic, much smaller than the sepals. Lip much shorter than the sepals in natural position, sigmoid when viewed from the side, simple or nearly so, from a cuneate, concave base gradually dilated in the middle forming a pair of upcurved, semiorbicular lobules, then

slightly contracted into an oblong-subquadrate, sulcate, retuse apical portion. Column short, stout, prominently angled in front.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 22612*.—Junín: Chanchamayo Valley, 1800 meters, *Schunke 1844, 1845*. Also Colombia (type of *Ornithidium nubigenum*).

Maxillaria nutans Lindl. Benth. Pl. Hartw. 154. 1845.

Plant large, caespitose. Pseudobulb not seen, apparently oblong-cylindric, entirely concealed and surpassed by a pair of distichous, conduplicate, leaf-bearing sheaths, unifoliate at the apex. Leaves petioled; lamina elliptic to oblong ("oval"), acute or subacute, cuneate at the base, 15–22.5 cm. long, about 4 cm. or less wide; petiole more or less elongate, conduplicate, about 2 cm. or more long. Inflorescences 1-flowered, 2 or more, suberect, elongate, subequaling the leaves; peduncle about 30 cm. or less long, almost wholly concealed by about 8 loose, strict, tubular, acuminate sheaths. Flower rather large, nodding. Dorsal sepal ovate-lanceolate, almost 3 cm. long, apparently acute or acuminate. Lateral sepals similar, oblique, apparently acuminate or acute, produced at the base into a very prominent mentum. Petals not described. Lip oval, obtuse and thickened at the apex, lightly emarginate on each side above the middle, with the sides of the lower portion erect; disc pubescent, with an emarginate tubercle in the center. Column lightly arcuate, dilated toward the apex and base, produced into a prominent foot.

Peru: Near Chuquiribamba, on the mountains, *Hartweg s.n.* (type).—Cajamarca, fide Schlechter, Fedde Repert. Beih. 9: 163. 1921.

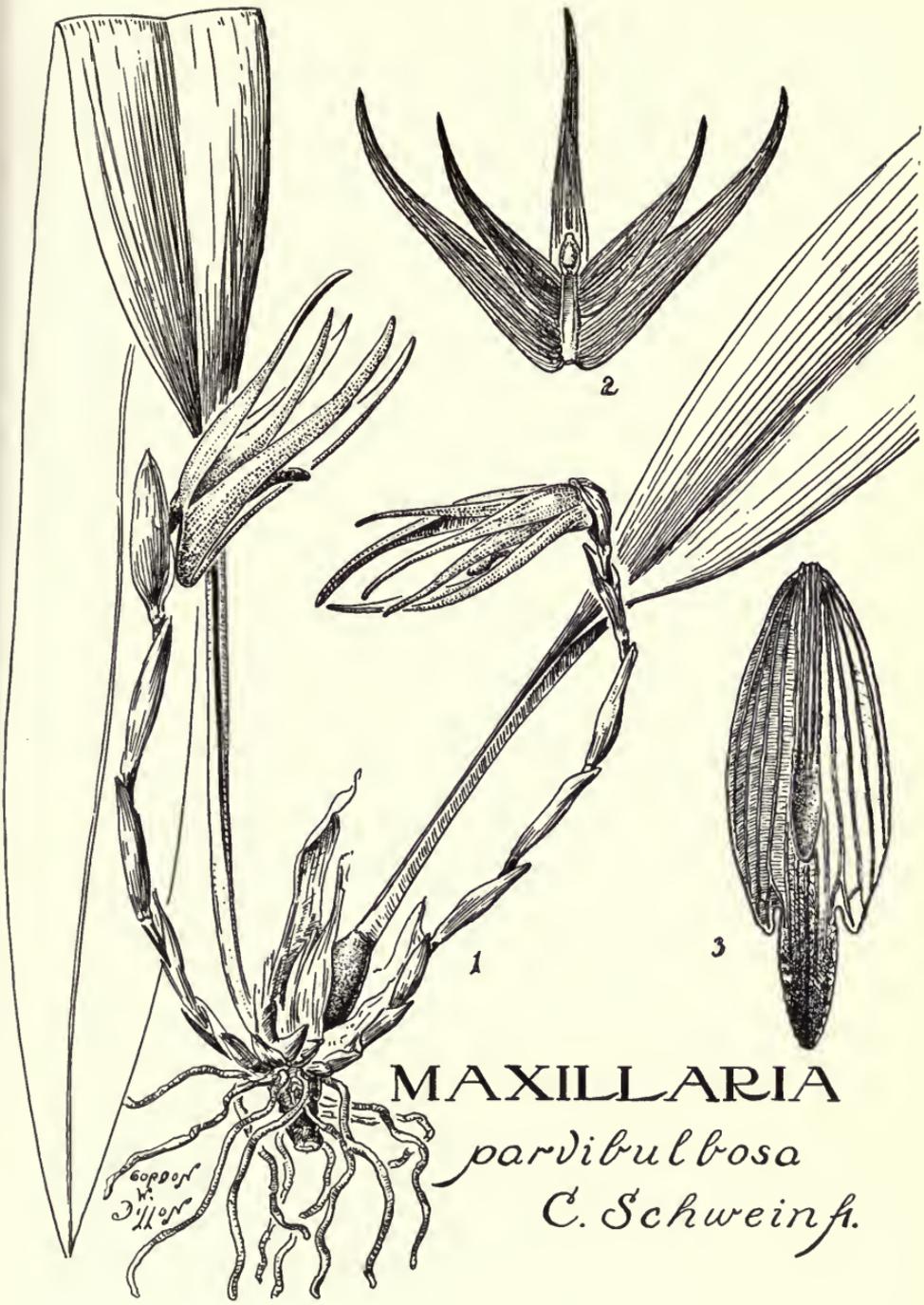
The diagnosis was made chiefly from a photograph of the type in the Ames Orchid Herbarium.

Maxillaria paniculata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 223. 1798. *Dendrobium paniculatum* Pers. Syn. Pl. 2: 524. 1807. *Dendrobium plicatum* F. G. Dietr. Lex. Gärtn. Bot. Nachtr. 2: 651. 1816.= obscure species, perhaps *Cyrtopodium*.

Huánuco: Near Pillao, on mountains and in rocky places, *Pavón s.n.* (type of *Maxillaria paniculata*).

Maxillaria parvibulbosa C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 283, t. 17. 1945. Figure 140.

Plant terrestrial, rather large, apparently with a short, creeping rhizome. Pseudobulbs commonly approximate, very small, obliquely cylindrical or ellipsoid-cylindrical when dry, somewhat compressed, unifoliate at the apex, about 2 cm. or less long, more or less concealed and much surpassed by several distichous sheaths which waste into fibres. Leaf conspicuously petioled; lamina linear-oblong or elliptic-oblong to narrowly oblong-lanceolate, acute, cuneate below, 14–21.4 cm. long, up to 2.9 cm. wide; petiole long, slender, channelled, 4–11 cm. long. Scapes



MAXILLARIA
parvibulbosa
 C. Schweinf.

FIG. 140. *Maxillaria parvibulbosa* C. Schweinf. 1, plant; $\times 1$. 2, flower without lip, expanded; $\times 1$. 3, lip from above, expanded; $\times 3$.

lateral, basal, 1-flowered, several, short, slender, lax to erect-ascending, up to 14 cm. long including the pedicellate ovary; peduncle more or less concealed by several loose, tubular sheaths which are smaller and imbricating below. Flower large, white and lilac-rose, with slightly spreading segments. Dorsal sepal linear-lanceolate, long-acuminate, tubular-involute, up to 3.4 cm. long and 7.6 mm. wide across the concave basal part when expanded. Lateral sepals slightly longer and wider below, narrowly triangular-lanceolate, oblique and slightly upcurved above, acuminate, forming a conspicuous triangular mentum at the base. Petals very similar to the lateral sepals, long-acuminate, markedly shorter and narrower than the dorsal sepal. Lip much shorter than the other segments, erect, parallel to the column, lightly recurved and up to 1.95 cm. long in natural position with the sides of the lower part erect, deeply 3-lobed near the apex, elliptic-oblong and about 6 mm. wide when expanded; lateral lobes long and narrow, with a short, ovate-rounded free apex; mid-lobe elliptic-lanceolate, obtuse, very fleshy through the middle, with undulate margins, about 6 mm. long; disc with an oblong-lanceolate, sulcate callus in the middle. Column short, stout, abruptly clavate, lightly arcuate, about 8 mm. long at the back, extended into a somewhat longer, sulcate foot.

San Martín: Zepelacio, near Moyobamba, about 1100 meters, in mountain forest, *Klug 3618*.

Maxillaria parviloba Rolfe, Kew Bull. (1918) 235.

Plant large, epiphytic. Pseudobulbs aggregated, oblong-cylindric, subcompressed, bifoliate at the apex, about 5 cm. long. Leaves subpetioled, lorate, subacute, cuneate below, about 35 cm. long and 3 cm. wide. Scapes 1-flowered, suberect, 9-12 cm. long, concealed by several "lanceolate-oblong" sheaths. Flowers rather large, light yellow suffused with pale pink, lip white suffused with pink, brown, red-purple and yellow. Dorsal sepal lanceolate-oblong, acute, lightly concave, 4 cm. long. Lateral sepals subspreading, equally long with the dorsal sepal, forming a very short, obtuse mentum at the base. Petals linear-oblong, subfalcate, acuminate, much shorter than the sepals. Lip about 1.3 cm. long, shortly 3-lobed; lateral lobes falcate-oblong, obtuse, 2.5 mm. wide; mid-lobe ovate-oblong, obtuse, fleshy, 3.5 mm. long, with a recurved margin; disc papillose, with an oblong, obtuse, fleshy callus. Column clavate-oblong, about 1 cm. long.

Peru (probably). Habitat not recorded (flowered with Messrs. Sander, St. Albans).

No specimen of this species was available.

Maxillaria pendula (Poepp. & Endl.) C. Schweinf. Bot. Mus. Leafl. Harvard Univ. 11: 285. 1945. *Scaphyglottis pendula* Poepp. & Endl. Nov. Gen. ac Sp. 1: 58, t. 98. 1836. *Ornithidium pendulum* Cogn. Martius Fl. Bras. 3, pt. 6: 92. 1904.

Plant rather large, epiphytic, caulescent. Stems elongate, pendent, divaricately branched, rather slender, bearing remote pseudobulbs, 50-60 cm. or more long, clothed with short, close, tubular, loosely imbricating, evanescent sheaths. Pseudobulbs in the axils of the branches, ovoid, strongly compressed, up to 3.5 cm. long, unifoliate at the apex, sheathed at the base when young with a pair of dis-

tichous, coriaceous, leaf-bearing sheaths. Leaves oblong-lanceolate or elliptic-oblong, acute, cuneate below, erect-spreading, 9–15 cm. long, up to 2.5 cm. wide. Inflorescences numerous, very short, fascicled in the axils of the cauline sheaths, 1-flowered; peduncles almost naked, up to 1 cm. long. Flowers minute, white, erect-spreading. Dorsal sepal oblong, acute, concave, about 5 mm. long and 1.5 mm. wide. Lateral sepals narrowly and obliquely deltoid, equally long with the dorsal sepal but a little wider at the base, forming a short obtuse mentum below. Petals lanceolate, acute, suboblique, a little shorter and narrower than the dorsal sepal. Lip from a rather long, narrow claw ovate-oblong, strongly concave, shortly acuminate, lightly constricted on each side near the middle (and thus subtrilobed), 4–4.5 mm. long, lamina subcordate at the base; disc callose. Column rather short, slender, gently arcuate, clavate, 3–4 mm. long.

Huánuco: Near Cuchero (Cochero), *Poeppig 1749*.

No specimens of this species were seen.

Maxillaria platyloba Schltr. Fedde Repert. Beih. 9: 104. 1921; Mansf. Fedde Repert. Beih. 57: t. 126, nr. 493. 1929.

Plant rather large, epiphytic, about 30 cm. high, rhizomatose. Rhizome stem-like, stout, erect, bearing distant pseudobulbs. Pseudobulbs ovoid or broadly ellipsoid, compressed, 1.85–2.5 cm. high, unifoliate at the apex, about 4–6 cm. apart, surrounded on each side by a leaf-bearing sheath. Leaf ligulate, mucronulate, very shortly petiolate-narrowed below, shining above, 5–7 cm. long, 1.4–1.7 cm. wide in the middle. Inflorescence basal, 1-flowered, solitary, erect; peduncle 6.5–7.5 cm. long, entirely concealed by about 4 long, tubular, acute sheaths. Flower rather large, pale brown, glabrous. Dorsal sepal narrowly lanceolate (“lanceolate-ligulate”), gradually narrowed to a subobtuse apex, about 4 cm. long and 6.7 mm. wide below. Lateral sepals obliquely and narrowly triangular-lanceolate, gradually narrowed above, about equally large with the dorsal sepal, forming at the base a short, obtuse mentum. Petals lanceolate-linear (“linear”), oblique near the base, long-acuminate, shorter than the dorsal sepal. Lip much shorter than the other segments, recurved, oblong-obovate (“broadly oblong”) in outline, 3-lobed at the anterior third, about 1.6 cm. long and 8 mm. wide; lateral lobes semiobovate (“semioblong”) with a short, rounded free apex; mid-lobe reniform, lightly retuse, 5 mm. long, about 7 mm. wide; lower half of the disc with a linear-oblong, obtuse, fleshy callus in the middle. Column short, clavate, about 9 mm. high, produced into a short foot.

Cuzco: Between Tambo Yancacoza and Ramapata, 2200–2400 meters, *Weberbauer 1337*.

No example of this species was available.

Maxillaria platypetala Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 221. 1798. *Dendrobium platypetalum* Pers. Syn. Pl. 2: 523. 1807. *Maxillaria polypetalata* Steud. Nom. Bot. ed. 1: 268. 1821. *Dendrobium polypetalum* Steud. l.c. = obscure species, perhaps *Lycaste*.

Huánuco: Near Muña and Chaclla, on forested mountains, *Pavón s.n.*

Maxillaria prolifera Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 226. 1798. *Dendrobium proliferum* Pers. Syn. Pl. 2: 524. 1807.—obscure species.

Junín: Huassa-huassi, in cold places, *Tafalla s.n.*, fide Ruíz & Pavón.—Huánuco, fide Schlechter, Fedde Repert. Beih. 9: 164. 1921.

Maxillaria purpurea (Spreng.) Ames & Correll, Bot. Mus. Leaflet. Harvard Univ. 11: 16. 1943. *Epidendrum vestitum* Sw. Prodr. Veg. Ind. Occ. 124. 1788, not *Maxillaria vestita* Schltr. 1924. *Cymbidium vestitum* Sw. Nov. Act. Ups. 6: 70. 1799. *Camaridium purpureum* Spreng. Syst. Veg. 3: 735. 1826. *Ornithidium vestitum* Reichb. f. Walp. Ann. 6: 491. 1863, in part; Cogn. Martius Fl. Bras. 3, pt. 6: 95. 1904, in part; Fawc. & Rendle, Fl. Jam. 1: 122, t. 26, figs. 1–4. 1910. *Ornithidium simulans* Ames & Schweinf. Sched. Orch. 10: 99. 1930.

Plant small to medium-sized, epiphytic or on rocky banks, rhizomatose. Stems elongate, more or less branched, often curved or flexuous, entirely concealed by short sheaths which are close, distichous, strongly imbricating and evanescent in age, provided with more or less distant pseudobulbs. Pseudobulbs cylindrical, unifoliate at the apex, 2–3 (rarely 3.7) cm. long, sheathed at the base by a pair of distichous, triangular, concave sheaths which are evanescent in course of development. Leaves variable, linear-oblong, lanceolate, lanceolate-oblong or narrowly elliptic-oblong, acute and apiculate to subacute, shortly narrowed to a conduplicate, subpetioled base, up to 16 (rarely 20) cm. long and 2 cm. wide (commonly much smaller). Inflorescences lateral, crowded in the axils of cauline sheaths at the base of the pseudobulbs, 1-flowered, very short; peduncles up to 7 mm. long, concealed by several distichous, closely imbricating, ventricose sheaths. Flowers minute, white or cream-color with a yellow lip, urceolate. Dorsal sepal elliptic or ovate-elliptic, complicate-acute, strongly concave, about 4.2 (rarely 5.5) mm. long and 2.5 mm. wide. Lateral sepals elliptic-ovate or rotund-ovate, abruptly acute, connate below, deeply concave at the base, a little shorter and wider than the dorsal sepal. Petals elliptic-oblong, complicate-acute, lightly oblique, a little shorter and much narrower than the sepals. Lip erect and subparallel to the column in natural position, prominently clawed, 3–4 mm. long; claw subquadrate, fleshy with the thickening bilobulate in front; lamina ovate or cordate-ovate in outline, more or less distinctly 3-lobed below the middle; lateral lobes short, obliquely semiobovate, erect-spreading; mid-lobe larger, ovate or triangular-ovate, obtuse to acute, flat; disc with a transverse, fleshy thickening between the lateral lobes. Column very short and stout, about 1.5 mm. long at the back.

Ayacucho: Aina between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 23201*.—Junín: Chanchamayo Valley, 1800 meters, *Schunke s.n.*—Loreto: Balsapuerto (lower Río Huallaga basin), 150–350 meters, in dense forest, *Killip & Smith 28603*. Vicinity of Iquitos, 100 meters, *Klug 10077*. San Isidro, Río Marañón, at the mouth of Río Pastaza, 135 meters, *Tessmann*

4982. The following collection is sterile, but is doubtless referable here: Junín: Pichis Trail, Eneñas, 1600–1900 meters, in dense forest, Killip & Smith 25723. Also Central America (Guatemala, type of *Ornithidium simulans*; Honduras), the West Indies (type of *Epidendrum vestitum* and *Camaridium purpureum*), Venezuela, Surinam and Brazil.

Maxillaria purpurea (Spreng.) Ames & Correll, var. **parviflora** (Poepp. & Endl.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 285. 1945. *Scaphyglottis parviflora* Poepp. & Endl. Nov. Gen. ac Sp. 1: 58, t. 97. 1836. *Ornithidium vestitum* Reichb. f. Walp. Ann. 6: 491. 1863, in part; Cogn. Martius Fl. Bras. 3, pt. 6: 96. 1904, in part.

This variety differs from the species in having commonly bifoliate pseudobulbs and in having the mid-lobe of the lip ligulate and much smaller than the lateral lobes.

Huánuco: Near Cuchero (Cochoero), epiphyte in forest, *Poeppig 1761* (type of *Scaphyglottis parviflora*).

No specimens of this orchid have been available.

Maxillaria ramosa Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 226. 1798. *Dendrobium ramosum* Pers. Syn. Pl. 2: 524. 1807.= obscure species.

Huánuco: Chinchao, near Mesapata and Machaynio, in open woods, on trees, *Pavón s.n.*

Maxillaria ramosissima Kränzl. Engler Bot. Jahrb. 54, Beibl. 117: 29. 1916; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 286. 1945.

Plant small, rhizomatose. Rhizome long-creeping, flexuous, more or less branching, entirely concealed by close sheaths which are short, distichous, densely imbricated and evanescent in age, bearing remote pseudobulbs. Pseudobulbs ellipsoid to pyriform-cylindric ("ovate"), more or less compressed, bifoliate at the apex, up to 3 cm. high, striate-rugose and often curved in the dried specimen, surrounded at the base by a pair of evanescent, leaf-bearing sheaths. Leaves linear-oblong to narrowly elliptic-oblong ("ligulate"), abruptly rounded at the bilobed apex, shortly cuneate at the conduplicate base, erect-spreading, coriaceous, up to 9 cm. long and 1.1 cm. wide. Inflorescences commonly 2–4, arising from the axils of the sheaths at the base of the pseudobulbs (rarely from the axils of sheaths between the pseudobulbs), 1-flowered, subequaling the leaves, about 11 cm. or less long including the pedicelled ovary; peduncles suberect, lightly fractiflex, entirely concealed by numerous (up to 15), close, distichous, densely imbricating, short sheaths. Flowers rather small, pale greenish yellow, with ringent segments. Dorsal sepal navicu-

lar, oblong-lanceolate ("narrowly ovate-triangular"), complicate-acute and apiculate, dorsally keeled near the apex, about 1.6 ("ad 2") cm. long and 5.6 mm. wide when expanded. Lateral sepals similar, obliquely lanceolate-oblong, about as long as the dorsal sepal but narrower, forming a short mentum at the base. Petals obliquely elliptic-linear ("lanceolate"), complicate-acute, a little shorter than the sepals and about half as broad as the dorsal sepal, minutely ciliate. Lip erect, parallel to the column and lightly recurved in natural position, when expanded oblong-obovate in outline from a small cuneate claw, about 9.5 mm. long and 5.4 mm. wide across the anterior flat portion, broadly rounded and lightly retuse at the apex, base of the lamina subcordate with erect, auriculiform lobules; disc with a prominent, ovate-rounded, sulcate callus between the basal lobules. Column small, arcuate, abruptly clavate at the apex, about 6 mm. long at the back, extended into a short foot.

Cajamarca: Prov. of Jaën (5° 10' 20" S. Br.), above Tabaconas, on the eastern declivity of the Cordillera, 2200–2400 meters, in sclerophyllous vegetation consisting of shrubs interspersed with small trees, *Weberbauer 6273, 6308*.

Maxillaria ringens Reichb. f. Walp. Ann. 6: 523. 1863; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 4: 91. 1937.

Plant commonly large, epiphytic, very variable. Rhizome stout, abbreviated. Pseudobulbs clustered (often only 1 shown in the specimen), cylindrical to ellipsoid or round-ovoid, strongly complanate, unifoliate at the apex, up to 5 (rarely 6.5) cm. tall, surrounded at the base by several distichous, imbricating sheaths which are triangular-ovate, conduplicate, more or less surpassing the pseudobulb and evanescent in age. Leaf petioled; lamina elliptic-oblong to lorate, subacute to rounded at the apex, cuneate below, up to 54 cm. long and 5 cm. wide (commonly much smaller); petiole conduplicate, up to 13 cm. long. Scapes lateral, basal, 1-flowered, commonly several in the axils of sheaths, short or elongate, erect, lax or flexuous; peduncle much shorter than the leaves, up to 18 cm. long, wholly or mostly concealed by several tubular to infundibuliform sheaths. Flowers extremely variable in size, with spreading or ringent segments, yellow-green to cream-color and yellow, often with a white, purple-spotted lip (rarely dull red). Dorsal sepal oblong or linear-oblong, abruptly acute or subacute, concave, 1.8–3.9 cm. long, 5.8–7.7 mm. wide. Lateral sepals similar, oblique, forming a short but prominent mentum at the base. Petals obliquely oblong-lanceolate or linear-lanceolate, narrowed to an acute tip, slightly shorter than the sepals and distinctly narrower. Lip much shorter than the other segments, erect and parallel to the column in natural position, 1.3–1.7 cm. long, about 5.8 mm. or more wide when expanded, elliptic in outline, deeply 3-lobed near the apex; lateral lobes erect, narrowly semiobovate with a short, rounded free portion having irregular margins; mid-lobe ovate to triangular-ovate, fleshy with irregular margins; disc through the lower portion with a central longitudinal thickening which is extended into a fleshy, obtuse or acute tip. Column small, about 6–7 mm. long at the back, lightly arcuate and subclavate, produced into a prominent foot.

Junín: Chanchamayo Valley, 1200 meters, *Schunke 535*. Pichis Trail, San Nicolas, about 1100 meters, in dense forest, *Killip & Smith*

26057.—Loreto: Vicinity of Iquitos, 100 meters, *Klug 10049*.—San Martín: Near Moyobamba, 1100–1600 meters, in forest, *Klug 10114*. Also Mexico (type) through Central America and Venezuela.

This species appears to be very similar to the Venezuelan *Maxillaria brunnea* and may prove to be referable to it.

Maxillaria rotundilabia C. Schweinf. Am. Orch. Soc. Bull. 13: 232, t., 1944. Figure 141.

Plant medium-sized, epiphytic. Rhizome abbreviated. Pseudobulbs complanate-ellipsoid, unifoliate at the apex, 3.2–5 cm. tall. Leaf distinctly petioled; lamina oblong-lanceolate or elliptic-oblong, acute, cuneate at the base, 14–19.5 cm. long, up to 2.8 cm. wide; petiole small, channelled, up to 2.5 cm. long. Scapes several, lateral, basal, 1-flowered, suberect to arcuate, much shorter than the leaf; peduncle entirely or mostly concealed by 5–7 narrow, tubular, erect sheaths. Flower dark purple or red-purple with a dark purple lip, having spreading segments. Dorsal sepal oblong or oblong-lanceolate, concave or navicular, acute to obtuse, 1.9–2.4 cm. long, 5–6.5 mm. wide. Lateral sepals obliquely oblong-lanceolate to ovate-lanceolate, complicate-acute, very slightly larger than the dorsal sepal. Petals obliquely elliptic-lanceolate, acute or subacute, somewhat smaller than the dorsal sepal. Lip much shorter than the other segments, erect and lightly recurved in natural position, suborbicular in outline when expanded, sharply 3-lobed in the middle, about 1 cm. long, up to 1 cm. broad across the lateral lobes when expanded, rounded-subtruncate in front, rounded to subcuneate at the very shortly clawed base; lateral lobes incurved, with a small, dentiform-triangular apex which is obtuse or rarely acute and more or less irregularly erose; mid-lobe much larger, transversely semiorbicular-oval or rotund-obovate, 5.5 mm. or more long, 7 mm. or more broad; disc with a suborbicular or obovate, sulcate callus between the lateral lobes. Column very short and stout, about 4 mm. long at the back, produced into a short, broad, sulcate foot.

Cuzco: Prov. of Paucartambo, slopes of Pillahuata, 2800 meters, in rainy forest of "Ceja de la montaña," *Vargas 3679* (type). Prov. of Urubamba, near Wenner Gren ruins, 3400–3600 meters, in dense wet forest with much fog and rain, *Metcalf 30771*.

Maxillaria rufescens Lindl. Bot. Reg. 21: sub t. 1802. 1836; 22: t. 1848. 1836; Reichb. f. Saund. Refug. Bot. 2: t. 133. 1882; Cogn. Martius Fl. Bras. 3, pt. 6: 12. 1904; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 287. 1945. *Maxillaria Abelei* Schltr. Fedde Repert. Beih. 9: 101. 1921; Mansf. Fedde Repert. Beih. 57: t. 125, nr. 488. 1929.

