

ORCHIDS OF ECUADOR: *STANHOPEA*

C. H. Dodson*

The genus *Stanhopea* Frost ex Hook. contains approximately 42 species, only five of which had been reported from Ecuador. The present account raises the total for Ecuador to eleven. Three new species are described.

Epiphytic herbs with ovoid or subcylindrical, unifoliate, dark green pseudobulbs with dry scarios bracts surrounding the base. Leaves plicate with several pronounced longitudinal nerves, elliptic to narrowly elliptic, petiolate. Inflorescences racemose, pendant, 2- to 15-flowered, arising at the base of the pseudobulbs; peduncle surrounded by loose spathaceous sheaths. Flowers generally large and showy, the pedicels concealed by large, spathaceous floral bracts. Dorsal sepal coriaceous, erect, ovate, acute to apiculate at the apex, concave, free, lateral sepals larger, connate at the lower margin, adnate to the lip, obliquely ovate, acute at the apex, usually reflexed. Petals narrower and less coriaceous than the sepals, usually strongly reflexed between the sepals, acute at the apex. Lip adnate to or continuous with the base of the column, thick and fleshy, usually divided into a saccate, inflated hypochile, a mesochile with elongate horns on each side, and a flattened cordate epichile, the edges of the hypochile infolded at their apex and produced into plates on each side, plates usually well defined, consisting of median plates running from the base of the hypochile to the apex, ventral plates short, located under the apex of the median plates, dorsal plates located at the apex of the hypochile, usually short and broad with an open or closed canal between them. Column elongate, usually broadly winged at the margins and with a small triangular ear on each side of the anther; rostellum spine-like. Anther terminal, operculate. Pollinia 2, narrowly obovate, waxy, mounted on an elongate cylindrical stipe which is articulated with a cordate viscidium.

The showy flowers make the species highly desirable as horticultural specimens. Unfortunately, the flowers are not long lasting. About 43 species are found at lower and intermediate elevations in humid areas in most of the neotropics. All are pollinated by euglossine bees.

The number and size of the flowers vary with the condition of the plant. Measurements given throughout the description are of intermediate-sized flowers. Variation in overall size of parts should be expected, but relative dimensions remain the same.

KEY TO THE SPECIES OF *Stanhopea* IN ECUADOR

- A. Epichile of the lip not articulated with the hypochile; lip divided into a hypochile and an epichile 1. *S. annulata*
- AA. Epichile of the lip articulated with the hypochile; lip divided into a hypochile, a mesochile, and an epichile.
 - B. Mesochile of the lip without horns, small horns present at the base of the hypochile 2. *S. candida*
 - BB. Mesochile of the lip with conspicuous horns, small horns lacking at the base of the hypochile.
 - C. Hypochile adnate to the column for one-third of its length 3. *S. connata*
 - CC. Hypochile free from the column or at most inconspicuously joined to it.

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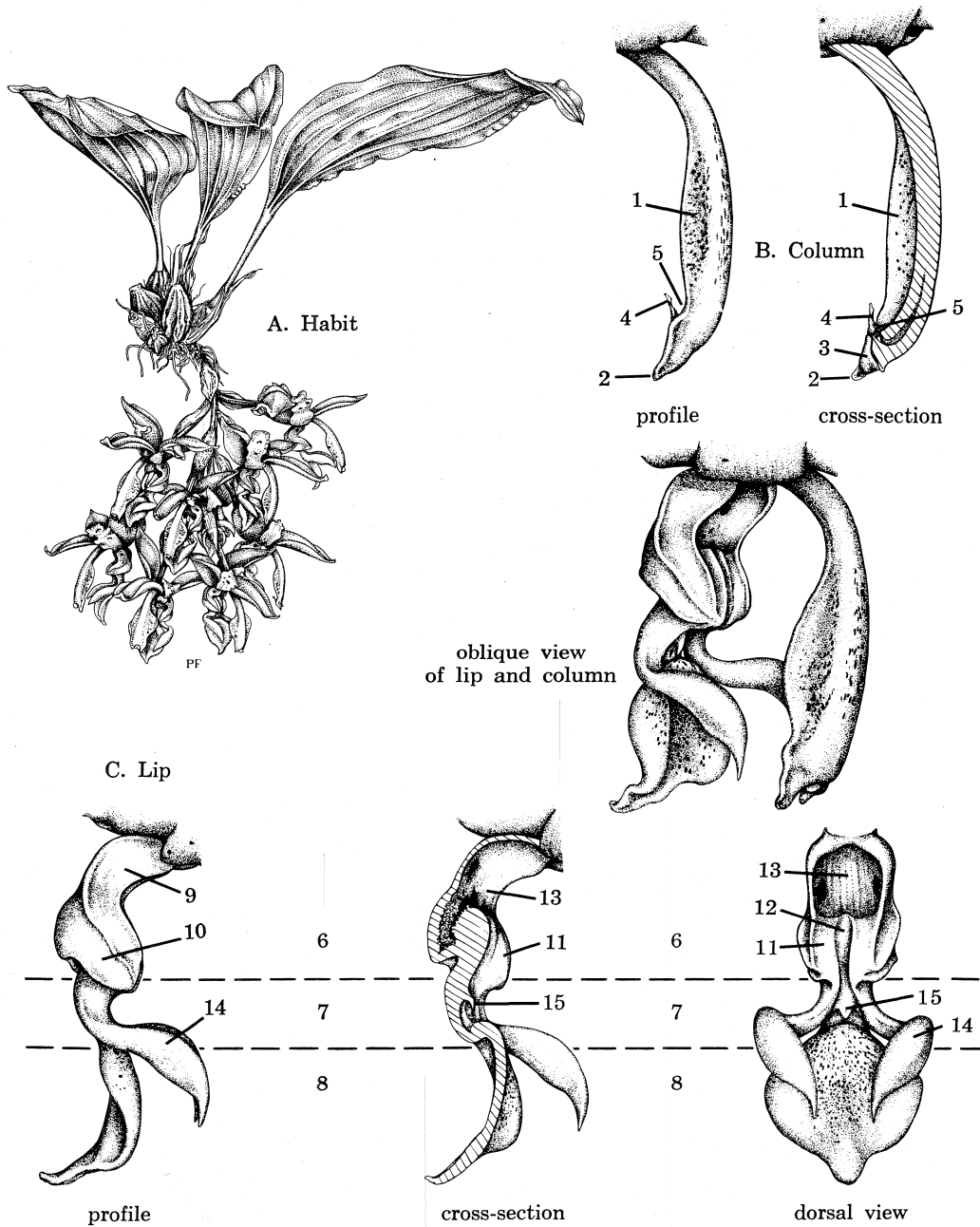


FIGURE 1.

