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ICONES PLEUROTHALLIDINARUM
XVI

SYSTEMATICS
OF
PLEUROTHALLIS
SUBGENERA
CROCODEILANTHE
RHYNCHOPERA
TALPINARIA

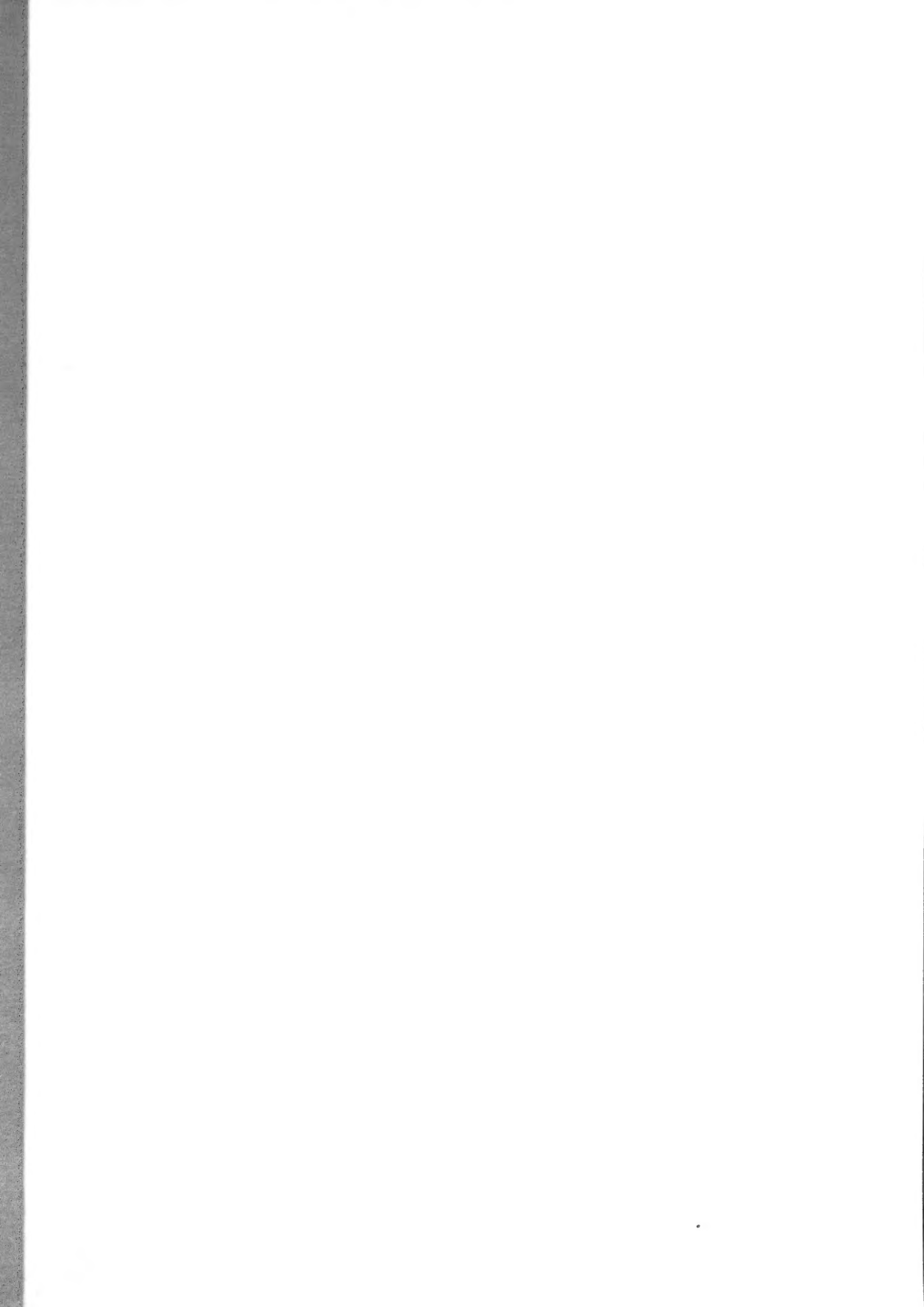
ADDENDA TO LEPANTHES OF ECUADOR, MASDEVALLIA, PLATYSTELE,
PLEUROTHALLIS, RESTREPIA AND SCAPHOSEPALUM

(ORCHIDACEAE)



Missouri Botanical Garden





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Carlyle A. Luer

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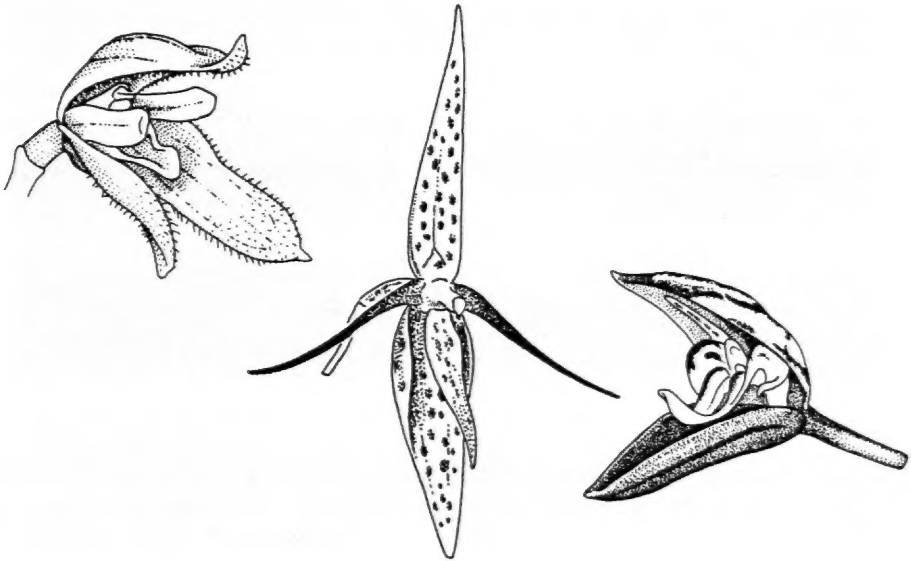
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Pleurothallis expansa Lindl., La Liberia, province of Pichincha, Ecuador, altitude 2700 meters above sea level, 17 November 1983, photograph by Alexander C. Hirtz.

SYSTEMATICS OF THE SUBGENUS *CROCODEILANTHE*
OF *PLEUROTHALLIS* (ORCHIDACEAE)

ABSTRACT

Subgenus *Crocodeilanthé* (Rchb.f. & Warsz.) Luer of *Pleurothallis* R.Br. is described and a key to the species is included. Each species is described and illustrated with a black and white drawing.

New species:

- Pleurothallis apposita* Luer, sp. nov.
Pleurothallis avirostris Luer & Hirtz, sp. nov.
Pleurothallis cosangae Luer & Hirtz, sp. nov.
Pleurothallis croatii Luer, sp. nov.
Pleurothallis galerasensis Luer, sp. nov.
Pleurothallis laevis Luer & Hirtz, sp. nov.
Pleurothallis laminata Luer, sp. nov.
Pleurothallis molletuoi Luer & Dodson, sp. nov.
Pleurothallis patateënsis Luer, sp. nov.
Pleurothallis pellucida Luer, sp. nov.
Pleurothallis pennelliana Luer, sp. nov.
Pleurothallis praealta Luer & Hirtz, sp. nov.
Pleurothallis prolificans Luer & Hirtz, sp. nov.
Pleurothallis salpingantha Luer & Hirtz, sp. nov.
Pleurothallis siphonantha Luer, sp. nov.
Pleurothallis vegrandis Luer & Dodson, sp. nov.
Pleurothallis virgata Luer, sp. nov.
Pleurothallis zunagensis Luer & Hirtz, sp. nov.

This taxon was proposed as a monotypic genus by Reichenbach with Warszewicz as co-author in 1854 when they published *Crocodeilanthé xiphizusa*, one of Warszewicz's collections from Peru. In 1861, Reichenbach reduced the genus to *Pleurothallis*. The earliest species attributable to this taxon were published in 1816 from collections made in 1801 in Colombia and Ecuador by Humboldt and Bonpland as *Dendrobium elegans* [*P. elegans* (H.B.K.) Lindl.] and *Stelis pulchella* [*P. pulchella* (H.B.K.) Lindl.]. Since then, about 95 additional epithets in *Pleurothallis* have been described for closely related taxa, encompassing about 70 valid species as recognized today in the subgenus *Crocodeilanthé*. These species were segregated into the subgenus *Crocodeilanthé* of *Pleurothallis* in *Systematics of Pleurothallis III* of *Icones Pleurothallidarum* in 1986.

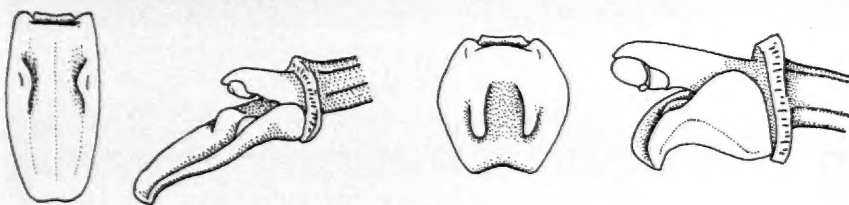
Vegetatively, the subgenus is characterized by well-developed ramicauls often clad in large, loose, papery sheaths. The ramicauls are usually produced in fascicles with sheaths often enclosing the lowermost portions of several ramicauls. A very few species are repent and a very few species are prolific. The leaf is either petiolate or sessile.

The inflorescence is always racemose and simultaneously flowered. The racemes are usually many-flowered, and produced singly or simultaneously in large numbers. They emerge from a spathe which is often conspicuous, rivaling that of subgenus *Rhynchopera*.

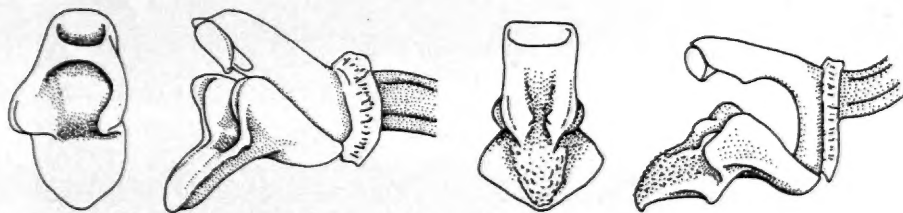
The sepals are glabrous or variously pubescent, variously connate, and never caudate. The petals are membranous, entire and glabrous, one- or three-veined. Plants of species characterized by single-veined petals, may occasionally produce 3-

veined petals. The lip is entire or three-lobed, almost always with a pair of calli somewhere near the middle, either on the disc, on the lateral lobes, or intramural on the margins. The base is concave below a more or less well-developed transverse callus. The cavity articulates with the tip of the column-foot which is often bulbous, but the cavity is sometimes shallow. The back margin of the cavity is either flexibly or inflexibly attached to the base of the column behind the bulbous tip. Two principal variations of the lip can be recognized: Type A: ovate, oblong or subquadrate usually with a pair of central or marginal calli, and Type B: ovate-trilobed with a pair of calli or intramural calli on the lateral lobes. Unfortunately, numerous intermediate forms occur, making recognition of a type impractical.

The column is terete, usually short, more or less erect, with an unhooded apex and a more or less subapical anther. The two pollinia are ovoid and flattened medially with the tips free from or lightly adherent to a small, viscid, detachable viscidium offered at the tip of the rostellum.



TYPE A



TYPE B

While many species of the subgenus are distinct and easily recognized, many others form large, widely distributed alliances of variations treated as species-complexes. They are not only difficult but impractical to distinguish. The *P. cassidis*-*P. laevigata*-complex consists of large plants with a fascicle of racemes subtended by a large, foliaceous spathe. The lips of no two populations are identical. Typical *P. laevigata* has a third callus near the apex of an oblong lip in addition to the pair below the middle. Indistinguishable plants lacking this third callus constitute the vast majority of specimens seen and attributed to *P. laevigata*. Various forms grade into it as *P. cassidis* which is distinguished by a subquadrate lip with a decurved apex and the pair of calli above the middle. I have no doubt that this whole lot is one big interbreeding super-species. Similarly, the *P. ligulata*-complex consists of numerous variations with Type A lips, and the *P. pulchella-velaticaulis*-complex consists of numerous variations with Type B lips.

A different kind of problem is the determination of the 19 species described by Schlechter, the holotypes of which were lost in the destruction of the Berlin herbarium at Dahlem in 1945. The isotypes of ten, now designated lectotypes, exist in other herbaria. Even though good descriptions of the nine remaining were published, many with line drawings published separately, identification of present collections can be uncertain. For instance, the published illustration of the lip of *P. conchopetala* fails to show two prominent calli that I find on the lip of a hydrated flower from an isotype. One of his species (*P. aloisii*) cannot be identified with any subsequent collection.

Except for one species (*P. domingensis*) in the Greater Antilles, all species of this subgenus are confined to the humid, mountainous forests of Central America and South America from coastal Venezuela to central Bolivia. The species in the Antilles is commonly confused with *P. velaticaulis*, most collections erroneously being referred to the latter. No species is known from Brazil.

Most species are relatively easy to cultivate, but few are found in collections because of their size that is too large for the connoisseurs of miniatures, and the usually small but numerous flowers that are unattractive until examined closely with a magnifying glass.

SUBGENUS CROCODEILANTHE

Pleurothallis subgen. **Crocodeilanthe** (Rchb.f. & Warsz.) Luer, Monogr. Syst. Bot. 20: 34, 1986.

Bas.: *Crocodeilanthe* Rchb.f. & Warsz., Bonplandia 2: 114, 1854.

Type: *Crocodeilanthe xiphizusa* Rchb.f. & Warsz. [*Pleurothallis xiphizusa* (Rchb.f.) Rchb.f.]

Ety.: From the Greek *krokodeilanthos*, "a crocodile-flower," in allusion to the shape of the flower.

Syn.: *Pleurothallis* sect. *Spathaceae* Lindl., Folia Orch. *Pleurothallis* 2, 1859.

Ety.: From the Latin *spathaceus*, "with a spathe," referring to the prominent spathe.

(*Stelis* sect. *Tubuliflorae* Barb.Rodr. and *Pseudostelis* Schltr. are transferred to synonymy of subgen. *Pleurothallis*.)

Plants medium to large in size, epiphytic, lithophytic to terrestrial, usually densely caespitose, rarely repent; roots slender to coarse. Ramicauls slender to stout, erect or ascending, usually produced in a fascicle with several, loose, imbricating, tubular sheaths below the middle, rarely superposed. **Leaf** erect, coriaceous, elliptical, oblong to ovate, acute to obtuse, the base cuneate, sessile or petiolate. **In-florescence** 1 to many, erect, subdensely to densely simultaneously several- to many-flowered racemes, shorter or longer than the leaf, produced from a spathe that is often large, conspicuous, compressed, and foliaceous, from near apex of the ramicaul with an annulus; floral bracts tubular to more or less infundibular or inflated, sometimes enclosing the base of the flower; pedicels short; ovary round in cross-section; **sepals** membranous, glabrous, ciliate, or pubescent, acute to obtuse, free to variously connate; **petals** membranous, entire, acute to obtuse, 1- or 3-veined; **lip** entire to distinctly or indistinctly trilobed, the disc with a pair of calli, usually near the middle, but intramural when lateral lobes are present, the base more or less concave below a transverse callus above or at the base, the cavity articulating with or solidly attached to the tip of the column-foot; **column** short, stout, semiterete, with a short, thick foot with the tip often bulbous, the anther subapical, deciduous, the rostellum and stigma subapical to ventral, the pollinia 2, yellow, hard, ovoid, flattened medially, free, or more or less lightly adherent to a minute viscidium.

EPITHETS ATTRIBUTABLE TO SUBGENUS *CROCODEILANTHE*
DESCRIBED IN *PLEUROTHALLIS* AND ILLUSTRATIONS

<i>Pleurothallis aligera</i> Luer & Vásquez	Fig. 1.
<i>Pleurothallis aloisii</i> Schltr.	Fig. 2.
<i>Pleurothallis apposita</i> Luer	Fig. 3.
<i>Pleurothallis atacasana</i> Luer = <i>P. ligulata</i>	
<i>Pleurothallis atwoodii</i> Luer	Fig. 4.
<i>Pleurothallis avirostris</i> Luer & Hirtz	Fig. 5.
<i>Pleurothallis batillacea</i> Luer	Fig. 6.
<i>Pleurothallis bogotensis</i> Schltr., not Lindl. = <i>P. pulchella</i>	
<i>Pleurothallis bucamangae</i> Luer & Escobar	Fig. 7.
<i>Pleurothallis cassidis</i> Lindl.	Figs. 8., 9.
<i>Pleurothallis cauliflora</i> Lindl.	Fig. 10.
<i>Pleurothallis chlamydotus</i> Schltr. = <i>P. ligulata</i>	
<i>Pleurothallis choerorhyncha</i> Luer	Fig. 11.
<i>Pleurothallis cochabambae</i> Luer & Vásquez = <i>P. cyathiflora</i>	
<i>Pleurothallis conchopetala</i> Schltr. = <i>P. laevigata</i>	
<i>Pleurothallis cosangae</i> Luer & Hirtz	Fig. 12.
<i>Pleurothallis crassipes</i> Lindl. = <i>P. velaticaulis</i>	
<i>Pleurothallis crassipes</i> Rchb.f. not Lindl. = <i>P. divaricans</i> Schltr.	
<i>Pleurothallis croatii</i> Luer	Fig. 13.
<i>Pleurothallis crocodeilanthe</i> Lindl. = <i>P. xiphizusa</i>	
<i>Pleurothallis cuatecasasii</i> Luer	Fig. 14.
<i>Pleurothallis cyathiflora</i> C. Schweinf.	Figs. 15., 16.
<i>Pleurothallis diffusa</i> sensu Lindl., not Poepp. & Endl. = <i>P. expansa</i>	
<i>Pleurothallis domingensis</i> Cogn.	Fig. 17.
<i>Pleurothallis ecuadorensis</i> Schltr. = <i>P. pulchella</i>	
<i>Pleurothallis elegans</i> (H.B.K.) Lindl.	Fig. 18.
<i>Pleurothallis endotrachys</i> Lehm. & Krzl. non Rchb.f. = <i>P. lehmanniana</i>	
<i>Pleurothallis exotica</i> Luer = <i>P. cauliflora</i>	
<i>Pleurothallis expansa</i> Lindl.	Fig. 19.
<i>Pleurothallis floribunda</i> Poepp. & Endl.	Fig. 20.
<i>Pleurothallis fons-florum</i> Lindl.	Fig. 21.
<i>Pleurothallis foveata</i> Lindl. = <i>P. jamesonii</i>	
<i>Pleurothallis fraterna</i> Lindl. = <i>P. galeata</i>	
<i>Pleurothallis galeata</i> Lindl.	Figs. 22., 23., 24.
<i>Pleurothallis galerasensis</i> Luer	Fig. 25.
<i>Pleurothallis gigas</i> Luer & Escobar	Fig. 26.
<i>Pleurothallis hartwegii</i> Lindl. 1845 = <i>P. laevigata</i>	
<i>Pleurothallis hopfiana</i> Schltr. = <i>P. ligulata</i>	
<i>Pleurothallis infundibulosa</i> Luer	Fig. 27.
<i>Pleurothallis jamesonii</i> Lindl.	Fig. 28.
<i>Pleurothallis jurisdixii</i> Luer & Escobar	Fig. 29.
<i>Pleurothallis laevigata</i> Lindl.	Figs. 30., 31.
<i>Pleurothallis laevis</i> Luer & Hirtz	Fig. 32.
<i>Pleurothallis laminata</i> Luer	Fig. 33.
<i>Pleurothallis lamprochlamys</i> Schltr. = <i>P. laevigata</i>	
<i>Pleurothallis langlassei</i> Schltr. = <i>P. laevigata</i>	
<i>Pleurothallis lehmanniana</i> Schltr.	Fig. 34.
<i>Pleurothallis ligulata</i> Lindl.	Figs. 35., 36., 37.
<i>Pleurothallis iloënsis</i> Schltr. = <i>P. pulchella</i>	
<i>Pleurothallis mandonii</i> Rchb.f.	Fig. 38.
<i>Pleurothallis maxima</i> Luer	Fig. 39.
<i>Pleurothallis molletuoi</i> Luer & Dodson	Fig. 40.

Pleurothallis moritzii Rchb.f.	Fig. 41.
<i>Pleurothallis naraniensis</i> Rchb.f. = P. pulchella	
Pleurothallis nivalis Luer	Fig. 42.
<i>Pleurothallis nubigena</i> Schltr., not Lindl. = P. ligulata	
Pleurothallis orectopus Luer	Fig. 43.
Pleurothallis pachypus (Lehm. & Krzl.) Garay	Fig. 44.
<i>Pleurothallis palmiformis</i> Lindl. = P. laevigata	
Pleurothallis patateënsis Luer	Fig. 45.
<i>Pleurothallis patula</i> Schltr. = P. ligulata	
Pleurothallis pellucida Luer	Fig. 46.
Pleurothallis pennelliana Luer	Fig. 47.
<i>Pleurothallis pichinchae</i> Rchb.f. = P. velaticaulis	
Pleurothallis pilifera Lindl.	Fig. 48.
<i>Pleurothallis pittieri</i> Schltr. = P. floribunda	
<i>Pleurothallis pleiostachys</i> Schltr. = P. laevigata	
<i>Pleurothallis pluriracemosa</i> Garay = P. floribunda	
Pleurothallis popayanensis Lehm. & Krzl.	Fig. 49.
<i>Pleurothallis potamophila</i> Schltr. = P. rhodantha	
Pleurothallis praealta Luer & Hirtz	Fig. 50.
<i>Pleurothallis procera</i> Luer & Vásquez = P. rhodantha	
Pleurothallis prolificans Luer & Hirtz	Fig. 51.
<i>Pleurothallis pteroglossa</i> Schltr. = P. pulchella	
Pleurothallis pulchella (H.B.K.) Lindl.	Fig. 52.
<i>Pleurothallis quadrata</i> C.Schweinf. = P. pachypus	
<i>Pleurothallis quinquecallosa</i> Luer = P. galeata	
Pleurothallis retusiloba C.Schweinf.	Fig. 53.
Pleurothallis rhodantha Rchb.f.	Fig. 54.
Pleurothallis rictoria Rchb.f.	Fig. 55.
<i>Pleurothallis roseo-punctata</i> Lindl. = P. elegans	
Pleurothallis salpingantha Luer & Hirtz	Fig. 56.
Pleurothallis scansor Luer	Fig. 57.
Pleurothallis simplicilabia C.Schweinf.	Fig. 58.
Pleurothallis siphonantha Luer	Fig. 59.
<i>Pleurothallis sodiroi</i> Schltr. = P. jamesonii	
<i>Pleurothallis sororia</i> Schltr., not 1912 = P. galeata	
Pleurothallis spathosa Luer & Escobar	Fig. 60.
<i>Pleurothallis sphenochila</i> Lindl. = P. pulchella	
Pleurothallis steliopsis Luer	Fig. 61.
Pleurothallis taxis Luer	Fig. 62.
<i>Pleurothallis tepuiënsis</i> Carnevali & I.Ramírez = P. pulchella	
<i>Pleurothallis trianae</i> Schltr. = P. galeata	
<i>Pleurothallis trilineata</i> Lindl. = P. velaticaulis	
Pleurothallis tunguraguae Lehm. & Krzl.	Fig. 63.
<i>Pleurothallis tunguraguae</i> var. <i>minor</i> Garay = P. tunguraguae	
Pleurothallis vargasii C.Schweinf.	Fig. 64.
Pleurothallis vegrandis Luer & Dodson	Fig. 65.
Pleurothallis velaticaulis Rchb.f.	Figs. 66., 67.
<i>Pleurothallis velatipes</i> Rchb.f. = P. velaticaulis	
Pleurothallis venosa Rolfe = P. galeata	
Pleurothallis verbiformis Luer	Fig. 68.
Pleurothallis virgata Luer	Fig. 69.
Pleurothallis weddelliana Rchb.f. ex Krzl.	Fig. 70.
Pleurothallis xiphizusa Rchb.f.	Fig. 71.
Pleurothallis zunagensis Luer & Hirtz	Fig. 72.

KEY TO THE SPECIES OF SUBGENUS *CROCODEILANTHE*

- 1 Habit repent 2
 1' Habit caespitose or prolific 5
- 2 Raceme as long as or shorter than the leaf 3
 2' Raceme considerably longer than the leaf 4
- 3 Rhizome up to 1 cm long between ramicauls; lip with lateral lobes above the middle *P. mandonii*
 3' Rhizome ca. 3 cm long between ramicauls; lip with lateral lobes near the middle *P. orectopus*
- 4 Dorsal sepal partially connate to the lateral sepals; lip oblong with central calli *P. cuatrecasii*
 4' Dorsal sepal free from the lateral sepals; lip lobed with intramural calli *P. scansor*
- 5 Ramicauls normally prolific 6
 5' Ramicauls not normally prolific 9
- 6 Lip subquadrate with a central pair of flat calli with acute points near the middle *P. expansa*
 6' Lip not subquadrate with flat calli 7
- 7 Lip oblong (type A), usually with a pair of rounded calli below the middle *P. galarasensis*
 7' Lip ovate-trilobed (type B), with the calli intramural on the lateral lobes 8
- 8 Raceme much longer than the leaf *P. prolificans*
 8' Raceme about as long as or shorter than the leaf *P. virgata*
- 9 Leaf with base decurrent on ramicaul; sepals tall-carinate below the middle *P. croatii*
 9' Leaf not decurrent on ramicaul; sepals not tall-carinate 10
- 10 Leaf sessile or nearly so 11
 10' Leaf petiolate or narrowly cuneate below 28
- 11 Petals 1-veined 12
 11' Petals 3-veined 14
- 12 Petals broadly elliptical to suborbicular; lip broadly to transversely ovate, without calli *P. popayanensis*
 12' Petals oblong; lip (type B) ovate-trilobed with intramarginal calli 13
- 13 Lip with a distinct, apical callus *P. galeata* (*P. quinquecallosa*)
 13' Lip without an apical callus *P. maxima*

Leaf sessile; petals 3-veined

- 14 Spathe small, narrow; lip deeply channeled between thickly calloused sides....
..... *P. praealta*
- 14' Spathe large, foliaceous; lip not channeled between thickly calloused sides.....15
- 15 Floral bracts large, conspicuous, mostly 8-10 mm long, enclosing pedicel, ovary
and part of the flower16
- 15' Floral bracts less than 8 mm long.....17
- 16 Lip suborbicular, slightly thickened centrally without calli.....*P. xiphyzusa*
- 16' Lip subquadrate, bicallous, cleft at the apex..... *P. infundibulosa*
- 17 Sepals connate to near middle into a sepaline tube; lip bicallous near middle....18
- 17' Dorsal sepal connate to the laterals below middle or not at all; lip variable.....19
- 18 Column with smooth apical margins.....*P. salpigantha*
- 18' Column with serrulate apical margins.....*P. siphonantha*
- 19 Lip (type B) deeply concave between thick, erect, lateral lobes above the middle
..... *P. lehmanniana*
- 19' Lip (type A) not deeply concave between thick, erect lobes.....20
- 20 Lip triangular-ovate, acute, with a pair of small calli below the middle.....
..... *P. moritzii*
- 20' Lip oblong-ovate to subquadrate, obtuse, with or without a pair of calli.....21
- 21 Lip without calli22
- 21' Lip with a pair of calli.....23
- 22 Lip suborbicular, with a pair of slight thickenings, without elevated calli.....
..... *P. elegans*
- 22' Lip obovate with obtuse apex recurved, shallowly concave without calli.....
..... *P. laevis*
- 23 Dorsal sepal free from lateral sepals; lip ovate, obscurely 3-lobed near the
middle with intramural calli24
- 23' Dorsal sepal partially connate to the lateral sepals; lip with calli on the disc,
not intramural25
- 24 Petals small, less than half as long as the sepals.....*P. vargasii*
- 24' Petals large, 2 thirds to 3 fourths as long as the sepals.....*P. spathosa*
- 25 Lip oblong with the tip not decurved, with calli near or below the middle.....26
- 25' Lip subquadrate with tip decurved, with calli above the middle.....27
- 26 Leaves 3-8 cm wide; racemes numerous; lip with calli below the middle.....
..... *P. laevigata*
- 26' Leaves 2-2.5 cm wide; racemes 2-3; lip with calli near the middle.....
..... *P. weddelliana*
- 27 Leaves 3-7 cm wide; racemes numerous.....*P. cassidis*
- 27' Leaves 2-2.5 cm wide; racemes 1-2.....*P. taxis*

<i>Leaf petiolate, spathe small, petals 1-veined</i>	
28 Petals 1-veined	29
28' Petals 3-veined	41
29 Spathe small, narrow, mostly less than 1.5 cm long; lip various.....	30
29' Spathe large, broad, mostly more than 2 cm long; lip (type B) 3-lobed with intramural calli.....	37
30 Leaves less than 2 cm wide	31
30' Leaves more than 2 cm wide.....	34
31 Sepals less than 5 mm long	32
31' Sepals more than 5 mm long.....	33
32 Lip suborbicular or subquadrate with thick, intramural calli below the apex.....	<i>P. pachypus</i>
32' Lip suborbicular with a continuous callus within the margin.....	<i>P. steliopsis</i>
33 Sepals connate to middle into a tube; lip ovate with a pair of calli near the middle.....	<i>P. verbiformis</i>
33' Dorsal sepal free from laterals; lip ovate-trilobed with intramarginal calli.....	<i>P. pulchella</i>
34 Lip with low, obtuse, oblique, marginal calli below the middle.....	<i>P. victoria</i>
34' Lip trilobed with thick, erect, intramural calli near the middle.....	35
35 Petals acute; lip with lateral lobes acute.....	<i>P. tunguraguae</i>
35' Petals obtuse; lip with lateral lobes obtuse.....	36
36 Leaves oblong-obovate, obtuse to rounded at the apex; petals up to 2 mm long..	<i>P. domingensis</i>
36' Leaves elliptical, acute to subacute; petals 2-3 mm long..	<i>P. galeata (P. trianae)</i>
<i>Leaf petiolate, spathe large, petals 1-veined</i>	
37 Racemes half the length of leaf or shorter.....	<i>P. floribunda</i>
37' Racemes as long as or longer than the leaf.....	38
38 Lip with a central pair of small, conical calli.....	<i>P. fons-florum</i>
38' Lip without a central pair of small, conical calli.....	39
39 Lip with lateral lobes much larger than the apical lobe.....	<i>P. atigera</i>
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40 Leaf long-petiolate; racemes about as long as the leaf or shorter.....	<i>P. galeata</i>
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42 Lip suborbicular, shallowly concave	43
42' Lip oblong to ovate, obtuse	44

- 43 Spathe exceptionally large, 4-6.5 cm long; lip with the apex round...*P. cauliflora*
 43' Spathe narrow, 1-1.5 cm long; lip with the apex retuse.....*P. vegrandis*
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- 45 Lip oblong, fleshy, not concave*P. aloisii*
 45' Lip ovate to obscurely 3-lobed, concave.....*P. ligulata*
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Pleurothallis aligera Luer & Vásquez, *Rev. Soc. Bol. Bot.* 2: 9, 1997.

Fig. 1.

Ety.: From the Latin *aliger*, "wing-bearing," in reference to the lobes of the lip.

Plant large, epiphytic, densely caespitose; roots coarse. Ramicauls erect, stout, 15-25 cm long, with a loose, tubular sheath near the middle, and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, suffused with purple beneath, elliptical, obtuse, sessile-subpetiolate, shortly petiolate, the blade 8-14 cm long, 4.5-6 cm wide, broadly cuneate below into the petiole 1 cm long. **Inflorescence** few simultaneous, more or less secund, densely simultaneously many-flowered racemes, 8-12 cm long including the peduncle 2-3 cm long, subtended by a conspicuous spathe 3 cm long, from an annulus 4-5 mm below the abscission layer; floral bracts 3-4 mm long; pedicels 3 mm long; ovary 1.5-2 mm long; **sepals** purple-brown, subcarinate, glabrous, the dorsal sepal ovate, subacute, 5.5 mm long, 2.5 mm wide, 3-veined, free, the lateral sepals oblong, oblique, obtuse, 5.5 mm long, 2.75 mm wide, 3-veined, connate 1 mm; **petals** translucent, with purple midvein, oblong, obtuse, 2.75 mm long, 0.75 mm wide, 1-veined; **lip** fleshy, ovoid-oblong-trilobed, 2.25 mm long, 3 mm wide across the lateral lobes, the apical lobe thick, ovate, broadly obtuse, the lateral lobes erect, near the middle, obtuse, with an intramural callus along the anterior margin, the disc shallowly concave, with a transverse callus above the concave base, hinged to the back of the end of the column-foot; **column** terete, 3 mm long, the foot thick, the anther and rostellum subapical, the stigma ventral.

BOLIVIA: **Cochabamba**: "Polea" northeast of Cochabamba, alt. 2500 m, 1 Feb. 1983, *C. Luer, J. Luer & R. Vásquez 8670* (Holotype: SEL).

This robust species occurs on the north slope of the Andes of central Bolivia. It is most similar to Peruvian *P. vargasii*. *Pleurothallis aligera* is distinguished by the large habit with a large, shortly petiolate leaf and a conspicuous spathe from which the few racemes about as long as the leaf emerge. The flowers are similar to those of *P. vargasii*, but with single-veined petals, and erect, much longer, winglike lobes of the lip.

Pleurothallis aloisii Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 8: 57, 1921. Fig. 2.

Ety.: Named in honor of Father Aloysius Sodiro of Quito who collected this species.

Plant large, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 25-28 cm long, with a loose, tubular sheath near the middle, and another at the base. **Leaf** erect, coriaceous, ligulate, obtuse, ca. 14 cm long, 1.3-1.5 cm wide, gradually narrowed below into a subpetiolate base. **Inflorescence** a subax, subsecund, simultaneously many-flowered raceme, up to 30 cm long including the peduncle 15 cm long, subtended by a compressed spathe, size not stated; floral bracts cucullate, length not stated; pedicel equal in length to the ovary; ovary ca. 6 mm long; **sepals** glabrous, the dorsal sepal narrowly oblong, obtuse, ca. 6.5 mm long, ca. 2 mm wide, 3-veined, free, the lateral sepals connate into a broadly ovate, obtuse, shortly bifid, concave synsepal, ca. 5 mm long, ca. 4 mm wide expanded; **petals** obovate, rounded at the apex, ca. 4 mm long, ca. 2 mm wide, 3-veined; **lip** fleshy, oblong, obtuse, hardly 4 mm long, 2 mm wide, the disc apparently featureless, sparsely verrucose along the margins, with a curved, transverse callus above the concave base; **column** terete, 2.5 mm long, the foot thick.

ECUADOR: **Napo**: subandean forest east of Oyacachi, Jan. 1901, *A. Sodiro s.n.* (Holotype destroyed at B, no isotypes known).

The type of this species was destroyed at Berlin, and apparently no isotype exists in any of the major European herbaria, and not even in Sodiro's herbarium (QPLS) preserved in Quito, Ecuador. The accompanying description and illustration were made from Schlechter's original description and figure 318 of plate 82 (*Repert. Spec. Nov. Regni Veg. Beih.* 57, 1929). Although he compared it to a gigantic *Stelis*, he thought it could belong to *Macrophyllae-Racemosae* or *Elongatae*, but not really compatible with either.

That this species belongs to subgenus *Crocodeilanthe* is not absolutely certain. The densely caespitose habit with large, cauline sheaths; narrowly elliptical leaf; long, many-flowered inflorescence; obtuse, obovate petals; and a cavity at the base of the lip below a curved callus strongly suggest this subgenus. The fleshy, entire, oblong lip that is verrucose along the margins is unusual for the subgenus.

Pleurothallis apposita Luer, sp. nov.

Fig. 3

Ety.: From the Latin *appositus*, "in apposition, side by side," referring to the calli of the lip.

Planta grandis, racemo folio elliptico longi-petiolato brevior, sepalis acutis, petalis oblongis triner-vis, labello oblongo callis ad medium crassis magnis apposis distinguitur.

Plant large, presumably epiphytic, probably caespitose, ramicauls incomplete; roots not seen. Ramicauls slender, presumably erect, more than 10 cm long. **Leaf** erect, coriaceous, elliptical, subacute, the blade 9-13 cm long, 2.5-4 cm wide, cuneate below into a slender petiole 2 cm long. **Inflorescence** racemose, 2-4 slender, subcongested, more or less distichous, simultaneously several-flowered racemes, 7-10 cm long including the peduncle 3 cm long, subtended by a slender spathe 1 cm long, from an annulus 10-12 mm below the abscission layer; floral bracts infundibular, 3 mm long, enclosing the pedicel; pedicels 3 mm long; ovary 2 mm long; **sepals** subcarinate, glabrous, the dorsal sepal elliptical-ovate, subacute, apiculate, concave, 6 mm long, 4 mm wide, 3-veined, the lateral sepals elliptical-oblong, subacute, apiculate, 6 mm long, 2.25 mm wide, connate 1.5 mm, 3-veined; **petals** translucent, oblong, rounded at the apex, 3.25 mm long, 1.5 mm wide, 3-veined; **lip** oblong-subtrilobed, 2.4 cm long, 1.2 mm wide unexpanded, rounded above the middle, the sides below the middle erect, obtuse, with a large, thick pair of parallel calli in apposition below the middle, the base with a rounded cavity, attached to the column-foot; **column** semiterete, stout, 1.5 mm long, the foot thick, 0.5 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Without locality, *W. Jameson s.n.* (Holotype: K), C. Luer illustr. 17234.

This species is known only from a collection by Jameson in the nineteenth century. The only data is "Peru," an erroneous assumption applied to many of Jameson's collections from Ecuador. I know of no other collection of this species.

Pleurothallis apposita is distinguished by an elliptical leaf with a slender petiole. The few ramicauls present have been broken off about ten centimeters below the spathe. The spathe is small from which two to four several-flowered racemes shorter than the leaf are borne. The sepals and oblong, the three-veined petals are not unusual in the subgenus. The lip, however, is distinct from all others. Filling the lower half is a pair of large, thick calli that nearly touch in the center. The lip cannot be spread without fracturing between the calli,

Pleurothallis atwoodii Luer, *Lindleyana* 11: 67, 1996.

Fig. 4.

Ety.: Named in honor of John Atwood of the Selby Botanical Gardens who discovered this species.

Plant medium in size, epiphytic, shortly repent to caespitose; roots slender. Ramicauls slender, erect, 7-13 cm long, with a loose, 3-5 cm long, tubular sheath near the middle, and 2-3 tubular sheaths at the base. **Leaf** erect, coriaceous, narrowly elliptical, subacute to acute, 8-11 cm long including an indistinct petiole ca. 1 cm long, 1-1.6 cm wide, narrowly cuneate below into the petiole. **Inflorescence** a single, distichous, loosely few-flowered raceme, 12-13 cm long including the peduncle 5-6 cm long, subtended by a slender spathe 12-13 mm long, from an annulus 2-3 mm below the abscission layer; floral bracts oblique, 5-6 mm long, enclosing the pedicel 3 mm long; ovary 2 mm long; **sepals** green, glabrous, the dorsal sepal ovate, acute, concave, 6 mm long, 2.5 mm wide, 3-veined, the lateral sepals completely connate into a subovate, acute lamina, deflexed near the middle, 5 mm long expanded, 2 mm wide, 4-veined; **petals** translucent green, elliptical-obovate, concave, 2.75 mm long, 1.3 mm wide, 3-veined, the apex rounded; **lip** green, ovate, obtuse, concave, 2 mm long, 1.5 mm wide, with erect, rounded basal angles, the disc with a low calli on either side and a transverse callus above a basal concavity that accommodates the end of the column-foot; **column** stout, 1.5 mm long, the foot stout, 1 mm long with the tip free, the anther, rostellum and stigma subapical.

COSTA RICA: **Cartago**: cloud forest along the road to Providencia de Dota, 9 July 1986, *J. Atwood 86-64* (Holotype: SEL), C. Luer illustr. 16518.

This species, known from a single Costa Rican collection, is a unique member of the subgenus. Vegetatively, the slender ramicaul with a relatively long sheath, the slender spathe, and the slender, distantly few-flowered raceme of small flowers are exceptional. The flowers, however, are typical for the subgenus with a deflexed synsepal; concave, membranous petals; and an ovate lip with a transverse callus above a basal cavity and a pair of low calli on the disc near the middle.

***Pleurothallis avirostris* Luer & Hirtz, sp. nov.**

Fig. 5.

Ety.: From the Latin *avirostris*, "bird-beaked," in allusion to the appearance of the lip.

Species haec *P. jamesonii* Lindl. affinis, sed labello trilobo, lobo antico convexo callosio transverse rhombiformi angulis obtusis, lobis lateralibus erectis obtusis crassissimis utrinque callosis distinguitur.

Plant medium in size, appears to have been growing terrestrially, caespitose; roots numerous, slender. Ramicauls fasciculate, stout, erect, 8-13 cm long, enclosed by 3-4 tubular, imbricating sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 8-11 cm long, 2.5-3.5 cm wide, cuneate below into a petiole 1 cm long. **Inflorescence** a single, second, densely and simultaneously many-flowered raceme, up to 23 cm long including the peduncle 12 cm long, subtended by a spathe 2.5 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts 4-5 mm long, enclosing pedicel and ovary; pedicels 2 mm long; ovary 2 mm long; **sepals** light yellow, subcarinate, minutely pubescent above the middle, the dorsal sepal ovate, acute, concave, 8.5 mm long, 4 mm wide unexpanded, 3-veined, the lateral sepals ovate, oblique, acute, 9 mm long, 3.75 mm wide, 3-veined, connate 1.5 mm; **petals** translucent, suffused with pink, elliptical-obovate, 4.5 mm long, 2.5 mm wide, 3-veined, the apex rounded, subapiculate; **lip** yellow, suffused with red, fleshy, trilobed, 3.5 mm long, 2.5 mm wide, the middle lobe transversely rhombic, convex, obtuse, the lateral lobes near the middle, erect, obtuse, thick with a rounded callus on both the external and internal surfaces, and a small conical callus on the inner lower portion, the lobes cannot be spread, almost meeting in the midline, the disc shallowly concave between the callous lobes, the base with a transverse cavity articulated with the end of the column-foot; **column** stout, 2.5 mm long, the foot 1.5 mm long with the tip free, the anther, rostellum and stigma subapical.

ECUADOR: **Bolivar**: Chimborazo, La Palma, alt. 3600 m, Nov. 1983, A. Hirtz 1344 (Holotype: MO), C. Luer illustr. 14933.

This species from a very high altitude on Mt. Chimborazo is closely related to *P. jamesonii* from lower altitudes. Except for the lip, it is similar vegetatively and florally. Although basically similar, the lip of *P. avirostris* is distinguished by the transversely rhombic anterior lobe that is broader than the lower portion occupied by the erect lateral lobes. The central portion of the anterior lobe is minutely verrucose. The erect lateral lobes are very thickened, with rounded calli on both surfaces and an additional, small, conical callus on each side near the base within. The lobes cannot be spread without fracturing the lip.

***Pleurothallis batillacea* Luer, Selbyana 3: 58, 1976.**

Fig. 6.

Ety.: From the Latin *batillaceus*, "resembling a shovel," referring to the large leaf.

Plant large, epiphytic to terrestrial, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, stout, erect, 10-75 cm long, with a loose, tubular sheath near the middle, and 2-3 tubular, imbricating, loose sheaths about the base. **Leaf** erect, coriaceous, elliptical to suborbicular, obtuse, petiolate, the blade 11-22 cm long, 5-16 cm wide, cuneate below into a petiole 1.5-2.5 cm long. **Inflorescence** racemose, 1 to 5 simultaneous, second, densely simultaneously many-flowered racemes, 18-27 cm long including the peduncle 3-4 cm long, subtended by a broad spathe 1-3 cm long, from an annulus just below the abscission layer; floral bracts inflated, 4-5 mm long; pedicels 1.5-2 mm long; ovary 1-1.5 mm long; **sepals** yellowish, suffused with purple along the veins, minutely ciliate, the dorsal sepal broadly ovate, obtuse, concave, 5.5 mm long, 4.5 mm wide unexpanded, 3-veined, the lateral sepals oblong, obtuse, apiculate, 5-6 mm long, 1.75-2 mm wide, connate 2 mm, each 3-veined; **petals** translucent with purple veins, elliptical-obovate, obtuse, 3-3.5 mm long, 1.3-1.5 mm wide, 3-veined; **lip** yellow, suffused with brown apex, fleshy, oblong-ovate, obscurely trilobed near the middle, 2.25 mm long, 1.5 mm wide unexpanded, the apical third rounded, minutely apiculate, callous, the lateral lobes rounded, erect, each with a small, lunate callus within the margin, the disc slightly concave between the apical callus and a transverse callus above the basal cavity, articulated with the column-foot; **column** stout, 1.5 mm long, the foot thick, 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: terrestrial on a road embankment between Quito and Chiriboga, alt. 2200 m, 12 Mar. 1976, C. Luer, J. Luer & P. Taylor 853 (Holotype: SEL); same area, alt. 1800 m, 10 Mar. 1975, C. Luer & R. Kent 227 (SEL); same area, alt. 2200 m, 22 Mar. 1979, B. Løjtnant & U. Molau 11289 (AAU, GB). **Carchi**: terrestrial on the road embankment between Tulcán and Maldonado, alt. 1600 m, 16 Mar. 1991, C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15094 (MO).

COLOMBIA: **Putumayo**: epiphytic in cloud forest between La Cocha and Sibundoy, alt. 2700 m, 3 Aug. 1978, C. Luer, J. Luer, R. Escobar et al., 3142 (SEL).

This species occurs locally in northern Ecuador and southern Colombia. It is often found on road embankments. Some plants attain a far greater size than others. Vegetatively similar to the other robust species of the subgenus, *P. batillacea* is characterized by the petiolate leaf and several erect, strict, secund, densely many-flowered racemes longer than the leaf, and subtended by a large, foliaceous spathe. The sepals are obtuse and minutely ciliate; the petals are obtuse and three-veined; and the ovate lip is obscurely three-lobed, the anterior lobe rounded and callous, the rounded lateral lobes erect with an intramarginal callus.

***Pleurothallis bucamangae* Luer & Escobar, Orquideología 20: 38, 1996. Fig. 7.**

Ety.: Named for the city of Bucaramanga in Santander, Colombia, near where this species occurs.

Plant medium in size to large, epiphytic to terrestrial, densely caespitose but forming ascending rhizomes up to 8 mm thick between clumps; roots slender, numerous. Ramicauls fasciculate, relatively slender, erect, 12-20 cm long, with a slender, tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, petiolate, subacute to obtuse, the blade 7-10 cm long, 2-3 cm wide, cuneate below into a petiole 1 cm long. **Inflorescence** racemose, the racemes 1 or 2, stout, densely and simultaneously many-flowered, with the flowers erect and more or less distichous, 8-11 cm long including the peduncle 1-2 cm long, subtended by a slender spathe 1 cm long, from an annulus 1 cm below the abscission layer; floral bracts tubular, 5 mm long, enclosing the pedicel, ovary and lower portion of the flower; pedicels 1-1.5 mm long; ovary 2-2.5 mm long; **sepals** yellow, finely ciliate, the dorsal sepal elliptical-obovate, acute to subacute, concave, 8-9 mm long, 3.5-5 mm wide expanded, 3-veined, connate to the lateral sepals for 4 mm to form a cylindrical sepaline tube, the lateral sepals oblong, obtuse, 7-9 mm long, 2.5-3 mm wide, 3-veined, connate 3 mm; **petals** translucent yellow, veined in purple, elliptical, obtuse, more or less concave, 4-5 mm long, 2.5-3 mm wide, 3-veined; **lip** yellow, edged in purple, fleshy, ovate-oblong, 3.5 mm long, 1.5-2 mm wide, the apex obtuse to rounded, the disc broadly shallowly concave and smooth between a pair of low, lunate calli near or below the middle, and with a transverse callus above the narrowly concave base, the base truncate, solidly fixed to the column-foot; **column** stout, 1.5 mm long, the foot thick, 1 mm long with the apex short and thick, the anther, rostellum and stigma subapical.

COLOMBIA: **Santander**: in scrub forest east of Bucaramanga toward Berlin, alt. 3300 m, 7 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10107 (Holotype: MO); same area, alt. 2600 m, 14 May 1982, C. Luer, J. Luer, R. Escobar & D. Portillo 7878 (SEL).

Although the flowers of this species are very similar to those of *P. salpingantha*, the habit immediately distinguishes this species from the Eastern Cordillera of Colombia. *Pleurothallis bucamangae* is a slender plant with distinctly petiolate leaves and a small, slender spathe only about one centimeter long. The inflorescence emerges about two centimeters below the blade of the leaf. *Pleurothallis salpingantha* is stouter with large, sessile leaves and a large, broad, foliaceous spathe. The sepals of both species are connate to near the middle into a sepaline tube. The three-veined petals and oblong, bicallous lips are also similar.

***Pleurothallis cassidis* Lindl., Ann. Mag. Nat. Hist. ser. 1, 15: 384, 1845. Figs. 8., 9.**

Ety.: From the Latin *cassidis*, "of a helmet," referring to the cucullate dorsal sepal.

Syn.: *Pleurothallis palmiformis* Lindl., Folia Orch. *Pleurothallis* 3, 1859.

Ety.: From the Latin *palmiformis*, "like a palm," is allusion to the appearance of the plant.

Syn.: *Humboldtia cassidis* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia palmiformis* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis langlassei* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 105, 1920.

Ety.: Named in honor of E. Langlasse who collected this species.

Syn.: *Pleurothallis pleiostachys* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 27: 53, 1924.

Ety.: From the Greek *pleiostachys*, "most spikes," referring to the multiple racemes.

Plant medium in size to large, coarse, epiphytic to terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, stout, erect, 15-35 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 8-17 cm long, 3-6 cm wide, cuneate below into a sessile base. **Inflorescence** racemose, the racemes few to many, simultaneous, more or less secund, densely and simultaneously many-flowered, 7-19 cm long including the peduncle 1-5 cm long, subtended by a foliaceous spathe 2.5-5 cm long, from an annulus adjacent to the abscission layer; floral bracts inflated, 4-8 mm long, enclosing pedicel and ovary, and sometimes the base of the flower; pedicels 3-4 mm long; ovary 2-2.5 mm long; **sepals** yellowish to purple, more or less veined in brown or purple, subcarinate, ciliate, variously short-pubescent above the middle within, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 7-10 mm long, 4-7 mm wide expanded, 3- or 5-veined, connate to the lateral sepals for less than 2 mm, the lateral sepals parallel, acutely deflexed below the middle, oblong, subacute to obtuse, 6-7.5 mm long, 2-3 mm wide, 3-veined, connate to near the middle; **petals** translucent, veined in brown or purple, elliptical-obovate, rounded at the apex, more or less concave, 3.5-5 mm long, 2.5-3.5 mm wide, 3-veined; **lip** yellow to purple, fleshy, subquadrate-oblong to broadly or transversely oblong, more or less dilated below the middle with erect sides, 2-3 mm long, 2-3 mm wide, the apex broadly obtuse, decurved, producing a retuse appearance, the disc concave and smooth between a pair of calli produced near or above the middle, the calli sometimes prominent lunate protuberances continuous with the transverse callus above the concave base, the base fixed to the column-foot; **column** stout, 2-2.5 mm long, the foot thick, 1 mm long with the apex short and thick, the anther, rostellum and stigma subapical.

COLOMBIA: **Cauca:** near Popayán, on the ascent to Sotara, on the ground, at 10,000 ft., *T. Hartweg s.n.* (Holotype: K), C. Luer illustr. 16368; Páramo de Guanacas, above Popayán, alt. 3000-3400 m, *F. C. Lehmann 4510* (K); Alto del Trueno, alt. 2800 m, 27 Nov. 1899, *E. Langlassé 97* (holotype of *P. langlassei* presumably destroyed at B; lectotype here designated: AMES; isoelectotypes: G, K, US), C. Luer illustr. 15487. **Boyacá:** Sierra Nevada del Cocuy, below El Playón, alt. 3200 m, 11 Sept. 1957, *P. J. Grubb, B. Curry & A. Fernandez-Perez 819* (K). **Tolima:** Alto de Oséras, alt. 3000-3300 m, 11 Jan. 1883, *F. C. Lehmann 2445* (K); Mt. Tolima, alt. 9,000-10,000 ft., Aug. 1917, *W. Tracey 181* (K). **Nariño:** Andes of Pasto, alt. 13,000 ft., 2 Jan. 1856, *W. Jameson 398* (AMES, K); terrestrial on Volcán Galeras, alt. 4000 m, May 1922, *W. Hopp 174* (holotype of *P. pleiostachys* presumably destroyed at B; neotype here designated: *W. Jameson 398*: AMES; isoneotype: K); east of La Victoria, alt. 3000 m, 4 Nov. 1979, *C. Luer, J. Luer & A. Hirtz 4647* (SEL). **Putumayo:** near La Laguna, 2 May 1876, *E. André 3042* (K); epiphytic in cloud forest between La Cocha and Sibundoy, alt. 2700 m, *C. Luer, J. Luer, R. Escobar et al. 3115* (SEL).

ECUADOR: **Carchi:** eastern declivity of the Andes bordering Colombia (Pasto), alt. 12,000 ft., *W. Jameson 13* (holotype of *P. palmiformis*: K), C. Luer illustr. 16369; between Tulcán and Maldonado, alt. 3150 m, 17 May 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 5623* (AAU, AMES); same area, alt. ca. 2500 m, 21 Feb. 1978, *C. Luer, J. Luer & A. Hirtz 2684* (SEL); Playón de San Francisco, El Mirador, 16 Aug. 1978, *J. D. Boeke & J. Jaramillo 2697* (NY); above Playón de San Francisco, alt. 3300 m, 14 Feb. 1994, *A. Hirtz 6031* (MO). **Imbabura:** terrestrial on the road cut between Otavalo and Apuela, alt. 2500 m, 8 Feb. 1979, *C. Luer, J. Luer, A. Hirtz & R. Escobar 3901, 3906* (SEL); Selva Alegre, alt. 2600 m, Apr. 1984, *A. Hirtz 1685* (MO). **Loja:** epiphytic elfin forest at the pass between Loja and Saraguro, alt. 3000 m, 12 Feb. 1978, *C. Luer, J. Luer & M. Portilla 2563* (holotype of *P. taxis*: SEL); Parque Nacional Podocarpus, east of Nudo de Cajanuma, alt. 3050-3420 m, 24 Feb. 1985, *B. Øllgaard et al. 58086* (AAU, QCA). **Napo:** above Papallacta, alt. 3200 m, Jan. 1994, *A. Hirtz 6008* (MO). **Pichincha:** northwest of Calacali, Hda. Yunguilla, alt. 2800 m, 20 Mar. 1942, *O. Haught 3181* (AMES, US); terrestrial on the road cut, old road between Quito and Chiriboga, alt. 2900 m, 18 Feb. 1978, *C. Luer & J. Luer 2790* (SEL); north of San Juan between Quito and Chiriboga, alt. 3400 m, 15 Mar. 1979, *B. Løjtnant & U. Molau 11042* (AAU). **Tungurahua:** Cordillera de los Llanganates, alt. 2950 m, 11 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11138* (MO). **Zamora-Chinchipe:** between Loja and Zamora, alt. 2750 m, 19 Apr. 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3987* (AAU, AMES); Parque Nacional Podocarpus, Cerro Toledo, alt. 2800-2850 m, 27 Feb. 1985, *B. Øllgaard et al. 58288* (AAU, QCA); terrestrial on the road cut east of the pass between Loja and Zamora, alt. 2000 m, Feb. 1978, *C. Luer & J. Luer 2779* (SEL); east of Yangana, alt. 3200 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10781* (MO).

PERU: **Amazonas:** Chachapoyas, between Leimebamba and Balsas, alt. 3400-3600 m, 19 Apr. 1964, *R. Ferreyra 15591* (US). **San Martín:** Huallaga, valley of Río Apisoncho, 30 Km above Jucusbamba, alt. 3600 m, 23 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1277* (K). **Huánuco:** near Chinchao, Carpath Pass, alt. 2760 m, *W. Hodge 6280* (US?); Paucartambo, Pillahuata, alt. 2700 m, *Vargas 4960* (AMES?).

Lindley described nearly simultaneously three collections by Hartweg, made in nearby localities in the department of Cauca near Popayán in southern Colombia: *P. cassidis*, *P. hartwegii* and *P. laevigata*. He had used the epithet *hartwegii* for an unrelated species three years earlier. Both *P. cassidis* and *P. laevigata* are very similar and very closely allied, being distinguished by subtle differences in the position of the sepals and calli of the lip. They could conceivably be treated as one, polymorphic species-complex. Both are widely distributed in the Andes of Colombia, Ecuador and into Peru at high altitudes.

Both concepts are characterized by a large habit with stout ramicauls clad in loose, papery sheaths. The leaf is usually large, elliptical and sessile with a large, foliaceous spathe at the base. However, the ramicauls of some populations are slender, and some leaves and spathes are comparatively small. A few to many erect racemes of small to medium-sized, yellow or purple flowers variously marked or veined in purple are produced simultaneously.

The sepals are variously pubescent. The dorsal sepal of *P. cassidis* is concave and commonly three-veined, but in larger-flowered forms the dorsal sepal is five-veined. The lateral sepals are usually acutely deflexed near or below the middle with the tips of the petals and lip barely protruding above the deflexed surface. The petals are broad, rounded at the apex and three-veined.

The fleshy lip broadly oblong, to subquadrate, more or less dilated below the middle with erect sides. The apex is broadly obtuse with the tip decurved to impart a retuse appearance. The center of the lip is shallowly concave between a pair of erect, lunate calli that are continuous with the curved basal carina above the basal cavity. Instead of being movably articulated, the concave base is firmly ankylosed to the bulbous tip of the column-foot. The lip of *P. laevigata* is longer, not decurved at the apex, and the pair of calli are located below the middle. Intermediate forms are encountered, often making a determination less than positive.

Pleurothallis cauliflora Lindl., Companion Bot. Mag. 2: 355, 1836.

Fig. 10.

Ety.: From the Latin *cauliflorus*, "bearing flowers directly from the main stem," referring to the short-pedicellate flowers largely engulfed by inflated floral bracts and appressed to the rachis.

Syn.: *Humboldtia cauliflora* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Pleurothallis exotica* Luer, Selbyana 3: 104, 1976.

Ety.: From the Latin *exoticus*, "exotic," alluding to unusual features of the depauperate specimen.