Plant epiphytic, extremely variable. Rhizome creeping, more or less elongate. Pseudobulbs commonly approximate (rarely 2–3 cm. distant), cylindrical to narrowly ovoid or ellipsoid, compressed, more or less distinctly 4-angled in section, unifoliate at the apex, 1.5–6 cm. long, at first surrounded below by several distichous, membranaceous, ovate-triangular sheaths. Leaf sessile or shortly petioled; lamina

narrowly elliptic to elliptic-oblong, oblong-lanceolate or ligulate, acute (rarely acuminate), cuneate below, coriaceous, 4.3–31 cm. long, up to 4.8 (rarely 6) cm. wide; petiole short or indistinct, up to 4 cm. long, conduplicate. Scapes lateral, basal, 1-flowered, 1 to several, short, shorter than the pseudobulb or a little longer; peduncle ascending, arcuate or spreading, with several rather remote, ventricose sheaths. Flower small to medium-sized, commonly yellow to orange with red or purple spots on the lip, more rarely white, reddish-green or salmon pink striped with red. Dorsal sepal oblong to elliptic-oblong, acute to obtuse, concave, 9–24 mm. long and 2.8 to about 9 mm. wide. Lateral sepals broadly oblong or elliptic-oblong, lightly oblique, about as long as the dorsal sepal but somewhat wider. Petals obliquely oblong-lanceolate to oblong-elliptic, subacute at the rounded apex, a little shorter than the dorsal sepal but commonly subequally wide. Lip erect and parallel to the column in natural position, ovate or elliptic in outline when expanded, sharply 3-lobed near the middle, 8–21 mm. long, 6.4–12 mm. wide across the lateral lobes; lateral lobes erect, relatively small, obliquely triangular or ovate-dentiform; mid-lobe much larger, oblong-subquadrate or ovate-oblong, abruptly truncate and commonly lightly retuse (sometimes broadly obtuse) in front; disc with a median, linear-oblong, more or less distinct callus below the middle. Column prominent, arcuate, clavate, about 7–16 mm. long at the back, extended into a short foot.

Peru: Probably from the Chanchamayo Valley (type of *M. Abelei*).—Junín: Chanchamayo Valley, 1200 meters, *Schunke 1244, 1279*. Same locality, 1600 meters, *Schunke 1875* (no lip present), *2013*. Pichis Trail, Yapas, 1350–1600 meters, in dense forest, *Killip & Smith 25540*. Prov. of Tarma, Agua Dulce, 1800 meters, *Woytkowski s.n.* Río Pinedo, north of La Merced, 700–900 meters, in dense woods, *Killip & Smith 23652* (no good flower).—Loreto: Vicinity of Iquitos, 100 meters, *Klug 10020, 10118*. Puerto Meléndez, below the Pongo de Manseriche (upper Marañon River), 155 meters, *Tessmann 4750*.—San Martín: Tingo María, 625–1100 meters, *Allard 22589*. Also Central America, the West Indies (type of *M. rufescens*), Colombia, Venezuela, British Guiana and Brazil.

Maxillaria Sanderiana Reichb. f., *Sander, Reichenbachia* 1: 57, t. 25. 1888; *Cogn. & Goos. Dict. Ic. Orch. Maxillaria* t. 5. 1900; *Warner & Williams, Orch. Alb.* 10: t. 463. 1893; *Hook. f. Bot. Mag.* 123: t. 7518. 1897.

Plant large, robust, epiphytic or on stony slopes. Rhizome short or more or less elongate. Pseudobulbs clustered, subglobose to oblong-ellipsoid or ovoid, compressed, unifoliate at the apex, up to 5 cm. long, surrounded below by 2 or more lanceolate, acuminate, evanescent sheaths. Leaf petioled; lamina narrowly oblong or elliptic-oblong, abruptly acute or cuspidate, cuneate below, up to 40 cm. long and 5.7 cm. wide, coriaceous; petiole stout, deeply channelled or conduplicate, up to 19.5 cm. long. Scapes 1 to several, lateral, basal, 1-flowered, stout, ascending or arcuate; peduncle about 25 cm. or less long, entirely or mostly concealed by several distichous, tubular sheaths, of which the lower are smaller and densely



FIG. 141. *Maxillaria rotundilabia* C. Schweinf. 1, plant; $\times \frac{1}{5}$. 2, flower, expanded, with lip removed; $\times 1\frac{1}{2}$. 3, column and lip from side, natural position; $\times 3$. 4, lip, expanded, from above; $\times 3$.

imbricating. Flower large, showy, fleshy, sepals and petals pure white with blotches of deep purple at the base. Dorsal sepal oblong or oblong-lanceolate, acute or subobtuse, concave, up to 7.5 cm. long and 2 cm. wide. Lateral sepals obliquely triangular-ovate or triangular-oblong, acute, a little longer and considerably wider below than the dorsal sepal, forming a prominent, conical mentum at the base. Petals obliquely lanceolate, acuminate, a little shorter and broader than the dorsal sepal. Lip erect, parallel to the column and recurved in natural position with the sides erect below, about half as long as the sepals, oval in outline, subtrilobed above the middle with the anterior lobe ovate-suborbicular, rounded at the apex, crisped-undulate on the margin and bright yellow within; disc with a median, flattened, clavate, smooth appendage through the lower half. Column short, stout, clavate, about 1.5 cm. long at the back, produced into a longer foot.

Peru: Habitat not recorded, about 1200 meters, *Klaboch s.n.* (type). Also Ecuador.

Maxillaria sanguineomaculata Schltr. Fedde Repert. Beih. 9: 164. 1921. *Dichaea arbuscula* Kränzl. Engler Bot. Jahrb. 37: 385. 1906.

Plant caulescent, without pseudobulbs. Stems elongate, branching with erect branches, densely leafy. Leaf-sheaths thick and diverging from the stem in the dried specimen. Leaves oblong-linear, obtusely bilobed and apiculate at the apex, thickly coriaceous, 2.5–3 cm. long, 6–7 mm. wide. Inflorescences in the axils of the leaves, 1-flowered, subequaling the leaves in length, the very short peduncle with 2 sheaths. Flowers white, with a blood-red spot on the lip. Dorsal sepal narrowly ligulate, subacute, about 1.2 cm. long. Lateral sepals similar, ligulate, lightly oblique, acute, about equally long with the dorsal sepal but somewhat wider, forming at the base a short, obtuse mentum 5–6 mm. long. Petals as long as the sepals but wider, obtuse. Lip broadly oblong, obtuse, about 1.2 cm. long, with a minute fold on each side, slightly thickened above, similar to the petals. Column nearly equaling the dorsal sepal, lightly arcuate.

Amazonas: Molinopampa, east of Chachapoyas, 2000–3000 meters, in sclerophyllous vegetation (principally trees with scattered shrubs), in open places, *Weberbauer 4352 (Dichaea arbuscula)*.

No specimen of this species was available.

Maxillaria saxatilis Reichb. f. Bonpl. 3: 216. 1855.

Plant medium-sized to large, caulescent, growing on rocks or trees. Stems stout, entirely concealed by distichous, closely imbricating, leaf-bearing sheaths. Pseudobulbs remote, complanate-ovoid or ellipsoid, about 4–7 cm. long, bifoliate at the apex, surrounded at the base by distichous, leaf-bearing sheaths. Leaves oblong-linear (“linear-ligulate”), abruptly obtuse and unequally bilobulate at the apex, slightly narrowed near the base, 6.6–20 cm. long, up to 1.5 cm. wide. Peduncles scattered, axillary, 1-flowered, provided with several ancipitous sheaths. Ovary long-exserted. Perianth campanulate, rather small. Dorsal sepal oblong, acute, concave, about 1.6 cm. long. Lateral sepals about equally long, obliquely oblong-lanceolate, forming a prominent, saccate mentum with the column-foot.

Petals similar to the lateral sepals in form but shorter, slightly narrower or broader. Lip oblong-subquadrate ("ligulate") in outline, subsimple to obscurely 3-lobed or more or less contracted on each side near the middle, truncate-retuse in front, minutely denticulate, about 1.2 cm. long; disc through the lower half with a median, fleshy, obtuse callus. Column about half as long as the dorsal sepal, slender, arcuate, lightly clavate, produced into a short foot.

Amazonas: Chachapoyas, *Mathews s.n.?* (type).—Junín: Prov. of Tarma, Utcuyacu, 1900 meters, on tree in low forest, *Woytkowski 35355*.—Puno, fide Schlechter, Fedde Repert. Beih. 9: 164. 1921.

Maxillaria spathulata C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 15: 164, t. 54. 1952. Figure 142.

Plant epiphytic, with an elongate rhizome bearing pseudobulbs at remote intervals. Segments of the rhizome slender, straight, terete in section, about 9–11 cm. long, joining at an obtuse angle beneath the pseudobulb, entirely concealed by close, tubular, imbricating sheaths. Pseudobulbs remote, complanate-ovoid, unifoliate at the apex, up to 2 cm. high, clothed at the base by 2 pairs of imbricating, conduplicate sheaths of which the upper ones are leaf-bearing. Leaves variable in size and shape, ovate-elliptic, lanceolate or elliptic-oblong, sharply acute or acuminate, sessile at the complicate base, up to 8.4 cm. long and 3.4 cm. wide. Flower small, solitary in the axils of sheaths surrounding the pseudobulbs, subsessile, reddish with a cream-colored lip. Sepals and petals subparallel, rather fleshy. Dorsal sepal lanceolate or oblong-lanceolate, acuminate, concave, about 10 mm. long and 3 mm. wide. Lateral sepals obliquely and narrowly triangular-lanceolate, short-acuminate, about equaling the dorsal sepal, forming with the column-foot a mentum about 4 mm. long. Petals oblanceolate-linear, acute, a little shorter than the sepals and much narrower. Lip a little shorter than the sepals, lightly recurved in natural position, sharply 3-lobed with the lateral lobes incurved to form a tubular-involute basal portion, oblong-spatulate when forcibly expanded, lightly retuse in front, about 9.5 mm. long and 6.1 mm. wide above the middle; lateral lobes small, linear-oblong, the free part short, porrect, ovate-oblong, obliquely rounded at the apex, about 1.6 mm. long; mid-lobe much larger, suborbicular-obovate, broadly rounded above, lightly retuse, with crenulate-erose margins, about 6.8 mm. long; disc thickened below, the thickening terminating in a subquadrate, retuse callus between the free apices of the lateral lobes. Column short, stout, about 4 mm. high at the back, extending into a short, stout, concave foot.

Cuzco: Prov. of Paucartambo, between Sta. Isabel and Asunción, 1800 meters, *Vargas 5532*.

Maxillaria splendens Poepp. & Endl. Nov. Gen. ac Sp. 1: 38, t. 66. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 25. 1904.

Plant large, epiphytic, with a very short, stout rhizome. Pseudobulbs aggregated (often appearing solitary in the specimen), oblong-ovoid, fusiform or cylindric, up to 10 cm. long, strongly compressed, unifoliate at the apex, surrounded, surpassed and more or less concealed by several pairs of distichous, imbricating sheaths which are conduplicate and mostly leaf-bearing. Leaves

variable, petioled; lamina commonly oblong to linear-ligulate or lorate (rarely elliptic-oblong or linear-lanceolate), abruptly obtuse to rounded at the apex with unequal lobules and often with a small apicule, cuneate below, up to 43 cm. long and 4 cm. wide, coriaceous; petiole very variable, deeply channelled or conduplicate, up to 15 cm. long. Inflorescences relatively short, lateral, basal, in the axils of leaf-bearing sheaths, 1-flowered, suberect to recurved, 13–30 cm. long, entirely concealed by several elongate-tubular, close, imbricating sheaths. Flower large, with slightly spreading segments, white, commonly with a yellow or orange lip. Dorsal sepal narrowly linear-lanceolate, acute to long-acuminate, concave below, 3.5–7.3 cm. long, up to 7.3 mm. wide. Lateral sepals similar, commonly a little longer and subequally wide, slightly oblique, forming a very short, rounded mentum at the base. Petals triangular-linear, long-acuminate, often lightly sigmoid, a little shorter and narrower than the dorsal sepal. Lip much shorter than the other segments, erect, parallel to the column and lightly recurved in natural position, up to 1.5 cm. long, deeply 3-lobed above the middle; lateral lobes erect, narrowly semielliptic, with a very short, rounded or obliquely triangular-ovate free portion; mid-lobe very fleshy, ovate to oblong-lanceolate, obtuse, callose-thickened toward the apex beneath; disc with a median callose thickening through the lower half. Column short, stout, arcuate, subclavate, about 1 cm. or less long at the back, extended into a short, concave foot; clinandrium ciliolate.

Huánuco: Between Huánuco and Pampayaco (Pampayacu), *Kanehira* 321. In the mountain woods near Pampayaco and Cuchero (Cohero), *Poeppig* 1729 (type).—Junín: Chanchamayo Valley, 1200 meters, *Schunke* 1311.—Loreto: Middle Itaya River near Iquitos, about 100 meters, *Tessmann* 3552.—San Martín: Zepelacio, near Moyobamba, 1200–1600 meters, *Klug* 3589. Near Monsón and Tingo María, 625–1100 meters, *Allard* 22188, 22535. Also Colombia, Surinam and Bolivia.

Maxillaria striata Rolfe, *Orch. Rev.* 1: 265. 1893; Rolfe, *Lindenia* 9: 31, t. 398. 1893; Cogn. & Goos. *Dict. Ic. Orch.* *Maxillaria* t. 4. 1899.

Plant large, stout, showy. Pseudobulbs clustered (sometimes appearing solitary in the specimen), oblong-cylindric to ovoid, more or less compressed, 4.7–8 cm. long, unifoliate at the apex, partly concealed and surpassed by several pairs of distichous, imbricating sheaths which are conduplicate, leaf-bearing above and evanescent. Leaves petioled; lamina oblong to elliptic-oblong, acute or obtuse, cuneate below, coriaceous, about 24 cm. or less long, 4–6 cm. wide; petiole stout, deeply channelled or conduplicate, up to 10 cm. long. Scapes several, lateral, basal, 1-flowered, suberect to arcuate, about 30 cm. or less long; peduncle mostly concealed by several (up to 9) tubular sheaths which are smaller and imbricating below. Flower large, showy, the sepals greenish yellow closely striped with red-purple and the lip white radially striped on the sides with red-purple. Dorsal sepal oblong-lanceolate, subacute, concave, 4.6–7 cm. long, up to 1.2 cm. wide. Lateral sepals very obliquely triangular-lanceolate, attenuate above, acute, about as long as the dorsal sepal but much wider below, forming a conspicuous, conical

MAXILLARIA
spathulata
C. Schweinf.



FIG. 142. *Maxillaria spathulata* C. Schweinf. 1, plants; $\times \frac{5}{8}$. 2, flower from side; $\times 2$. 3, dorsal sepal; $\times 3$. 4, petal; $\times 3$. 5, lip, expanded; $\times 3$.

mentum about 2.5 cm. long at the base. Petals obliquely lanceolate, acuminate with a recurved, uncinat tip, much shorter and slightly narrower than the dorsal sepal. Lip erect, parallel to the column and strongly recurved in natural position, lightly 3-lobulate near the apex, cuneate toward the base, rhombic in outline and about 3.5-4 cm. long when forcibly expanded; lateral lobes erect, semiobovate, with an abbreviated, broadly rounded free portion; mid-lobe ovate-lanceolate, strongly recurved, subobtus, with subcrenulate and undulate margins; disc through the lower half with a linear-oblong, plurisulcate, apically rounded callus. Column short, stout, abruptly clavate at the apex, about 1.1 cm. long at the back, produced into a foot which is about twice as long.

Peru: Habitat unrecorded (introduced by Messrs. Linden of Brussels; type).—Puno: Prov. of Sandía, Santo Domingo area, 1550 meters, *McCarroll 122*.

Maxillaria Tafallae (Reichb. f.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 288. 1945. *Scaphyglottis Tafallae* Reichb. f. Linnaea 22: 855. 1849. *Ornithidium Tafallae* Reichb. f. Bonpl. 2: 18. 1854. *Ornithidium dichotomum* Schltr. Fedde Repert. Beih. 7: 178. 1920; Mansf. Fedde Repert. Beih. 57: t. 63, nr. 245. 1929.

Plant large, sprawling, caulescent, epiphytic. Stems slender, branching, bearing pseudobulbs at varying intervals (1-19 cm.), with divaricately spreading branches from the axils of the sheaths below the pseudobulbs, invested by close, short, tubular sheaths which are approximate or imbricating. Pseudobulbs strongly complanate, subglobose to ellipsoid or ovoid, unifoliate at the apex, up to 3.5 cm. long, concealed at the base by 1 or 2 pairs of distichous, imbricating, leaf-bearing sheaths. Leaves very variable, sessile or nearly so, oblong (broadly or narrowly) to elliptic-oblong, acute or short-acuminate at the oblique apex, slightly narrowed to a complicate base, chartaceous, 4-21 cm. long, up to 4.2 cm. wide (commonly much smaller). Inflorescences numerous, abbreviated, in the axils of sheaths near the pseudobulbs, 1-flowered. Flowers minute, campanulate, often with recurved segments, cream-color or greenish yellow frequently with green or rosy white. Dorsal sepal oblong or ovate-oblong, acute or obtuse, concave below, 5-6 mm. long, 2 mm. wide. Lateral sepals similar and about as large as the dorsal sepal, obliquely oblong, acute, forming a short, saccate mentum at the base. Petals oblanceolate-linear, acute or subacute, slightly shorter and much narrower than the dorsal sepal (about half as wide). Lip erect, with the basal portion tubular-involute and parallel to the column, and the anterior part abruptly reflexed in natural position, when expanded obovate-oblong or cuneate-oblong, sharply 3-lobed above the middle, about 7 mm. long and 3.5 mm. wide above; basal portion oblong-cuneate, terminating on each side in a rounded, free apex; mid-lobe subquadrate-ovate, deeply bilobed in front, constricted in the middle of each side (and thus subtrilobed), with the margins irregularly crenulate; disc with a transverse callus between the erect apices of the basal portion. Column short, stout, 3-4 mm. high, extended into a short foot.

Huánuco: Near Chicoplaya, *Ruiz s.n.* (type of *Scaphyglottis Tafallae*). Prov. of Huánuco, Tingo María, on gravelly bank, on Río Huallaga, *Asplund 12373*.—Junín: Río Pinedo, north of La Merced,

700–900 meters, in dense woods, *Killip & Smith 23650* (sterile). San Ramón, 900–1300 meters, in dry woods, *Killip & Smith 24762* (fruiting).—San Martín: Zepelacio, near Moyobamba, 1200–1600 meters, *Klug 3544*. Same locality, about 1100 meters, *Klug 3694*. Also Colombia (type of *Ornithidium dichotomum*) and Venezuela.

Maxillaria tenuis C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 289, t. 18. 1945. Figure 143.

Plant small, slender, epiphytic. Rhizome abbreviated. Pseudobulbs clustered, cylindrical, complanate and often oblique in the dried specimen, unifoliate at the apex, about 2.3 cm. or less long, surrounded and surpassed by relatively large, distichous, triangular, pustulose sheaths. Leaf petioled; lamina linear, sharply acute, cuneate at the base, coriaceous, about 14 cm. or less long, up to 8 mm. wide; petiole short, slender, deeply channelled, about 1.5 cm. or less long. Scapes lateral, basal, 1-flowered, very short; peduncle about 3.2 cm. high, entirely concealed by a few loose, tubular, imbricating sheaths. Flower large for the plant, white and yellow. Dorsal sepal linear-lanceolate, complicate-acute, apiculate, concave near the base, about 2.7 cm. long, nearly 4 mm. wide below. Lateral sepals very similar, lanceolate-linear, lightly oblique, acute, apiculate, forming a short, inconspicuous mentum. Petals obliquely linear-triangular, acuminate, somewhat shorter and narrower than the sepals. Lip relatively very short, erect, parallel to the column, lightly recurved and about 9.5 mm. long in natural position, sessile, sharply 3-lobed about two-thirds the distance from the base, elliptic-ovate in outline when expanded; lateral lobes erect, narrow, terminating in a short, ovate-rounded free portion; mid-lobe triangular-ovate, short-acuminate, very fleshy, about 4 mm. long; disc through the lower half with a median, longitudinal thickening which becomes a conspicuous, fleshy, sulcate callus above. Column very small, lightly arcuate, about 5.5 mm. high at the back, produced into a short foot.

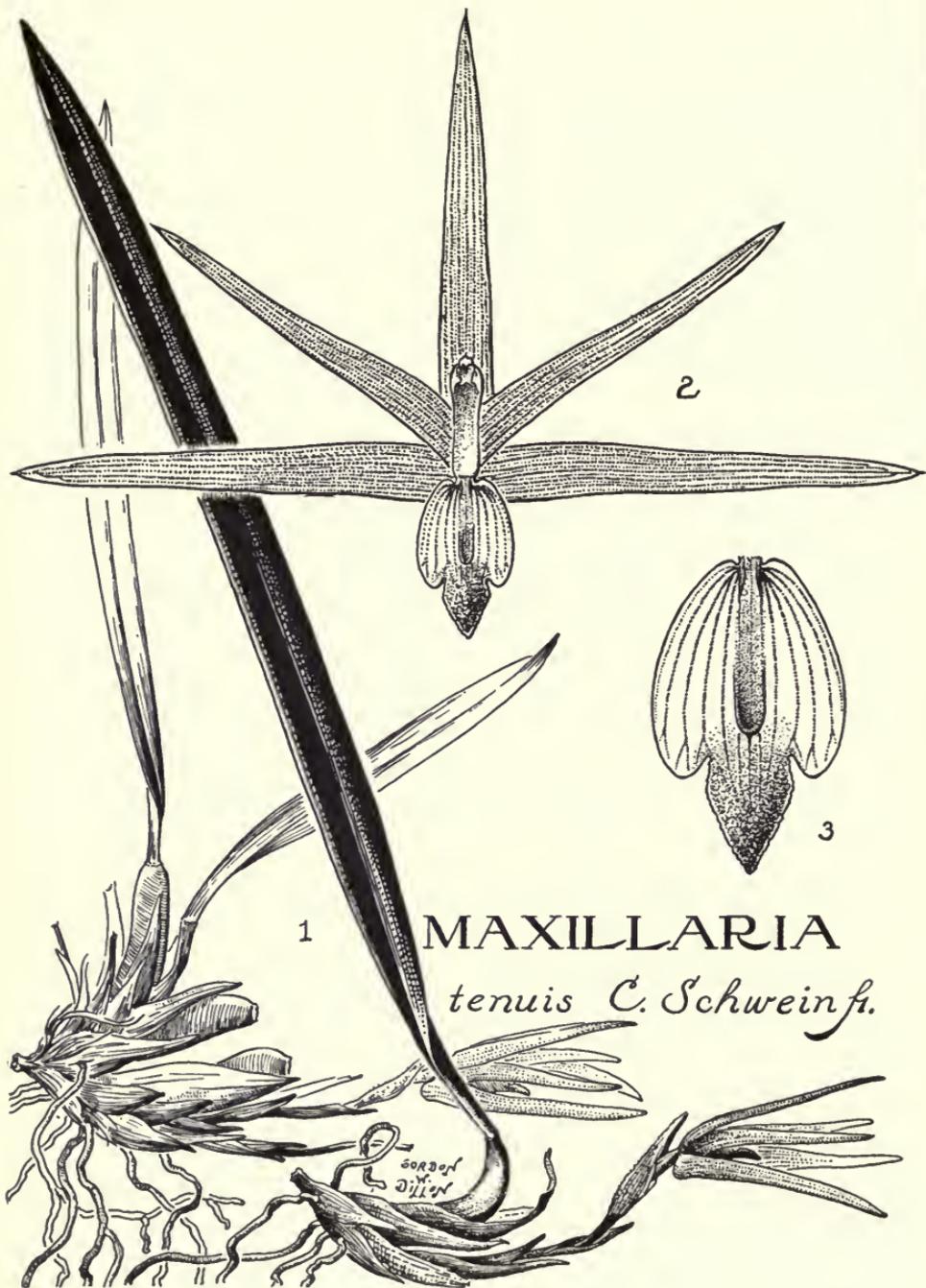
Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1045*.

Maxillaria tricolor Ruiz et Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 224. 1798. *Dendrobium tricolor* Pers. Syn. Pl. 2: 524. 1807.=obscure species, probably *Xylobium*.

Junín: Huassa-huassi, in steep, hot places on rocks, *Pavón s.n.*

Maxillaria trigona C. Schweinf. Am. Orch. Soc. Bull. 13: 266, t., 1945. Figure 144.

Plant epiphytic, rhizomatose, growing in the woods. Rhizome relatively stout, creeping, with widely separated sheaths which are short, broad and infundibuliform. Pseudobulbs remote, ovoid to slenderly pyriform, strongly complanate when dry, about 5.5 cm. distant on the rhizome, unifoliate at the apex, up to 2.1 cm. high, concealed in youth by distichous, imbricating sheaths. Leaf narrowly oblong, obtuse or subacute, cuneate-narrowed to a sessile, subconduplicate base, up to 11.9 cm. long, about 1.5 cm. wide, rigid and coriaceous. Inflorescences arising from the axils of sheaths on the rhizome, 1-flowered, short,



MAXILLARIA
tenuis C. Schweinf.

FIG. 143. *Maxillaria tenuis* C. Schweinf. 1, plant; $\times 1$. 2, flower, expanded; $\times 2$. 3, lip from above, expanded; $\times 4$.

MAXILLARIA

trigona C. Schweinf.



FIG. 144. *Maxillaria trigona* C. Schweinf. 1, plant; $\times 1$. 2, flower, natural position; $\times 3$. 3, dorsal sepal; $\times 2$. 4, petal; $\times 2$. 5, lateral sepal; $\times 2$. 6, lip from above; $\times 4$.

solitary, concealed by imbricating sheaths. Flower medium-sized but large for the plant, with spreading, fleshy segments, dark red with a yellow border or yellow-brown. Dorsal sepal oblong, sharply acute, navicular, dorsally carinate, 18–22.4 mm. long, about 6 mm. wide. Lateral sepals recurved in natural position, obliquely oblong-lanceolate, acute, ecarinate, slightly shorter than the dorsal sepal but equally wide. Petals obliquely linear, lightly decurved, acute, slightly narrower toward the base, somewhat shorter than the dorsal sepal and about half as wide. Lip in natural position erect, parallel to the column and recurved with the sides of the lower half erect, when expanded ovate-oblong, subtrilobed, about 14 mm. long and 7.6 mm. wide across the lateral lobules; lateral lobules erect, semielliptic, entire, with an irregularly dentate, rounded apex, almost half as long as the lip; mid-lobe broadly ovate, rounded to subacute in front, flat, sulcate in the center and bluntly carinate beneath; disc in the lower third with a median, sulcate callus or a pair of low, fleshy keels meeting in front. Column short, stout, flattened in front, clavate when viewed from the side, about 7.3 mm. long at the back, extended into a prominent foot. Ovary trigonous.