MORPHOLOGY OF THE LIP AND COLUMN OF A REPRESENTATIVE *Stanhopea* FLOWER

A. Plant habit

B. Column

C. Lip

- 1. wings
- 2. ears
- 3. anther
- 4. rostellum
- 5. stigma

- 6. hypochile
- 9. median plate
- 10. ventral plate
- 11. dorsal plate
- 12. canal
- 13. cavity

- 7. mesochile
- 14. horns
- 15. auricle
- 8. epichile

- D. Projection from the center of the mesochile conspicuous and horn-like; petals erect on each side of the column 4. *S. tricornis*
- DD. Projection from the center of the mesochile inconspicuous, or lacking; petals reflexed.
- E. Horns of the mesochile broad and flattened 5. *S. napoensis*
- EE. Horns of the mesochile essentially round, at most only slightly flattened.
- F. Apex of the epichile apiculate and deflexed conspicuously, hypochile sharply geniculate in the middle in profile; flowers small (lip less than 4 cm long) 6. *S. anfracta*
- FF. Apex of the epichile apiculate to acute but never deflected, hypochile not sharply geniculate; flowers medium to large (lip more than 5 cm long).
- G. Lateral edges of the hypochile deeply impressed at the midpoint, apical portions of the dorsal plates of the hypochile very broadly expanded 7. *S. impressa*
- GG. Lateral edges of the hypochile not impressed at the mid-point, apical portions of the dorsal plates of the hypochile not conspicuously expanded.
- H. Hypochile distinctly L-shaped from a lateral view, hypochile concave on underside 8. *S. florida*
- HH. Hypochile quadrate or semi-ovate from a lateral view but not L-shaped, saccate on underside.
- I. Hypochile more than twice as long as broad from a dorsal view 9. *S. jenishiana*
- II. Hypochile about as broad as long from a dorsal view.
- J. Hypochile narrower at the apex from a dorsal view, channel between the front plates of the hypochile narrowing toward the apex; flowers straw-colored, blotched with red-brown 10. *S. frymirei*

JJ. Hypochile as broad at the base as at the apex from a dorsal view, channel between the front plates of the hypochile equal in width at the base and at the apex; flowers pale yellow to white, base of hypochile orange, very little red spotting on flower 11. *S. embreei*

1. *Stanhopea annulata* Mansf., Orchis 16:19. 1938.

Plant typical of genus. Inflorescence 2-flowered. Flowers small for genus; pale orange with red spotting at the base of the lip. Dorsal sepal elliptic, 3.5 cm long, 2 cm broad; lateral sepals 3.5 cm long, 2.4 cm broad. Petals reflexed at the midpoint, margins flattened, narrowly elliptic, 3 cm long, 1.3 cm broad. Lip not clearly divided into two parts, 2.5 cm long; the hypochile 7 mm long, 7 mm broad, 1 cm deep, transversely elliptic in profile with a raised, fleshy ring encircling the hypochile at the center, 1 mm broad, apex of the hypochile at the junction with the epichile formed into a broadly rhombic plate (from a dorsal view), 6 mm long which overhangs the epichile, the epichile connected to the apex of the hypochile, 5 mm wide broadly rhombic, apiculate, margins flattened, apex acute, 1.5 cm long, 1.3 cm broad. Column short, erect, transversely rhombic in cross section at the base, narrowly winged for the apical one third, 1.3 cm long, 8 mm broad across the wings, wings broadly obtrullate, ears 1 mm long, shallowly, triangular. (Figure 2A.)

ECUADOR: Los Rios: Near Quevedo along river, *Lehmann s.n.* (W); Rio Palenque Biological Station, in trees along river, alt. 220 m, *Dodson 5250* (SEL). IMBABURA: Lower Intag Valley, Playa Luisa Below Magnolia, alt. 3200 ft., *W. B. Drew E-673* (A). PICHINCHA: Rio Baba, 28 km south of Santo Domingo, alt. 350 m, 15 May 1962, *Dodson and Thien 2166* (SEL: NEOTYPE; HOLOTYPE at B destroyed, *H. Schulze-Rhonhof 373*); Rio Baba, 10 km south of Santo Domingo, alt. 500 m, 15 June - 26 July 1967, *Dodson, Williams and Adams 3745 and 3834* (SEL). Also Colombia.

This is a common species in trees overhanging rivers at elevations from 100-600 meters on the west side of the Andes in northern Ecuador and southern Colombia. It has the smallest flowers of the Ecuadorian Stanhopeas. It is pollinated by *Euglossa granti* Cheesman. Rare hybrids are encountered between *S. annulata* and *S. impressa*.

2. *Stanhopea candida* Barb. Rodr., Gen. Sp. Orch. Pl. 1:101. 1877.

Stanhopea randii Rolfe., Kew Bull. 363. 1894

Plant typical of the genus. Inflorescence 2- to 5-flowered. Flowers white with faint flecks of red at the base of the lip. Dorsal sepal 4 cm long, 2.3 cm broad; lateral sepals 4.5 cm long, 2.5 cm broad. Petal margins flattened, narrowly ovate, 3.7 cm long, 1.1 cm broad. Lip 3.8 cm long, composed of 3 parts: hypochile 2 cm long, 9 mm broad, 6 mm deep, rectangular in profile, median plate long and narrow, 2 cm long, 1 mm broad, developed

into short, stout, erect curved horns on each side at the juncture with the column, 5 mm long, 2 mm broad, 1 mm thick, mouth of the cavity of the hypochile a slender transverse slot between the horns, ventral plate on each side of hypochile shallowly triangular, 2 cm long, 3 mm broad, joined with the median and dorsal plates at their apex, hypochile oblong from the dorsal view, dorsal plates fused into a triangular platform 1.2 cm long, 6 mm broad at the base; no canal in the mesochile, no auricle; epichile articulated with the lower apex of the hypochile, triangular, depressed, margins flat, 1.1 cm long, 1 cm broad at the base. Column elongate, arcuate, depressed, shallowly triangular in cross section at the base, broadly winged for the apical third, 3.6 cm long, 9 mm broad across the rhombic wings. (Figure 2B.)

ECUADOR: NAPO: Zatsayacu on Rio Napo, alt. 400-500 m, *Mexia 7066a* (US). Also Colombia, Venezuela, Brazil (type), and Pedu.

This species occurs throughout the upper drainage region of the Amazon at elevations of 100-600 m. It is pollinated by *Euglossa chlorosoma* Cockerell.

3. ***Stanhopea connata*** Kl., Allg. Gartenzeitung 22:226. 1854.

Stanhopea graveolens Kl. ex Rchb.f., Xenia Orch. 1:118. 1855.

Plant typical of the genus. Inflorescence 2- to 5-flowered. Flowers of average size for the genus, very showy; sepals and petals orange specked or spotted with dark red, basal portion of the lip dark red, column and apical half of the lip orange. Dorsal sepal 5.6 cm long, 4.1 cm broad; lateral sepals slightly reflexed, 6.3 cm long, 5.3 cm broad. Petals slightly reflexed between the dorsal and lateral sepals, margins slightly undulate, ovate, 4.5 cm long, 3.4 cm broad. Lip 4.3 cm long, composed of 3 parts: hypochile 1.1 cm long, 3.3 cm broad, 2.3 cm deep, transversely broadly elliptical in profile, median plates slightly broader in the middle, 1.5 cm long, 9 mm broad, dorsal plates obliquely triangular, united with the column for the basal half, 1 cm long, 8 mm broad, hypochile transversely elliptic from the dorsal view, canal 8 mm broad, no auricle, opening of the hypochile oblong, 1 cm wide, apex of the hypochile 2.6 cm broad across the dorsal plates; mesochile very short, articulated with the apex of the hypochile, 5 mm long, 1.7 cm broad, lateral margins forming short, thick, slightly curved horns, 2.5 cm long, 1 cm broad, 1 cm thick; epichile articulated with the apex of the mesochile, very broadly trullate, apiculate, margins flattened, apex slightly recurved, 2 cm long, 2.4 cm broad. Column short, erect, 3 cm long, partially adnate to the hypochile for the basal 6 mm, transversely broadly rhombic in cross section at the base and towards the apex, 1.5 cm broad across the thick, narrow, broadly rhombic wings. (Figure 2C.)