Plant large, epiphytic, caespitose; roots slender. Ramicauls fasciculate, stout, erect, 10-30 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, broadly elliptical-ovate, obtuse, petiolate, the blade 7-14 cm long, 4-7.5 cm wide, the rounded base contracted into a slender petiole 1.5-2.5 cm long. **Inflorescence** racemose, racemes 1 or 2, stout, more or less secund, densely and simultaneously many-flowered, 15-25 cm long including the peduncle 4-7 cm long, subtended by a foliaceous spathe 4-6.5 cm long, from an annulus 1-3 mm below the abscission layer; floral bracts inflated, 10-13 mm long, 8-10 mm wide expanded, enclosing pedicel, ovary and much of the flower; pedicels 2 mm long; ovary 3 mm long; **sepals** dull yellow, speckled with purple, subcarinate, glabrous, the dorsal sepal ovate, subacute, concave, 11 mm long, 6 mm wide unexpanded, 3-veined, connate to the lateral sepals for 2 mm, the lateral sepals connate to near the apex into an ovate, concave, lamina, 11 mm long, 9 mm wide, 6-veined, the apex obtuse, minutely bifid; **petals** translucent, marked with purple, oblong, obtuse, 6 mm long, 2.5 mm wide, 3-veined; **lip** red-purple, thin, suborbicular, lightly concave, 4.5 mm long, 4.5 mm wide, the base truncate, broadly fixed to the column-foot; **column** stout, 3 mm long, the foot thick, 1.5 mm long, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: "on trunks of trees near Lloa," *W. Jameson s.n.* (Holotype: K); "Quito," *W. Jameson s.n.* (AMES); between San Juan and Chiriboga, alt. 3200 m, 31 Dec. 1955, *E. Asplund 18950* (S); old road between Quito and Santo Domingo above Chiriboga, alt. 2500 m, 18 Feb. 1978, *C. Luer, J. Luer & A. Hirtz 2637* (SEL). **Bolívar**: cloud forest north of Guaranda toward Facundo Vela, alt. 3100 m,

24 Mar. 1984, C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9674 (MO); along old road to Pueblo Viejo, alt. 3100 m, 26 Mar. 1984, C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9743 (MO); epiphytic west of Salinas toward La Palma, alt. 3000 m, 10 Mar. 1991, C. Luer, A. Hirtz et al. 14954 (MO); terrestrial on the road cut, west of Guaranda toward Catarama, alt. 3150 m, 13 Mar. 1991, C. Luer, A. Hirtz et al. 15022 (MO). **Azuay:** cloud forest remnant along the new road north of Cuenca, alt. 2900 m, 8 Feb. 1987, C. Luer, J. Luer & A. Hirtz 12731 (MO). **Carchi:** at pass between Tufiño and Maldonado, alt. 3300-3400 m, 19 Jan. 1988, U. Molau, B. Eriksen & M. Fredrikson 2592 (AAU, GB). Without locality, collected by Janet Kuhn, flowered in cultivation at J. & L. Orchids, Easton, CT., Oct. 1975, C. Luer 614 (holotype of *P. exotica*: SEL). **PERU:** **Cajamarca:** *fide* Schlechter.

This large species is recognizable even when not in flower. Although the ramicauls clad in large, loose sheaths are similar to those of related species (e.g. *P. elegans*, *P. galeata*, etc.), the broadly elliptical, obtuse, long-petiolate leaf with the long, foliaceous spathe are distinctive. One or two long, stout, distichous racemes emerge from the sheath and bear numerous flowers appressed to the rachis and half-engulfed by large, inflated floral bracts. The lip is thin, round and smooth without any callus.

Pleurothallis choerorhyncha Luer, *Orquideología* 20: 204, 1996.

Fig. 11.

Ety.: From the Greek *choiros*, "a pig," and *rhynchos*, "a snout," in allusion to the labellar callus.

Plant large, epiphytic, densely caespitose; roots coarse. Ramicauls erect, stout, 10-19 cm long, with a loose, tubular sheath above the middle, and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, petiolate, elliptical, 12-16 cm long, 3.5-4.5 cm wide, cuneate below into the petiole 1-2 cm long. **Inflorescence** several (8) simultaneous, more or less secund, densely simultaneously many-flowered racemes, 10-23 cm long including the peduncle 2-4 cm long, subtended by a broad, conspicuous spathe 2-3 cm long, from an annulus 5 mm below the abscission layer; floral bracts infundibular, 3 mm long; pedicels 3 mm long; ovary 1.5 mm long; **sepals** appear to have been brownish with darker veins, subcarinate, glabrous, the dorsal sepal ovate, subacute, concave, 5 mm long, 3 mm wide, 3-veined, free, the lateral sepals oblong, acute, 5 mm long, 1.25 mm wide, 3-veined, connate 1 mm; **petals** translucent, with dark midvein, elliptical, acute, 3.5 mm long, 1.25 mm wide, 1-veined with a lesser vein on either side below the middle; **lip** fleshy, ovoid-trilobed, 2 mm long, 1.5 mm wide, the apical lobe thick, ovate, broadly obtuse, concave, demarcated from the rest of the lip by a transverse callus and a constriction, the lateral lobes erect, near the middle, obtuse, with an intramural callus filling the inner surface, the disc shallowly concave, with a transverse callus above the concave base, hinged to the back of the end of the column-foot; **column** terete, 2 mm long, the foot thick with the bulbous tip free, the anther and rostellum subapical, the stigma ventral.

COLOMBIA: **Valle del Cauca:** Cordillera Occidental, Los Farrallones, northern extreme, Roblal, alt. 2600-2870 m, 13 Oct. 1944, J. Cuatrecasas 18116 (Holotype: US; Isotype: AMES).

This species is known from the Western Cordillera of Colombia by a single collection by José Cuatrecasas. Although the type-specimen at US is incomplete, a large, complete specimen with five ramicauls with leaves is present at AMES. In habit, it resembles many of the species with a large, petiolate leaf, a conspicuous spathe, and a fascicle of several, many-flowered racemes. Most unusual is the lip which resembles the lip of *P. galeata*, but the anterior lobe of *P. choerorhyncha* possesses an ovoid, concave callus distinctly demarcated from the disc above a constriction. The lateral lobes are erect, each with an intramural callus as commonly seen in its numerous relatives.

Pleurothallis cosangae Luer & Hirtz, sp. nov.

Fig. 12.

Ety.: Named for the community of Cosanga near where this species was discovered.

Inter species subgeneris *Crocodylanthidis* habitu grandis, ramicaulibus gracilibus, racemis paucis multifloris secundis foliis ellipticis plus minusve brevioribus, sepalis ovatis minute ciliatis, petalis obovatis obtusis trinervis et labello subquadrato cum lobis lateralibus erectis truncatis distinguitur.

Plant large, epiphytic, rhizome thickened and ascending; roots slender. Ramicauls fasciculate, erect, 20-30 cm long, with a tubular sheath near the middle and enclosed at the base by 2 or more tubular, imbricating sheaths. **Leaf** erect, coriaceous, elliptical, acute, petiolate, the blade 9-12 cm long, 2.5-3.5 cm wide, the base cuneate into a slender petiole 1.5-2 cm long. **Inflorescence** a few, simultaneously many-flowered, secund racemes 9-11 cm long including the peduncle ca. 1 cm long, subtended by a spathe 1-1.5 cm long, from an annulus 2 mm below the abscission layer; floral bracts, oblique, inflated, 2-3 mm long; pedicel 1-2 mm long; ovary 1-1.5 mm long; **sepals** yellow, ovate, acute, minutely ciliate, the dorsal sepal 4.5-5 mm long, 2 mm wide, 3-veined, connate to the lateral sepals for 0.25 mm, the lateral sepals 4.5-5 mm long, 1.25 mm wide, connate 1-1.5 mm; **petals** translucent yellow, broadly obovate, obtuse, 2.5 mm long, 1-1.25 mm wide, 3-veined; **lip** yellow, thick, subquadrate-trilobed, 1.25 mm long, 1.5 mm wide across the lateral lobes expanded, the apex thickened, broadly truncate, the sides with erect, thick, truncate lateral lobes near the middle, the disc concave between the thickened apex and the transverse callus above the concave base, the base hinged to the back of the tip of the column-foot; **column** stout, 1.5 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma ventral.

ECUADOR: **Napo**: Cosanga, alt. ca. 1500 m, 13 Apr. 1991, A. Hirtz & S. Ortega 5402 (Holotype: MO), C. Luer illustr. 15327; between Baeza and Archidona, Mar.-Apr. 1865, Juan Isern 1787 (GB, MA), C. Luer illustr. 15330.

The first known collection of this species was made in 1865, and apparently had not been collected again until 1991 when it was found by Hirtz in an area thought to be reasonably well-explored botanically. To my knowledge, it has not been collected again in the intervening 136 years. It is readily distinguished by the thick, ascending rhizome with long, close, slender ramicauls; an elliptical, petiolate leaf; and a fascicle of racemes of small flowers shorter than the leaf. The tiny lip is most remarkable with a pair of erect, marginal, oblong, truncate lobes. The base is concave above the articulating cavity that is attached to the back surface of the free, bulbous tip of the column-foot.

Pleurothallis croatii Luer, sp. nov.

Fig. 13.

Ety.: Named in honor of Dr. Thomas B. Croat who first discovered this species.

Planta grandis dense caespitosa, foliis ellipticis acutis supra basin decurrentibus, racemo disticho vel secundo dense multifloro folio longiore, spatha parva, sepalis obtusis concavis carinatis infra medium connatis, petalis obtusis trinervis, labello ovoideo subtrilobo apice crasso anguste obtuso disco ad medium bicalloso.

Plant medium to large in size, epiphytic, densely caespitose; roots numerous, slender. Ramicauls fasciculate, erect, laterally compressed, 12-30 cm long, enclosed by a tubular sheath near the middle and 2-3 other tubular sheaths about the base. **Leaf** erect, coriaceous, elliptical, acute, 6-9 cm long, 3-3.5 cm wide, the base cuneate, decurrent 1-1.2 cm onto the ramicaul. **Inflorescence** racemose, 1 to several racemes produced simultaneously, dense, secund to distichous, simultaneously many-flowered, 12-20 cm long including the peduncle 3-5 cm long, sometimes cleistogamous, subtended by a slender spathe ca. 1 cm long, from the apex of the ramicaul embedded 1 cm into the leaf; floral bracts infundibular, 4-5 mm long, enclosing pedicel; pedicels 2 mm long; ovary 2 mm long; **sepals** yellow, elliptical, concave, obtuse, with the margins microscopically cellular-glandular, tall-carinate toward the base, the dorsal sepal 7 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 2-3 mm, the lateral sepals 6.5 mm long, connate 3 mm, 4.5 mm wide together; **petals** translucent yellow, obovate, obtuse, 4.25 mm long, 1.75 mm wide, 3-veined; **lip** yellow, ovate-trilobed, 3 mm long, 2 mm wide expanded, the apical lobe triangular, thick at the narrowly obtuse apex, the lateral lobes below the middle, erect, broadly rounded, the disc concave between the semilunate calli near the middle, with a narrow, transverse callus above the shallowly concave base, articulated to the tip of the column-foot; **column** stout, 2 mm long, the foot thick, 0.5 mm long, the anther subapical, and the rostellum and stigma ventral.

PANAMA: **Chiriquí**: Cerro Pate Macho, along the continental divide, northeast of Boquete, alt. ca. 2200 m, 23 Nov. 1979, *T. B. Croat 48506* (Holotype: MO), C. Luer illustr. 17022. **Bocas del Torro**: along the continental divide, northeast of Cerro Pate Macho, alt. 2100-2200 m, 12 Nov. 1981, *S. Knapp, A. Herre & L. Coley 2156* (MO).

This species, apparently endemic in western Panama, is unique in the subgenus with the bases of the leaves decurrent on a stout, laterally compressed ramicauls that are fasciculate with common, loose, tubular sheaths. The elongate racemes are subtended by a small spathe. In one of the two collections seen, all ovaries are swollen. The sepals are remarkable with tall, more or less irregular carinae along the midvein below the middle. The petals are obtuse and three-veined. The triangular-trilobed lip with the lateral lobes erect and broadly rounded below the middle, and a small pair of calli, is similar to that of *P. moritzii*. The column is terete, a little longer than usual in the subgenus.

Pleurothallis cuatrecasasii Luer, *Orquideología* 20: 208, 1996.

Fig. 14.

Ety.: Named in honor of the late Dr. José Cuatrecasas, distinguished Spanish botanist, who collected this species.

Plant large, coarse, epiphytic, repent; rhizome thick, enclosed by fragmenting, tubular sheaths, creeping, 3-5 cm long between ramicauls; roots slender, from nodes along the rhizome. Ramicauls ascending to erect, stout to slender, 8-16 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 8-10 cm long including a petiole 1 cm long, 2.5-3 cm wide, cuneate below into the petiole. **Inflorescence** a single, secund, simultaneously many-flowered raceme up to 18 cm long including the peduncle 5-6 long, subtended by a slender spathe 1-1.2 cm long, from an annulus 3 mm below the abscission layer; floral bracts infundibular, 4 mm long, enclosing pedicel; pedicels 3 mm long; ovary 2.5 mm long; **sepals** yellowish, subcarinate, the dorsal sepal elliptical, obtuse, concave, 7 mm long, 4 mm wide, 3-veined, connate to the lateral sepals for 2 mm, the lateral sepals minutely ciliate, parallel, acutely deflexed below the middle, oblong, obtuse, 5 mm long, 2 mm wide, 3-veined, connate to near the middle; **petals** translucent, oblong-elliptical, concave, obtuse, 3 mm long, 1.8 mm wide, 3-veined; **lip** yellow to purple, oblong, 2.5 mm long, 1.5 mm wide, the apex broadly truncate, retuse, the disc shallowly concave and smooth between a pair of low, rounded calli near the middle, the base with a transverse callus creating a cavity on the end, fixed to the column-foot; **column** stout, 1.5 mm long, the foot thick, nearly 1 mm long, the anther, rostellum and stigma subapical.

COLOMBIA: **Cauca**: Cabeceras del Río Palo, Quebrada de Santo Domingo, alt. 2950-3150 m, 13 Dec. 1944, *J. Cuatrecasas 19264* (Holotype: NY).

This species is apparently endemic in the Central Cordillera of southern Colombia where it was collected by J. Cuatrecasas. In habit, the thick, ascending, long-repent rhizome of this species resembles that of *P. scansor*, but the flowers differ markedly. Although produced only in a solitary raceme, the flowers of *P. cuatrecasasii* are most similar to those of *P. cassidis*. The dorsal sepal is connate to the lateral sepals about a third of the length, and the lateral sepals are acutely deflexed just beyond the connation. The petals are oblong, concave, obtuse and three-veined. The lip is subquadrate or oblong with a broadly retuse apex and a low pair of calli near the middle.

Pleurothallis cyathiflora C. Schweinf., *Bot. Mus. Leaf.* 15: 88, 1951.

Fig. 15.

Ety.: From the Latin *cyathiflorus*, "with cup-shaped flowers," referring to the corolla.

Syn.: *Pleurothallis cochabambae* Luer & Vásquez, *Lindleyana* 6: 94, 1991.

Fig. 16.

Ety.: Named for the department of Cochabamba, Bolivia, where this species occurs.

Plant medium in size to large, epiphytic to terrestrial, densely caespitose; roots slender. Ramicauls fasciculate, stout, erect, 10-22 cm long, with a long, loose, tubular sheath more or less covering the upper half and 2-3 imbricating sheaths about the base including more than one ramicaul. **Leaf** erect, thickly coriaceous, elliptical, petiolate, subacute, the blade 6-12 cm long, 1.5-4 cm wide, cuneate below into a

petiole 1-1.5 cm long. **Inflorescence** racemose, 1-3, secund, densely and simultaneously many-flowered, 8-15 cm long including the peduncle 2-4 cm long, subtended by a slender spathe 1.5-2.5 cm long, from an annulus 1 cm below the abscission layer; floral bracts infundibular, 6-8 mm long, enclosing the pedicel and ovary; pedicels 2-3 mm long; ovary 3 mm long; **sepals** translucent rose with purple veins, rosy yellow to yellow-brown, finely ciliate and pubescent above the middle, the dorsal sepal broadly ovate, obtuse, 6-8 mm long, 4-5.25 mm wide expanded, 3-veined, the lateral sepals oblong-obovate, obtuse, 6-8.5 mm long, 3.5-4.5 mm wide, 3-veined, connate 4 mm; **petals** translucent, veined in purple, elliptical-obovate, obtuse, more or less concave, 3-5 mm long, 2-3 mm wide, 3-veined; **lip** dark purple, fleshy, oblong-obovate, slightly narrowed above the middle, 3-5 mm long, 2-3 mm wide, the apex broadly rounded, the disc broadly shallowly concave and smooth between a pair of low, lunate calli near or slightly above the middle, and with a transverse callus above the concave base, the base truncate, solidly fixed to the back of the tip of the column-foot; **column** terete, 2-3 mm long, the foot thick, 2 mm long with the apex free, the anther, rostellum and stigma subapical.

PERU: **Cuzco**: Paucartambo, Pillahuata, epiphytic in rain forest, alt. 2800 m, 25 Jan. 1945, *C. Vargas* 4957 (Holotype: AMES; herb. Vargas), *C. Luer* illustr. 15491.

BOLIVIA: **La Paz**: Murillo, valley of Río Zongo, alt. 3000 m, 8 Jan. 1988, *J. C. Solomon* 17470 (K, MO). **Cochabamba**: Chapare, terrestrial on the road embankment, El Balconcillo, northeast of Cochabamba, alt. 3200 m, 18 Nov. 1984, *C. Luer*, *J. Luer* & *R. Vásquez* 10494 (holotype of *P. cochabambae*: MO); epiphytic in scrubby vegetation below the pass between Cochabamba and Villa Tunari, alt. 3180 m, 26 Nov. 1978, *C. Luer*, *J. Luer*, *R. Vásquez* et al. 3469 (SEL); same area along a quebrada, alt. 3150 m, 14 Nov. 1992, *C. Luer*, *J. Luer*, *R. Vásquez*, *D. Ric* & *W. Teague* 16407 (MO); along the old, abandoned road to Villa Tunari, alt. 3150 m, 1 Feb. 1997, *C. Luer*, *J. Luer*, *R. Vásquez*, *D. Ric* & *W. Teague* 16407 (MO); same area, alt. 2500 m, *C. Luer* et al. 18368, 18377 (MO).

This species was described from southeastern Peru, but it is frequent in areas on the north slopes of the Andes of Bolivia where both stout and slender variations occur. The species is distinguished by the oblong, petiolate leaf, a small spathe, and one to three racemes of usually purple-striped flowers slightly longer than the leaf. The sepals and three-veined petals are broad and obtuse; the lip is elliptical-oblong with a pair of lunate calli barely above the middle.

Pleurothallis domingensis Cogn., *Symb. Antill.* 6: 420, 1909.

Ety.: Named for Santo Domingo where the species was first recognized.

Fig. 17.

Plant medium to large, epiphytic, densely caespitose; roots slender. Ramicauls fasciculate, slender, erect, 7-20 cm long, with a close, tubular sheath covering the middle, and 2-3 more or less loose, often fragmented, tubular sheaths about the base. **Leaf** erect, coriaceous, elliptical-obovate, subacute to obtuse, petiolate, 8-13 cm long including the petiole 1.5-3 cm long, 2-3.5 cm wide, cuneate below into the slender petiole. **Inflorescence** racemose, with 1-2 simultaneous, distichous, densely and simultaneously many-flowered racemes, 4-12 cm long including the peduncle 1-2 cm long, subtended by a spathe ca. 1 cm long, from an annulus 3-5 mm below the abscission layer; floral bracts infundibular, 2-3 mm long; pedicels 1.5-2.5 mm long; ovary 1-1.5 mm long; **sepals** pale yellow to yellow-green, subcarinate, minutely pubescent within, the dorsal sepal ovate, acute, concave, 3-5 mm long, 1.75-2 mm wide, 3-veined, the lateral sepals oblong-ovate, subacute to obtuse, 3-5 mm long, 1.25-1.5 mm wide, 3-veined, connate 0.5-1 mm; **petals** translucent, oblong, rounded at the apex, 1.75-2 mm long, 0.75-0.8 mm wide, 1-veined; **lip** yellowish, trilobed, 1.5-1.75 mm long, 1-1.5 mm wide, the middle lobe thick, rounded, the lateral lobes near the middle, erect, rounded, with an obtuse callus on the inner surface extending to the anterior margin, the disc slightly concave above a transverse callus above the basal cavity, articulated with the end of the column-foot; **column** stout, 1 mm long, the foot thick, 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

DOMINICAN REPUBLIC: below Valle Nuevo, alt. 1900 m, 29 May 1887, *Eggers* 2176 (Holotype: BR; Isotype: K); Loma Isabel de Torre, alt. 770 m, 3 July 1887, *Eggers* 2763 (K); near Constanza, alt. 1300 m, May 1910, *H. von Türckheim* 3331 (K); Constanza, alt. 1950 m, June 1910, *H. von Türckheim* 3425 (AMES, BR), *C. Luer* illustr. 17195; near Constanza, alt. 1250 m, Aug. 1910, *H. von Türckheim* 3526 (K). **Azua**: San Juan, Loma La Virja, alt. 1500 m, 28 Aug. 1929, *E. L. Ekman* 13427 (AMES, K, S), *C. Luer* illustr. 17264; La Loma Torro, Jan.-Feb. 1982, *B. Phillips* 58 (K); San Juan, Piedra del Aguacate, 16 Sept. 1946, *R. A. Howard* & *E. S. Howard* 8999 (AMES, B, BM). **De la Vega**: July 1912, *M. Fuertes* 1805 (K). **Monte Cristi**: Sabaneta, alt. 500-600 m, 28 Nov. 1930, *J. E. Valeur* 26 (K). **Santo Domingo**: La Cumbre, alt. 300 m, 5 May 1929, *E. L. Ekman* 12384 (K, S). Sierra de Yaroa, alt. 850 m, 28 Jan. 1969, *A. Liogier* 13566 (AMES, NY); Puerto Plata, Loma Isabel de Torres alt. 700-800 m, 25 Mar. 1969, *A. Liogier* 14571 (AMES, NY); Jarabacoa, Loma de la Sal, alt. 1300-1400 m, 30 Oct. 1968, *A. Liogier* 13367 (AMES, NY); El Montazo between Constanza and Valle Nuevo, alt. 1600-1800 m, 29 May 1969,

A. Liogier 15435 (AMES, NY); Loma del Pavo above Aguacate, alt. 1500 m, 18 Feb. 1968, *A. Liogier 14020* (AMES, NY); Norte Buena Berg, alt. 1800 m, Sept. 1911, *Pater Fuertes 1172* (AMES); San José de Ocoa, La Nevera, alt. 2100 m, 20 Jan. 1975, *A. Liogier 22361* (AMES, NY); **Bahoruco**: Zapoten Abajo above Aguacate, alt. 1300 m, 5 May 1986, *C. Luer, J. Luer & D. Dod 12191* (MO).

HAITI: D'Artibonite: Montagnes Noires, Morne Basil, alt. 1300-1450 m, 15 Nov. 1924, *E. L. Ekman 2523* (K, S); Morne de la Houtte, Ma Blanche, alt. ca. 1400 m, 7 Aug. 1917, *E. L. Ekman H-528* (K, S).

Du Nord: Marmelade, alt. 800 m, 20 Dec. 1925, *E. C. Leonard 8365, 8367* (AMES); Morne Brigand, Massif du Nord, alt. 800 m, 11 Dec. 1924, *E. L. Ekman 2827* (AMES); Savane Zombis, 19 July 1939, *G. H. Pridge 122* (AMES); Bouaiu Chat, Mornes des Commissaires, alt. 1600 m, 12 May 1942, *L. R. Holdrige 1199* (AMES, BM).

CUBA: **Oriente**: near Monte Verde, Jun-July 1859, *C. Wright 1499* (AMES, BR, K); Loma del Gato, 8 Dec. 1859, *C. Wright 1706* (AMES, BR, BM, K), *C. Luer* illustr. 16382; Oriente, Firmeza to Gran Piedra, 4-5 Mar. 1911, *J. A. Shafer 8967* (K); Oriente, La Perla to Santa Ana, 11 Feb. 1911, *J. A. Shafer 8589* (AMES, NY); Firmeza to Gran Piedra, 3 Mar. 1911, *J. A. Shafer 8967* (AMES, K, NY); Sierra Maestra, alt. 1300-1700 m, Apr. 1915, *E. L. Ekman 5335, 5408* (S); Sierra Maestra, alt. 1000 m, 29 Oct. 1916, *E. L. Ekman 8137* (G, S); Alto de Iberia, alt. 900 m, 12 Nov. 1916, *E. L. Ekman 8304* (AMES, G, LD, S); Loma del Gato, alt. 1200 m, 11 July-14 Aug. 1921, *Bros. Leon, Clement & M. Roca 10305* (AMES); Sierra de Cristal, alt. 700 m, 28 Dec. 1955, *Bros. A. & M. López Figuerias 4721* (AMES), *C. Luer* illustr. 17194.

JAMAICA: near Cinchona, on rocks and trees, alt. 5000 ft, 11 Nov. 1899, *W. Harris 7745* (BM, K); Mt. Diablo, Feb. 1916, *H. N. Ridley s.n.* (K).

PUERTO RICO: Adjuntas, montis cerrote, 27 May 1886, *P. Sintenis 4408* (K), *P. Sintenis 4406* (BR). Maricao, "Alegriño," 23 Nov. 1884, *P. Sintenis 510* (K). **Barranquitos**: Monte Torrecilla, 30 Oct. 1885, *P. Sintenis 1983* (BM, K, LD, W); Maricao, 5 Sept. 1960, *R. O. Woodbury s.n.* (UPR). San Germán: Maricao Forest Reserve, alt. 750-790 m, 16 Jan. 1992, *F. Axelrod, J.D. Ackerman & J. 3691* (UPRRP). Barrio Barrancas, Monte La Torrecilla, alt. 920-950 m, 28 Jan. 1988, *G. R. Proctor & O. Thomas 44443* (SJ); Cerro Torrecilla, alt. 935 m, 24 Feb. 1987, *F. Axelrod & J.D. Ackerman 756* (UPRRP); Torrecilla, alt. 900 m, 24 Aug. 1982, *A.H. & P. Liogier & L.F. Martorell 33374* (UPR).

Ponce: Toro Negro, 17 Feb. 1961, *R. O. Woodbury 4790* (UPR); Toro Negro Forest Reserve, alt. 1300 m, 17 Dec. 1983, *J.D. Ackerman 1870* (UPRRP); Jayuya: Toro Negro Forest Reserve, alt. 1300 m, 8 Oct. 1989, *J.D. Ackerman & M.A. Campbell 2645* (UPRRP). **Cayey**: Carite Forest Reserve, Cerro La Santa, alt. 850-890 m, 19 Nov. 1984, *J.D. Ackerman 2045* (UPRRP). Cerro La Santa, alt. 860 m, 14 Feb. 1989, *J.D. Ackerman 2488* (UPRRP). **Río Grande**: Sierra de Luquillo, Monte Yunque, 13 Aug. 1885, *P. Sintenis 1744* (BM, K, W); Sierra de Luquillo, Monte Jiménez, July 1885, *P. Sintenis 1406* (K); near San Patricio, 14 May 1886, *P. Sintenis 4533* (K); Luquillo Mts., El Yunqui, alt. 650 m, 10 Dec. 1983, *J.D. Ackerman 1865* (UPRRP); Naguabo, Luquillo Mts., El Yunque, alt. 850 m, *J.D. Ackerman & M. & H. Nir 2675* (UPRRP); Mt. Britton trail, alt. 830 m, 4 Nov. 1985, *C. Luer, J. Luer & J. Akerman 17780* (MO); near Utuado, Monte Colón, 16 Mar. 1887, *P. Sintenis 6508* (K).

This species, the only member of the subgenus *Crocodelanthé* found in the West Indies, is confined to the four large islands of the Greater Antilles: Cuba, Jamaica, Hispaniola and Puerto Rico. Until it was described in 1909 from the Dominican Republic, it had been identified as the South American *P. velaticaulis*. It is extremely similar to slender forms (treated herein as *P. trianae*) of *P. galeata* which is frequent and widely distributed in the Andes.

Pleurothallis domingensis is distinguished by one or two densely flowered racemes shorter than to slightly surpassing the oblong, more or less obovate, obtuse, petiolate leaf. The sepals are less than five millimeters long, the petals are single-veined and less than two millimeters long, and the small lip is trilobed with intramural calli on erect, lateral lobes, indistinguishable from the lip of *P. velaticaulis*. The latter has narrower leaves and longer racemes, and the petals are three-veined.

***Pleurothallis elegans* (H.B.K.) Lindl., Edwards' Bot. Reg. 28: Misc. 70, 1842. Fig. 18.**

Bas.: *Dendrobium elegans* H.B.K., Nov. Gen. et Sp. 1: 358, 1816.

Ety.: From the Latin *elegans*, "elegant," referring to qualities of the plant.

Syn.: *Specklinia elegans* (H.B.K.) Lindl., Edwards' Bot. Reg. 21: sub t. 1797, 1835.

Syn.: *Pleurothallis roseopunctata* Lindl., Orch. Linden. 2, 1846.

Ety.: From the Latin *roseopunctatus*, "rose-spotted," referring to the flowers.

Syn.: *Humboldtia elegans* (H.B.K.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia roseopunctata* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Plant medium in size to large, coarse, epiphytic to terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, stout, erect, 13-45 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 11-23 cm long, 4-7 cm wide, cuneate below into a subpetiolate base. **Inflorescence** racemose, the racemes several, 4-7, simultaneous, slender, more or less distichous, subdensely and simultaneously many-flowered, 10-25 cm long including the peduncle 1-5 cm long, subtended by a spathe 3-6 cm long, 1-2 cm broad, from an annulus a short distance below the abscission layer; floral bracts 4-6 mm long, enclosing pedicel; pedicels 5 mm long; ovary 2.5 mm long; **sepals** whitish, spotted with light purple, minutely short-pubescent above the middle, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 9-11 mm long, 6-7 mm wide, 5-veined, the lateral sepals ovate, subacute to obtuse, 7.5-10 mm long, 3-4 mm wide, 3-veined, connate 3-4 mm; **petals** translucent veined in purple, elliptical-ovate, obtuse, more or less concave, 4-5 mm long, 3-4 mm wide, 3-veined; **lip** white, spotted with purple, suborbicular, 3.5-4 mm long, 3.5-4 mm wide, the apex rounded, the disc broadly shallowly concave and smooth with an obscure pair of low, calli near the middle, and with a transverse callus above the base, the base truncate, solidly fixed to the column-foot; **column** stout, 3-3.5 mm long, the foot thick, 1.5 mm long with the apex short and thick, the anther, rostellum and stigma subapical.

COLOMBIA: Cauca: on wooded mountain slopes between La Erre and Almaguer, alt. ca. 6,000 ft., ("1000 hex.") 1801, A. Humboldt & A. Bonpland 2129 (Holotype: P; fragment of type: W); without collection data, F. C. Lehmann 6258 (K); Páramo de Barbillas, southeast of Popayán, alt. 3070 m, 27 July 1978, C. Luer, J. Luer, R. Escobar et al. 3048 (MO, SEL). Magdalena: Sierra Nevada de Santa Marta, Quebrada de la Laguna Río Frio, alt. 3100-3250 m, 1 Aug. 1972, E. Forero & J. H. Kirkbride 645 (COL, NY). Risaralda: Santa Rosa de Cabal, Hda. La Sierra, alt. 3700 m, 15 Nov. 1985, J. Wolf 29 (COL, MO); Camino Real between Termales de Santa Rosa and Hda. La Sierra, alt. 3670 m, 20 Mar. 1986, J. Wolf 886 (COL, MO). Nariño: Alto del Tabano near Pasto, alt. 3200 m, E. André 2998 bis (K). Putumayo: Laguna above Pasto, 23 Nov. 1876, F. C. Lehmann s.n. (W); epiphytic in cloud forest between La Cocha and Sibundoy, alt. 2700 m, 30 July 1978, C. Luer, J. Luer, R. Escobar et al. 3105 (SEL).

VENEZUELA: Mérida: forests of the Sierra Nevada, alt. 9,000-10,000 ft., Apr. 1842, J. Linden 629 (holotype of *P. roseopunctata*: W, isotypes: AMES, G, K). Táchira: terrestrial and epiphytic in forest below Páramo de Tamá, alt. 2500-2600 m, May 1967, G.C.K. Dunsterville 75.

This widely distributed species was first described from a collection from Cauca, Colombia, by Humboldt and Bonpland. It is one of several species characterized by a large, robust habit with stout, fascicled ramicauls, subpetiolate leaves, and a large, foliaceous spathe subtending several to many simultaneous, many-flowered racemes. Among them, *P. elegans* is distinguished by large flowers and a proportionately large, suborbicular lip with the usual pair of calli obscure. A collection by Linden from westernmost Venezuela was described by Lindley as *P. roseopunctata*. The color of the sepals varies from yellow to rose with rose spots.

Pleurothallis expansa Lindl., Folia Orch. *Pleurothallis* 4, 1859.

Ety.: From the Latin *expansus*, "expanded," referring to the flowers.

Syn.: *Pleurothallis diffusa* Poepp. & Endl. *sensu* Lindl., Folia Orch. *Pleurothallis* 3, 1859.

Syn.: *Humboldtia expansa* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Fig. 19.

Plant large, epiphytic, climbing; roots slender. Ramicauls fasciculate or superposed, stout, erect, 10-60 cm long, with or without a tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, broadly elliptical-ovate, subacute to obtuse, subpetiolate, the blade 8-16 cm long, 3-8.5 cm wide, the rounded base contracted into a petiole ca. 1 cm long. **Inflorescence** racemose, racemes 1 to 3, distichous or secund, densely and simultaneously many-flowered, 15-35 cm long including the peduncle 3-7 cm long, subtended by a foliaceous spathe 2-4.5 cm long, from an annulus 2-4 mm below the abscission layer; floral bracts inflated, 5 mm long, 4 mm wide expanded, enclosing the pedicel and ovary; pedicels 2-3 mm long; ovary 2 mm long; **sepals** dull yellow-green, marked with purple, subcarinate, minutely and finely ciliate, the dorsal sepal broadly elliptical to suborbicular, obtuse, concave, 6-8 mm long, 3.5-5 mm wide, 3-veined, free from the lateral sepals, the lateral sepals ovate, obtuse, 5.5-8 mm long, 2-3 mm wide, connate below the middle; **petals** translucent, marked with purple along the veins, oblong-obovate, obtuse, concave at the apex, subapiculate, 4-5 mm long, 2-2.5 mm wide, 3-veined; **lip** yellow, marked with purple, subquadrate, obscurely lobed, 3 mm long, 2.5-3 mm wide, the apex transverse, decurved in the center with a retuse appearance, the sides below the middle

erect, broadly rounded, the disc with a broad, flat callus to either side near the middle with a pair of approximate, minute tuberosities extending from the calli, the base truncate, concave below a transverse callus, articulated with a small, conical tip of the column-foot; **column** stout, 2 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma subapical.

ECUADOR: **Pitchincha**: "on trees in the valley of Lloa," *W. Jameson s.n.* (Holotype: K); "Quito," *W. Jameson 1848* (W, as *P. diffusa*); Lloa, alt. 9,000 ft., Dec. 1856, *W. Jameson 449* (G); between San Juan and Chiriboga, alt. 3300 m, 27-29 Apr. 1955, *E. Asplund 16080, 16120* (AMES, NY, S); same area, alt. 3180 m, 22 Feb. 1986, *V. Zak 944* (G, K); epiphytic along the old road between Quito and Santo Domingo above Chiriboga, alt. 2650 m, 28 May 1978, *C. Luer & A. Hirtz 13695* (K, MO); along the new road between Quito and Santo Domingo, July 1975, *C. Luer, G. Luer & S. Wilhelm 244* (SEL); NW of Calacalí, Hda. Yunguilla, alt. 2600 m, 11 Mar. 1942, *O. Haugt 3160* (AMES, US); between Tandapi and Aloag, alt. 3150 m, 29 May, 1979, *B. Løjtnant, A. & U. Molau 13960* (AAU, GB); same area, alt. 2650 m, 7 Feb. 1985, *U. Molau & L. Öhman 1153* (AAU, GB); same area, alt. 2600 m, 1 Feb. 1985, *C. H. Dodson & P. M. Dodson 15565* (MO); west of Calacalí, alt. 2800 m, 4 Apr. 1985, *C. Luer, J. Luer, A. Hirtz, C. Dodson & P. Dodson 11040* (MO); La Liberia, alt. 2700 m, Nov. 1983, *A. Hirtz 1415* (MO); Pulumahua, road to Lulumbamba, alt. 2000-2500 m, 26 Feb. 1987, *C. E. Cerón, M. Cerón & M. Macías 927* (K, MO, US). **Carchi**: between Tulcán and Maldonado, alt. 2800 m, 2 Apr. 1984, *C. Luer, S. Dalström & T. Höjjer 9953* (MO); same area, alt. 3000 m, 16 Mar. 1991, *C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15075* (MO); between Maldonado and Chical, alt. 2200 m, May 1992, *A. Hirtz 5769* (MO). **Imbabura**: Selva Alegre, alt. 1400 m, May 1989, *A. Hirtz & X. Hirtz 4222* (MO). COLOMBIA: **Nariño**: Oriente of Pasto, alt. 13,000 ft., Oct. 1856, *W. Jameson 398* (G).

Pleurothallis expansa is apparently restricted to the western slopes of the Andes of northwestern Ecuador and adjacent Colombia. It is a robust species with prolific ramicauls. Great masses of plants can be found climbing through the scrubby vegetation in wet forests at high altitudes. Long racemes of relatively large, showy, yellow and purple flowers are produced. The subquadrate lip is divided into a transverse, retuse, apical lobe, and a pair of broadly rounded lateral lobes each with a flat, rounded callus. Between them is a minute pair of conical calli similar to those of *P. fons-florum*.

Pleurothallis floribunda Poepp. & Endl., Nov. Gen. Sp. 1: 48, 1835, not *P. floribunda* (Lindl.) Lindl. 1842. Fig. 20.

Ety.: From the Latin *floribundus*, "flowering in profusion," referring to the inflorescence.

Syn.: *Pleurothallis pittieri* Schltr., Repert. Spec. Nov. Regni Veg. 3: 240, 1907.

Ety.: Named in honor of H. Pittier who collected this species in Costa Rica.

Syn.: *Pleurothallis pluriracemosa* Garay, Arquiv. Jard. Bot. Rio de Janeiro 12: 174, 1953.

Ety.: From the Latin *pluriracemosus*, "with several racemes," referring to the inflorescence.

Plant large, epiphytic, commonly terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, stout, erect, 10-35 cm long, usually with a large, loose, tubular sheath covering the middle, and 2-3 loose, often fragmented, tubular sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, petiolate, the blade 10-20 cm long, 4-7 cm wide, cuneate below into a petiole 2-3.5 cm long. **Inflorescence** racemose, with the racemes simultaneous, 5 to 15 or more, distichous, densely and simultaneously many-flowered, 8-12 cm long including the peduncle ca. 1 cm long, subtended by a spathe 2-2.5 cm long, from an annulus ca. 5 mm below the abscission layer; floral bracts infundibular, 2.5-3 mm long; pedicels 1.5 mm long; ovary 1 mm long; **sepals** pale yellow to yellow-orange, subcarinate, ciliate and sparsely pubescent within, the dorsal sepal ovate, acute, concave, 3.5-5.5 mm long, 1.5-2.5 mm wide, 3-veined, the lateral sepals oblong-ovate, acute, oblique, 3.5-5 mm long, 1.5-2 mm wide, 3-veined, connate 1-2 mm; **petals** translucent, marked with purple along the margins, linear-obovate, obtuse, 2-3 mm long, 0.75-1 mm wide, 1-veined; **lip** yellow, suffused with purple along the margins, trilobed, 1.5-2 mm long, 1.5 mm wide, the middle lobe ovate, subacute to obtuse, thickened, the lateral lobes near the middle, erect, obtuse, with a callus on the inner surface extending to the anterior margins, the disc slightly concave below the middle above a transverse callus above the basal cavity, articulated with the end of the column-foot; **column** stout, 1 mm long, the foot thick, 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

PERU: **Huánuco**: near Pampayacu and Cuchero, on trees, Dec. 1829, *Poeppig 1599* (Holotype: W; Isotype: G); near Tingo Maria, alt. 627 m, 21 Apr. 1965, *F. G. Brieger 9289* (HB, K); Cerros de Sira, alt. 1850 m, 31 July 1969, *T. R. Dudley 13537* (NA). **Junín**: Tarma, Agua Dulce, alt. 1900 m, 6 Mar. 1948, *F. Woytkowski 35421* (AMES); Río Huasahuasi, alt. 2600 m, collected by D. Bennett, flowered in cultiva-

- tion 27 Feb. 1964, *P. C. Hutchison 4161A* (AMES, F, K, MO, NY, UC, US, USM). **Puno:** Casabaya, Valle de S. Gaban, alt. 2000-2700 m, 9 Feb. 1967, *C. Vargas 18968* (AMES). **San Martín:** near Chachapoyas, 1840, *Mathews 3184* (K); Zepelacio near Moyabamba, alt. 1100 m, May 1934, *G. Klug 3623* (AMES, K, NY, S). **Ayacucho:** Aina, alt. 750-1000 m, 7 May 1929, *E.P. Killip & A.C. Smith 23167* (AMES, US). **Cuzco:** Quispicanchis, alt. 1960 m, 28 Jan. 1943, *C. Vargas 3141* (AMES).
- COLOMBIA:** **Antioquia:** Yarumal, May 1941, *Fomás s.n. 4448* (US). **Cauca:** above Pitayó near Popayán, alt. 3000-3200 m, 16 Mar. 1884, *F. C. Lehmann 3746* (BR). **Cundinamarca:** without locality, *J. C. Mutis 1752* (MA, US); without locality, 1851-1854, *J. J. Triana 267* (NY, US); between Bogotá and Calera, alt. 10,000 ft., May 1921, *W. Tracey 400* (K); Nemocón, Cerro del Mortuño, alt. 2780 m, 30 Dec. 1962, *H. García-Barriga 17713* (AAU, COL, NY).
- ECUADOR:** **Chimborazo:** near Puela, 10 Oct. 1968, *H. Lugo 587* (GB). **Imbabura:** southeast of Lita, alt. 1200 m, 11 Jan. 1992, *C. Luer et al. 15556* (MO). **Morona-Santiago:** near Mendez, alt. 700 m, 28 May 1947, *G. Harling 963* (NY, S); Bomboiza, alt. 750 m, 25 July 1985, *W. Palacios 565* (MO); Bomboiza, Río Cuyes, alt. 800 m, 1 Nov. 1986, *C. Cerón et al. 418* (MO); Cordillera del Condor, epiphytic in forest east of Guisamé, alt. 1750 m, 21 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreaetta & W. Teague 13557* (MO). **Pastaza:** Shell-Mera, alt. 1000 m, 10 Mar. 1956, *E. Asplund 19712* (NY, S); same area, alt. 1100 m, 25 May-6 June 1968, *G. Harling, G. Storm & B. Ström 9831, 9838, 9885, 9928* (AMES); between Puyo and Veracruz, alt. 900 m, 16 May 1967, *B. Sparre 14606* (S). **Pichincha:** between Alogo and Santo Domingo, alt. 2000 m, 25 Feb. 1967, *B. Sparre 14613* (S). **Tungurahua:** Baños, alt. 1500-2000 m, *F. C. Lehmann 4506* (K, US); Baños, alt. 6,500 ft., 1924, *C.H.H. Tate 627* (US); west of Baños, alt. 2000 m, 13 Jan. 1934, *H.J.F. Schimpff 627* (AMES, US); Baños, on rocks near Río Pastaza, alt. 1800 m, 20 Feb. 1920, *I. Holmgren 340* (holotype of *P. plurimacemosa*: S; isotypes: AMES, BM, G, US); same area, alt. 1750 m, 14 Mar. 1939, *C. W. Penland & R. H. Summers 61* (AMES); Baños, alt. 1800 m, 20 Aug. 1939, *E. Asplund 8424* (S); near Baños, alt. 1850 m, 24 Mar. 1956, *E. Asplund 19916* (AMES, B, K, NY, S); west of Baños, alt. 1800 m, 9 Nov. 1955, *E. Asplund 18287* (NY, S); Río Verde between Baños and Puyo, alt. 1300 m, 17 July 1967, *B. Sparre 17678* (S); Puerto Velasco Ibarra, 10 Km west of Baños, alt. 2100 m, 10 Jan. 1968, *L. Holm-Nielsen & S. Jepperson 602* (AAU, AMES); Aگویan Falls, 11 Km east of Baños, 1 June 1968, *L. Holm-Nielsen & S. Jepperson 138* (AAU); Río Blanco, east of Baños, 13 Mar. 1969, *H. Lugo 722* (GB); between Baños and Río Verde, alt. 1500 m, 2 July 1983, *J. Bohlin & M. Bohlin 728* (GB); terrestrial on the lava fields around Baños, alt. 2200 m, 17 Mar. 1976, *C. Luer, J. Luer & P. Taylor 881* (SEL). **Zamora-Chinchipe:** Cordillera del Condor, epiphytic in forest east of Los Encuentros, alt. 1500 m, 19 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreaetta & W. Teague 13480* (MO); epiphytic in cloud forest above Valladolid, alt. 1900 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10842* (MO); above Valladolid, alt. 2300-2500 m, 2 Apr. 1985, *G. Harling & L. Andersson 23511* (GB); Parqué Nacional Podocarpus, Quebrada de Leon south of Zamora, alt. 1100 m, 16 Apr. 1989, *J. E. Madsen & B. Eriksen 85977* (MO).
- VENEZUELA:** **Bolívar:** Cerro Venamo, alt. 1100 m, 21 Apr. 1960, *J. A. Steyermark & S. Nilsson 430* (NY); Anzoátegui, Dist. Freites, Cerro Peonia, 2 Dec. 1981, *G. Davidse & A. Gonzáles 19925* (MO, NY); Anzoátegui, Río Zumbador, alt. 800-1000 m, 1 Mar. 1945, *J. A. Steyermark 61276* (NY). **Sucre:** Pen. de Paria, Arismendi, alt. 900 m, *J. A. Steyermark, R. Liesner & V. Carreño E. 121665* (MO, NY); between Pocitos and Santa Isabel, alt. 900-1250 m, 12 July 1972, *K. Dumont, G. Morillo, G. Samuels & R. Cain 7607* (NY); Cerro Patao, alt. 3,400 ft., 29 Aug. 1984, *Milliken, Bevan & Smart 59* (K).
- TRINIDAD:** between Tucuche and Naranja, alt. 2,300 ft., 2 Jan. 1948, *N. W. Simmonds 235* (AMES, TRIN).
- BOLIVIA:** **La Paz:** Sud Yungas, along Río Unduavi, alt. 2000 m, 30 Jan. 1980, *C. Luer, J. Luer, R. Vásquez & R. Lara 5042* (K, SEL); Saavedra, along river below Charazani, alt. 2550 m, 20 Nov. 1992, *C. Luer, J. Luer, R. Vásquez et al. 16453* (MO).
- PANAMA:** **Chiriquí:** between Alto de las Palmas and Cerro de la Horqueta, alt. 2100-2268 m, 18 Mar. 1911, *H. Pittier 3227* (AMES).
- COSTA RICA:** without locality, ca. 1867, *A. Endres s.n.* (W); without locality, *Hübsch s.n.* (W); on the banks of Río Manewan, alt. 2100 m, 15 Feb. 1890, *H. Pittier 2067* (holotype of *P. pittieri* presumably destroyed at B); same collection data, *H. Pittier 2023* (Neotype of *P. pittieri* here designated: AMES 23666, illustr.). **Cartago:** Las Nubes, alt. 7,500 ft., Feb. 1920, *C. H. Lankester s.n.* (K-364); La Palma, June 1921, *C. Wercklé 149*; Las Nubes, alt. 7,500 ft., Feb. 1920, *C. H. Lankester s.n.* (K); Cordillera de Talamanca, Cerro de la Muerte, alt. 2700 m, 20 May 1956, *L. O. Williams 20182* (SEL). **Heredia:** Cerros de Zurquí, NE of San Isidro, alt. 2000-2400 m, 3 Mar. 1926, *P. C. Standley & J. Valerio 50533, 50606* (AMES); Los Cartagos, alt. 2100 m, 25 Jan. 1970, *R. W. Lent 1890* (CR). **Puntarenas:** Monteverde, Ojo de Agua, Pacific slope, alt. 1600 m, 18 Nov. 1987, *W. A. Haber & E. Bello 7804* (CR, MO). **San José:** La Palma, alt. ca. 1600 m, Feb.-Mar. 1924, *P. C. Standley 32929, 38262, 38299, 38319* (AMES); Las Nubes, alt. 1500-1900 m, 20 Mar. 1924, *P. C. Standley 38894* (AMES); La Hondura de San José, 9 Nov. 1932, *A. M. Brenes 173* (CR); La Palma de San José, alt. 1400 m, 21 Jan. 1972, *P.J.M. Maas & L.D. Gómez 847* (CR); Parqué Nacional Braulio Carrillo, Zurquí, alt. 1660 m, 27 Oct. 1990, *S. Ingram & K. Ferrell-Ingram 639* (AMES, CR, F, K, MO, SEL), *C. Luer* illustr. 12192.

This robust, vegetatively variable species occurs extensively in the mountains of Central America, and through the Andes from Venezuela into Bolivia. It seems indifferent to altitudes, ranging from a few hundred meters above sea level to over 2000 meters above sea level. A well-known population grows by the tens of thousands as a terrestrial weed in full sunlight on ancient lava beds around Baños in eastcentral Ecuador, where, it seems, every collector who has entered Ecuador has collected it at least once. A collection from this locality by I. Holmgren that was labeled by Schlechter as *P. pastazae* was described by Garay as *P. pluriracemosa*.

Even though variable vegetatively, *P. floribunda* is easily recognized by the loose sheaths that surround the ramicaul; a large, leathery, petiolate leaf, and a fascicle of small-flowered racemes usually less than half the length of the leaf. The spathe is large, but not particularly conspicuous; the sepals are acute and three-veined; the petals are obtuse and single-veined; and the lip is trilobed with erect, obtuse, lateral lobes with intramural calli.

The ramicauls vary from short and stout with proportionately larger, loose, overlapping sheaths in fully exposed, lithophytic habitats as compared to the longer ramicauls with slenderer, shorter sheaths in shaded, moist, epiphytic habitats. In some populations the sheaths are greatly reduced. The flowers, however, are remarkably stable throughout the range. They are practically inseparable from the flowers of the *P. pulchella*.

Pleurothallis fons-florum Lindl., Folia Orch. *Pleurothallis* 5, 1859.

Fig. 21.

Ety.: From the Latin *fons florum*, "a fountain of flowers," referring to the inflorescence.

Syn.: *Humboldtia fons-florum* (Lindl.) Kuntze, Rev. Gen. Pl. 667, 1891.

Plant large, epiphytic, caespitose; roots slender. Ramicauls fasciculate, stout, erect, 25-55 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical-ovate, subacute to obtuse, short-petiolate, the blade 10-22 cm long, 6-9 cm wide, broadly cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, numerous racemes produced simultaneously, slender, more or less secund, densely and simultaneously many-flowered, 15-25 cm long including the slender peduncle ca. 2 cm long, subtended by a spathe 2-3 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts 2 mm long, enclosing pedicel and ovary; pedicels 1 mm long; ovary 1 mm long; **sepals** yellowish to rose, more or less veined in purple, subcarinate, ciliate, short-pubescent above the middle, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 3.5-4 mm long, 2 mm wide unexpanded, 3-veined, the lateral sepals diverging, ovate, acute to subacute, 3.5-4 mm long, 1.5 mm wide, 3-veined, essentially free; **petals** translucent with the midvein purple, elliptical-obovate, obtuse, 2.5-3 mm long, 1 mm wide, 1- or 3-veined; **lip** yellow or rose, fleshy, ovoid-trilobed, 1.5-2 mm long, 1.5 mm wide, the apical lobe ovate, obtuse, the lateral lobes or margins obtuse, erect at the middle, with broad, intramarginal calli, the disc with a pair of adjacent, conical calli in the center above the middle, shallowly concave below, with a transverse callus above the concave base, the base truncate, articulated with the column-foot; **column** stout, 1-1.5 mm long, the foot thick, 1 mm long with the apex free and bulbous, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: "forests on the eastern and western slopes of the Andes, on fallen trunks of trees and on the ground," *W. Jameson s.n.* (Holotype: K); Quito, alt. 6,000 ft., *H. Karsten s.n.* (W); forest above Tandapi, alt. 2100 m, 31 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & X. Hirtz 11030* (MO); along the new road between Quito and Santo Domingo, alt. 2000 m, 1 Mar. 1986, *C. Luer, C. Dodson, A. Hirtz & A. Embree 12071* (MO); above Tandapi, alt. 2000 m, Apr. 1991, *A. Hirtz 5417* (MO); near Nono, terrestrial on shrubby slope, alt. 2700 m, 16 Apr. 1956, *E. Asplund 20266* (S). **Carchi**: above Maldonado, alt. 2500 m, Nov. 1991, *A. Hirtz et al. 5629* (MO). **Chimborazo**: between Riobamba and Baños, 24 Apr. 1971, *H. Lugo 1818* (AMES, GB). **Napo**: between Baeza and Tena, alt. 1800 m, 30 June 1985, *C. H. Dodson & A. Hirtz 15904* (MO). **Pastaza**: near Papallacta, alt. 2500 m, 2 Feb. 1978, *C. Luer, J. Luer & A. Hirtz 2397* (SEL). **Sucumbios**: between Santa Bárbara and La Bonita, alt. 2100 m, 17 May 1982, *H. Balslev, J. L. Luteyn & B. Boom 2613* (AMES, NY, QCA). **Tungurahua**: Volcán Tungurahua, alt. 2850-3150 m, 15 Jan. 1988, *U. Molau, B. Eriksen & M. Fredrikson 2485* (AAU, GB).
PERU: **Huánuco**: near Cuchero, *Poeppig s.n.* (K).

Lindley described this species from a fragment of a single inflorescence collected by Poeppig in Peru, and a part of a plant with leaf and complete inflorescence collected by Jameson in Ecuador. The latter collection is labeled the type in Lindley's herbarium at Kew, and it is hereby so designated. Lindley's outline of the lip fails to include the pair of conical calli in the center. A hydrated flower reveals their presence.

Pleurothallis fons-florum is characterized by the stout ramicauls with large, loose, inflated sheaths; large, short-petiolate leaves; a foliaceous spathe; and a fascicle of numerous small-flowered racemes that usually surpass the leaves. The sepals are shortly pubescent, the dorsal concave and more or less cucullate, and the laterals more or less free and spreading.

The petals are oblong with a slightly thickened tip, and either single-veined or three-veined. Lindley's type has single-veined petals, as found in most collections, but about a fifth of all collections examined has petals with three veins, there being absolutely no other difference that might indicate two look-alike taxa. Should this scenario apply to other species, *P. pulchella* and *P. velaticaulis* might melt into one.

The lip is characterized by erect, obtuse, lateral lobes that are callous on their inner surfaces, and a pair of approximate, subacute, conical calli at the base of the triangular, middle lobe. Sometimes spectacular masses of the tiny flowers are produced on as many as 50 simultaneous racemes.

***Pleurothallis galeata* Lindl., Ann. Mag. Nat. Hist. ser. 1, 15:107, 1845.**

Ety.: From the Latin *galeatus*, "with a helmet," referring to the cucullate dorsal sepal.

Syn.: *Pleurothallis fraterna* Lindl., Folia Orch. *Pleurothallis* 3, 1859.

Ety.: From the Latin *fraternus*, "like a brother," referring to the similarity to *P. galeata*.

Syn.: *Humboldtia fraterna* (Lindl.) Kuntze, Rev. Gen. Pl. 667, 1891.

Syn.: *Humboldtia galeata* (Lindl.) Kuntze, Rev. Gen. Pl. 667, 1891.

Syn.: *Pleurothallis sororia* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 115, 1920, not 1912.

Ety.: From the Latin *sororius*, "sisterly," referring to an affinity to *P. pulchella* H.B.K.

Syn.: *Pleurothallis trianae* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 117, 1920.

Ety.: Named for the collector José Triana, noted Colombian, botanical explorer

Syn.: *Pleurothallis venosa* Rolfe, Bull. Misc. Inform. 30, 1906.

Ety.: From the Latin *venosus*, "veined," referring to the purple veins of the sepals.

Syn.: *Pleurothallis quinquecallosa* Luer, Phytologia 49: 214, 1981.

Ety.: From the Latin *quinquecallosus*, "with five calli," referring to the labellum.

Fig. 22.

Fig. 24.

Fig. 23.

Plant large, epiphytic, caespitose; roots coarse. Ramicauls fasciculate, stout, erect, 20-80 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, broadly ovate to elliptical, acute, subacute to obtuse, long-petiolate, 10-25 cm long, 4-12 cm wide, rounded or cuneate below, contracted into a petiole 2-3 cm long. **Inflorescence** a fascicle of few to many, arching, disheveled to strict, simultaneously many-flowered racemes, 12-18 cm long including the peduncle 2-3 cm long, usually subtended by a broad spathe 2-4 cm long, from an annulus ca. 1 cm below the abscission layer; floral bracts 2-3 mm long, enclosing pedicel and ovary; pedicels 1-2 mm long; ovary 2-2.5 mm long; **sepals** yellow to green, more or less veined in purple, subcarinate, ciliate, short-pubescent above the middle within, the dorsal sepal ovate, subacute to obtuse, concave, 4.5-6 mm long, 3.5-3.75 mm wide unexpanded, 3-veined, the lateral sepals oblong-ovate, acute to subacute, more or less convex, 4.75-6 mm long, 1-1.75 mm wide, 3-veined, connate 2 mm; **petals** translucent with the midvein brown or purple, linear-oblong, subacute to obtuse, 3-4 mm long, 1 mm wide, 1-veined; **lip** yellow to brown, margined and veined in purple, fleshy, obovoid-trilobed, 2 mm long, 1.5 mm wide, the apical lobe obtuse to rounded, with a distinct cushion-like callus, the lateral lobes obtuse, erect just above the middle, with broadly rounded, intramarginal calli, the disc shallowly concave, with a transverse callus above the concave base, sometimes with thickening over the midvein, the base truncate, concave, articulated with the column-foot; **column** stout, 1.5-2 mm long, the foot thick, 1 mm long with the apex free and bulbous, the anther, rostellum and stigma subapical.