Cuzco: Prov. of Convención, Sahuayaco, 1500 meters, *Vargas 6283*. Prov. of Urubamba, Tuncapata (Santa Rita), 2800 meters, in woods, *Vargas 2651* (type).

Maxillaria triphylla Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 225. 1798. *Dendrobium triphyllum* Pers. Syn. Pl. 2: 524. 1807.= obscure species, probably *Xylobium*.

Junín: Prov. of Tarma, toward the villages of Vitoc and Collac, in open woods, especially near the banks of the Maraynioc River, *Pavón s.n.*

Maxillaria uncata Lindl. Bot. Reg. 23: sub t. 1986. 1837; Cogn. Martius Fl. Bras. 3, pt. 6: 66, t. 21, fig. 3. 1904. *Maxillaria Macleanii* Batem. ex Lindl. Bot. Reg. 26, Misc. 70, no. 155. 1840.

Plant small to medium-sized, growing on trees or rocks, caulescent. Stem stout, simple or more commonly branched, more or less elongate, commonly flexuous or arcuate, entirely concealed by close, distichous, densely imbricating sheaths. Pseudobulbs very small, subremote to approximate, axillary from sheaths of the stem, linear-cylindric or in age oblong-ellipsoid, ascending or appressed (often oblique in the dried specimen), up to 1 cm. long, unifoliate at the apex. Leaf small, very variable in length, thickly fleshy, linear, semiterete in cross section, deeply channelled, obtuse, commonly 2–5 cm. long and 3 mm. or less wide, rarely up to 8.2 cm. long, slightly narrowed at the base, usually arcuate in the dried specimen. Scapes very short, axillary, 1-flowered, solitary, the abbreviated sheathed peduncle concealed by the cauline sheaths. Pedicellate ovary slender, exserted, often much exceeding the subtending bract. Flower small, white or cream-color and white, commonly with purple stripes (rarely greenish or purplish). Dorsal sepal elliptic-lanceolate, acute to subobtuse, concave, up to 10 mm. long and 4 mm. wide. Lateral sepals considerably larger than the dorsal sepal, obliquely oblong-triangular, narrowed above with an acute tip,

forming at the base a conspicuous, elongate-conical mentum. Petals obliquely oblong-lanceolate, acute or obtuse, slightly shorter and narrower than the dorsal sepal. Lip erect, parallel to the column and lightly recurved in natural position, oblong-cuneate or narrowly obovate-oblong, commonly slightly constricted on each side above the middle, obtuse to rounded at the apex, up to 16 mm. long and 5 mm. wide; disc with a median thickening extending from the base and merging into a fleshy, sulcate callus beyond the middle. Column straight, with a pair of obliquely semiovate, more or less uncinete wings, up to 6 mm. long at the back, extended into a subequally long foot.

Loreto: Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1406*. Vicinity of Iquitos, 100 meters, *Klug 10029*. Upper Marañón River at the mouth of the Santiago River, 160 meters, *Tessmann 4145*. Also Central America (type of *M. Macleei*), British Guiana (type of *M. uncata*), Surinam, Venezuela and Brazil.

Maxillaria undatiflora Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 225. 1798. *Dendrobium undatiflorum* Pers. Syn. Pl. 2: 524. 1807.=obscure species, surely not *Maxillaria*.

Junín: Prov. of Tarma, near Vitoc, in open woods, *Tafalla s.n.*, fide Ruíz & Pav.

Maxillaria unicarinata C. Schweinf. Am. Orch. Soc. Bull. 13: 162, t., 1944. Figure 145.

Plant small, epiphytic, slender, with a long, creeping rhizome. Pseudobulbs numerous, appressed to the rhizome, more or less approximate, cylindrical, commonly slender, unifoliate at the apex, about 2 cm. or less long, when immature concealed (together with the rhizome) by a series of distichous, imbricating, triangular-ovate sheaths, at length naked. Leaf narrowly oblong to oblanceolate, subacute and minutely apiculate, gradually petiolate-narrowed to the conduplicate base, up to 9.2 cm. long and 1.1 cm. wide, coriaceous. Scapes short, lateral, basal, 1-flowered; peduncle 2-3 cm. long, entirely concealed by several distichous, loose, imbricating sheaths. Flower rather small, fleshy, pinkish brown or reddish, sometimes with a green lip, or light green with the lip purple at the apex; ovary trigonous, with a slender pedicel. Dorsal sepal linear-lanceolate, long-acuminate, navicular, up to 1.95 cm. long and 3.7 mm. wide below when expanded, prominently carinate with the keel produced into a mucro. Lateral sepals obliquely linear-lanceolate, complicate-acute and minutely apiculate, slightly shorter and wider than the dorsal sepal, forming an abbreviated mentum at the base, ecarinate. Petals obliquely linear, minutely apiculate at the rounded apex, considerably shorter and narrower than the sepals. Lip much shorter than the other segments, erect and parallel to the column in natural position, sessile, 7-7.5 mm. long, oval in outline and about 5.4 mm. wide when expanded, sharply 3-lobed near the apex; lateral lobes erect, semielliptic, with a short, rounded (sometimes acute), free apex, about 6 mm. long; mid-lobe small, very fleshy, strongly recurved, broadly ovate in outline, obtuse; disc with a pair of carinate lines which are confluent to form a sulcate callus above. Column short, very stout, clavate when viewed from the side, about 4.5 mm. long at the back, extended into a short foot.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 22538, 23152* (type), *23157*.

Maxillaria vandiformis (Schltr.) C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 291. 1945. *Camaridium vandiforme* Schltr. Beih. Bot. Centralbl. 42, Abt. 2: 137. 1925. *Marsupiaria vandiformis* Hoehne, Arquiv. Bot. Estad. S. Paulo, n.s. 2, pt. 4: 71. 1947.

Plant robust, medium-sized, without pseudobulbs, epiphytic, caespitose when well developed. Stems rather short, suberect to arcuate, sometimes with a few short branches near the base, about 22 cm. or less long, entirely enveloped by distichous, spreading leaf-sheaths which are evanescent in age. Leaves numerous, distichous, equitant, linear, abruptly acute or obtuse, apparently fleshy, commonly arcuate-recurved in the dried specimen, very variable in length, up to 18 cm. long and 8 mm. wide (laterally) but commonly much shorter and somewhat narrower. Inflorescences numerous, 1-flowered, very short, axillary, commonly solitary; peduncle erect, entirely concealed by several distichous, loose, densely imbricating sheaths; pedicellate ovary slender, much exserted, up to 2.8 cm. long. Flowers rather small, campanulate, cream-color or greenish and yellow, with a deep violet lip. Dorsal sepal oblong-lanceolate, complicate-acute to "sub-obtuse," concave, 1.4–1.7 cm. long, about 5.5 mm. wide. Lateral sepals obliquely oblong-lanceolate, acuminate with involute upper margins or acute, about equaling the dorsal sepal, forming a short mentum at the base. Petals elliptic-lanceolate, obtuse, acute or short-acuminate, slightly shorter than the sepals and much narrower. Lip erect and parallel to the column in natural position, recurved, with the lower sides erect, oblong-ovate in outline when expanded, lightly constricted or indistinctly 3-lobed above the middle, abruptly complicate-acute, 1.3–1.5 cm. long, up to 7.5 mm. wide when expanded; disc with an indistinct, median thickening extending from the base to above the middle. Column slender, arcuate, abruptly clavate near the apex, up to 1 cm. long at the back, produced into a short foot.

Amazonas: Near Napo, about 100 meters, *Tessmann 3737*.—Loreto: Lower Río Huallaga, Santa Rosa, 155–210 meters, in forest, *Williams 4908* (sterile). Vicinity of Iquitos, 100 meters, in dense forest, *Klug 10076*.—San Martín: Chazuta, Río Huallaga, about 260 meters, in forest, *Klug 4101*. Also Brazil (type of *Camaridium vandiforme*).

Maxillaria variegata Ruiz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 222. 1798. *Dendrobium variegatum* Pers. Syn. Pl. 2: 524. 1807.= *Xylobium* sp. probably.

Huánuco: Muña, in hot open woods, *Pavón s.n.*

Maxillaria verrucifera C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 292, t. 19. 1945. Figure 146.

Plant large, robust, epiphytic. Pseudobulb apparently ovoid or cylindrical-pyriform (mutilated in the specimen seen), unifoliate at the apex, about 5 cm.

MAXILLARIA

unicarinata C. Schweinf.

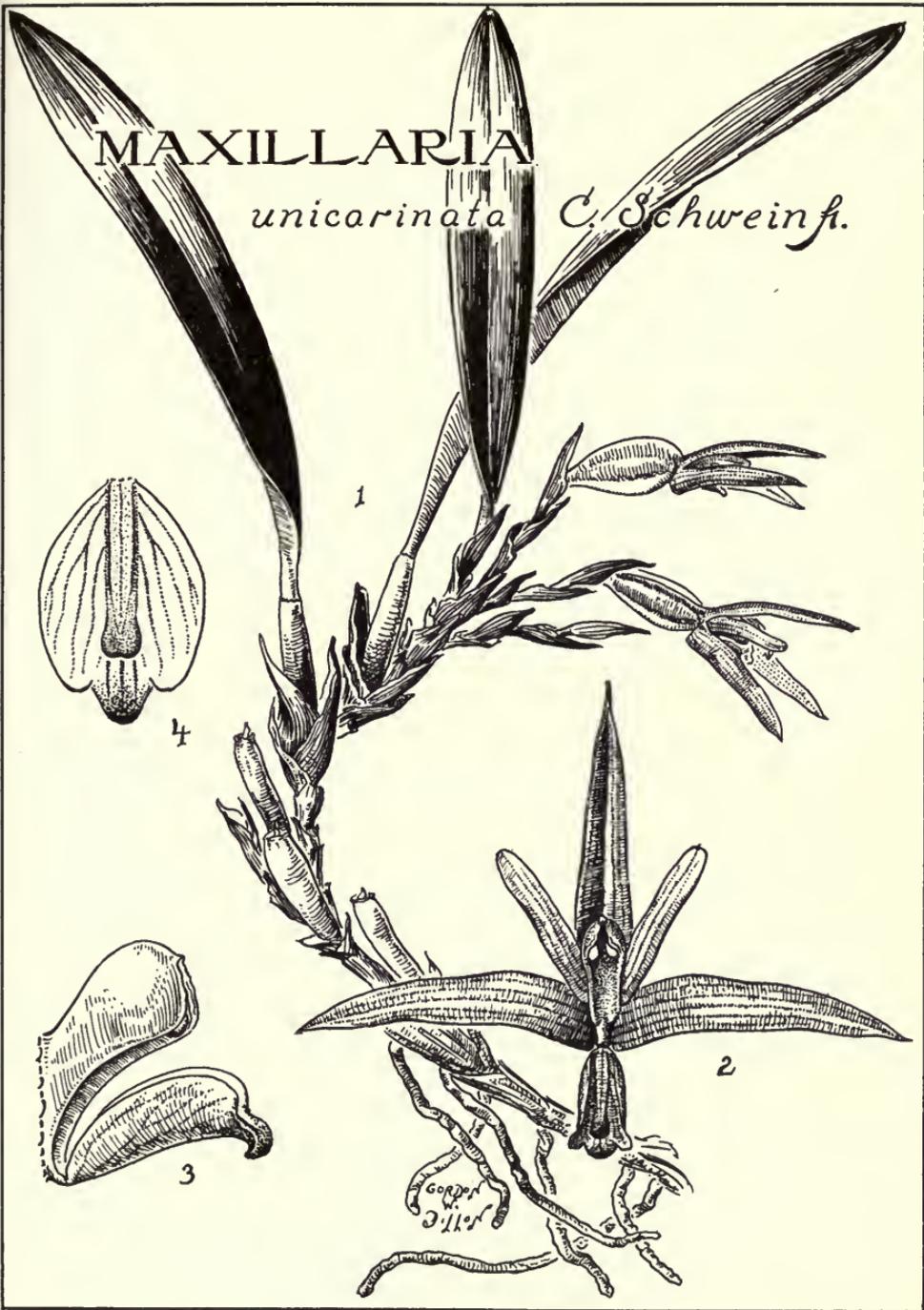


FIG. 145. *Maxillaria unicarinata* C. Schweinf. 1, plant; $\times 1$. 2, flower, expanded; $\times 2$. 3, lip and column from side, natural position; $\times 4$. 4, lip from above, expanded; $\times 4$.

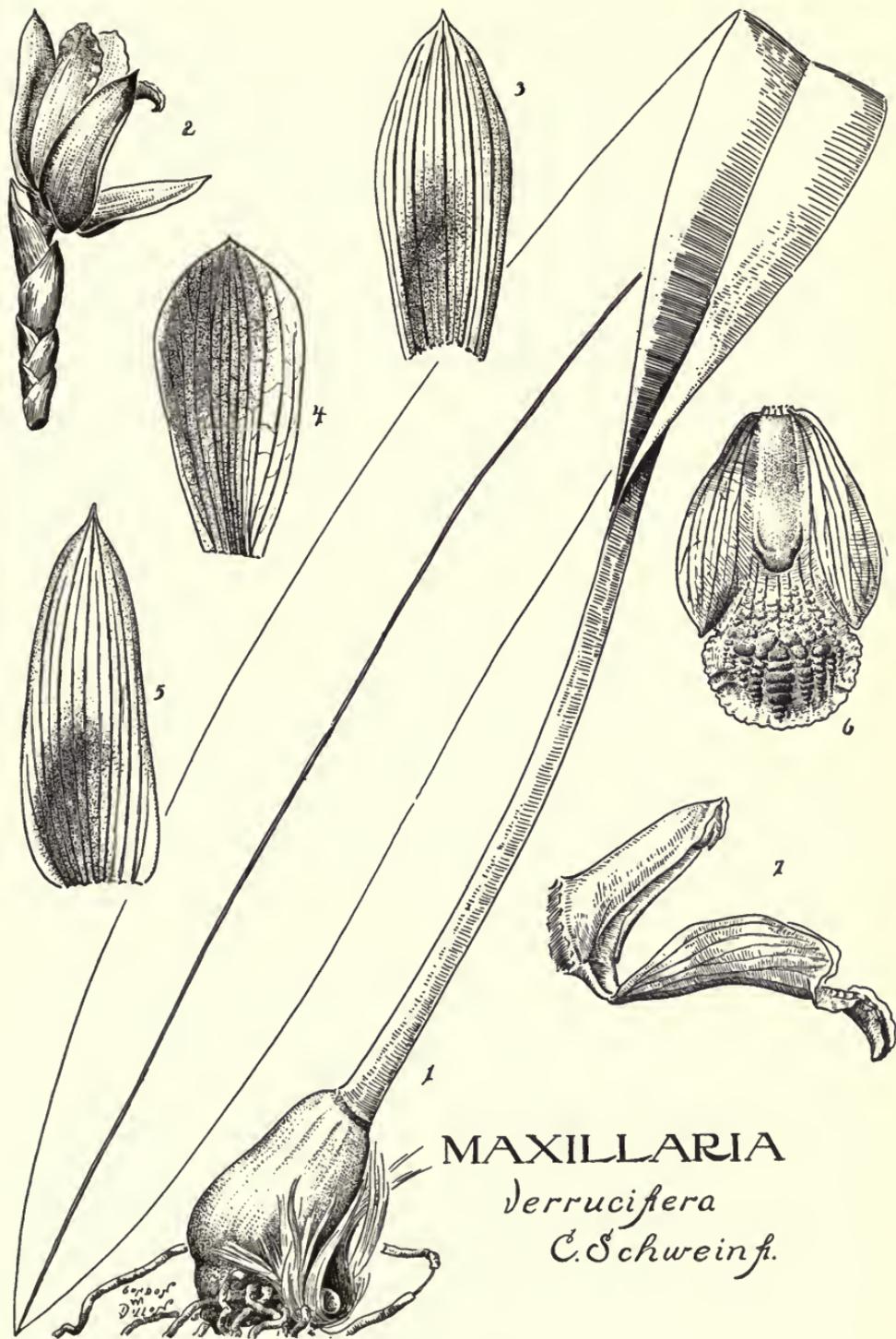
high, surrounded by the fibres of sheaths. Leaf large, petioled; lamina oblong or elliptic-oblong, acute or subacute, about 50.8 cm. long and 5.8 cm. wide, cuneate below, coriaceous; petiole elongate, stout, conduplicate or deeply channelled, about 17.3 cm. long. Inflorescence (separate in the type collection) very short, 1-flowered, the peduncle with pedicellate ovary about 2.9 cm. long, entirely invested by 6 broadly ovate, distichous, imbricating sheaths. Flower rather small for the plant, "brown-yellow and wine-red," with the lip apparently maculate. Sepals with revolute margins. Dorsal sepal ovate-oblong, abruptly complicate-acute, about 2.2 cm. long and 9 mm. wide when expanded. Lateral sepals similar, obliquely ovate-oblong, a little longer and wider than the dorsal sepal, forming an abbreviated mentum at the base. Petals concave, obovate-oblong, subacute, slightly shorter than the sepals but about as broad. Lip relatively large, erect, parallel to the column and recurved in natural position, sharply 3-lobed above the middle, when expanded oblong-elliptic in outline, about 1.9 cm. long and 1.2 cm. wide; lateral lobes erect, very narrow with an abbreviated, rounded, crenulate free apex; mid-lobe suborbicular from a very short claw, abruptly recurved above, with the margins undulate and crenulate-erose, fleshy and densely verrucose (except near the margin); disc through the lower portion with a median, linear-oblong thickening which terminates in a prominent rounded callus. Column rather straight, sulcate in front, about 1.1 cm. high at the back, produced into a very short foot.

Loreto: Vicinity of Iquitos, 100 meters, in dense forest, *Klug* 10047.

Maxillaria villosa (Barb. Rodr.) Cogn. Martius Fl. Bras. 3, pt. 6: 34, t. 12. 1904. *Dicrypta villosa* Barb. Rodr. Gen. et Sp. Orch. Nov. 1: 125. 1877.

Plant large, robust, with a stout, apparently abbreviated rhizome, commonly epiphytic. Pseudobulbs congested (sometimes a single one present in the specimen), ancipitous, complanate-cylindric to oblong-ovoid, up to 8 cm. long, unifoliate at the apex, surrounded on each side by several pairs of distichous, equitant, imbricating sheaths of which the upper ones are leaf-bearing. Leaves large, variable, petiolate; lamina broadly oblong to lorate, acute to broadly rounded with an obliquely bilobed apex, more or less gradually cuneate below, coriaceous, up to 44 cm. long and 5.2 cm. wide; petiole conduplicate, more or less robust, about 9 cm. or less long. Scapes relatively very short, 1 or 2, lateral, basal, 1-flowered, subequaling the pseudobulb; peduncle up to 8 cm. long, concealed by several tubular, loose, mostly imbricating sheaths. Flower small, fleshy, yellow or brown-yellow to orange, sometimes with a whitish lip, campanulate. Dorsal sepal oblong or ovate-oblong, acute, concave, 1.5-1.9 cm. long, up to 8 mm. wide when expanded. Lateral sepals similar, about equaling the dorsal sepal, obliquely oblong or ovate-oblong, forming an inconspicuous mentum at the base.

FIG. 146. *Maxillaria verrucifera* C. Schweinf. 1, plant; $\times \frac{1}{2}$. 2, flower on peduncle, from side, natural position; $\times 1$. 3, dorsal sepal, partially expanded; $\times 2$. 4, petal; $\times 2$. 5, lateral sepal, partially expanded; $\times 2$. 6, lip from above, expanded; $\times 2$. 7, column and lip from side, natural position; $\times 2$.



MAXILLARIA
verrucifera
 C. Schweinf.

Petals obliquely elliptic-lanceolate or oblanceolate, acute or obtuse, somewhat shorter and markedly narrower than the sepals. Lip erect, parallel to the column and lightly recurved in natural position, oblong-ovate or rhombic-ovate, obtuse to subacute, more or less lightly trilobed above the middle, with the sides of the lower portion erect, 1.3–1.55 cm. long, up to 8 mm. wide when expanded; disc with an indistinct, central, pubescent thickening which is commonly constricted in the middle. Column rather large, lightly arcuate, clavate, up to 1 cm. long at the back, extended into a short foot.

Huánuco: Tingo María, 670 meters, on trees, *Carpenter 108*.—Junín: Chanchamayo Valley, 1500 meters, *Schunke 1256*. East of Quimiri Bridge, near La Merced, 800–1300 meters, in dense forest, *Killip & Smith 23965*. Schunke Hacienda, above San Ramón, 1400–1700 meters, terrestrial in dense forest, *Killip & Smith 24527*.—Loreto: Middle Marañon River, at the mouth of the Apaga, 145 meters, *Tessmann 5008*. Vicinity of Iquitos, 100 meters, *Klug 10119*.—San Martín: Zepelacio, near Moyobamba, in forest, 1100–1200 meters, *Klug 3382*. Also British Guiana and Brazil (type of *Dicrypta villosa*).

Maxillaria violaceopunctata Reichb. f. Bonpl. 3: 216. 1855; Cogn. Martius Fl. Bras. 3, pt. 6: 14. 1904.

Plant large, stout, epiphytic, with a stout (probably short) rhizome. Pseudobulbs clustered (frequently a single one present in the specimen), large, more or less compressed, oblong-cylindric, 9–13 cm. high, unifoliate at the apex, surrounded below by several pairs of distichous, conduplicate, leaf-bearing sheaths. Leaves large, oblong or lorate, abruptly rounded to acute, with an unequally bilobed apex, gradually narrowed to a petioliform, conduplicate base, up to 69 cm. long and 5.2 cm. wide. Scapes several, lateral, basal, 1-flowered, shorter than or slightly surpassing the pseudobulb, invested by several loose, tubular, more or less imbricating sheaths; peduncle 7–10 cm. long. Flower medium-sized, fleshy, green, cream-color or cream-color and golden yellow with violet or lilac spots. Dorsal sepal oblong, complicate-acute, with revolute margins, about 2.7 cm. long and 9 mm. wide. Lateral sepals similar, oblong or elliptic-oblong, complicate-acute, slightly oblique, very little shorter and wider than the dorsal sepal. Petals obliquely linear-oblanceolate, subacute to acuminate, slightly shorter than the sepals and much narrower. Lip erect, parallel to the column and recurved in natural position, prominently 3-lobed above the middle, ovate in outline, about 2 cm. long and 1.2 cm. wide when expanded, acute or subacute, rounded at the base; lateral lobes erect, oblong-semiobovate, with the truncate free portion having an obtuse-angled outer termination; mid-lobe triangular-ovate; disc with a linear-oblong, median callus (extending to about the middle) more prominent at the rounded apex. Column rather large, arcuate, subclavate, concave-sulcate in front, about 1.5 cm. long at the back, produced into a very short foot.

Loreto: Vicinity of Iquitos, 100 meters, *Klug 10087, 10121*. Also British Guiana (type), Surinam and Brazil.

Maxillaria Weberbaueri Schltr. Fedde Repert. Beih. 9: 105. 1921; Mansf. Fedde Repert. Beih. 57: t. 126, nr. 494. 1929.

Plant small to medium-sized, 13–38 cm. high, epiphytic, with a creeping, more or less abbreviated rhizome. Pseudobulbs closely crowded (sometimes only one in a specimen), cylindric to narrowly ellipsoid, compressed, unifoliate at the apex, 2–4 cm. high, invested at the base by 1 or 2 pairs of distichous, imbricating sheaths which are triangular, concave, verrucose and about equaling the pseudobulb. Leaf petioled; lamina narrowly oblong or elliptic-oblong (“ligulate”), very variable in size, acute, cuneate below, chartaceous, 8–21 cm. long, 10–21 mm. wide; petiole very slender, channelled, up to 8 cm. long. Inflorescences solitary or few, lateral, basal, 1-flowered, relatively short, up to 9.5 cm. high including the pedicellate ovary; peduncle filiform, 4.5–6.7 cm. long, entirely concealed by several tubular, imbricating sheaths. Flower large for the plant, with little spreading segments which are variable in length, cream-color and orange with violet stripes, lip often whitish with an orange apical lobe. Dorsal sepal linear or lanceolate-linear, complicate-acute and apiculate, concave, 3.2–4 cm. long, about 4 mm. wide below. Lateral sepals obliquely linear-lanceolate, falcate-decurved, acute, forming a very short, rounded mentum at the base, about as long as the dorsal sepal but somewhat wider at the base. Petals very similar to the lateral sepals but a little smaller. Lip relatively very short, erect, gently recurved and 1.4–1.6 cm. long in natural position, elliptic-ovate (“oblong”) in outline, deeply 3-lobed in the middle, 5–6 mm. wide below the middle when expanded; lateral lobes erect, shallowly semielliptic with an abbreviated, ovate, apically rounded free portion; mid-lobe linear-triangular, subobtuse, very fleshy, thickened beneath in front, about 8 mm. long; disc with a median, linear thickening which merges into a distinct callus near the middle. Column small, stout, arcuate, subclavate, concave-sulcate in front, about 7.5 mm. long at the back, produced into a short, sulcate foot.

Loreto: Near La Calzada, not far from Moyobamba, 900–1000 meters, in woods, *Weberbauer 4584* (type). Pumayacu, between Balsapuerto and Moyobamba, 600–1200 meters, epiphyte in forest, *Klug 0.12*.

Maxillaria Woytkowskii C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 15: 166, t. 55. 1952. Figure 147.

Plant medium-sized, epiphytic, with an apparently abbreviated rhizome. Pseudobulb oblong-cylindric or oblong-ovoid, strongly ancipitous, unifoliate, about 2.5–3 cm. long, surrounded at the base by 2 pairs of imbricating, concave, non-leaf-bearing sheaths. Leaf distinctly petioled; lamina elliptic-oblong, acute, cuneate below, about 16.5 cm. long and 3.2 cm. wide; petiole rather slender, channelled, 2.7 cm. long. Inflorescences 1 or 2, erect or spreading, much shorter than the leaf; peduncle slender, about 7 cm. long, mostly concealed by 6 loose, convolute, scarious sheaths. Flower medium-sized for the genus, rigid-nervose. Dorsal sepal oblong, abruptly rounded above but with a dorsal, subapical mucro, about 2.1 cm. long and 8 mm. wide. Lateral sepals lanceolate-oblong, lightly oblique, obtuse, mucronate, a little longer and narrower than the dorsal sepal. Petals oblong-lanceolate or elliptic-lanceolate, acute, somewhat smaller than the sepals. Lip lightly recurved and tubular-involute in natural position, narrowly elliptic in

outline when expanded, lightly 3-lobed above the middle, about 1.6 cm. long and 7.6 mm. wide across the middle when expanded; lateral lobes rounded above, without a free apex; mid-lobe ovate-oblong, very fleshy, rounded at the apex, about 5.1 mm. long; disc with a median fleshy band which gradually forms a well-defined, ovate-oblong, fleshy callus. Column stout, arcuate, about 9.5 mm. long, produced into a stout foot about 7 mm. long.