ECUADOR: TUNGURAHUA: Rio San Francisco, km 35 Baños-Puyo, *Dodson 2605* (SEL). **PASTAZA:** Rio Topo, km 45 Baños to Puyo, alt. 1100 m, *Dodson 2069* and *2312* (SEL). Rio Topo, alt. 100 m *Horich s.n.* (Mo); Llangana, *Tistop o Zundales 423* (SEL); Rio Pastaza, alt. 1700 m, *Lehmann s.n.* (W); Rio Pastaza, *Lehmann 47* (W); **ZAMORA-CHINCHIPE:** road Loja, to Zamora, km 50, alt. 1100 m, *Dodson 2460* (SEL); Near Zamora, *Lehmann 771* (K). Also Colombia and Peru.

This beautiful species is rarely seen in cultivation. It occurs in a narrow elevational band on the eastern slopes of the Andes from Colombia to Northern Peru. Pollinated by *Eulaema speciosa* Mocsary.

A

B

C

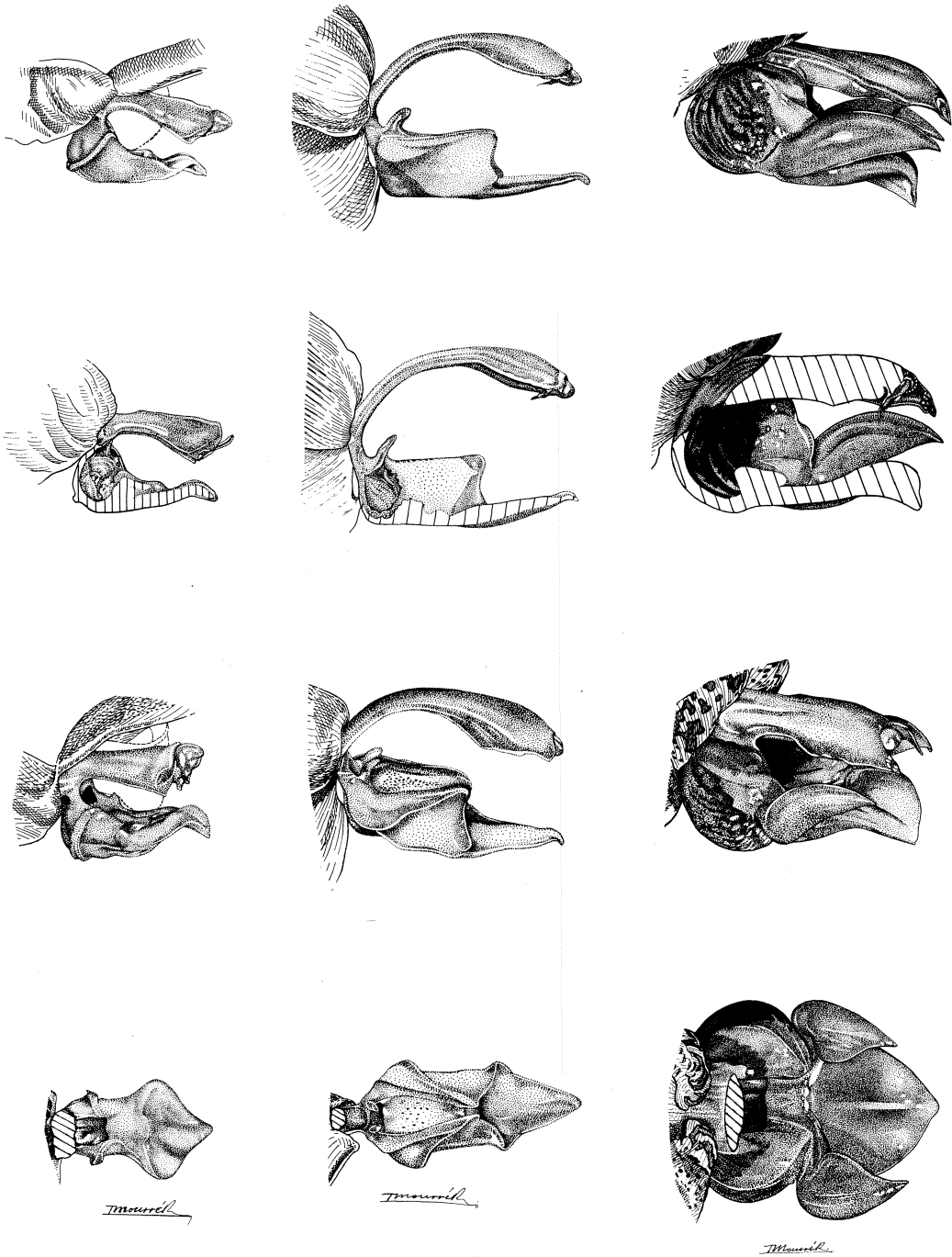


FIGURE 2.

A. *Stanhopea annulata*

B. *S. candida*

C. *S. connata*

4. ***Stanhopea tricornis*** Lindl., Hort. Soc. London 4:263. 1849.
Stanhopea wallisii Rehb.f., Linnaea 41:109. 1877.
Stanhopea stenochila Lehm. & Kranzl., Gard. Chron. 369. 1900.
Stanhopea langlasseana Cogn., Gard. Chron. 426. 1901.
Stanhopea convulata Rolfe, Kew Bull. 366. 1909.

Plant typical of the genus. Inflorescence 2-flowered. Flowers of average size for the genus; sepals, petals and lip ivory white, base of the petals and lip flecked with red. Dorsal sepal 5.5 cm long, 3.2 cm broad; lateral sepals 5.5 cm long, 3.2 cm broad. Petals erect alongside the column and lip, obliquely elliptic, margins flat, acute at the apex, 4.5 cm long, 3.4 cm broad. Lip 4.2 cm long, composed of 3 parts: hypochile 1.2 cm long, 2 cm broad, 1.5 cm deep, elliptic in profile, broadly ovate from the dorsal view, median plate extremely narrow, incurved at the edge, 1.4 cm long, 0.5 mm broad, extending at the apical margins into horns, no ventral plate, dorsal plate not distinguishable, canal very broad, slightly open at the base; mesochile connected directly to the apex of the hypochile and forming a broad plate which terminates in a horn-like triangular auricle 6 mm long, horns of the mesochile short, straight, angular, 1.5 cm. long, 4 mm broad, 3 mm thick; epichile articulated with the apex of the hypochile, rectangular, margin incurved, apiculate, apex slightly inflated, 2 cm long, 1 cm broad. Column elongate, slightly arcuate, depressed ovate in cross section at the base, 4 cm long, 1.4 cm broad, winged for the apical two thirds, wings ovate. (Figure 3A.)