ECUADOR: **Tungurahua**: "at the foot of Tunguragua, at about 11,000 feet above the level of the sea, Feb. 1843" *T. Hartweg 1408* (Holotype: K; Isotypes: G, LD, W); Cordillera de los Llanganates, above Baños, alt. 2870 m, 11 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11136* (MO). **Carchi**: epiphytic in cloud forest between Tulcán and El Carmelo, alt. 3000 m, 23 Feb. 1978, *C. Luer, J. Luer & A. Hirtz 2772* (SEL). **Sucumbios**: between El Carmelo and La Bonita, alt. 2800 m, 8 Apr. 1979, *B. Løjtnant, U. Molau & M. Madison 12001* (AAU, GB); terrestrial on the road embankment above El Carmelo, alt. 3200 m, 17 May 1981, *C. Luer, J. Luer & A. Hirtz 6269* (holotype of *quinquecallosa*: SEL); between La Bonita and Rosa Florida, alt. 1600-2000 m, 14 Mar. 1996, *S. Dalström, S. Ingram & K. Ferrell-Ingram 2129* (MO). **Cotopaxi**: terrestrial, west of Pilalo, alt. 2200-2350 m, 8 Apr. 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Ølgaard 2308* (AAU, S). **Loja**: Cerro Toledo, southeast of Yangana, alt. 2500 m, 7 Apr. 1985, *G. Harling & L. Andersson 23811* (AMES, GB); upriver from Vilcabamba, alt. 2000-2400 m, May 1985, *D. D'Alessandro 364* (MO); above San Pedro de Vilcabamba, alt. 2400 m, 23 Apr. 1986, *D. D'Alessandro 629* (MO). **Morona-Santiago**: between Gualaceo and Limón, terrestrial, alt. 1900-2000 m, 22 Mar. 1974, *G. Harling 12739* (AMES, GB); **Napo**: cloud forest below Papallacta, alt. 2800 m, 28 Aug. 1978, *C. Luer, J. Luer & A. Andreetta 3417* (SEL); Cuyuja, between Quito and Baeza, alt. 2450 m, 29 May 1986, *C. H. Dodson & T. A. Dodson 16424*. **El Oro**: forest above Zaruma, alt. 1800 m, 1 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12568* (MO). **Pastaza**: near Papallacta, alt. 2800 m, 28 Aug. 1978, *C. Luer, J. Luer & A. Hirtz 3417* (SEL). **Zamora-Chinchipe**: cloud forest in the Cajanuma range south of Loja, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10762* (MO).

COLOMBIA: **Antioquia**: Frontino, Alto de Alegrías, alt. 2300 m, 22 Oct. 1884, *F. C. Lehmann CLXXX* (K); cloud forest on Raton Pelado, alt. 2650 m, 1 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10058* (MO). **Cundinamarca**: *J.J. Triana 569* (holotype of *P. trianae* presumably destroyed at B; lectotype here designated: US); Guasca, alt. 3000 m, 24 Apr. 1932, *J. Cuatrecasas 3039* (K); same area, 9 Oct. 1946, *M. B. & R. Foster 1804* (K); Guadalupe Hill above Bogotá, lithophytic, alt. 3200 m, 16 Apr. 1949, *O. Haught 6423* (US); Maeizo de Bogotá, Quebrada Chicó, alt. 8,500-9,500 ft., 30 Nov. 1952, *R. E. Schultes 18593* (AMES, NY, US); Nemocón, Cerro del Mortiño, alt. 2780 m, 30 Dec. 1962, *H. García-Barriga 17713* (AMES, COL, US); La Calera, camino a Mundo Nuevo, alt. 2950 m, 28 May 1967, *L. Uribe U. 5855* (US); between Une and Fosca, alt. 3000-3200 m, 14 June 1974, *H. García-Barriga 20526* (COL, US). **Norte de Santander**: forest below Páramo de Jurisdicciones, alt. 3150 m, 10 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10245* (MO); Alto de San Francisco above Villacaró, alt. 2850 m, 11 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10280* (MO). **Risaralda**: near Pereira, cult. by S. Tsubota, 10 May 1993, *C. Luer 16757* (MO). **Valle del Cauca**: Finca Zingara, between Cali and Buenaventura, alt. 1900 m, 23 Jan. 1994, *J. Giraldo Gensini & L. Olver A. 131* (MO, TULV). **Cauca**: highlands of Popayán, alt. 1500-1800 m, Oct., *F. C. Lehmann 6931* (holotype of *P. sororia* presumably destroyed at B; lectotype here designated: K; Isolectotype: US), *C. Luer* illustr. 16990A. "Capilla," *F. C. Lehmann B.T. 310* (AMES, K, NY). Without collection data, "tropical America," imported by Sander & Co., flowered in cultivation at their nursery, Oct. 1890, *F. Sander s.n.* (holotype of *P. venosa*: K; isotype: AMES), *C. Luer* illustr. 16990.

VENEZUELA: **Mérida**: between La Carbonera and Azulita, alt. ca. 5,000 ft., June 1962, *G.C.K. Dunsterville 699*.

PERU: **Amazonas**: Chachapoyas, between Leimebamba and Balsas, alt. 2400 m, 26 Mar. 1964, *P. C. Hutchison & D. Bennett 4561* (F, K, M, MICH, MO, P, UC, US, USM).

Although published as having been collected by Hartweg in Colombia, Volcán Tungurahua is in Ecuador, where this species is still to be found today. It is relatively frequent and widely distributed in the Andes from Venezuela into Peru.

Typically, *P. galeata* is distinguished by stout ramicauls; large, broadly ovate, long-petiolate leaves; a fascicle of numerous, curving or disheveled, small-flowered racemes nearly as long as or longer than the leaf, and subtended by a conspicuous, foliaceous spathe. The dorsal sepal is concave, and the one-veined petals are narrow. The three-lobed lip is characterized by erect, obtuse, lateral lobes near the middle that bear a callus on the inner surface of the anterior margin, and an obtuse apex with a cushion-like callus.

The dimensions and shape of the leaves vary throughout the wide distribution. In some variations (Fig. 24) the leaves are narrower, elliptical and acute with fewer, strict racemes with a much smaller spathe. The flowers of all the forms are identical except that the middle lobe of the lip becomes merely thickened instead of bearing a distinct callus as found in the broad-leaved forms. These variations have been described by Schlechter as *P. sororia* and *P. trianae*, and by Rolfe as *P. venosa*. Because there are far too many intermediate variations to recognize these

taxa, they are treated within *P. galeata* as one variable species.

The acute, narrower-leaved forms with few racemes and a small spathe approach *P. domingensis* of the Antilles, the only difference being in the oblong, more or less obovate, obtuse leaves of the latter, which could be considered to be merely a geographical, vegetative variant. *Pleurothallis domingensis* is commonly identified as the South American *P. velaticaulis* which it resembles vegetatively.

Hydrated flowers from the types of *P. fraterna*, *P. galeata*, *P. sororia*, *P. trianae* and *P. venosa* have been examined and found to be inseparable.

Pleurothallis quinquecallosa varies from typical *P. galeata* with subpetiolate leaves and more pronounced calli of the lobes of the lip.

***Pleurothallis galerasensis* Luer, sp. nov.**

Ety.: Named for Volcán Galeras where the species was collected.

Fig. 26.

Inter species subgeneris *Crocodelanthidis* ramicaulibus prolificantibus, racemis paucis multifloris folio elliptico petiolato multilongioribus, spatha magna, sepalis semiconnatis acutis intus pubescentibus, petalis trinervis, et labello oblongo infra medium bicalloso distinguitur.

Plant large, coarse, terrestrial, scandent, ascending-creeping below, roots slender. Ramicauls approximate below, proliferating above, stout to slender, erect to suberect, 5-25 cm long, with a loose, tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 6-9 cm long, 1.2-2.7 cm wide, cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, 1-3 slender, simultaneous, secund, densely and simultaneously many-flowered racemes, 10-22 cm long including the peduncle 3-6 cm long, subtended by a foliaceous spathe 1-3 cm long, from an annulus 5 mm below the abscission layer; floral bracts tubular, 4 mm long, enclosing pedicel; pedicels 2-3 mm long; ovary 1.5 mm long; **sepals** light green, suffused with purple, fleshy, subcarinate, pubescent within, the dorsal sepal elliptical-ovate, acute, concave, 7 mm long, 2.5 mm wide, 3-veined, connate to the lateral sepals for 1.5-2 mm, the lateral sepals ovate, oblique, acute, 5.5 mm long, 1.75 mm wide, 3-veined, connate 2 mm to near the middle; **petals** translucent greenish white, edged in purple, elliptical, obtuse, 3 mm long, 1.75 mm wide, 3-veined; **lip** purple, fleshy, oblong, 2.5 mm long, 1.5 mm wide, the apex subtruncate, the disc smooth, shallowly concave between a pair of small, rounded calli below the middle, the base concave below a transverse callus, firmly articulated with the bulbous tip of the column-foot; **column** stout, 1.5 mm long, the foot thick, with the apex short, free, the anther, rostellum and stigma ventral.

COLOMBIA: **Nariño**: epiphytic in cloud forest surrounding a lake in the crater of Volcán Galeras, alt. ca. 3200 m, 21 Jan. 1979, C. Luer & J. Luer 3749 (Holotype: SEL).

This species is apparently endemic in southern Colombia where it is known only from the original collection. In the subgenus, it is distinguished by the prolific habit of the ramicauls. Below, the ramicauls are ascending and approximate; above, they proliferate from within the spathe of the uppermost ramicaul. One to three slender, secund racemes far surpass the elliptical, petiolate leaves. The racemes and another ramicaul are subtended by a foliaceous spathe. The sepals are connate below the middle, pubescent within, the dorsal sepal concave and acute, the lateral sepals recurving and also acute. The petals are three-veined. The lip is oblong with a pair of low calli below the middle.

***Pleurothallis gigas* Luer & Escobar, Orquideología 20: 52, 1996.**

Etyymology: From the Greek *gigas*, "a giant," referring to the large habit of the plant.

Fig. 26.

Plant very large, terrestrial, densely caespitose; roots numerous, coarse. Ramicauls stout, fasciculate, erect, 40-90 cm long, with a tubular sheath near the middle and 2-5 large, loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, broadly elliptical-ovate, acute, 18-33 cm long, 12-16 cm wide, cuneate below into a conduplicate petiole 1-2 cm long. **Inflorescence** racemose, 5-10 racemes, 15-30 cm

long, erect, congested, many-flowered, produced simultaneously in a fascicle, from a foliaceous spathe 3-4 cm long, with an annulus at the apex of the ramicaul, less than 1 cm below the abscission layer; floral bracts 2-2.5 mm long; pedicels 1.5-2 mm long; ovary 1 mm long; **sepals** greenish or creamy white, ciliate, ovate, obtuse, minutely apiculate, the dorsal sepal concave, 3.5 mm long, 2.75 mm wide unexpanded, 3-veined, the lateral sepals essentially free, 3.5 mm long, 2.25 mm wide, 3-veined; **petals** translucent, glabrous, obovate, obtuse, 2.25 mm long, 1.75 mm wide, 3-veined; **lip** yellow-green, thick, oblong, 2 mm long, 1.25 mm wide, the blade obtuse, microscopically pubescent, the disc featureless, the base broadly and deeply concave to accommodate the column-foot; **column** stout, terete, 1.75 mm long, the foot bulbous, cellular-pubescent, the anther and stigma subapical.

COLOMBIA: **Antioquia:** Munic. of Yarumal, terrestrial on the road-cut between Ventanas and El Cedro, alt. 1920 m, 15 Mar. 1989, C. Luer, J. Luer, S. Dalström & W. Teague 14152 (Holotype: MO); terrestrial on the road-cut along Río El Oro north of Yarumal, alt. 1700 m, 1 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10067 (MO); Munic. of El Carmen de Viboral, above San Lorenzo, alt. 2500 m, 21 Mar. 1989, C. Luer, J. Luer & W. Teague 14341 (MO).

This gigantic member of the subgenus *Crocodelianthe* is locally abundant in the northern parts of the Central Cordillera of Colombia. It grows into immense masses on road-cuts and in the ditches. No plants were seen growing epiphytically. It is distinguished by the great size of the ramicauls and leaves, some ramicauls reaching well over one meter in height, and leaves far larger than a dinner plate. Numerous, erect racemes of crowded, little, greenish white flowers are produced from a large spathe below the petiole. The sepals are obtuse and ciliate, the petals are obovate and obtuse, and the blade of the lip is oblong and microscopically pubescent. In one locality, little, black flies were being attracted in fairly large numbers.

Pleurothallis infundibulosa Luer, *Orquideología* 20: 210, 1996.

Fig. 27.

Ety.: From the Latin *infundibulosus*, "with funnels," referring to the large, prominent, floral bracts.

Plant large, epiphytic, densely caespitose; roots slender. Ramicauls fasciculate, stout, erect, 15-29 cm long, with a tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, sessile, subacute to obtuse, 9-12 cm long, 3-4 cm wide, cuneate below into the base. **Inflorescence** an erect, stout, subclax, distichous, simultaneously many-flowered raceme, up to 20 cm long including the peduncle 6-7 cm long, with the flowers erect, semiclosed, subtended by a foliaceous spathe 4-4.5 cm long, from the apex of the ramicaul at the base of the leaf; floral bracts infundibular, 12 mm long low in the raceme, 5 mm long toward the apex, enclosing the pedicel, ovary and lower portion of the flower; pedicels 2-3 mm long; ovary 2 mm long; **sepals** lemon yellow (appear to have been suffused with a darker color toward the base), glabrous, the dorsal sepal ovate, narrowly obtuse, concave, 10 mm long, 4 mm wide expanded, 3-veined (faintly and incompletely 7-veined), connate to the lateral sepals for 4 mm to form a cylindrical sepaline tube, the lateral sepals oblong, narrowly subacute to obtuse, 10 mm long, connate 5 mm, 5 mm wide together, each 4-veined; **petals** membranous, translucent, broadly oblong-elliptical, 4 mm long, 2.75 mm wide, 3-(5)-veined, with the apex broadly truncate-retuse, the inner surface convex; **lip** fleshy, ovate-oblong, 1.9 mm long, 2 mm wide expanded, the apex shallowly bilobed with the lobes obtuse, the disc shallowly concave between a pair of low, lunate calli near the middle within the margins, and with a transverse callus above the narrowly concave base, the base truncate, fixed to the base of the column; **column** stout, 1 mm long, the foot obsolescent, the anther apical, the rostellum and stigma subapical.

COLOMBIA: **Santander:** epiphytic in cloud forest west of Galán, Cerro Guicha, headwaters of Quebrada Chiriviti, alt. 8500 ft, 8 Sept. 1944, N. C. Fassett 25732 (Holotype: US), C. Luer illustr. 17080.

This species is known only from the original collection by N. C. Fassett in the Eastern Cordillera with the Colombian Cinchona Mission in 1944. The species is distinguished by the large habit; a sessile, elliptical leaf; a large, foliaceous spathe; and an erect inflorescence with large, funnel-shaped, floral bracts that enclose the pedicel, ovary and basal portion of each flower. The inconspicuous flowers with barely parting sepals are held erect within the floral bracts. The petals are broad and convex with the apex retuse. The lip is proportionately small with the apex bilobed, and the usual calli within the margins near the middle.

***Pleurothallis jamesonii* Lindl., Edwards' Bot. Reg. 21: sub t. 1797, 1835. Fig. 28.**

Ety.: Named in honor of Dr. William Jameson of Quito, Ecuador, who first collected this species.

Syn.: *Pleurothallis foveata* Lindl., Folia Orch. *Pleurothallis*, 31, 1859.

Ety.: From the Latin *foveatus*, "with a small pit," referring to the labellum.

Syn.: *Humboldtia foveata* (Lindl.) Kuntze, Rev. Gen. Pl. 667, 1891.

Syn.: *Humboldtia jamesonii* (Lindl.) Kuntze, Rev. Gen. Pl. 667, 1891.

Syn.: *Pleurothallis sodiroi* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 14: 132, 1915.

Ety.: Named in honor of Father Aloysius Sodiro of Quito, Ecuador, who collected this species.

Plant medium in size to large, epiphytic, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, stout, erect, 8-35 cm long, with a long, tubular sheath near the middle, and 2-3 tubular, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 8-12 cm long, 2-2.5 cm wide, cuneate below into a petiole 0.5-1 cm long. **Inflorescence** racemose, racemes 1 to 4 simultaneous, secund, densely and simultaneously many-flowered, 12-25 cm long including the peduncle 6-7 cm long, subtended by a spathe 15-22 mm long, from an annulus just below the abscission layer; floral bracts 3 mm long, enclosing the pedicel and ovary; pedicels 1.5 mm long; ovary 1.5 mm long; **sepals** white to pale yellow or rose, sometimes suffused with purple, subcarinate, minutely pubescent above the middle, the dorsal sepal elliptical, subacute, concave, 6 mm long, 3 mm wide unexpanded, 3-veined, the lateral sepals ovate, oblique, subacute to obtuse, 5.5 mm long, 3.5 mm wide, 3-veined, connate 1.5 mm; **petals** translucent, sometimes veined in purple, obovate, obtuse, 3.5 mm long, 1.75 mm wide, 3-veined; **lip** white, yellow or purple, fleshy, trilobed, 2 mm long, 1.5 mm wide, the middle lobe ovate, subacute, convex, decurved, the lateral lobes below the middle, erect, obtuse, pyramidal, the disc concave below the middle above a transverse callus above the basal cavity, articulated with the end of the column-foot; **column** stout, 1 mm long, the foot thick, 1 mm long with the tip free, bulbous, the anther, rostellum and stigma subapical.

ECUADOR: Pichincha: "Ravines of Pichincha, valley of Lloa on trees," April 1855, W. Jameson s.n. (Holotype: K; Isotype: AMES); Valley of Lloa, 21 Jan. 1856, W. Jameson 482 (AMES, G); Quito, 1847, Jameson 62 (W); Quito, H. Karsten s.n. (W); Valley of Lloa, alt. 8,000 ft., Col. Hall s.n. (K); between San Juan and Chiriboga, alt. 2800 m, 3 May 1955, E. Asplund 16200, 16204 (AMES, C, G, K, LD, S, US); between Alaspungo and Gualea, 22 May 1920, I. Holmgren 639 (BM, G, S, US); between Chiriboga and Chillogallo, alt. 2900 m, 7 June 1967, B. Sparre 16932 (S); between San Juan and Chiriboga, alt. 2900-3300 m, 20 May 1982, B. M. Boom & J. L. Luteyn 1478 (NY); same area, alt. 2940 m, 23 July 1984, C. H. Dodson, A. Gentry, W. Palacios & J. Zaruma 14332 (MO); same area, alt. 3100 m, 28 May 1988, C. Luer & A. Hirtz 13690 (K, MO); east of Salcedo, alt. 3500 m, 12 Nov. 1979, C. Luer, J. Luer & A. Hirtz 4769 (SEL). **Napo:** near Oyacachi, Jan. 1901, A. Sodiro 3 (holotype of *P. sodiroi* destroyed at B; lectotype here designated: BR; isolectotypes: G, QPLS). **Cotopoxi:** above Pilalo, between Quevedo and Latacunga, alt. 3200-3300 m, 8 Apr. 1973, L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3276 (AAU, AMES); same area, alt. 3200 m, July 1975, C. Luer, G. Luer & S. Wilhelm 864 (SEL). **Imbabura:** between Otavalo and Selva Alegre via Lago Cuicocha, alt. 2950 m, 20 Mar. 1986, C. H. Dodson, A. & X. Hirtz 16402 (K, MO). **Bolívar:** north of Guaranda toward Facundo Vela, alt. 2800 m, 24 Mar. 1984, C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9689 (MO); pass north of Chillanes, alt. 2650 m, 25 Mar. 1984, C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9722 (MO); same area, 11 Feb. 1990, S. Dalström & L. Årby 1314 (MO), C. Luer illustr. 14934. **Azuay:** El Chorro, above Molleturo, alt. 2800-2900 m, 7 Mar. 1985, G. Harling & L. Andersson 22864 (AMES, GB); west of the pass beyond Zorrogucho, alt. 2800 m, 15 Feb. 1986, C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11788 (MO).

COLOMBIA: Cauca: Alto del Duende, páramo, alt. 3300 m, 1 Dec. 1944, J. Cuatrecasas 18794 (AMES, NY, US). **Nariño:** subparamo forest east of La Victoria, alt. 3300 m, 4 Nov. 1979, C. Luer, J. Luer & A. Hirtz 4644 (SEL).

PERU: San Martín: Dist. Huallaga, valley of Río Apisoncho, 30 Km above Jucusbamba, alt. 2800 m, 18 July 1965, A. C. Hamilton & P. M. Holligan 1015 (K); same area, alt. 3100 m, 27 Aug. 1965, A. C. Hamilton & P. M. Holligan 1295 (K); same area, alt. 2800 m, 18 July 1965, A. C. Hamilton & P. M. Holligan 1018 (AMES, K).

This species is relatively frequent through both sides of the Andes of Ecuador and adjacent Colombia. Among the species of this subgenus, *P. jamesonii* is characterized by a few long, secund racemes of small flowers borne from a narrow, erect spathe at the base of a petiolate leaf. The finely pubescent sepals and the three-veined, obtuse petals are similar to those seen in many allied species, but the lip possesses a convex, apical lobe and a pair of pyramidal calli on the disc contiguous with lateral lobes below the middle. Similar modifications have developed in the lips of two closely related species: *P. avirostris* and *P. praecalta*.

***Pleurothallis jurisdixii* Luer & Escobar, Orquideología 20: 64, 1996.**

Fig. 29.

Ety.: Named for Páramo de Jurisdicciones in the Eastern Cordillera of Colombia where this species was discovered.

Plant medium in size for the subgenus, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 6-10 cm long, with a close, tubular sheath below the middle and 2-3 inflated, imbricating sheaths about the base. **Leaf** erect, coriaceous, oblong, obtuse, 7-9 cm long including a petiole 1 cm long, 1.5-2 cm wide, cuneate below into the petiole. **Inflorescence** a single, subdense, subsecund, simultaneously several-flowered raceme 10-12 cm long including the peduncle 2-3 cm long, subtended by a slender spathe 2 cm long, from an annulus 5 mm below the abscission layer; floral bracts infundibular, 2.5-3 mm long, enclosing pedicel; pedicels 1.5-2 mm long; ovary 1.5 mm long; **sepals** light yellow-green, subcarinate, with the margins cellular, the dorsal sepal elliptical, obtuse, with the apex rounded, 5 mm long, 3 mm wide, 3-veined, essentially free from the lateral sepals, the lateral sepals in apposition, elliptical, obtuse, 3 mm long, 3.75 mm wide, 3-veined, connate 3 mm; **petals** light yellow-green with thin purple margins, oblong-elliptical, obtuse, 3.75 mm long, 1.5 mm wide, 3-veined; **lip** yellow-green with thin purple margins, ovate, 2.25 mm long, 2 mm wide, the apex triangular, narrowly rounded, the disc deeply concave between a pair of pyramidal calli above the middle that overlap the margin, the base truncate, fixed to the column-foot; **column** stout, 1.75 mm long, the foot thick, the anther, rostellum and stigma subapical.

COLOMBIA: Norte de Santander: Páramo de Jurisdicciones, alt. 2100 m, 10 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10211 (Holotype: MO).

This species from the Eastern Cordillera of Colombia is related to the numerous species allied to *P. velaticaulis*, but it is distinguished from the latter by the slender habit; an oblong, petiolate leaf; a slender spathe two centimeters long; a subsecund raceme about as long as the leaf; gaping flowers with obtuse floral parts; and an ovate-triangular, concave lip with a pair of pyramidal calli that overlap the margin, and a triangular apex.

***Pleurothallis laevigata* Lindl., Ann. Mag. Nat. Hist. ser. 1, 15: 106, 1845. Fig. 30, 31.**

Ety.: From the Latin *laevigatus*, "smooth," referring to the spathe.

Syn.: *Pleurothallis hartwegii* Lindl., Ann. Mag. Nat. Hist. ser. 1, 15: 106, 1845, not 1842.

Ety.: Named in honor of its collector, Karl Theodor Hartweg.

Syn.: *Humboldtia hartwegii* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia laevigata* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis lamprochlamys* Schltr., Repert. Spec. Nov. Regni Veg. 14: 130, 1915.

Ety.: From the Greek *lamprochlamys*, "a shiny cloak," in allusion to the large sheaths.

Syn.: *Pleurothallis conchopetala* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8:57, 1921.

Ety.: From the Greek *conchopetalon*, "a shell-like petal," referring to the concave petals.

Plant medium to large, coarse, epiphytic to terrestrial, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, stout to slender, erect, 10-45 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 8-20 cm long, 3-8 cm wide, cuneate below into a sessile base. **Inflorescence** few to many, simultaneous, more or less secund, densely and simultaneously many-flowered racemes, 10-30 cm long including the peduncle 2-5 cm long, subtended by a broad, foliaceous spathe 2-5 cm long, from an annulus adjacent to the abscission layer; floral bracts inflated, 4-6 mm long, enclosing pedicel and ovary; pedicels 2-4 mm long; ovary 2-2.5 mm long; **sepals** yellow to purple, more or less veined or suffused in brown or purple, subcarinate, ciliate, variously pubescent above the middle, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 6-10 mm long, 3-5 mm wide unexpanded, 3-veined, connate to the lateral sepals for 2-3 mm, the lateral sepals more or less decurved near the middle, oblong, subacute to obtuse, 5-8 mm long, 2-3 mm wide, 3-veined, connate to near the middle; **petals** translucent, veined in brown or purple, elliptical-obovate, obtuse to rounded at the apex, more or less concave, 3-4 mm long, 2-3 mm wide, 3-veined; **lip** yellow to purple, fleshy, broadly oblong to broadly ovate, 2-3.5 mm long, 2.5-3.5 mm wide, sides erect and rounded below the middle, the apex broadly obtuse, the disc shallowly concave and smooth between a pair of calli slightly below the middle, often with a midline third callus near the apex, the base concave below a curved, transverse callus, fixed to the column-foot; **column** stout, 2-2.5 mm long, the foot thick, 1 mm long with the apex short and thick, the anther, rostellum and stigma subapical.

COLOMBIA: **Cauca**: above Popayán, on the trunks of trees, on the declivity of Purecé, alt. 10,000 ft., 1843, T. Hartweg 1406 (Holotype: K, Isotypes: G, LD, W), C. Luer illustr. 16366; Sotara, above Popayán, 1843, T. Hartweg 1405 (holotype of *P. hartiwegii*: K; isotypes: LD, W), C. Luer illustr. 16367; Páramo de Delicias, F. C. Lehmann B.T. 324 (AMES, K, NY). **Antioquia**: near the pass between Urroa and Carmen de Atrato, alt. 2700 m, 30 May 1995, C. Luer, J. Luer, R. Escobar et al. 17644, 17645 (MO). **Norte de Santander**: Toledo, Alto de Santa Inez, alt. 2250 m, 13 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10335 (MO). **Santander**: scrub forest east of Bucaramanga toward Berlin, alt. 2950 m, 7 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10164 (MO). **Valle del Cauca**: forests of Tocotá, west Andes of Cali, alt. 1600-2200 m, F. C. Lehmann 7145 (AMES, K, NY), C. Luer illustr. 16390. **Nariño**: east of La Victoria, alt. 3200 m, 4 Nov. 1979, C. Luer, J. Luer & A. Hirtz 4648 (SEL).
 ECUADOR: **Carchi**: roadcut between Tulcán and Maldonado, alt. 3125 m, 24 Jan. 1977, J. D. Boeke 819 (NY); terrestrial on roadcut, alt. 3250 m, 14 Jan. 1992, C. Luer, J. Luer, A. & P. Jesup 16001, 16002 (MO); above La Esperanza between Tulcán and El Carmelo, alt. 3200-3450 m, 9 Apr. 1979, B. Løjtnant, U. Molau & M. Madison 12042, 12043 (AAU, GB); terrestrial north of El Playón, alt. 3100 m, C. Luer, J. Luer & A. Hirtz 15199 (MO); between Tulcán and El Carmelo, alt. 3200 m, 5 Apr. 1984, C. Luer, S. Dalström & T. Höijer 9958 (MO); same area, alt. 3200 m, 6 Apr. 1985, C. Luer, J. Luer & A. Hirtz 11117 (MO); between Julio Andrade and El Playón, El Mirador, alt. 3300 m, 22 Mar. 1991, A. Hirtz, X. Hirtz, J. del Hierro & S. Ortega 5292 (MO). **Sucumbios**: terrestrial east of Santa Bárbara, 10-15 Feb. 1959, G. Harling 4115 (S); between El Carmelo and La Bonita, alt. 2450 m, 8 Apr. 1979, B. Løjtnant, U. Molau & M. Madison 11960 (AAU, GB); south of Santa Bárbara, alt. 2700 m, 6 Apr. 1985, C. Luer, J. Luer, A. Hirtz & X. Hirtz 11109 (MO). **Pichincha**: Quito, W. Jameson s.n. (W); alt. 6,000 ft., H. Karsten s.n. (W); Río San Lorenzo on Volcán Corazón, July 1874, A. Sodiro 8 (holotype of *P. lamprochlamys* presumably destroyed at B, lectotype here designated: QPLS); terrestrial on the road cut of the new road between Quito and Santo Domingo, alt. 3000 m, 10 Mar. 1976, C. Luer, J. Luer & P. Taylor 800 (SEL); San Juan, Cerro Pichincha, alt. 2500-3000 m, 15 June 1983, J. Bohlin & M. Bohlin 476 (AMES, GB); San Juan, alt. 3000 m, Nov. 1983, A. Hirtz 1351 (MO). **Napo**: near Papallacta, on lava-bed, alt. 2600 m, 14 Apr. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 11286 (MO); east of Yangana, alt. 3200 m, 22 Mar. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 10784 (MO); Cerro Toledo, southeast of Yangana, alt. 3000-3200 m, 6 Apr. 1985, G. Harling & L. Andersson 23775 (AMES, GB); **Tungurahua**: Cordillera de los Llanganates, alt. 2850-3100 m, 11 Apr. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 11135, 11159 (MO). **Pastaza**: Río Zuñag, alt. 2400 m, A. Hirtz et al. 4630 (MO). **Chimborazo**: Río Alao, alt. 3600 m, June 1991, A. Hirtz 5500, 5501 (MO). **Bolívar**: terrestrial on road cut west of Guaranda toward Catarama, alt. 3150 m, 13 Mar. 1991, C. Luer, J. Luer, A. Hirtz et al. 15024 (MO). **Azuay**: Las Cajas west of Sayausí, alt. 3300 m, 4 Feb. 1982, G. Harling et al. 20203 (AMES, GB), C. Luer illustr. 15331. **Cañar**: pass between Pindilig and Rivera, alt. 3200 m, 9 Mar. 1985, G. Harling & L. Andersson 22994 (GB). **Loja**: near Santa Bárbara, on cold crests of the Andes of Loja, alt. 3300-3800 m, year not stated, F. C. Lehmann 8203 (Holotype of *P. conchopetala* presumably destroyed at B: lectotype here designated: K), C. Luer illustr. 17004. **Morona-Santiago**: road construction from Sigsig to Gualaquiza, alt. 3000 m, 8 Apr. 1968, G. Harling, G. Storm & B. Ström 8049, 8063 (GB); between Gualaquiza and Limón, alt. 2800-3300 m, 2 Apr. 1974, G. Harling & L. Andersson 13126 (AMES, GB); east of Sigsig, alt. 3200 m, 15 May 1988, C. Luer, A. Hirtz, W. Flores, A. Andreaetta & W. Teague 13365 (MO). **Zamora-Chinchipe**: pass between Loja and Zamora, alt. 2750 m, 20 Feb. 1986, C. Luer, J. Luer, A. Hirtz & A. Embree 11976 (MO); Nudo de Sabanilla, above Valladolid, alt. 2800 m, 4 Feb. 1985, G. Harling & L. Andersson 21587 (AMES, GB); above Valladolid, alt. 2450 m, 18 Mar. 1984, C. Luer, S. Dalström, T. Höijer & J. Kujit 9571 (MO); above Valladolid, alt. 2700 m, 23 Mar. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 10901, 10902, 10939 (MO); Loja-Zamora pass, alt. 2750 m, 21 Mar. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 10705, 10706 (MO); between Loja and Zamora, alt. 2750 m, 19 Apr. 1973, L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3987 (AAU, AMES); Parqué Nacional Podocarpus, Cerro Toledo, alt. 2800-2850 m, 27 Feb. 1985, B. Øllgaard et al. 58288 (AAU, QCA); northeast of Tambillo, trail toward Manú, alt. 2600-2750 m, 21 Feb. 1988, U. Molau & B. Eriksen 3142 (AAU, GB).

PERU: **Amazonas**: Chachapoyas, Mathews s.n. (K).

Pleurothallis laevigata is closely allied to *P. cassidis*, the two concepts being indistinguishable vegetatively. They are widely distributed in the Andes at high altitudes from Colombia into Peru. Both are characterized by a large habit with stout ramicauls clad in loose, papery sheaths. The leaf is large, elliptical and sessile with a large, foliaceous spathe at the base. A few to many erect racemes of small to medium-sized, yellow or purple flowers variously marked or veined in purple are produced simultaneously. See frontispiece of *Icones Pleurothallidinarum* - III.

The sepals are variously pubescent. The dorsal sepal of *P. laevigata* is

concave and three-veined. The lateral sepals are more or less reflexed near the middle. The petals are broad, rounded at the apex and three-veined.

The fleshy lip is broadly oblong, to ovate, more or less dilated below the middle with erect sides. The apex is broadly obtuse with the tip not decurved. The center of the lip is shallowly concave between a pair of rounded calli below the middle that are more or less continuous with the curved basal carina above the basal cavity. A third callus is sometimes present medially near the apex. This callus is present on the type of the species as well as on the type of *P. hartwegii*, but it has proved to be frequently absent. Instead of being movably articulated, the concave base is firmly ankylosed to the bulbous tip of the column-foot as it is in *P. cassidis*.

The lip of *P. cassidis* is proportionately broader with the apex decurved, and the pair of calli are located above the middle. Intermediate forms are encountered, sometimes making a determination less than positive,

Pleurothallis laevis Luer & Hirtz, sp. nov.

Fig. 32

Ety.: From the Latin *laevis*, "smooth," referring to the glabrous sepals and smooth lip

Species haec *P. elegantis* (H.B.K.) Lindl. affinis, sed sepalis glabris lateralibus non deflexis et labello majore subplano ecaloso differt.

Plant large, epiphytic, densely caespitose; roots numerous, slender. Ramicauls fasciculate, stout, erect, 10-22 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, obtuse, the blade 12-14 cm long, 3.5-6 cm wide, cuneate below into a subpetiolate base. **Inflorescence** racemose, the racemes 3 to 6, simultaneous, slender, more or less secund, densely and simultaneously many-flowered, 20-25 cm long including the slender peduncle ca. 6 cm long, subtended by a spathe 3-4 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts inflated, 4-5 mm long, enclosing pedicel and ovary; pedicels 1.5 mm long; ovary 1.5 mm long; **sepals** cream-colored with purple dots, especially along the veins, subcarinate, glabrous, the dorsal sepal elliptical-ovate, subacute, concave, 7-9 mm long, 6 mm wide unexpanded, 3-veined, the lateral sepals ovate, oblique, subacute, 7-9 mm long, 4 mm wide, 3-veined, connate 1.5 mm; **petals** translucent, veined in purple, elliptical-obovate, 5.5 mm long, 3.5 mm wide, 3-veined, the apex obtuse, thickened; **lip** orange, suffused with purple, fleshy, obovate, 5 mm long, 3.5 mm wide, the apex obtuse, decurved producing a retuse appearance from above, the disc broadly shallowly concave and smooth, without a callus, the base truncate with a narrow, transverse cavity without a transverse callus, solidly fixed to the column-foot; **column** slender, 4 mm long, the foot thick, 2 mm long, the anther, rostellum and stigma subepical.

ECUADOR: **Bolivar**: cloud forest west of Guaranda on the old road to Puebloviejo, alt. 2600 m, 26 Mar. 1984, C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9746 (Holotype: MO); wet, secondary forest west of Guaranda, alt 2600 m, 12 Feb. 1990, S. Dalström & Årnby 1334 (MO); terrestrial on the road cut west of Guaranda toward Catarama, alt. 3150 m, 13 Mar. 1991, C. Luer, A. Hirtz et al. 15023 (MO).

This species, apparently endemic in southeast-central Ecuador, is closely allied to the variable *P. laevigata*-complex. With the large habit with a large spathe, the two concepts are indistinguishable vegetatively. A similar rash of racemes reaches beyond the leaf. *Pleurothallis laevis* is distinguished by the totally glabrous flowers, and lateral sepals that are not deflexed near the middle. The lip is larger, obovate and without any callus. The obtuse apex is decurved.

Pleurothallis laminata Luer, sp. nov.

Fig. 33.

Ety.: From the Latin *laminatus*, "laminated," referring to the tall, thin calli of the lip.

Species haec *P. ligulatae* Lindl. affinis, sed floribus majoribus purpurascensibus, sepalis acutis intus pubescentibus, petalis ovatis et labello oblongo bilaminato distinguuntur.

Plant medium in size, epiphytic, densely caespitose; roots slender. Ramicauls suffused with purple, fasciculate, slender, erect, 4-8 cm long, with a long, tubular sheath along the middle, and 2-3 imbricating sheaths about the base. **Leaf** erect, rigidly coriaceous, suffused with purple beneath, narrowly elliptical, acute to subacute, petiolate, the blade 6-8 cm long including the slender petiole 1.5 cm long, 1.5-2 cm wide, cuneate below into the petiole. **Inflorescence** a single, subsecund, subdense, simultaneously several-flowered raceme, 18 cm long including the peduncle 9 cm long, subtended by a slender spathe 1.5 cm long; floral bracts infundibular, 5-6 mm long; pedicels 1-2 mm long; ovary 2.5 mm long; **sepals** purple, densely short-pubescent within, the dorsal sepal ovate, acute, concave, 10-12 mm long, 5 mm wide, 3-veined, the lateral sepals elliptical-oblong, acute, oblique, 10-11 mm long, 3.5 mm wide, 3-veined, connate 4-5 mm; **petals** translucent, ovate, narrowly obtuse, 4-5 mm long, 2.5 mm wide, 3-veined; **lip** purple, elliptical-oblong, with the sides erect below the middle, 3-4 mm long, 2.5 mm wide, the apex broadly rounded, the disc slightly concave between tall, broadly rounded calli just within the margins below the middle, with a transverse callus above a small basal cavity, articulated with the column-foot; **column** stout, 1.75 mm long, the base thickened, pedestal-like, the anther, rostellum and stigma subapical.

ECUADOR: **Loja:** epiphytic in elfin forest at the pass between Loja and Saraguro, alt. 2950 m, collected Jan. 1992, flowered in cultivation by P. & J. Jesup in Bristol, CT, 21 May 1992, *C. Luer* 16247 (Holotype: MO). **Azuay:** Quebradas leading into Río Collay, north of Sevilla de Oro, alt. 7,000-8,300 ft., 27 Aug. 1945, *W. H. Camp E-4990* (NY), *C. Luer* illustr 17069.

This species is related to the widely distributed group of species identified herein as *P. ligulata*. *Pleurothallis laminata* is characterized by the medium-sized habit with a thick, rigid, elliptical, petiolate leaf, acute at the apex and suffused with purple. The solitary inflorescence of comparatively large, gaping, purple flowers, surpasses the leaf twice its length. The sepals are acute and shortly pubescent within, and the petals are ovate with a narrowly obtuse apex. The lip is oblong with a tall, thin, broadly rounded lamella within each margin of the basal half.

***Pleurothallis lehmanniana* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 235, 1920.**

Ety.: A new name for *P. endotrachys*, in honor of its collector, Consul Lehmann.

Syn.: *Pleurothallis endotrachys* Lehm. & Krzl., Bot. Jahrb. Syst. 26: 439, 1899, not Rech.f. 1876.

Ety.: From the Greek *endotrachys*, "rough within," referring to the pubescent sepals.

Fig. 34.

Plant very large, epiphytic, caespitose; roots numerous, coarse. Ramicauls stout, fasciculate, erect, 40-65 cm long, with a loose, tubular sheath near the middle and 2-4 large, loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, ovate, acute, 20-23 cm long, 7-8 cm wide, the cuneate or rounded, contracted into a conduplicate petiole ca. 1 cm long. **Inflorescence** racemose, racemes numerous, 15-20 cm long, erect, congested, many-flowered, produced simultaneously in a fascicle, from a broad, foliaceous spathe 1.5-2 cm long, with an annulus at the apex of the ramicaul, 2-3 mm below the abscission layer; floral bracts 2 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; **sepals** yellowish, suffused with brown, ciliate, long-pubescent above the middle, subcarinate, the dorsal sepal ovate, obtuse, concave, 4 mm long, 3 mm wide unexpanded, 3-veined, the lateral sepals oblong, acute, 4.5 mm long, 1.5 mm wide, 3-veined, connate near the base, lightly adherent to above the middle; **petals** translucent, veined in brown, glabrous, linear-obovate, obtuse, 3 mm long, 1 mm wide, 3-veined; **lip** yellow, thick, oblong-trilobed, 2 mm long, 1 mm wide, the apical lobe obtuse, transversely callous, the lateral lobes erect, subacute, thickly callous, the disc concave, with a transverse callus above the basal cavity, articulated with the column-foot; **column** stout, terete, 1.75 mm long, the foot bulbous, free from the ovary, the anther and stigma subapical.

COLOMBIA: **Cauca:** Páramo de Guanacas, alt. 3000-3400 m, *F. C. Lehmann* 4510 (Holotype of *P. endotrachys* presumably destroyed at B, Neotype here designated: *C. Luer* 12552; MO); subparamo forest, Páramo de Barbillas, alt. 3070 m, 27 July 1978, *C. Luer, J. Luer, R. Escobar et al.* 3029 (SEL). **Nariño:** epiphytic in dwarf forest near the pass between Pasto and La Cocha, alt. 3150 m, 27 Jan. 1987, *C. Luer, J. Luer & C. Dodson* 12552 (MO). **Putumayo:** epiphytic in cloud forest between La Cocha and Sibundoy, alt. 2700 m, 4 Aug. 1978, *C. Luer, J. Luer & R. Escobar et al.* 3152 (SEL). **ECUADOR:** **Sucumbíos:** between Tulcán and El Carmelo, alt. 3200 m, 7 July 1990, *C. H. Dodson, E. Hagsater, D. Rubio & N. Rivera* 18405 (MO).

This large member of the subgenus is found locally in southern Colombia and northernmost Ecuador. It is distinguished by the great size of the ramicauls and

ovate, shortly petiolate leaves. Fascicles of numerous, erect racemes of small, yellowish brown flowers are produced from a thick spathe. The sepals are obtuse, ciliate and pubescent; the narrowly oblong petals are three-veined; and the lip is oblong with an erect pair of callous-thickened lobes just above the middle that cannot be spread, and with an obtuse, transversely callous middle lobe.

Pleurothallis ligulata Lindl., *Folia Orch. Pleurothallis* 29, 1859.

Fig. 35.

Ety.: From the Latin *ligulatus*, "ligulate," referring to the shape of the leaf.

Syn.: *Humboldtia ligulata* (Lindl.) Kuntze, *Rev. Gen. Pl.* 2: 667, 1891.

Syn.: *Pleurothallis chlamydropus* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 7: 103, 1920.

Ety.: From the Greek *chlamydropus*, "clothed foot," referring to the sheathed base of the ramicaul.

Syn.: *Pleurothallis patula* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 7: 110, 1920.

Fig. 36.

Ety.: From the Latin *patulus*, "patulous," referring to the flowers.

Syn.: *Pleurothallis nubigena* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 27: 50, 1924, not Lindl.

Ety.: From the Latin *nubigenus*, "borne of clouds," referring to the habitat.

Syn.: *Pleurothallis hopfiana* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 27: 164, 1924.

Fig. 37.

Ety.: Named for the German collector H. Hopf.

Syn.: *Pleurothallis atacasana* Luer, *Phytologia* 46, 358, 1980.

Ety.: Named for Volcán Atacasa where the species was collected.

Plant medium in size to large, epiphytic, commonly terrestrial, ascending, densely caespitose; roots slender. Ramicauls fasciculate, slender, erect, 3-30 cm long, with a closely appressed, tubular sheath near the middle, and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, narrowly elliptical, acute, subacute to narrowly obtuse, petiolate, the blade 4-13 cm long, 0.5-2 cm wide, cuneate below into a petiole 1-2 cm long. **Inflorescence** 1-3 distichous or subsecund, subdense, simultaneously many-flowered racemes, 4-25 cm long including the peduncle 1-5 cm long, subtended by a slender spathe 0.5-1.5 cm long, from an annulus ca. 1 cm below the abscission layer; floral bracts infundibular, 3-4 mm long; pedicels 2-3 mm long; ovary 2-3 mm long; **sepals** yellow, sometimes marked with purple, or uncommonly completely purple, pubescent, apiculate, ciliate and sparsely pubescent within, the dorsal sepal ovate, subacute, concave, 3-9 mm long, 2-4 mm wide, 3-veined, the lateral sepals elliptical-oblong, obtuse, oblique, 3-8 mm long, 1.5-2.75 mm wide, 3-veined, connate 1-2 mm; **petals** translucent, broadly elliptical-obovate, rounded at the apex, 2-4 mm long, 1.75-3.25 mm wide, 3-veined; **lip** yellow or purple, elliptical-obovate, slightly dilated below the middle with the sides incurved, 2-3.25 mm long, 1.75-2.5 mm wide, the apex broadly rounded, the lateral margins variously callous near the middle (sometimes with calli absent), the disc slightly concave, with a transverse callus above a transverse, basal cavity, articulated with the base of a vestigial column-foot; **column** stout, 1.5-2 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Without locality, *W. Jameson (Stelis No. 2) s.n.* (Holotype: K). **Carchi**: Nudo de Boliche, Voladero, alt. 3800 m, 13 June 1939, *C. W. Penland & R. H. Summers 920* (AMES); between El Angel and Tulcán, alt. 3450 m, 14 May 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnani & B. Øllgaard 5247* (AAU, AMES, K, S); between Tulcán and El Carmelo, alt. 3200 m, 6 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11069* (MO); same area, alt. 3200 m, 7 July 1990, *C. H. Dodson, E. Hagsater, D. Rubio & N. Rivera 18418, 18419* (MO); between San Gabriel and Playón de San Francisco, alt. 3300 m, 9 July 1990, *C. H. Dodson, E. Hagsater, D. Rubio & N. Rivera 18505* (MO); El Mirador, between Julio Andrade and Playón de San Francisco, alt. 3600 m, Aug. 1990, *A. Hirtz, X. Hirtz, J. del Hierro & F. Sarmiento 4946, 4949* (MO); same area, alt. 3300 m, 22 Mar. 1991, *A. Hirtz, X. Hirtz, J. del Hierro & S. Ortega 5293* (MO); west of the pass between Tulcán and Maldonado, alt. 3400 m, 2 Apr. 1984, *C. Luer, S. Dalström & T. Höjjer 9882, 9883* (MO); terrestrial on the road embankment west of the pass between Tulcán and Maldonado, alt. 3400 m, 16 Mar. 1991, *C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15060* (MO); epiphytic in subparamo forest between El Angel and Tulcán, alt. 3350 m, 5 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & X. Hirtz 11063* (MO). **Sucumbios**: south of Sta. Bárbara, alt. 2600 m, 4 Apr. 1984, *C. Luer, S. Dalström & T. Höjjer 9975* (MO); beyond Sta. Bárbara, alt. 2860 m, 8 July 1990, *C. H. Dodson, E. Hagsater, D. Rubio & N. Rivera 18448* (MO). **Imbabura**: near Lago Mojanda, alt. 3300 m, 17 Feb. 1998, *C. Luer, J. Luer, A. Hirtz & J. del Hierro 18709* (MO). **Pichincha**: Andes of Quito, April 1864, *W. Jameson s.n.* (US); Mt. Atacaso, alt. 3500 m, 16 Feb. 1979, *A. Hirtz A-1* (holotype of *P. atacasana*: SEL). **Napo**: between Papallacta and Baeza, alt. 2850 m, 14 Apr. 1984, *C. H. Dodson, A. Hirtz & W. & M. Thurston 14259* (MO); Guacamayo Range between Tena and Baeza, alt. 2150 m, 13 Apr. 1985,

C. Luer, J. Luer, A. Hirtz & W. Flores 11261 (MO); Cuyuja, between Quito and Baeza, alt. 2450 m, 29 May 1986, *C. H. Dodson & T. A. Dodson 16425* (MO). **Morona-Santiago:** east of pass east of Sigsig, alt. 2700 m, 15 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13363* (MO). **Cañar:** above Taday, alt. 3000 m, 4 Apr. 1974, *G. Harling & L. Andersson 13144* (AMES, GB). **Azuay:** "paramos" Andinum occident. aequator, ca. 3900 m, July 1876, *E. André 4641* (K); near San Marcos northeast of Azogues, 13 Apr. 1945, collected by F. Prieto, *W. H. Camp E-2608* (AMES, S); Río Machangara, northwest of Cuenca, alt. 3300-3400 m, 17 Sept. 1967, *B. Sparre 18554, 18570* (S); above Sayausí, alt. 3000-3200 m, 18 Mar. 1974, *G. Harling & L. Andersson 12608* (AMES, GB); west of Sayausí, alt. 3300 m, 4 Feb. 1982, *G. Harling et al. 20206* (AMES, GB); south of Cuenca, terrestrial, alt. 3400 m, 6 Mar. 1985, *G. Harling & L. Andersson 22822, 22828* (AMES, GB); Páramo de Tinajillas, south of Cumbe, alt. 3300 m, 3 Feb. 1982, *G. Harling et al. 20158* (AMES, GB); same area, 29 Jan. 1988, *U. Molau, B. Eriksen & M. Fredrikson 2701* (AAU, GB); new road west of Zorrogucho, alt. 3450 m, 16 Mar. 1984, *C. Luer, S. Dalström, T. Højjer & J. Kuijt 9518* (MO); above Lago Zorrogucho, alt. 3200 m, 15 Feb. 1986, *C. Luer, J. Luer, A. Hirtz & A. Embree 11786* (MO). **Loja:** terrestrial on the road cut north of Loja, alt. ca. 2500 m, 2 Mar. 1977, *C. Luer, J. Luer & K. Cordoba 1537* (SEL); above Jimbura, alt. 3350 m, 21 Mar. 1984, *C. Luer, S. Dalström, T. Højjer & J. Kuijt 9649* (MO). **Zamora-Chinchipec:** terrestrial, Páramos del occidente de Saraguro, alt. 2500 m, 10 Mar. 1947, *R. Espinosa 1420* (AMES); between Loja and Zamora, alt. 2750 m, 19 Apr. 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3847, 3851* (AAU, AMES); Cajanuma Range, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10737* (MO).

COLOMBIA: **Cundinamarca:** around Bogotá, alt. 2000-2300 m, 1921, *H. Hopf. s.n.* (holotype of *P. hopfiana*, destroyed at B); epiphytic in subparamo forest below Páramo de Jurisdicciones, alt. 3130 m, 11 Nov. 1981, *C. Luer, J. Luer, R. Escobar & D. Portilla 6658* (neotype for *P. hopfiana* here designated: SEL); same area, alt. 3150 m, 10 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10248* (MO); Páramos of Bogotá, 7 Nov. 1916, *M. T. Dawe 314* (K); Guasca, Los Gaques, alt. 3000 m, 24 Apr. 1932, *J. Cuatrecasas 3042* (K); Macizo de Bogotá, Quebrada del Rosal, alt. 3200 m, 29 June 1939, *J. Cuatrecasas 5712* (COL, US); Quebrada del Chicó, alt. 2700-3200 m, 3 June 1943, *M. Schneider 144* (AMES). **Cauca:** without locality, alt. 2000 m, *M. Madero s.n.* (holotype of *P. chlamydopus* destroyed at B); highlands of Popayán, alt. 1500-1800 m, *F. C. Lehmann 4508* (neotype for *P. chlamydopus* here designated: AMES; isoneotype: NY); without locality, *M. Madero s.n.* (holotype of *P. patula* destroyed at B); highlands of Popayán, alt. 1500-1800 m, *F. C. Lehmann 4508* (neotype for *P. patula* here designated: AMES); Páramo de Las Papas, alt. 3490 m, 11 Oct. 1958, *H. G. Barclay & P. Vuajibioy 6035* (AMES). **Nariño:** on a volcano near Pasto, alt. 3000-4000 m, Mar. 1921, *W. Hopp 30* (holotype of *P. nubigena* destroyed at B); Túquerres, forests of Chaquilulu and Chillanquas, alt. 3000-3300 m, *F. C. Lehmann 6924* (neotype for *P. nubigena* here designated: AMES; isoneotypes: NY, US).

BOLIVIA: **Cochabamba:** deserted old road from Cochabamba to Villa Tunari, alt. 3150 m, 1 Feb. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18363* (MO).

This species is treated as a morphologically variable species-complex of interrelated taxa that exhibit all combinations of variations of the specific characters. It is frequent in the Andes from the Eastern Cordillera of Colombia into southern Ecuador, and into Bolivia. It has not yet been identified from Venezuela or Peru, but unidentified collections must certainly exist. It was first described by Lindley from a collection by Jameson in northernmost Ecuador where plants exactly the same as the type are common and locally abundant today. However, even within this original area, various deviations from the typical plant are also found.

Pleurothallis ligulata sensu lato is distinguished by the ascending, densely fasciculated, sheathed ramicauls; elliptical to narrowly elliptical, petiolate leaves; and one to three subdense, elongate racemes of small or medium-sized, yellowish to purplish flowers. Sometimes exceedingly tall specimens are encountered. The sepals are variously pubescent within, and the petals are broadly obtuse, three-veined (at least below the middle), and rounded at the apex. The lip (type A) is elliptical-ovate and shallowly concave with suberect, more or less callous margins below the middle. However, these marginal calli vary from a short, lunate, marginal pair near the middle to longitudinally callous margins below the middle. Throughout the range, the calli are completely lacking in numerous collections that are otherwise similar in all other respects. No correlation can be made with the lip and the other floral parts or vegetative morphology. Marked deviations are rec-

ognized as distinct species (i.e. *P. laminata*, *P. patateënsis*, *P. pellucida*, and *P. pennelliana*). Other species (i.e. *P. atacasana*) have been judged to be too similar to maintain separately. Several species described by Schlechter that fit within the above description are difficult to assess because the holotypes were destroyed at Berlin, and no isotypes have been found. These species (*P. chlamydropus*, *P. hopeniana*, *P. patula* and *P. nubigena*) are included here in synonymy.

Pleurothallis ligulata is sympatric with another common species, *P. pulchella*, which is similar both vegetatively and florally. The latter is distinguished by narrower, single-veined petals, and an ovate-trilobed lip (type B) with distinct marginal calli on the lateral lobes.

***Pleurothallis mandonii* Rchb.f., Xenia Orch. 3: 24, 1878.**

Fig. 38.

Ety.: named in honor of Gustave Mandon, botanical collector in Bolivia between 1856 and 1861.

Syn.: *Humboldtia mandonii* (Rchb.f.) Kuntze, Rev. Gen. Pl. 668, 1891.

Plant medium in size, shortly repent, with the rhizome stout up to 10 cm long, 0.5-2 cm long between ramicauls, occasionally branching, enclosed by tubular sheaths; roots slender, produced along the rhizome. Ramicauls ascending to erect, separate, not fasciculate, slender, 5-14 cm long, with a tubular sheath near the middle and 2-3 other sheaths at the base. **Leaf** erect, coriaceous, elliptical, acute to subacute, petiolate, the 4-9 cm long, 1.5-2 cm wide, cuneate below into a slender petiole 1-1.5 cm long. **Inflorescence** a solitary, subax, distichous to secund, simultaneously several-flowered raceme, 5-8 cm long including the peduncle ca. 2 cm long, subtended by a slender spathe 1-1.5 cm long, from an annulus below the abscission layer; floral bracts infundibular, 4-5 mm long; pedicels 2 mm long; ovary 2 mm long; **sepals** yellow, ciliate, pubescent within, the dorsal sepal ovate, obtuse, concave, 4.5-5 mm long, 2 mm wide, 3-veined, the lateral sepals elliptical-ovate, acute, 4.5-5 mm long, connate 2.5 mm, 3 mm wide together, each 3-veined; **petals** translucent, oblong, rounded at the tip, 2-2.75 mm long, 1 mm wide, 3-veined; **lip** fleshy, oblong, trilobed from near the middle, 1.5-2.4 mm long, 1.25 mm wide, the apical lobe rounded, the lateral lobes erect, rounded, with an intramural callus on the anterior margins, concave between, the base with a transverse carina above the basal concavity, articulated with the end of the column-foot; **column** stout, 1.5 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma subapical.

BOLIVIA: **La Paz:** Larecaja, vicinity of Sorata, Lancho de Cochipata, in scopulis, Mt. Illampu, alt. 3300 m, Jan. 1860, *Mandon 1129* (lectotype: W, isotypes: AMES, BM, G, K, S), C. Luer illustr. 18521; Nor Yungas, Chuspipata, alt. 3000 m, 21 Aug. 1991, C. Luer, J. Luer, R. Vásquez et al. 15362 (MO).

This species is apparently endemic in the Yungas of Bolivia where it was first collected by Mandon in the nineteenth century. He made many specimens of his *1129* which are distributed among the major herbaria of the world. However, not one has an open flower. The most mature bud that could be found was hydrated and illustrated. A second collection was recently made also in the Yungas of northern Bolivia.

Pleurothallis mandonii is characterized by a shortly creeping and ascending rhizome, erect ramicauls, and an oblong, petiolate leaf. The raceme, about as long as the leaf, is subtended by a slender spathe. The sepals are minutely ciliate, in common with many other species of the subgenus. The petals are oblong with a single vein, but three-veined below the middle. The lip is three-lobed above the middle with the anterior margins of the lobes thickened.

Other repent members of the subgenus include *P. orectopus* and *P. scansor* with much more elongated rhizomes.

***Pleurothallis maxima* Luer, Selbyana 3: 140, 1976.**

Ety.: From the Latin *maximus*, "greatest," referring to the large number of flowers.

Fig. 39.