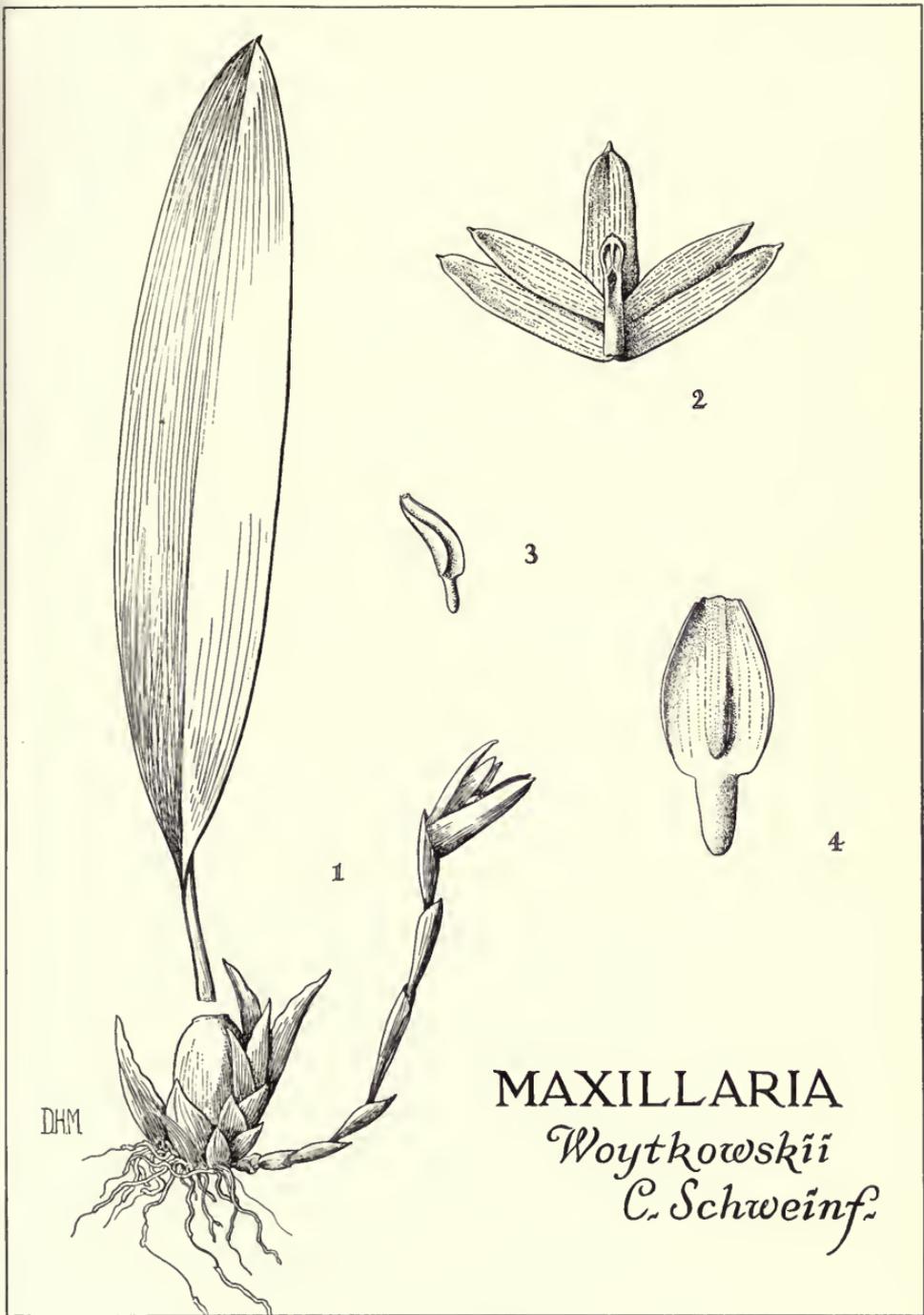
Junín: Prov. of Tarma, Vitoc, 1400 meters, flower white with a yellowish green hue, *Woytkowski 2*.

Maxillaria xantholeuca Schltr. var. **peruviana** C. Schweinf.
Bot. Mus. Leaf. Harvard Univ. 11: 293. 1945.

Plant small, growing on trees or rocks, vegetatively very variable. Rhizome long-creeping, simple or much branched, provided with numerous separated, spreading, shallow, infundibuliform sheaths which have an acute or triangular-acuminate apex. Pseudobulbs at widely varying intervals, from 0.5 (rarely) to 7 cm. distant, ovoid to pyriform-cylindric in the dried specimen, more or less complanate, unifoliate at the apex, up to 1.5 cm. high, at first surrounded at the base by a pair of distichous, triangular-ovate sheaths which are unequal, concave and disappear in age. Leaves elliptic-oblong to narrowly elliptic (rarely oblong), acute to subobtuse, narrowed below to a conduplicate base, apparently thickly coriaceous, up to 12.6 cm. long and 2.1 cm. wide (commonly much smaller). Scapes lateral, axillary from the sheaths of the stem or rhizome, 1-flowered, short; peduncle about 1.3–4 cm. long, concealed by several loose, imbricating, ancipitous, carinate sheaths. Flower rather small, with spreading segments, reddish brown with green tips, light green with a darker lip or salmon-red with a yellow lip. Dorsal sepal oblong or narrowly lanceolate-oblong, acute, apiculate, navicular, dorsally carinate toward the apex, about 1.6–2.2 cm. long and 5 mm. wide. Lateral sepals spreading, obliquely lanceolate, lightly falcate-decurved, sharply acute, apiculate, ecarinate, somewhat shorter and a little wider than the dorsal sepal. Petals obliquely linear, acute or subacute, markedly shorter than the dorsal sepal and about half as wide. Lip erect, parallel to the column, lightly recurved and about 1.3 cm. long in natural position, lightly 3-lobed near the middle, rounded at the apex; lateral lobes erect, semielliptic, with an abbreviated, round-ovate free apex; mid-lobe suborbicular to broadly ovate with crenulate-erose margins, often sharply paucidentate at the base, flat but sulcate in the middle with recurved sides; disc with a median, sulcate, more or less sharply tricarinate callus through the lower half. Column arcuate, clavate, concave-sulcate in front, 7.5–8.5 mm. long at the back, extended into a short foot. Ovary sharply trigonous.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 23155*.—Cuzco: Prov. of Calca, Lares Valley above Mantoc, 2600–2700 meters, on rocks, *Weberbauer 7912* (type). Also Venezuela.

Maxillaria xanthorhoda Schltr. Notizbl. Bot. Gart. Mus. Berl. 7: 279. 1918; Mansf. Fedde Repert. Beih. 58: t. 52, nr. 205. 1930; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 294. 1945.



MAXILLARIA
Woytkowskii
 C. Schweinf.

FIG. 147. *Maxillaria Woytkowskii* C. Schweinf. 1, plant; $\times \frac{5}{8}$. 2, flower without lip, expanded; $\times 1$. 3, lip, three quarters view; $\times 1$. 4, lip, expanded; $\times 2$.

Plant small, epiphytic. Rhizome elongate, arcuate-flexuous, rather stout, entirely concealed by closely imbricating sheaths which are ovate-triangular and acuminate. Pseudobulbs 5–6.5 cm. distant, cylindrical-ellipsoid to oval, compressed, bifoliate at the apex, about 2 cm. high, surrounded below by a pair of distichous, membranaceous, mucronate sheaths. Leaves elliptic-oblong (“ligulate”), broadly rounded at the apex, cuneate below with a conduplicate base in the dried specimen, about 3.4 (“3–4.5”) cm. long and 10 (“8–11”) mm. wide. Scapes short, lateral, 1-flowered, altogether concealed by 3 acute sheaths. Flower campanulate, rather fleshy, small, yellow with the lip red at the base. Dorsal sepal oblong-obovate (“obovate”), apiculate, about 1.2 cm. long and 7 mm. wide. Lateral sepals similar, oblique. Petals obliquely obovate-oblong, obtuse or broadly rounded at the apex, a little shorter than the sepals. Lip erect, parallel to the column and recurved in natural position, entire, obovate-oblong (“oblong”), broadly rounded and flat in front, minutely ciliolate except near the apex, 9 mm. long, 5.5 mm. wide above; disc through the lower half with a median, ligulate thickening which is callose near the apex and obtuse in front. Column semiterete, arcuate, about 6 mm. long, extended into a short foot.

“Peru(?)” (type), fide Schlechter, Fedde Repert. Beih. 9: 165. 1921.

The above diagnosis was based chiefly upon a photograph of the type in the Berlin Herbarium.

Maxillaria xylobiiflora Schltr. Fedde Repert. 27: 76. 1929; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 11: 295. 1945.

Plant small, epiphytic, caespitose, with an abbreviated rhizome, up to 18 cm. high, vegetatively variable. Pseudobulbs apparently aggregated, ellipsoid-cylindrical with an abrupt, linear, complanate beak, about 2 cm. or less high, surrounded by several pairs of distichous sheaths of which the uppermost ones are leaf-bearing. Leaves linear, acute, narrowed to a conduplicate, more or less petioled base, up to 17 cm. long (commonly much less) and 6 mm. wide. Inflorescences 1–2, lateral, in the axil of sheaths, 1-flowered, shorter than or subequalling the leaves in the course of development; peduncle filiform, mostly concealed by several (up to 6) narrow, tubular sheaths. Flower small but large for the plant, whitish, pinkish, brownish or yellow. Dorsal sepal linear-lanceolate, gradually narrowed to an acute point, concave below, about 1.6 cm. long, up to 4.4 mm. wide near the base. Lateral sepals obliquely and narrowly lanceolate or triangular-lanceolate, acuminate, about as long as the dorsal sepal and equally wide below, forming at the base a prominent, triangular mentum. Petals obliquely lanceolate-linear, acute or acuminate, similar to the lateral sepals, shorter and narrower than the dorsal sepal. Lip erect, parallel to the column and recurved in natural position, 3-lobed near the apex, about 1 cm. long, oblong, elliptic-oblong or obovate-oblong (in outline), up to 5.5 mm. wide above the middle when expanded; lateral lobes erect, narrow, terminating in a rounded to subtruncate, crenulate free portion; mid-lobe oblong-ovate to suborbicular, more or less acute, fleshy, crenulate-undulate on the margins; disc with a linear, median thickening (becoming callose above) extending from the base to above the middle. Column short, arcuate, clavate, about 4 mm. long at the back, extended below into a longer foot.

Ayacucho: Aina, between Huanta and Río Apurímac, 750–1000 meters, in open woods, *Killip & Smith 22596, 22611, 23163*.—Cuzco: Prov. of Paucartambo, Sta. Isabel to Asunción, 1800 meters, epiphyte, *Vargas 5535*.—Junín: Prov. of Tarma, Agua Dulce, 2000 meters, on tree in low highland forest, *Woytkowski 35486*. Utcuyacu, 1900 meters, on tree in low forest, *Woytkowski 35354*. Also Bolivia (type).

PITYPHYLLUM Schltr.

A very small genus of insignificant orchids at present limited to Colombia and Peru.

Plants epiphytic, small, branching. Rhizome stem-like, branching, concealed by distichous, imbricating sheaths and bearing more or less distant pseudobulbs. Pseudobulbs ovoid to cylindrical, bearing 2 to several (up to 20) leaves, crowned with a more or less conspicuous, scarious, scaly sheath. Leaves filiform, pine-like, acute, channelled, glabrous. Inflorescences very short, basal or in the axil of sheaths, 1-flowered. Flowers very small, almost minute. Sepals subparallel, free, oblong-lanceolate or linear-lanceolate ("ligulate"), acute or subacute; the lateral ones lightly oblique. Petals similar to the sepals but rather smaller. Lip erect in natural position, sessile, "oblong" to elliptic in outline, simple or 3-lobulate. Column much shorter than the lip, footless. Anther cucullate; pollinia 4, obliquely obovoid, subequal.

Pityphyllum laricinum (Kränzl.) Schltr. Fedde Repert. Beih. 7: 163. 1920; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 11: 200. 1944. *Maxillaria laricina* Kränzl. Engler Bot. Jahrb. 54, Beibl. 117: 30. 1916.

Plant small, copiously branching. Primary stem or rhizome slender, enveloped by close, distichous, imbricating sheaths, bearing pseudobulbs at commonly remote intervals. Pseudobulbs cylindrical to pyriform, oblique and deeply plurisulcate in the dried specimen, commonly 2-leaved at the apex which is crowned by a short scaly outgrowth, about 1 cm. or less long. Leaves borne both on the pseudobulbs and often singly at the apex of the cauline sheaths, filiform, channelled, subacute, about 1.5 cm. or less long, arcuate in the dried specimen. Scapes abbreviated, 1-flowered, basal or in the axil of sheaths, the short peduncle and ovary concealed by scarious, imbricating sheaths. Flower very small, pale yellow, with subparallel segments. Dorsal sepal lanceolate, acute or acuminate, nervose, about 3.7 mm. long and 1 mm. wide. Lateral sepals similar but slightly wider, lightly oblique. Petals thinner in texture, linear, acute, about 3 mm. long, 1-nerved. Lip slightly shorter than the petals, erect, tubular-involute and arcuate-recurved in natural position, ovate-elliptic in outline when flattened, lightly indented on each side above the middle (and thus trilobulate), subacute, the basal portion obovate with a broad, concave base, and the anterior part smaller and triangular-ovate; disc mostly smooth, with a pair of short, arcuate folds near the constriction. Column very short, stout, clavate, about 1.75 mm. long including the cap-like, incumbent, deeply cucullate anther.

Cajamarca: Prov. of Jaën, on the eastern slope of the Cordillera from Tabaconas, 2400 meters, in sclerophyllous vegetation consisting of shrubs and occasional small trees, *Weberbauer 6299* (type of *Maxillaria laricina*).—Junín, fide Schlechter, Fedde Repert. Beih. 9: 161. 1921.

MORMOLYCA Fenzl¹

A very small group of tropical American orchids, at the present writing limited to three species, one widely spread from Mexico to Costa Rica, and the others in South America (Peru and Brazil).

Plants medium-sized to large, epiphytic, commonly with a creeping rhizome, but apparently caespitose with an abbreviated rhizome in the Peruvian species. Pseudobulbs subglobose to subquadrate-ovoid or cylindric-ellipsoid, unifoliate at the apex. Leaf relatively large, elliptic-oblong to lorate, acute or subacute, cuneate-narrowed to a sessile or shortly petioled and conduplicate base, coriaceous. Scapes lateral, basal, 1-flowered, 1 to several, commonly elongate, with 2 or more remote, tubular sheaths. Flower rather small, long-pedicelled. Sepals similar, free, spreading, the lateral ones lightly oblique. Petals narrower and shorter than the sepals. Lip erect, subparallel to the column and more or less recurved in natural position, 3-lobed; lateral lobes erect, relatively small, more or less dentiform or lanceolate; mid-lobe much larger, ovate to subquadrate; disc with a prominent callus. Column arcuate, semiterete, wingless, without a foot. Anther terminal, opercular, incumbent, strongly convex; pollinia 4, ovoid.

Mormolyca peruviana C. Schweinf. Am. Orch. Soc. Bull. 13: 196, t., 1944. Figure 148.

Plant medium-sized, about 16 cm. high, apparently caespitose. Pseudobulb subquadrate-ellipsoid, strongly complanate in the dried specimen, unifoliate at the apex, about 2 cm. long. Leaf oblong or narrowly oblong, abruptly subacute and apiculate, sessile, coriaceous, about 14 cm. or less long, up to 1.2 cm. wide. Scapes numerous, lateral, basal, slender, 1-flowered, elongate but shorter than the mature leaf, 8–12 cm. long, with 2 remote, close, tubular sheaths. Flower large for the genus, the sepals and petals having revolute sides. Dorsal sepal lanceolate-oblong, abruptly complicate-acute and mucronate, about 2.1 cm. long and 5 mm. wide. Lateral sepals similar, oblique, slightly larger than the dorsal sepal. Petals linear-oblong, abruptly acute or apiculate at the rounded apex, a little shorter and narrower than the dorsal sepal. Lip erect and parallel to the column, with the anterior portion abruptly recurved in natural position, sharply 3-lobed below the middle, cuneate toward the base, about 1.5 cm. long and subquadrate-ovate in outline when expanded; lateral lobes erect, obliquely lanceolate-triangular, porrect, acute or acuminate; mid-lobe much larger, subquadrate, rounded-subtruncate and lightly retuse in front, about 9.5 mm. long and 6.5 mm. wide; disc with a broadly ovate, concave,

¹ Owing to the recent discovery of a species intermediate between *Mormolyca* and the following genus, *Cyrtoglottis*, these two genera have been combined under the earlier concept, *Mormolyca* (cf. L. A. Garay & M. Wirth, Canadian Journ. Bot. 37: 479. 1959).

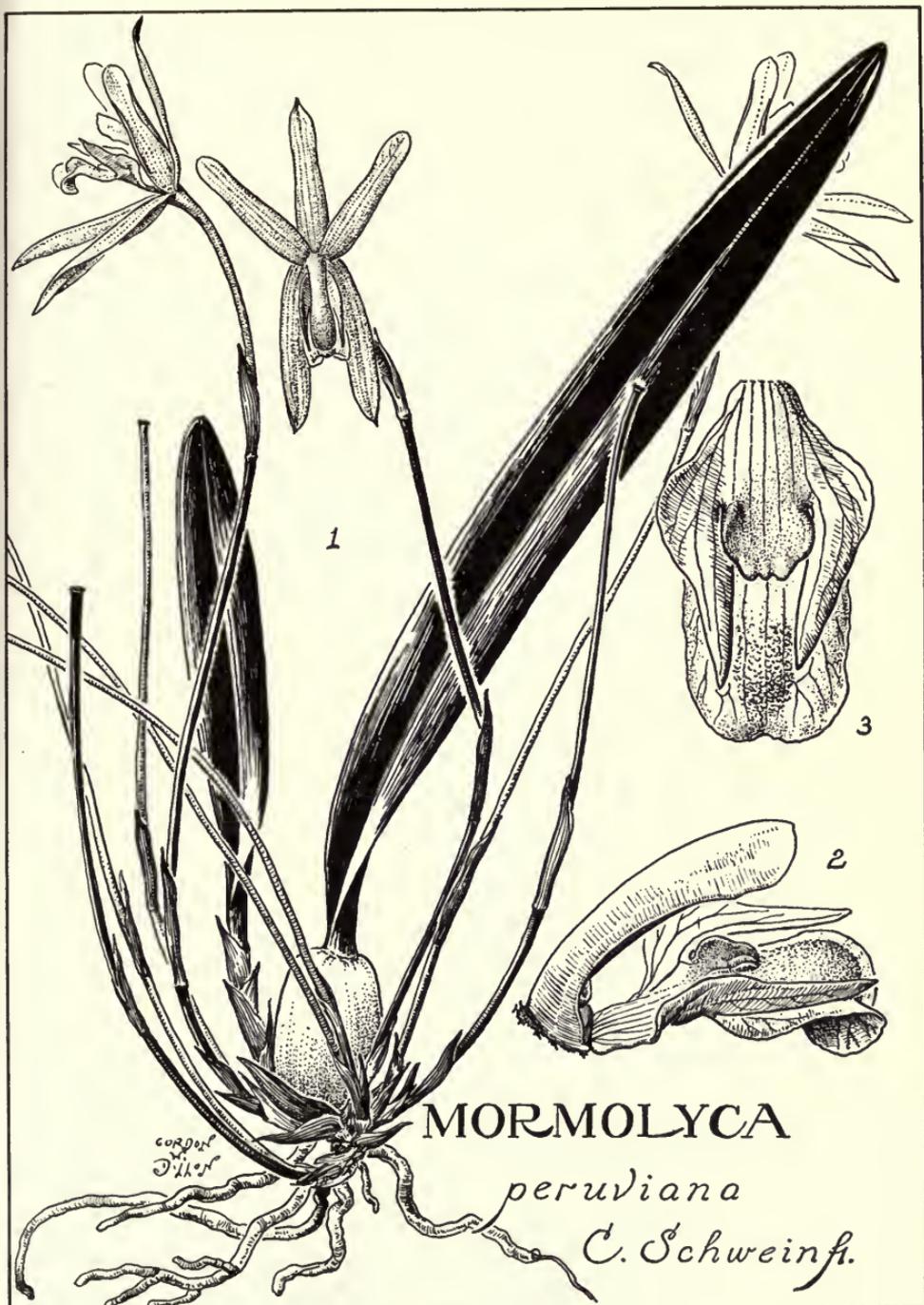


FIG. 148. *Mormolyca peruviana* C. Schweinf. 1, plant; $\times 1$. 2, column and lip from side; $\times 3$. 3, lip from above; $\times 3$.

3-lobulate callus, of which the middle lobule is 3-dentate. Column arcuate, slightly dilated upward, footless, concave in front, about 1.3 cm. long at the back.

Junín: Chanchamayo Valley, 1800 meters, *Schunke 564*.

CYRTOGLOTTIS Schltr.

A small genus of American epiphytic orchids, at present confined to Colombia, Ecuador and Peru.

Plants medium-sized, with an abbreviated or long-creeping rhizome. Pseudobulbs approximate (often only one showing in the specimen), oblong-cylindric to oblong-ovoid, strongly compressed, unifoliate at the apex. Leaf oblong-elliptic to "ligulate," sessile or with a short conduplicate petiole, acute, cuneate below. Scapes 1 to several, lateral, basal, 1-flowered, subequaling or more commonly surpassing the leaf, very slender, with several distant, close, tubular sheaths. Flower relatively large, with spreading segments. Dorsal sepal ovate, concave, acuminate or long-acuminate. Lateral sepals obliquely lanceolate or ovate-lanceolate, long-acuminate. Petals obliquely linear or lanceolate-linear, acute, much shorter than the dorsal sepal. Lip relatively short, simple or 3-lobulate, strongly convex or reduplicate, ovate, obovate or rhombic-obovate, acuminate or abruptly acute. Column very short, slender or stout, more or less clavate, footless. Anther cupuliform; pollinia 4, 2 large and 2 small.

- A1. Lip simple or subsimple, broadly obovate or rhombic-obovate, abruptly acute *C. gracilipes*
 A2. Lip 3-lobed, ovate, acuminate *C. peruviana*

Cyrtoglottis gracilipes Schltr. Fedde Repert. Beih. 7: 182. 1920; Mansf. Fedde Repert. Beih. 57: t. 65, nr. 250. 1929. Figure 149.

Plant up to 28 cm. tall, epiphytic. Rhizome apparently abbreviated. Pseudobulbs solitary or approximate, cylindric to oblong-ovoid, strongly complanate, unifoliate at the apex, 1.5–3.5 cm. high. Leaf elliptic-oblong ("ligulate"), acute, cuneate below with a sessile, complicate base, chartaceous, 5.5 to over 11 cm. long, 1.3–2.8 cm. wide. Scapes 2 or more, lateral, basal, 1-flowered, commonly more or less surpassing the leaf; peduncle about 23 cm. or less long, with 4 or 5 appressed, tubular, mostly distant sheaths. Flower large for the plant, orange-yellow or salmon-pink. Dorsal sepal lanceolate-ovate, long-acuminate with the upper margins involute, concave, 2.3–3.4 cm. long, up to 1.3 cm. wide. Lateral sepals lanceolate or ovate-lanceolate, oblique, long-acuminate with the upper margins involute, somewhat longer and narrower than the dorsal sepal. Petals much shorter than the dorsal sepal, obliquely linear or lanceolate-linear, sharply acute. Lip short, strongly convex or reduplicate in natural position, broadly obovate or rhombic-obovate when expanded, often with an indistinct indentation on each side above the middle, abruptly acute, about 9.2 mm. long, 6–7.4 mm. wide, with the central part thickened throughout. Column small, slender, arcuate, clavate, footless, up to 8.2 mm. high at the back.

Cuzco: Prov. of Convención, alturas de Pintobamba, 2700 meters, *Vargas 3257a*. Prov. of Quispicanchis, Hda. Ttío, Marcapata, 2000

meters, in open rocky places, *Vargas 3125*.—Junín: Chanchamayo Valley, 1500 meters, *Schunke 1119*. Same locality, 1600 meters, *Schunke 1734*. Schunke Hacienda, above San Ramón, 1400–1700 meters, in dense forest, “3 perianth segments and column salmon pink; lip purple-dotted,” *Killip & Smith 24883*. Also Colombia (type).

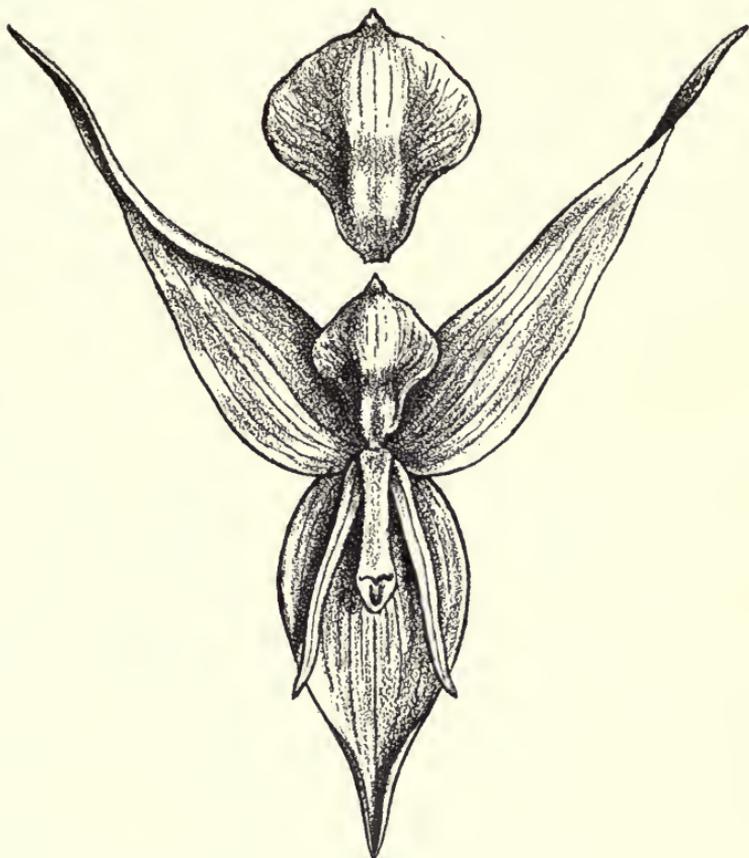


FIG. 149. *Cyrtoglottis gracilipes* Schltr. Flower, front view; $\times 2$. Lip, expanded; $\times 3$.