ECUADOR: Los Rios: Near Quevedo in old cacao, alt. 70 m, 20 March, 1960, *Dodson 29 and 54* (SEL); Rio Palenque Biological Station km 56 Quevedo to Santo Domingo, alt. 220 m, *Dodson 5231* (SEL); PICHINCHA: km 102, road Quito to Santo Domingo on road side embankments, alt. 900-1100 m, *Dodson 2603* (SEL); Rio Baba, 28 km south of Santo Domingo, alt. 350 m, 24 Dec. 1961, *Dodson and Thien 1628* (SEL); Rio Baba, 10 km south of Santo Domingo, alt. 400 m, 15 June 1967, *Dodson, Williams and Adams 3701* (SEL); Without location: *Klabock s.n.* (W). COTOPAXI: km 62 on road from Quevedo to Latacunga, alt. 500 m, 28 March 1960, *Dodson 90* (SEL); BOLIVAR: *Lehmann 41* (W); Puente de Chimbo. *Lehmann 6818* (K); CANAR: km 84 on road from Duran to Tambo near Cochencay, alt. 400 m, *Dodson 2604* (SEL); km 84 near Cochencay on road to Tambo, alt. 400 m, *Horich s.n.* (MO). Also Colombia and Peru.

This lovely species is occasionally encountered in horticultural collections. It is the most frequent member of the genus in lowland rainforests along the western slope of the Andes from northern Colombia to northern Peru. The species has invaded cacao plantations and occurs in trees shading coffee. It is pollinated by *Eulaema meriana* Olivier.

5. ***Stanhopea napoensis*** Dodson, sp. nov.

Pseudobulbi aggregati, late ovoidei, subangulati, olivacei, 4-4.5 cm longi, 3.5-4 cm lati, vaginis ovato-lanceolatis subcoriaceis vestiti, monophylli. Folia longe petiolata, elliptico-oblonga, breviter acuminata, plicata, subcoriacea, 20-35 cm longa, 5-10 cm lata; petioli 7-8 cm longi. Scapi axillares, penduli, vaginis elliptico-ovatis concavis subimbricatis vestiti, 2-4-flori; pedicelli 6 cm longi. Flores grandes, speciosi pallide flavi, rubro-maculati. Sepala subconniventia, sepalum posticum elliptico-oblongum, obtusum, concavum, circiter 5.5-6 cm longum, sejala lateralia ovata, obtusa, valde con-

A

B

C

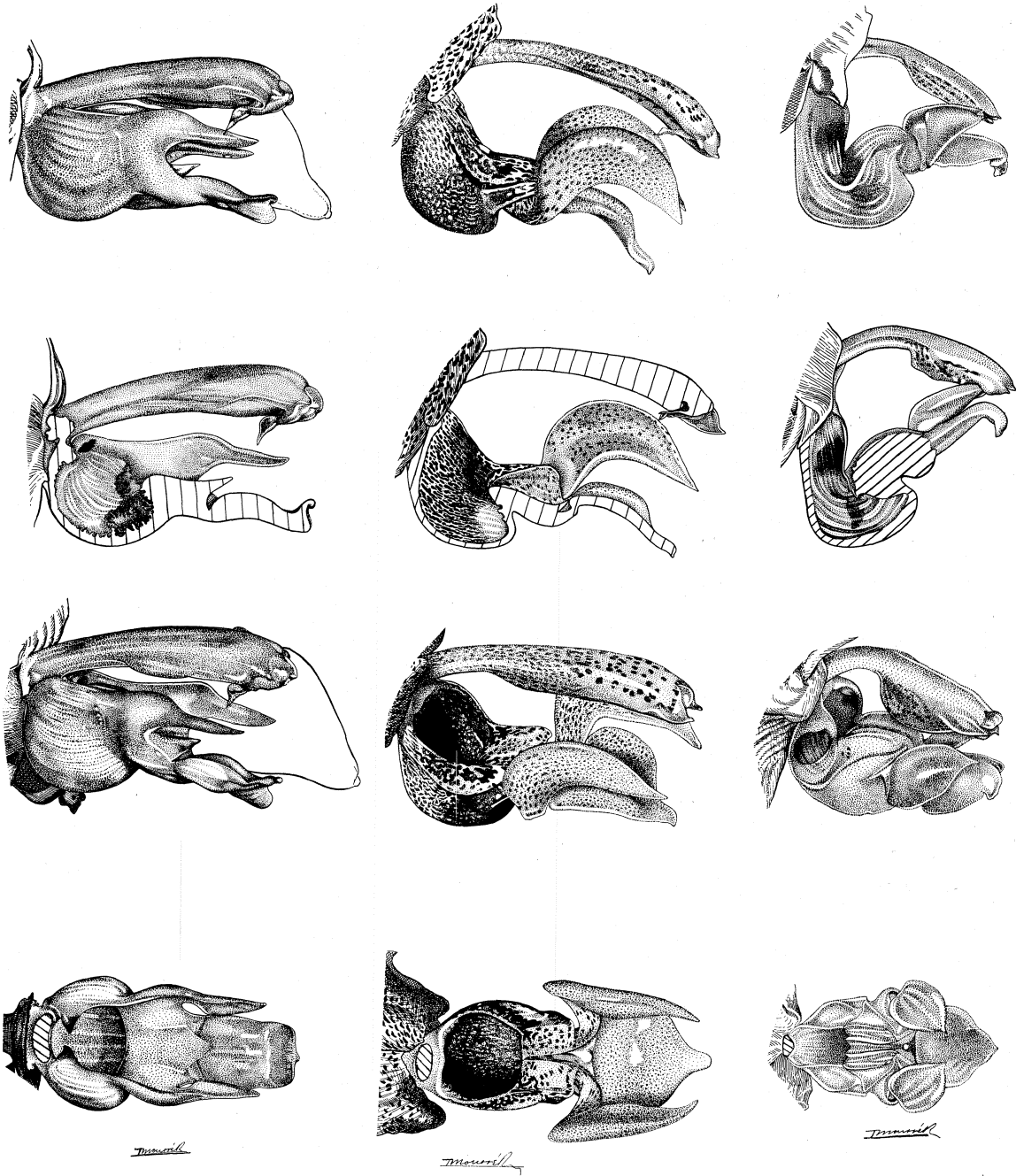


FIGURE 3.

A. *Stanhopea tricornis*

B. *S. napoensis*

C. *S. anfracta*

cava, circiter 5.5-6 cm longa. Petala revoluta, oblonga, obtusa, valde concava, undulata, circiter 4.5-5 cm longa. Labellum carnosum, profunde 3-lobum, circiter 5 cm longum; hypochilum transverse ellipticum, dorsaliter ovatum, late carinatum, canali angustissimo aperto; mesochilum profunde 2-partitum, in cornua valida extensa, cornibus late, complanatis, acuminatis; epichilium articulatatum, ovatum, subobtusum, convexum. Columna subincurva, 4.5 cm longa, supra medium dilatata; pollinia 2; stipes oblongo-liniaris; vicidium cordatum.