Plant large, epiphytic to terrestrial, densely caespitose; roots slender. Ramicauls fasciculate, stout, erect, 22-50 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical-ovate, subacute to obtuse or rounded at the apex, the blade 11-28 cm long, 5-10 cm wide, broadly cuneate below into a subpetiolate base. **Inflorescence** a fascicle of to 30 racemes produced simultaneously, distichous or subsecund, densely and simultaneously many-flowered, 15-30 cm long including the peduncle 2-6 cm long, subtended by a foliaceous spathe 2-4.5 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts broadly infundibular, 2-2.5 mm long, enclosing pedicel and ovary; pedicels 1 mm long; ovary 1-1.5 mm long; **sepals** brownish or yellowish veined in purple, subcarinate, shortly and sparsely ciliate, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 4-6 mm long, 2.5-3 mm wide unexpanded, 3-veined, free from the laterals, the lateral sepals ovate, subacute, 4-5.5 mm long, 2-2.5 mm wide, 3-veined, connate less than 1 mm; **petals** translucent with the midvein purple, elliptical to oblong, obtuse to rounded at the apex, 2.75-3.5 mm long, 1-2 mm wide, 1-veined; **lip** yellow or brown, suffused with purple, fleshy, ovoid-trilobed, 2-3 mm long, 1.5-1.75 mm wide, the apical lobe ovate, subacute to obtuse, the lateral lobes thick, obtuse, erect, near the middle, the disc shallowly concave, with a transverse callus above a large cavity at the base, the base truncate, articulated with a large, bulbous tip of the column-foot; **column** stout, 1.5 mm long, the foot bulbous at the tip, 1 mm long with the apex free and bulbous, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: forest along the old road between Chiriboga and Santo Domingo, alt. 1500 m, 17 Aug. 1975, flowered in cultivation 6 Feb. 1976, C. Luer, G. Luer & S. Wilhelm 651 (Holotype: SEL); same area, alt. 1200 m, 16 Feb. 1991, C. H. Dodson, M. Whitten & A. Embree 18664 (MO); Santa Rosa de Toachi, alt. 1000 m, Mar. 1989, A. Hirtz, X. Hirtz & K. H. Baumann 4667 (MO); between Calacali and La Liberia, alt. 2250 m, 7 Apr. 1984, C. Luer, S. Dalström, T. Höijer & A. Hirtz 10003 (MO). **El Oro**: cloud forest above Zaruma, alt. 1800 m, 23 Feb. 1986, C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 12022 (MO). **Carchi**: epiphytic in forest above Maldonado, alt. 2300 m, 14 Jan. 1992, C. Luer, J. Luer, A. Hirtz, J. del Hierro et al. 16016 (MO).

COLOMBIA: "Cordillera occidental," alt. 1800 m, 10 Dec. 1899?, E. Langlássé 99-6 (K), C. Luer illustr. 16387. **Antioquia**: Frontino, Alto de Cuevas, alt. 1220-2150 m, 7 June 1989, J. L. Luteyn & S. Sylvas S. 13299 (NY), C. Luer illustr. 17066.

This large species, found from central Colombia into central Ecuador, is similar to the many-flowered *P. batillacea* and *P. fons-florum*, but it is distinguished from them by subpetiolate leaves and single-veined petals. It is also similar to the single-veined *P. galeata*, but *P. maxima* is distinguished by subpetiolate leaves and much longer racemes. It is also distinguished from *P. galeata* by the absence of a distinct callus on both lateral and apical lobes of the lip.

***Pleurothallis molleturoi* Luer & Dodson, sp. nov.**

Ety.: Named for the community of Molleturo in southwestern Ecuador where the species was discovered.

Fig. 40.

Inter species subgeneris *Crocodelanthe* foliis ellipticis ramicaulis gracilibus terlongioribus cum racemibus paucis multifloribus subaequalibus, floribus carosis nonresupinatis, sepalis acutis, petalis obtusis et labello ovato anguste obtuso disco obscure bicalloso distinguuntur.

Plant large, coarse, epiphytic, densely caespitose; roots slender. Ramicauls fasciculate, slender, erect, 20-23 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, acute, 11-12 cm long including a petiole 2-2.5 cm long, 2.5-3.5 cm wide, cuneate below into the petiole. **Inflorescence** 1-2 congested, simultaneously many-flowered racemes, more or less distichous, 10-12 cm long including the peduncle 2-3 cm long, subtended by a slender spathe 2 cm long, from an annulus 5-6 mm below the abscission layer; floral bracts oblique, 3-4 mm long; pedicels 2 mm long; ovary 2 mm long; flowers non-resupinate; **sepals** yellow, fleshy, thickly carinate, narrowly obtuse, concave, with the edges narrowly incurved, the middle sepal 5 mm long, 2 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals, oblique, 5 mm long, 2 mm wide, 3-veined, connate 1.5 mm; **petals** translucent, elliptical, obtuse, 3 mm

long, 1.6 mm wide, 3-veined; **lip** yellow, ovate, 2.8 mm long, 2 mm wide, the apex narrowly obtuse, the sides broadly rounded below the middle and erect, the disc shallowly concave and smooth between a minute pair of obsolescent, lunate calli within the margins below the middle, and with a narrow, transverse callus above the base, narrowly concave below, the base truncate, inflexibly attached to the column-foot; **column** stout, 2 mm long, the foot thick, 1 mm long, anther, rostellum and stigma subapical.

ECUADOR: **Azuay**: between Cuenca and Molleturo, alt. ca. 2800 m, 21 July 1985, C. H. Dodson, P. M. Dodson, T. Dodson & A. Embree 15941 (Holotype: MO).

This large species, apparently endemic in southwestern Ecuador, is characterized by comparatively slender ramicauls and a few multiflowered racemes shorter than the long-petiolate, elliptical leaf. The small, non-resupinate flowers are fleshy and thickly carinate. The petals are comparatively large, obtuse, and three-veined. The lip is ovate with the usual pair of calli barely visible within the margin just below the middle.

Pleurothallis moritzii Rchb.f., *Linnaea* 22: 824, 1849.

Fig. 41.

Ety.: Named in honor of the German collector J. W. K. Moritz who discovered this species.

Syn.: *Humboldtia moritzii* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Plant medium in size to large, coarse, epiphytic to terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, stout, erect, 7-30 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 5-22 cm long, 1.5-4 cm wide, cuneate below into the subpetiolate or shortly petiolate base. **Inflorescence** 1-4 subcongested, simultaneously several- to many-flowered racemes, more or less dichotomous, 8-15 cm long including the peduncle 2-3 cm long, subtended by a compressed spathe 1.5-3.5 cm long, from an annulus 2-3 mm near or below the abscission layer; floral bracts inflated, infundibular, 4-5 mm long, enclosing the pedicel; pedicels 2-3 mm long; ovary 1.5-2.5 mm long; **sepals** yellow, subcarinate, minutely ciliate, pubescent within above the middle, the dorsal sepal elliptical-oblong, acute to narrowly obtuse, concave, 6-9 mm long, 2.5-3.5 mm wide, 3-veined (sometimes with a partial, additional pair), connate to the lateral sepals for 1-2 mm, the lateral sepals oblong-ovate, oblique, subacute, 6-9 mm long, 2 mm wide, 3-veined, connate 2-4 mm; **petals** translucent yellow, membranous, broadly elliptical, obtuse, concave, 3-4 mm long, 2-2.5 mm wide expanded, 3-veined; **lip** yellow, triangular, 2.5 mm long, 1.5 mm wide above the base, the apex acute to narrowly obtuse, the basal angles erect, rounded, the disc shallowly concave and smooth between a pair of lunate calli within the margins below the middle, and with a narrow, transverse callus above the base, narrowly concave below, the base truncate, inflexibly attached to the column-foot; **column** stout, 1-1.5 mm long, the foot thick, 1 mm long with the apex short, thick, pubescent, with the anther, rostellum and stigma subapical.

VENEZUELA: **Aragua**: near Colonia Továr, Mar. 1848, J.W.K. Moritz 854 (Holotype: W); Henri Pittier National Park, Pico Guacamaya, alt. 1725 m, 11 Feb. 1990, K. S. Edwards et al. 178 (K), C. Luer illustr. 17283. **Bolívar**: Chimantá Massif, Apácará-tepui, alt. 2200-2300 m, 20 June 1953, J. A. Steyermark 75839 (AMES, NY); Cerro Venamo, dwarf rain forest, alt. 4,500 ft., July 1964, G.C.K. Dunster-ville 884; Meseta del Jaua, Cerro Jaua, alt. 2250 m, 27 Feb. 1974, J. A. Steyermark, V. Carreño Espinoza & C. Brewer-Carias 109561 (AMES, K, VEN), C. Luer illustr. 16383; Churi-tepui, alt. 2050 m, 1 Feb. 1953, J.J. Wurdack 34280 (AMES, NY), C. Luer illustr. 17065. Terr. Fed. Amazonas: Atabapo, alt. 2520-2650 m, 26 Feb. 1985, J.A. Steyermark 130790 (NY); Cerro Marahuaca, alt. 2520-2650 m, 26 Feb. 1985, J.A. Steyermark & B. Holst 130660 (MO), C. Luer illustr. 17020; same area, alt. 2555 m, 25-26 Feb. 1985, R.L. Liesner 17958, 18004 (MO).

ECUADOR: **Azuay**: cloud forest on slopes near Sayausí, 1981, *Oxford Expedition to Las Casaz* 215 (K), C. Luer illustr. 16386.

This species was first collected in the coastal mountains of Venezuela by the German collector Moritz, but it is more frequently found in the forested interior of the state of Bolívar. A disjunct collection is known from southeastern Ecuador. Examinations of plants from all areas reveal no significant difference. The type-specimen in Reichenbach's herbarium at W (Vienna) is pitiful and incomplete without a flower; Reichenbach's sketch, however, clearly shows vegetative and floral details that agree with plants found today in the same coastal mountains.

Vegetatively, *P. moritzii* is characterized by stout, fascicled ramicauls with

loose sheaths at the base and another near the middle. The leaves are elliptical and subpetiolate, sometimes shortly petiolate. From a large spathe the few, elongate, simultaneously several- to many-flowered racemes emerge. The sepals are connate only near the base, and pubescent within above the middle; the three-veined petals are thin, broadly elliptical and concave, and the proportionately small lip is triangular and narrowly obtuse, with a small pair of calli below the middle.

Pleurothallis nivalis Luer, *Selbyana* 1: 420, 1976.

Ety.: From the Latin *nivalis*, "snowy, or frosty," referring to the snow white flowers.

Fig. 42

Plant large, epiphytic to terrestrial, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, stout, erect, 10-30 cm long, mostly concealed by large, loose, tubular, imbricating sheaths. **Leaf** erect, coriaceous, elliptical, obtuse, petiolate, the blade 10-15 cm long, 3-6 cm wide, cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, 1 to 4 simultaneous, secund, subdensely simultaneously many-flowered racemes, 25-35 cm long including the peduncle 5-10 cm long, subtended by a broad spathe 2-3.5 cm long, from an annulus 4-5 mm below the abscission layer; floral bracts infundibular, 4 mm long; pedicels 2 mm long; ovary 2.5-3 mm long; **sepals** white with a few purple dots, ciliate-pubescent above the middle, ovate, narrowly obtuse, the dorsal sepal concave, 6.5-8 mm long, 3.5-4.5 mm wide unexpanded, 3-veined, the lateral sepals oblong, subacute, apiculate, 6.5-8 mm long, oblique, 2.5-3.5 mm wide, connate below the middle, each 3-veined; **petals** translucent with a few purple spots, obovate, obtuse, concave, 4.5-5 mm long, 2-3 mm wide, 3-veined; **lip** white with a few purple dots, fleshy, ovoid, trilobed below the middle, 3.5-4 mm long, 2.5-3 mm wide, the apical third ovate, obtuse, the lateral lobes erect, broadly rounded, deeply cleft between with calli extending from the lateral lobes onto the anterior lobe, the basal cavity continuous with the central cleft, articulated with the end of the column-foot; **column** stout, 3 mm long, the foot thick, 1 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

ECUADOR: Cotopaxi: terrestrial on the edge of the paramo between Pilalo and Latacunga, alt. 3500 m, 5 Mar. 1975, C. Luer & R. Kent 290 (Holotype: SEL); same area, 14 Feb. 1963, C. H. Dodson & L. B. Thien 2259 (MO, SEL); terrestrial on the road cut above Pilalo, alt. 3300 m, 26 Feb. 1986, C. Luer, J. Luer & A. Embree 12043 (MO); terrestrial between Angamarca and Corazón, alt. 3000 m, 17 Feb. 1979, C. Luer, J. Luer & A. Hirtz 3991 (SEL). **Pichincha:** Proyecto Agua Potable, near Yana Cocha, alt. 3500 m, 9 Mar. 1996, S. Dalström & J. del Hierro 2086 (MO). **Bolívar:** epiphytic in cloud forest remnant west of Salinas, alt. 3400 m, 10 Mar. 1991, C. Luer, A. Hirtz et al., 14949 (MO).

This pretty species occurs at high altitudes on the western slopes of the Andes of central Ecuador. Vegetatively similar to the other robust species of the subgenus, *P. nivalis* is characterized by the shortly petiolate leaf and a few erect, secund, densely many-flowered racemes much longer than the leaf and subtended by a conspicuous spathe. The snow white sepals are densely pubescent within; the petals are obtuse and three-veined; and the lip is three-lobed, the anterior lobe triangular, the lateral lobes rounded and erect, and with the disc deeply cleft.

Pleurothallis orectopus Luer, *Selbyana* 3: 356, 1977.

Ety.: From the Greek *orectopus*, "a stretched out foot," referring to the creeping rhizome.

Fig. 43.

Plant medium in size to large, epiphytic to terrestrial, repent, with the rhizome stout, 15 or more cm long, 2-3 cm long between ramicauls, occasionally branching, enclosed by tubular sheaths; roots slender, produced along the rhizome. Ramicauls ascending to erect, separate, not fasciculate, slender, 15-30 cm long, with a close, tubular sheath near the middle and 2-3 other sheaths at the base. **Leaf** erect, coriaceous, elliptical, acute, long-petiolate, the blade 8-12 cm long, 2.5-3.5 cm wide, cuneate below into a slender petiole 3-4 cm long. **Inflorescence** 1 or 2 subulax, subsecund, simultaneously several- to many-flowered racemes, 4-11 cm long including the peduncle 1-2 cm long, subtended by a slender spathe 1-1.5 cm long, from an annulus below the abscission layer; floral bracts infundibular, 3-5 mm long; pedicels 2-4 mm long; ovary 2 mm long; **sepals** yellow, ciliate, pubescent within, the dorsal sepal ovate, acute, concave, 5.5 mm long, 2.5 mm wide, 3-veined, the lateral sepals elliptical-oblong, subacute, 5.5 mm

long, connate to the middle, 3.5 mm wide together, each 3-veined; **petals** translucent yellow, oblong-obovate, obtuse, 3 mm long, 1.75 mm wide, 3-veined; **lip** yellow, fleshy, ovoid, trilobed below the middle, 2.25 mm long, 1.5 mm wide, the apical lobe rounded, the lateral lobes erect, broadly rounded, with thick, lunate, intramural calli on the anterior margins, concave between, the base with a transverse carina above the basal concavity, articulated with the end of the column-foot; **column** stout, 1.5 mm long, the foot thick, 0.5 mm long, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: terrestrial on the road bank, new road, Quito to Santo Domingo, alt. ca. 2000 m, 16 Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 547* (Holotype: SEL); Pululagua, alt. 2600-3000 m, 13 Jan. 1967, *B. Sparre 13932* (S); La Liberia, alt. 2700 m, Nov. 1983, *A. Hirtz 1411* (MO). **Imbabura**: road to Apuela, alt. ca. 2500 m, 8 Feb. 1979, *C. Luer, J. Luer & A. Hirtz 3914* (SEL).

This species is apparently endemic in northwestern Ecuador where it is occasionally discovered. It is characterized by an elongated, creeping rhizome, but not long-scandent as in *P. scansor*. The long, slender ramicauls are produced two to three centimeters apart. The petiole of the elliptical leaf is elongate. The raceme approximates the length of the leaf. The sepals are pubescent within; the petals are membranous, obtuse and three-veined; and the lip is obscurely three-lobed with intramural calli on the anterior margins of broadly rounded lateral lobes.

Pleurothallis pachypus (Lehm. & Krzl.) Garay, *Canad. J. Bot.* 34:254, 1956. Fig. 44.

Bas.: *Stelis pachypus* Lehm. & Krzl., *Bot. Jahrb. Syst.* 26: 447, 1899.

Ety.: From the Greek *pachypus*, "thick-footed," referring to the thickened bases of the ramicauls.

Syn.: *Pleurothallis quadrata* C. Schweinf., *Bot. Mus. Leaflet* 10: 184, 1942.

Ety.: From the Latin *quadratus*, "quadrate," referring to the shape of the lip.

Plant small to medium in size, epiphytic, densely caespitose; roots slender. Ramicauls erect, fasciculate, slender, slightly thickened at the base, 5-15 cm long, with a loose, tubular sheath below the middle and 2-3 other imbricating sheaths at the base. **Leaf** erect, coriaceous, narrowly elliptical, acute to subacute, petiolate, 5-11 cm long including the petiole, 1-2 cm long, 1.5-2 cm wide, narrowly cuneate below into the slender petiole. **Inflorescence** 1 or 2 congested, distichous, simultaneously many-flowered racemes, 5-12 cm long including the peduncle 1-3 cm long, subtended by a slender spathe 1-1.5 cm long, from an annulus 3-5 mm below the abscission layer; floral bracts infundibular, 1.5-2 mm long, enclosing the pedicel; pedicels 0.5-1 mm long; ovary 0.75-1 mm long; **sepals** yellow to tan, more or less flecked with brown, glabrous, with the margins microscopically ciliate, the dorsal sepal broadly elliptical-ovate, concave, obtuse, subcarinate, 2-3 mm long, 2-2.5 mm wide, 3-veined, the lateral sepals ovate, obtuse, subcarinate, 2-3 mm long, connate to near the middle, 2-3 mm wide together, each 2-(3)-veined; **petals** translucent with purple midvein, membranous, oblong, obtuse to subtruncate, 1.5-2 mm long, 1-1.5 mm wide, 1-veined; **lip** red-brown, ovoid-subquadrate, broadly obtuse at the apex, 1.5-1.8 mm long, 1-1.5 mm wide, with the sides dilated below the middle and incurved, the disc smooth, concave between a pair of calli above the middle, the basal third transversely concave, the base broadly truncate, articulated to the bulbous tip of the column-foot; **column** stout, 1 mm long, the foot thick, bulbous, 0.25 mm long, the anther, rostellum and stigma subapical.

COLOMBIA: **Antioquia**: epiphytic and terrestrial between Río Piedras and La Ceja, alt. 2400 m, Sept. 1883, *F. C. Lehmann 3176* (Holotype presumably destroyed at B; Lectotype: K; Isolectotypes: NY, US), *C. Luer* illustr. 16993. **Risaralda**: forest above Santa Rosa de Cabal, alt. 2800 m, 12 May 1993, *C. Luer, J. Luer & R. Escobar 16794* (MO).

ECUADOR. **Pastaza**: near Puyo, alt. 1000 m, Mar. 1976, flowered in cultivation, 31 Dec. 1976, *C. Luer I292* (SEL). **Zamora-Chinchiipe**: near Zamora, alt. ca. 1000 m, July 1975, *C. Luer, G. Luer & S. Wilhelm 404* (SEL).

PERU: **Junín**: epiphytic in dense forest, Schuncke Hacienda above San Ramón, alt. 1400-1700 m, 8 June 1929, *E. P. Killip & A. C. Smith 24856* (holotype of *P. quadrata*: US).

BOLIVIA: **Cochabamba**: northeast of Cochabamba on road to Villa Tunari, alt. 2500 m, 4 Feb. 1983, *C. Luer, J. Luer & R. Vásquez 8683* (SEL).

This species is local, but widely distributed from central Colombia through the Andes of Ecuador and Peru into central Bolivia. Superficially it resembles a *Stelis*, and indeed is related to *P. stelidiopsis*. The ramicauls are fasciculate with imbricating sheaths. The slender inflorescence surpasses the leaf. The tiny sepals are obtuse and concave; the petals are broad and one-veined; and the lip is subquadrate with a callus at either corner of the broadly obtuse apex.

***Pleurothallis patateënsis* Luer, sp. nov.**

Fig. 45.

Ety.: Named for Patate, near where the species was collected.

Species haec *P. ligulatae* Lindl. affinis, sed habitu majore, foliis longipetiolatis multilatoribus, racemis paucis folio brevioribus differt.

Plant medium in size or large, epiphytic, densely caespitose; roots slender. Ramicauls fasciculate, slender, erect, 8-16 cm long, with a long, tubular sheath along the middle, and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, petiolate, the blade 10-12 cm long including the slender petiole 2.5-3 cm long, 2.5-3.2 cm wide, cuneate below into the petiole. **Inflorescence** 2-3, subsecund, subdense, simultaneously several-flowered racemes, 6-11 cm long including the peduncle 1-2 cm long, subtended by a slender spathe 1.5 cm long; floral bracts infundibular, 4 mm long; pedicels 4 mm long; ovary 2.5 mm long; **sepals** purple, microscopically pubescent within, the dorsal sepal ovate, acute, concave, 7 mm long, 3 mm wide, 3-veined, the lateral sepals elliptical-oblong, acute, oblique, 7 mm long, 2.5 mm wide, 3-veined, connate 1 mm; **petals** translucent, elliptical, rounded at the apex, 4 mm long, 1.5 mm wide, 3-veined; **lip** purple, oblong-trilobed, with the sides erect and broadly rounded below the middle, 3 mm long, 2 mm wide expanded, the apex broadly rounded, the disc slightly concave between erect, thick, rounded calli just within the margins at the middle, with a transverse callus above a basal cavity, articulated with the column-foot; **column** stout, 2 mm long, the base thickened, the anther, rostellum and stigma subapical.

ECUADOR: **Tungurahua**: epiphytic in forest, vicinity of Patate, Hda. Leito, alt. 3050 m, 2 Aug. 1939, E. Asplund 8000 (Holotype: S; Isotypes: AMES, US).

This species, or perhaps subspecific taxon, is apparently rare, known only from the original collection by Erik Asplund. Although obviously related to the widely distributed group of species treated herein as *P. ligulata*, *P. patateënsis* differs from all of them in the broad, long-petiolate leaves that are not surpassed by the inflorescences of purple flowers. The sepals are microscopically pubescent within. The petals are three-veined with a rounded apex. The calli of the lip are prominent, rounded and erect. Although the morphology of the flower parts falls within the limits acceptable for *P. ligulata*, the distinctive vegetative characters set this taxon apart.

***Pleurothallis pellucida* Luer & Hirtz, sp. nov.**

Fig. 45.

Ety.: From the Latin *pellucidus*, "transparent," referring to sepaline tube.

Species haec *P. ligulata* Lindl. affinis, sed foliis latioribus cum racemo plus minusve aequilongis, spatia longiore et sepalis longioribus differt.

Plant medium in size, epiphytic, densely caespitose; roots numerous, slender. Ramicauls fasciculate, erect, 8-12 cm long, enclosed by a tubular sheath near the middle and 2-3 tubular sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, subacute to obtuse, 6-11 cm long, 2-2.5 cm wide, the base cuneate into a petiole 7-8 mm long. **Inflorescence** a subdense, secund, simultaneously many-flowered raceme 12-14 cm long including the peduncle 4-5 cm long, subtended by a slender spathe 18-22 mm long, from an annulus 2-3 mm below the abscission layer; floral bracts 6-7 mm long, enclosing pedicel; pedicels 3 mm long; ovary 1 mm long; **sepals** translucent greenish white, elliptical-oblong, acute, ciliate, lightly pubescent within, the dorsal concave, 9 mm long, 3 mm wide, connate to the lateral sepals for 3 mm, to form a sepaline tube, the lateral sepals 8.5 mm long, 2 mm wide, connate 4 mm; **petals** dark purple, obovate, obtuse, 4.5 mm long, 2.5 mm wide, 3-veined; **lip** dark purple, thick, elliptical with the sides erect, 3 mm long, 1.5 mm wide, the apex rounded, the sides with intramural calli below the middle, the disc concave between the calli, and with a transverse callus above the narrowly concave base, firmly attached to the column-foot; **column** stout, 1.5 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Prov. of Azuay: epiphytic in scrub vegetation south of Cuenca, alt. 3000 m, 17 Mar. 1984, C. Luer, S. Dalström, T. Höijer & J. Kuijt 9629 (Holotype: MO).

This seldomly collected species occurs in scrub vegetation in high, semi-arid terrain in southern Ecuador. It is closely allied to the *P. ligulata*-complex, but it is distinguished from the latter by the much broader, shortly petiolate leaves and a

shorter raceme barely longer than the leaf. The semitubular flowers apparently do not open widely. The sepals are longer and translucent greenish white which permits the dark purple petals and lip to shine through. The petals are broad, concave and three-veined. The lip is oblong with calli below the middle within the walls of the erect sides.

***Pleurothallis pennelliana* Luer, sp. nov.**

Fig. 47.

Ety.: Named in honor of Francis W. Pennell who first collected this species.

Species haec *P. ligulatae* Lindl. affinis, sed habitu et floribus majoribus, sepalis longiciliatis et labello ad medium bicalloso differt.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls ascending, fasciculate, erect, slender, 10-20 cm long, with a close, tubular sheath near the middle and enclosed by 2-3 tubular, imbricating sheaths at the base. **Leaf** erect, coriaceous, narrowly elliptical-oblong, subacute to obtuse, 8-11 cm long, 1.5-2.5 cm wide, the base narrowly cuneate into a petiole ca. 1 cm long. **Inflorescence** a solitary, simultaneously many-flowered raceme 17-23 cm long including the slender peduncle 5-7.5 cm long, subtended by a slender spathe 1-2 cm long, borne laterally from the ramicaul 7-8 mm below the abscission layer; floral bracts tubular, 5 mm long; pedicels 5-8 mm long; ovary 2.5 mm long; **sepals** yellow-green, finely long-ciliate, the dorsal sepal free, ovate, concave, acute, 9-11 mm long, 4-5 mm wide, the lateral sepals oblong, acute, 9-11 mm long, 2-2.75 mm wide, connate ca. 5 mm; **petals** translucent, with the midvein and margins brown, elliptical, subcarinate, rounded at the apex, 5-5.5 mm long, 2-2.5 mm wide, 3-veined; **lip** ovate-subtrilobed, 4.25 mm long, 3 mm wide expanded, the apex rounded, dilated below the middle with the sides erect, the disc smooth with a pair of small, lunate calli near the middle near the margins, the base concave on the end, densely hinged to the small, bulbous apex of the column-foot; **column** stout, 2.5 mm long, the foot thick, 0.5 mm long, the anther, rostellum and stigma ventral.

COLOMBIA: **Cundinamarca**: Río San Cristobal near Bogotá, alt. 3000-3200 m, 20-26 Sept. 1917, *F. W. Pennell 2043* (Holotype: US; Isotype: AMES); Cerro Negro, Hato Grande, east of Gachetá, alt. 3000 m, 13 June 1944, *M. L. Grant 9407* (NY), C. Luer illustr. 17068; San Miguel near Sibató, alt. 2800-3250 m, 4 Sept. 1949, *M. Schneider 151* (S), C. Luer illustr. 17106; Páramo de Guerrero, between Zipaquirá and Pacho, alt. 3280 m, 28 Nov. 1976, *P.J.M. Maas & R. Jaramillo 1791* (K, NY), C. Luer illustr. 17067; Vereda Bóchica, Fusagasugá, finca Lolandia, alt. 1780-1900 m, 6 Nov. 1980, *H. García-Barriga 21237* (US); Mountains of Bogotá, without altitude or date, *Bro. Ariste-Joseph A442b* (US).

This species, closely related to *P. ligulata*-complex, is apparently endemic in the Eastern Cordillera of Colombia where it grows sympatrically with the latter. Similar to the latter, it is characterized by slender, densely fascicled, ascending ramicauls. The elliptical, petiolate leaves are broader than those acceptable for *P. ligulata*. The flowers, borne in shorter racemes, are larger and yellow-green with the sepals long-ciliate. The petals are veined in purple. The lip is oblong, dilated below the middle with the sides erect. A pair of low, rounded calli are present near the middle near the margins.

***Pleurothallis pilifera* Lindl., Folia Orch. *Pleurothallis* 9, 1859.**

Fig. 48.

Ety.: From the Latin *pilifer*, "hair-bearing," referring to the pilose sepals.

Syn.: *Humboldtia pilifera* Kuntze, Rev. Gen. Pl. 668, 1891

Plant large, epiphytic, densely caespitose, roots coarse. Ramicauls stout, erect, 20-55 cm long, with a close, tubular sheath near the middle and 2-3 sheaths about the base. **Leaf** erect, coriaceous, elliptical, acute, long-petiolate, the blade 12-17 cm long, 5-7 cm wide, cuneate below into a slender petiole 1.5-3 cm long. **Inflorescence** a fascicle of 3-6, congested, simultaneously many-flowered, more or less secund racemes 18-40 cm long including the slender peduncle 5-12 cm long, subtended by a spathe 1-1.5 cm long, from an annulus ca. 1 cm below the abscission layer; floral bracts 3 mm long, enclosing pedicel and ovary; pedicels 1.5 mm long; ovary 1.5 mm long; **sepals** yellow or purple, subcarinate, thickened toward the apices, with a long, whitish, pubescence within above the middle, the dorsal sepal elliptical,

concave, subacute, 5-7 mm long, 2.5-3.5 mm wide, 3-veined, free from the laterals, the lateral sepals 5-7 mm long, 2.5-3 mm wide, 3-veined, connate 1.5 mm; petals yellow, purple or brown, obovate, obtuse, 3-4 mm long, 2-2.25 mm wide, 3-veined, the margins often lightly irregular; lip yellow to purple, fleshy, oblong, subacute at the thickened apex, 2.5-3.5 mm long, 1.2-1.5 mm wide, the margins erect below the middle, obliquely continuous with a pair of central calli, narrowly cleft between, the disc with a suborbicular callus above the concave base, the base truncate, articulated with the column-foot; column stout, 1.5 mm long, the foot thick, 1-1.5 mm long, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: "Valley of Lloa, on the branches of trees, forests at 8,000 ft., 1854," *W. Jameson s.n.* (Holotype: K); Quito, *W. Jameson 107* (W); "Pichincha," alt. 7,000 ft., *H. Karsten s.n.* (W); Salvador below San Juan, alt. ca. 2500 m, 3 May 1955, *E. Asplund 16173* (S); between Chiriboga and San Juan, alt. 1900-2200 m, 28 Jan. 1977, *G. Harling, U. Eliasson & L. Andersson 14917* (GB); between San Juan and Chiriboga, undated, *F. Fagerlind & G. Wibom 1882* (S); same area, alt. 2950 m, 15 May 1981, *C. H. Dodson et al. 10867* (MO); forest west of Calacali, alt. 2550 m, 4 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & C. Dodson 11051* (MO); Lloa, alt. 2400 m, May 1985, *A. Hirtz 2566* (MO); epiphytic on the west slope of Volcán Corazón, collected by Ch. Hirtz, flowered in cultivation in Quito, 25 Jan. 1989, *C. Luer 14077* (K, MO). **Carchi**: forest between Tulcán and Maldonado, alt. 2900 m, 2 Apr. 1984, *C. Luer, S. Dalström & T. Höjjer 9890* (MO); same area, alt. 3400 m, 16 Mar. 1991, *C. Luer, A. Hirtz et al. 15055* (MO); alt. 2850 m, 16 Mar. 1991, *C. Luer, A. Hirtz et al. 15076* (MO); alt. 1600 m, 16 Mar. 1991, *C. Luer, A. Hirtz et al. 15095* (MO). **Imbabura**: Selva Alegre, alt. 1400 m, May 1989, *A. Hirtz & X. Hirtz 4225* (K, MO).

This species is frequent and locally abundant in the forests of the western slopes of the Andes of northern Ecuador. Vegetatively it is large and coarse with densely caespitose, stout ramicauls that bear an ovate, acute, long-petiolate leaf. Three to six long, densely flowered racemes extend as long as or much longer than the leaf. The flowers vary in color. The sepals are long-pubescent within above the middle, and the petals are obtuse and three-veined. The lip is oblong with a pair of marginal, pyramidal calli below the middle with the anterior margins angling forward onto the disc as a pair of carinae and cleft between. A low, rounded callus is present above the basal cavity. Except for the central cleft and the rounded basal callus, the lip is similar to that of *P. jamesonii*. The lip is practically identical to that of the prolific *P. prolificans*.

Pleurothallis popayanensis Lehm. & Krzl., Bot. Jahrb. Syst. 26: 438, 1899. Fig. 49.
Ety.: Named for the city of Popayán, above which the species was collected.

Plant medium in size to large, epiphytic, densely caespitose; roots numerous, slender. Ramicauls fasciculate, stout, erect, 12-15 cm long, with a loose, tubular sheath near the middle and 2-3 imbricating sheaths about the base. Leaf erect, coriaceous, elliptical-oblong, subacute, sessile, 13-15 cm long, 2.5-3 cm wide, cuneate below into the conduplicate base. Inflorescence racemose, 1-2 slender, congested, more or less distichous, simultaneously many-flowered racemes, 15-21 cm long including the slender peduncle ca. 4 cm long, subtended by a broad spathe 3-4.5 cm long, from the apex of the ramicaul at the base of the leaf; floral bracts infundibular, 3.5 mm long, enclosing the pedicel; pedicels 1.5-2 mm long; ovary 1.5 mm long; sepals greenish white according to Lehmann, subcarinate, glabrous, with the margins minutely ciliate, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 4 mm long, 2.5 mm wide, 3-veined, connate to the lateral sepals for nearly 1 mm, the lateral sepals ovate, oblique, concave, 3.5 mm long, connate to above the middle, 4 mm wide together, each obtuse, 3-veined; petals translucent, broadly-oblong to suborbicular, with the apex rounded, 2.4 mm long, 1.8 mm wide, 1-veined; lip brown according to Lehmann, suborbicular to transversely ovate when expanded, 2.25 mm long, 2.75 mm wide expanded, the apex broadly rounded, the sides below the middle dilated and incurved, the disc concave, the base narrowly transversely concave below a narrow transverse carina, firmly attached to the column-foot; column semiterete, stout, 1.5 mm long, the foot thick, 0.5 mm long, the anther, rostellum and stigma subapical.

COLOMBIA: **Cauca**: dense forests around Corrales near Popayán, alt. 2500-3000 m, *F. C. Lehmann 4514* (Lectotype: K), *C. Luer* illustr. 16995.

Although there are discrepancies, the above description was made from the lectotype at Kew, the flower having been hydrated in concentrated ammonia. I know of no other collection of this species which apparently is endemic in the for-

ests above Popayán.

Pleurothallis popayanensis is similar vegetatively to several related species with a large foliaceous bract emerging from the base of a sessile leaf. The numerous, small flowers are more or less globose with broad, concave sepals. The petals are proportionately large, suborbicular and single-veined. The lip is simple, transversely ovate when expanded, and free of any callus.

***Pleurothallis praealta* Luer & Hirtz, sp. nov.**

Fig. 50.

Ety.: From the Latin *praealtus*, "at a very high altitude," referring to the habitat.

Species haec *P. jamesonii* Lindl. affinis, sed labello trilobo, lobo antico subacuto convexo decurvo, lobis lateralibus erectis obtusis crassissimis distinguitur.

Plant medium in size, appears to have been growing terrestrially, caespitose; roots numerous, slender. Ramicauls fasciculate, stout, erect, 6-9 cm long, enclosed by 3 tubular, imbricating sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 8-9 cm long, 2-2.5 cm wide, cuneate below into a subpetiolate base. **Inflorescence** racemose, racemes 1 or 2 simultaneous, secund, densely and simultaneously many-flowered, 18-23 cm long including the peduncle 8-9 cm long, subtended by a spathe 1.5 cm long, from an annulus 2 mm below the abscission layer; floral bracts 3-4 mm long, enclosing pedicel and ovary; pedicels 1.5 mm long; ovary 2 mm long; **sepals** white, subcarinate, minutely pubescent above the middle, the dorsal sepal ovate, acute, concave, 7.5 mm long, 4 mm wide unexpanded, 3-veined, the lateral sepals ovate, oblique, subacute to obtuse, 7 mm long, 3.75 mm wide, 3-veined, connate 1.5 mm; **petals** translucent with pink margins, elliptical-obovate, 4 mm long, 3 mm wide, 3-veined, the apex rounded, subapiculate; **lip** white, suffused with pink, fleshy, trilobed, 3.5 mm long, 2.5 mm wide, the middle lobe ovate, subacute, convex, decurved, the lateral lobes near the middle, erect, obtuse with irregular margins, very thick basally and cannot be spread, almost meeting in the midline, the disc narrowly concave between the callous lobes, continuous with the basal cavity, articulated with the end of the column-foot; **column** stout, 2 mm long, the foot thick, 1 mm long with the tip free, the anther, rostellum and stigma subapical.

ECUADOR: **Pichincha**: "North Pichincha," alt. 3800 m, Nov. 1983, *A. Hirtz 1389* (Holotype: MO), *C. Luer* illustr. 14932.

This species from a very high altitude in northern Ecuador is closely related to *P. jamesonii* of lower altitudes. Vegetatively and florally they are very similar, but *P. praealta* is distinguished by the thick, trilobed lip with a convex and decurved, triangular, anterior lobe, resembling a parrot's beak. The erect lateral lobes are very thickened, especially at the base, the two lobes nearly meeting, separated only by a deep, midline cleft. The lateral lobes cannot be spread without fracturing the lip.

***Pleurothallis prolificans* Luer & Hirtz, sp. nov.**

Fig. 51.

Ety.: From the Latin *prolificans*, "proliferating," referring to the production of ramicauls from the apex of other ramicauls.

Inter species subgeneris *Crocodelanthidis* ramicaulibus prolificantibus, racemo solitario longissimo multifloro, spathe parva, folio ovato acuto brevipetiolato, sepalis liberis acutis intus pubescentibus, petalis trinervis, et labello oblongo bicaloso illi *P. piliferae* Lindl. similis distinguitur.

Plant large, coarse, terrestrial, scandent, roots slender. Ramicauls proliferating, stout to slender, erect to suberect, 5-20 cm long, with a close, tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, narrowly ovate, acute, shortly petiolate, 8-13 cm long, 1.5-3.5 cm wide, cuneate below into a petiole 0.5-1 cm long. **Inflorescence** one or occasionally two, slender, distichous to secund, densely and simultaneously many-flowered racemes, 20-40 cm long including the peduncle 3-12 cm long, subtended by a slender spathe 1 cm long, from an annulus ca. 5 mm below the abscission layer; floral bracts infundibular, 3 mm long, enclosing pedicel and ovary; pedicels 1 mm long; ovary 1.5 mm long; **sepals** greenish, suffused with purple or brown, subcarinate, long-pubescent within, the dorsal sepal ovate, acute, concave, 6.5 mm long, 3 mm wide, 3-veined, free from the lateral sepals,

the lateral sepals ovate, oblique, subacute, 6 mm long, 3 mm wide, 3-veined, connate 1 mm; petals translucent purple or brown, elliptical, obtuse, 3.5 mm long, 2 mm wide, 3-veined; lip yellow or green, fleshy, oblong, 3.5 mm long, 1.5 mm wide, the apex thick, rounded, the disc with a pair of erect, lobe-like, marginal calli below the middle, continuous with a pair of approximate, longitudinal calli, cleft between, the base concave below a basal callus, articulated with the bulbous tip of the column-foot; column stout, 1.75 mm long, the foot with the apex short, free, the anther, rostellum and stigma ventral.

ECUADOR: **Pichincha**: epiphytic between San Juan and Chiriboga, alt. 2450 m, 28 May 1988, C. Luer & A. Hirtz 13699 (Holotype: MO; Isotypes: K, QCNE); old road from Quito to Santo Domingo, 12 Mar. 1976, P. Taylor, J. & C. Luer 16305 (K); forest above Tandapi, alt. 2600 m, Mar. 1983, A. Hirtz 1270 (MO); same area, alt. 2500 m, 31 Mar. 1985, C. Luer, J. Luer, A. Hirtz & X. Hirtz 11012 (MO).

This species is apparently endemic in northwestern Ecuador. It is one of four prolific species known in the subgenus, the others being *P. expansa*, *P. galerasensis* and *P. virgata*. All four species are characterized by the climbing habit, but *prolificans* is distinguished by the ovate, very acute leaves, an inconspicuous spathe, one or occasionally two long racemes, and flowers similar to those of *P. pilifera*. For many years, *P. prolificans* was regarded as a prolific form of *P. pilifera*.

Pleurothallis pulchella (H.B.K.) Lindl., in Hooker's Exotic Flora 2: sub t. 123, 1825.

Fig. 52.

Bas.: *Stelis pulchella* H.B.K., Nov. Gen. Sp. 1: 364, 1816.

Ety.: From the Latin *pulchellus*, "pretty," referring to the inflorescence.

Syn.: *Pleurothallis sphehochila* Lindl., Folia Orch. *Pleurothallis* 22, 1859.

Ety.: From the Greek *sphenocheilos*, "a wedge-shaped lip," in reference to the labellum.

Syn.: *Pleurothallis naramiensis* Rchb.f., Beitr. Orch. Centr. Amer. 96, 1866.

Ety.: Named for the community of Naranjo where the species was collected.

Syn.: *Humboldtia naramiensis* (Rchb.f.) Kuntze, Rev. Gen. Pl. 668, 1891.

Syn.: *Humboldtia pulchella* (H.B.K.) Kuntze, Rev. Gen. Pl. 668, 1891.

Syn.: *Humboldtia sphehochila* (Rchb.f.) Kuntze, Rev. Gen. Pl. 668, 1891.

Syn.: *Pleurothallis ecuadorensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 14: 129, 1915.

Ety.: Named for the country of origin.

Syn.: *Pleurothallis pteroglossa* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 112, 1920.

Ety.: From the Greek *pteroglossa*, "a winged tongue," referring to the lip.

Syn.: *Pleurothallis iloënsis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 59, 1921.

Ety.: Named for the community of Lloa where the plant was collected.

Syn.: *Pleurothallis bogotensis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 27: 162, 1924, not Lindl. 1846.

Ety.: Named for the area around Bogotá where the species was collected.

Syn.: *Pleurothallis tepuiensis* Carnevali & I. Ramírez, Novon 3: 121, 1993.

Ety.: Named for a "tepai" where the species was collected.

Plant medium in size, commonly terrestrial, densely caespitose; roots coarse, numerous. Rami-cauls fasciculate, slender, erect, 4-25 cm long, with a closely appressed, tubular sheath near the middle, and several tubular, imbricating sheaths about the more or less thickened base. **Leaf** erect, coriaceous, narrowly elliptical, acute to subacute or narrowly rounded, petiolate, the blade 6-18 cm long, 1-3 cm wide, cuneate below into a slender petiole 1-2 cm long. **Inflorescence** racemose, racemes 1 to 2 simultaneous, secund, densely and simultaneously many-flowered, 10-18 cm long including the peduncle 2-4 cm long, subtended by a slender spathe 6-8 mm long, from an annulus 2-5 mm below the abscission layer; floral bracts 1.5-2.5 mm long; pedicels 1-2 mm long; ovary 1-2 mm long; sepals pale yellow, sometimes suffused with rose, carinate, minutely pubescent within above the middle, the dorsal sepal ovate, acute, concave, 3.5-5 mm long, 2.5 mm wide unexpanded, 3-veined, the lateral sepals oblong, subacute, apiculate, 3.5-5 mm long, 1.5-1.8 mm wide, 3-veined, connate to near the middle; petals trans-lucent, more or less edged in purple, elliptical-oblong, obtuse, 2.5-3.5 mm long, 1-1.25 mm wide, 1-veined; lip yellow, suffused with purple on the margins, fleshy, trilobed, 2 mm long, 1.5 mm wide, the middle lobe ovate, obtuse, thickened, the lateral lobes below the middle, erect, obtuse to rounded, callous within the anterior margins, the disc slightly concave below the middle above a transverse callus above the basal cavity, articulated with the end of the column-foot; column stout, 1 mm long, the foot thick, 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

ECUADOR: **Imbabura?** in the valley Ichubamba near Chillo, home of Marchionis de Selvaegre, alt. "1370 hex.," *A. Humboldt* & *A. Bonpland* s.n. (Holotype: P, as *Stielis pulchella*; Isotype: W). **Carchi:** north of San Gabriel, 31 July 1985, *C. H. Dodson* & *A. Embree* 16126 (K, MO); south of San Gabriel, alt. 2700 m, 7 July 1990, *C. H. Dodson*, *E. Hagsater*, *D. Rubio* & *N. Rivera* 18401 (MO); terrestrial near San Gabriel, alt. 2750 m, 13 Jan. 1992, *C. Luer*, *J. Luer*, *A.* & *P. Jesup* 15590 (MO). **Imbabura:** common terrestrial between Ibarra and Quito, alt. 2400-3000 m, *F. C. Lehmann* s.n. (K); Lago Cuicocha, alt. 3100 m, 10 Apr. 1956, *E. Asplund* 20213 (S); same area, alt. 3000 m, 10 Dec. 1966, *B. Sparre* 13317 (S); lithophytic, Cuyicocha crater, 6 Dec. 1976, *E. W. Davis* 343 (AMES). **Pichincha:** "Quito," 1845, *W. Jameson* 63 (G); without locality, *W. Jameson* 179 (K); road to Lloa, 22 Nov. 1862, *W. Jameson* s.n. (US); slopes of Pichincha near Quito, alt. 3000 m, 29 Dec. 1879, *F. C. Lehmann* 419 (W); same area, 20 Nov. 1880, *F. C. Lehmann* 211 (W); west slopes of Corazón, alt. 2000 m, 14 Jan. 1881, *F. C. Lehmann* 337; eastern forests of Mt. Pichincha, Mar. 1900, *A. Sodiro* 6 (holotype of *P. ecuadorensis* presumably destroyed at B, lectotype here designated: QPLS); in subandean forest, Vally of Lloa, *L. Mille* 4 (holotype of *P. lloënsis* presumably destroyed at B, lectotype here designated: K; isolectotype: QPLS); Colina, alt. 2700, Nov. 1927, *G. Firmin* 268 (AMES, US); vicinity of Quito below Guápalo, 3 Nov. 1931, *E. Asplund* 9660 (B, C, BR, GB, K, LD, NY, S, US); near Lloa, alt. 3000 m, 9 Sept. 1939, *E. Asplund* 10087 (S); above Quito, alt. 10,000 ft., 25 Dec. 1938, *E. K. Balls* 5785 (US); San Juan, alt. 3500 m, 28 Nov. 1952, *F. Fagerlind* & *G. Wibom* 1572 (S); Quebrada Yanahuaico, west of Conocoto, alt. 2700-2800 m, 3 Dec. 1966 *B. Sparre* 13277 (S); between Nono and Tandayapa, alt. 9,220 ft., 15 Nov. 1974, *T. Plowman* & *E. W. Davis* 4433 (S); terrestrial, east of Pintag, alt. 3200-3300 m, 1 July 1979, *B. Løjtnant* & *U. Molau* 15422 (GB); between Tandayapi and Mindo, alt. 2800 m, 11 Nov. 1979, *C. Luer*, *J. Luer* & *A. Hirtz* 4703 (SEL); La Liberia west of Quito, alt. 2700 m, Nov. 1983, *A. Hirtz* 1412 (MO), *C. Luer* illustr. 14936. **Loja:** between Cumbe and Saraguro, alt. 3120 m, 2 Aug. 1959, *H. G. Barclay* & *P. Juajibioy* 8508 (AMES). **Zamora-Chinchipe:** above Valladolid, alt. 1900 m, 23 Mar. 1985, *C. Luer*, *J. Luer*, *A. Hirtz* & *W. Flores* 10841 (MO). **Azuay:** Páramo de Tinajillas, south of Cuenca, *W.H. Camp* E-2109 (AMES, NY, S).

PERU: **Cajamarca:** Cutervo, Tres Cruces, terrestrial on rocky slopes, alt. 2560 m, 14 Nov. 1986, *J. Mostacero et al.* 1607 (F, HUT).

COLOMBIA: **Antioquia:** La Ceja, Tuza, alt. 2880 m, 5 June 1876, *E. André* 3612 (K). **Santa Marta:** 1898-1901, *H.H. Smith* 2486 (K). **Antioquia:** Río Piedras, alt. 2000 m, 20 Sept. 1883, *F. C. Lehmann* 3142 (K). **Cauca:** Pasto, alt. 2500 m, Nov. 1880, *F. C. Lehmann* 24 (W). **Cundinamarca:** mountains east of Bogotá, 28 Jan. 1854, *I.F. Holton* 162 (AMES); Bogotá, alt. 8,100 ft., *H. Karsten* s.n. (W); Facatativa, alt. 2700 m, 16 Dec. 1876, *E. André* 690, 691 (K); vicinity of Bogotá, alt. 8,500 ft., 1918, *W. Tracey* 245 (K); surroundings of Bogotá, alt. 2000-2500 m, 1921, *H. Hopf* s.n. (holotype of *P. bogotensis* destroyed at B; on rocks near Bogotá, alt. 8,900 ft., *T. Hartweg* s.n. (K, erroneously labelled as the holotype, neotype of *P. bogotensis* here designated: K; Macizo de Bogotá, 25 May 1939, *J. Cuatrecasas* 5005 (AMES, US); Macizo de Bogotá, 25 June 1939, *J. Cuatrecasas* 5619 (AMES, US); Bogotá, macizo de Usaquén, alt. 2600 m, Apr. 1940, *L. Uribe* U. 423 (AMES); near Bogotá, north of Quebrada El Obispo, 10 Jan. 1943, *F.R. Fosberg* 19709 (AMES); Suesca, lithophytic, alt. 8,600 ft., 9 Oct. 1946, *M.B. & R. Foster* 1825 (AMES); lithophytic between Facatativa and San Francisco, alt. 2300 m, 18 May 1952, *M. Schneider* 626 (S). **Tolima:** Toche, alt. 2500 m, 25 May 1942, *K. von Sneidern* 3123 (AMES, S). **Valle del Cauca:** Alto de Las Brisas, alt. 2160 m, 26 Oct. 1944, *Cuatrecasas* 18206 (AMES, S). Without locality, *T. Hartweg* s.n. (K). **Santander:** Páramo San Pedro, alt. 6,000 ft., 3 Mar. 1854, *H. Wagners* 559 (W). **Risaralda:** Santa Rosa de Cabal, Ucumari, alt. 2200 m, 2 Nov. 1992, *A. DeWilde* 378 (MO). **Nariño:** La Laja near Ipiales, alt. 3080 m, 17 June 1876, *E. André* 3480 (K); Sapuyes, Páramo de Gualmatán, alt. 3100-3480 m, 4 Jan. 1964, *L. E. Mora* 2910 (AMES, PSO). Without locality, *J. J. Triana* 565 (holotype of *P. pteroglossa* presumably destroyed at B; lectotype here designated: US).

VENEZUELA: **Bolívar:** Meseta del Jaua, Cerro Jaua, alt. 1800 m, 24 Feb. 1974, *J. A. Steyermark et al.* 109446 (holotype of *P. tepuiensis*: VEN); Cerro Sarissariñama, alt. 700 m, 12-15 Feb. 1974, *J. A. Steyermark et al.* 109105 (AMES, VEN).

COSTA RICA: **Cartago:** Naranjo, 29 Mar. 1853, *H. Wendland* 593 (holotype of *P. naranziensis*: W; isotype: AMES); without locality, ca. 1867, *A. Endres* s.n. (W, and illustr.); Cachi, alt. 4,000 ft., Oct. 1925, *C. H. Lankester* 1059 (AMES); El Muñeco, alt. 4,500 ft., 19 June 1928, *H. E. Stork* 2699 (AMES); hills near Navarro valley, alt. 6,000 ft., 1 May 1928, *H. E. Stork* 1731 (AMES). **Alajuela:** Alfaro Ruiz, Tapescode Zarcero, alt. 1575 m, 12 Sept. 1938, *A. Smith* H-1183 (AMES). **Puntarenas:** lower montane rain forest east of Monteverde on Pacific watershed, alt. 1300-1450 m, 29 Oct. 1975, *W. Burger & R. Baker* 9610 (F). **San José:** La Palma, alt. 1225 m, 10 Nov. 1922, *A. M. Brenes* 112 (AMES); La Palma, alt. 1600 m, 17 Mar. 1924, *P. C. Standley* 38313 (AMES).

PANAMA: **Coclé:** El Valle de Antón, alt. 1000 m, 10 Nov. 1940, *P. H. Allen* 2245 (AMES).

This species and *P. elegans*, both collected by Humboldt and Bonpland, were the first species of the subgenus to be described. The various forms of *P. pulchella* are relatively frequent and widely distributed from Costa Rica (*P. naranziensis*) through the Andes into Peru. The concept is distinguished by the slender stature;

narrow, petiolate leaves; and ramicauls sometimes more or less thickened toward the base with several imbricating sheaths. One or a very few slender racemes about as long as or longer than the leaf are produced from a small, narrow spathe. The small flowers, basically similar to most in the subgenus, are simple with one-veined petals. The lip is three-lobed (type B) with the lateral lobes erect, obtuse and callous. The anterior lobe is obtuse and thickened, and the disc between the lateral lobes is smooth and shallowly concave above the transverse callus above the basal cavity that articulates with the tip of the column-foot. This description of the lip also applies to *P. floribunda* and *P. velaticaulis*.

Vegetatively similar *P. ligulata* grows sympatrically. The latter is distinguished by the three-veined petals and an oblong lip (type A) with variously callous margins at and below the middle.

***Pleurothallis retusiloba* C. Schweinf., Bot. Mus. Leaflet 15: 100, 1951.**

Fig. 53.

Ety.: From the Latin *retusilobus*, "with a retuse lobe," referring to the apex of the lip.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, fasciculate, 9-14 cm long, with a loose, tubular sheath above the middle, and 2-3 loose, tubular, imbricating sheaths about the base including one or more ramicauls. **Leaf** erect, coriaceous, elliptical-oblong, obtuse, petiolate, the blade 6-7 cm long, 2 cm wide, cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, 1-2 simultaneous, more or less secund, densely simultaneously many-flowered racemes, 9-14 cm long including the peduncle ca. 2 cm long, subtended by a spathe 1-1.5 cm long, with an annulus just below the abscission layer; floral bracts 3 mm long; pedicels 1-2 mm long; ovary 1 mm long; **sepals** carinate, glabrous with ciliate margins, the dorsal sepal ovate, obtuse, apiculate, 5 mm long, 2.5 mm wide, 3-veined, the lateral sepals oblong-ovate, oblique, subacute, apiculate, 5 mm long, 1.5 mm wide, connate 1 mm, parallel, 3 mm wide together, each 3-veined; **petals** translucent, oblong-obovate, truncate, 2.25 mm long, 1.25 mm wide, 3-veined; **lip** fleshy, subquadrate-trilobed, 1.25 mm long, 1.5 mm wide expanded, the apical lobe thick, transverse, retuse with broadly rounded angles, the lateral lobes erect, near the middle, triangular, slightly uncinatate, with an intramural callus along the anterior margin, the disc shallowly concave, with a transverse callus above the cavity at the base to accommodate the end of the column-foot; **column** terete, 1 mm long, the foot thick, nearly as long with the tip free, the anther subapical, the rostellum and stigma ventral.

PERU: **Cuzco**: Paucartambo, Pillahuata, epiphytic in rain forest, alt. 3000 m, 12 Dec. 1942, C. Vargas 3030 (Holotype: AMES; Isotype: Herb. Vargas), C. Luer illustr. 15490.

This robust species is known only from the original collection from a rain forest in southeastern Peru. The drawing was made from a flower from the type rehydrated in concentrated ammonia. It differs in some details from the original illustration and description.

Pleurothallis retusiloba is distinguished by the slender habit, the ramicaul with a long, loose sheath above the middle. The many-flowered raceme of small flowers from an inconspicuous spathe slightly exceeds the oblong, petiolate leaf. The sepals are ciliate; the petals are truncate; and the lip is three-lobed. The anterior lobe is broad and retuse. The lateral lobes are erect, slightly uncinatate at the tip with an intramural callus along the anterior margin.

Pleurothallis rhodantha Rchb.f., *Linnaea* 22: 825, 1849.

Fig. 54.

Ety.: From the Greek *rhodanthos*, "reddish flower," referring to the flowers that were described as *gelb, rosa gestreift* (yellow, striped with rose).

Syn.: *Humboldtia rhodantha* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Syn.: *Pleurothallis potamophila* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 27: 53, 1924.

Ety.: From the Greek *potamophilos*, "river-loving," in reference to the habitat.

Syn.: *Pleurothallis procera* Luer & Vásquez, *Phytologia* 49: 214, 1981.

Ety.: From the Latin *procerus*, "tall, slender," referring to the habit.

Plant medium in size to large, epiphytic, densely caespitose; roots numerous, slender. Ramicauls fasciculate, slender, erect, 10-22 cm long, with a tubular sheath near the middle and 2-3 imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, obtuse, the blade 11-15 cm long, 2-3.5 cm wide, cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, 2-3 slender, congested, more or less distichous, simultaneously many-flowered racemes, 15-25 cm long including the slender peduncle ca. 3 cm long, subtended by a slender spathe 1 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts infundibular, 2-2.5 mm long, enclosing the pedicel; pedicels 1-2 mm long; ovary 1-2 mm long; **sepals** yellow-green, more or less veined with red, subcarinate, glabrous, with the margins minutely ciliate, the dorsal sepal elliptical-ovate, subacute to obtuse, 4-6 mm long, 2-3 mm wide, 3-veined, the lateral sepals elliptical-oblong, 4-6 mm long, connate to above the middle, 3-4 mm wide together, each subacute to obtuse, 2-veined; **petals** translucent with the margin purple, elliptical-oblong, obtuse, 3-3.5 mm long, 1-1.5 mm wide, 3-veined; **lip** yellow-green with the margin spotted in purple, ovoid-subtrilobed, 2.5 mm long, 1.5 mm wide unexpanded, the apex obtuse, the sides below the middle slightly dilated and incurved, the disc concave between an erect pair of lunate calli near the middle, the base shortly unguiculate below a transverse cavity on the end, firmly attached to the column-foot; **column** semiterete, stout, 1.5 mm long, the foot thick, 0.5 mm long, the anther, rostellum and stigma subapical.

COLOMBIA: **Santander** (old prov. of Pamplona): La Baja, alt. 9,000 ft., Jan. 1847, *L. Schlim* 1442 (Holotype: W; Isotype: G), *C. Luer* illustr. 16372. **Cauca**: on trees along Río Pasto, alt. 2300 m, Oct. 1921, *W. Hopp* 119 (holotype of *P. potamophila* presumably destroyed at B); above Popayán, alt. 1000-1800 m, Jan. 1886, *F. C. Lehmann* 4502 (neotype of *P. potamophila* here designated: K; isoneotype: AMES), *C. Luer* illustr. 16385.

ECUADOR: **Azuay**: Sayausí, terrestrial, alt. 3000 m, 1 Apr. 1968, *G. Harling*, *G. Storm* & *B. Ström* 7924 (GB); south of Cumbe, alt. 2900-3000 m, 9 June 1979, *B. Løjtnant*, *A. & U. Molau* 14351 (AAU, GB); between Jarata and La Paz, between Cuenca and Loja, alt. 3400 m, 8 Mar. 1985, *G. Harling* & *L. Andersson* 22818 (GB).