Cyrtoglottis peruviana C. Schweinf. *Am. Orch. Soc. Bull.* 14: 152, t., 1945. Figure 150.

Plant epiphytic, medium-sized. Rhizome creeping, more or less elongate. Pseudobulbs approximate or subapproximate, strongly ascending, cylindrical to oblong-ellipsoid, strongly compressed, unifoliate at the apex, 2.5–5.7 cm. long. Leaf sessile to short-petioled in the dried specimen; lamina elliptic to elliptic-oblong, acute and often apiculate, cuneate below, 6.5–9.8 cm. long, 1.5–2.8 cm. wide; petiole more or less distinct, conduplicate, up to 1.4 cm. long. Scapes lateral, 1 or 2 in the axil of sheaths surrounding each pseudobulb, 1-flowered, elongate, slender, more or less exceeding the erect leaf, about 23 cm. or less long, with 2 or

3 remote, close, tubular sheaths above. Flower rather large, with spreading segments, reddish purple with a green column, pinkish with green at the apex, a green purple-spotted lip and purple column or flesh-red with darker lines, dark red lip and reddish yellow petals. Dorsal sepal ovate, acuminate, mucronate, concave, 2.1–2.6 cm. long, about 1.1 cm. wide. Lateral sepals similarly large, obliquely ovate-lanceolate, long-acuminate. Petals about half as long as the sepals, obliquely linear, acute. Lip very short, spreading, strongly convex with an abruptly reflexed apex in natural position, when expanded ovate in outline, 3-lobed below the middle, acuminate, 9.1–10 mm. long, 5–6 mm. wide across the lateral lobes; lateral lobes very small, triangular-dentiform, wide-spreading; mid-lobe much larger, ovate, about 6.8 mm. long. Column short, stout, footless, more or less clavate when viewed from the side, about 8 mm. high at the back.

Ayacucho: Aina, between Huanta and Río Apurimac, 750–1000 meters, in open woods, *Killip & Smith 22595*. Carrapa, between Huanta and Río Apurimac, about 1500 meters, in densely forested valley, *Killip & Smith 23218* (type).—Junín: Prov. of Tarma, Agua Dulce, 2000 meters, on a tree in open highland forest, *Woytkowski 35439*.

TRIGONIDIUM Lindl.

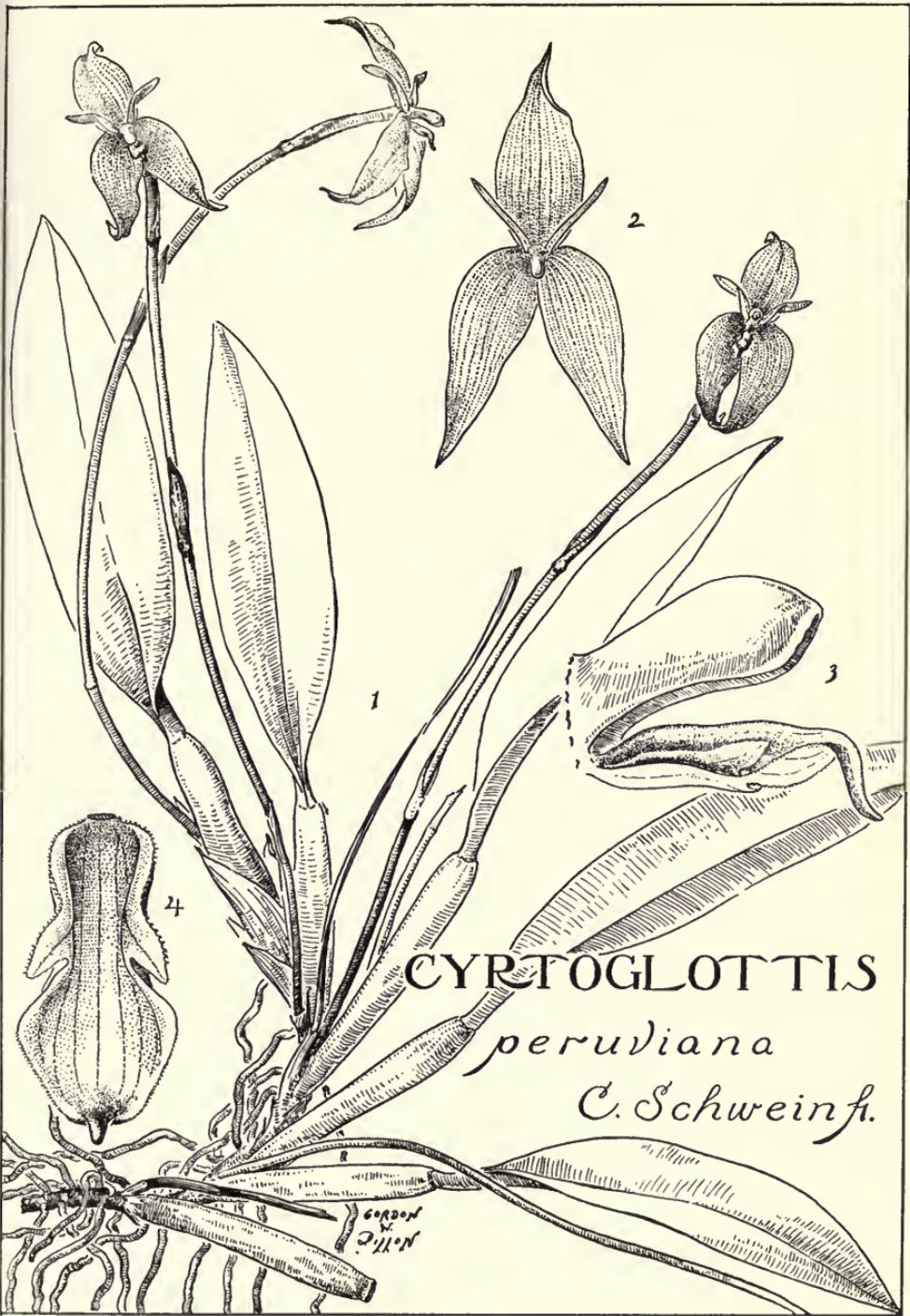
A small genus of tropical American, epiphytic orchids extending from Mexico through Central America to Brazil and Peru.

Rhizome short or elongate. Stems thickened into a cylindrical-oblong, ovoid or oval, flattened pseudobulb, bearing 1 or 2 leaves. Leaves linear to oblong or oblanceolate, duplicative. Scapes lateral, basal, 1-flowered, several-sheathed. Sepals subequal, the lateral ones oblique, connivent into a tube through the lower part, the upper portion spreading or reflexed. Petals much smaller than the sepals, commonly fleshy-thickened near the apex. Lip shorter than the petals, 3-lobed, erect; lateral lobes erect and incurved; mid-lobe spreading or recurved; disc with a median, callose thickening in the middle or through the lower part. Column commonly shorter than the expanded lip, semiterete, wingless, footless. Anther terminal, opercular, incumbent, 1-celled; pollinia 4.

- A1. Leaves 2, oblong or oblanceolate-oblong, about 3.5 cm. wide; sepals 3.3 cm. long; petals oblanceolate-spatulate. *T. loretoense*
 A2. Leaves 1, linear, 1 cm. or less wide; sepals about 2.2 cm. long; petals not spatulate. *T. tenue* (*T. peruvianum*)

Trigonidium loretoense Schltr. Fedde Repert. Beih. 9: 106. 1921; Mansf. Fedde Repert. Beih. 57: t. 127, nr. 496. 1929.

Plant rather large, about 25 cm. high, with a short rhizome. Pseudobulbs complanate-oval, bifoliate at the apex, about 6 cm. high. Leaves erect-spreading, oblong or oblanceolate-oblong, shortly acuminate, gradually petiolate-narrowed below, up to 19.5 cm. long, about 3.5 cm. wide. Scapes springing from the base of the pseudobulb, erect, 1-flowered; peduncle about 10–12 cm. long, almost wholly concealed by 4 or 5 clasping sheaths. Flower erect, relatively large. Dorsal sepal elliptic, acute or acuminate, cuneate below, 3.3 cm. long, about 1.1 cm. wide,



CYRTOGLOTTIS
peruviana
 C. Schweinf.

FIG. 150. *Cyrtoglottis peruviana* C. Schweinf. 1, plant; $\times \frac{2}{3}$. 2, flower, with lip removed; $\times 1$. 3, column and lip from side; $\times 4$. 4, lip, under surface; $\times 5$.

recurved through the upper half. Lateral sepals similar, obliquely lanceolate-elliptic, slightly broader than the dorsal sepal, similarly recurved above. Petals much smaller than the sepals, erect, obliquely oblanceolate-spatulate, subobtuse, about 1.8 cm. long. Lip erect, oblong in outline, 3-lobed at the anterior third, recurved above, when expanded about 1 cm. long and 5 mm. wide; lateral lobes erect-incurved, with an abbreviated, rounded free portion; mid-lobe decurved, quadrate-rounded, broadly obtuse, lightly thickened; disc with a median, linear-ligulate callus (which is apically round-dilated) extending from the base nearly to the mid-lobe. Column erect, semiterete, about 7 mm. long.

Loreto: Near Moyobamba, *Filomeno s.n.*

This species may prove to be referable to *T. obtusum* Lindl., which appears to have smaller pseudobulbs, narrower leaves and somewhat different floral segments, but no example was available for comparison.

Trigonidium tenue Lodd. ex Lindl. Bot. Reg. 25, Misc. 44, no. 59. 1839; Cogn. Martius Fl. Bras. 3, pt. 6: 102. 1904. *Trigonidium peruvianum* Schltr. Fedde Repert. Beih. 9: 107. 1921; Mansf. Fedde Repert. Beih. 57: t. 127, nr. 497. 1929.

Plant about 30 cm. or less high, with a creeping, closely sheathed, more or less branching rhizome. Pseudobulbs short, cylindrical to ovoid or ellipsoid, strongly complanate, 4 cm. or less distant, unifoliate at the apex, 1.7-3 cm. tall. Leaves linear, erect, acute, slightly narrowed toward the conduplicate base, up to 27 cm. long, 5-10 mm. wide. Scapes lateral, basal, more or less shorter than the leaf, up to 14 cm. long including the ovary, entirely or mostly concealed by several to numerous, close, tubular sheaths. Flower solitary, relatively small, cream-color to dull yellow or brown-yellow, often with violet stripes, or sometimes gray or purplish-brown. Sepals tubular-connivent below, abruptly recurved above. Dorsal sepal oblanceolate or rhombic-oblanceolate, long-acuminate, about 2.2 (rarely 2.85) cm. or less long, 4-8 mm. wide. Lateral sepals very obliquely ovate ("oblong"), more or less abruptly long-acuminate, subequally long with the dorsal sepal but markedly broader. Petals about half as long as the sepals, obliquely lanceolate-elliptic to oblong ("ligulate"), abruptly acute to subobtuse, more or less thickened near the apex. Lip erect, 3-lobed above the middle, elliptic-oblong in outline, about 6.8 mm. or less long; lateral lobes erect, narrow, with an abbreviated, subacute to rounded free apex; mid-lobe recurved, round-ovate or elliptic-ovate, broadly obtuse; disc through the lower half with a median, linear-clavate callus which is represented below by 3 more or less distinct, callose lines. Column short, semiterete in section, lightly arcuate, 3-4 (rarely 5) mm. long at the back.

Junín: La Merced, Chanchamayo Valley, 1000 meters, *Weberbauer 1942* (type of *T. peruvianum* Schltr.). Same locality, 1800 meters, *Schunke s.n.* (Herb. Chicago Mus. 571638) (slender plant with a large flower).—Loreto: Vicinity of Iquitos, 100 meters, *Klug 10130*. Mishuyacu, near Iquitos, 100 meters, in forest, *Klug 1408*.—San Martín: Chazuta, Río Huallaga, about 260 meters, on rock in forest, *Klug 4086*. Also British Guiana (type of *T. tenue*), Surinam, Brazil and Venezuela.

CRYPTOCENTRUM Benth.

A small genus of inconspicuous, tropical American epiphytes, ranging from Costa Rica and Panama to Colombia, Ecuador, and Peru.

Plants very small to medium-sized, with an abbreviated rhizome. Stems short or very short, entirely concealed by distichous, imbricating, leaf-bearing sheaths, rarely with bifoliate pseudobulbs. Leaves linear to subterete, often arcuate in the dried specimen. Inflorescences lateral, basal or axillary, 1-flowered, spreading, adorned with several narrow, tubular sheaths. Sepals connate at the base, similar or the lateral ones longer, the latter produced into a long slender tube or spur. Petals somewhat similar to the sepals but more or less shorter in natural position. Lip produced at the base into a long, cylindrical, more or less slender spur enclosed within the sepaline spur; lamina ovate-lanceolate. Column very short, straight, footless, often wing-dilated and concave above. Anther terminal, opercular, incumbent, semiglobose, 1-celled; pollinia 2.

- A1. Plant relatively large, about 20 cm. tall; flowers large, dorsal sepal (free part) about 15.5 mm. long. *C. inaequisepalum*
 A2. Plant relatively small to very small, 5 cm. or less tall; flowers small, dorsal sepal (free part) about 7.7 mm. or less long. I
 Ia. Pseudobulbs present, bifoliate. *C. pseudobulbosum*
 Ib. Pseudobulbs absent. 1
 1a. Sepals obtuse, dorsal sepal about 6 mm. long; petals obtuse. *C. minus*
 1b. Sepals acute or acuminate, dorsal sepal 4.5 mm. or less long; petals acute or acuminate. *C. peruvianum* (*Centroglossa peruviana*)

Cryptocentrum inaequisepalum C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 12: 186, t. 30. 1946. Figure 151.

Plant slender, rather tall for the genus, about 20 cm. high. Stem short, about 3.3 cm. high, entirely concealed by numerous, distichous, imbricating leaf-sheaths. Leaves narrowly linear, arcuate in the dried specimen, abruptly obtuse, conduplicate below, about 20 cm. or less long and 3.2 mm. or less wide. Inflorescences lateral, basal, numerous, spreading, 1-flowered; peduncle filiform, up to 8.3 cm. long, provided with several close, tubular sheaths which are elongate and separated in the upper part. Flower rather large, yellow-green, translucent, with spreading segments. Sepals connate into a tube at the base (as in the genus). Dorsal sepal linear-lanceolate, complicate-acute or subacuminate, free part about 15.5 mm. long and 3.7 mm. wide, 5-nerved. Lateral sepals considerably longer, obliquely lanceolate-linear, complicate-acute, 5-nerved, 19 mm. long, slightly narrower than the dorsal sepal, produced below into an elongate spur. Petals much shorter than the sepals, obliquely linear-lanceolate, long-acuminate, 3-nerved. Lip produced below into an elongate spur; free part lanceolate, long-acuminate to an acute tip, cuneate near the base, 3-nerved, about 11 mm. long and 4.2 mm. wide across the dilated and concave lower portion when expanded; spur filiform-cylindric, about 16 mm. long. Column very short and stout, straight, wing-dilated on each side, with a concave upper portion, about 2 mm. high at the back.

Ayacucho: Aina, between Huanta and Río Apurimac, 750-1000 meters, epiphyte in open woods, *Killip & Smith 23154*.

CRYPTOCENTRUM

inaequisepalum C. Schweinf.

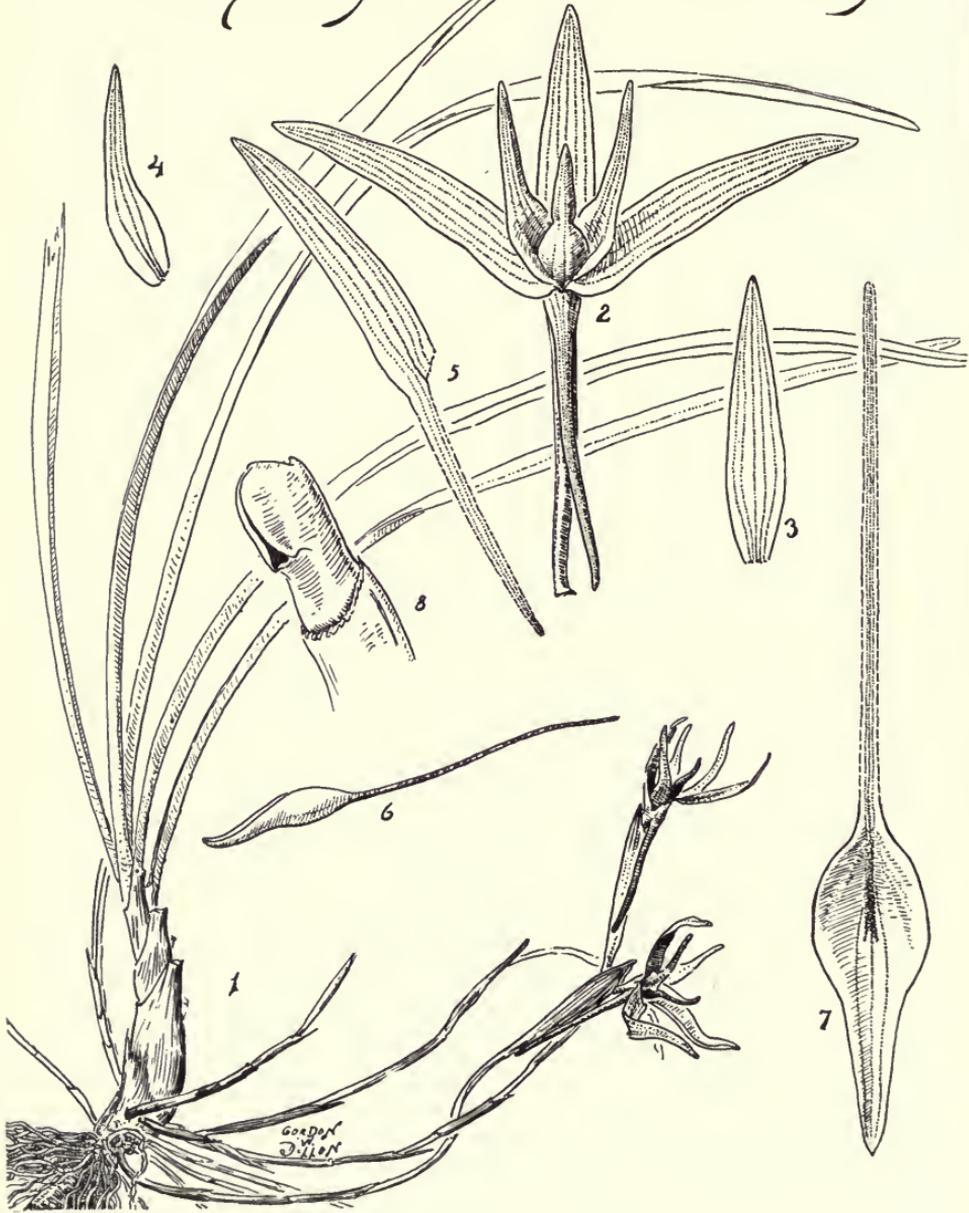


FIG. 151. *Cryptocentrum inaequisepalum* C. Schweinf. 1, plant; $\times \frac{1}{6}$. 2, flower; $\times 2$. 3, dorsal sepal; $\times 2$. 4, petal; $\times 2$. 5, lateral sepal; $\times 2$. 6, lip from side; $\times 2$. 7, lip from above; $\times 4$. 8, column; $\times 6$.

CRYPTOCENTRUM

pseudobulbosum C. Schweinf.

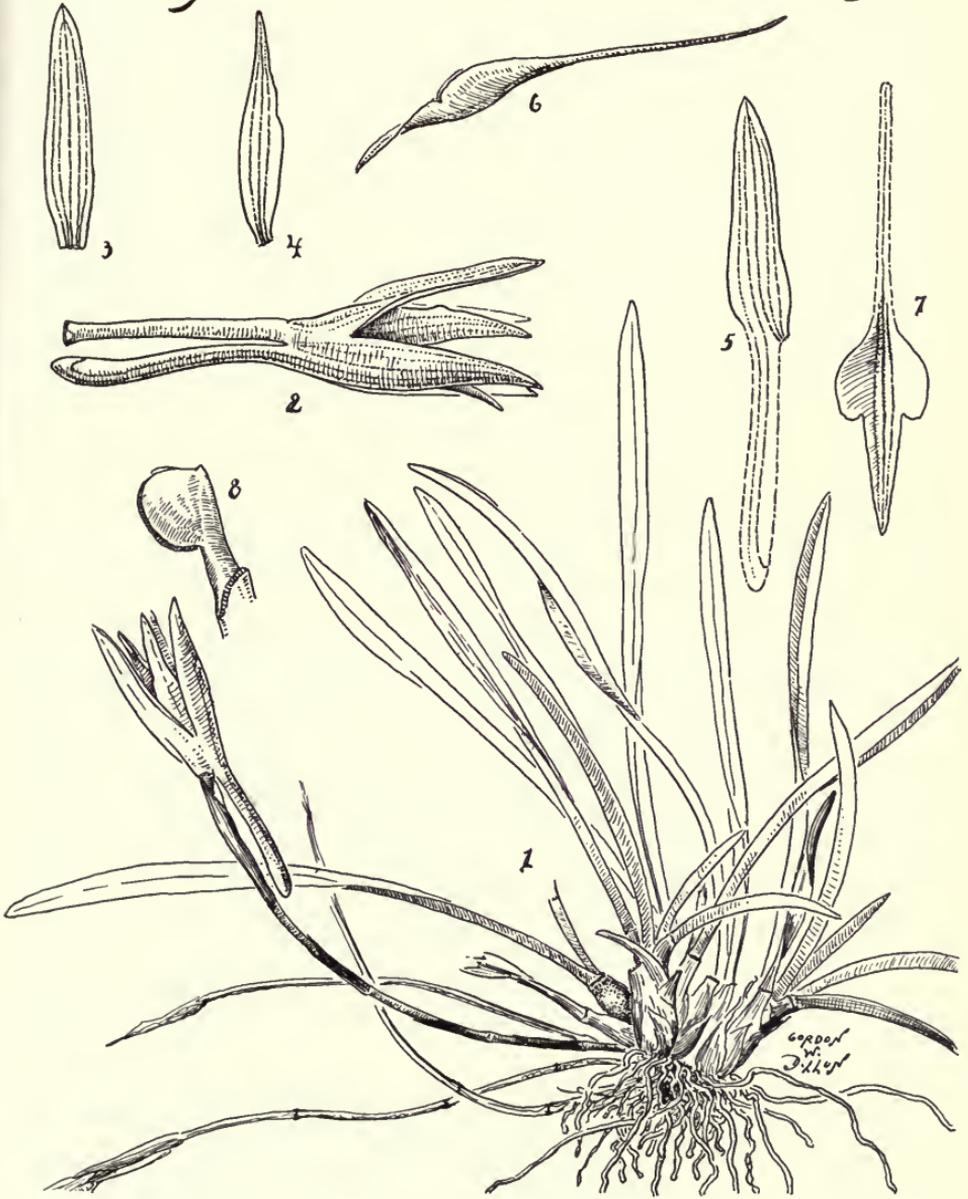


FIG. 152. *Cryptocentrum pseudobulbosum* C. Schweinf. 1, plant; $\times 2$. 2, flower; $\times 3$. 3, dorsal sepal; $\times 3$. 4, petal; $\times 3$. 5, lateral sepal; $\times 3$. 6, lip from side; $\times 3$. 7, lip from above; $\times 3$. 8, column; $\times 6$.

Cryptocentrum minus Schltr. Fedde Repert. 10: 389. 1912; Mansf. Fedde Repert. Beih. 58: t. 53, nr. 210. 1930.

Plant small, erect, stout, 4–5 cm. high. Stem abbreviated, entirely concealed by numerous, distichous, closely imbricating leaf-sheaths. Leaves narrowly linear, acute, erect-spreading, rather fleshy, 1.5–2 cm. long, up to 2 mm. wide. Inflorescences lateral, axillary, 1-flowered; peduncles filiform, a little shorter than the leaves. Flowers very small, campanulate. Dorsal sepal oblong-lanceolate (“oblong”), obtuse, about 6 mm. long and 1.9 mm. wide. Lateral sepals triangular-lanceolate, falcate, or “falcate-oblique,” subobtuse, the free part about as long and wide as the dorsal sepal, produced below into an elongate spur. Petals obliquely ovate-lanceolate, obtuse, nearly as long as the sepals and slightly wider. Lip produced into an elongate spur; lamina ovate-lanceolate, narrowed to an obtuse apex, about 6 mm. long and 2.2 mm. wide below when expanded; spur slender-cylindric, about 9 mm. long. Column very short and stout, mostly concave, with a pair of semiorbicular wings.

Junín: Chanchamayo Valley, Río Blanco, near Hacienda Sta. Teresa, about 1500 meters, on trees, *Köhler s.n.*

No example of this concept was seen.

Cryptocentrum peruvianum (Cogn.) C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 12: 188. 1946. *Centroglossa? peruviana* Cogn. Bull. Soc. Roy. Bot. Belg. 43: 331. 1906.

Plant very small, stout, up to 2.5 cm. tall. Stem abbreviated, about 1 cm. high, entirely concealed by numerous, distichous, closely imbricating leaf-sheaths. Leaves numerous, crowded, narrowly linear, apparently subterete and channelled, abruptly acute or obtuse, approximate, widely spreading, more or less arcuate-recurved, 1–2 cm. long, up to 1.5 mm. wide. Inflorescences lateral, axillary, slightly exceeding the leaves; peduncle filiform, nearly equaling the leaves. Flower very small, purple, of firm, subfleshy texture. Sepals connate at the base (as in the genus). Dorsal sepal linear or lanceolate-linear, acute,¹ free part up to 4.5 mm. long, about 1.3 mm. wide. Lateral sepals similar, acute or short-acuminate, a little larger than the dorsal sepal. Petals similar to the sepals but rather smaller, linear, acuminate. Lip lanceolate-ovate, acute or acuminate, concave below, 4–4.5 mm. long, about 2 mm. wide, extended into an elongate, linear-cylindric spur 6.5–7 mm. long. Column short, rather stout, about 1.5 mm. long.