Plant typical of the genus. Inflorescence 2- to 4-flowered. Flowers intermediate in size for the genus, very showy, ivory with reddish dots throughout, apex of the hypochile more densely red colored, strongly and oppressively fragrant of Indole. Dorsal sepal 5.5-6 cm long, 3 cm broad; lateral sepals 5.5-6 cm long, 4 cm broad. Petals reflexed and curled between the dorsal and the lateral sepals, margins undulate, narrowly elliptic, acute at the apex, 4.5-5 cm long, 2 cm broad. Lip 5 cm long, composed of 3 parts: hypochile 2.7 cm long, 2 cm broad, 2 cm deep, obliquely transversely ovate in profile, ovate from a dorsal view, median plate narrow, slightly broader in the middle, 2.5 cm long, 4 mm broad, ventral plate 1.2 cm long, 2 mm broad, dorsal plates 1.2 cm long, 5 mm broad, canal between the dorsal plates mostly closed, only open slightly the for apical 3 mm; mesochile short, inserted under the concave apex of the hypochile, 7 mm long, 9 mm broad, lateral margins forming elongate, curved, flattened horns, 2.5 cm long, 1.2 cm broad, 3 mm thick, auricle between the horns appressed, emarginate at the apex; epichile articulated with the apex of the mesochile, broadly ovate, apiculate, margins flattened, apex somewhat recurved, 1.8 cm long, 2.2 cm broad. Column elongate, slightly arcuate, depressed obtrullate in cross section at the base, broadly winged for the apical two thirds, 4.5 cm long, 1.8 cm broad across the wings, wings ovate, 3.5 cm long. (Figure 3B.)

TYPE: *ECUADOR*: NAPO: 3 km below Tena in virgin forest on banks of Rio Masahualli, alt. 400 m, 22 May 1963, *Dodson and Thien 2398* (HOLOTYPE: SEL).

OTHER MATERIAL EXAMINED: *ECUADOR*: NAPO: Near Tena on forested banks of Rio Masahualli, alt. 400 m, *Mexia 7241* (UC, US); Ecuador or Peru without locality, collector unknown (W, herb. no. 23094). Endemic to Ecuador?

This new species with its flattened mesochile horns is reminiscent of *Stanhopea platyceras* Rchb.f. of northern Colombia. However, in *S. platyceras* the hypochile is elongated and boat-shaped, whereas in *S. napoensis* the hypochile is transversely ovate in profile. The species is probably found only in the Napo region of eastern Ecuador. The pollinator is unknown.

6. ***Stanhopea anfracta*** Rolfe, *Orchid Rev.* 12:357. 1904.

Stanhopea wardii Lodd. ex Lindl. var. *venusta* Rolfe, *Lindenia* 7:315. 1892.

Plant typical of the genus. Inflorescence 5- to 12-flowered. Flowers small for the genus; sepals, petals and base of the lip orange, the column and apical half of the lip white, the hypochile of the lip usually with a large red "eye" spot, the rest of the lip and column flecked with red. Dorsal sepal 4 cm long, 2 cm broad; lateral sepals 4.2 cm long, 3 cm broad. Petals reflexed and curled between the dorsal and the lateral sepals, margins undu-

late elliptic, acute at the apex, 3 cm long, 1.4 cm broad. Lip 3.5 cm long, composed of three parts: hypochile 2 cm long, 1.5 cm broad, 2 cm deep, rectangular in profile, rectangular from a dorsal view, deeply geniculate at the mid-point, median plate 3 cm long, 5 cm broad, broadest toward the base, ventral plate 1 cm long, 4 mm broad, dorsal plates 1.3 cm long, 3 mm broad, parallel, canal between the dorsal plates 1 mm broad; mesochile short, inserted under the concave apex of the hypochile, 5 mm long, 5 mm broad, lateral margins forming elongate, curved, slightly flattened horns, 1.8 cm long, 6 mm broad, 4 mm thick, auricle between the horns appressed, triangular, 1 mm long; epichile articulated with the apex of the mesochile, ovate, concave, apiculate, the apicule deflexed, 1.3 cm long, 1 cm broad. Column elongate, arcuate, depressed, obovate in cross-section at the base, broadly winged for the apical third, 3.5 cm long, 1.3 cm broad across the wings, wings elliptical, 1.2 cm long. (Figure 3C.)

ECUADOR: ZAMORA-CHINCHIPE: Along Rio Zamora from town of Zamora to Cumbaratza 15 km down river, alt. 700-1200 m, July and August 1960, *Dodson 135, 150 and 381* (SEL). Without locality: *Lehmann 773* (in part), 788 and *s.n.* (K). Also Peru.

This small flowered species is one of the most attractive in the genus due to the number of flowers produced and the density of the inflorescence. It might be confused with *Stanhopea peruviana* Rolfe if that species were to be found in Ecuador. *Stanhopea peruviana*, however, has a globose hypochile while *S. anfracta* has a strongly geniculate, quadrate hypochile. Both species have small flowers and are found in the eastern slopes of the Andes at moderate elevations to 1000 m. The pollinator is unknown.

7. ***Stanhopea impressa*** Rolfe, Kew Bull. 196. 1898.

Plant typical of the genus. Inflorescence 5- to 7-flowered. Flower size average for the genus; pale yellow to creamy white, the petals sometimes flecked with red near the base, the base of the lip dark yellow to nearly white, flecked or spotted with red. Dorsal sepal 5 cm long, 3 cm broad; lateral sepals 5.5 cm long, 3.6 cm broad. Petals reflexed and curled between the dorsal sepals and lateral sepals, margins undulate, narrowly elliptic, acute at the apex, 5 cm long, 2 cm broad. Lip 4.8 cm long, composed of 3 parts: hypochile saccate, inflated, 2 cm long, 2.2 cm broad, 1.3 cm deep, obovate in profile, broadly obovate from the dorsal view, median plate twisted inward at the midpoint, forming an impressed area on each side of the upper edge of the hypochile at the midpoint, 2 cm long, 7 mm broad, ventral plate triangular curving over the median plate, apex reaching the apex of the dorsal plate at the edge of the canal between the dorsal plates, 1.5 cm long, 1 cm broad at the base, dorsal plate triangular, 8 mm long, 4 mm broad at the base, extending into the median plate at the apex, canal between the dorsal plates 1 mm wide; mesochile short, inserted under the concave apex of hypochile, 5 mm long, 6 mm broad, lateral margins forming elongate, curved horns, 2 cm long, 6 mm broad, 2 mm thick, the auricle between the horns appressed, emarginate at the apex; epichile articulated with the apex of the mesochile, broadly ovate, apiculate, margins somewhat recurved, apex somewhat recurved, 2 cm long, 2.1 cm broad. Column elongate, slightly arcuate, elliptic in cross section at the base, broadly winged for the apical two thirds, 4.2 cm long, 1.6 cm broad across the wings, the wings elliptic, 2 cm long. (Figure 4A.)

ECUADOR: Los Rios: Ricaurte, *Lehmann 79* (K and NY); **CARCHI:** hills above Rio Blanco, alt. 1400 m, *Dodson 2466* (SEL); **COTOPAXI:** near Macuchi, alt. 1000 m, 10 July 1961, *Dodson 410* (SEL); **BOLIVAR:** Balzapamba, alt. 800 m, *Dodson 2600* (SEL); **CAÑAR:** near Inca camp, km 94 Duran to Tambo, alt. 1000 m, *Dodson 2601* (SEL); between Cochencay and Inca camp, km 88-106 Duran to Tambo, alt. 1000 m. *Horich s.n.* (UC). Also Colombia?