BOLIVIA: **Cochabamba**: Chapare, epiphytic in cloud forest along Río Ronco, NE of Cochabamba, alt. 1780 m, 13 Jan. 1981, *C. Luer*, *J. Luer* & *R. Vásquez* 5630 (holotype of *P. procera*: SEL, isotype: K).

This species was described by Reichenbach from a collection by Schlim at La Baja in the eastern Cordillera of Colombia. It is characterized by slender, densely caespitose ramicauls with an oblong, petiolate leaf. The few, elongated inflorescences emerge from an inconspicuous spathe. The sepals are acute and ciliate. The petals are oblong, obtuse and three-veined. The lip is oblong with spots along the rounded apical margin. A pair of prominent, erect, rounded calli are present at the middle of the disc, and a transverse callus is present above the narrow, transverse cavity at the base.

Pleurothallis rhodantha is similar to *P. velaticaulis*, the flowers differing mostly in details of the lip. The lip of *P. rhodantha* is oblong with a pair of erect, central calli. The basal cavity is narrow and transverse. The lip of *P. velaticaulis* is ovate with intramarginal calli, and the basal cavity is more or less rounded.

The description of *P. potamophylla*, collected by Hopp in the department of Cauca in southwestern Colombia, and described by Schlechter, fits *P. rhodantha*. An older, erroneously identified collection by Lehmann from Cauca, also fits this concept. Because Hopp's collection was presumably lost at B, the Lehmann collection at AMES is designated the neotype.

***Pleurothallis rictoria* Rchb.f., Linnaea 61: 14, 1877.**

Fig. 55.

Ety.: Probably derived from the Latin *rictus*, "an open mouth," referring to the flowers.

Plant large, presumably epiphytic. Ramicauls broken off above the base, slender, erect, 17 or more cm long, with a tubular sheath near the middle. **Leaf** erect, coriaceous, elliptical, subacute, 14-18 cm long, 4-4.7 cm wide in the dry state, cuneate below into a slender petiole 1.5-2 cm long. **Inflorescence** racemose, the racemes few, slender, simultaneous, more or less secund, subdensely many-flowered, 5-13 cm long including the peduncle ca. 6 cm long, subtended by a spathe 2-2.5 cm long, from an annulus 5 mm below the abscission layer; floral bracts oblique, 2-2.5 mm long, 5 mm apart, pedicels 2 mm long; ovary 1.5 mm long; **sepals** brown, minutely ciliate, narrowly ovate, acute, carinate, the dorsal sepal concave, 6.5 mm long, 3 mm wide, 3-veined, free from the lateral sepals, the lateral sepals 7 mm long, 1.5 mm wide, 3-veined, barely connate at the base; **petals** translucent, elliptical, acute, 3.3 mm long, 1 mm wide, 1-veined; **lip** ovate to oblong, 2 mm long, 1 mm wide, the apex obtuse, the margins below the middle broadly thickened and suberect with the calli ending on the disc near the middle, the base truncate without an obvious, transverse callus, hinged on the end to a short column-foot; **column** stout, 1.5 mm long, the foot thick, the anther, rostellum and stigma subapical.

COLOMBIA: "Medellín," without specific locality, *J. R. von R. Warszewicz s.n.* (Holotype: W), C. Luer illustr. 16371.

This species is known only from the original collection by Warszewicz probably from somewhere near "Medellín." In habit it is indistinguishable from *P. velaticaulis*. Reichenbach declared that the small flowers were like those of *P. pulchella*, but brown (instead of yellow or white). The sepals are narrowly ovate, acute and minutely ciliate. The petals are elliptical, acute and single-veined. The lip is ovate with obscure, broadly rounded lobes below the middle with broadly thickened margins.

***Pleurothallis salpingantha* Luer & Hirtz, sp. nov.**

Fig. 56.

Ety.: From the Greek *salpinganthos*, "with trumpet-like flowers," referring to the sepaline tube.

Planta grandis dense caespitosa, racemo multifloro folio elliptico sessile longiore, spatha magna, sepalis vivide aureis ad medium in tubum arcuatum connatis, petalis obtusis trinervis, labello ovoideo obtuso disco ad medium bicalloso.

Plant medium in size to large, coarse, epiphytic to terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, stout, erect, 6-32 cm long, with a loose, tubular sheath near the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 7-14 cm long, 2-6 cm wide, cuneate below into a sessile base. **Inflorescence** racemose, 1 to a few, comparatively stout, simultaneous, more or less secund or distichous, densely and simultaneously many-flowered racemes, 12-22 cm long including the peduncle 3-5 cm long, subtended by a spathe 2-4.5 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts tubular, 6-7 mm long, enclosing the pedicel, ovary and lower portion of the flower; pedicels 1.5-2 mm long; ovary 1.5-2 mm long; **sepals** yellow, ciliate, variously short-pubescent above the middle, the dorsal sepal elliptical-obovate, acute to obtuse, concave, 9-11 mm long, 3.5-4.5 mm wide expanded, 3-veined (sometimes with a partial, additional pair), connate to the lateral sepals for 4 mm to form a cylindrical sepaline tube, the lateral sepals oblong-obovate, subacute, 9-10 mm long, 3.5 mm wide, 3-veined, connate 4 mm; **petals** translucent yellow, elliptical-obovate, obtuse, more or less concave, 4-5 mm long, 2.75 mm wide, 3-veined; **lip** yellow, fleshy, ovate to oblong, 2.5-3 mm long, 2 mm wide, the apex obtuse to rounded, the disc broadly shallowly concave and smooth between a pair of low, lunate calli near or below the middle, and with a transverse callus above the narrowly concave base, the base truncate, solidly fixed to the column-foot; **column** stout, 1.5 mm long, the foot thick, 1 mm long with the apex short and thick, the anther, rostellum and stigma subapical.

ECUADOR: **Loja**: near the pass south of Yangana, alt. 2400 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10865* (Holotype: MO); páramo above Saraguro, alt. 3320 m, 26 May 1978, *J. A. Hart 1432* (AMES, NY, US); Nudo de Sabanilla above Yangana, alt. 2600 m, 6 Feb. 1985, *G. Harling & L. Andersson 21683* (AMES); same area, alt. 2500 m, 3 Apr. 1985, *G. Harling & L. Andersson 23604* (AMES, GB); Parque Nacional Podocarpus, east of Nudo de Cajanuma, alt. 2850-2950 m, 21 Feb. 1985, *B. Øllgaard et al. 57818* (AAU, QCA); same locality, alt. 2900-3000 m, 10 Apr. 1989, *J. E. Madsen 85906, 85952* (AAU, QCA). **Carchi**: terrestrial on road embankment east of the pass above Maldonado, alt. 3400 m, 15 Jan. 1992, *C. Luer, J. Luer, A. Jesup & P. Jesup 16044* (MO). **Pichincha**: along the new

road between Quito and Santo Domingo, alt. 3000 m, 28 Oct. 1979, *C. Luer, J. Luer & A. Hirtz 4390* (SEL). **Napo:** Guacamayo Range, alt. 1800 m, 18 Nov. 1984, *A. Hirtz 2107* (MO); Cosanga, alt. 2000 m, May 1984, *A. Hirtz 1778* (MO). **Morona-Santiago:** between Gualaceo and Limón, alt. 2650 m, 16 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11839* (MO). **Napo:** Quijos south of Cosanga, alt. 2120 m, 15 Feb. 1978, *J. H. Kirkbride & H. Chamba 4102* (NY, US); between Baeza and Tena, alt. 2200 m, *C. H. Dodson & T. A. Dodson 16446* (MO). **Loja:** Altos de Numbala, east of Yangana, alt. 2500-2900 m, May 1985, *D. D' Alessandro 410* (MO). **Zamora-Chinchipe:** above Valladolid, alt. 2450 m, 18 Mar. 1984, *C. Luer, S. Dalström, T. Höjjer & J. Kuiji 9570* (MO); Cajanuma range south of Loja, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10735A* (MO); between Yangana and Valladolid, alt. 2600-2700 m, 2-6 Feb. 1985, *G. Harling & L. Andersson 21470, 21683* (AMES, GB); Quebrada Honda, alt. 1450 m, 14 Mar. 1986, *D. D' Alessandro 548* (MO); between Loja and Zamora, alt. 2770 m, 19 Apr. 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3842* (AAU); east of the Loja-Zamora pass, alt. 2750 m, 20 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11970* (MO); same area, alt. 2800 m, 15 Mar. 1989, *J. E. Madsen 85906* (AAU); same area, alt. 2500-3000 m, 25 Mar. 1990, *J. E. Madsen 87084* (AAU, QCA).

COLOMBIA: Norte de Santander: Munic. of Toledo, Alto de Santa Inez, alt. 2250 m, 13 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10335* (MO). **Santander:** cloud forest between Bucaramanga and Berlin, alt. 2600 m, 15 May 1982, *C. Luer & R. Escobar 7878* (SEL). **Quindío:** epiphytic at pass between Salento and Tocha, alt. 3250 m, 10 May 1993, *C. Luer, J. Luer, R. Escobar & A. DeWilde 16751* (MO).

VENEZUELA: Táchira: headwaters of Río Quinimari, below cliffs of La Relumbrante, alt. 2550 m, Feb. 1968, *G.C.K. Dunsterville 1063*.

PERU: Pasco: Oxapampa, alt. 2700 m, 7 Mar. 1986, *H. van der Werff et al. 8572* (MO).

This species is widely distributed in the Andes from the Eastern Cordillera of Colombia into Peru. It is allied to the frequent and variable *P. laevigata*, with which it is sympatric in the southern half of its range. One to a few, long, multi-flowered racemes are produced from a large, foliaceous spathe at the base of a sessile leaf. The flowers are distinguished by the bright yellow color, and deeply connate sepals that form a sepaline tube below the middle. The free portions are about equal in size and shape and recurve only slightly. The broad, three-veined petals and oblong lip are very similar to those of *P. laevigata*. The apex of the lip is broadly rounded or more or less narrowly obtuse, and the pair of lunate calli are present near or below the middle of the disc.

***Pleurothallis scansor* Luer, Phytologia 49: 216, 1981.**

Fig. 57.

Ety.: From the Latin *scansor*, "a climber," referring to the creeping habit.

Plant large, epiphytic to terrestrial, repent, with the rhizome stout, 50 cm long or longer, 2-8 cm long between ramicauls, occasionally branching, enclosed by tubular sheaths; roots numerous along the rhizome. Ramicauls ascending, more or less fasciculate with the rhizome, stout, 5-12 cm long, enclosed by loose, imbricating, tubular sheaths. **Leaf** erect, coriaceous, elliptical-oblong, obtuse, petiolate, the blade 5-12 cm long, 2-4 cm wide, cuneate below into a petiole 1-2 cm long. **Inflorescence** a solitary, densely simultaneously many-flowered raceme, 15-35 cm long including the peduncle 7-10 cm long, subtended by a slender spathe 1.5-2.5 cm long, from an annulus 4-5 mm below the abscission layer; floral bracts infundibular, 4-6 mm long; pedicels 3-4 mm long; ovary 2-3 mm long; **sepals** yellow-orange to yellow-green, glabrous, the dorsal sepal ovate, acute, 7.5 mm long, 3.5 mm wide, 3-veined, the lateral sepals oblong, oblique, subacute, 8 mm long, 2.5 mm wide, connate 3 mm, each 3-veined; **petals** translucent brown, oblong-obovate, obtuse, 4 mm long, 1.5 mm wide, 3-veined; **lip** brown, fleshy, ovoid, trilobed below the middle, 2.5 mm long, 1.5 mm wide, the apical third ovate, obtuse, the lateral lobes erect, broadly rounded, with intramural calli, concave between, the base with a comparatively large cavity below a transverse carina, articulated with the end of the column-foot; **column** stout, 2 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Sucumbios: epiphytic in cloud forest southeast of El Carmelo, alt. 2700 m, 17 May 1981, *C. Luer, J. Luer & A. Hirtz 6259* (Holotype: SEL). **Carchi:** between El Playón de San Francisco and El Carmelo, alt. 3200 m, 12-14 Apr. 1979, *B. Løjtnant, U. Molau & M. Madison 12299, 12439* (AAU, GB); terrestrial in loose humus in remnant of cloud forest north of El Playón, alt. 3100 m, 20 Mar. 1991, *C. Luer, J. Luer & A. Hirtz 15183* (MO); same area, alt. 3100 m, Feb. 1995, *A. Hirtz 6212* (MO).

COLOMBIA: Cauca: Cabeceras del Río Palo, Quebrada de Santo Domingo, alt. 2950-3150 m, 13 Dec. 1944, *J. Cuatrecasas 19264* (AMES). **Nariño:** Alto del Cabano, alt. 3200 m, 4 May 1876, *E. André 2973* (K); near Laguna La Cocha, 25 July 1960, *L. A. Garay 25, 51* (AMES).

This long-scandent species grows in loose humus and among scrubby vegetation at high altitudes in northern Ecuador and Colombia. It is most similar to *P. cuatrecasii*, both of which are characterized by a thick, ascending rhizome. The ramicauls arise irregularly; the leaves are shortly petiolate, and far exceeded by a long, many-flowered raceme subtended by a slender spathe. The yellowish sepals are glabrous; the petals are oblong and three-veined; and the lip is three-lobed, the anterior lobe ovate and obtuse, and the lateral lobes rounded and erect, with intramural calli. The lip of *P. cuatrecasii* is oblong with a pair of central calli.

***Pleurothallis simplicilabia* C. Schweinf., Rev. Acad. Colomb. 5: 350, 1943. Fig. 58.**

Ety.: From the Latin *simplicilabius*, "with a simple lip," referring to an entire lip.

Plant large, epiphytic, probably caespitose; roots slender. Ramicauls erect, 15-18 cm long, with a long, tubular sheath near the middle, and 2-3 tubular, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical-ovate, obtuse, shortly petiolate, the blade 9-10 cm long, 3-4 cm wide, broadly cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, numerous (ca. 13), simultaneous, more or less secund, densely simultaneously many-flowered racemes, 15-25 cm long including the peduncle ca. 3 cm long, subtended by a spathe 1.5 cm long, from an annulus just below the abscission layer; floral bracts 1 mm long; pedicels 1 mm long; ovary 1.25 mm long; **sepals** yellow, carinate, ciliate, the dorsal sepal narrowly ovate, acute, apiculate, 3.75 mm long, 1.5 mm wide, 3-veined, the lateral sepals narrowly ovate, oblique, acute, apiculate, 4 mm long, connate 2 mm, 2.5 mm wide together, each obscurely 2-veined; **petals** translucent, oblong, obtuse, 2.75 mm long, 0.8 mm wide, 3-veined below the middle; **lip** yellow, fleshy, oblong-ovate, 1.75 mm long, 1.25 mm wide, the apex broadly rounded, the disc longitudinally concave between a pair of lunate calli near the middle which grasp the column in the natural position, the base subcordate with a transverse callus above the narrow, basal cavity, firmly articulated with the end of the column-foot; **column** terete, 1.5 mm long, the foot thick, 0.25 mm long with the bulbous tip intimately attached to the basal cavity of the lip, the anther and rostellum subapical, the stigma ventral.

PERU: **Cuzco**: Convención, Hda. Potrero, Sapan-Sachayocc, alt. 2200 m, 5 Mar. 1942, C. Vargas 2543 (Holotype: Herb. Vargas; Isotype: AMES), C. Luer illustr. 15488.

This species is known only from the original collection by Vargas in a dense forest in southeastern Peru. The drawing was made from a flower from an isotype rehydrated in concentrated ammonia. It differs in some details from the original description. Some details of the habit are unknown.

Numerous, slender, simultaneously many-flowered racemes far exceeding the leaf are produced from a relatively small spathe. The small flowers are not unusual in the subgenus except for the oblong lip. The terete column, nearly as long as the lip, lies in the center of the lip and is grasped above its middle by a pair of lunate calli. These calli are unique modifications of the pair commonly seen in this subgenus.

***Pleurothallis siphonantha* Luer, sp. nov.**

Ety.: From the Greek *siphonanthos*, "with tubelike flowers," referring to sepaline tube.

Fig. 59.

Planta grandis dense caespitosa, racemis paucis secundis dense multifloris folio elliptico leviter breviori, spathe magna, sepalis camosis glabris ad medium in tubum connatis, petalis grandis oblongis truncatis trinervis, labello ovoideo obtuso subtruncato disco infra medium bicalloso.

Plant medium large, epiphytic, densely caespitose; roots numerous, slender. Ramicauls stout, fasciculate, erect, 15-28 cm long, enclosed by a close sheath near the middle and 2-3 tubular sheaths at the base. **Leaf** erect, thickly coriaceous, elliptical-oblong, subacute to obtuse, 15-18 cm long, 5-6 cm wide, the base sessile, broadly cuneate. **Inflorescence** 3-6 congested, secund, simultaneously many-flowered racemes 13-15 cm long including the peduncle ca. 3 cm long within the spathe, the spathe 3-4 cm long, 1.2 cm wide, from the base of the leaf; floral bracts 4 mm long, enclosing pedicel; pedicels 3 mm long; ovary 2-3 mm long; **sepals** light yellow, fleshy, glabrous, the dorsal sepal oblong-ovate, obtuse, concave, 7 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 3 mm to form a thick, cylindrical tube,

the lateral sepals oblong, 6 mm long, each 3 mm wide, connate 3 mm, the free portions recurved, obtuse; **petals** proportionately large, translucent white with a pink spot near the apex, broadly oblong-obovate, subtruncate, 5 mm long, 2.5 mm wide, 3-veined; **lip** pale yellow, thick, ovoid, subtruncate, 3 mm long, 1.6 mm wide, the disc broadly concave, with a pair of low, rounded calli below the middle just within the edge, and a low, transverse callus at the base, the base broadly truncate, hinged to the column-foot; **column** red, stout, 1.5 mm long, the apex hooded and minutely serrate, foot thick, less than 1 mm long, the anther, rostellum and stigma ventral.

PERU: **Amazonas**: cloud forest between Leimebamba and Balsas, alt. 3050 m, 25 Aug. 1980, C. Luer, J. Luer, W. & H. Königler & M. Arias 5431 (Holotype: SEL).

This species occurs in northern Peru at an altitude over 3000 meters above sea level. It is distinguished by the long, stout ramicauls, thickly coriaceous, sessile leaves, and a few secund, densely many-flowered racemes nearly as long as the leaf. The sepals are fleshy and connate to near the middle into an arched tube, only the free parts of the laterals more or less decurved. The petals are proportionately large and truncate. The ovoid lip, bearing a pair of calli near the middle, is broadly hinged below a transverse carina to the column-foot. The column is stout with a hooded apex that is minutely serrate.

Pleurothallis spathosa Luer & Escobar, *Orquideología* 20: 86 1996.

Fig. 60.

Ety.: From the Latin *spathosus*, "with a large spathe," referring to the size of the spathe.

Plant large, epiphytic, densely caespitose; roots coarse, numerous. **Ramicauls** fasciculate, stout, erect, 20-30 cm long, with a large, loose tubular sheath near the middle, and 2-3 tubular, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, the blade 12-15 cm long, 3-4.5 cm wide, cuneate below into a sessile base. **Inflorescence** racemose, racemes 1 to 4 simultaneous, more or less secund, densely and simultaneously many-flowered, 12-15 cm long including the peduncle ca. 4 cm long, subtended by a large, conduplicate, foliaceous spathe 4-5.5 cm long, from an annulus at the base of the leaf, 2-3 mm below the abscission layer; floral bracts 3 mm long; pedicels 1.5 mm long; ovary 1.5 mm long; **sepals** yellow, carinate, minutely ciliate, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 4.75 mm long, 3 mm wide unexpanded, 3-veined, the lateral sepals elliptical-oblong, subacute, apiculate, 5 mm long, 1.8 mm wide, 3-veined, connate 2.5 mm; **petals** translucent yellow, oblong-obovate, obtuse, 3 mm long, 1.25 mm wide, 3-veined; **lip** yellow, fleshy, trilobed, 2 mm long, 1 mm wide, the middle lobe ovate, obtuse, the lateral lobes below the middle, erect, obtuse to rounded, each fully occupied by a rounded callous on the inner surface, the disc slightly concave above a tall, transverse callus above the basal cavity, articulated with the end of the column-foot; **column** stout, 1.5 mm long, the foot 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

COLOMBIA: **Santander**: epiphytic in dwarf cloud forest east of Bucaramanga toward Berlin, alt. 3300 m, 7 May 1984, C. Luer, J. Luer, R. Escobar & E. Valencia 10175 (Holotype: MO).

Vegetatively this robust species resembles *P. laevigata* and its relatives; stout ramicauls with long, inflated sheaths; large, sessile leaves; and a very large, foliaceous spathe. The inflorescence, however, is very similar to that of *P. velaticaulis*: small flowers with obtuse floral parts, three-veined petals, and a three-lobed lip with obtuse lateral lobes overlaid by rounded calli. Most distinctive of the lip is the tall, narrow, transverse callus that separates the disc from the basal cavity.

Pleurothallis steliidiopsis Luer, *Phytologia* 49: 218, 1981.

Fig. 61.

Ety.: Named for the fancied resemblance to the genus *Stelis* Sw.

Plant small to medium in size, epiphytic, densely caespitose; roots slender. **Ramicauls** ascending to erect, fasciculate, slender, slightly thickened at the base, 4-10 cm long, with a loose, tubular sheath below the middle and 2-3 other imbricating sheaths at the base. **Leaf** erect, coriaceous, narrowly elliptical, acute, petiolate, 7-11.5 cm long including the petiole, 1-2 cm long, 1-1.2 cm wide, narrowly cuneate below into the slender petiole. **Inflorescence** a solitary, congested, secund, simultaneously many-flowered raceme, 7-18 cm long including the peduncle 3 cm long, subtended by a slender spathe 8-11 mm long, from an annulus 2-3 mm below the abscission layer; floral bracts infundibular, 2 mm long, enclosing the pedicel; pedicels 1 mm long; ovary 1.5 mm long; **sepals** translucent green, suffused with rose,

glabrous, the dorsal sepal broadly elliptical, concave, obtuse, subcarinate, 2.75 mm long, 2 mm wide, 3-veined, the lateral sepals ovate, obtuse, subcarinate, 2.7 mm long, 1.5 mm wide, connate 1.5 mm, 1-veined; petals purple, membranous, oblong, obtuse, 1.75 mm long, 1 mm wide, 1-veined; lip ovoid, rounded at the apex, 2 mm long, 1.5 mm wide, with the sides dilated below the middle and incurved, the disc smooth, concave centrally behind a low carina that is continuous behind the margin around the apex, the base broad, transversely concave on the end, inflexibly articulated to the column-foot; column stout, 1 mm long, the foot thick, 0.25 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Loja: Epiphytic in cloud forest south of Yangana, alt. 2250 m, 11 May 1981, C. Luer, J. Luer & D. D'Alessandro 6169 (Holotype: SEL).

Superficially, this species from southern Ecuador resembles a *Stelis*. The bases of the slender ramicauls are densely fasciculate with imbricating sheaths. The slender, many-flowered raceme exceeds the narrow leaf. The sepals of the tiny flowers are obtuse and concave; the petals are broad and one-veined; and the ovoid lip is concave within a low, U-shaped callus that runs around the apex just within the margin. *Pleurothallis stelidiopsis* is closely related to *P. pachypus* which is distinguished by a subquadrate lip with a pair of intramarginal calli below the apex.

***Pleurothallis taxis* Luer, Selbyana 5: 184, 1979.**

Ety.: From the Greek *taxis* "a row," referring to the second inflorescence.

Fig. 62.

Plant small, epiphytic, caespitose; roots coarse. Ramicauls fasciculate, stout, erect, 2.5-4 cm long, enclosed by a loose, tubular sheath from below the middle and 2-3 loose, imbricating sheaths about the base. Leaf erect, thickly coriaceous, elliptical-oblong, obtuse, the blade 4.5-6 cm long, 2-2.5 cm wide, cuneate below into a petiole 1 cm long. Inflorescence a single, secund, simultaneously many-flowered raceme, 6-7 cm long including the peduncle ca. 1 cm long, subtended by a foliaceous spathe 12-14 mm long; floral bracts inflated, 8 mm long, 8 mm wide expanded, enclosing pedicel, ovary and part of the flower; pedicels 2 mm long; ovary 1.5 mm long; sepals purple, suffused with darker purple along the veins, subcarinate, pubescent within above the middle, the dorsal sepal ovate, acute, concave, 8.5 mm long, 4 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals parallel, ovate, acute, 8 mm long, 2.25 mm wide, 3-veined, connate 3.5 mm; petals translucent, striped in purple, oblong, obtuse, 4.5 mm long, 2.5 mm wide, 3-veined; lip fleshy, subquadrate-cordate, 3 mm long, 3.5 mm wide, the apex broadly obtuse, recurved, the disc concave and smooth between a pair of low, rounded calli above the middle, continuous with the transverse callus above the concave base, the sides below the middle erect and broadly rounded, the base fixed to the column-foot; column stout, 2 mm long, the foot thick, 1 mm long, the anther, rostellum and stigma subapical.

ECUADOR: Loja: epiphytic elfin forest at the pass between Loja and Saraguro, alt. 3000 m, 12 Feb. 1978, C. Luer, J. Luer & M. Portilla 2563 (Holotype: SEL).

This species is apparently rare, known only from the original collection from a high altitude in southern Ecuador. It is the smallest known in the subgenus, but with proportionately large flowers subtended by cucullate floral bracts that engulf the lowermost flowers. Borne from a small, foliaceous spathe, the secund raceme is about as long as the elliptical, petiolate leaf. The sepals are acute and pubescent within; the petals are three-veined; and the lip is subquadrate, similar to that of *P. cassidis* with an obtuse, decurved apex, and a pair of low, rounded calli above the middle. The sides of the lip below the middle are erect and broadly rounded, protruding beyond the base.

***Pleurothallis tunguraguae* Lehm. & Krzl., Bot. Jahrb. Syst. 26: 439, 1899.** Fig. 63.

Ety.: Named for Volcán Tungurahua (as Tunguragua) where the species was discovered.

Syn.: *Pleurothallis tungurahua* var. *minor* Garay, Canad. J. Bot. 34: 255, 1956.

Plant medium to large in size, epiphytic, commonly terrestrial, densely caespitose; roots slender, numerous. Ramicauls fasciculate, slender, erect, 5-40 cm long, with a closely appressed, tubular sheath near the middle, and 2-3 tubular, imbricating sheaths about the thickened base. Leaf erect, coriaceous,

elliptical, acute to subacute, petiolate, the blade 6-20 cm long, 2-4.5 cm wide, cuneate below into a slender petiole 1-3 cm long. **Inflorescence** racemose, with 2-5 simultaneous, distichous, densely and simultaneously many-flowered racemes, 10-13 cm long including the peduncle 1-2 cm long, subtended by a slender spathe 9-16 mm long, from an annulus 3-5 mm below the abscission layer; floral bracts 3 mm long; pedicels 1.5-2 mm long; ovary 1.5 mm long; **sepals** pale yellow to greenish white, sometimes with purple dashes along the veins, subcarinate, minutely ciliate, the dorsal sepal ovate, acute, slightly acuminate, concave, 4.5-5.5 mm long, 2-3 mm wide, 3-veined, the lateral sepals ovate, acute, apiculate, oblique, 4.5-5.5 mm long, 1.5-1.8 mm wide, 3-veined, barely connate at the base; **petals** translucent, narrowly ovate, acute, 3-3.5 mm long, 0.75-1 mm wide, 1-veined; **lip** yellow, fleshy, trilobed, 2 mm long, 1.5 mm wide, the middle lobe ovate, subacute to obtuse, shortly acuminate, thickened, the lateral lobes near the middle, erect, acute, callous on the anterior margins, the disc slightly concave below the middle above a transverse callus above the basal cavity, articulated with the end of the column-foot; **column** stout, 1-1.5 mm long, the foot thick, 0.5-1 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

ECUADOR: **Tungurahua**: epiphytic and terrestrial on the lava fields around Baños by Volcán Tungurahua, alt. 1800-2400 m, no date, *F. C. Lehmann 4504* (Holotype presumably destroyed at B; lectotype here designated: K; Isolectotypes: NY, US); same area, alt. 2200 m, 24 July 1975, *C. Luer, G. Luer & S. Wilhelm 425* (SEL); same area, alt. 2200 m, 17 Mar. 1976, *C. Luer, J. Luer & P. Taylor 880* (SEL). **Carchi**: terrestrial on road cut between Tulcán and Maldonado, alt. 2300 m, 14 Jan. 1992, *C. Luer, J. Luer, A. & P. Jesup 16017* (MO); east of pass above Maldonado, alt. 2500 m, 15 Jan. 1992, *C. Luer, J. Luer, A. & P. Jesup 16043* (MO); same area, alt. 2500 m, Nov. 1991, *S. Hirtz 5628* (MO). **Chimborazo**: between Riobamba and Baños, 24 Apr. 1971, *H. Lugo 1819* (AMES, GB). **Loja**: terrestrial on the road embankment north of Loja, alt. 1700 m, 5 Mar. 1977, *C. Luer, J. Luer & K. Cordoba 1574* (SEL). COLOMBIA: **Valle del Cauca**: Pance, alt. ca. 1800 m, collected by J. Aguirre, cult. at Colomborquí-deas, 26 Mar. 1997, *R. Escobar 8299* (MO). **Putumayo**: Valle de Sibundoy, near Sibundoy, alt. ca. 2200 m, 23 Apr. 1963, *M. L. Bristol 865* (AMES, US), *C. Luer* illustr. 17086; Facatativa, alt. 2400 m, 29 Sept. 1918, *Bro. Ariste-Joseph A194* (holotype of var. *minor*; US; isotype: AMES). PERU: **Huánuco**: between Macara and Chaglia, without alt., 21 Mar. 1959, *F. Woytkowski 5210* (AMES, NY). BOLIVIA: **La Paz**: Nor Yungas, Río Unduavi, alt. 2800 m, 4 Feb. 1980, *C. Luer, J. Luer & R. Vásquez 5128* (SEL).

This species occurs occasionally on the eastern slopes of the Andes, but most frequently on the old lava beds above Baños where the closely related *P. floribunda* is exceedingly abundant. *Pleurothallis tunguraguae* is distinguished by the closely appressed sheaths of the ramicauls, and racemes shorter, about as long as, or a little longer than the leaves. The sepals are acute and slightly acuminate; the petals are narrow, single-veined, and acute; and the callous lateral lobes of the three-lobed lip are erect and acute. Another distinguishing character is the obtuse but often shortly acuminate, anterior lobe of the lip which bears a low, thickened callus.

Pleurothallis Vargasii C.Schweinf., Bot. Mus. Leafl. 10: 192, 1942.

Fig. 64.

Ety.: Named in honor of Dr. C. Vargas C. of Cuzco, Peru, who discovered this species.

Plant large, epiphytic, densely caespitose; roots coarse. Ramicauls erect, stout, 15-28 cm long, with a loose, tubular sheath near the middle, and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, obtuse, sessile-subpetiolate, the blade 10-15 cm long, 3.5-7.5 cm wide, broadly cuneate below into the base. **Inflorescence** few to several, simultaneous, more or less secund, densely simultaneously many-flowered racemes, 10-19 cm long including the peduncle 2-3 cm long, subtended by a conspicuous spathe 2.5-3.5 cm long, with an annulus just below the abscission layer; floral bracts 4-7 mm long; pedicels 3-5 mm long; ovary 2.5-3 mm long; **sepals** fleshy, subcarinate, pubescent within, the dorsal sepal ovate, subacute to obtuse, 6-8 mm long, 3-4.5 mm wide, 3-veined with a faint vein to either side in the type, connate to the lateral sepals for less than 1 mm, the lateral sepals ovate, oblique, subacute, 6-8 mm long, 1.75-2.75 mm wide, 3-veined, connate 2 mm; **petals** translucent, oblong-obovate, subcarinate, obtuse, 3.25 mm long, 1.5 mm wide, 3-veined; **lip** fleshy, oblong-subtrilobed, 2.5-3.5 mm long, 1.75-2 mm wide, the apical lobe thick, broadly rounded, the lateral lobes erect, near the middle, broadly rounded with a rounded, intramural callus on the anterior margin, the disc shallowly concave, with a transverse callus above the concave base, hinged to the back of the end of the column-foot; **column** terete, 1.5-2 mm long, the foot thick, the anther and rostellum subapical, the stigma ventral.

PERU: **Apurimac**: Abancay, forest of Altos de Ampay, alt. 3700 m, June 1938, *C. Vargas 1075* (Holotype: AMES), *C. Luer* illustr. 15489; same area, alt. 3550 m, *C. Vargas 2040* (AMES).
 BOLIVIA: **La Paz**: without locality, ca. 1884, *M. Bang 2564* (NY), *C. Luer* illustr. 17074.

This robust species occurs at a high altitude in southeastern Peru and the adjacent Yungas of Bolivia where it was first collected by Miguel Bang in the nineteenth century. Details lacking from the incomplete Peruvian collections were obtained from the Bolivian collection. In habit, *P. vargasii* is similar to several other stout, caespitose, Andean members of the subgenus. Several simultaneously flowered racemes about as long as the leaf are produced from a conspicuous, foliaceous spathe. The color of the flowers is not stated with either the Bolivian or the Peruvian collections. The sepals, petals and the obscurely three-lobed lip with rounded, intramural calli on the lateral lobes are basically similar to those of the relatives of *P. floribunda* and *P. velaticaulis*.

Pleurothallis vegrandis Luer & Dodson, sp. nov.

Fig. 65.

Ety.: From the Latin *vegrandis*, "not large," referring to the small habit.

Species haec *P. laevigatae* Lindl. affinis, sed statura multiminore, racemo folio anguste oblongo brevior, spatha conspicua, sepalo dorsali oblongo-ovato obtuso trinervo, synsepalo bifurcato obtuso, petalis ellipticis concavis subacutis trinervis, labello subrotundo plano apice leviter retuso differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 3-5 cm long, enclosed by a tubular sheath from below the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, coriaceous, narrowly elliptical-oblong, subacute to obtuse, the blade 4-6 cm long, 0.8-1 cm wide, cuneate below into a petiole 0.5 cm long. **Inflorescence** a solitary (always?) raceme, densely and simultaneously few-flowered, 2.5 cm long to probably longer, subtended by a spathe 1-1.5 cm long, from an annulus adjacent to the abscission layer, floral bracts 3 mm long; pedicels 1.5 mm long; ovary 2 mm long; **sepals** yellow, subcarinate, sparsely minutely ciliate, the dorsal sepal oblong-obovate, obtuse, concave, 7.5 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 1 mm, the lateral sepals oblong, obtuse, 6 mm long, connate 3.5 mm into a bifid lamina, each 3-veined; **petals** translucent, elliptical, concave subacute, 3.5 mm long, 2 mm wide, 3-veined; **lip** yellow, fleshy, suborbicular, 2.2 mm long, 2 mm wide, the apex broadly obtuse to truncate, slightly decurved, producing a retuse appearance, the disc concave, featureless, with an obscure transverse callus above the cordate base, the base fixed to the column-foot; **column** stout, 1 mm long, the foot thick, equally long with the apex short and thick, the anther, rostellum and stigma subapical.

ECUADOR: **Zamora-Chinchi**: south of the pass between Yangana and Valladolid, alt. 2100 m, 24 July 1985, *C. H. Dodson, A. Embree & D. D' Alessandro 16047* (Holotype: MO), *C. Luer* illustr. 17205.

This small species is a dwarf member among the numerous members of the subgenus closely allied to the *P. laevigata*-complex. The leaves are small and oblong borne by ramicauls that superficially do not resemble those typically seen in the subgenus. Although small, the spathe is conspicuous. Unfortunately, the only raceme present on the single specimen appears to have been shortened either from insects, or damage in collection, but possibly not. It is only 2.5 centimeters long and bore five or six flowers.

The dorsal sepal is obovate and three-veined. The obtuse lateral sepals are connate to above the middle. The elliptical petals are proportionately large, membranous and concave. The lip is suborbicular with the apex broadly retuse, and lacking the usual pair of calli.

Pleurothallis velaticaulis Rchb.f., *Linnaea* 22: 824, 1849.

Fig. 66.

Ety.: From the Latin *velaticaulis*, "with covered stem," referring to the imbricating sheaths of the ramicaul.

Syn.: *Pleurothallis velatipes* Rchb.f., *Linnaea* 22: 828, 1849.

Ety.: From the Latin *velatipes*, "with covered foot," referring to the sheaths of the ramicaul.

Syn.: *Pleurothallis crassipes* Lindl., *Folia Orch. Pleurothallis* 29, 1859.

Ety.: From the Latin *crassipes*, "with a thick foot," referring to the stout ramicaul.

Syn.: *Pleurothallis trilineata* Lindl., *Folia Orch. Pleurothallis* 29, 1859.

Ety.: From the Latin *trilineatus*, "three-lined," in reference to the three-veined petals.

Syn.: *Pleurothallis pichincae* Rchb.f., *Linnaea* 12: 47, 1877.

Fig. 67.

Ety.: Named for the Ecuadorian province where the species was discovered.

Syn.: *Humboldtia crassipes* (Lindl.) Kuntze, *Rev. Gen. Pl.* 667, 1891.

Syn.: *Humboldtia trilineata* (Lindl.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Syn.: *Humboldtia velaticaulis* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Syn.: *Humboldtia velatipes* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Plant medium in size to large, epiphytic, densely caespitose; roots slender to coarse. Ramicauls fasciculate, slender, erect, 5-25 cm long, with a closely appressed, tubular sheath near the middle, and 2-3 tubular, imbricating sheaths about the base. Leaf erect, coriaceous, elliptical, acute to subacute or narrowly rounded, the blade 5-16 cm long, 2-4.5 cm wide, cuneate below into a petiole 1-1.5 cm long. **Inflorescence** racemose, racemes 1 to 4 simultaneous, more or less secund, densely and simultaneously many-flowered, 10-33 cm long including the peduncle 2-5 cm long, subtended by a slender spathe 1-2.5 cm long, from an annulus 4-5 mm below the abscission layer; floral bracts 3-5 mm long; pedicels 1.5-2 mm long; ovary 2 mm long; sepals pale yellow, more or less finely lined in purple, carinate, minutely pubescent within, the dorsal sepal ovate, acute to subacute, concave, 5 mm long, 2.5-3 mm wide unexpanded, 3-veined, the lateral sepals ovate, acute to subacute, 5 mm long, 1.5-1.75 mm wide, 3-veined, connate 1.5 mm; petals translucent, marked with purple, elliptical-oblong, obtuse, 2.5-3 mm long, 1-1.5 mm wide, 3-veined; lip yellow, marked with purple, fleshy, trilobed, 1.5-2 mm long, 1-1.5 mm wide, the middle lobe ovate, obtuse to rounded, the lateral lobes below the middle, erect, obtuse to rounded, callous on the anterior margin, the disc slightly concave below the middle above a transverse callus above the basal cavity, articulated with the end of the column-foot; column stout, 1-1.5 mm long, the foot thick, 0.5 mm long with the bulbous tip free, the anther, rostellum and stigma subapical.

VENEZUELA: **Dist. Fed.**: "Caracas," flowered in cultivation at Berlin, Apr. 1848, collected by *Otto*, *s.n.* (Holotype: W); Caracas, "Silla," *L. Schlim* 189 (holotype of *P. crassipes*: K); around Caracas, Oct. 1917, *H. Pittier* 7554 (AMES). **Aragua**: near Colonia Tovar, 1854, *Fendler* 1472 (BR, G, K, W). **Mérida**: in mountains, *Moritz* 1053 (W). Guatopo, alt. ca. 2,000 ft., May 1958, *G.C.K. Dunsterville* 132; Mérida, alt. 7,000 ft., July 1846, *L. Schlim* 1194 (lectotype of *P. velatipes*: W; isolectotypes: BR, LD). COLOMBIA: **Antioquia**: Peque, Vereda de La Tumba, alt. 2500 m, 30 June 1984, *G. Lozano et al.* 3945 (NY); Sonsón, Alto de Buenos Aires, alt. 2000 m, collected by E. Valencia, cult. at Colomborquídeas, 5 May 1993, *C. Luer* 16644 (MO). **Caldas**: Río Cauya near Anserma Vieja, alt. 1500 m, 27 Oct. 1883, *F. C. Lehmann* 3270 (K). **Cauca**: Olaya, alt. 1950 m, 27 Apr. 1876, *E. André* 2926 (K); above Popayán, alt. 1500-1800 m, *F. C. Lehmann* 4508 (K); forests of Ceja, Central Andes of Popayán, alt. 1800-2100 m, *F. C. Lehmann* 7144 (AMES, K, W). **Cundinamarca**: without locality, *J. C. Muñiz* 1688, 1744 (M, US); Boquerón de Chipaque, alt. 2900-3200 m, 15 May 1951, *M. Schneider* 304 (S); Sabana near Suba, Finca San Pedro, alt. 2620-2700 m, 13 Sept. 1961, *J. Cuatrecasas & R. Jaramillo* 25935 (US); Chía, Cerro de La Balvanera, terrestrial, alt. 2800 m, 11 Sept. 1964, *H. García-Barrigo* 18095 (COL, US); Guasca, Páramo de Guasca, terrestrial, alt. 3000 m, 19 Nov. 1971, *H. García-Barrigo* 20214 (COL, US); Alto de San Francisco, alt. 2600 m, 11 May 1984, *C. Luer, J. Luer, R. Escobar* 10251 (MO); Gutiérrez, alt. 2200 m, 15 May 1984, *C. Luer, J. Luer, R. Escobar* 10361 (MO); Mesitas del Colegio, alt. 2600 m, collected by F. Lopez, cult. at Colomborquídeas, 2 Jan. 1993, *R. Escobar* 5156 (MO). **Magdalena**: Sierra de Perijá, Hoya del Río Manaure, San Antonio, alt. 1700 m, 15 Nov. 1959, *J. Cuatrecasas & R. Romero* 25343 (US). **Nariño**: near Túquerres, 16 May 1876, *E. André* 3212 (K). ECUADOR: **Pichincha**: Andes of Quito, Mar. 1864, *W. Jameson s.n.* (holotype of *P. pichincae*: W); Pululahua crater, alt. 2800 m, Oct. 1983, *A. Hirtz* 1305 (MO); west flank of Volcán Illiniza, Cerro Azul, alt. 2800 m, 23 Jan. 1987, *C. Luer, J. Luer & A. Hirtz* 12456 (MO). **Imbabura**: Montaña Mojanda, alt. 2500 m, 4 Jan. 1880, *F. C. Lehmann* 432 (W). PERU: "Vitoz," *McLean s.n.* (K). Without collection data, (hopotype of *P. trilineata*: K).

This species is frequent and variable in its wide distribution through the mountains of South America where it has acquired several names from Venezuela into Peru. In the Greater Antilles *P. domingensis* had been identified as *P. velaticaulis* until Cogniaux made the distinction in 1909.

Pleurothallis velaticaulis is related to *P. floribunda* and *P. pulchella*, with which it shares very similar flowers, especially very similar lips. *Pleurothallis floribunda* is characterized by the broader leaf and several, simultaneous racemes half or less as long as the leaf. *Pleurothallis pulchella* is distinguished by the smaller, more slender habit with narrow leaf. The petals of *P. velaticaulis* are three-veined while the petals of the other two are one-veined.

Pleurothallis velaticaulis is distinguished by densely caespitose ramicauls that are noticeably longer than the elliptical, petiolate leaves. From a slender spathe below the abscission layer one or a very few, simultaneous, more or less secund racemes, as long as or longer than the leaf, are produced. The flowers are small, yellow-green to pale yellow or white, but variously minutely marked or striped with purple, especially on the petals and lip. The flowers often emit an odor disagreeable to humans.

The specimens cited by Schweinfurth for this species in the *Orchids of Peru* are a mixture of several, different taxa including *P. floribunda*, and *P. virgata* as the superposed specimens.

***Pleurothallis verbiformis* Luer, Selbyana 2: 389, 1978.**

Fig. 68.

Ety.: From the Latin *verbiformis*, "like a lash or whip," referring to the long, slender inflorescence.

Plant medium to large in size, epiphytic, densely caespitose; ramicauls fasciculate, slender, erect, 6-14 cm long, mostly concealed by a tubular sheath and 2-3 basal sheaths. **Leaf** coriaceous, narrowly elliptical-linear, subacute to obtuse, 7-17 cm long, 1.2-2 cm wide, narrowly cuneate below into an indistinct petiole 1-1.5 cm long. **Inflorescence** a slender, secund, densely and simultaneously many-flowered raceme of small flowers, 15-35 cm long including the peduncle 6-10 cm long; spathe slender, 1-2 cm long; floral bracts tubular, sometimes prominent, 2-4 mm long, enclosing pedicel and ovary; pedicels 0.5-1 mm long; ovary 1 mm long; sepals yellowish white to greenish white, minutely ciliate, elliptical, obtuse, connate 2-3 mm into a cylindrical tube, the dorsal sepal 5-7.5 mm long, 1.8-2 mm wide, 3-veined, the lateral sepals 5-7 mm long, 1.5-2 mm wide, 3-veined; **petals** translucent, broadly ovate or suborbicular, obtuse, 1.2-1.6 mm long, 1-1.5 mm wide, 1- to faintly 3-veined; **lip** yellow, elliptical-ovate, obtuse, 2-2.25 mm long, 1.25-1.5 mm wide, with the sides suberect below the middle, the disc with a rounded callus within each margin above the middle, slightly concave above a transverse callus above a narrow, basal cavity, connected to a rudimentary column-foot; **column** stout, 1-1.5 mm long, the anther and stigma subapical.

ECUADOR: Without locality, collected by Janet Kuhn, 1973, cult. by J & L Orchids, 12 Jan. 1977, *C. Luer* 1297 (Holotype: SEL); without locality, collected by F L Stevenson, cult. in Chamblee, GA, 5 Dec. 1977, *C. Luer* 2253 (SEL). **Chimborazo**: Pallatanga, alt. ca. 1500 m, cult. in Chamblee, GA, 21 Dec. 1989, *C. Luer* 18482 (MO). **Loja**: terrestrial in a forested valley near El Cisne, alt. 2350 m, 28 Feb. 1986, *C. Luer, J. Luer, & A. Embree* 12036 (MO); terrestrial on road-cut in semi-arid terrain between Cariamanga and Amaluza, alt. 2500 m, 20 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt* 9631 (MO); cloud forest remnant along the new road from Santa Rosa to Loja, alt. 2000 m, 20 Mar. 1985, *C. Luer, J. Luer A. Hirtz & W. Flores* 10694 (MO).
PERU: **Cajamarca**: Santa Cruz, Catache, upper Río Zaña valley above Monte Seco, alt. 1500-2000 m, 16 Mar. 1986, *M. O. Dillon et al.* 4362 (F), *C. Luer* illustr. 18543.

This species is found occasionally in southern Ecuador and northern Peru. In habit it resembles a large form of the widely distributed *P. deregularis* (Barb.Rodr.) Luer of subgenus *Pleurothallis*. It is distinguished from the latter by a longer, narrowly elliptical leaf, and a solitary, much longer inflorescence. The floral bracts sometimes cause the rachis to appear saw-toothed. The flowers are more or less cylindrical with minutely ciliate sepals that are connate to about the middle. The

petals are membranous, suborbicular and 1- or faintly 3-veined. Although much smaller, the ovate lip with the pair of calli near the middle is very similar to that of *P. ligulata* and its numerous relatives. The base is narrowly concave below a transverse callus.

***Pleurothallis virgata* Luer, sp. nov.**

Ety.: From the Latin *virgatus*, "twiggy," referring to the branching habit.

Fig. 69.

Inter species subgeneris *Crocodelanthidis* ramicaulibus superpositis, racemis paucis parvifloris folio elliptico plus minusve aequilongis, sepalis carnosis subacutis, labello parvo trilobato, lobis crassicallosis distinguitur.

Plant large, coarse, terrestrial, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, superposed, stout to slender, erect, 10-32 cm long below to 3-10 cm long above, with a long, tubular sheath near the middle and several, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, subacute to obtuse, the blade up to 14 cm long and 3 cm wide below to 4 cm long and 1.5 cm wide above, cuneate below into a petiole ca. 1 cm long. **Inflorescence** racemose, 1-3 slender, simultaneous, more or less secund, densely and simultaneously many-flowered racemes, 7-15 cm long including the peduncle 1-2 cm long, subtended by a spathe 8-12 mm long, from an annulus 8-9 mm below the abscission layer; floral bracts infundibular, imbricating, 3-4 mm long, enclosing pedicel; pedicels 2-3 mm long; ovary 2 mm long; **sepals** yellow-green, fleshy, subcarinate, minutely ciliate, pubescent within, the dorsal sepal elliptical-ovate, subacute to obtuse, concave, 4.5-6 mm long, 2-3.25 mm wide, 3-veined, connate to the lateral sepals at the base, the lateral sepals oblong-ovate, subacute to obtuse, 4.25-6 mm long, 3-4 mm wide together, 3-veined, connate 2-2.5 mm to near the middle; **petals** translucent, elliptical-obovate, obtuse, lightly concave, 2-3 mm long, 1.2-1.75 mm wide, 1-veined (sometimes with 2 faint, accessory veins); **lip** yellow-green, fleshy, ovate-trilobed, 1.75-2 mm long, 1 mm wide, the apical lobe thickened, rounded, the lateral lobes erect, rounded, with a thick, prominent intramural callus on the anterior margin, the disc shallowly concave above a transverse callus, the base deeply concave below the transverse callus, articulated with the bulbous tip of the column-foot; **column** stout, 1 mm long, the foot thick, with the apex short, thick, with the apex free, the anther, rostellum and stigma ventral.

PERU: **Cajamarca**: Chota, between Huámbos and Cochabamba, alt. 2240 m, 16 Apr. 1988, *C. Díaz & S. Baldeón 2794* (Holotype: MO; Isotype: NY), *C. Luer* illustr. 17075; terrestrial between Cajamarca and Pacasmayo, below Paso Gavilán, alt. 2900 m, 27 Jan. 1985, *J. Sánchez V. 3664A* (CPUN, F); between Cajamarca and Celendín, alt. 2950-3500 m, 18 Oct. 1986, *C. Díaz S. 2162* (F, MO); Cutervo, Laguña, road to Cochabamba, alt. 1800 m, 26 Feb. 1985, *S. Llatas Q. 1180* (F); San Miguel, Cerro Lanchez, Niepos, alt. 2400 m, 18 Feb. 1992, *S. Llatas Q. 3089* (F, MO), *C. Luer* illustr. 18541. **Huancabamba**: above Huancabamba, road to Piura, alt. 2750 m, 10 Oct. 1957, *P. C. Huchison 1599* (AMES, F, NY, UC). **Huánuco**: terrestrial near Huánuco, 31 Aug. 1985, *D. Bennett & A. Bennett 3520* (MO). **La Libertad**: Sánchez Carrión, in dry scrub, NW of Huámachuco, alt. 3200-3500 m, 8 Jan. 1983, *U. Molau, M. Dillon & P. Matekaitis 432* (GB, S), *C. Luer* illustr. 17104.

This robust, terrestrial species is apparently endemic in central Peru where it is apparently frequent. It was identified by Schweinfurth as *P. velaticaulis*. In the subgenus it is distinguished by the prolific habit of the ramicauls. The lower ramicauls are stout, fasciculate, and elongate before they produce one to three more but shorter ramicauls at the apex that are also prolific. Dense, branching, shrublike plants are produced, much like *Myoxanthus frutex* (Schltr.) Luer. Numerous, congested racemes are about as long as the leaf. The flowers are small with fleshy sepals and a proportionately small, trilobed lip with large, rounded intramural calli.

Pleurothallis weddelliana Rchb.f., *Xenia Orchid.* 3: 24, 1878.

Fig. 70.

Ety.: Named in honor of H.A. Weddell, French botanical explorer in Bolivia between 1846 and 1851.

Syn.: *Humboldtia weddelliana* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 668, 1891.

Plant medium in size, epiphytic, densely caespitose; roots coarse. Ramicauls fasciculate, stout, erect, 6-10 cm long, enclosed by a loose, tubular sheath from below the middle and 2-3 loose, imbricating sheaths about the base. **Leaf** erect, thickly coriaceous, elliptical-oblong, obtuse, the blade 7-10 cm long, 2-2.5 cm wide, cuneate below into a subpetiolate base. **Inflorescence** 1-3 simultaneous, distichous, densely and simultaneously many-flowered racemes, 7-11 cm long including the peduncle 1.5-2 cm long, subtended by a broad, foliaceous spathe 1.5-2.5 cm long, from an annulus adjacent to the abscission layer; floral bracts inflated, 4-5 mm long, enclosing pedicel and ovary; pedicels 3 mm long; ovary 2 mm long; **sepals** subcarinate, ciliate, short-pubescent within above the middle, the dorsal sepal elliptical-ovate, obtuse, concave, cucullate, 7.5 mm long, 4.5 mm wide, 3-veined, connate to the lateral sepals for 2 mm, the lateral sepals parallel, acutely deflexed near the middle, oblong, obtuse, 6 mm long, 2.5 mm wide, 3-veined, connate 1.5 mm; **petals** translucent, elliptical-obovate, obtuse, 4 mm long, 2.5 mm wide, 3-veined; **lip** fleshy, oblong, 3 mm long, 2.5 mm wide, the apex broadly obtuse or rounded, the disc concave and smooth between a pair of low, rounded calli near the middle, continuous with the transverse callus above the concave base, the base fixed to the column-foot; **column** stout, 1.5 mm long, the foot thick, less than 1 mm long, the anther, rostellum and stigma subapical.

BOLIVIA: **La Paz**: Larecacha vicinity of Sorata, Monte Chilieca, Lancha de Cochipata, Mt. Illanapi, alt. 3300 m, May 1860, *Mandon 1128* (Holotype: W; Isotype: AMES, NY), C, Luer illustr. 16373.

This species is widely distributed in the Andes from southern Ecuador into Bolivia where it was first collected by Mandon. It is very closely related to *P. cassidis*, but vegetatively, the two species are readily distinguishable. Instead of large, broadly elliptical leaves borne by stout ramicauls, the leaf of *P. weddelliana* is much smaller, narrowly elliptical, and borne by a smaller, more slender ramicaul. Both species produce a large foliaceous bract from the subpetiolate base of the leaf from which a large number of simultaneous racemes are borne in *P. cassidis*, and only one to three are borne in *P. weddelliana*.

Pleurothallis xiphizusa (Rchb.f. & Warsz.) Rchb.f., *Ann. Bot. Syst.* 6: 172, 1861.Bas.: *Crocodelanthé xiphizusa* Rchb.f. & Warsz., *Bonplandia* 2: 114, 1854. Fig. 71.Ety.: Named for the similarity of the plant to the genus *Xiphizusa* Rchb.f. in the Bulbophyllinae. *Xiphizusa* from the Greek *xiphizein*, "to dance with arms extended," in allusion to the appearance of the flower.Syn.: *Pleurothallis crocodelanthé* Lindl., *Folia Orch. Pleurothallis* 4, 1859.Ety.: From the Greek *krokodelanthos*, "a crocodile-flower," in allusion to the appearance of the flower.Syn.: *Humboldtia xiphizusae* (Rchb.f.) Kuntze, *Rev. Gen. Pl.* 666, 1891.

Plant medium in size to large, epiphytic, densely caespitose; roots coarse, numerous. Ramicauls fasciculate, stout, erect, 9-12 cm long, with a loose, tubular sheath near the middle, and 2-3 loose, tubular, imbricating sheaths about the base. **Leaf** erect, coriaceous, elliptical, acute to subacute, subpetiolate, the blade 10-14 cm long, 2-3 cm wide, cuneate below into the base. **Inflorescence** a second, densely and simultaneously many-flowered raceme 15-23 cm long including the peduncle 8-10 cm long, subtended by a spathe 2.5-3.5 cm long, from an annulus 2-3 mm below the abscission layer; floral bracts inflated, cucullate, obtuse, 10-12 mm long, enclosing the pedicel, ovary and base of the flower; pedicels 3-4 mm long; ovary 3-4 mm long; **sepals** yellow, sometimes suffused with brown, subcarinate, glabrous, the dorsal sepal ovate, acute, 17 mm long, 6 mm wide, 5-veined, the lateral sepals connate into an ovate lamina, 17 mm long, 8 mm wide, 10-veined, the apex subacute, shortly bifid; **petals** translucent, with a few purple-brown spots, broadly elliptical-obovate, 7 mm long, 4.75 mm wide, 3-veined, the apex broadly rounded; **lip** yellow, with a few purple-brown spots, suborbicular, slightly concave, 4.5 mm long, 4.5 mm wide, the apex broadly rounded, the disc with a transverse callus above the basal cavity, firmly attached to the end of the column-foot; **column** stout, 4 mm long, the foot thick, 1 mm long, the anther subapical, the rostellum and stigma ventral.

PERU: source of the Río Marañón, *J. R. von Warszewicz s.n.* (Holotype: W; Isotype: K). **Piura**: above Canchoque before Cima, terrestrial on wind-blown slopes, alt. 3200 m, 21 Feb. 1988, *D. Bennett, A. Bennett & G. Bennett 4258* (MO).

ECUADOR: **Carchi**: Páramo El Angel, between Tulcán and Maldonado, alt. 1600 m, 1 Aug. 1985, *C. H. Dodson & A. Embree 16140* (MO); terrestrial on the road embankment to Maldonado from Tulcán, alt. 3250 m, 14 Jan. 1992, *C. Luer, J. Luer, P. Jesup & A. Jesup 15998* (MO).

This infrequent species was first collected in northern Peru nearly a century and a half ago by Warszewicz, and recently by David Bennett. It also has been found recently as far as northernmost Ecuador growing on a road embankment. It is characterized by the robust stature with inflated sheaths about the fascicled ramicauls. The stout, secund racemes of elongated flowers emerge from a large spathe at the base of the subpetiolate leaf. The base of each flower is contained within a large, inflated floral bract. The sepals, the longest of the subgenus, are multi-veined. The petals and the lip are broadly obovate with rounded apices. The lip possesses only the transverse callus above the concavity at the base.

***Pleurothallis zunagensis* Luer & Hirtz, sp. nov.**

Fig. 72.