Loreto: Near Cerro de Ponasa, 1300 meters, on trees, *Ule 6688*.

Cryptocentrum pseudobulbosum C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 12: 189, t. 31. 1946. Figure 152.

Plant small, slender, caespitose, 4–5 cm. tall. Pseudobulbs very small, cylindrical, complanate and closely striate-rugose in the dried specimen, bifoliate at the apex, about 7.5 mm. long, surrounded in youth by 1 or more pairs of leaf-bearing

¹ A flower from the type collection of *Centroglossa peruviana* showed acute or acuminate segments, the lateral sepals being obviously broken off; the floral measurements were taken from the description, since the available flower was in an imperfect condition.

sheaths. Leaves narrowly linear, abruptly acute, up to 4 cm. long and 2 mm. wide, conduplicate below. Inflorescences lateral, basal, filiform, spreading, 1-flowered; peduncle about 4 cm. long. Flowers small, nervose. Sepals connate below (as in the genus), 5-nerved. Dorsal sepal (free part) linear-lanceolate, abruptly acute and apiculate, about 7.7 mm. or less long and 2 mm. wide. Lateral sepals very similar to the dorsal sepal but slightly larger, suboblique. Petals narrowly lanceolate, acuminate, slightly shorter than the sepals in natural position but actually somewhat longer, 3-nerved. Lip produced into a long spur; free part lanceolate, long-acuminate, cuneate toward the narrow base, concave below, more or less lightly 3-lobed below the middle, up to about 9 mm. long and 3.8 mm. wide across the lateral lobes when expanded, 3-nerved; lateral lobes (when distinct) erect, semielliptic, very broadly rounded; mid-lobe much longer, linear-triangular; spur very slender, cylindrical, obtuse, up to 9.5 mm. long. Column short, straight, concave and wing-dilated above, about 2.2 mm. long.

Cuzco: Prov. of Paucartambo, Sta. Isabel to Asunción, 1800 meters, epiphyte, flower wine-red, *Vargas 5539*.—Junín: Chanchamayo Valley, 1800 meters, *Schunke s.n.* (type).

TRICHOCENTRUM Poepp. & Endl.

A small genus of American epiphytes extending from Mexico and Central America south to Brazil and Peru.

Stems very short, at length thickened into a small, fleshy pseudobulb. Pseudobulbs 1-leaved, caespitose or separated. Leaf flat or equitant, oblong or obovate-oblong to elliptic (rarely linear), coriaceous. Inflorescences lateral, basal, 1- to few-flowered. Flowers small to large, with spreading segments. Sepals free, subequal, the lateral ones oblique. Petals similar to the sepals, especially to the dorsal sepal. Lip adnate to the column, commonly more conspicuous than the rest of the flower, simple to 3-lobed or pandurate, acute to retuse or bilobed, produced at the base into a short or very long spur. Column abbreviated, stout, footless, commonly with a pair of erect-spreading wings. Anther terminal, opercular, incumbent; pollinia 2.

- A1. Leaves equitant, vertical; lamina of the lip much broader than long. *T. triquetrum*
- A2. Leaves flat, horizontal; lamina of the lip longer than broad. I
- Ia. Leaf linear; lip deeply concave, strongly narrowed above; spur very short, conic-saccate. *T. brevicaratum*
- Ib. Leaf oblong or oblanceolate to elliptic; lip flat, more or less dilated above; spur relatively elongate, narrowly conic or slender-cylindric to filiform. 1
- 1a. Lip simply obovate; spur much longer than the lip. *T. pulchrum*
- 1b. Lip pandurate; spur subequaling or markedly shorter than the lip. 2
- 2a. Basal part of the lip gradually cuneate, without a well-defined claw; spur elongate, about equaling the pedicellate ovary; arms of the column with a broad, erose-dentate apex. *T. panduratum*
- 2b. Basal part of the lip with a well-defined claw and an abruptly dilated lamina; spur short, half as long as the pedicellate ovary; arms of the column with a narrow, subentire apex. *T. albopurpureum*

Trichocentrum albopurpureum Linden & Reichb. f. ex Reichb. f. Gard. Chron. (1866) 219, fig.; Hook. f. Bot. Mag. 94: t. 5688. 1868.

Plant medium-sized, about 10 cm. or less high. Rhizome abbreviated. Pseudobulbs very small, approximate, ovoid, unifoliate. Leaf elliptic ("oblong-lanceolate"), acute, sessile, fleshy, about 7.7–9 cm. long, 2.5–4 cm. wide. Scapes lateral, solitary, 1-flowered at the apex; peduncle about 2.5 cm. long. Flower variable, rather large, with spreading segments; sepals and petals within brown with a reddish tint. Dorsal sepal oblong-obovate ("cuneate-ligulate"), acute, about 2 cm. long and 9 mm. wide. Lateral sepals obliquely oblong-elliptic, subacute, about as long as the dorsal sepal and slightly narrower. Petals oblanceolate-oblong, acute ("acuminate"), a little shorter and narrower than the sepals. Lip much larger than the sepals and petals, adnate to the column at the base, about 2.5 cm. in greatest length and 2.2 cm. wide above and below; claw broadly cuneate, white, with 4 purple raised lines; lamina abruptly dilated, subquadrate-pandurate, bilobed in front, subcordate at the base, entirely purple, or white with 2 large purple blotches at the base, produced below into a relatively short, conic, curved spur about 1.2 cm. long. Column very short, stout, white, about 5 mm. high at the back, with a pair of large, porrect, decurved, triangular-lanceolate wings above.

Amazonas: La Peca, about 35 km. east of the Marañon River, 20 km. east of the Utcubamba River, about 1200 meters, on tree, *Woytkowski 37027*. Also northern Brazil? (type).

Trichocentrum brevicaratum C. Schweinf. Am. Orch. Soc. Bull. 13: 388, t., 1945. Figure 153.

Plant medium-sized. Rhizome apparently abbreviated, concealed by imbricating sheaths. Stems very short, commonly approximate, thickened into minute, 1-leaved pseudobulbs. Leaf linear (when young linear-oblong), acute, more or less narrowed to a sessile, conduplicate base, fleshy-coriaceous, up to 16.3 cm. long and about 1 cm. wide. Inflorescences lateral, basal, very short, 1-flowered; peduncles up to 2.2 cm. long, provided below with 2 loose, broad sheaths. Flower rather large for the genus, with the segments recurved at the tips. Dorsal sepal elliptic, subacute and dorsally apiculate, about 2.5 cm. long when expanded and 1.1 cm. wide. Lateral sepals obliquely elliptic-lanceolate, lightly falcate-recurved, acute, a little longer and narrower than the dorsal sepal. Petals obliquely oblong-elliptic or lanceolate-elliptic, subacute, somewhat smaller than the dorsal sepal. Lip markedly shorter than the lateral sepals in natural position, very deeply concave, lanceolate and sigmoid when viewed from the side, narrowed to a strongly recurved and subacute or minutely retuse, channelled tip, more or less fleshy-thickened on each side at the subcordate, sessile base, produced below into a short, conic-saccate spur which is about 5 mm. long. Column very short and stout, about 3 mm. high at the back, with a short, very broad, lobulate wing extending around the clinandrium. Anther hemispherical. Pollinia 2, pyriform.

Junín: Chanchamayo Valley, 1800 meters, *Schunke s.n.* (type). Same locality, 1500 meters, *Schunke 565*.

TRICHOCENTRUM

brevicalcaratum

C. Schweinf.

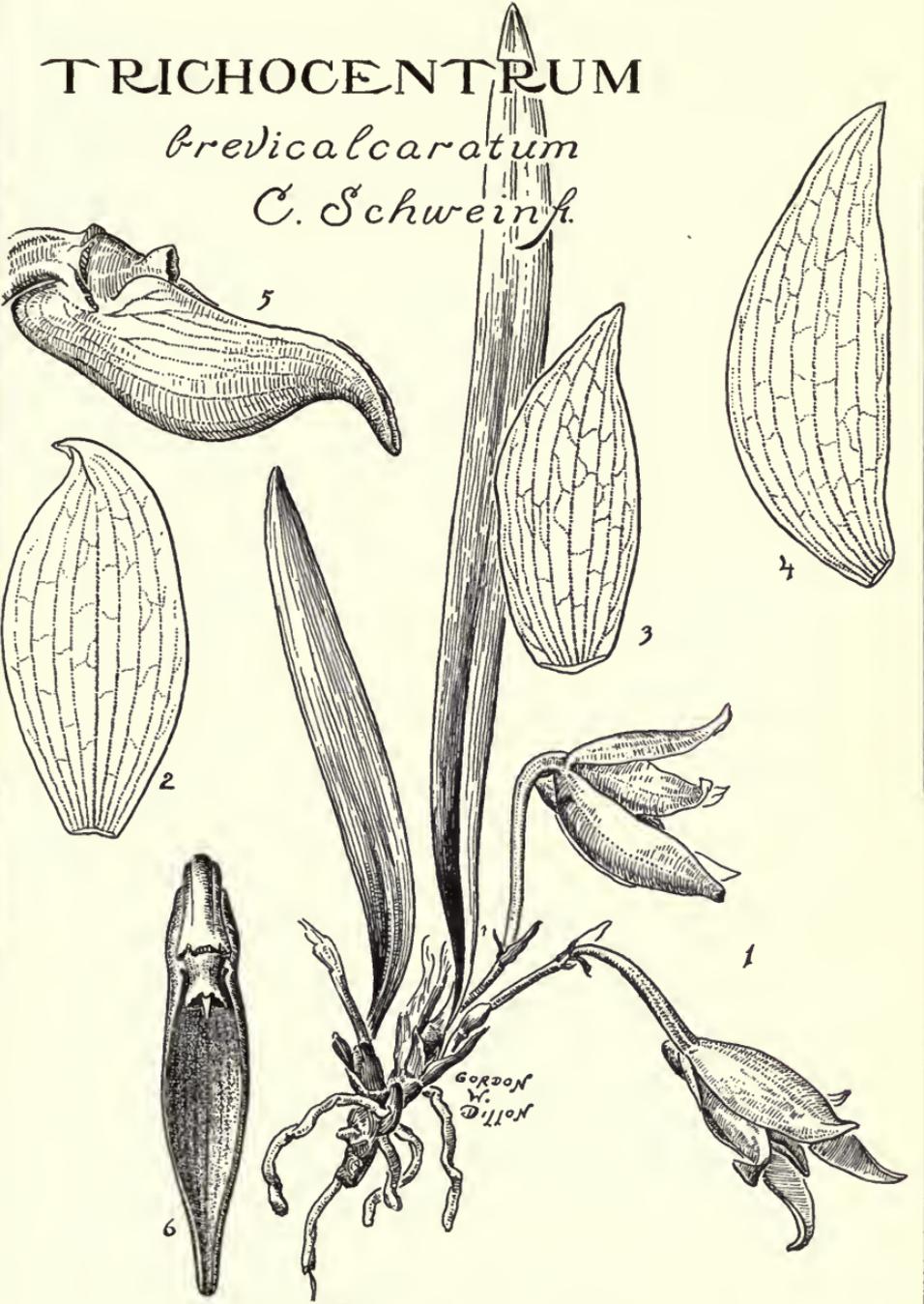


FIG. 153. *Trichocentrum brevicalcaratum* C. Schweinf. 1, plant; $\times \frac{1}{6}$. 2, dorsal sepal; $\times 2$. 3, petal; $\times 2$. 4, lateral sepal; $\times 2$. 5, lip and column from side; $\times 2$. 6, lip and column from above; $\times 2$.

Trichocentrum panduratum C. Schweinf. Am. Orch. Soc. Bull. 14: 104, t., 1945. Figure 154.

Plant medium-sized. Rhizome creeping, apparently short, invested by loose, imbricating sheaths, producing at intervals abbreviated, pseudobulbous, 1-leaved stems. Leaf oblong to oblong-elliptic (rarely oblong-oblancheolate), 8.2–20.2 cm. long, up to 3.6 cm. wide, acute, more or less gradually narrowed to a conduplicate, sessile base. Inflorescences lateral, basal, very loosely 2- to 5-flowered, about 10.5 cm. or less long, with several remote, spreading, ovate, concave bracts; rachis fractiflex. Flowers rather small, yellow and violet, with spreading segments. Dorsal sepal obovate-oblong, rounded at the apex with a dorsal apicule, 9.5–10.5 mm. long, 5.1–5.8 mm. wide. Lateral sepals obliquely elliptic-lanceolate, subacute, subcarinate and thickened through the middle without, somewhat longer and narrower than the dorsal sepal. Petals very similar to the dorsal sepal, elliptic-oblong, minutely apiculate at the rounded apex. Lip subquadrate-pandurate, constricted slightly above the middle, broadly rounded in front and emarginate in the middle, sessile, cuneate at the base, 17–20 mm. long, 12–14 mm. wide across the basal half, 9–13 mm. wide across the anterior part, produced below into a slender-cylindric spur about 18 mm. long; disc obscurely bicarinate below. Column very short and stout, about 4 mm. high, with a pair of erect-spreading wings which are very obliquely ovate-triangular terminating in a broad, truncate, erose apex. Pollinia 2, complanate-pyriform.

San Martín: Juan Juí, Alto Río Huallaga, 400–800 meters, on river bank in forest, *Klug 4260*.

Trichocentrum pulchrum Poepp. & Endl. Nov. Gen. ac Sp. 2: 11, t. 115. 1837–8; Cogn. Martius Fl. Bras. 3, pt. 6: 145. 1904.

Plant rather small, epiphytic. Rhizome very short, stout, clothed by several imbricating, truncate sheaths. Stems or pseudobulbs minute, 1-leaved. Leaf oblong or oblong-elliptic, subacute and sometimes minutely mucronate, more or less long-cuneate at the base, fleshy-coriaceous, 9–10 cm. long, 2–2.5 cm. wide. Inflorescences lateral, basal, 1-flowered; peduncle very short, 5–10 mm. long, concealed by 2 or 3 imbricating sheaths; pedicellate ovary elongate, linear-clavate, acutely 4-angled, about 5 cm. long. Flower rather large, white variegated with blood-red. Sepals spreading, membranaceous, rather concave. Dorsal sepal ovate-elliptic or oval, subacute, dorsally keeled, about 2 cm. long, 12–13 mm. wide. Lateral sepals similar but slightly narrower, suboblique. Petals similar to the sepals, obtuse. Lip distinctly longer than the sepals, obovate, sessile, lightly emarginate in front, broadly cuneate below, with crenulate anterior margins and reflexed sides, about 3 cm. long and 17–18 mm. wide above, produced at the base into a linear-attenuate spur 4.5–5 cm. long; disc through the lower half thickly bicarinate. Column very short and stout, 3–4 mm. long, with a pair of erect wings which are short, very broad and terminate in a truncate, long-ciliate apex.

Huánuco: Near Pampayaco (Pampayacu), on trunks of old trees, *Poeppig s.n.*

No specimens of this species were available.

TRICHOCENTRUM

panduratum

C. Schweinf.

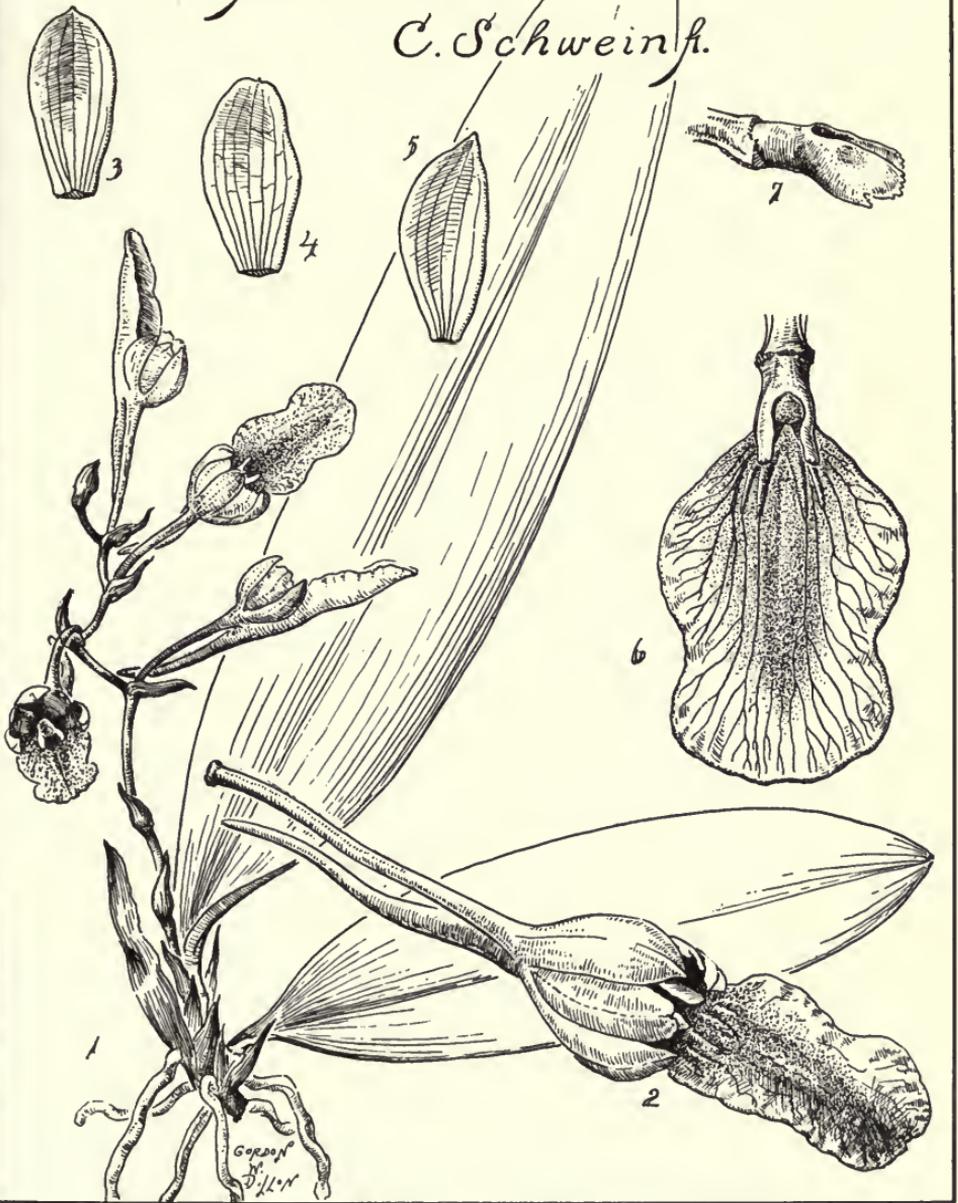


FIG. 154. *Trichocentrum panduratum* C. Schweinf. 1, plant; $\times \frac{1}{5}$. 2, flower; $\times 2$. 3, dorsal sepal; $\times 2$. 4, petal; $\times 2$. 5, lateral sepal; $\times 2$. 6, lip; $\times 2$. 7, column from side; $\times 2$.

Trichocentrum triquetrum Rolfe, Gard. Chron. ser. 3, 9: 701. 1891.

Plant rather small, about 15 cm. high. Leaves equitant, erect, tapering to an acute apex, about 15 cm. long and 1.3 cm. wide at the base. Peduncles axillary, about 2.5 cm. long, with several bracts which are conduplicate, linear-lanceolate and acute. Pedicellate ovary triquetrous, about 3.2 cm. long. Flower rather large. Dorsal sepal ovate-lanceolate, acute, pale straw-color, about 1.9 cm. long and 1 cm. wide. Lateral sepals similar, prolonged behind and adnate to the spur of the lip. Petals suborbicular, considerably shorter than the sepals, somewhat broader than long, pale straw-color. Lip reniform-orbicular, about 1.9 cm. long and 3 cm. wide, straw-color suffused with dull orange, produced at the base into a spur; disc with a pair of converging keels at the base; spur slender, tapering to an acute tip, about 3.2 cm. long. Column stout, with small, rounded wings.

Peru: Habitat unrecorded (introduced by Messrs. Charlesworth, Shuttleworth & Co.).

This description was taken from the original diagnosis.

DIADENIUM Poepp. & Endl. (*Chaenanth* Lindl.)

A very small group of inconspicuous epiphytes, apparently restricted to northern South America.

Stems commonly short, usually thickened into a minute, 1-leaved pseudobulb. Leaf rather large, elliptic-oblong, coriaceous. Scapes lateral, basal, much exceeding the leaves, laxly spreading-paniculate above. Flowers very small. Sepals subequal, narrowly lanceolate, concave, the lateral ones connate into a bidentate lamina and produced below into a more or less narrow, cylindrical-conic spur. Petals long-decurrent on the column-foot, broader than the sepals. Lip long-clawed, simple, prominently bicallose with the calli often erect (simulating lobes) and the apex recurved; disc adnate to the column-foot at the base, then produced below into a free, thin lamina which extends to the tip of the sepaline spur. Column short, wingless, produced into an elongate foot. Anther terminal, opercular, incumbent; pollinia 2, compressed-pyriform.

Diadenium micranthum Poepp. & Endl. Nov. Gen. ac Sp. 1: 41, t. 71. 1836; Cogn. Martius Fl. Bras. 3, pt. 6: 186. 1904. *Chaenanth* *micrantha* O. Ktze. Rev. Gen. Pl. 2: 656. 1891. Figure 155.

Plant slender, epiphytic, about 25–35 cm. high. Pseudobulbs minute, solitary or approximate, oblong-cylindrical, strongly compressed, 1–1.5 cm. high, unifoliate, surrounded on each side by 1 or 2 small, leaf-bearing sheaths. Leaves oblong, oblong-lanceolate or elliptic-oblong, acute, cuneate at the sessile base, fleshy-coriaceous, 3–10 cm. long, 1.3–2.3 cm. wide. Inflorescence lateral, basal, erect, loosely paniculate above, 2 to over 4 times longer than the leaves; peduncle more or less surpassing the leaves, slender, provided with several short, appressed, very remote sheaths; panicle laxly diffuse and spreading, with rather densely many-flowered branches. Floral bracts short, triangular, concave, acuminate. Flowers

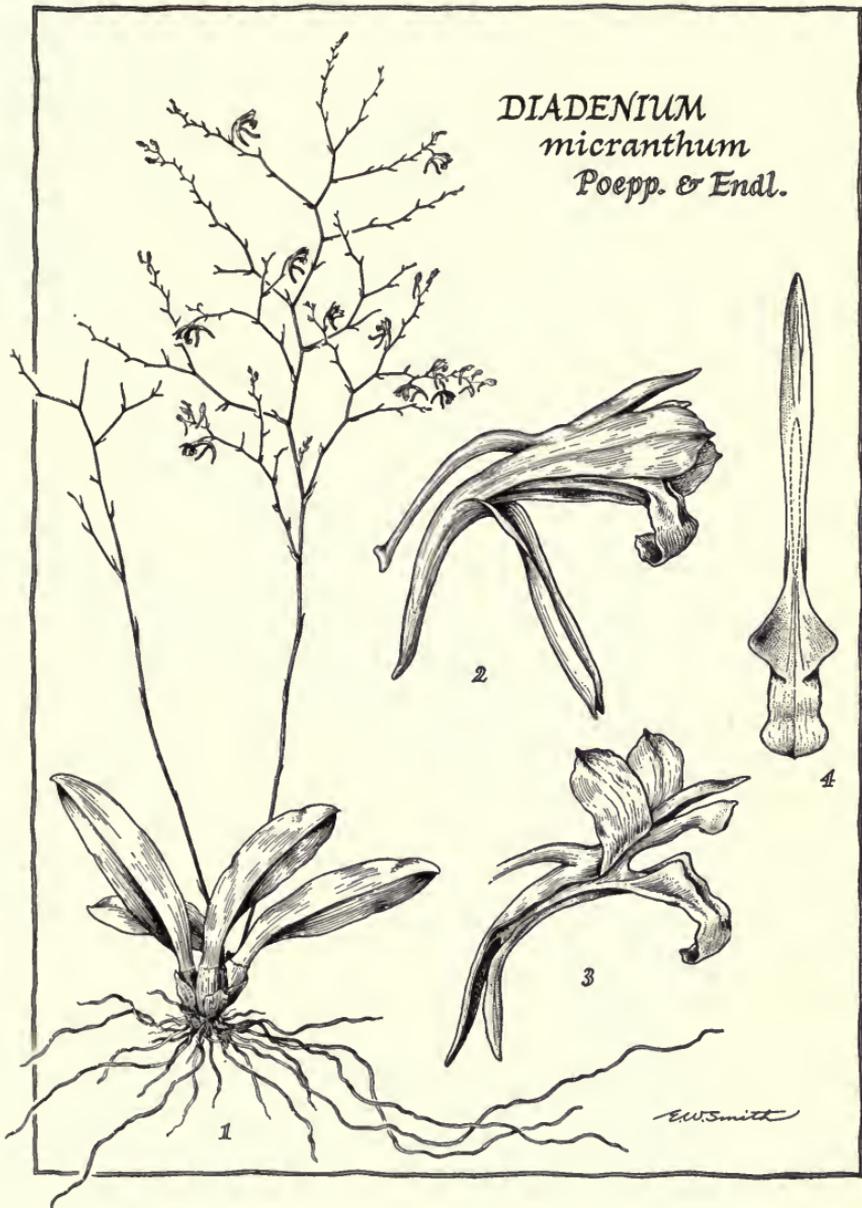


FIG. 155. *Diadenium micranthum* Poepp. & Endl. 1, plant; $\times \frac{3}{5}$. 2, flower from side, natural position; $\times 6$. 3, flower from side, with lateral sepals removed to show column and lip; $\times 6$. 4, lip, expanded; about $\times 6\frac{1}{2}$.

small, reddish or magenta often with white tips, campanulate. Sepals membranaceous, about equally long or the lateral ones longer, oblong-lanceolate, concave, acute, about 4–5 mm. long and 1.5 mm. wide, the lateral sepals connate into a bidentate lamina which is produced below into an elongate, narrowly cylindrical spur about 5 mm. long. Petals obovate-oblong, acute, nearly as long as the dorsal sepal but broader, long-decurrent along the column-foot. Lip long-clawed, simple, lightly adnate to the column-foot at the base and then produced into a very narrow, thin, free lamina extending to the tip of the sepaline spur, about 10 mm. long; disc with a pair of prominent, erect, flattened calli (simulating lobes) and with an acute, recurved apex. Column short, wingless, about 3 mm. high, produced into a long, narrow foot.

Huánuco: Near Cuchero (Cochero), *Poeppig s.n.* (type).—Loreto: Iquitos, in forest, *Tessmann 5054*. Also Bolivia.

IONOPSIS HBK.