This attractive species occurs along the western slope of the Andes at elevations from 700-1500 meters from central Ecuador to extreme southern Colombia. It is pollinated by *Euglossa grantii*. Rare hybrids between this species and *S. annulata* have been found.

8. ***Stanhopea florida*** Rchb.f., Gard. Chron. 615. 1879.

Plant typical of the genus. Inflorescence 5- to 7-flowered. Flowers of average size for the genus, ivory white to pale pink flecked throughout with red, often with darkened "eye" spots on each side of the base of the lip. Dorsal sepal 6.3 cm long, 3.2 cm broad, lateral sepals 6.5 cm long, 4 cm broad. Petals reflexed and curled between the dorsal sepal and lateral sepals, margins undulate, narrowly ovate acute at the apex, 5.3 cm long, 1.5 cm broad. Lip 5.5 cm long, composed of 3 parts: hypochile 2.5 cm long, 1.8 cm broad, 8 mm deep, geniculate-obovate in profile, ovate from a dorsal view, median plate narrow, slightly broader at the base, 2 cm long, 7 mm broad, ventral plate 9 mm long, 4 mm broad, dorsal plate 8 mm long, 3 mm broad, canal between the dorsal plates closed basally open to 1 mm from the midpoint to the apex; mesochile short, inserted under the concave apex of the hypochile, 6 mm long, 4 mm broad, lateral margins forming elongate, curved horns, 2.1 cm long, 5 mm broad, 4 mm thick, no auricle evident; epichile articulated with the apex of the mesochile, broadly ovate, apiculate, margins recurved, the apex somewhat recurved 2.1 cm long, 2 cm broad. Column elongate, arcuate, transversely broadly rhombic in cross section at the base, broadly winged for the apical two thirds, 5 cm long, 1.4 cm broad, wings elliptic, 2.5 cm long. (Figure 4B.)

ECUADOR: EL ORO: Asuncion on road from Cuenca to Pasaje, alt. 1000 m, 15 April 1961, *Dodson 419* (SEL); **TUNGURAHUA:** Rio San Francisco, km 40 Baños to Puyo, alt. 1300 m, 21 Feb. 1963, *Dodson and Thien 2293* (SEL); 5 km west of Rio Negro on road from Baños to Puyo, alt. 1500 m, 8 Jan. 1962, *Dodson and Thien 1921* (SEL); **ZAMORA-CHINCHIPE:** km 49 road from Loja to Zamora, alt. 1300 m, *Dodson and Thien 2169* (MO); woods of Chiquinda, east Andes of Sig Sig, alt. 1500-1800 m, *Lehmann 6579* (K). Also Peru.

This species occurs at intermediate elevations along the eastern slope of the Andes from central Ecuador to northern Peru. It also occurs at one locality in southwestern Ecuador. It is pollinated by *Euglossa nigropilosa* Mouri.

9. ***Stanhopea jenishiana*** Kramer et Rchb.f., Bot. Zeitung (Berlin) 10:934. 1852.

Epidendrum grandiflorum Humboldt & Bonpl., Pl. Aequinoct. 94. 1805.
Anguloa grandiflora (Humb. & Bonpl.) HBK, Nov. Gen. Sp. Pl. 1:345. 1815.

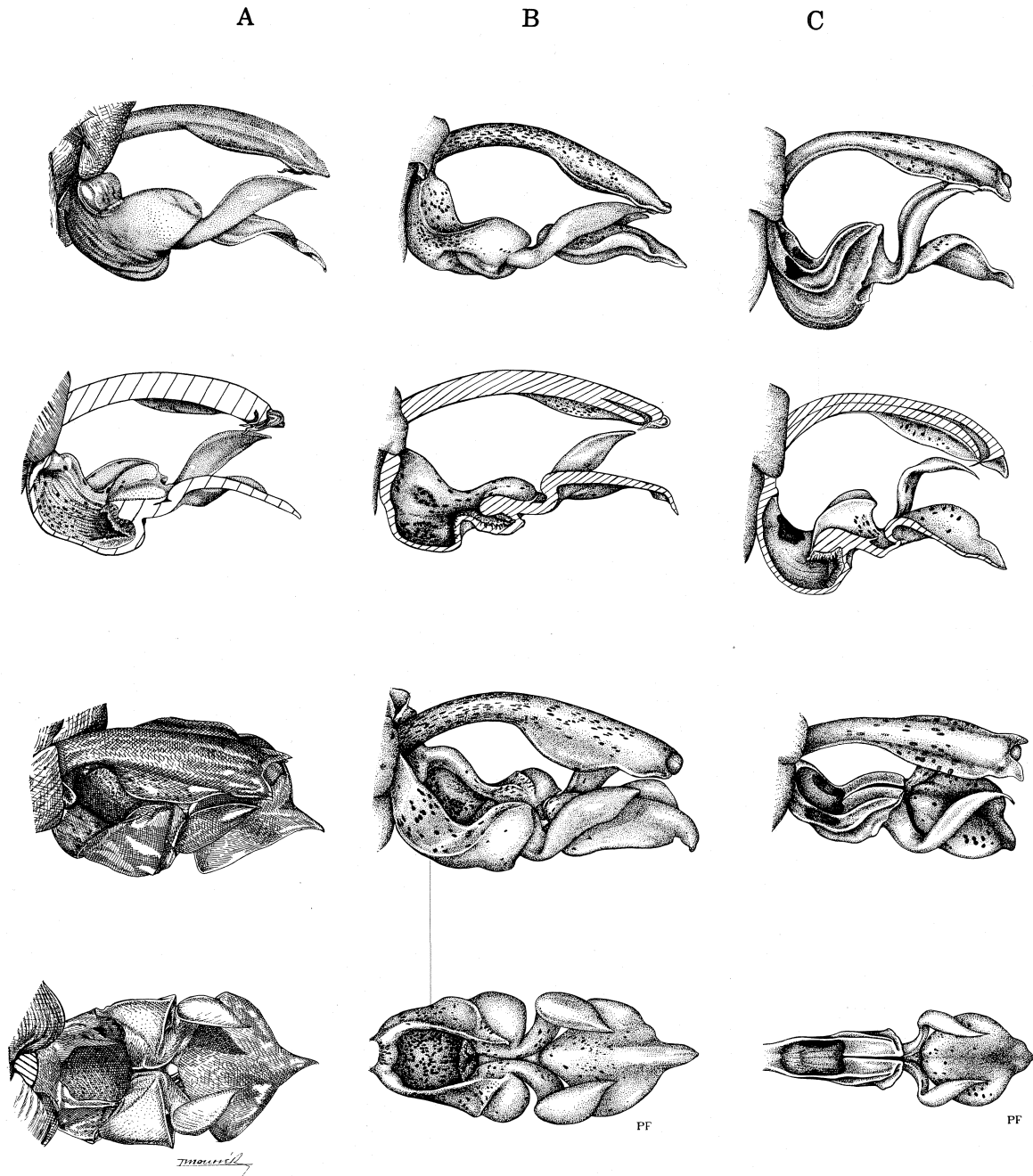


FIGURE 4.

A. *Stanhopea impressa*

B. *S. florida*

C. *S. jenishiana*

Stanhopea grandiflora (Humb. & Bonpl.) Rchb.f., Walp. Ann. 6:587. 1856.