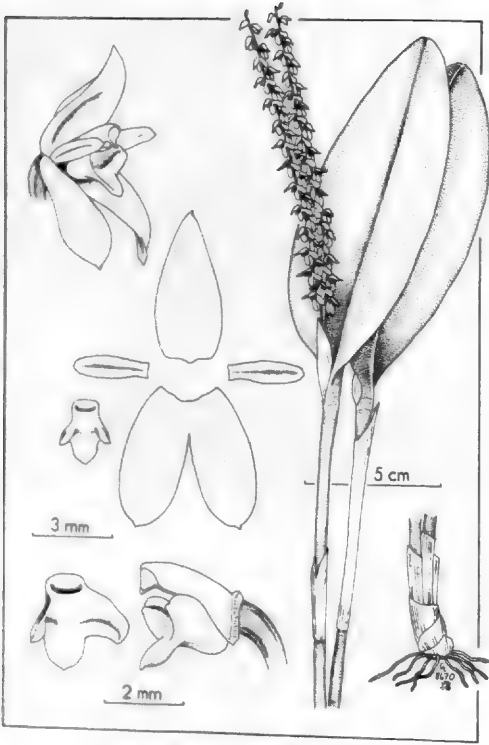
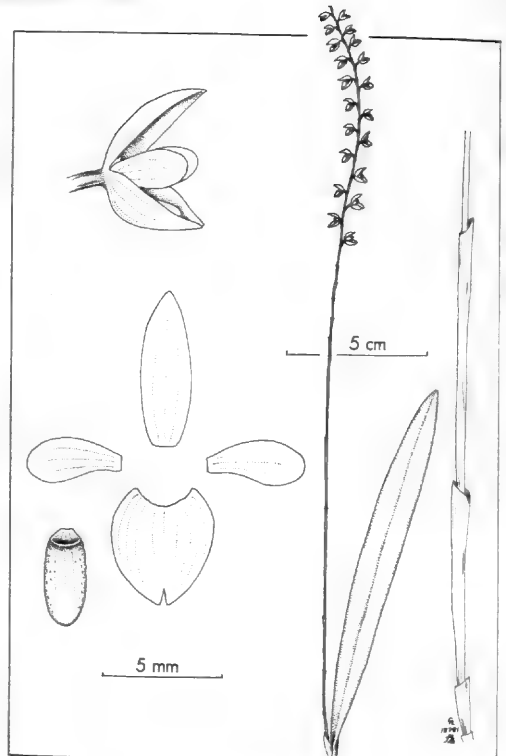
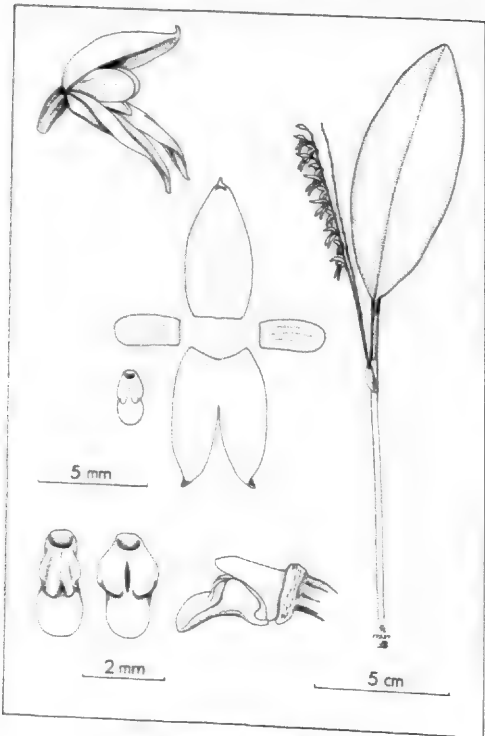
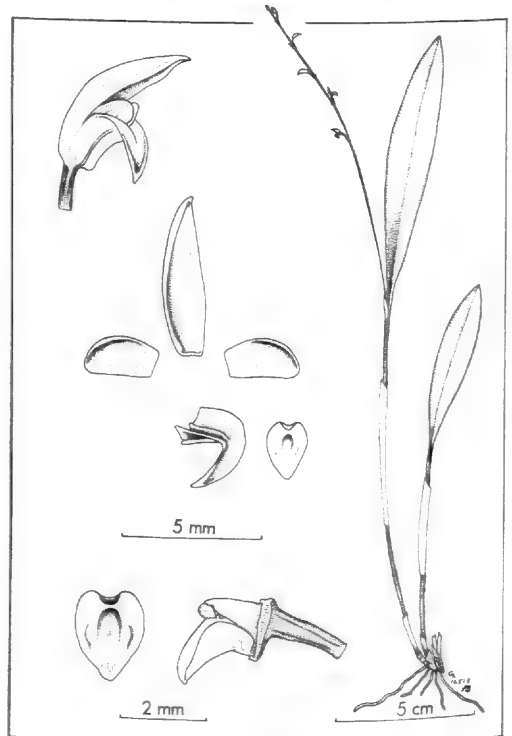
Ety.: Named for the remote Río Zuñag where this species was discovered.

Species haec *P. velaticaulis* Rchb.f. affinis, sed racemis folio brevioribus, labello quam columna multiminore cum lobo antico convexo et cum cavitate basali minutissima differt.

Plant medium to large in size, epiphytic, caespitose; roots numerous, slender. Ramicauls fasciculate, erect, 12-17 cm long, enclosed by a long, tubular sheath above the middle and 2-3 other tubular sheaths about the base. **Leaf** erect, coriaceous, elliptical, subacute, petiolate, 10-12 cm long, 3-3.3 cm wide, the base cuneate into a petiole 1 cm long. **Inflorescence** 1-3 subdense, secund, simultaneously many-flowered racemes, 11-12 cm long including the peduncle 2-5 cm long, subtended by a slender spathe ca. 1 cm long, from an annulus 1 cm below the abscission layer; floral bracts infundibular, 3-4 mm long, enclosing pedicel; pedicels 2 mm long; ovary 2 mm long; **sepals** yellow, ovate, carinate, subacute, concave below the middle, convex with revolute sides above the middle, sparsely short-ciliate, the dorsal 5.5 mm long, 2.5 mm wide, the lateral sepals 5.5 mm long, 1.5 mm wide, connate 1.5 mm; **petals** yellow, obovate, obtuse, 2.5 mm long, 1.25 mm wide, 3-veined; **lip** yellow, thick, ovate-trilobed, 1.25 mm long, 0.9 mm wide, the apex rounded, convex, cellular-glandular, the lateral lobes below the middle, erect, rounded, callous-thickened, the disc concave between the lobes, and with a broad, transverse callus above the minutely concave base, articulated to the tip of the column-foot; **column** stout, 1 mm long, the foot thick, 1 mm long with the apex free, the anther, rostellum and stigma subapical.

ECUADOR: **Pastaza**: epiphytic in cloud forest along Río Zuñag, alt. 2400 m, 28 Feb. 1990, *A. Hirtz, S. Dalström et al. 4628* (Holotype: MO), *C. Luer* illustr. 14937.

This species is similar to *P. velaticaulis*, but differs in the long, tubular, cauline sheath above the middle, shorter racemes, flowers with the sides of the sepals markedly revolute, and the most distinctive lip. The lip is smaller than the short, thick column, and articulated to the tip of the free base of the column by a very small, superficial, basal cavity. The apical lobe is convex with a callus. The lobes near the middle are erect and rounded with the anterior margin thickened. Below the middle the disc is concave.

Fig. 1. *Pleurothallis aligera*Fig. 2. *Pleurothallis aloisii*Fig. 3. *Pleurothallis apposita*Fig. 4. *Pleurothallis atwoodii*

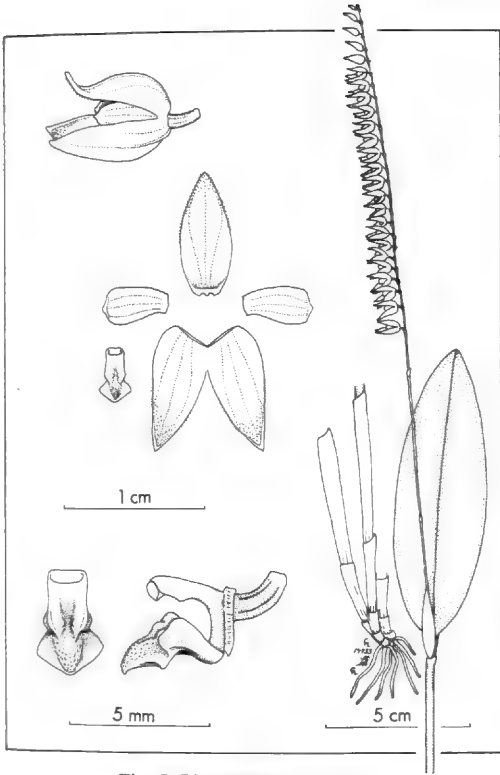


Fig. 5. *Pleurothallis avirostris*

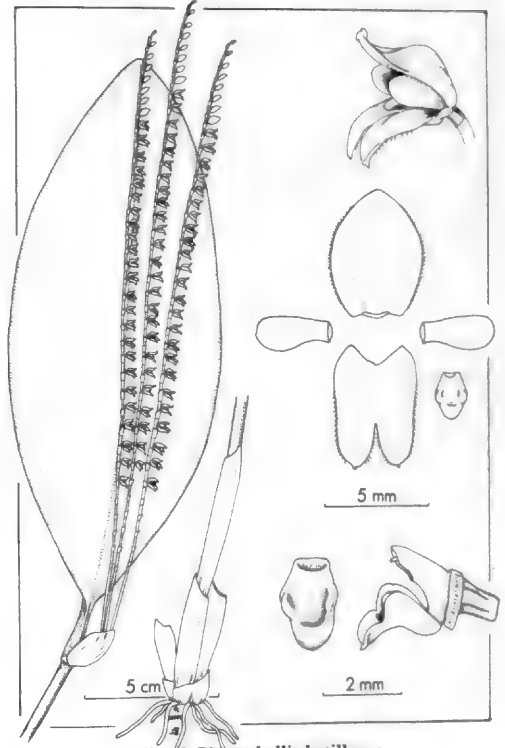


Fig. 6. *Pleurothallis batillacea*

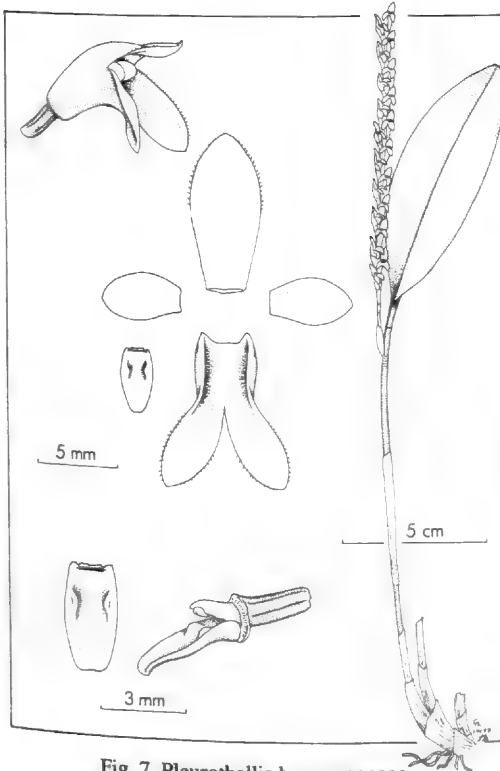


Fig. 7. *Pleurothallis buccaramangae*

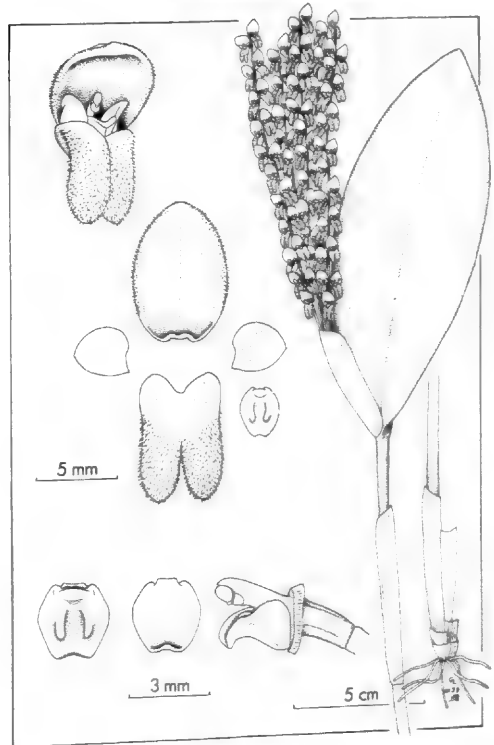
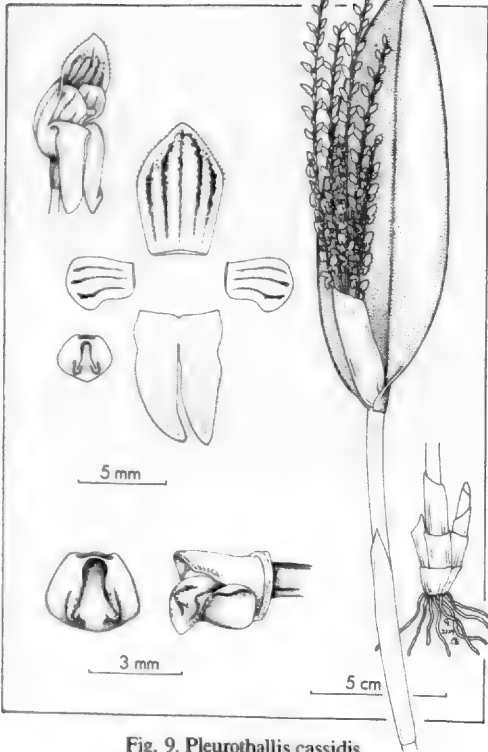
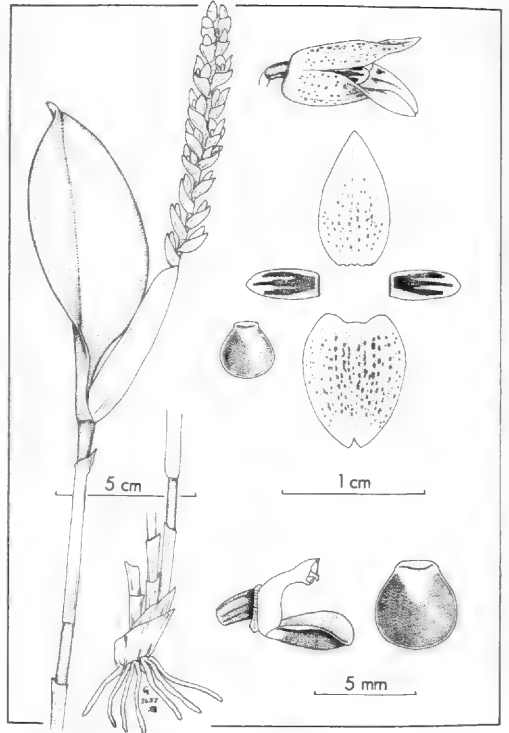
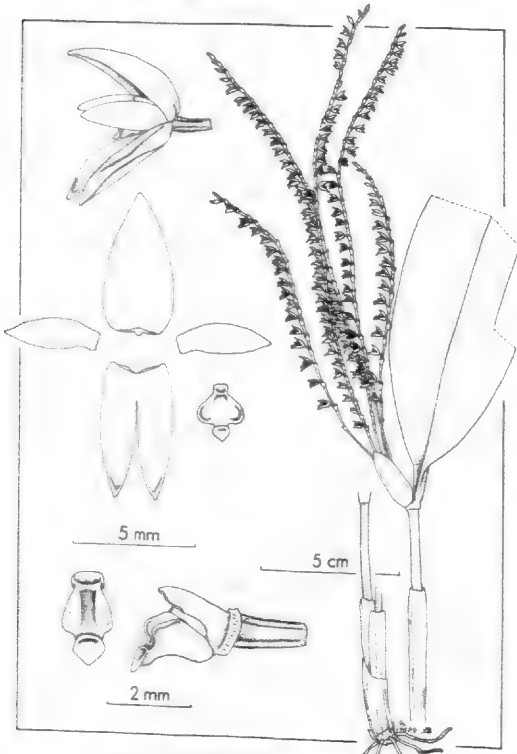
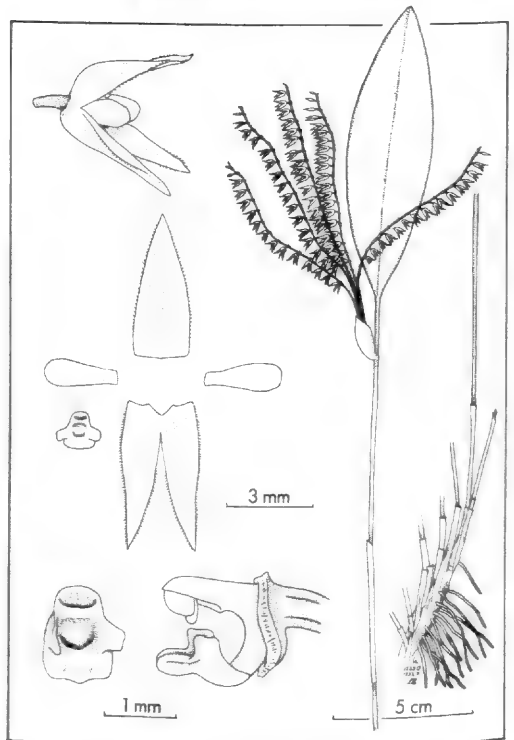


Fig. 8. *Pleurothallis cassidis*

Fig. 9. *Pleurothallis cassidis*Fig. 10. *Pleurothallis cauliflora*Fig. 11. *Pleurothallis choerorhyncha*Fig. 12. *Pleurothallis cosangae*

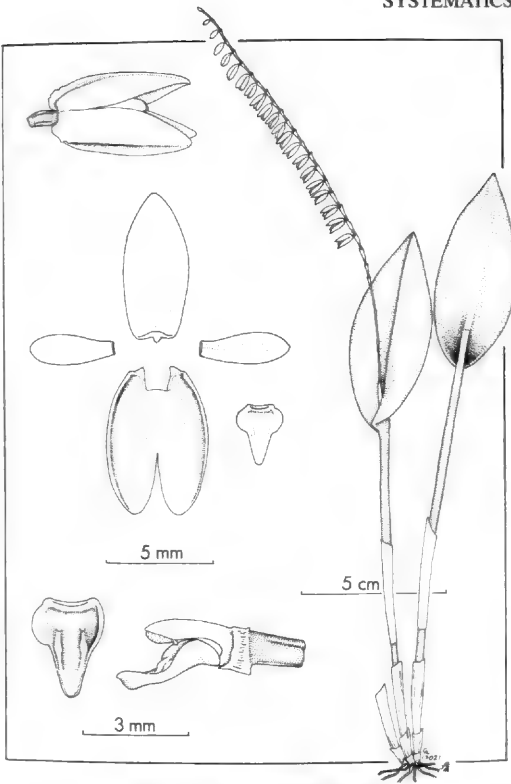


Fig. 13. *Pleurothallis croatii*

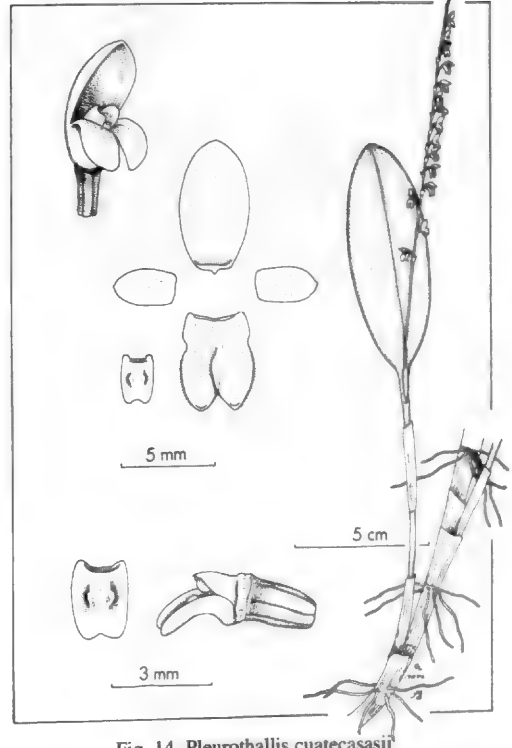


Fig. 14. *Pleurothallis cuatrecasasi*

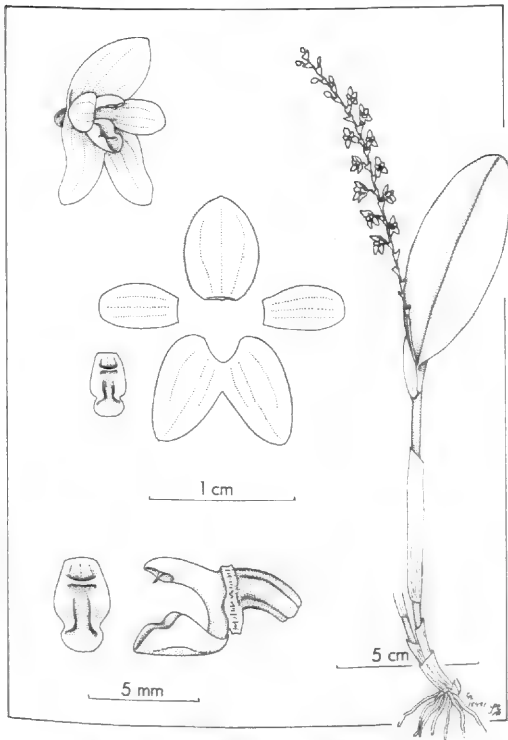


Fig. 15. *Pleurothallis cyathiflora*

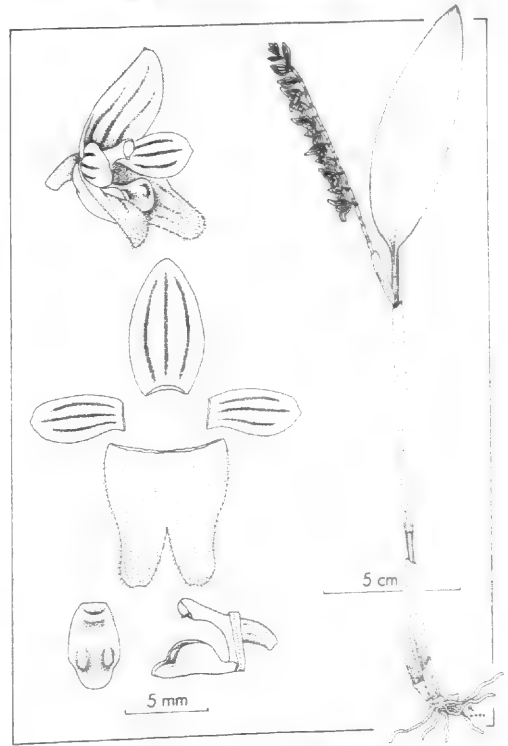
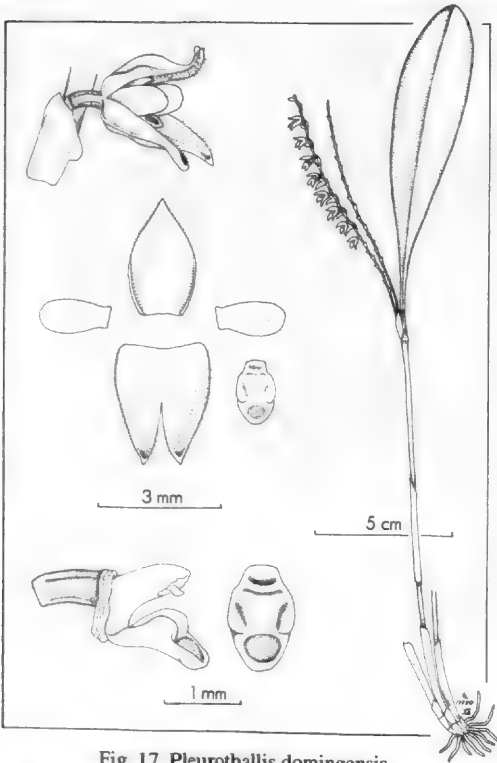
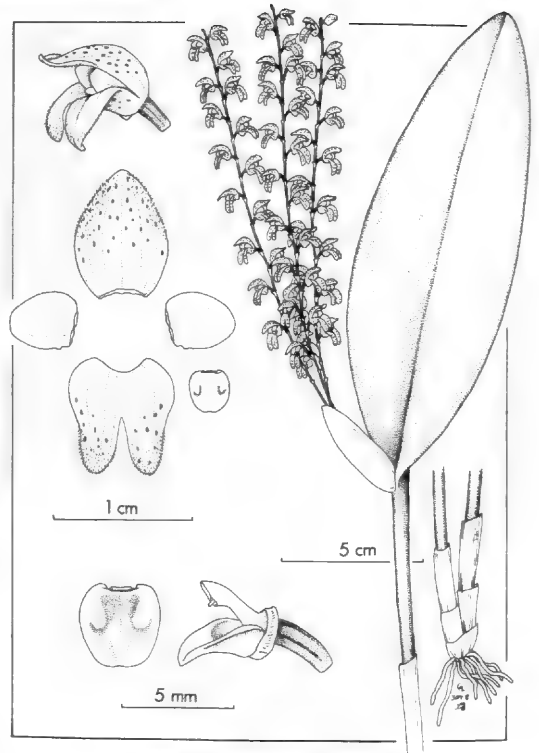
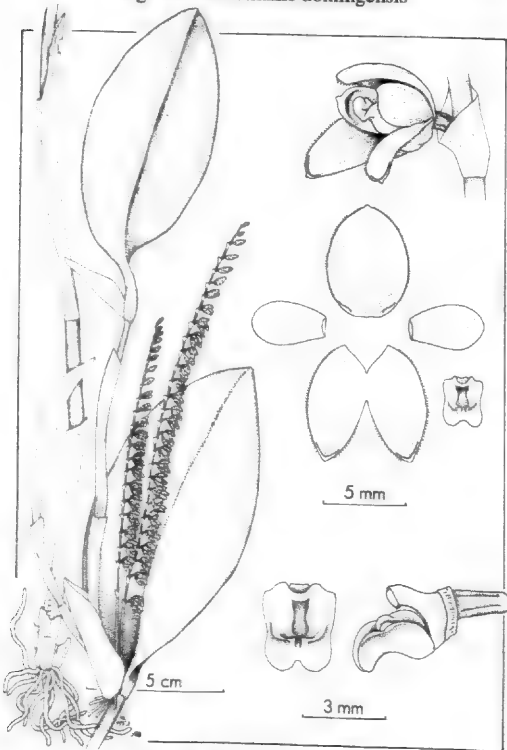
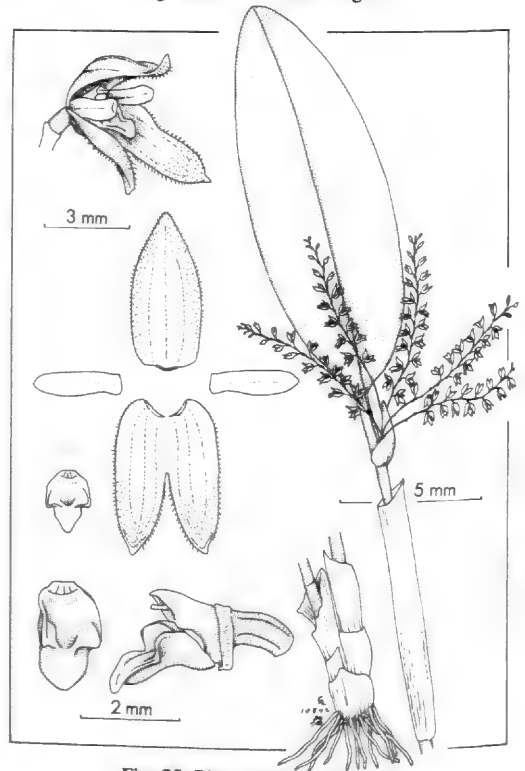


Fig. 16. *Pleurothallis cyathiflora*
(*Pleurothallis cochabambae*)

Fig. 17. *Pleurothallis domingensis*Fig. 18. *Pleurothallis elegans*Fig. 19. *Pleurothallis expansa*Fig. 20. *Pleurothallis floribunda*

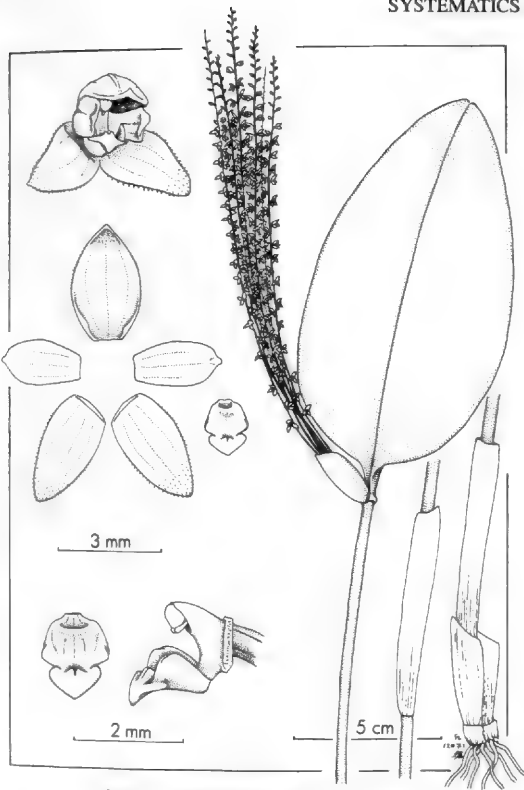


Fig. 21. *Pleurothallis fons-florum*

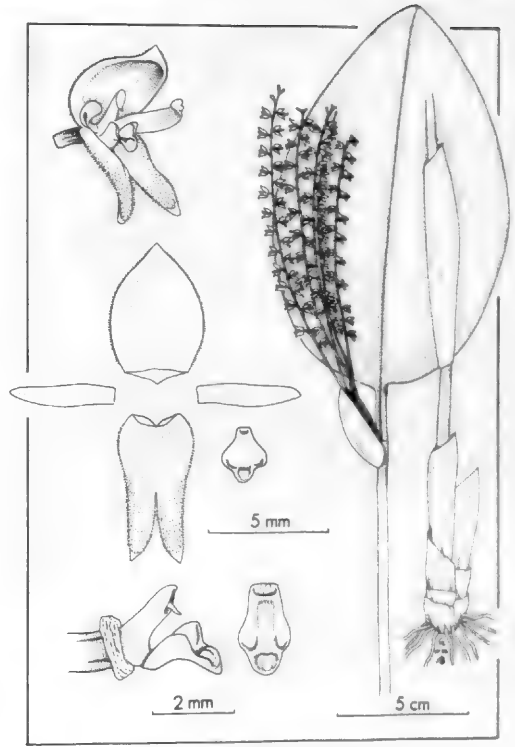


Fig. 22. *Pleurothallis galeata*

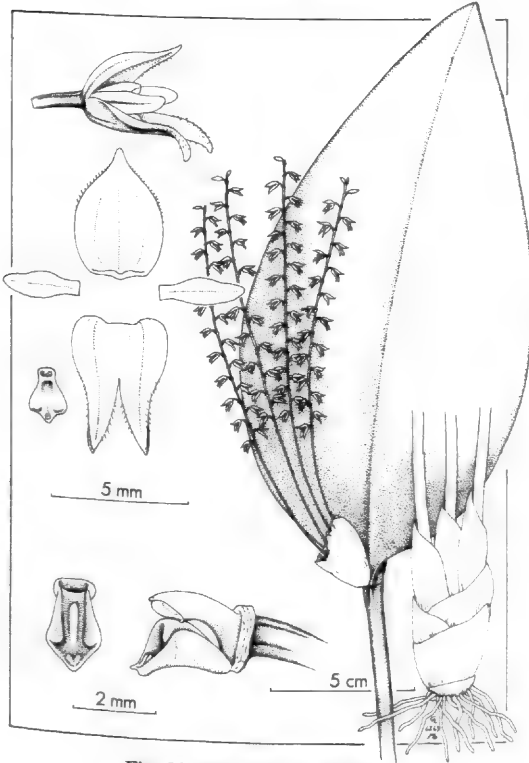


Fig. 23. *Pleurothallis galeata*
(*Pleurothallis quinquecallosa*)

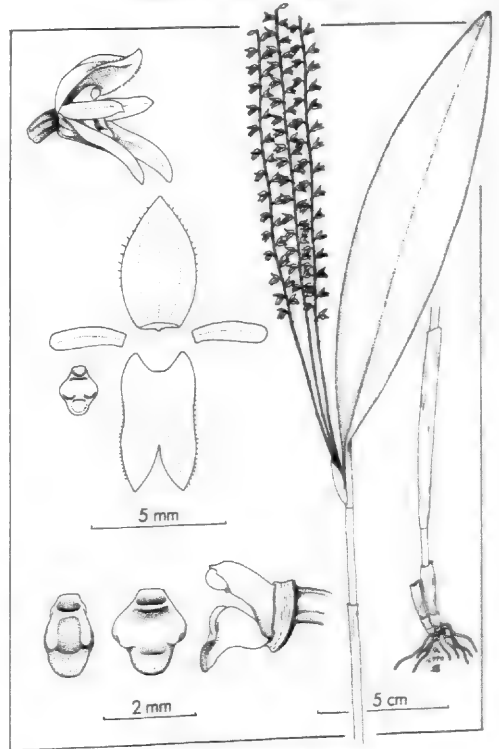
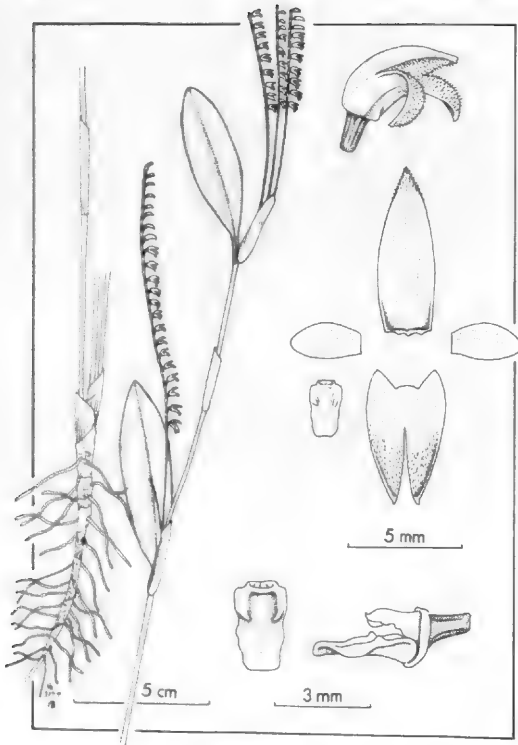
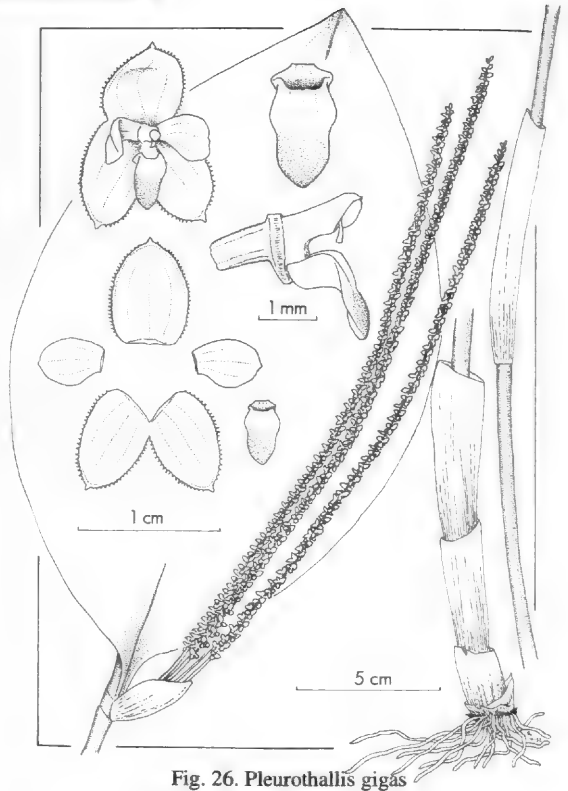
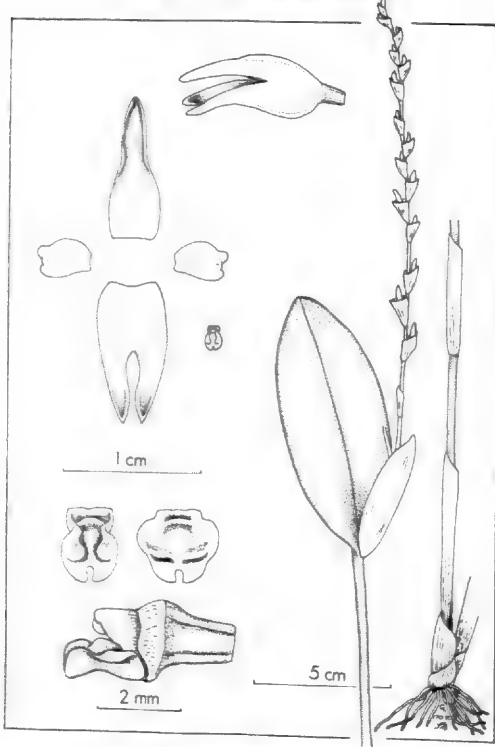
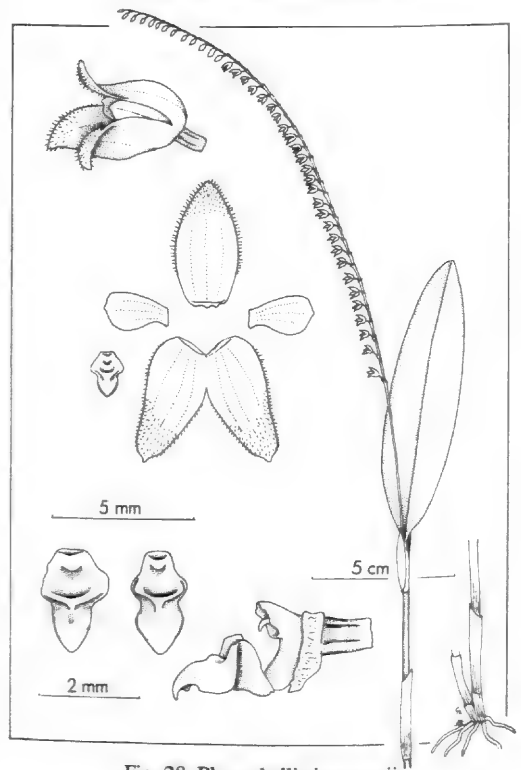


Fig. 24. *Pleurothallis galeata*
(*Pleurothallis trianae-venosa*)

Fig. 25. *Pleurothallis galerasensis*Fig. 26. *Pleurothallis gigas*Fig. 27. *Pleurothallis infundibulosa*Fig. 28. *Pleurothallis jamesonii*

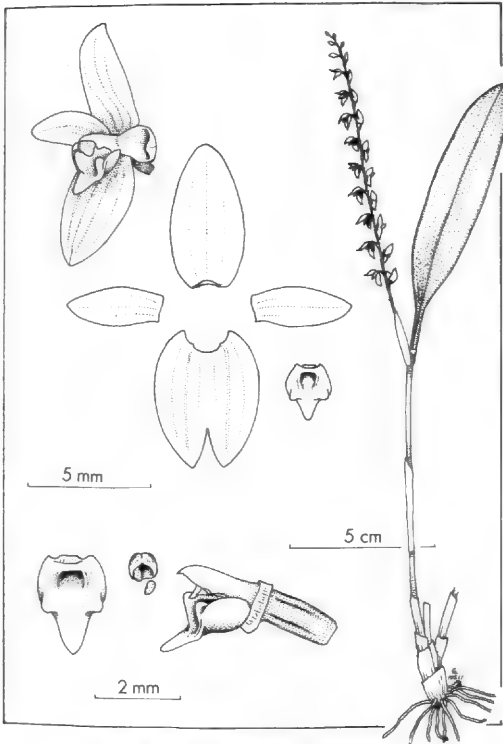


Fig. 29. *Pleurothallis jurisdixii*

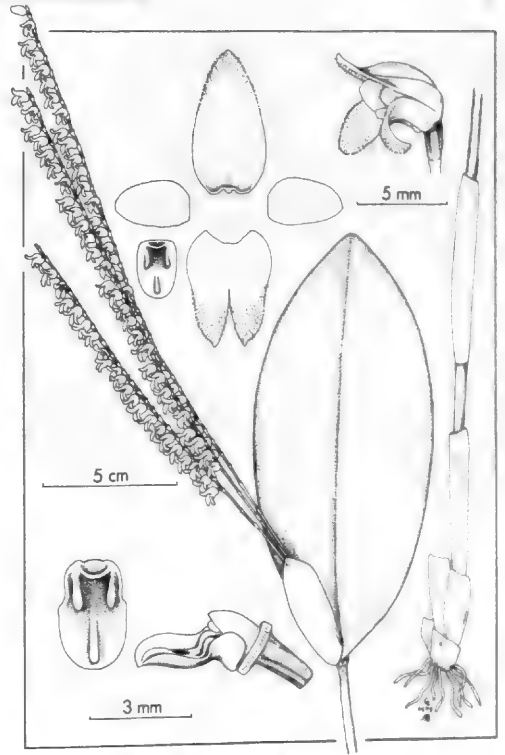


Fig. 30. *Pleurothallis laevigata*

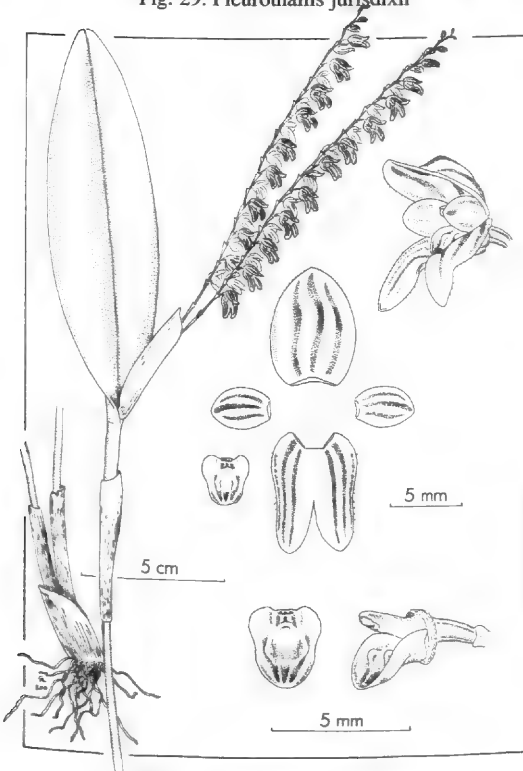


Fig. 31. *Pleurothallis laevigata*

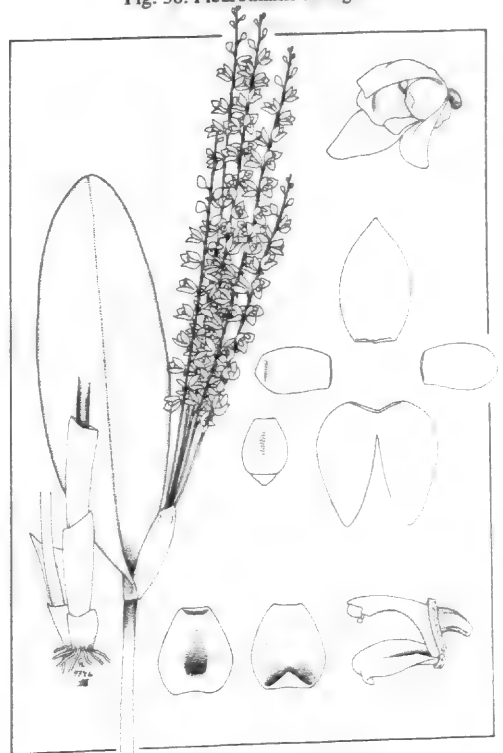
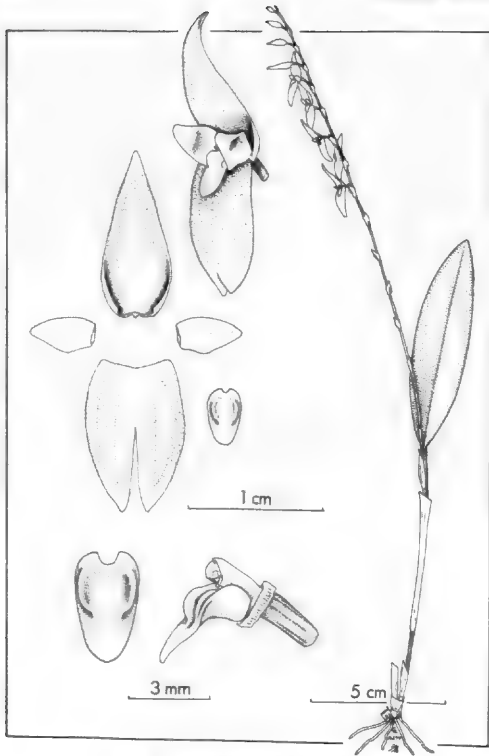
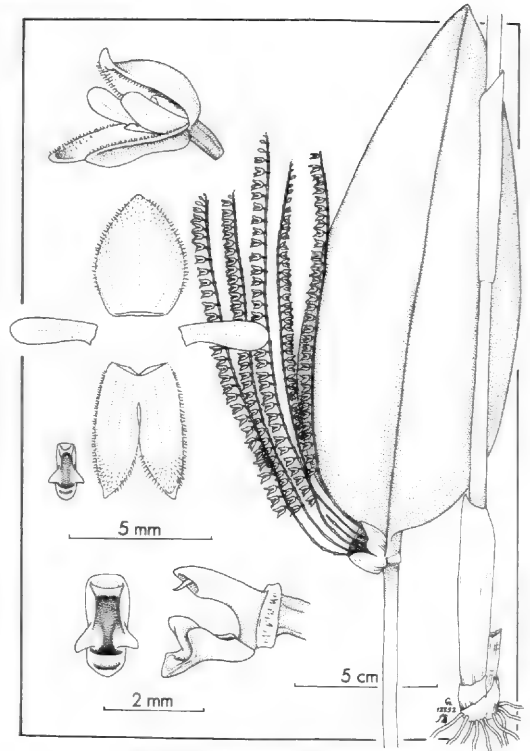
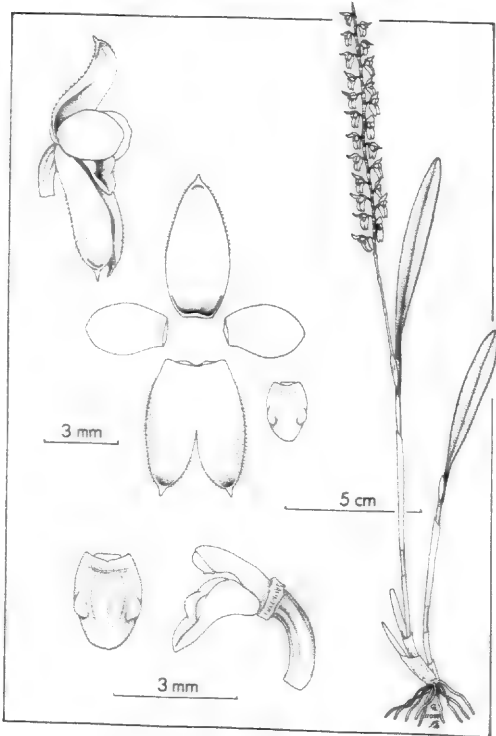
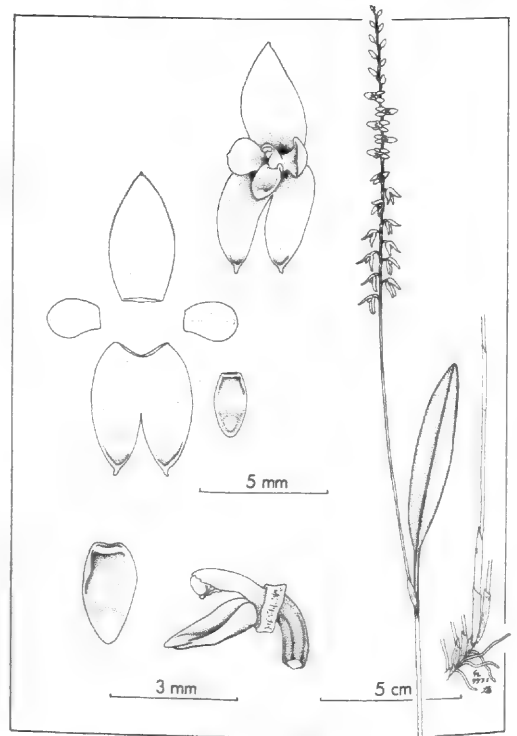
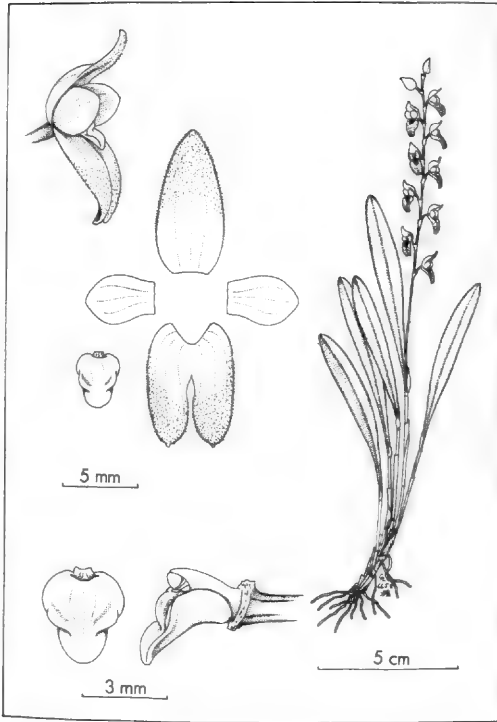
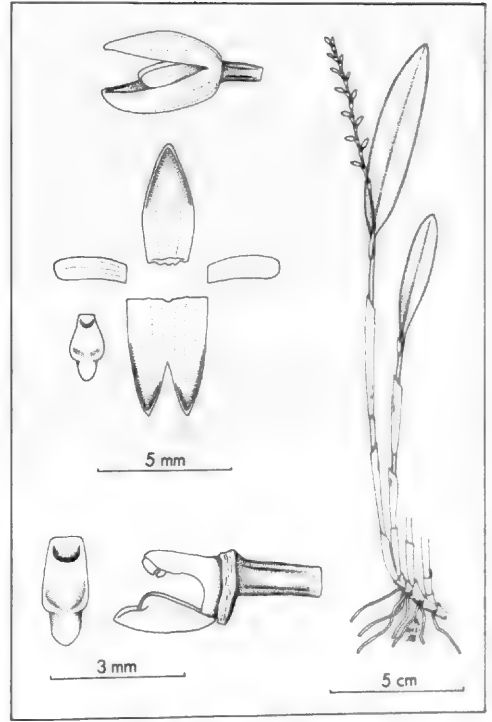
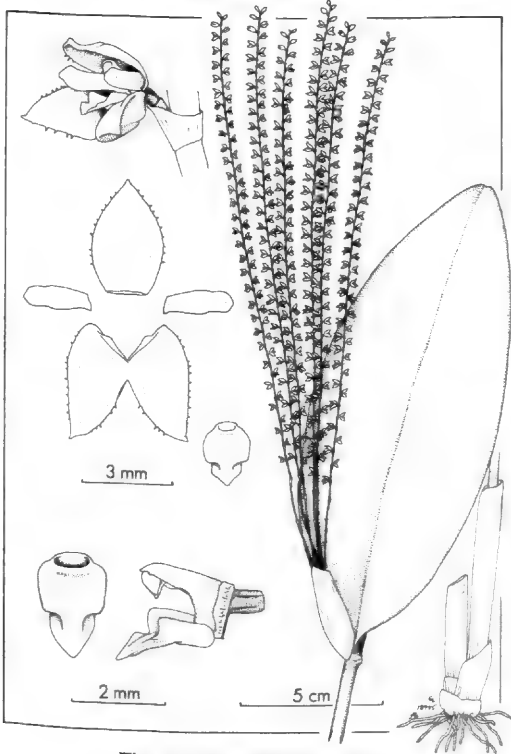
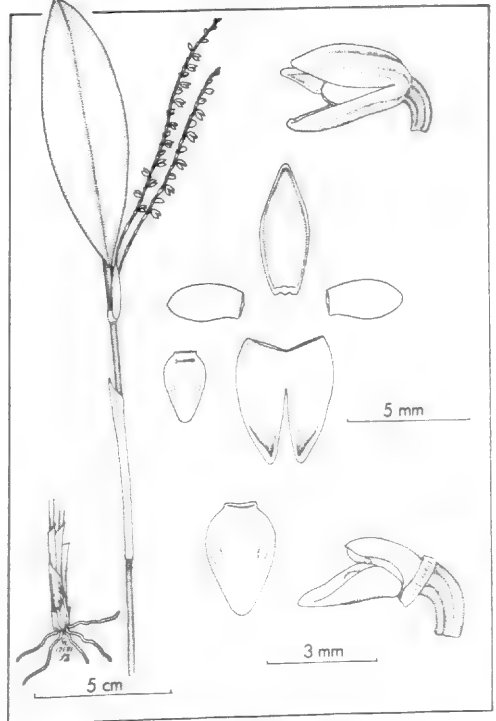
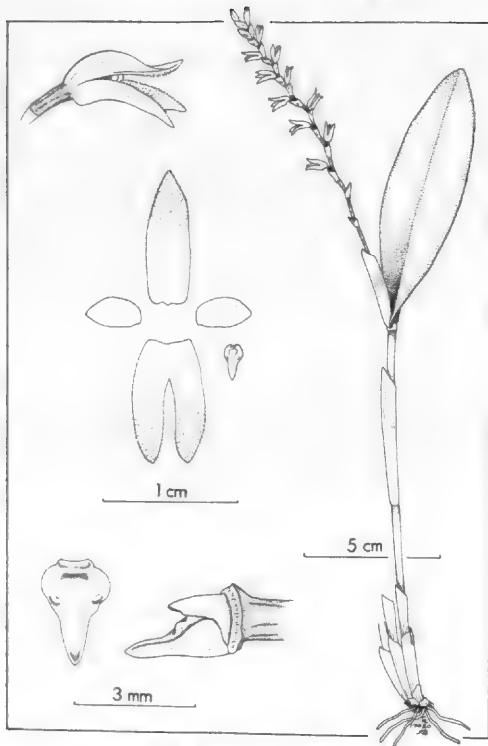
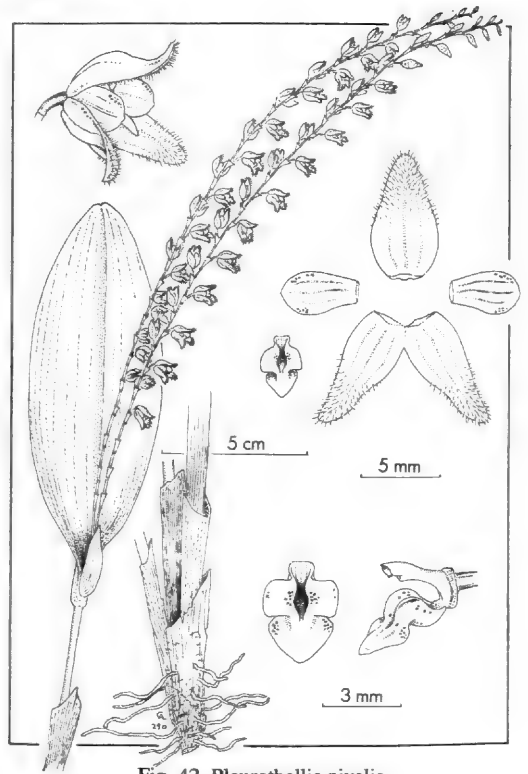
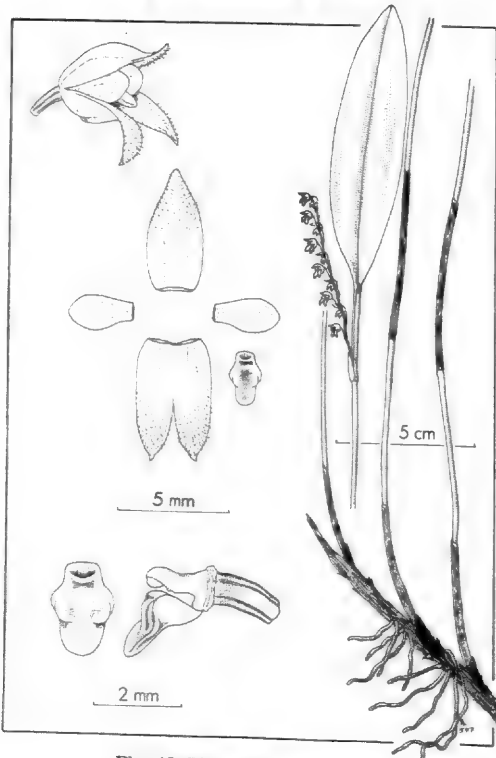
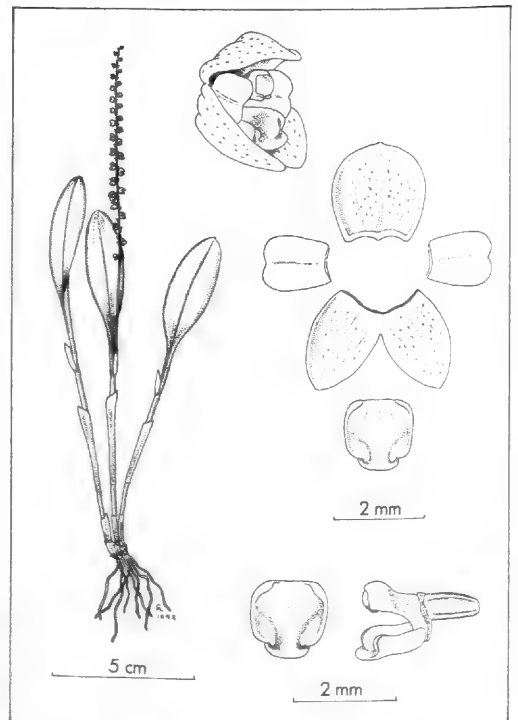


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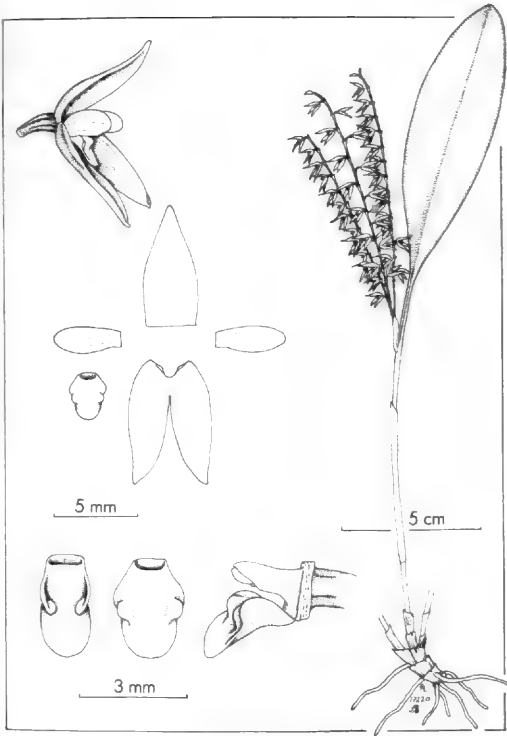