A small group of more or less showy tropical American orchids extending from Florida (U.S.A.) and Mexico through Central America and the West Indies to most of South America.

Plants epiphytic, small to large. Stems abbreviated, thickened to pseudobulbous. Leaves few, distichous, congested, narrow or very narrow, coriaceous, spreading. Inflorescences usually several to many times surpassing the leaves, 1–3 to a plant, lateral, axillary, racemose or paniculate above, with a slender, remotely sheathed peduncle. Flowers small to rather large and conspicuous, long-pedicelled. Floral bracts minute. Sepals subequally long, campanulate, erect or spreading at the apex. Dorsal sepal free. Lateral sepals connate at the base, forming a short sac. Petals similar to the sepals, but frequently broader. Lip adnate to the base of the column, much surpassing the other segments, commonly indistinctly 3-lobed near the base; lateral lobes (if present) very small, semiorbicular; mid-lobe relatively very large, cuneate-flabellate or obcordate, deeply emarginate or bilobed; disc near the base bicallose. Column short, stout, erect, wingless, footless. Anther terminal, opercular, incumbent, more or less 1-celled; pollinia 2, waxy, obovoid-subglobose, affixed to a lorate stipe.

Ionopsis utricularioides (Sw.) Lindl. Coll. Bot. t. 39A. 1821; Fol. Orch. *Ionopsis* 2, no. 5. 1852; Cogn. Martius Fl. Bras. 3, pt. 6: 174. 1904; Ames, Orch. 1: 19, t. 5. 1905; Allen, Ann. Mo. Bot. Gard. 36: 142, fig. 187. 1949. *Epidendrum utricularioides* Sw. Prodr. Veg. Ind. Occ. 122. 1788. Figure 156.

Plant small to large, epiphytic, up to 7.5 dm. tall. Rhizome usually abbreviated (more rarely long-creeping straight and stem-like). Stems approximate,

FIG. 156. *Ionopsis utricularioides* (Sw.) Lindl. 1, plant; $\times 1$. 2, lip from front; $\times 3$. 3, lateral sepals; $\times 3\frac{1}{4}$. 4, petal; $\times 3$. 5, dorsal sepal; $\times 3$. 6, column, with anther raised, front-side view; $\times 10$. 7, pollinia and stipe, enlarged.



very short, thickened to more or less pseudobulbous. Leaves several, congested, distichous, spreading, linear or linear-lanceolate to oblong-lanceolate or oblong-elliptic, acute, apiculate, coriaceous, sessile, about 3.5–17 cm. long, up to 1.8 cm. wide. Inflorescences 1–3 to a plant, lateral, axillary, erect or arcuate, simple or spreading-paniculate above; peduncle slender or stout, provided with several remote, close, inconspicuous, tubular sheaths. Flowers few to numerous, small to relatively large and conspicuous, lavender through rose-purple to white. Sepals subequal, campanulate, membranaceous. Dorsal sepal free, oblong-lanceolate to elliptic-lanceolate, obtuse to acute, 3–6 mm. long, 1–3 mm. wide, concave. Lateral sepals similar, more or less connate below, concave, produced at the base into a short, broad sac. Petals about equal to the dorsal sepal, elliptic-ovate, acute or obtuse and apiculate, slightly shorter or longer and broader than the sepals. Lip about twice as long as the sepals, 5–16 (rarely 21) mm. long, up to 20 mm. broad above, obcordate to cuneate-flabellate, deeply bilobed, obscurely biauriculate at the base, with a pair of small, thin keels near the base. Column short, rather stout, footless, about 2 mm. high.

Junín: Along Río Perene, near “Hacienda 3,” Colonia Perene, about 600 meters, epiphyte in forest, sepals and petals light pink with darker stripes, lip pink, purple-blotched near the base, white at the base, *Killip & Smith 25149*.—Loreto: Tarapoto, *Spruce s.n.*, fide Cogn.—San Martín: Zepelacio, near Moyobamba, 1200–1600 meters, epiphyte in mountain forest, flowers pale lilac, *Klug 3391*. (This collection varies from the usual form of growth in showing an elongate, stem-like rhizome and in having often uncommonly large flowers.) Species very widespread and variable, extending from southern Florida (U.S.A.) through Middle America and the West Indies (type of *Epidendrum utricularioides*) to South America as far as Paraguay.

RODRIGUEZIA Ruíz & Pav.

A rather small group of epiphytes centered in South America, extending southward to Argentina and northward in Central America to Costa Rica. Up to the present, but two species and one variety are known surely to occur in Peru.

Plants small to medium-sized. Rhizome often elongated, bearing 1- or 2-leaved pseudobulbs. Leaves oblong to narrowly ligulate, coriaceous or fleshy. Inflorescences lateral, basal, racemose above with several to many flowers. Flowers often showy, loose to subdense. Sepals subequal, concave. Dorsal sepal free. Lateral sepals more or less deeply connate, often spreading, incurved below, ascending above. Petals similar to the dorsal sepal, lightly oblique. Lip commonly exceeding the rest of the perianth, obcordate or rarely obovate above, with a narrowed, usually auriculate-dilated, lower portion, produced into a short, solid horn or spur at the base; disc with one or more keels or crests. Column short or long, footless, clavate, with a pair of arms or auricles above. Anther terminal, opercular, incumbent; pollinia 2, ovoid or subglobose, with a linear stipe.

- A1. Flowers small, dorsal sepal about 1.2 cm. or less long, more or less deeply rose-purple..... *R. secunda*
- A2. Flowers large, dorsal sepal about 1.6-4 cm. long, white or greenish white, more or less spotted or streaked with lilac, rarely lilac, white and yellow, or brown..... I
- Ia. Flowers lilac or pinkish to white, sometimes with yellow on the lip; sepals 1.6-3 cm. long; lip 1.8-3.5 cm. long..... *R. Batemanii*
- Ib. Flowers carmine and white with orange-brown on the lip; sepals about 4 cm. long; lip about 4.6 cm. long..... *R. Batemanii* var. *speciosa*

Rodriguezia Batemanii Poepp. & Endl. Nov. Gen. ac Sp. 1: 41, t. 70. 1836; Reichb. f. Saund. Refug. Bot. 2: t. 128. 1882; Cogn. Martius Fl. Bras. 3, pt. 6: 153. 1904. *Burlingtonia rubescens* Lindl. Bot. Reg. 23: sub t. 1927. 1837. *Burlingtonia Batemanii* Lindl. ex Cogn. Martius Fl. Bras. 3, pt. 6: 154. 1904. *Rodriguezia candida* Reichb. f. var. *Batemanii* Hort. ex Stein Orchideenb. 538. 1892.

Plant small to medium-sized, very variable. Rhizome creeping, simple or branched. Pseudobulbs remote (often only one present in the specimen), cylindrical to ellipsoid, strongly complanate, unifoliate, 3-5 cm. long, surrounded and more or less concealed by 1-3 pairs of distichous, leaf-bearing, conduplicate sheaths. Leaves linear to oblong (often conduplicate in the dried specimen), acute and apiculate at the apex, more or less narrowed to the sessile, complicate base, 7-35 cm. long, up to 3 cm. wide, commonly thickly coriaceous. Inflorescences lateral in the axils of the leaf-bearing sheaths surrounding the pseudobulb, commonly flexuous or pendent, more or less shorter than the longer leaves, few- to many-flowered above, the racemes being loose to subdense. Floral bracts spreading, concave, acuminate. Flowers very variable in size and color, white (often spotted with lilac) or lilac or white and yellow, membranaceous. Sepals concave. Dorsal sepal lanceolate-oblong or elliptic-oblong, acute, 1.58-2.5 cm. long, 8 mm.-1.2 cm. wide. Lateral sepals connate into a deeply concave, oblong-lanceolate, apically bidentate lamina which is spreading below at the saccate base and strongly incurved above, 2-3 cm. long. Petals obliquely obovate-oblong or elliptic-lanceolate, rounded and apiculate or abruptly acute at the apex, about equally long with the dorsal sepal and slightly narrower or wider. Lip exceeding the other segments, simple, cuneate-obovate, the long narrow basal portion gently semiorbicular-dilated above on each side, more or less deeply emarginate at the broad apex, 1.8-3.5 cm. long, 9-22 mm. wide near the apex, produced at the base into a short, fleshy horn; disc with a pair of elongate keels extending through the narrow part and curving out onto the lateral dilations below, the central pair commonly supplemented on each side by a shorter keel. Column slender, more or less pubescent, abruptly clavate, 0.8-1.1 (rarely 1.9) cm. high, with a pair of ascending or suberect, lanceolate-oblong, obtuse auricles near the apex.

Huánuco: Tingo María, 670 meters, on trees, *Carpenter 104*. Prov. of Huamalies, between Supte and Tubumayo Rivers, north of Tingo María, 610 meters, *Stork & Horton 9563*.—Junín: Chanchamayo Valley, 1500 meters, *Schunke 530, 1101*. Same locality, 1000 meters, *Schunke 1860*. La Merced, Hacienda Schunke, about 1200 meters, on

coffee bush, *Macbride* 5620. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke* A 48, A 61, A 63.— Loreto: Río Huallaga Cañon, below Río Santo Domingo, about 1200 meters, epiphyte in open dry woods, very fragrant, *Macbride* 4214. Gamitanacocha, Río Mazán, 100–125 meters, *Schunke* 41. Iquitos, Muena-Caño, 105 meters, in dense forest, fragrant, *Mexia* 6505a. Mishuyacu, near Iquitos, 100 meters, epiphyte in forest, *Klug* 985. Vicinity of Iquitos, 100 meters, epiphyte in clearing, *Klug* 10043, 10072. Lower Marañon River, about 125 meters, *Tessmann* 3753.—San Martín: Juan Juí, Alto Río Huallaga, 400–800 meters, clearing in forest, *Klug* 4223. Near Moyobamba, *Wallis s.n.* Prov. of Maynas, Yumaguas Mission, in very hot region, *Poeppig* 2150 (type). Tingo María, 625–1100 meters, *Allard* 22392.

Rodriguezia Batemanii Poepp. & Endl. var. *speciosa* Mansf. Notizbl. Bot. Gart. Berl. 10: 240. 1928.

This plant differs from the typical form in having larger, carmine and white flowers, the sepals being about 4 cm. long and the lip about 4.6 cm. long and 2.8 cm. wide.

San Martín: Putria, near the mouth of the Río Pastaza, in a flooded cow-pasture, *Tessmann* 4939.

Rodriguezia ensiformis Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 218. 1798.

Huánuco: Near Pozuzo, in open woods, upon rocks and trees, towards Cheniço and Tramo, *Pavón s.n.*

This is an obscure species, perhaps referable to *R. Batemanii* Poepp. & Endl., judged from a photograph of the type.

Rodriguezia lanceolata Ruíz & Pav. Syst. Veg. Fl. Peruv. et Chil. 1: 219. 1798.

Junín: Prov. of Tarma, on mountains, near the villages of Vitoc, Palca, Collac and Monobamba, *Pavón s.n.*—Also Loreto, fide Schlechter, Fedde Repert. Beih. 9: 168. 1921.

This doubtful species may be referable to *R. Batemanii* Poepp. & Endl., judged from a record of the type.

Rodriguezia secunda HBK. Nov. Gen. & Sp. 1: 367, t. 92. 1816; Cogn. Martius Fl. Bras. 3, pt. 6: 150, t. 40, fig. 2. 1904. *Pleurothallis coccinea* Hook. Exot. Fl. 2: t. 129. 1824.

Plant medium-sized to rather large, epiphytic. Rhizome creeping, simple or branched, concealed by distichously imbricating sheaths. Pseudobulbs remote, often on short branches of the rhizome, oblong-ellipsoid, unifoliate at the apex, about 2-4 cm. high, more or less compressed, striate-rugose and shining in age, often concealed by several pairs of distichous, conduplicate, leaf-bearing sheaths. Leaves elliptic-oblong to ligulate, subacute and apiculate to obtuse and sometimes obliquely bilobed at the apex, sessile at the slightly narrower, complicate base, 7-23.5 cm. long, up to 3.2 cm. wide, often conduplicate in the dried specimen. Inflorescences lateral in the axils of leaf-sheaths, commonly more or less surpassing the leaves (rarely shorter), about 12-40 cm. long, racemose above; peduncle bearing remote, tubular, scarios sheaths; raceme loosely to subdensely many-flowered, usually secund but sometimes distichous, up to 17 cm. long. Flowers rather small, more or less deeply rose-purple or crimson, rarely with whitish markings. Dorsal sepal very deeply cucullate-concave, acute and apiculate, ovate to oblong-elliptic, 9-14 mm. long, up to 6.4 mm. wide when expanded. Lateral sepals entirely connate into a bidentate lamina which is ovate-oblong, deeply longitudinally concave and saccate at the base, slightly longer and wider than the dorsal sepal. Petals obliquely elliptic-ovate or obovate, broadly rounded and apiculate at the summit, a little shorter than the dorsal sepal but equally wide or wider. Lip about equaling the lamina of the lateral sepals, pandurate-oblong, about 12-15 mm. long in greatest extent, up to 6.9 mm. wide near the apex and 5.5 mm. wide near the dilated basal portion, produced into a short, curved horn at the base; disc with a pair of keels extending to about the middle, the keels lower and diverging onto the basal dilations and then converging, higher and flattened toward the front. Column relatively small, abruptly dilated at the apex with a pair of rather short, narrowly triangular or triangular-linear ascending arms, more or less finely pubescent, about 3.3 mm. high at the back.

Loreto: Near Iquitos, one or two miles above the junction of the Itaya and Amazon Rivers, on trees, *Patrick s.n.* Frequent from Panama and Colombia (type of *Rodriguezia secunda*) through Venezuela to British Guiana, French Guiana, Surinam and Brazil; also on Trinidad (type of *Pleurothallis coccinea*) and St. Vincent.

NEOKOEHLERIA Schltr.

Small or very small, inconspicuous plants, apparently confined to Peru.

Rhizome abbreviated. Pseudobulbs very small, caespitose, cylindrical to ellipsoid or subglobose, unifoliate, concealed in youth and surpassed by 2 or more distichous, imbricating sheaths. Leaf very narrow, linear or linear-lanceolate, with flat or more or less tubular-incurved blades. Inflorescences lateral, basal, either shorter than the leaves or slightly surpassing them, racemose or more rarely paniculate. Flowers several to numerous, loose or dense. Dorsal sepal "oblong" or elliptic-oblong, concave. Lateral sepals connate into an entire or emarginate lamina, produced below into a stout, bifid or subentire, saccate spur. Petals obovate-oblancoate to broadly obovate or oval, broadly obtuse to rounded above, much broader than the dorsal sepal. Lip oblong-spatulate or oblong-subpandurate, pro-

duced at the base into a pair of filiform, commonly apically dilated appendages; disc with a pair of high, parallel keels or lamellae. Column small, footless, with the clinandrium much produced at the back. Anther opercular, incumbent, semiovoid, 1-celled; pollinia 2.

- A1. Lip oblong-subpandurate, with the lateral margins (except near the apex and base) irregularly dentate-fimbriate; petals oval. *N. Markgrafii*
- A2. Lip not oblong-subpandurate, with entire or undulate lateral margins; petals oblanceolate-oblong to cuneate-obovate. I
 - Ia. Inflorescence commonly paniculate; spur of the lateral sepals abruptly truncate. *N. paniculata*
 - Ib. Inflorescence racemose; spur of the lateral sepals often prominently bifid. 1
 - 1a. Petals broadly spatulate-obovate; spur formed by the lateral sepals at most emarginate. *N. peruviana*
 - 1b. Petals oblanceolate-spatulate; spur formed by the lateral sepals sharply bilobed. *N. equitans*

Neokoehleria equitans Schltr. Fedde Repert. 10: 390. 1912; Mansf. Fedde Repert. Beih. 58: t. 53, nr. 211. 1930; C. Schweinf. Bot. Mus. Leaflet. Harvard Univ. 12: 190. 1946.

Plant small, epiphytic, about 15 cm. or less tall. Rhizome abbreviated. Pseudobulbs small, oblong-cylindric, unifoliate at the apex, striate-rugose in the dried specimen, 5–15 mm. long, mostly concealed and surpassed by several distichous, imbricating sheaths. Leaf linear or narrowly lanceolate-ligulate, acute, more or less cuneate-narrowed below, 4.5–11.6 cm. long, 4–6.5 mm. wide. Inflorescences lateral, basal, commonly equaling or surpassing the leaf, up to 14.7 cm. tall, racemose, subdensely 4- to 10-flowered above, the peduncle having a few distant, close, lanceolate sheaths. Flowers small, membranaceous. Dorsal sepal "oblong" or elliptic-oblong, subacute, concave, 5–6.5 mm. long, about 2 mm. wide. Lateral sepals connate into an oblong-ovate, concave lamina which is shortly bidentate at the apex, about equally long but broader than the dorsal sepal, produced at the base into a spur about 3 mm. long which is divided into a pair of conical sacs. Petals oblanceolate-oblong or oblong-spatulate, obtuse or broadly rounded at the apex, a little longer than the sepals and as wide as the lamina of the lateral sepals. Lip cuneate-spatulate, broadly rounded or lightly retuse in front, concave with upcurved sides, more or less obscurely trilobulate above the middle, 6.5–7 mm. long, 3.2–3.5 mm. wide; disc traversed through the lower half by 2 broad, flat keels, produced below into a pair of linear, apically thickened appendages about 2 mm. long. Column stout, gently clavate and recurved, 4.5–5.5 mm. long, with a conspicuous, oblong-ovate, concave clinandrium.

Junín: Chanchamayo Valley, Río Blanco, Hacienda Sta. Teresa, about 1400 meters, on coffee trees, *Köhler s.n.* (type). Chanchamayo Valley, 1500 meters, *Schunke 550*.

Neokoehleria Markgrafii Friedr. Mittel. Bot. Staatssaml. München 16: 259, t., 1957.

Plant small, epiphytic, 6–10 cm. high. Pseudobulbs small, subglobose, indistinctly compressed, unifoliate, 4–6 mm. high, provided on each side at the base

with 1 or 2 membranaceous sheaths. Leaves linear-lanceolate or oblong-lanceolate, acute, fleshy, channelled, 2.5–6.5 cm. long, about 5 mm. wide, produced at the base into a short, complicate petiole, becoming reddish. Inflorescences lateral, basal, loosely 4- to 6-flowered, up to 7 cm. long, racemose or tardily paniculate; peduncle with several distant, minute, bract-like sheaths. Flowers small, membranaceous, whitish yellow. Dorsal sepal elliptic-oblong, obtuse at the subcucullate apex, 6–7 mm. long. Lateral sepals connate into an oblong-ovate, apically bidentate lamina which is produced at the base into a stout, bidentate spur, rather longer than the dorsal sepal. Petals obliquely oval, broadly rounded at the apex, about as long as the dorsal sepal and more than twice as broad. Lip subpandurate-oblong, about 10 mm. or less long, lightly retuse at the subtruncate apex, produced at the base into a pair of short, filiform spurs, with the lateral margins (except near the apex and base) irregularly dentate-fimbriate; disc toward the base with a pair of high, trapezoid keels produced in front into a pair of linear keels and near the apex with a tuft of yellow papillae. Column slender, clavate, biauriculate near the apex.

Peru: Habitat and collector unknown; cultivated in the Botanical Garden, München.

Neokoehleria paniculata C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 12: 190, t. 29. 1946. Figure 157.

Plant very small, inconspicuous. Pseudobulbs small, caespitose, oblong-cylindric and deeply striate-rugose in the dried specimen, unifoliate at the apex, about 11 mm. or less long, concealed in youth by several distichous, imbricating sheaths. Leaf narrowly linear, semicylindric in cross section in the dried plant, acute, sessile at the cuneate base, apparently very fleshy, about 8.9 cm. long and 3–5 mm. wide (only one complete blade present in the specimen). Inflorescences lateral, basal, numerous, commonly loosely branched or paniculate, with short, more or less recurved, several-flowered branches. Floral bracts widely spreading, lanceolate, concave. Flowers very small, membranaceous. Dorsal sepal elliptic-oblong, subacute, concave, 4.7–5 mm. long, 2 mm. wide. Lateral sepals connate into a suborbicular-ovate, concave, retuse lamina about 2.5 mm. long, produced below into a stout spur which is subquadrate-cylindric, abruptly truncate and about 2.3 mm. long. Petals obliquely cuneate-obovate, very broadly rounded or subtruncate and concave above, about as long as the dorsal sepal but wider. Lip oblong-obovate, broadly rounded at the (imperfect) apex, very obscurely 3-lobed above the middle, about 3.8 mm. long and 2 mm. wide above, produced at the base into a pair of triangular-linear, lightly sigmoid spurs about 2.2 mm. long; disc through the lower half traversed by a pair of semiobovate, flat lamellae. Column stout, clavate, about 3.7 mm. long, terminating in a prominent ovate, concave clinandrium.

Junín: Chanchamayo Valley, 1800 meters, *Schunke 545*.

Neokoehleria peruviana Schltr. Fedde Repert. 10: 391. 1912; Mansf. Fedde Repert. Beih. 58: t. 54, nr. 213. 1930; C. Schweinf. Bot. Mus. Leaf. Harvard Univ. 12: 192. 1946.

Plant small, slender, epiphytic, about 10 cm. high. Rhizome abbreviated. Pseudobulbs caespitose, ovoid or oblong-cylindric, 5–8 mm. long, unifoliate at the

apex, partially concealed and surpassed by 2 or more distichous, imbricating sheaths. Leaf linear or oblong-lanceolate, acute, slightly cuneate at the sessile base, thickly fleshy, 4.7–8.5 cm. long, 2.5–8 mm. wide. Inflorescence lateral, basal, up to 10 cm. long; peduncle slender, about 6.3 cm. or less long, with a very few, distant, lanceolate sheaths; raceme about 3.5 cm. long, rather densely many-flowered. Floral bracts spreading, lanceolate, concave. Flowers small, membranaceous. Dorsal sepal "oblong" or elliptic-oblong, "obtuse" or acute, concave, about 4.5 mm. long and 2 mm. wide. Lateral sepals connate into an oval-ovate, minutely bidentate, concave lamina which is nearly as long as the dorsal sepal, produced below into an oblong-cylindric sac about 2.8 mm. long which is abruptly truncate and at most lightly retuse at the apex. Petals broadly spatulate-obovate, oblique, broadly rounded at the apex, about equaling the dorsal sepal. Lip from a narrow claw obovate-spatulate, apiculate, about 3.5 mm. long and 1.8 mm. wide above the middle, produced at the base into a pair of linear, diverging appendages about 2 mm. long; disc through the lower half with a pair of high, flat, semioblanceolate appendages. Column slender, recurved, 3–3.3 mm. long, with a high, oblong-ovate, concave clinandrium.

Junín: Chanchamayo Valley, Río Blanco, Hacienda Sta. Teresa, about 1400 meters, on coffee trees, *Köhler s.n.* (type). Chanchamayo Valley, 1500 meters, *Schunke s.n.* (Herb. Chicago Nat. Hist. Mus. 571654).

SCELOCHILUS K1.

Small to medium-sized epiphytes, growing from Guatemala to Costa Rica in Central America, and in Venezuela, Colombia, Ecuador and Peru in South America.

Stems very short, thickened into a cylindric, 1-leaved pseudobulb. Leaf oblong to elliptic, coriaceous. Scapes lateral, basal, erect or pendulous, simple or branched. Flowers small to medium-sized, campanulate. Dorsal sepal strongly concave. Lateral sepals connate to the middle or nearly to the apex, usually somewhat longer than the dorsal sepal, produced at the base into a sac or short spur. Petals commonly broader than the sepals. Lip more or less long-clawed, commonly broader near the apex, often with a pair of small, erect lobules on the claw, produced at the base into a pair of short, narrow spurs within the sepaline sac. Column small, footless, wingless, with a small clinandrium. Anther terminal, opercular, incumbent, 1-celled; pollinia 2, usually subglobose.

- A1. Plant small, about 6 cm. or less tall; scape shorter than the leaf; petals falcate, broader above the middle. *S. brevis*
 A2. Plant larger, 14.5 cm. or more tall; scape longer than the leaf; petals not falcate, narrower above the middle. I
 Ia. Scapes erect; petals narrowly lanceolate, acute, about as wide as the sepals. *S. saccatus*
 Ib. Scapes pendent; petals elliptic or ovate-elliptic, markedly wider than the sepals. *S. latipetalus*

Scelochilus brevis Schltr. Fedde Repert. 10: 391. 1912; Mansf. Fedde Repert. Beih. 58: t. 54, nr. 214. 1930.

NEOKOEHLERIA

paniculata C. Schweinf.

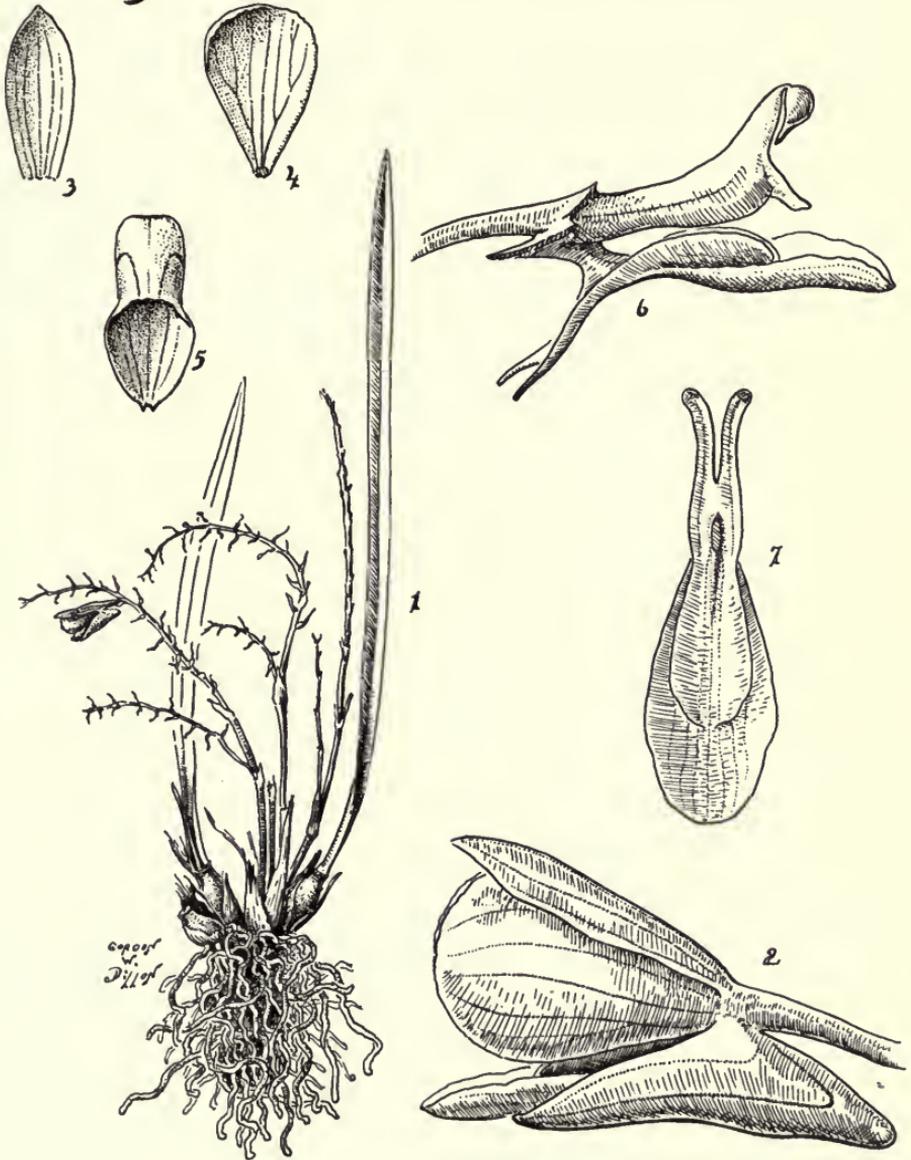


FIG. 157. *Neokoehleria paniculata* C. Schweinf. 1, plant; $\times 1$. 2, flower from side; $\times 8$. 3, dorsal sepal; $\times 4$. 4, petal; $\times 4$. 5, lateral sepals; $\times 4$. 6, lip and column from side; $\times 8$. 7, lip from above; $\times 8$.