Stanhopea bucephalus Lindl. var. *guttata* Lindl., Paxton's Fl. Gard. 3:128. 1856.

Stanhopea hoppii Schltr., Repert. Spec. Nov. Regni Veg. Beih. 27:82. 1924.

Plant typical of the genus. Inflorescence 5- to 7-flowered. Flowers of average size for the genus; orange-yellow with occasional red spots on the sepals, petals and lip, often with dark red "eye" spots on each side of the hypochile of the lip. Dorsal sepal 5.1 cm long, 2.5 cm broad; lateral sepals 5.5 cm long, 3.5 cm broad. Petals reflexed, curled between the dorsal and the lateral sepals, margins undulate, acute at the apex, 4.7 cm long, 1.5 broad. Lip 4.6 cm long, composed of 3 parts: hypochile, 2.4 cm long, 9 mm broad, 7 mm deep, obliquely transversely elliptic in profile, narrowly obovate from the dorsal view, forming a smooth, unbroken curve on the underside, median plate long and narrow, 2.3 cm long, 2 mm broad, ventral plate 1.2 cm long, 4 mm broad, dorsal plate 1.2 cm long, 2 mm broad, canal between the plates open but narrowing until the margins of the dorsal plates touch at the apex; mesochile short, inserted under the concave apex of the hypochile, 5 mm long, 4 mm broad, lateral margins forming elongate curved horns, 1.8 long, 3 mm broad, 3 mm thick, auricle between the horns appressed emarginate at the apex; epichile articulated with the apex of the mesochile, quadraterhombic, apiculate, margins recurved, 1.7 cm long, 1.5 cm broad. Column elongate, arcuate, deltate in cross section at the base, broadly winged for the apical two thirds, 4.6 cm long, 1.5 cm broad, wings ovate, 2.5 cm long. (Figure 4C.)

ECUADOR: EL ORO: Los Bonos near Paccha, Cerro de Azucar, alt. 1500 m, *Dodson 2461, 2467* (SEL); without locality: Ecuador (W). Quito (W); AZUAY: Valley of Cuenca, *Bonpland 3263* (P, Type of *Epidendrum grandiflorum*); Cuenca, *Lehmann 6491* (K); LOJA: *Rivet 996* (P).

This attractive species has been shrouded in nomenclatorial difficulties. It is probably best known as *Stanhopea bucephalus*. Unfortunately, that name is based on a specimen of *S. oculata* (Lodd. ex Lindl.) Lindl. from Mexico. This species was also known as *S. grandiflora* based on Reichenbach's transfer of *Epidendrum grandiflorum* to *Stanhopea*. Unfortunately, Lindley had already transferred *Ceratochilus grandiflorus* Lodd., a quite different species from the Guianas, to *Stanhopea*. *Stanhopea jenishiana* is the next available name. Its pollinator is unknown. (See Selbyana 1 (1):46).

10. *Stanhopea frymirei* Dodson, sp. nov.

Pseudobulbi aggregati, late ovoidei, subangulati, olivacei, 4-4.5 cm longi, 3.5-4 cm lati, vaginis ovato-lanceolatis subcoriaceis vestiti, monophylli. Folia longe petiolata, elliptico-oblonga, breviter acuminata, plicata, subcoriacea, 20-35 cm longa, 5-10 cm lata; petioli 7-8 cm longi. Scapi axillares, penduli, vaginis elliptico-ovatis concavis subimbricatis vestiti, 5-7 flori; pedicelli 9-10 cm longi. Flores grandes, speciosi flavi vel fulvi, brunneo-maculati. Sepala subconniventia, sepalum posticum elliptico-oblongum, obtusum, concavum, circiter 5.5 cm longum, sepala lateralia ovata, obtusa valde concava, circiter 6 cm longa. Petala revoluta, oblonga, obtusa, valde concava, undulata, circiter 5.1 cm longa. Labellum carnosum, profunde 3-lobum, circiter 4 cm longum;

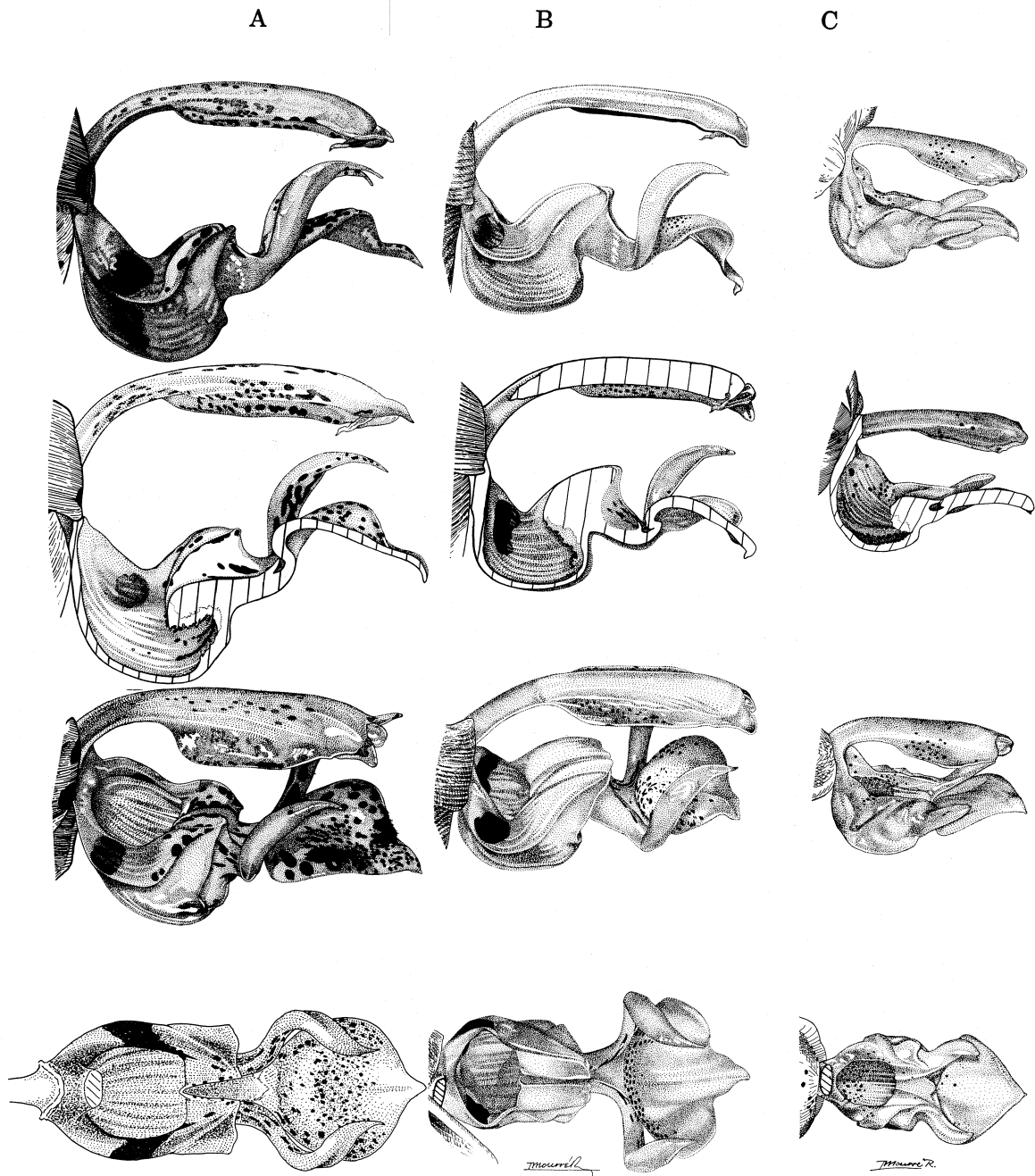


FIGURE 5.