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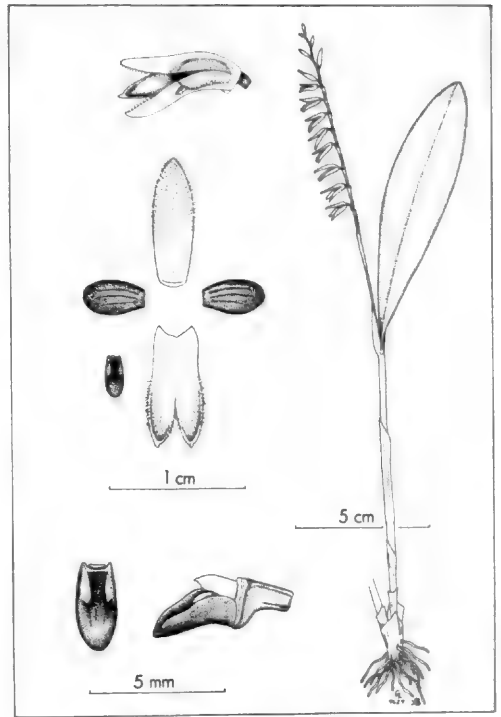


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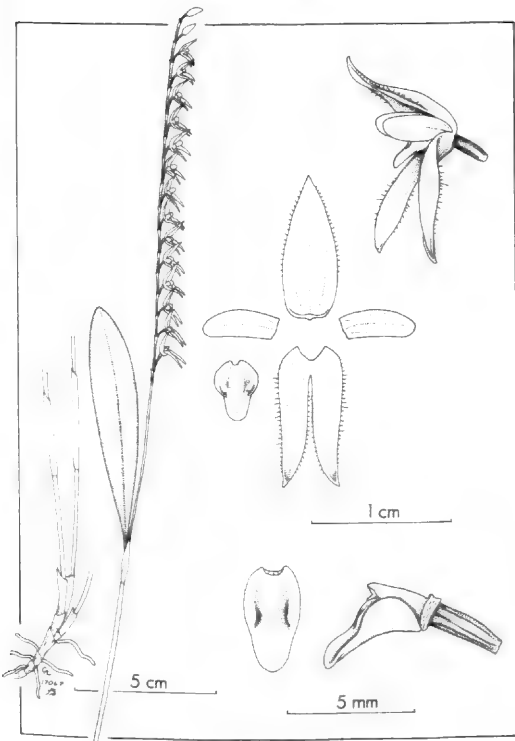


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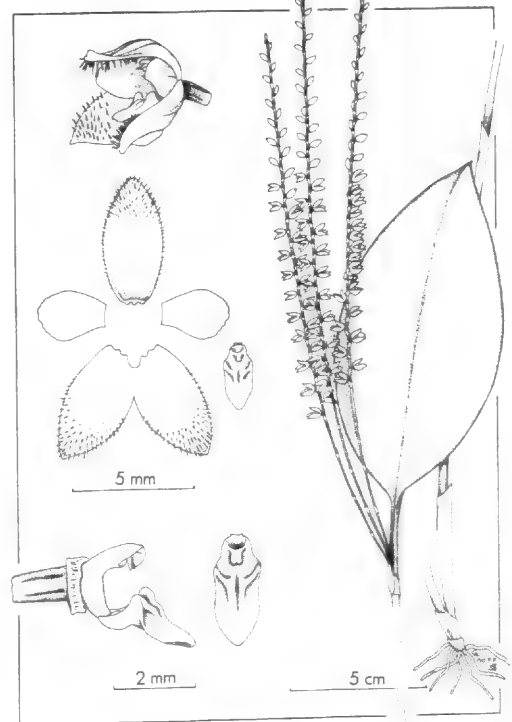
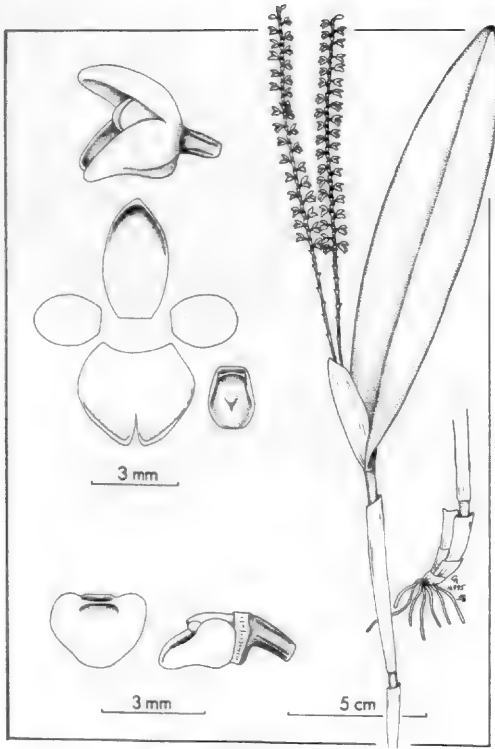
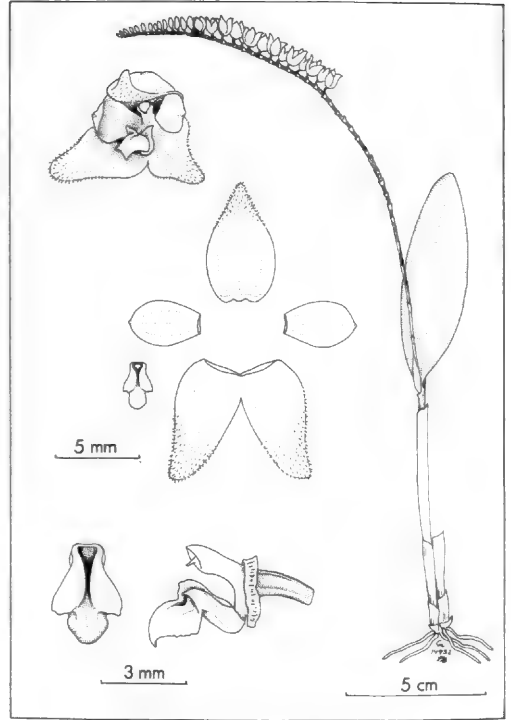
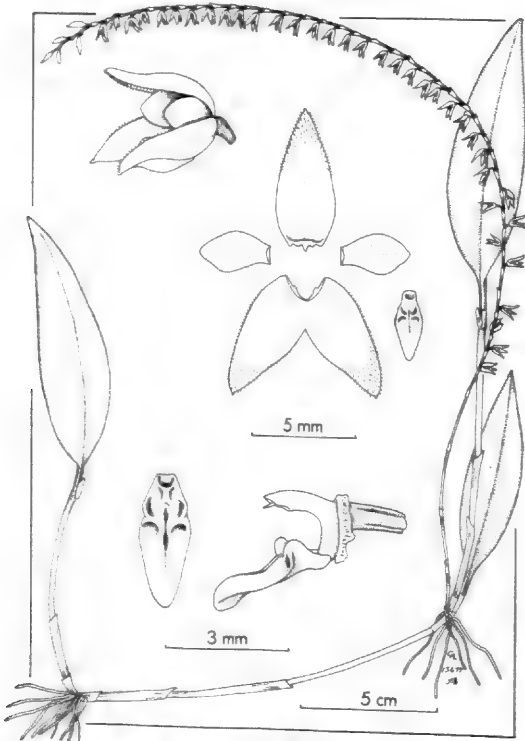
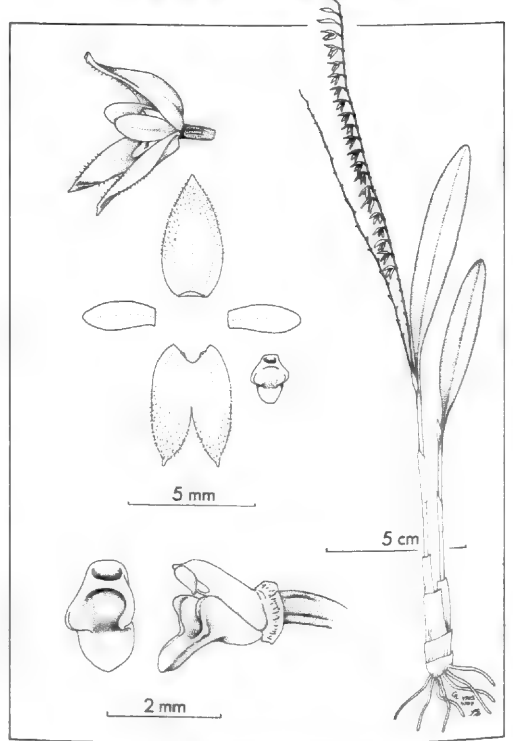


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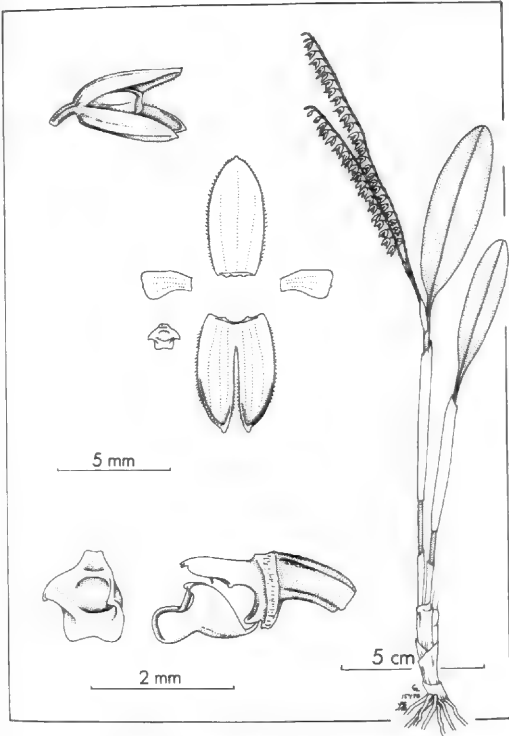


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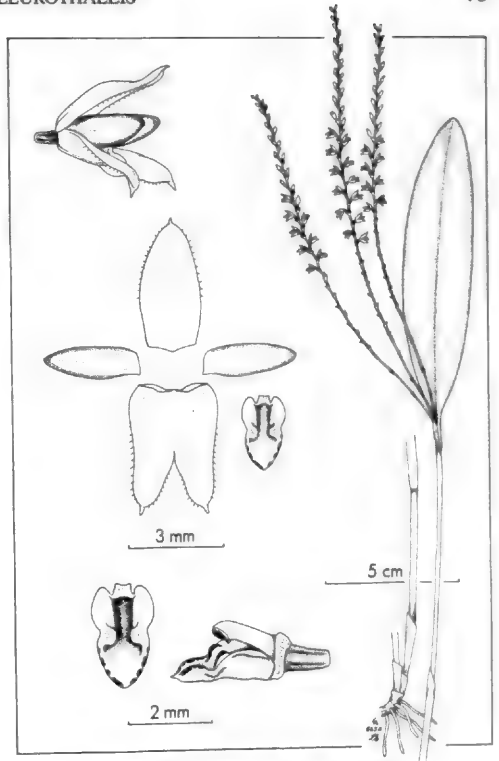


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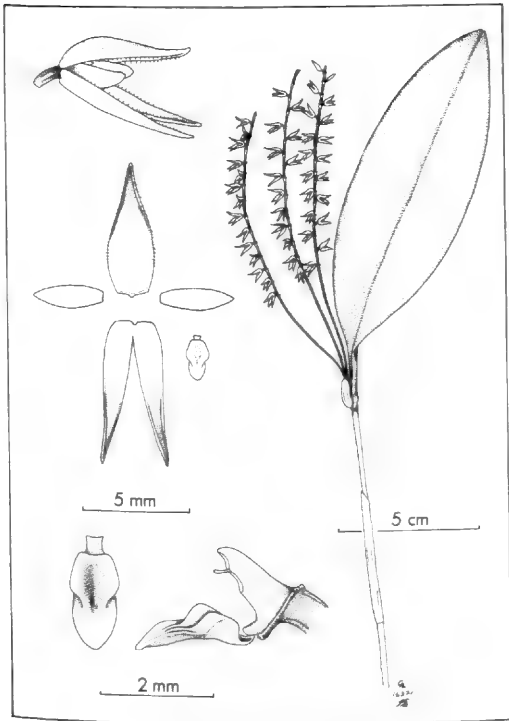


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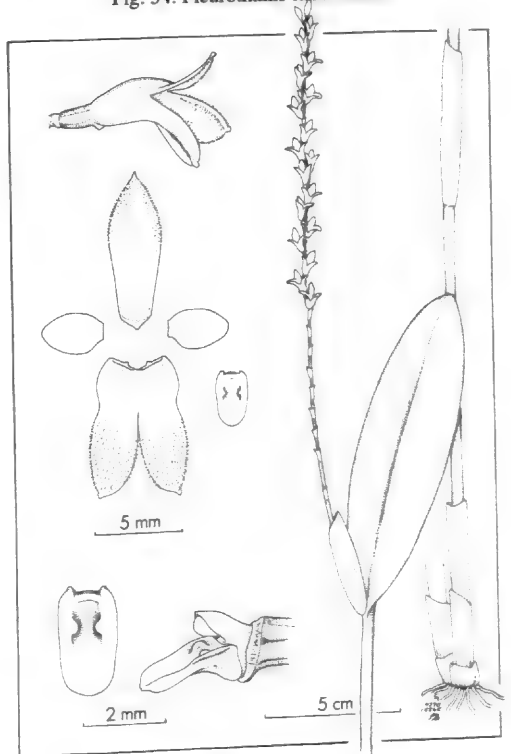
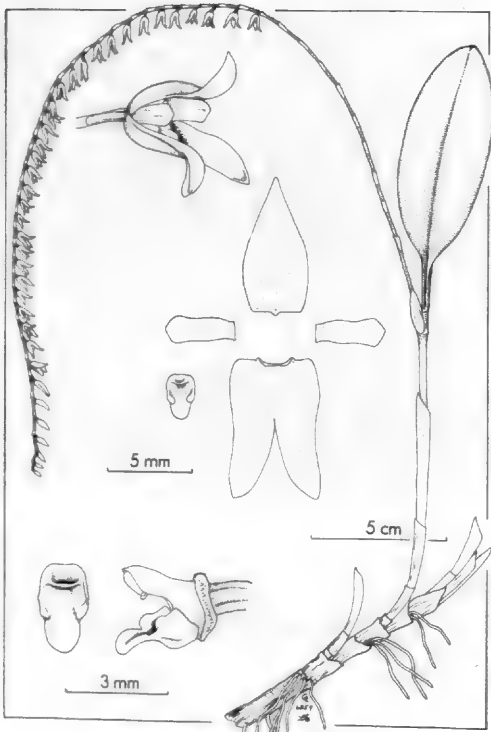
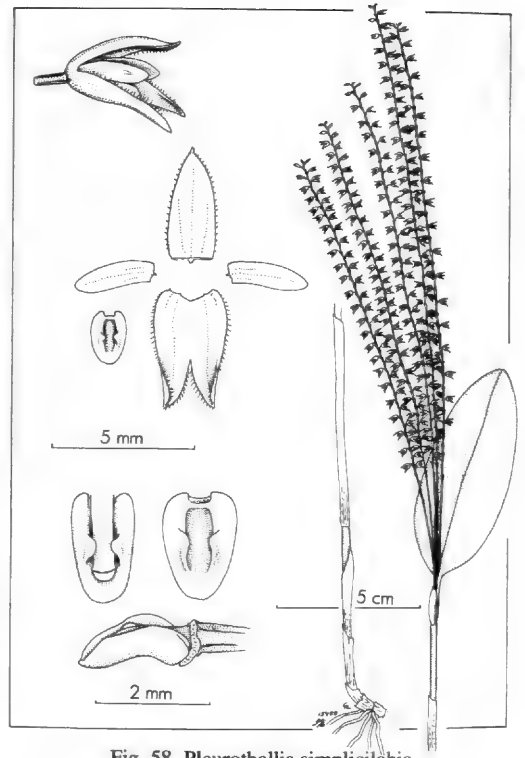
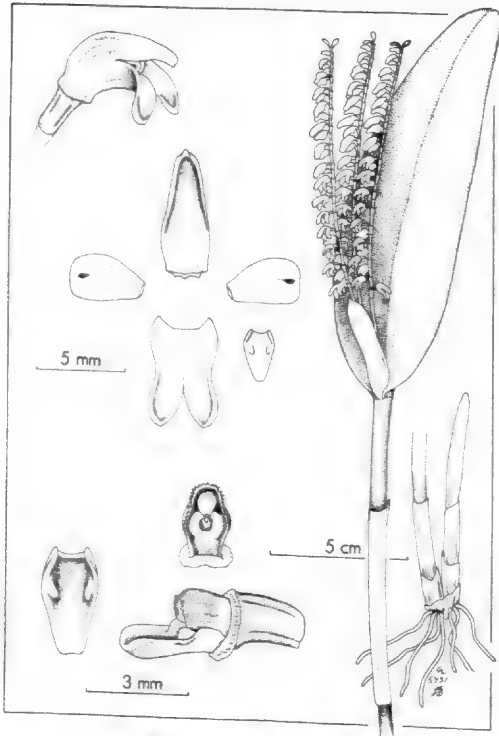
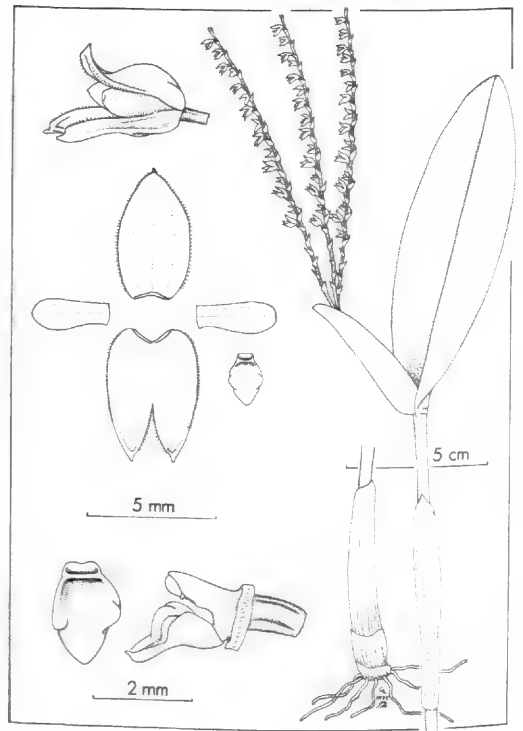


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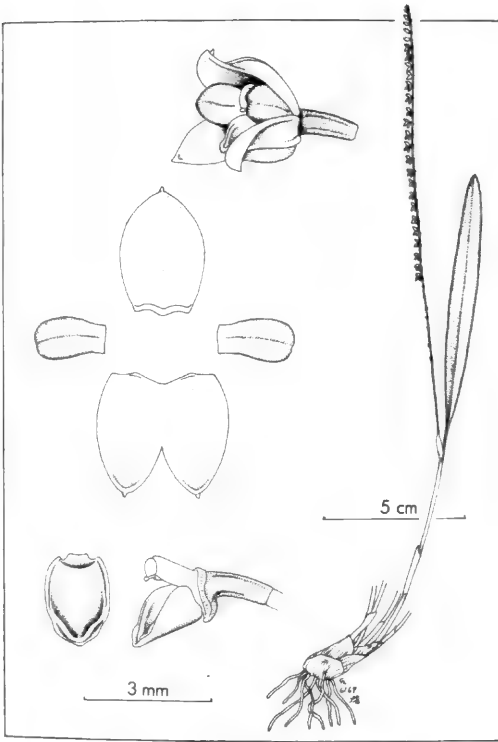


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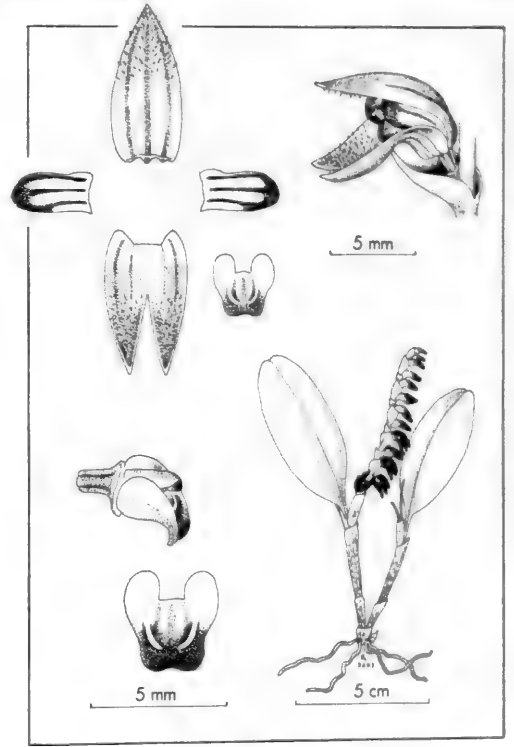


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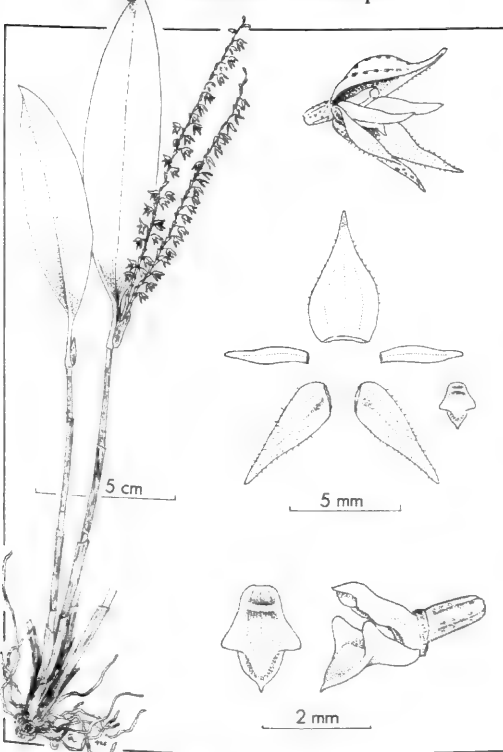


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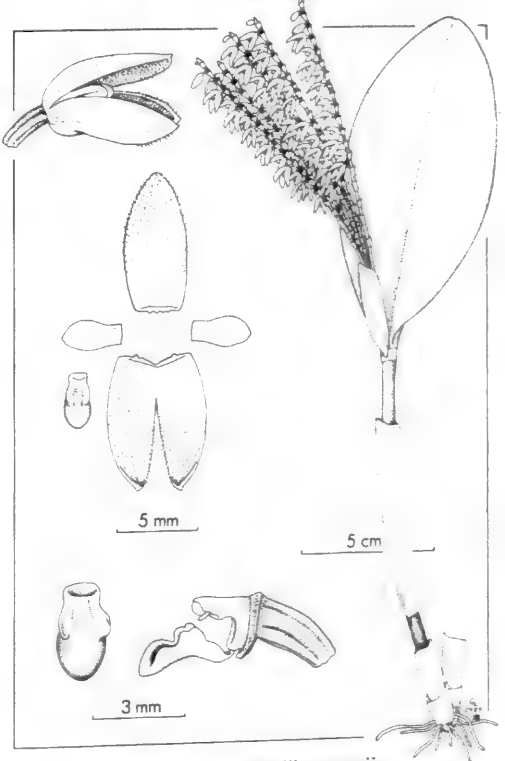
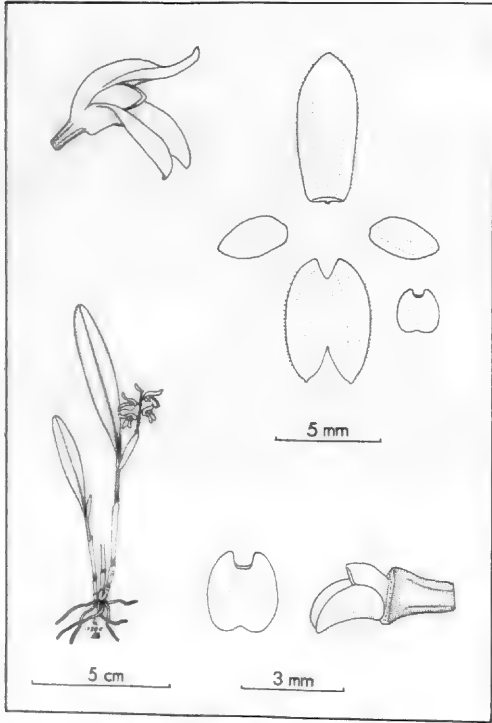
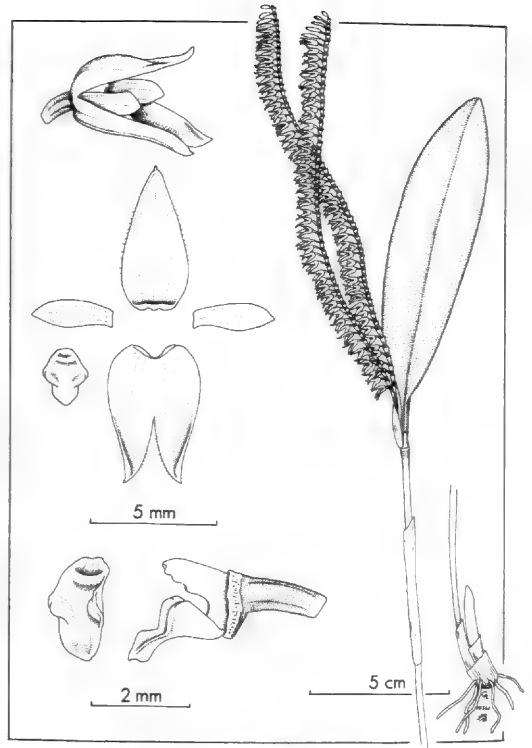
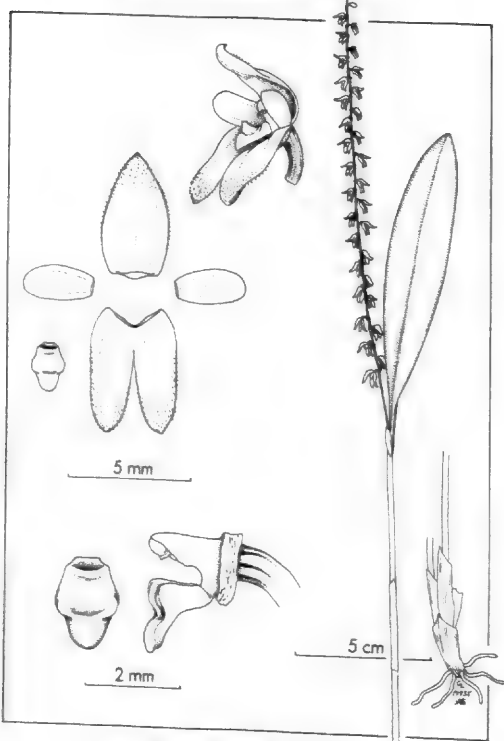
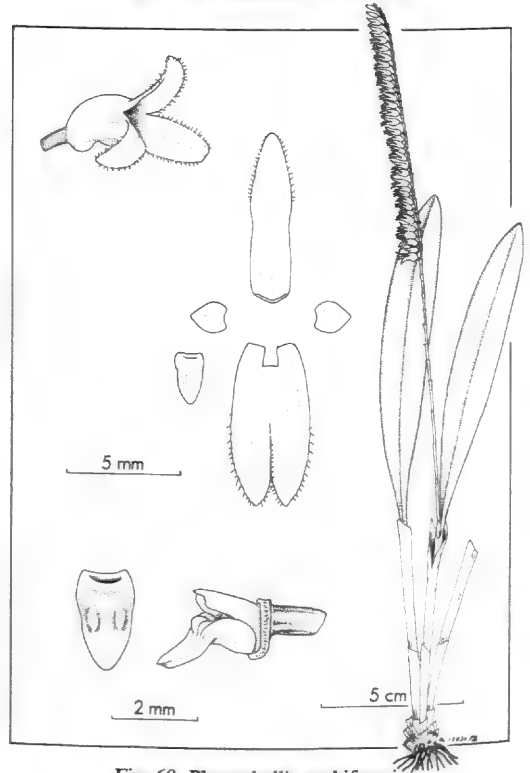


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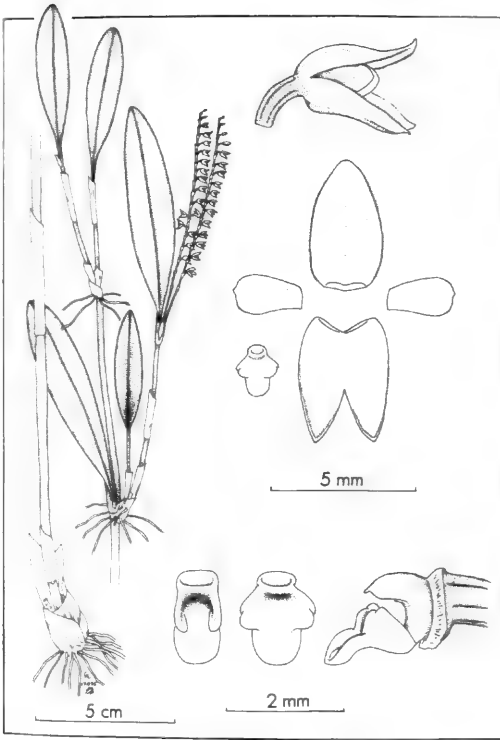


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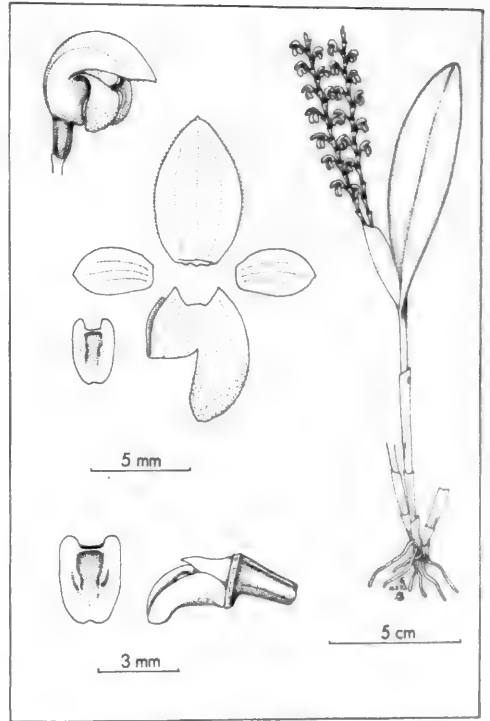


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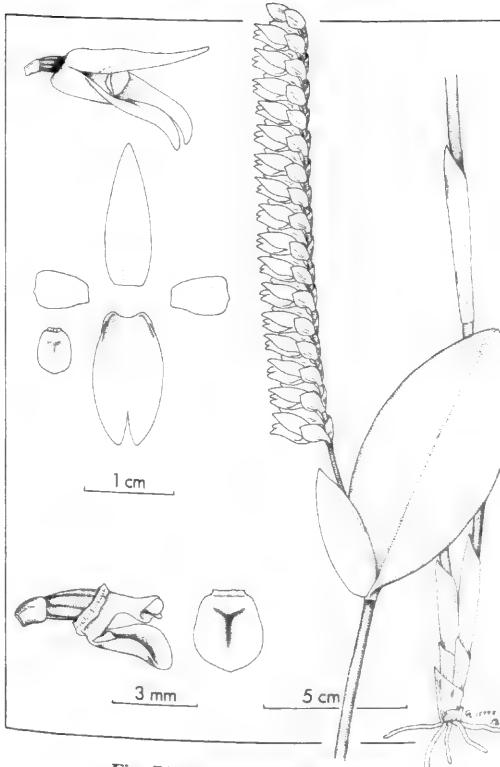


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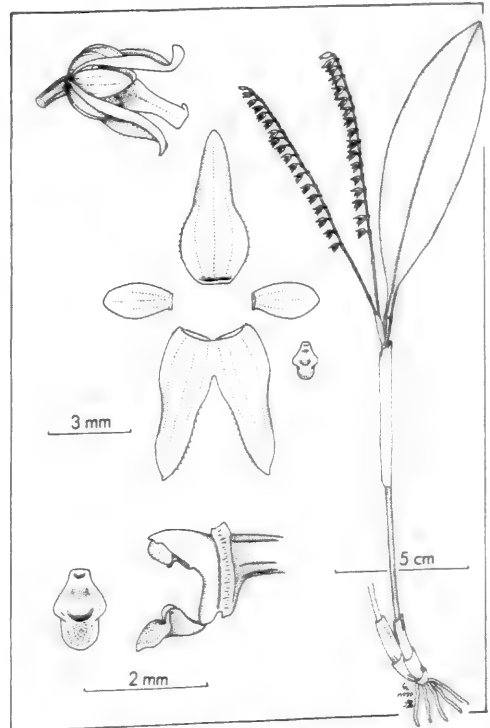
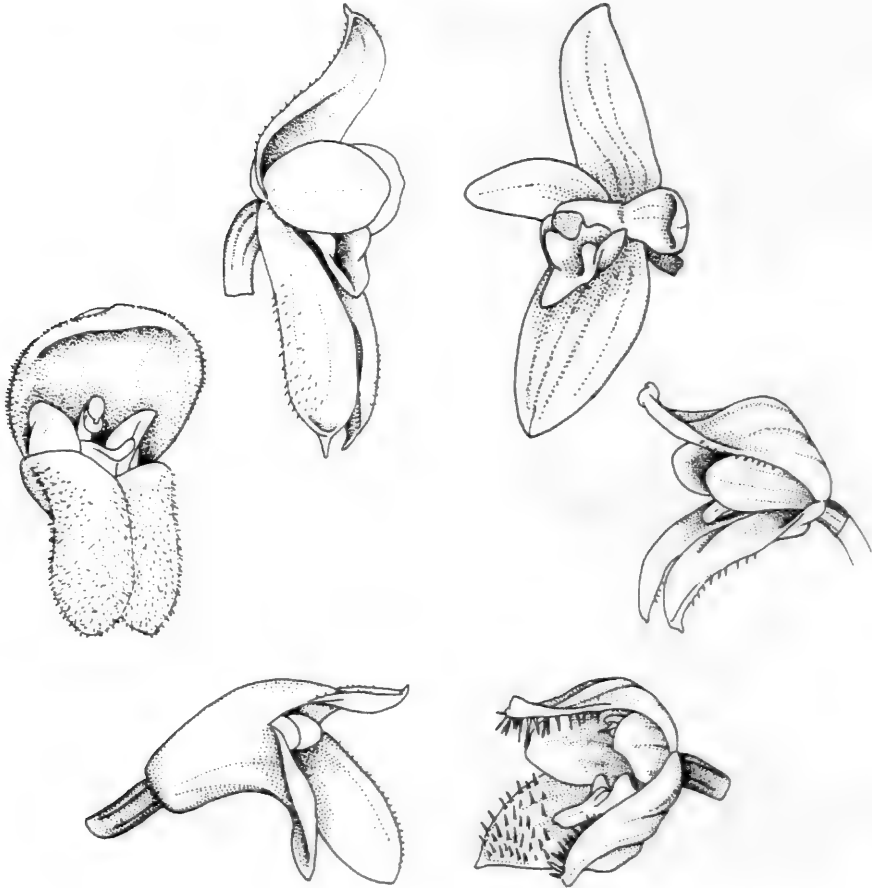


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CORRIEENDA TO ICONES PLEUROTHALLIDINARUM - 15

The designation of the holotype of *Trichosalpinx patula* was inadvertently omitted on page 31. It should read:

***Trichosalpinx patula* Luer, sp. nov.**

ECUADOR: Prov. of Zamora-Chinchipec: east of the pass east of Loja, alt. 2250 m, 22 May 1988, C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13595 (Holotype: MO).

Due to a typographical error, the citation of *Trichosalpinx spilantha* on page 32 should read:

***Trichosalpinx psilantha* Luer & Vásquez, sp. nov.**

BOLIVIA: Dept. of La Paz: Inquisivi, epiphytic in cloud forest between Inquisivi and Cirquata, alt. 2500 m, 27 Jan. 1981, C. Luer, J. Luer & R. Vásquez 5805B (Holotype: SEL).
 (This species had been in manuscript as *Pleurothallis psilantha* Luer & Vásquez before the segregation of *Trichosalpinx* from *Pleurothallis*.)

Due to an oversight, *Platystele xiphochila* should have been deleted from page 1, and on page 16 it should have been cited *Platystele xiphochila* (Rchb.f.) Garay.

CORRIEENDUM TO NOVON 1(4): 170, 1991

Due to an oversight, the holotype of *Masdevallia rubeola* is incorrectly cited. The collection should read:

***Masdevallia rubeola* Luer & Vásquez, sp. nov.**

TYPE: Bolivia. La Paz: Prov. of Nor Yungas, north of Caranavi, 1,550 m, collected 26 Jan. 1988 by R. Vásquez, C. Luer et al., flowered in cultivation by P. and A. Jesup in Bristol, CT, Aug. 1988, C. Luer 12952 (holotype: MO).



SYSTEMATICS OF THE SUBGENUS *RHYNCHOPERA*
OF *PLEUROTHALLIS* (ORCHIDACEAE)

ABSTRACT

Subgenus *Rhynchopera* (Klotzsch) Luer of *Pleurothallis* R.Br. is described. A key to the species is given. Each species is described and illustrated with a black and white drawing.

This taxon was proposed by Klotzsch in 1844 as a monotypic genus when he described *Rhynchopera pedunculata*. In 1850, Reichenbach reduced the species to *Pleurothallis*. Since that time, 20 additional binomials in *Pleurothallis* for closely related taxa or variations thereof, encompassing only eight valid species as recognized today, have been proposed. These species were segregated into subgenus *Rhynchopera* of *Pleurothallis* (Luer, 1986).

Pleurothallis lanceolata, customarily referred to this group of allied species, has been in confusion for a century and a half. *Humboldtia lanceolata* Ruiz & Pavón [*Stelis lanceolata* (Ruiz & Pavón) Pers.] was transferred to *Pleurothallis* by Lindley in 1830 in his *Genera and Species of Orchidaceous Plants*. In his *Folia Orchidacea Pleurothallis* of 1859 he cited a collection by Fendler made in Venezuela between 1854 and 1856 also as *P. lanceolata*, and in his herbarium this specimen is labeled as the type, which, of course, it cannot be. The latter species is *P. pedunculata* (Klotzsch) Rchb.f.

In Reichenbach's herbarium, side-by-side sterile plants of two different species, apparently collected by Pavón in Peru, are labeled *P. lanceolata* Lindl. One is a large *Stelis*; the other of about the same size with a large spathe is most likely a species attributable to this subgenus. Lindley apparently was referring to these two specimens when he made the combination *P. lanceolata*.

Vegetatively, the subgenus is characterized by well-developed ramicauls and a large leaf with a distinct, more or less twisted petiole. A large, conspicuous, conduplicate spathe emerges apically from the ramicaul at, or immediately below, the abscission layer. The racemes are usually weak with delicate, ephemeral flowers. The sepals are membranous, acute, and often attenuated. The petals are also elongate, but sometimes thickened. The lip is simple with the truncate base firmly and inflexibly attached to the pedestal-like base of a short, semiterete column with an apical anther and stigma. The pair of ovoid pollinia share a minute viscidium.

Most species of this subgenus are closely allied, and boundaries between them are sometimes indistinct with intermediate forms. Seven species are confined to the humid forests of Central America and the Andes from coastal Venezuela to central Bolivia with one disjunct species on Hispaniola.

Vegetatively, some unrelated species of *Pleurothallis* are deceptively similar with a racemose inflorescence produced from a large, conduplicate spathe at the base of a petiolate leaf, i.e., in the subgenus *Crocodelanthe* (Rchb.f. & Warsz.) Luer and subgenus the *Dracontea* Luer. A similar habit with single flowers occurs in subgenus *Talpinaria*.

SUBGENUS *RHYNCHOPERA*

Pleurothallis subgenus **Rhynchopera** (Klotzsch) Luer, Monogr. Syst. Bot. 20: 70, 1986.

Bas.: *Rhynchopera* Klotzsch in Link, Klotzsch & Otto, Ic. Pl. Rar. 2: 103, 1844.

Type: *Rhynchopera pedunculata* Klotzsch [*Pleurothallis pedunculata* (Klotzsch) Rchb.f.

Ety.: From the Greek *rhynchopera*, "a beaked bag," in allusion to the appearance of the flower.

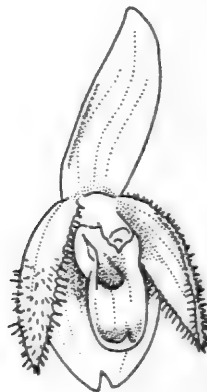
Plants medium to large in size, epiphytic, caespitose; roots slender. Ramicauls slender to stout, erect, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. Leaf erect, coriaceous, elliptical, oblong to ovate, acute to obtuse, the base cuneate into a more or less twisted, channeled petiole. Inflorescence 1 to 3, erect to arcuate, loose, distichous, simultaneously few- to many-flowered racemes, borne by a slender peduncle within a large, conspicuous, compressed, foliaceous spathe, from the apex of the ramicaul, the flowers membranous, delicate and short-lasting; floral bracts thin, more or less infundibular; pedicels slender; ovary cylindrical, round in cross section; sepals membranous and translucent, glabrous, ovate, acute, the lateral sepals connate to the apex; petals often as long as the sepals, acute, ciliate or glabrous; lip entire, more or less ovate, often attenuated at the apex, often dilated below the middle, the base truncate, solidly attached to the base of the column; column stout, semiterete, with an obsolescent foot, the deciduous anther, rostellum and stigma apical, the pollinia 2, yellow, hard, ovoid, with the apex more or less granular, more or less adherent to a minute viscidium.

EPITHETS ATTRIBUTABLE TO SUBGENUS *RHYNCHOPERA*
DESCRIBED IN *PLEUROTHALLIS*
AND LIST OF ILLUSTRATIONS

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<i>Pleurothallis punctata</i> (H.Karst.) Schltr. = <i>P. loranthophylla</i>	
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<i>Pleurothallis violaceorosea</i> Schltr. = <i>P. loranthophylla</i>	

KEY TO THE SPECIES OF SUBGENUS *RHYNCHOPERA*

- 1 Spathes less than 2 cm long2
 1' Spathes more than 3 cm long3
- 2 Sepals and petals less than 5 mm long.....*P. micklowii*
 2' Sepals and petals ca. 13 mm long.....*P. clauderi*
- 3 Petals glabrous.....4
 3' Petals pubescent or ciliate8
- 4 Lip flat without incurved margins5
 4' Lip more or less concave with incurved margins in the lower third6
- 5 Petals attenuate; lip ovate to narrowly ovate, shorter than the sepals.....
*P. fastidiosa*
 5' Petals filiform above the base; lip subulate, about as long as the sepals.....
*P. schweinfurthii*
- 6 Sepals less than 25 mm long; lip more than half as long as the sepals.....7
 6' Sepals more than 25 mm long; lip one-third as long as the sepals.....*P. aggeris*
- 7 Inflorescence few-flowered (up to 6 flowers); sepals usually 15-20 mm long.....
*P. pedunculata*
 7' Inflorescence several- to many-flowered; sepals usually 6-12 mm long.....
*P. loranthophylla*
- 8 Sepals 8-10 mm long; petals ciliate-pubescent; lip 6-7 mm long, obtuse.....
*P. loranthophylla*
 8' Sepals 6 mm long; petals densely long-pubescent; lip 4 mm long, acute, apiculate.
*P. dasypetala*



Pleurothallis aggeris Luer, *Lindleyana* 11: 143, 1996.

Fig. 1.

Ety.: From the Latin *agger*, *aggeris*, "a dam," referring to the Paute dam site where the species was found.

Syn.: *Pleurothallis lanceolata* sensu Lindl., Gen. Sp. Orch. 5, 1830.

Ety.: From the Latin *lanceolatus*, "lanceolate," referring to the leaves.

Syn.: *Pleurothallis pedunculata* var. *peruviana* C. Schweinf., Bot. Mus. Leafl. 16: 54, 1953.

Ety.: Named for Peru, the country of origin.

Plant large, epiphytic to terrestrial, caespitose; roots slender. Ramicauls stout, erect, 10-27 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, subacute, petiolate, 12-22 cm long, 3.5-5 cm wide, the base cuneate into the petiole 2-2.5 cm long. **Inflorescence** an erect, loose, distichous, simultaneously several-flowered raceme, 20-28 cm long, borne by a slender peduncle within a foliaceous spathe 5-7 cm long, 1-1.2 cm wide, from near the apex of the ramicaul; floral bracts oblique, acute, 5 mm long; pedicels 9-10 mm long; ovary spotted with purple, 6 mm long; **sepals** translucent greenish white, spotted with light purple, glabrous, the dorsal sepal narrowly triangular, acute, 25-27 mm long, 2.75 mm wide, 3-veined, the lateral sepals completely connate into a narrowly ovate, acute lamina, shallowly concave below the middle, 25-27 mm long, 5 mm wide, 6-veined; **petals** yellow-green, glabrous, narrowly linear-triangular, acute, attenuate, 25 mm long, 2.25 mm wide at the base, 3-veined; **lip** greenish white, ovate, obtuse, 8 mm long, 4 mm wide expanded, concave in the lower half, thickened at the apex, the base truncate, solidly attached to the base of the column; **column** greenish white, stout, semiterete, 3 mm long, the anther, rostellum and stigma apical, the foot obsolescent.

ECUADOR: **Morona-Santiago**: terrestrial in deep humus in the bottom of a valley east of Paute, alt. 1500 m, July 1977, C. Luer, J. Luer, G. Luer & A. Andreetta 1632 (Holotype: SEL); near Campamento Guanmables, alt. 1650 m, 24 Mar. 1991, C. Luer & J. Luer 15248 (MO).

PERU: **Amazonas**: Chachapoyas, Cerro Calla Calla above Leimebamba, alt. 2400 m, 26 Mar. 1964, P. C. Hutchinson & D. Bennett 4549 (JEPS, K, NY). **Huánuco**: Yanano, alt. ca. 1800 m, *Macbride 3849* (holotype of *P. pedunculata* var. *peruviana*: AMES).

Without locality: labeled *Humboldtia lanceolata*, Pavón s.n. (W).

This species, the largest-flowered of the subgenus, is known from the Andes of southeastern Ecuador and adjacent Amazonian Peru. Except for its large size, it is vegetatively similar to the other members of the subgenus. A sterile collection by Pavón, most probably of this species, is mounted side by side with a large sterile *Stelis* in Reichenbach's herbarium. They are labeled *Pleurothallis lanceolata*.

Pleurothallis aggeris is distinguished by the erect racemes of large flowers with narrow, long-acuminate sepals and petals. The ovate lip is concave in the lower half, thickened at the apex, and only a third the length of the sepals and petals. It is often referred to *P. pedunculata*. The lip of the smaller *P. schweinfurthii* is long-attenuate, approaching the sepals in length.

Pleurothallis claudei Rchb.f. ex Dod, *Moscosoia* 1(3): 57, 1978.

Fig. 2.

Ety.: Named in honor of Louis Claude Richard, French botanist, who first collected this species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 3.5-7 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, coriaceous, elliptical, obtuse, petiolate, 3-7.5 cm long, 1.1-1.8 cm wide in the dry state, the base cuneate into a petiole 5-15 mm long. **Inflorescence** an erect, loose, secund, simultaneously few-flowered raceme, 6-12 cm long including the slender peduncle 3-6 cm long, borne from a spathe 7-15 mm long, from near the apex of the ramicaul; floral bracts oblique, acute, 4-5 mm long; pedicels 7-12 mm long; ovary 4 mm long; **sepals** membranous, glabrous, the dorsal sepal narrowly ovate, acute, 13.5 mm long, 3.5 mm wide, 3-veined, the lateral sepals connate into a narrowly ovate, acute, shortly bifid, shallowly concave lamina, 13.5 mm long, 4 mm wide, 6-veined; **petals** glabrous, elliptical and 3-veined in the basal third, 5 mm long, 2 mm wide, contracted above the basal third into a narrowly terete apical portion 9 mm long, the total length 14 mm; 3-veined; **lip** ovate, obscurely 3-lobed, 6 mm long, the anterior lobe oblong, obtuse, 1.5 mm wide, dilated and concave below the middle with the obtuse to rounded margins erect, the base truncate, solidly attached to the base of the column; **column** stout, semiterete, 3.5 mm long, the anther subapical, the foot 1 mm long.

DOMINICAN REPUBLIC: Hierba Buena, Hondo Valle, alt. 1300 m, 17 May 1975, *D. D. Dod* 527 (Holotype: JBSD; Isotypes: AMES, SEL, NY, US); Duvergé, Sierra del Baoruco, alt. 1400 m, 7 Apr. 1973, *D. D. Dod* 377 (JBSD); "Santo Domingo," without locality, *L. C. Richard s.n.* (P, W), *C. Luer* illustr. 16549.

This species was first collected by L. C. Richard in the nineteenth century, and specimens are present at P (Paris) and in Reichenbach's herbarium at W (Vienna). They are simply labeled "Santo Domingo, Richard, Claudii." There are no notes about habitat, altitude, or color, but the Rev. Don Dod has discovered this species twice in recent years in the Dominican Republic.

Pleurothallis claudei is distinguished from the others in subgenus *Rhynchopera* by the small habit with an unusually small spathe. A few flowers, similar to and about the same size as those of *P. loranthophylla*, are borne in a loose, erect raceme. Most distinctive are the petals that are longer than the sepals. Above a membranous, elliptical lower third, the petals are contracted into a long, subulate, terete apex.

***Pleurothallis dasypetala* Luer & Hirtz, Lindleyana 11: 158, 1996.**

Fig. 3.

Ety.: From the Greek *dasyptalon*, "a hairy petal," referring to the shaggy-pubescent petals.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 6-8 cm long, with a tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, thinly coriaceous, elliptical, acute, petiolate, 7-8.5 cm long, 2 cm wide, the base cuneate into a petiole 1 cm long. **Inflorescence** a weak, more or less arcuate or drooping, congested, distichous, simultaneously several-flowered raceme, 2.5 cm long, borne by a slender peduncle 6 cm long from within a foliaceous spathe 4 cm long, from near the apex of the ramicaul; floral bracts oblique, infundibular, acute, 2.5 mm long; pedicels 2.5 mm long; ovary purple, 2.5 mm long; **sepals** translucent rose, spotted with red-purple, glabrous, the dorsal sepal ovate, acute, 6 mm long, 2.5 mm wide, 3-veined, the lateral sepals connate to near the apex into an ovate, obtuse, bifid, concave lamina, 5.5 mm long, 5 mm wide, expanded, 6-veined; **petals** rose, spotted with purple, densely long-pubescent externally and marginally, ovate, oblique, acute, 5.5 mm long, 2 mm wide, 3-veined; **lip** purple, oblong, concave below the middle with erect margins, 4 mm long, 2 mm wide, the apex acute with an incurved apiculum, the base truncate, solidly attached to the base of the column; **column** white, stout, semiterete, 2 mm long, the anther, rostellum and stigma apical, the foot obsolescent.

ECUADOR: **Zamora-Chinipe**: Cordillera de Nanguipa, north of Nambija, alt. 1400 m, June 1991, *A. Hirtz* 5513 (Holotype: MO), *C. Luer* illustr. 15518.

This species is apparently restricted to the low cordilleras east of the main Andes. It is most similar to the widely distributed *P. loranthophylla*. Vegetatively, the two species are indistinguishable. *Pleurothallis dasypetala* is distinguished by the short, congested raceme of smaller flowers. The synsepal is broad, concave and bifid at the apex. The petals are proportionately wider and shaggy-pubescent externally, not just ciliate on the margins. The lip is short, broad and concave below the middle. The apex is acute with an upcurved apiculum.

***Pleurothallis fastidiosa* Luer, Selbyana 3: 300, 1977.**

Fig. 4.

Ety.: From the Latin *fastidiosus*, "fastidious," alluding to the delicate flowers.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 4-15 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, thinly coriaceous, narrowly ovate, acute, petiolate, 6-12 cm long, 2-3.5 cm wide, the base cuneate into the 1 cm long petiole. **Inflorescence** a (occasionally 2) weak, arcuate, loose, distichous, simultaneously several-flowered raceme, 10-20 cm long, borne by a slender peduncle within a foliaceous spathe 4-6 cm long, from near the apex of the ramicaul; floral bracts oblique, acute, 2-3 mm long; pedicels 2-3 mm long; ovary spotted with purple, 4 mm long; **sepals** translucent yellow-green, spotted with purple, gla-

brous, the dorsal sepal narrowly ovate, acute, 10-12 mm long, 2.5 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute lamina, concave below the middle, 10-12 mm long, 4.5-5 mm wide, 4-veined; **petals** purple, narrowly linear-triangular, acute, acuminate, 9-11 mm long, 1 mm wide, 3-veined at the base; **lip** yellow-green, lightly spotted with purple, ovate, acute, 6-9 mm long, 2 mm wide, the surface flat or slightly convex, the base truncate, solidly attached to the base of the column; **column** stout, semiterete, 1.5 mm long, the anther, rostellum and stigma apical, the foot obsolescent.

ECUADOR: **Napo**: epiphytic in felled trees north of Archidona, alt. ca. 1000 m, 27 July 1975, C. Luer, G. Luer & S. Wilhelm 670 (Holotype: SEL). **Pastaza**: epiphytic in felled trees east of Puyo, alt. ca. 1000 m, 28 July 1975, C. Luer, G. Luer & S. Wilhelm 1266 (SEL); Mera, alt. 1000 m, 13 Oct. 1984, A. Hirtz & C. Dodson 2024 (MO). **Zamora-Chinchi**: terrestrial on scrubby slope between Loja and Zamora, alt. 1600-1650 m, 21 Apr. 1973, L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 4030 (AAU, AMES, K, NY); Nambija, alt. 1300 m, Feb. 1987, A. Hirtz 3294 (MO).

In habit this species is very similar to most of the others of the subgenus. It is apparently restricted to the eastern slopes of the Andes of Ecuador. The flowers are medium-sized with a spotted, narrowly ovate dorsal sepal and synsepal between 10 and 12 millimeters long, and subulate petals. The most distinguishing feature is the lip that is less than 9 mm long, between a half to two-thirds the length of the synsepal. It is narrowly ovate, acute, flat, rigid and somewhat thickened for the entire length. The flowers are most similar to those of *P. schweinfurthii* which are significantly larger with a subulate lip about as long as the synsepal.

Pleurothallis loranthophylla Rchb.f., Bot. Zeitung (Berlin) 10: 674, 1852. Fig. 5.

Ety.: Named for a supposed similarity of the leaf to that of the Loranthaceae (the Mistletoe Family).

Syn.: *Rhynchopera punctata* H.Karst., Auswahl selt. Gew. Venez. 21, t. 7, 1848, neither *Pleurothallis punctata* Ker-Gawl. 1823 nor Lindl. 1835.

Ety.: From the Latin *punctatus*, "punctate," referring to the spotted flowers.

Syn.: *Pleurothallis navicularis* Lindl., Folia Orch. *Pleurothallis* 6, 1859.

Ety.: From the Latin *navicularis*, "boat-shaped," referring to the shape of the lip.

Syn.: *Pleurothallis subpellucida* Klotzsch, Ind. Sem. Hort. Berol. App. 1, 1852.

Ety.: From the Latin *subpellucidus*, "semitranslucent," referring to the sepals.

Syn.: *Humboldtia subpellucida* (Klotzsch) Kuntze, Rev. Gen. Pl. 666, 1891.

Syn.: *Pleurothallis intermedia* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 6: 85, 1919.

Ety.: From the Latin *intermedius*, "intermediate," suggesting a position intermediate between *P. loranthophylla* and *P. pedunculata*.

Syn.: *Pleurothallis punctata* (H.Karst.) Schltr., Repert. Spec. Nov. Regni Veg. Beih. 6: 63, 1919, neither Ker-Gawl. 1823 nor Lindl. 1835.

Syn.: *Pleurothallis violaceorosea* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 198, 1923.

Ety.: From the Latin *violaceoroseus*, "violet-rose," the color of the flowers.

Syn.: *Pleurothallis spathata* Schltr., Repert. Spec. Nov. Regni Veg. 27: 54, 1929.

Ety.: From the Latin *spathatus*, "with a spathe," referring to the prominent spathe.

Plant medium in size to large, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 4-20 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, thinly coriaceous, elliptical, acute, petiolate, 5-14 cm long, 1.5-4.5 cm wide, the base cuneate into the 1-1.5 cm long petiole. **Inflorescence** a (occasionally 2) weak, arcuate, loose, distichous, simultaneously several-flowered raceme, 10-20 cm long, borne by a slender peduncle within a foliaceous spathe 3.5-5 cm long, from near the apex of the ramicaul; floral bracts oblique, acute, 2-3 mm long; pedicels 2-3 mm long; ovary spotted with purple, 3 mm long; **sepals** translucent yellow-green, more or less spotted or mottled with purple, glabrous, the dorsal sepal narrowly ovate-triangular, acute, 8-14 mm long, 2-3 mm wide, 3-veined, the lateral sepals completely connate into an ovate, acute, shallowly concave lamina, 7-14 mm long, 4-5 mm wide, 4-veined; **petals** yellow-green, spotted with purple, glabrous, minutely ciliate to ciliate-pubescent, narrowly ovate, acute, 5-12 mm long, 1.5-2 mm wide, 3-veined; **lip** yellow-green, lightly spotted with purple, ovate, acute, more or less cellular-glandular, 5-9 mm long, 2.5-3 mm wide, dilated and concave in the lower third with the thin margins erect, the base truncate, solidly attached to the base of the column; **column** green, stout, semiterete, 2 mm long, the anther, rostellum and stigma apical, the foot obsolescent.

COSTA RICA: **Alajuela:** humid forest, Santiago de San Ramón, alt. 1075 m, Nov. 1921, *A. M. Brenes 153* (holotype of *P. violaceosea* presumably destroyed at B, lectotype: CR; isoelectotypes: AMES, NY); without locality, ca. 1867, *A. Endres 621* (W); Palmira, Alfaro Ruiz, alt. 2400 m, 16 May, 1938, *A. Smith 593* (NY). **Llano:** Parque Nacional Braulio Carrillo, Carrillo Station, alt. 630-780 m, 15 Nov. 1990, *S. Ingram & K. Ferrell-Ingram 703* (AMES, CR, F, K, MO, SEL).

PANAMA: **Veraguas:** alt. 900 m, 1976, *C. Luer & R. Dressler 1256* (SEL).