Plant epiphytic, relatively small, about 6 cm. or less tall. Rhizome strongly abbreviated. Pseudobulbs apparently approximate, oblong-cylindric, unifoliate, up to 1.5 cm. long. Leaf oval or oblong-elliptic, acute, apiculate, cuneate-narrowed to a more or less petioled base, 3.4–4.4 cm. long, up to 1.5 cm. wide, coriaceous. Inflorescence short, about 3 cm. long, strictly and densely paniced with 1-flowered branches. Floral bracts elliptic or oblong-elliptic, acuminate. Flowers small, apparently successive, campanulate. Dorsal sepal ovate, subacute, concave, about 7 mm. long and 3 mm. wide. Lateral sepals connate into an ovate-oblong ("oblong"), acute, bidentate, concave lamina which is slightly longer than the dorsal sepal, produced at the base into a sac which is oblong-cylindric, incurved, broadly obtuse or retuse and about 5 mm. long. Petals distinctly longer than the dorsal sepal, falcate, spatulate-oblong, rounded at the apex, with a band of scattered, stipitate papillae through the middle within. Lip oblong-cuneate, emarginate at the broadly rounded apex, about 1.2 cm. long and 4 mm. wide above, extended at the base into a pair of short, retrorse appendages about 1 mm. long; disc above the middle with 2 short, parallel, linear keels which are diverging and ascending in front and with a small lamella near the base. Column slender, strongly clavate above, about 4 mm. long.

Junín: Chanchamayo Valley, Río Blanco, Hacienda Sta. Teresa, about 1500 meters, on coffee trees, *Köhler s.n.*

No specimen of this species was available.

Scelochilus latipetalus C. Schweinf. Am. Orch. Soc. Bull. 13: 306, t., 1945. Figure 158.

Plant medium-sized, apparently epiphytic, with an abbreviated rhizome. Pseudobulb oblong-cylindric, unifoliate, about 3 cm. high. Leaf elliptic-oblong, acute, cuneate at the sessile base, about 11.5 cm. long and 2.4 cm. wide, thickly coriaceous. Inflorescences lateral, basal or issuing from near the base of the pseudobulb, pendulous, the two in the type very unequal; peduncle up to 19 cm. long, bearing numerous, slender, appressed sheaths which are more or less separated above, and larger and imbricating below; raceme flexuous, very loosely about 10-flowered, rachis about 9 cm. or less long. Floral bracts spreading, narrowly lanceolate. Flowers campanulate, membranaceous. Dorsal sepal strongly concave, when expanded elliptic-oblong, apiculate at the rounded apex, about 10.2 mm. long and 5.8 mm. wide, dorsally carinate. Lateral sepals connate into an oblong lamina which is sharply bidentate near the apex, bicarinate without, extended into a spur below; free portion about 14 mm. long and 4.9 mm. wide; spur short, incurved, dorsally sulcate, apically retuse, about 5 mm. long. Petals elliptic or ovate-elliptic, abruptly contracted above into an ovate-rounded, minutely apiculate, recurved apex, somewhat longer and wider than the dorsal sepal. Lip complex, long-clawed, abruptly inflexed above, slightly exceeding the rest of the perianth, extended into a pair of short spurs at the base; claw narrowly linear, about 9 mm. long, slightly above the middle with a pair of erect, small lobules which are falcate-oblong, intramarginal and recurved; apical part abruptly obcordate with reduplicate halves, broadly retuse and apiculate, about 5 mm. long and 6 mm. wide when expanded; just below, at the flexure, a pair of small, erect-incurved, obliquely semiorbicular-flabellate lobules; spurs linear-lanceolate,

SCELOCHILUS

latipetalus C. Schweinf.

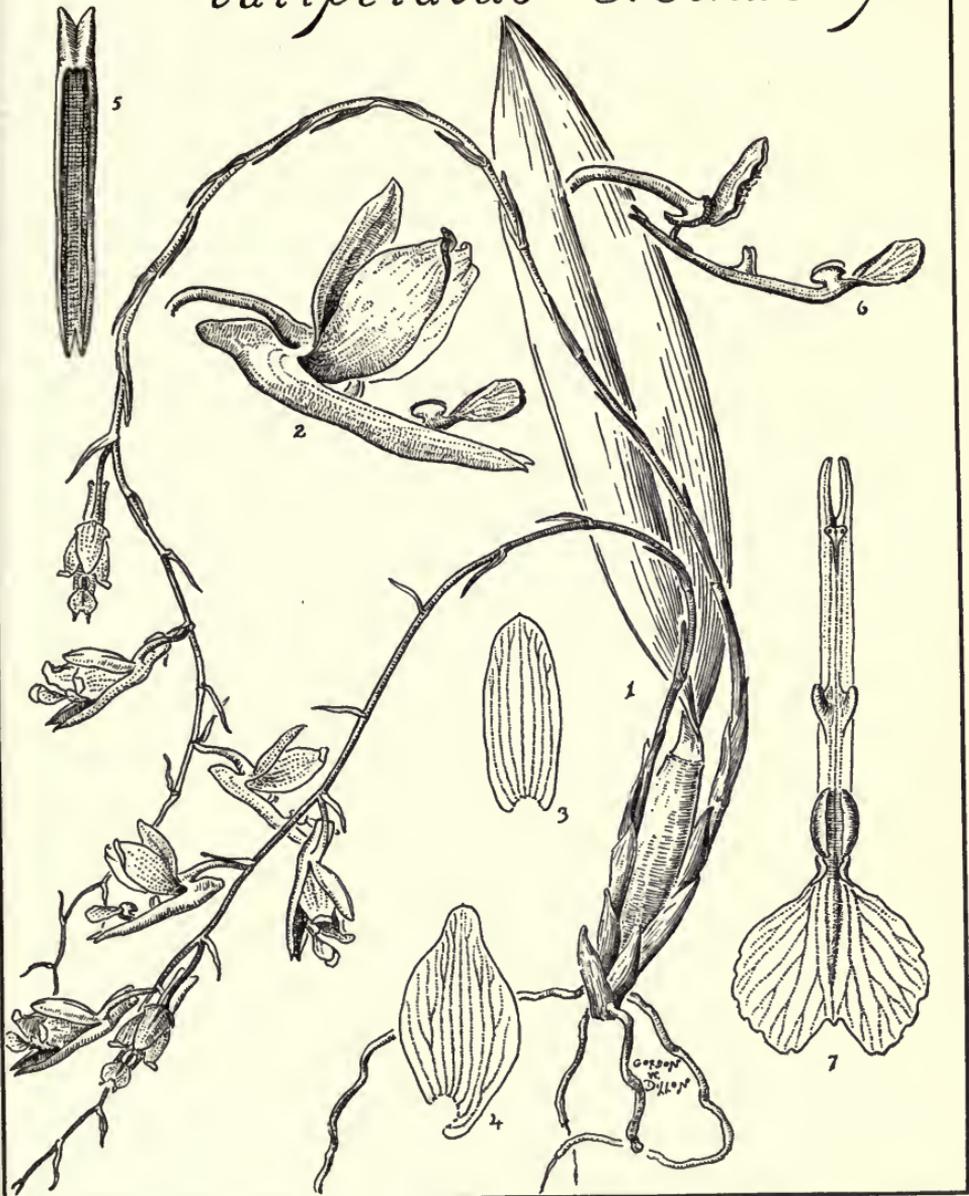


FIG. 158. *Scelochilus latipetalus* C. Schweinf. 1, plant; $\times \frac{4}{5}$. 2, flower from side; $\times 2$. 3, dorsal sepal, spread out; $\times 2$. 4, petal, spread out; $\times 2$. 5, lateral sepals, natural position; $\times 2$. 6, lip and column from side, natural position; $\times 2$. 7, lip from above, expanded; $\times 4$.

about 2.3 mm. long. Column small, about 5.8 mm. high at the back, slightly dilated on each side below and above, with a concave, pilose, inner face.

Junín: Chanchamayo Valley, 1200 meters, *Schunke s.n.*

Scelochilus saccatus (Poepp. & Endl.) Reichb. f. Walp. Ann. 6: 689. 1863; Cogn. Martius Fl. Bras. 3, pt. 6: 179. 1904. *Comparettia saccata* Poepp. & Endl. Nov. Gen. ac Sp. 1: 42, t. 72. 1836.

Plant medium-sized, epiphytic, with an abbreviated rhizome. Pseudobulbs aggregated, cylindrical ("narrowly ligulate"), unifoliate, 2–2.5 cm. tall, clothed with several unequal, oblong-lanceolate, acuminate sheaths. Leaves oblong-lanceolate or lanceolate-elliptic, shortly acuminate, narrowed below into a rather short, sulcate petiole, 15–17 cm. long, 3–4 cm. wide, fleshy-coriaceous. Inflorescences lateral, basal, erect, distinctly surpassing the leaves, simple or somewhat branched, 24–30 cm. tall, adorned below with several long, acuminate, remote sheaths, rather loosely several-flowered above. Floral bracts linear-lanceolate, acuminate, concave. Flowers rather small, campanulate. Sepals somewhat concave, straw-color. Dorsal sepal oblong-linear or linear-ligulate, strongly acute, dorsally carinate, about 10 mm. long, 2–2.5 mm. wide near the base. Lateral sepals connate into a narrow lamina similar to the dorsal sepal but slightly longer, bidentate at the apex, produced at the base into a short sac which is oblong-subglobose and somewhat divided or lobulate at the apex. Petals narrowly lanceolate, acute, rose-color, slightly shorter than the dorsal sepal. Lip about equaling the lateral sepals, produced at the base into a pair of short, linear-oblong horns; claw long, narrow, cuneate-linear, 7–8 mm. long; lamina deflexed, deeply 3-lobed; lateral lobes small, erect, dentiform, linear-falcate; mid-lobe obcordate-reniform, lightly retuse, 3–4 mm. long and wide; disc with a pair of diverging horns. Column rather long and slender, lightly dilated in the middle, 6–7 mm. long.

Huánuco: Near Pampayaco (Pampayacu) and Cuchero (Cochero), *Poeppig 1762*.

No example of this orchid was accessible.

COMPARETTIA Poepp. & Endl.

A small genus of attractive and graceful American epiphytes extending from Peru, Bolivia and Brazil northward through Central America to Mexico and the West Indies.

Plants small to large. Stems more or less short, thickened into sometimes aggregated, 1-leaved pseudobulbs which are surrounded by 2 or more distichous, often leaf-bearing sheaths. Leaves narrowly oblong to elliptic, coriaceous, duplicative. Scapes lateral, basal, simple or branched, few- to many-flowered. Flowers medium-sized to large. Sepals about equally long, erect-spreading. Dorsal sepal concave, free. Lateral sepals connate into a concave lamina, produced at the base into a long, narrow, more or less curved spur. Petals similar to the sepals, lightly oblique, commonly more or less broader than the dorsal sepal. Lip larger than the rest of the perianth, 3-lobed or subpandurate with the apex much wider than the basal portion and retuse, extended at the base into a pair of linear horns

which are concealed within the sepaline spur; disc usually callose or carinate below. Column small, stout, wingless, footless. Anther terminal, opercular, incumbent; pollinia 2, broadly ovoid, sulcate.

- A1. Petals obovate, or ovate-elliptic, obtuse to subacute; disc of the lip naked or with one elevation near the base *C. falcata*
 A2. Petals ovate, strongly oblique and dilated below in front, acuminate; disc of the lip bicarinate near the base *C. peruviana*

Comparettia falcata Poepp. & Endl. Nov. Gen. ac Sp. 1: 42, t. 73. 1836; Hook. Bot. Mag. 83: t. 4980. 1857; Cogn. Martius Fl. Bras. 3, pt. 6: 181, t. 42, fig. 1. 1904; Ames & Correll, Orch. Guat. 601, fig. 172. 1953. Figure 159.

Plant medium-sized, very variable vegetatively. Rhizome abbreviated. Pseudobulbs caespitose, oblong-cylindric, somewhat compressed, unifoliate at the apex, 1-4 cm. high, invested (together with the base of the scape) by 1 or more pairs of distichous, imbricating, often leaf-bearing sheaths. Leaves elliptic to oblong (rarely oval or obovate-oblong), acute to broadly rounded at the apex, cuneate at the sessile, complicate base, 2.7-18 cm. long, 1-5 cm. wide, thickly coriaceous. Scape lateral, basal, much surpassing the leaves, commonly arcuate to nodding, 5.5-90 cm. long, adorned below with several small, close, tubular sheaths; inflorescence racemose or more rarely paniculate, very loosely 2- to many-flowered. Floral bracts small, spreading, concave. Flowers medium-sized, purple to deep rose-color or pinkish sometimes marked with white, with spreading segments. Dorsal sepal oblong-ovate to elliptic, acute, concave, up to 10 mm. long and 5 mm. wide. Lateral sepals connate into an ovate-oblong, deeply concave, entire or bidentate lamina which is commonly somewhat larger than the dorsal sepal, extended at the base into a slender, linear-cylindric, curved spur up to 15 mm. long. Petals narrowly obovate or elliptic-ovate, obtuse to subacute, somewhat oblique, commonly distinctly larger than the dorsal sepal. Lip surpassing the rest of the perianth, broadly obcordate in outline, 3-lobed, about 12-17 mm. long and 11 mm. wide; produced into a pair of capillary spurs 7-10 mm. long concealed within the sepaline spur; lateral lobes basal, relatively very small, auriculiform, broadly semiovate; mid-lobe large, reniform-semiorbicular, deeply and narrowly emarginate in front, very broadly cuneate to cordate at the base; disc naked or with a central, callose keel at the base. Column small, stout, clavate, about 4-5 mm. high.

Peru: Habitat?, *Mathews 1815*.—Huánuco: Near Cuchero (Cochero) and between Cassapi and Pampayaco (Pampayacu), epiphyte, *Poeppig 1646* (type). Also Mexico and Central America, the West Indies, Venezuela and Colombia to Brazil, Bolivia and Peru.

Comparettia peruviana Schltr. Fedde Repert. 10: 389. 1912; Mansf. Fedde Repert. Beih. 58: t. 53, nr. 212. 1930.

Plant rather large, erect. Rhizome much abbreviated. Pseudobulbs narrowly oblong-cylindric, unifoliate, deeply striate-rugose in the dried specimen, about 4.5 cm. long, surounded (together with the base of the scape) by 1 or 2 pairs of



FIG. 159. *Comparettia falcata* Poepp. & Endl. 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; $\times 3$.

distichous, imbricating sheaths which are sometimes leaf-bearing. Leaves lanceolate-oblong to ligulate, subacute to obtuse, cuneate at the sessile, complicate base, 9.5–15 cm. long, about 2 cm. wide, coriaceous. Scape erect, much exceeding the leaf, paniculate above; peduncle rather slender, provided with several remote, small, appressed, clasping sheaths, about 33.5 cm. long; panicle loose, with erect-spreading, laxly several-flowered branches, about 20 cm. long. Floral bracts spreading, concave, ovate, acute, small. Flowers similar to those of *C. coccinea* Lindl., membranaceous. Dorsal sepal ovate, sharply acute, strongly concave, about 7 mm. long and 3.3 mm. wide. Lateral sepals connate into a broadly elliptic-ovate, subacute lamina which is deeply concave and about equally long with the dorsal sepal but markedly broader, produced below into a filiform-cylindric, strongly curved spur about 1.3 cm. long. Petals obliquely ovate, short-acuminate, about equally long with the sepals but wider than the dorsal one. Lip surpassing the other segments, about 9 mm. long, broadly orbicordate in outline when expanded, pandurate-trilobed, produced at the base into a pair of narrowly linear appendages about 10 mm. long; lateral lobes basal, relatively very small, broadly semielliptic; mid-lobe much larger, very broadly elliptic-reniform, strongly emarginate and apiculate, with denticulate margins, about 1.2 cm. wide; disc with a pair of semiovate lamellae near the apex of the basal portion. Column slender, clavate, rather long, without appendage.

Junín: Chanchamayo Valley, Río Blanco, about 1400 meters, epiphyte in woods, *Köhler s.n.*

No material of this concept has been available for study.

SUTRINA Lindl.

An inconspicuous, epiphytic genus so far represented by a single Peruvian species.

Plant small. Rhizome abbreviated. Pseudobulbs clustered, ovoid, unifoliate, rather small. Leaf broad, acute, fleshy. Inflorescence lateral, basal, pendent, subdensely several-flowered nearly to the base. Floral bracts minute, scale-like. Flowers cylindric-campanulate with parallel segments. Sepals subequal, narrow, longitudinally concave, acute or apiculate, with a recurved apex, coriaceous. Dorsal sepal free. Lateral sepals connate nearly to the apex, saccate-concave at the base. Petals similar, acute, membranaceous. Lip almost equally long with the sepals, tubular-concave, oblong-pandurate from a narrow base, adnate to the column without a spur, rounded and erose-cripsed in front. Column shorter than the lip, clavate, footless, with a pair of triangular-lanceolate, upcurved arms at the apex. Anther terminal, opercular, incumbent, imperfectly 2-celled, with a high, semicircular membrane in front; pollinia 2, pyriform, with a linear stipe.

Sutrina bicolor Lindl. Ann. & Mag. Nat. Hist. 10: 185. 1842.
Rodriguezia bicolor (Lindl.) Schltr. Fedde Repert. Beih. 9: 168. 1921.

Plant small, apparently about 14 cm. high including the pendent raceme. Rhizome abbreviated. Pseudobulbs approximate, ovoid, 1-leaved, about 1.5 cm.

or less high. Leaf elliptic ("oval") to lanceolate-ovate, acute, coriaceous, up to 7.6 cm. long, sessile. Inflorescence lateral, at the base of a pseudobulb, pendulous, about 10 cm. long, subdensely about 12-flowered above. Flowers cylindrical-campanulate with parallel segments, about 1.6 cm. long. Sepals oblong or lanceolate-oblong, longitudinally concave, with a recurved apex. Dorsal sepal free. Lateral sepals connate nearly to the apex, concave at the base. Petals similar, slightly shorter and broader than the sepals, acute. Lip nearly as long as the sepals, sessile and adnate to the column at the base without any spur, oblong or pandurate-oblong from a narrower base, tubular-concave, rounded and erose-dentate ("crisped") in front, yellow; disc unicarinate in the middle below. Column shorter than the lip, clavate, with a pair of upcurved, linear-triangular arms at the summit.

Peru: Habitat not recorded, *Mathews s.n.* (type).—Amazonas(?), fide Schlechter, Fedde Repert. Beih. 9: 168. 1921.

While no example of this plant was available, the Ames Herbarium contains an excellent pen drawing with floral analysis from the Lindley Herbarium.

TRIZEUXIS Lindl.

But one member of this very small (probably monotypic) genus occurs in Peru. This delicate little epiphyte, which was first found in Trinidad, appears in Central America (in Costa Rica and Panama) and is recorded in South America from Colombia and Venezuela to Brazil, Ecuador and Bolivia.

Plants epiphytic, minute to medium-sized, with an abbreviated rhizome. Pseudobulbs caespitose, oblong-cylindric or ellipsoid, strongly complanate, unifoliate, surrounded by 1 to several pairs of distichous, conduplicate, mostly leaf-bearing sheaths. Leaves linear to linear-lanceolate, equitant, often falcate. Inflorescences lateral, basal, axillary, loosely spreading-paniculate above, commonly surpassing the leaves. Flowers minute, capitate or densely racemose at the ends of the branches. Sepals about equally long, oblong. Dorsal sepal free, deeply concave, geniculate-fornicate. Lateral sepals deeply connate. Petals obliquely ovate, broader than the sepals. Lip free, a little longer than the sepals, lightly 3-lobed above the middle; lateral lobes erect; mid-lobe ovate-oblong, acute or obtuse, recurved. Column very short, wingless, footless. Anther terminal, opercular, incumbent; pollinia 2, oblong-pyriform.

Trizeuxis falcata Lindl. Collect. Bot. t. 2. 1823; Hook. Exot. Fl. 2: t. 126. 1824; Cogn. Martius Fl. Bras. 3, pt. 6: 195, t. 42, fig. 2. 1904; Cogn. Urban Symb. Antill. 6: 627. 1910. *Trizeuxis andina* Schltr. Fedde Repert. Beih. 10: 52. 1922; Mansf. Fedde Repert. Beih. 57: t. 141, nr. 552. 1929.

Plant small to medium-sized, epiphytic, 3–25 cm. high. Pseudobulbs small, aggregated, strongly complanate, oblong-cylindric to ellipsoid, unifoliate, about 2 cm. or less high, surrounded and often concealed by 1 or more pairs of distichous,

imbricating sheaths of which the upper ones are leaf-bearing. Leaves equitant, linear to linear-lanceolate or elliptic-linear, often falcate in the dried plant, acute, commonly more or less narrowed below, up to 10.5 (rarely 13) cm. long and 10 mm. wide. Inflorescences lateral, basal, axillary, usually more or less surpassing the leaves, paniculate above; peduncle with several remote, small, appressed sheaths; panicle loose, spreading, with the flowers disposed at the ends of the branches either in capitate clusters or in abbreviated racemes. Floral bracts minute, approximate and almost imbricated. Flowers minute, subglobose, white, greenish or yellow, with an orange lip. Sepals and petals membranaceous. Dorsal sepal oblong or oblong-ovate, geniculate-fornicate and deeply concave, obtuse, up to about 2.2 mm. long, and 2 mm. wide when expanded. Lateral sepals subequally long, connate into a longitudinally concave, obovate-oblong lamina which is divided well above the middle into 2 ovate-rounded lobules. Petals broadly ovate, very oblique, obtuse, a little shorter and wider than the sepals. Lip erect and parallel to the column in natural position, linear-lanceolate or elliptic-linear, slightly exceeding the sepals, lightly 3-lobed above the middle, with the mid-lobe recurved, up to about 2.9 mm. long and 1 mm. wide when expanded; lateral lobes shallow, fleshy, erect; mid-lobe ovate-oblong or triangular-ovate, obtuse or subacute; disc obscurely bicallose below. Column minute, very stout, clavate, footless, about one fourth to one third as long as the lip.

Junín: Chanchamayo Valley, 1400 meters, *Schunke 1130*. Schunke Hacienda, above San Ramón, 1300–1700 meters, in dense forest, *Schunke A 60*.—Loreto: Upper Río Ucayali, about 225 meters, epiphyte in cow pasture, *Tessmann 3320*.—San Martín: Moyobamba (environs), 860 meters, *Scolnik 1206a*. San Roque, 1350–1500 meters, forest epiphyte, *Williams 7270, 7357*. The following three collections have too immature flowers for exact determination, but they appear to represent this species.—Junín: Chanchamayo Valley, 1500 meters, *Schunke 1153, 1208*. Río Paucartambo Valley, near Perene Bridge, 700 meters, *Killip & Smith 25251*. Also occurs in Costa Rica and Panama, Trinidad (type of *T. falcata*), Colombia, Venezuela, British Guiana, Brazil, Bolivia (type of *T. andina*) and Ecuador.

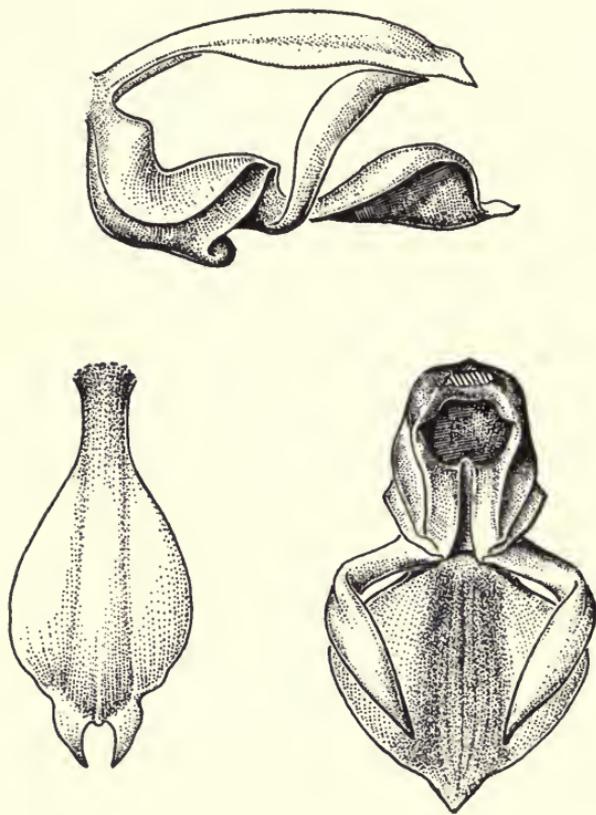


FIG. 160. *Stanhopea Wardii*. Top, column and lip, side view ($\times 1$); lower left, column, dorsal view ($\times 1$); lower right, lip, from above ($\times 1$).





UNIVERSITY OF ILLINOIS-URBANA

580.5FB C001
FIELDIANA, BOTANY\$CHICAGO
30



3 0112 009379121