A. *Stanhopea frymirei*

B. *S. embreei*

C. *S. annulata* X *S. impressa*

hypochilum obliquum transverse ellipticum late carinatum, lamella dorsalis basi dentata, canalis dimidio basali apertus, dimidio apicali clausus; mesochilum profunde 2-partitum, brachiis falcato-incurvis, acuminatis; epichilum articulatum, ovatum, subobtusum, convexum. Columna subincurva, 5.1 cm longa, supra medium dilatata; pollina 2; stipese oblongo-liniaris; vicidium cordatum.

Plant typical of the genus, inflorescence 5- to 7-flowered. Flowers intermediate in size for the genus; tawny yellow to brown, blotched and spotted with red-brown. Dorsal sepal 5.5 cm long, 2.2 cm broad; lateral sepals 6 cm long, 3 cm broad. Petals reflexed between the dorsal and lateral sepals, elliptic, margins undulate, acute at the apex 5.1 cm broad. Lip 4 cm long, composed of 3 parts: hypochile 2.2 cm long, 1.5 cm broad, 1.6 cm deep, obliquely transversely elliptic in profile, ovate from a dorsal view; median plate broad, slightly broader at the base, 2.5 cm long, 7 mm broad, ventral plate 8 mm long, 4 mm broad, dorsal plates 1 cm long, 4 mm broad, canal between the dorsal plates open in the basal half, closed in the apical half, mesochile short, inserted under the concave apex of the hypochile, 5 mm long, 4 mm broad, lateral margins forming elongate, curved horns, 2 cm long, 4 mm broad, 2 mm thick, auricle between the horns appressed, emarginate at the apex; epichile articulated with the apex of the mesochile, broadly ovate, apiculate, margins deeply recurved, apex slightly recurved, 1.4 cm long, 2.3 cm broad. Column elongate, arcuate, depressed trullate in cross-section at the base, broadly winged for the apical two thirds, 5.1 cm long, 1.3 cm broad, wings narrowly elliptic, 3.2 cm long. (Figure 5A.)

TYPE: *ECUADOR*: MANABI: At summit of Monte Cristi, alt. 200 m, March 1961, *Dodson 2452* (HOLOTYPE: SEL).

OTHER MATERIAL EXAMINED: *ECUADOR*: MANABI: Monte Cristi, alt. 600 m, March 1958, *Frymire & Dodson s.n.*, flowered in cult. 1959 (SEL-spirit coll.); same place, alt. 200 m, March 1961, *Dodson 2455* (SEL); *GUAYAS*: Dos Mangas, near Manglaralto, alt. 30 m, *Dodson 2606* (SEL). Endemic.

This attractive species occurs only in the hill tops of the low coastal mountains near the sea. The species is dedicated to G. P. Frymire who first collected it. The pollinator is *Eulaema bomboides* Friese.

11. *Stanhopea embreei* Dodson, sp. nov.

Pseudobulbi aggregati, late ovoidei, subangulati, olivacei, 4-4.5 cm longi, 3.5-4 cm lati, vaginis ovato-lanceolatis subcoriaceis vestiti, monophylli. Folia longe petiolata, elliptico-oblonga, breviter acuminata, plicata, subcoriacea, 20-35 cm longa, 5-10 cm lata; petioli 7-8 cm longi. Scapi axillares, penduli, vaginis elliptico-ovatis concavis subimbricatis vestiti, 5-7 flori; pedicelli 9-10 cm longi. Flores grandes, speciosi pallide flavi, sparsim rubro-punctatis. Sepala subconniventia, sepalum posticum elliptico-oblongum, obtusum, concavum, circiter 6.4 cm longum, sepala lateralia ovata, obtusa, valde concava, circiter 6.8 cm longa. Petala revoluta oblonga, obtusa, valde concava, undulata, circiter 5.4 cm longa. Labellum carnosum, profunde 3-lobum, circiter 5.5 cm longum; hypochilum obliquum transverse late ellipticum, late carinatum, lamella dorsalis non basi dentata, canalis subclausus basi apertus; mesochilum profunde 2-partitum, brachiis falcato-incurvis acuminatus; epichilum articulatum, ovatum, subobtusum, convexum. Columna subincurva,

5.5 cm longa, supra medium dilatata; pollinia 2; stipes oblongo-liniaris; vicidium cordatum.

Plant typical of the genus. Inflorescence 5- to 7-flowered. Flowers average in size for the genus; pale yellow to nearly white with the basal half of the hypochile and the base of the sepals and petals orange, petals, lip and column sparsely flecked and spotted with red. Dorsal sepal 6.4 cm long, 2.3 cm broad; lateral sepals 6.8 cm long and 4.5 cm broad. Petals reflexed and curled between the dorsal and lateral sepals, narrowly ovate, margin undulate, apex acute, 5.4 cm long, 1.5 cm broad. Lip 5.5 cm long, composed of 3 parts: hypochile 2.8 cm long, 2 cm broad, 1.8 cm deep, obliquely transversely obovate in profile, ovate from a dorsal view, median plate broad, slightly broader toward the base, 3 cm long, 7 mm broad, ventral plate 1.5 cm long, 4 mm broad, dorsal plates 1.8 cm long, 8 mm broad, canal between the dorsal plates equal in width at the base and the apex narrowly at the midpoint; mesochile short, inserted under the concave apex of the hypochile, 1 cm long, 8 mm broad, lateral margins forming elongate curved horns, 3 cm long, 6 mm broad, 4 mm thick, auricle between the horns appressed, emarginate at the apex; epichile articulated with the apex of the mesochile, broadly ovate, apiculate, margins flattened, apex slightly recurved, 3 cm long, 2.8 cm broad. Column elongate, arcuate, depressed in cross-section, trullate at the base, broadly winged for the apical two thirds, 5.5 cm long, 1.5 cm broad, wings narrowly obovate, 3.5 cm long. (Figure 5B.)

TYPE: *ECUADOR*: CAÑAR: Epiphytic in cloud forest, km 94, road from Duran to Tambo, alt. 1000 m, March 1961, *Dodson 208* (HOLOTYPE: SEL).

OTHER MATERIAL EXAMINED: *ECUADOR*: BOLIVAR: Km 96, road from Duran to Tambo, alt. ca. 1000 m, Nov. 1957, *A. Embree s.n.*, flowered in cult. April 1959 (SEL-spirit coll.); Naranjapata, km 100, railroad Duran to Quito, alt. 750 m, March 1958, *Dodson s.n.* (SEL). Endemic.

This species occurs at intermediate elevations along the western slopes of the Andes in central Ecuador. It is dedicated to Mr. Alvin Embree who first collected and brought the plant to my attention. It is pollinated by *Eulaema bomboides* Friese.