COLOMBIA: **Magdalena:** St. Antonio, Nevada de Santa Marta, *Purdie s.n.* (holotype of *P. navicularis*: K); **Antioquia:** Colorado between Amalpi and Carolina, alt. 2000 m, 23 Sept. 1884, *F. C. Lehmann CLXXIII* (G, K); Munic. of Urao, Hda. Chuzcal, alt. 2000 m, cult. at Colomborquídeas, 10 Apr. 1988, *C. Luer 13121* (MO). **Cauca:** El Hatigo above Popayán, alt. 1600 m, July 1889, *F. C. Lehmann 7138* (AMES, K, NY); highlands of Popayán, alt. 1600-2000 m, Feb. 1900, *F. C. Lehmann B.T.306, 309* (AMES, G, NY, W); El Hatigo above Popayán, alt. 1600 m, July 1889, *F. C. Lehmann 7138* (G); Galacé, *F. C. Lehmann s.n., H.K.116* (K). **Norte de Santander:** between Convención and El Carmen, alt. 5,000 ft., 23 Sept. 1946, *M. B. Foster 1765* (AMES).

VENEZUELA: **Dist. Fed.:** "Caracas," *H. Wagens 148* (Holotype W, as *Rhynchopera punctata* H. Karst.); *H. Wagens s.n.* (holotype of *P. subpellucida*: W); near Caracas, imported by K. W. John, cult. in Andermarch, Germany, June 1906, *K. W. John s.n.* (holotype of *P. intermedia* presumably destroyed at B; lectotype here designated: AMES 23183, illustr. of type); Cerro Naiguatá, alt. 1500-1635 m, 15 Nov. 1963, *J. A. Steyermark 92025* (AMES). **Aragua:** near Colonia Tovar, Junquito road, alt. 1300-1500 m, 12 Oct. 1965, *J. A. Steyermark 94377* (AMES); on seaward slopes of road to Choroni, alt. 5,000 ft., Sept. 1958, *G. C. K. Dunsterville 472*; cult. at El Hatillo, 25 July 1982, *C. Luer 8093* (SEL); Parque Nacional Henry Pittier, alt. 1300-1400 m, 20-25 Oct. 1961, *J. A. Steyermark 89794, 89887* (AMES). **Borburata,** Jan. 1961, *A. Aristeguieta & F. Tamayo 4468* (NY); Maracay, Rancho Grande, alt. 1375 m, 18 Apr. 1978, *R. Owens & K. Gaffee s.n.* (K).

ECUADOR: **Pichincha:** Centinella, alt. ca. 600 m, cult. in Chamblee, GA, by *F. L. Stevenson 91-1212-1* (MO). **Loja:** Numbala, above Valladolid, alt. 1700-2000 m, July 1986, *D. D' Alessandro 733* (MO). **Napo:** Borja, alt. 1500 m, 5 Oct. 1984, *A. Hirtz & A. Andreetta 1946* (MO); 44 Km north of Tena, alt. 3,900-4,000 ft., 16 Aug. 1978, *G. L. Webster 23240* (MO, UC-Davis). **Tungurahua:** Río Negro, alt. 1200 m, 12 Nov. 1955, *E. Asplund 18405* (S). **Morona-Santiago:** Dos Monos, Oct. 1987, cult. at Chamblee, GA, by *F. L. Stevenson 90-0102-1* (MO). **Zamora-Chinchipe:** Zamora, *F. C. Lehmann s.n.* (K, H.K.132); Río Palanda south of Valladolid, alt. 1050 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10834* (MO); Río Jamboe near Zamora, alt. 600 m, cult. at Chamblee, GA, 27 Jan. 1990, *F. L. Stevenson 90-0127-1* (MO); upstream from Valladolid, alt. 1700-1800 m, 16 Apr. 1986, *D. D' Alessandro 585* (MO).

PERU: **Huánuco:** Tingo Maria, alt. 650 m, 28 June 1958, *F. Woytkowski 5004* (AMES); Leoncio Prado, Jacintillo, Río Monzón, alt. 700-900 m, 29 June 1976, *J. Schunke 9463* (F, MO); same area, alt. 680-700 m, 13 July 1978, *J. Schunke 10358* (F, MO). **Loreto:** south of Tingo Maria, collected by Fred Fuchs, Jr., cult. 1975, *C. Luer 1273* (SEL). **Junín:** Tarma, Utcuyacu, alt. 1900 m, 14 Feb. 1948, *F. Woytkowski 35356* (AMES, UC). ?San Miguel, *K. Tokach P-2* (MO).

BOLIVIA: **La Paz:** Nor Yungas, hacienda Simaco, above the way to Tipuani, alt. 1400 m, Feb. 1920, *O. Buchtien 5013* (holotype of *P. spathata* presumably destroyed at B; lectotype here designated: AMES; isoelectotype: US); same data, *O. Buchtien 5014* (AMES); between Chuspipata and Yolosa, alt. 2100 m, 3 Apr. 1984, *J. C. Solomon & M. Uehling 12183* (MO); Sud Yungas, cult. by Dino Menato in Chulumani, 1 Feb. 1980, *C. Luer 5045* (SEL). **Cochabamba:** near Villa Tunari, alt. 350 m, 30 Jan. 1997, *C. Luer, J. Luer et al. 18312* (MO). **Santa Cruz:** Santa Cruz, alt. 600 m, cult. by Dr. Luis Moreno, 3 Feb. 1988, *C. Luer & R. Vásquez 12979* (MO).

This species is widely distributed from Central America through the Andes into Bolivia. It is little more than a small form of *P. pedunculata* with which it is sympatric in the northern part of the Andes. *Pleurothallis loranthophylla* is distinguished by the smaller habit and more numerous, smaller flowers that are often spotted. The lips of both species are concave in the lower third.

The petals are variably pubescent, forms with glabrous petals being more frequent in the northern parts of the distribution and variations with ciliate petals more frequent in the southern parts of the distribution. The latter from Bolivia was described as *P. spathata*. Both variations are intermingled in Colombia and Ecuador.

Pleurothallis micklowii Luer & Vásquez, *Phytologia* 49: 211, 1981.

Fig. 6.

Ety.: Named in honor of the late Fred Micklow who discovered this species.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5-10 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, thinly coriaceous, narrowly elliptical-oblong, acute, petiolate, 6-11.5 cm long, 1.2-2.2 cm wide, the base cuneate into a twisted petiole 0.7-1 cm long. **Inflorescence** 1-3, loose, distichous, simultaneously several-flowered racemes, 3-4 cm long, borne by a slender peduncle within a foliaceous spathe 12-18 mm long, from near the apex of the ramicaul; floral bracts infundibular, 1.5 mm long; pedicels 2 mm long; ovary 1 mm long; **sepals** translucent pale-green, with a few pale rose spots, glabrous, the dorsal sepal ovate, acute, concave, 3.5 mm long, 1.75 mm wide, 3-veined, the lateral sepals connate into an ovate, concave synsepal, 3.75 mm long, 2.75 mm wide expanded, 4-veined, the obtuse apex minutely bifid; **petals** pale green, with a few pale rose spots, ovate, acute, lightly acuminate, 2 mm long, 1 mm wide, 3-veined; **lip** light green, with a few purple spots, thick, ovoid, concave below the middle, round at the apex, 2 mm long, 1.25 mm wide, the base truncate, solidly attached to the base of the column; **column** stout, semiterete, 0.75 mm long, the anther, rostellum and stigma apical, the foot very short.

BOLIVIA: **Santa Cruz:** without locality, collected by F. Micklow, Aug. 1978, cult. 23 Nov. 1980, *C. Luer* 5599 (Holotype: SEL). **La Paz:** Nor Yungas, Bella Vista, alt. ca. 1000 m, Aug. 1991, cult. in Quito, A. Hirtz 5803 (MO).

This species, the smallest of the subgenus, is apparently endemic in Amazonian Bolivia. Except for its small size it is similar to the other members of the subgenus. The spathe is not two centimeters long. The sepals and petals are proportionately shorter and broader. The lip is thick, ovoid, concave and fixed to the column-foot.

Pleurothallis pedunculata (Klotzsch) Rchb.f., *Linnaea* 22: 822, 1849.

Fig. 7.

Bas.: *Rhynchopera pedunculata* Klotzsch, Ic. Pl. Rar. Hort. Berol. 2: 103, t. 41, 1844.Ety.: From the Latin *pedunculatus*, "pedunculate," referring to the inflorescence.Syn.: *Pleurothallis lanceolata* sensu Lindl., *Folia Orch. Pleurothallis* 6, 1859, not 1830.Syn.: *Humboldtia pedunculata* (Klotzsch) Kuntze, *Rev. Gen. Pl.* 2: 667, 1891.

Plant medium in size to large, epiphytic, caespitose; roots slender. Ramicauls rather stout, erect, 10-30 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, subacute, petiolate, 10-20 cm long, 3.5-8 cm wide, the base cuneate into the petiole 1-1.5 cm long. **Inflorescence** an arcuate, loose, distichous, simultaneously few-flowered raceme, 10-15 cm long, borne by a slender peduncle within a foliaceous spathe 4-10 cm long, from near the apex of the ramicaul; floral bracts oblique, acute, 4-5 mm long; pedicels 6-9 mm long; ovary 5 mm long; **sepals** translucent light green, suffused and mottled with purple, glabrous, the dorsal sepal narrowly triangular, acute, 18-23 mm long, 4-5 mm wide, 3-veined, the lateral sepals completely connate into an ovate-triangular, acute lamina, shallowly concave below the middle, 18-23 mm long, 7-8 mm wide, 4-veined; **petals** purple, narrowly triangular, acute, acuminate, 18-21 mm long, 3.5-4 mm wide, 3-veined; **lip** green, suffused with purple, narrowly ovate, acute, 14-15 mm long, 4.5-5 mm wide, dilated in the lower third with the thin margins erect, the base truncate, solidly attached to the base of the column; **column** green, stout, semiterete, 4 mm long, the anther, rostellum and stigma apical, the foot obsolescent.

VENEZUELA: **Dist. Fed.:** Silla of Caracas, Cerro de El Avila, alt. 5,000 ft., 1840, cult. in Berlin, *E. Otto* s.n. (Holotype: W, illustration of *Rhynchopera pedunculata* only); near Colonia Továr, 1854-56, *A. Fendler* 1476 (holotype of *P. lanceolata* sensu Lindley; K, isotypes: AMES, BR, G, MO); Without locality, *Moritz* s.n. (W); Cerro El Avila between El Asiento de la Silla and El Refugio No Te Apures, alt. 2000 m, 31 July 1976, *B. Manara* s.n. (MO, VEN); along the road between Janguito and Colonia Továr, alt. 7,000 ft., Nov. 1954, G. C. K. Dunsterville 241, cult. at El Hatillo, 25 July 1982, *C. Luer* 8093 (SEL). **Mérida:** Cerro San Isidro above Carbonera, alt. 2430-2745 m, 22 Apr. 1944, *J. A. Steyermark* 56038 (AMES, NY). **Táchira:** Páramo de Tamá, alt. 2475-2550 m, 18 May 1967, *J. A. Steyermark* & *G.C.K. Dunsterville* 98337 (AMES).

COLOMBIA: Old dept. of Ocaña, Páramo San Pedro, alt. 3400 m, 1851, *L. Schlim* 737 (G, K, W). **Antioquia:** Munic. of Alejandria, cult. by R. Londoño, 20 Mar. 1989, *C. Luer* 14318 (MO); Medellín, Cerro Padre Amaya, alt. 2400-2600 m, collected by E. Acevedo, Sept. 1992, cult. at Colomborquídeas, 26 Feb. 1997, *R. Escobar* 8270 (MO). **Magdalena:** Santa Marta, 1898-1899, *H. H. Smith* 2487 (K, NY); Santa Marta above Hda. Cincinnati, alt. 7,100 ft., 2 Aug. 1946, *M. B. Foster* 1338 (AMES). **Norte de Santander:** Culagá valley above Tapatá north of Toledo, alt. 2300 m, 5 Mar. 1927, *E. P. Killip* & *A. C.*

Smith 20315, 20316 (AMES, NY); Páramo de Hatico between Toledo and Pamplona, alt. 2400 m, 12 Mar. 1927, *E. P. Killip & A. Smith 20517* (AMES, NY). **Valle del Cauca:** Anserma Vieja above Roldanillo, alt. 1400-1800 m, 27 Oct. 1883, *F. C. Lehmann 3275* (BR, K); Cartago, crest of Cordillera de Santa Bárbara, between Modín and Villa Rodas, Loma de Montechara, 21 Nov. 1981, *F. Silverstone-Sopkin 987* (CUVC). **Cauca:** Highlands of Popayán, alt. 1600 m, July 1889, *FCL 7138* (W). Anserma Vieja above Roldanillo, alt. 1400-1800 m, 27 Oct. 1883, *F. C. Lehmann 3275* (BM).

This large species is known from coastal Venezuela and Colombia. A remarkably accurate and complete illustration accompanies Klotzsch's original description. Lindley has drawn the synsepal split into two halves (*Schlim 737*), which is not normally the case.

In common with the other members of the subgenus, *P. pedunculata* is characterized by the large, long, foliaceous spathe from the base of a petiolate leaf. Relatively few, large, simultaneous flowers are produced in an arching raceme. The dorsal sepal, synsepal, petals and lip are narrowly ovate and acute, and the ovate lip is concave in the lower third.

***Pleurothallis schweinfurthii* Garay, Orch. J. Calif. 3: 188, 1954, nom. nov. Fig. 8.**

Ety.: Named in honor of Charles Schweinfurth, author of the *Orchids of Peru*.

Syn.: *Pleurothallis lanceolata* Lindl. var. *gracilis* C. Schweinf., Bot. Mus. Leaflet. 10: 182, 1942.

Ety.: From the Latin *gracilis*, "slender," referring to the floral parts.

Syn.: *Pleurothallis capillifera* Luer & Vásquez, Phytologia 46: 359, 1980.

Ety.: From the Latin *capillifer*, "bearing a hair," alluding to the capillary petals and lip.

Plant medium to large in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 6-17 cm long, with a closely fitting, tubular sheath below the middle and 2-3 other sheaths about the base. **Leaf** erect, coriaceous, elliptical-oblong, acute or subacute, petiolate, 5-11 cm long, 2-3.5 cm wide, the base cuneate into the petiole 1-2 cm long. **Inflorescence** an (occasionally 2) arcuate or erect, loose, distichous, strict or lightly flexuous, simultaneously several-flowered raceme, 12-20 cm long, borne by a slender peduncle within a foliaceous spathe 3-6 cm long, from near the apex of the ramicaul; floral bracts oblique, acute, 5-8 mm long; pedicels 5-10 mm long; ovary 3-5 mm long; **sepals** translucent yellow-green, spotted with purple, glabrous, the dorsal sepal narrowly triangular, acute, concave below the middle, 15-21 mm long, 2-3.5 mm wide, 3-veined, the lateral sepals completely connate into an ovate-triangular, acute or subacute lamina, shallowly concave below the middle, 15-21 mm long, 3.5-4.5 mm wide, 6-veined; **petals** yellow-green, mottled with purple, narrowly linear-triangular or subulate, acute, long-attenuate, 14-16 mm long, 1-2 mm wide at the base, 3-veined; **lip** light green, suffused with red-purple, subulate, long-attenuate, 13-16 mm long, 2 mm wide, the surface flat, the base truncate, solidly attached to the base of the column; **column** light green, stout, semiterete, 1.5-2 mm long, the anther, rostellum and stigma apical, the foot obolescent.

PERU: San Martín: epiphytic in forest, Zepelacio, near Moyabamba, alt. 1200-1600 m, Mar. 1934, *G. Klug 3563* (Holotype of *P. lanceolata* var. *gracilis*: AMES; Isotypes K, MO, NY, S, US); Rogue, 28 Mar. 1925, *D. Melin 296* (S). **Amazonas:** Chachapoyas, Cerro Calla Calla above Leimebamba, alt. 2400 m, 26 Mar. 1964, *P. C. Hutchinson & D. Bennett 4549* (AMES, JEPS, MO, UC, USM). **Huánuco:** Muna, 5 Mar. 1959, *F. Woytkowski 5207* (AMES, MO, NY). **Loreto:** Tingo Maria, collected by F L Stevenson, 112674-2, cult. in Chamblee, GA, 26 Nov. 1974, *C. Luer 742* (SEL). **BOLIVIA: Cochabamba:** Chapare, epiphytic in wet forest west of Villa Tunari, alt. 600 m, 24 Jan. 1980, cult. 6 Mar. 1980, *C. Luer, J. Luer & R. Vásquez 5210* (holotype of *P. capillifera*: SEL).

This species is widely distributed on the eastern declivities of the Andes from northern Peru into Bolivia. Vegetatively, it is similar to the other members of the subgenus. *Pleurothallis schweinfurthii* is distinguished by the flowers with long-pointed floral parts. The lip is long-attenuate, similar to the petals, and about as long as the synsepal. The lower part of the lip is flat without incurved margins. The slight incurving of the margins noted in the original description is due to drying and rehydration of the flower. This misleading description led to the recognition of *P. capillifera*.

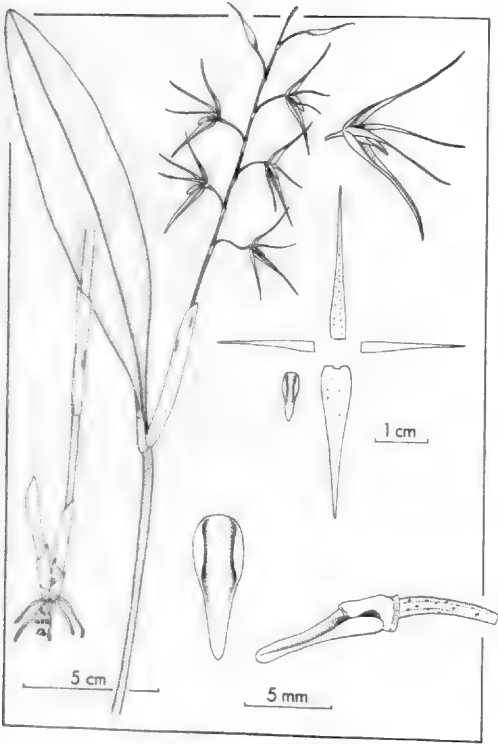


Fig. 1. *Pleurothallis aggeris*

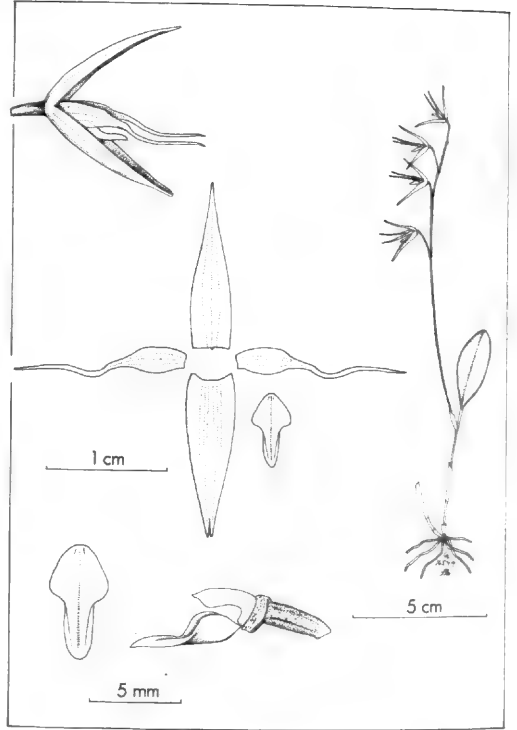


Fig. 2. *Pleurothallis claudei*

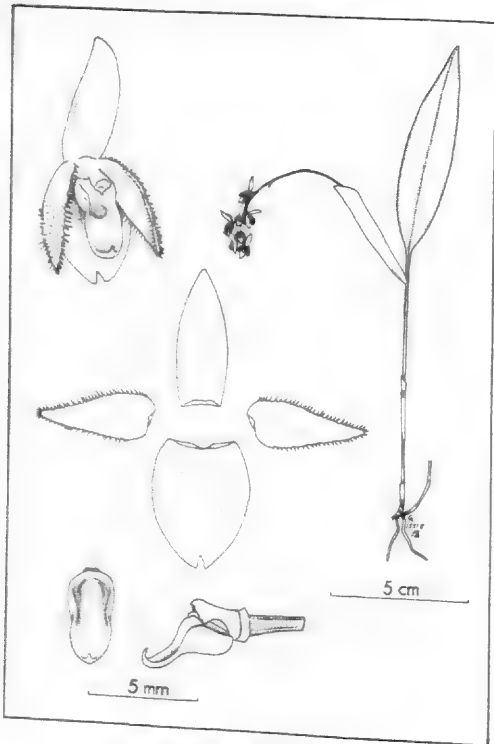


Fig. 3. *Pleurothallis dasypetala*

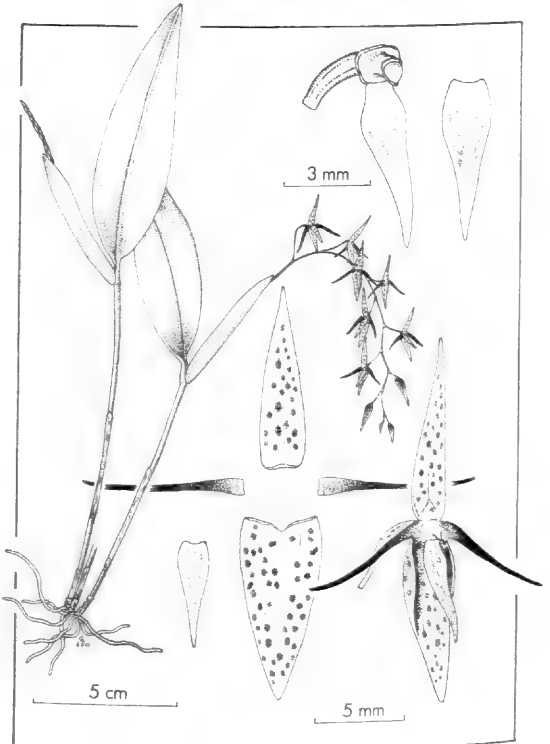


Fig. 4. *Pleurothallis fastidiosa*

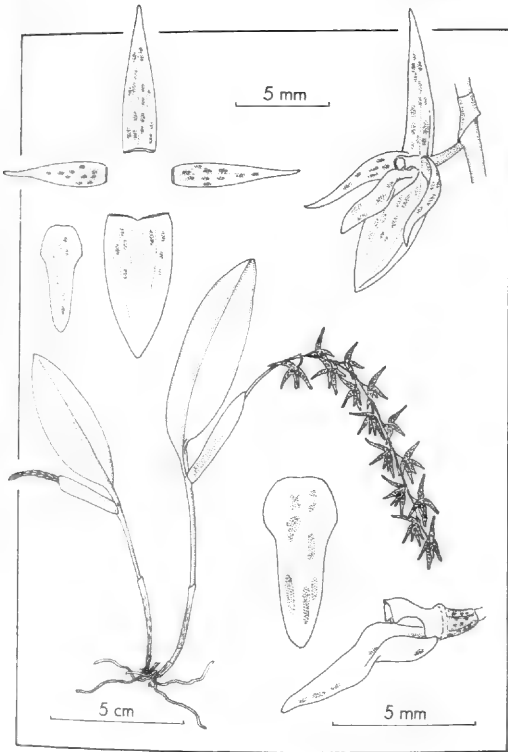


Fig. 5. *Pleurothallis loranthophylla*

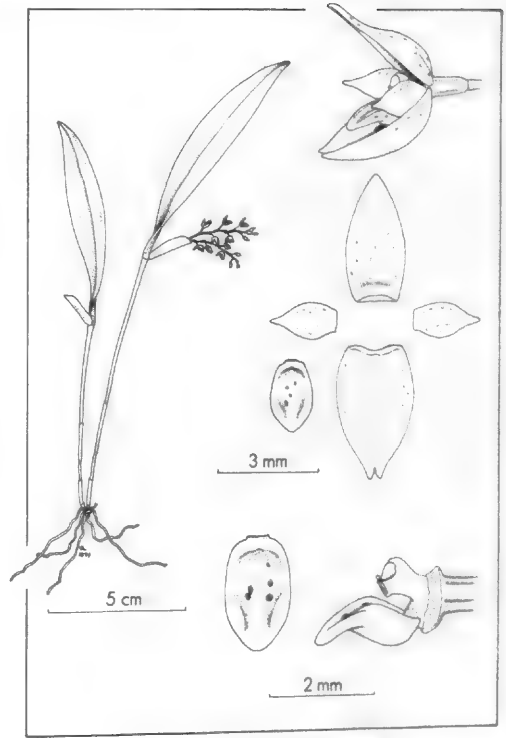


Fig. 6. *Pleurothallis micklowii*

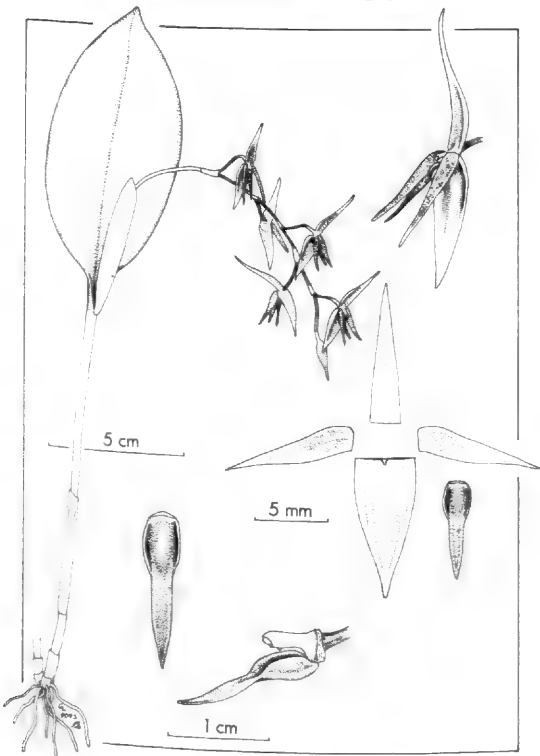


Fig. 7. *Pleurothallis pedunculata*

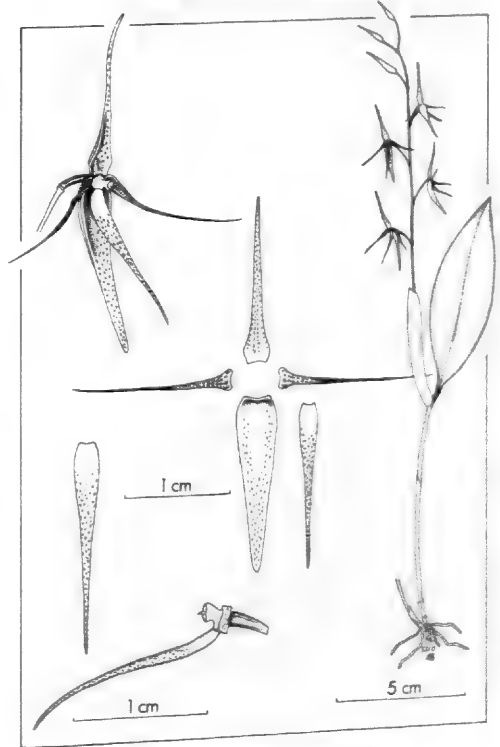


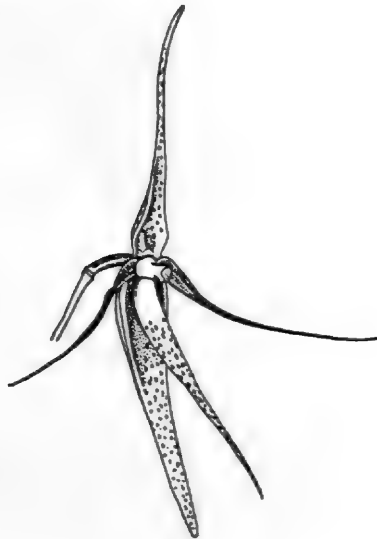
Fig. 8. *Pleurothallis schweinfurthii*

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SYSTEMATICS OF THE SUBGENUS *TALPINARIA*
OF *PLEUROTHALLIS* (ORCHIDACEAE)

ABSTRACT

Subgenus *Talpinaria* (Karst.) Luer of *Pleurothallis* R. Br. is described. A key to the species is given. Each species is described and illustrated with a black and white drawing.

From a collection from the Eastern Cordillera of Colombia, Karsten published the monotypic genus *Talpinaria* in 1859 with *T. bivalvis* as the species. The accompanying description and illustration are accurately detailed. In 1886, Reichenbach transferred the species to *Pleurothallis* as *P. talpinaria*. The epithet *bivalvis* was occupied by a different species (*P. bivalvis* Lindl., 1846, a species of section *Macrophyllae-Fasciculatae*). In 1921, apparently unaware of *P. talpinaria*, Schlechter described a Peruvian collection as *P. trimeroglossa*, followed by an unmistakable illustration. By a strange coincidence, Schlechter compared the species to Lindley's *P. bivalvis*, which bears no similarities.

In the century and a half since *P. talpinaria* was recognized, only three other species with a similar habit that fit nowhere else have come to attention: *P. punctulata* in 1888, *P. hitchcockii* in 1922, and *P. sandemanii* in 1996. Each has a distinctive lip. The subgenus is characterized by a well-developed ramicaul, a petiolate leaf, and a single, successive flower produced laterally with a conspicuous spathe from near the apex of the ramicaul. A similar habit is seen in subgenus *Rhynchopera* and some species of subgenus *Crocodelanthe* (Rchb.f. & Warsz.) Luer and subgenus *Dracontea* Luer, but all these species are distinguished by a racemose inflorescence.

The remarkable flowers of subgenus *Talpinaria* differ significantly from each other, causing an uneasy alliance. The dorsal sepals are ovate and free from the laterals that are connate into an ovate synsepal. The petals are narrowly acute, trilobed in *P. hitchcockii*. The lip of each species is distinct with lobes and calli unlike each other. The column of *P. hitchcockii* is short with a protruding anther-cap, while the column of the other three species is elongate with the apex hooded.

SUBGENUS *TALPINARIA*

***Pleurothallis* subgenus *Talpinaria* (Karst.) Luer, Monogr. Bot. Syst. 20: 96, 1986.**

Bas.: *Talpinaria* Karst., Fl. Columb. 1: 153, 1861.

Type: *Talpinaria bivalvis* Karst., Fl. Columb. 1: 153, 1861 = *P. talpinaria* (Karst.) Rchb.f.

Ety.: From the Latin *talpinus*, "molelike," referring to the fimbriate lobes of the lip, which were probably compared to the snout of the star-nosed mole.

Plants perennial, medium in size to large, epiphytic, caespitose; roots slender. Ramicauls erect, non-pseudobulbous, unifoliate, enclosed by a tubular sheath below the middle, and another 2-3 other sheaths at the base. **Leaf** erect, coriaceous, elliptical to ovate, the apex subacute to obtuse, the base petiolate, sometimes twisted. **Inflorescence** a successive, single flower, borne from a conspicuous spathe from near the apex of the ramicaul; peduncles abbreviated; floral bracts infundibular or tubular; pedicels slender, longer than the floral bract, bearing the flower beyond the spathe; ovary smooth, trivalvate; flowers showy, resupinate; sepals glabrous, non-caudate, the dorsal sepal free from the lateral sepals, the lateral sepals connate into a concave synsepal; **petals** elongate, acute, trilobed in one species; **lip** variously lobed, variously callous, the base delicately hinged to the base of the column or column-foot; **column** short to elongate, the anther, rostellum and stigma ventral, pollinia 2, obovoid, with a minute viscidium.

LIST OF SPECIES ATTRIBUTABLE TO SUBGENUS *TALPINARIA*

<i>Pleurothallis hitchcockii</i> Ames.....	Fig. 1.
<i>Pleurothallis magnispatha</i> Foldats = <i>Pleurothallis punctulata</i>	
<i>Pleurothallis punctulata</i> Rolfe	Fig. 2.
<i>Pleurothallis ringens</i> C.Schweinf. = <i>Pleurothallis hitchcockii</i>	
<i>Pleurothallis sandemanii</i> Luer.....	Fig. 3.
<i>Pleurothallis talpinaria</i> Rchb.f.....	Fig. 4.
<i>Pleurothallis trimeroglossa</i> Schltr. = <i>Pleurothallis talpinaria</i>	

KEY TO THE SPECIES OF SUBGENUS *TALPINARIA*

- 1 Petals 2- or 3-lobed above the base; lip 5-lobed.....*P. hitchcockii*
 1' Petals entire; lip not 5-lobed2
- 2 Lip entire, with a tall "U-shaped" callus.....*P. sandemanii*
 2' Lip lobed3
- 3 Lip 4-lobed, with recurved, fringed, lateral lobes.....*P. talpinaria*
 3' Lip 3-lobed, with low, erect, lateral lobes.....*P. punctulata*

Pleurothallis hitchcockii Ames, *Orchidaceae* 7: 117, 1922.

Fig. 1.

Ety.: Named in honor of Albert Spear Hitchcock who first collected this species.

Syn.: *Pleurothallis ringens* C.Schweinf., *Bot. Mus. Leaflet* 10: 184, 1942.Ety.: From the Latin *ringens*, "gaping," referring to the flower.

Plant medium in size to large, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 4-18 cm long, with a tubular sheath below the middle and 2-3 other sheaths at the base. **Leaf** erect, coriaceous, elliptical, subacute, petiolate, 6-10 cm long including the twisted petiole 0.5-1.5 cm long, 1.5-4.5 cm wide, cuneate below into the petiole. **Inflorescence** a single, successive flower produced in a fascicle within a foliaceous spathe 1.5-2 cm long near the apex of the ramicaul; peduncles 1-2 mm long deep within the spathe; floral bracts thin, tubular, 5-6 mm long; pedicels 6-18 mm long; ovary 4-5 mm long; **sepals** light yellow-green to light tan, heavily marked with purple or purple-brown, glabrous, the dorsal sepal ovate, acute, concave, 12-19 mm long, 5-6 mm wide, 3-veined, the lateral sepals connate into an ovoid, concave, acute synsepal, 12-17 mm long, 4.5-5 mm wide, 4-veined; **petals** translucent yellow with purple midvein, 3-lobed between middle and lower third, the midlobe acute, long attenuate, the lateral lobes minute, acute, obtuse or obsolescent, 6-8 mm long, 1-1.5 mm wide in lower third; **lip** green, heavily marked with purple, 5-lobed, 6-8 mm long, 3.5-5 mm wide expanded, the midlobe triangular, acute, the midlobes erect, curved, rounded, the basal lobes digitiform, incurved, ca. 2 mm long, decurved, obtuse, subtrilobed apical segment, the disc sulcate between a low pair of calli near the middle, the base narrowed, shortly unguiculate, truncate, attached to the base of the column; **column** more or less conical, 2 mm long, with the anther-cap protruding, with the viscidium and stigma ventral.

GUYANA: Potaro, 10 miles south of Potaro Landing, 7-8 Jan. 1920, A. S. Hitchcock 17394 (Holotype: AMES; Isotype: HB); Takuku village, left bank of the Cayuni, 21 July 1896, E. F. im Thurn 150 (K); Pakaraima Mts., Mt. Latipú, alt. 750 m, 10 Nov. 1979, P. J. M. Maas et al. 4239 (K, U).

VENEZUELA: Bolívar: Río Icabarú, second falls below junction with Río Uaiparú, May 1957, G. C. K. Dunsterville 406.

ECUADOR: **Pichincha**: new road between Quito and Santo Domingo, alt. 2500 m, 1 Apr. 1985, C. Luer & C. Dodson 11032 (MO). **Napo**: Cabañas Allinahui near Hatun-Sacha, alt. 450 m, Mar. 1991, A. Hirtz & X. Hirtz 5316 (MO). **Pastaza**: Tena, 14 Oct. 1939, E. Asplund 9310 (S, US). **Morona-Santiago**: Cordillera del Cutucú, new road east of Mendez, alt. 700 m, 5 Feb. 1987, C. Luer, J. Luer & A. Hirtz 12637 (MO); same area, new road from Mendez to Morona, alt. 950 m, 17 Jan. 1989, C. Luer, J. Luer, A. & P. Jesup, A. Hirtz & S. Ortega 13956 (MO). Without collection data, collected by the Oxford University Expedition in 1960 1710 (AMES, K).

PERU: **Amazonas:** Bagua, Río Santiago, alt. 300 m, 25 Oct. 1962, *J. J. Wurdack 2414* (AMES, US). Río Cenepa, alt. 2,000 ft., 27 Nov. 1972, *B. Berlin 398* (MO). **Junín:** La Merced, Hda. Schuncke, alt. ca. 1200 m, 27 Aug.-1 Sept. 1923, *J. F. Macbride 5618* (holotype of *P. ringens*: F); Chanchamayo Valley, alt. 1500 m, Sept. 1929, *C. Schuncke 1097* (AMES, F); same area, alt. 1200 m, Sept. 1930, *C. Schuncke 1110* (AMES). **San Martín:** Mariscal Cáceras, Toache Nuevo, alt. ca. 500 m, cult. Sept. 1978, *T. Plowman 7571* (SEL), C. Luer illustr. 3447.

This showy species is infrequent, but widely distributed. It is variable in size and colors, but the details of the intricate lip are constant. One or several single flowers appear from a conspicuous spathe at the base of a twisted petiole. The dorsal sepal is free from the concave synsepal. The petals are hidden inside the margins of the dorsal sepal. The unique lip is bilobed above a narrow base with the lobes finger-like and curving downward, with the tips more or less contained inside a pair of erect, larger, rounded lobes that occupy the middle third of the lip. The anterior lobe is triangular. The column is short and conical with an elongate, protruding anther-cap.

Pleurothallis punctulata Rolfe, Gard. Chron. 2: 756, 1888.

Fig. 2.

Ety.: From the Latin *punctulata*, "spotted," referring to the flowers.

Syn.: *Humboldtia punctulata* (Rolfe) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis magnispatha* Foldats, Acta Bot. Venez. 3: 382, 1968.

Ety.: From the Latin *magnispatha*, "with large spathe," referring, of course, to the spathe.

Plant medium in size to large, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 4-11 cm long, with a tubular sheath below the middle and 2-3 other sheaths at the base. **Leaf** erect, rigid, thickly coriaceous, blue-green glaucous beneath, elliptical-ovate, subacute to obtuse, petiolate, 7-10 cm long including a twisted petiole 0.5-1 cm long, 2-4.5 cm wide, rounded or broadly cuneate below, contracted into the petiole. **Inflorescence** a single, successive flower produced in a fascicle within a foliaceous spathe 2.5-3.5 cm long near the apex of the ramicaul; peduncles 2-3 mm long deep within the spathe; floral bracts thin, tubular, 7-8 mm long; pedicels 20-23 mm long; ovary 9-10 mm long; **sepals** yellow to light tan, variously spotted with red-purple, glabrous, the dorsal sepal ovate, subacute to obtuse, 22 mm long, 8 mm wide, 5-veined, the lateral sepals connate into an obovate, concave, obtuse synsepal, 22 mm long, 12 mm wide, 8-veined; **petals** light purple, suffused and spotted with darker purple, narrowly ovate, acute, 12 mm long, 3.5 mm wide; **lip** fleshy, white, covered with purple verrucae, oblong-trilobed, 14 mm long, 7 mm wide, the anterior lobe ovate, obtuse, minutely crose, the midlobes erect, low, obtuse, the disc broadly sulcate above the truncate base, hinged to the column-foot; **column** semiterete with low wings above the middle, 6 mm long, with the anther and stigma ventral.

COLOMBIA: New Granada, imported by Mssrs. Veitch, received at Kew for identification, Dec. 1988, *J. Veitch s.n.* (Holotype: K); New Granada, 1846-52, *L. Schlim s.n.* (AMES); *L. Schlim 1770* (W). **Santander:** west slope of Páramo Rico, alt. 3200 m, 15 Jan. 1927, *E. P. Killip & A. C. Smith 17840* (US); between Duitama and Charalá, 6 Jan. 1941, *O. Renz 3698* (AMES). **Norte de Santander:** subpáramo forest, Páramo de Jurisdicciones, alt. 2820 m, 10 Nov. 1981, *C. Luer, J. Luer, R. Escobar & D. Portilla 6642* (SEL).

VENEZUELA: **Táchira:** cabeceras del Río Quinimari, alt. 2400 m, 10 Jan. 1968, *J. A. Steyermark & G.C.K. Dunsterville 100626* (AMES, VEN); below Páramo de Tamá, near Colombian border, alt. 2475-2550 m, 18 May 1967, *J. A. Steyermark & G.C.K. Dunsterville 98347* (holotype of *P. magnispatha*: AMES, isotype: VEN).

This handsome species is known from westernmost Colombia and adjacent easternmost Venezuela. It is characterized by a thick, rigid leaf that is bluish green-glaucous beneath and sometimes mottled above. The petiole is twisted to permit the large spathe to rise along the back surface of the leaf. A large, purple-spotted flower emerges from the spathe. The sepals are obtuse and the petals are acute. The large, obtuse lip is three-lobed below the middle and covered by multiple, minute, purple papillae.

Pleurothallis sandemanii Luer, *Orquideología* 22: 222, 1996.

Ety.: Named in honor of its collector, C. Sandeman.

Fig. 3.

Plant large, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5-13 cm long, with a close, tubular sheath below the middle and 2-3 others at the base. **Leaf** erect, coriaceous, elliptical, obtuse, long-petiolate, the blade 6-11 cm long, 3-4.5 cm wide, cuneate below into a slender petiole 1.5-3 cm long. **Inflorescence** single-flowered, flowers red-brown, often produced in pairs, borne from an ascending spathe 10-18 mm long, near the apex of the ramicaul; peduncles 10-15 mm long; floral bracts 7 mm long; pedicels 10-12 mm long; ovary 4 mm long, costate; **sepals** glabrous, membranous, the dorsal sepal free, ovate, acute, slightly concave, 12 mm long, 5.5 mm wide, 3-veined, the lateral sepals connate into a narrowly ovate, acute synsepal, 13 mm long, 4 mm wide, 6-veined; **petals** widely spread, glabrous, membranous, elliptical-ovate, oblique, acute, 11 mm long, 3.5 mm wide, 3-veined; **lip** protuberant, ovate, acute, 5 mm long, 2 mm wide, the disc with an erect, rounded callus above the base that divides into two rami that disappear near the middle, shallowly cleft between, the base narrowed, subunguiculate, hinged to the base of the column-foot; **column** semiterete, 2 mm long, the anther, rostellum and stigma ventral, the foot thick with the end of the ovary.

COLOMBIA: **Meta**: epiphytic near Villavicencio, alt. 1600 ft. (ca. 500 m), Mar. 1948, C. Sandeman 5872 (Holotype: K), C. Luer illustr. 16388.

This species from lowland southeastern Colombia is apparently rare, known from only the type-collection. The elliptical leaves are remarkably long-petiolate. From near the base of the petiole solitary flowers arise from a conspicuous, foliaceous spathe. The relatively large, red-brown flowers, often produced in pairs, spread widely. The broad petals are held obliquely to either side while the ovate lip protrudes from the center. At the base of the disc a tall, horseshoe-shaped callus gradually decreases toward the apex.

Pleurothallis talpinaria Rchb.f., *Flora* 69: 554, 1886.Ety.: Named for the genus *Talpinaria* Karst. in which the species was originally published.

Fig. 4.

Syn.: *Talpinaria bivalvis* Karst., *Fl. Columb.* 1: 153, 1859, not *P. bivalvis* Lindl. 1846.Ety.: From the Latin *bivalvis*, "bivalved," referring to the bilabiate flower.Syn.: *Pleurothallis trimeroglossa* Schltr., *Repert. Spec. Nov. Regni Veg. Beih.* 9: 78, 1921.Ety.: From the Greek *trimeroglossa*, "a three-parted lip," referring to the apex of the labellum.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5-13 cm long, with a close, tubular sheath below the middle and 2-3 others at the base. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, petiolate, 4-11 cm long, 1-2.5 cm wide, cuneate below into a petiole 0.5-1.5 cm long. **Inflorescence** a single, successive flower, borne from an ascending spathe 10-17 mm long, from near the apex of the ramicaul; peduncles fasciculate, 2-3 mm long; floral bracts 10-12 mm long; pedicels 10-18 mm long; ovary 8 mm long; **sepals** green to white, glabrous, membranous, the dorsal sepal free, ovate, subacute, slightly concave, 10-11 mm long, 5 mm wide, 7-veined, the lateral sepals connate into an ovate, subacute, minutely bifid synsepal, similar to the dorsal sepal, 10-11 mm long, 5-5.5 mm wide, 8-veined; **petals** widely spread, glabrous, narrowly linear, acute, 6-7 mm long, 0.5-0.9 mm wide, 1-veined; **lip** protuberant, oblong-four lobed, 8 mm long, 3 mm wide, the apex forked into 2 acute lobes with a thick, protruding lobe-like callus between, the lateral lobes rounded, fimbriate and revolute near the middle, also revolute above the base, with the margins meeting beneath, the disc with an erect, low, conical callus above the base, the base tubular, subunguiculate, hinged to the edge of the base of the column-foot; **column** slender, semiterete, subclavate, 5 mm long, the anther, rostellum and stigma ventral, the apex of the foot protruding from the end of the ovary.

COLOMBIA: **Cundinamarca**: "Bogotá," *H. Karsten #6* (Holotype of *Talpinaria bivalvis*: W); Andes of Bogotá, El Boquerón, alt. 2690 m, 1856, *Triana 1229* (W); Boquerón de San Francisco near Bogotá, alt. 2700 m, 21 Jan. 1883, *F. C. Lehmann 2468* (W); slopes of Páramo de Guerrero near Zipaquirá, alt. 26-3000 m, May, *F. C. Lehmann 7063* (K). **Cauca**: west slopes of Sotará, alt. 3000 m, 21 Feb. 1884, *F. C. Lehmann 3738* (G). **Valle del Cauca**: Nogales, east of El Placer, alt. 2300 m, 13 Sept. 1991, *P. Silverstone & J. Giraldo 6383* (CUVC, MO).

VENEZUELA: **Dist. Fed.**: Near the Leprocomio, west of Junquito, collected by C. García E, 1959, *G. C. K. Dunsterville 521*. Without locality, flowered at K, received 21 Aug. 1961 from *G. C. K. Dunsterville s.n.* (K).

ECUADOR: **Morona-Santiago**: Río Yangantza below Limón, alt. 1600 m, 17 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11864* (MO). **Zamora-Chinchi**: south of Loja, Cajanuma range, alt. 2500 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10774* (MO).
 PERU: **Junín**: Huancayo, valley of Pariahuanca, between Panti and Rocchac, alt. 2400 m, Mar. 1913, *A. Weberbauer 6541* (holotype of *P. trimeroglossa* presumably destroyed at B; lectotype here designated: AMES 2769).

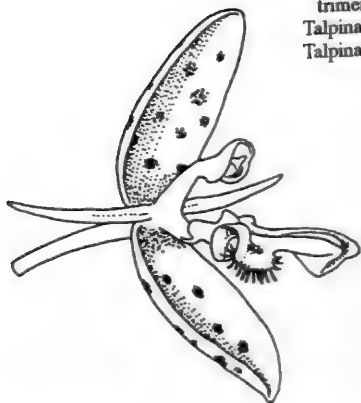
First described in a monotypic genus, this species is still unique in the Pleurothallidinae, even though a few vegetatively similar species are now known. The single flowers are produced from a conspicuous spathe at the base of the petiole of the leaf. The dorsal sepal is free from the synsepal, and the petals are narrowly linear. The peculiarly lobed lip is without comparison. The apex is forked into a pair of acute lobes with a thick, pointed callus nearly as long between them. The lateral lobes are rounded, long-fimbriate, and acutely recurved beneath to meet in the middle. The claw-like base is tubular with revolute margins, and delicately hinged to a protruding column-foot.

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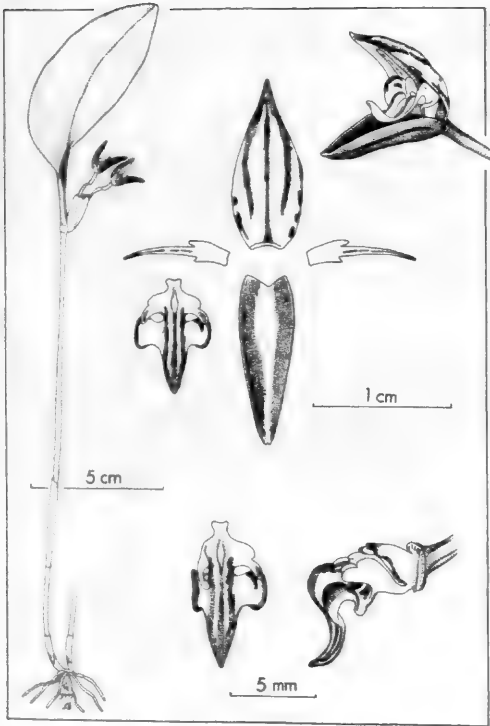


Fig. 1. *Pleurothallis hitchcockii*

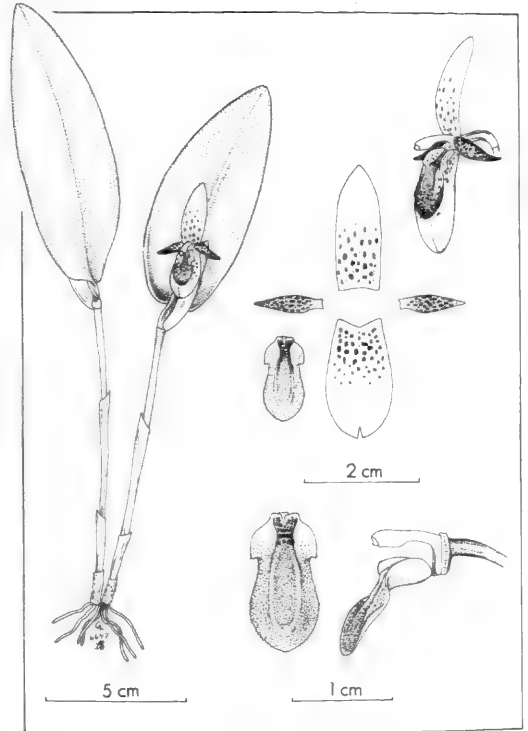


Fig. 2. *Pleurothallis punctulata*

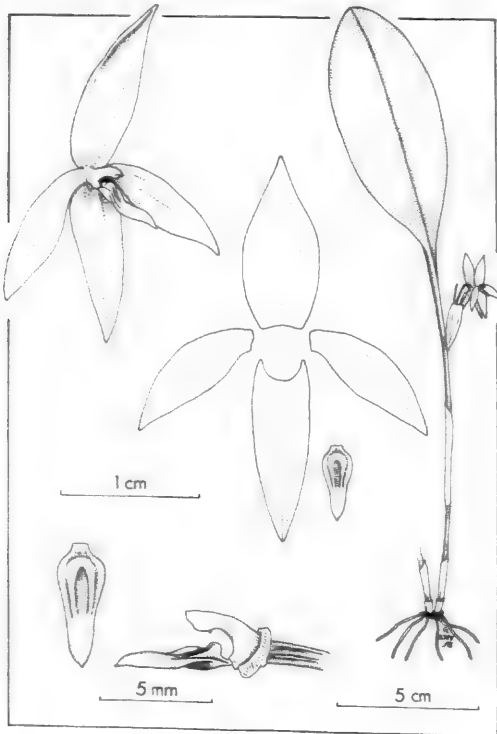


Fig. 3. *Pleurothallis sandemanii*

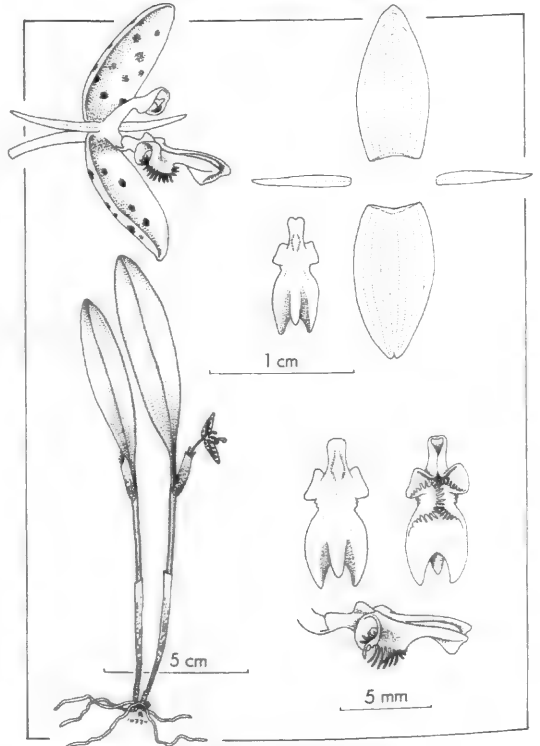


Fig. 4. *Pleurothallis talpinaria*

ADDENDA TO *LEPANTHES*, *MASDEVALLIA*, *PLATYSTELE*, *PLEUROTHALLIS*,
RESTREPIA AND *SCAPHOSEPALUM*

ABSTRACT

The following new species of *Lepanthes* Sw., *Masdevallia* Ruiz & Pav., *Platystele* Schltr., *Pleurothallis* R.Br. subgen. *Kraenzlinella*, *Restrepia* and *Scaphosepalum* Pfitz. are described. The plates are numbered as continuations of their respective appearances in *Icones*.

New species:

- Lepanthes caudigera* Luer & Hirtz, sp. nov.
Lepanthes conchilabia Luer & Hirtz, sp. nov.
Lepanthes cyrtostele Luer & Hirtz, sp. nov.
Lepanthes exserta Luer & Hirtz, sp. nov.
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Masdevallia manoloi Luer & Arias, sp. nov.
Masdevallia martiniana Luer, sp. nov.
Masdevallia niesseniae Luer, sp. nov.
Masdevallia regina Luer, sp. nov.
Platystele hampshireae Luer, sp. nov.
Pleurothallis phrynoglossa Luer & Hirtz, sp. nov.
Restrepia piperitosa Luer, sp. nov.
Scaphosepalum manningii Luer, sp. nov.

The following eight species of *Lepanthes* from Ecuador raise the total number of species for the genus in Ecuador to 286.

***Lepanthes caudigera* Luer & Hirtz, sp. nov.**

Fig. 267.

Ety.: From the Latin *caudiger*, "tail bearing," referring to the projecting column and lip.

Planta parva, racemo brevissimo congesto folio late ovato brevioris, sepalis longiacuminatis caudatis sparsim minute ciliatis, petalis transverse bilobis, lobis anguste oblique late triangularibus minute pubescentibus, lobis aequalibus, labelli laminae oblongis pubescentibus, connectivis basalibus ad columnam supra medium connatis, appendice vomeriformi.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 1.5-2.5 cm long, enclosed by 6-7 minutely ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, broadly ovate, obtuse, margined, 8-12 mm long, 7-9 mm wide, the base broadly cuneate or rounded, contracted into a petiole 1 mm long. **Inflorescence** a congested, distichous, successively few-flowered raceme up to 3 mm long, borne behind the leaf by a slender peduncle 2-3 mm long; floral bracts 0.75 mm long, glabrous; pedicels 1 mm long; ovary 1.75 mm long; **sepals** light yellow, sparsely minutely ciliate, the dorsal sepal broadly ovate, acute, long-acuminate, 6.5 mm long, 2 mm wide, connate to the lateral sepals for 0.5 mm, the lateral sepals ovate, oblique, acute, long-acuminate, 8 mm long, 1.5 mm wide, connate 1.5 mm; **petals** red with yellow border, minutely pubescent, transversely bilobed, 1 mm long, 2 mm wide, the lobes obliquely and broadly triangular, subacute, the lobes equal; **lip** red, bilaminar, the laminae oblong, convex, 1.25 mm long, pubescent, with the bases and apices rounded, the connectives short, from the bases of the blades, connate to the column above the middle, the appendix plow-shaped along the undersurface of the column, ciliate; **column** 1.5 mm long, the anther subapical and the stigma ventral.

ECUADOR: **Carchi**: south of Chical, Cerro Oscuro, alt. 2100 m, May 1997, A. Hirtz 6562 (Holotype: MO), C. Luer illustr. 18687.

This species, apparently endemic in northwestern Ecuador, is distinguished by the short inflorescence, much shorter than the small, broadly ovate leaf. The sepals are long-acuminate or with slender tails. The lobes of the petals are broadly and are obliquely triangular and about equal in size and shape. The blades of the lip are attached at the bases to the column near the middle. The appendix is plow-shaped along the undersurface of the column. The above characters place this species in subsection *Lepanthes* series *Lepanthes*.

Lepanthes conchilabia Luer & Hirtz, sp. nov.

Fig. 268.

Ety.: From the Latin *conchilabia*, "with shell-like lip," referring to the labellum.

Planta parva, inflorescentia cum racemo laxo folio anguste elliptico brevior, sepalis acutis laterali-bus uninervis, petalis glabris transverse panduriformibus, labelli laminis glabris oblongis arcuatis conca-vis, appendice nulla.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 3-7 cm long, enclosed by 6-7 closely fitting, lepanthiform sheaths with microscopically scabrous ribs. **Leaf** erect, coriaceous, narrowly elliptical, acute, 20-35 mm long, 7-8 mm wide, the base narrowly cuneate into a petiole ca. 1.5 mm long. **Inflorescence** a lax, successively several-flowered raceme up to 25 mm long including the slender peduncle 5-7 mm long; floral bracts 1.5 mm long; pedicels 1 mm long; ovary 1.5 mm long; **sepals** pale yellow, glabrous, the dorsal sepal concave above the base, ovate, acute, 4.75 mm long, 2.5 mm wide, 3-veined, connate to the lateral sepals for 0.75 mm, the lateral sepals tall-carinate, ovate-triangular, oblique, acute, 4.25 mm long, 1.5 mm wide, each 1-veined, connate 0.75 mm; **petals** glabrous, white with purple margin, transversely bilobed-panduriform, 0.75 mm long, 2.8 mm wide, the upper lobe broadly oblong, 1.5 mm long, 1.2 mm wide, the lower lobe triangular, narrowly obtuse, with the outer margin dilated, 1.3 mm long, 1 mm wide; **lip** glabrous, white with purple margins, bilobed, sublimate, the lobes oblong, arcuate, convex, concave beneath, with the apices narrowly obtuse, the bases rounded, 1.2 mm long, enclosing the column, without connectives, arising directly from a transverse body without an appendix, the body thick, connate to the column about midway to the base; **column** 2 mm long, the anther dorsal and the stigma apical.

ECUADOR: Imbabura: Mariano Acosta, El Tambo Reserve, alt. 3500 m, 21 Feb. 1998, A. Hirtz & J. del Hierro s.n. (Holotype: MO), C. Luer 18762.

This species, apparently endemic in northern Ecuador, is distinguished by the small habit with narrow, elliptical leaves; a shorter, lax, few-flowered raceme; and single-veined lateral sepals. In the key it would appear among those in section *Lepanthes* subsection *Breves* series *Breves*. The sepals are ovate, acute and glabrous. The petals are transversely pandurate. The lobes of the lip are arcuate and convex with a lateral groove that suggests an attempt to form a blade. The concave inner surfaces enclose the long, arcuate column and the transverse body is connate to the mid-portion of the column. The lobes arise from the body without connectives, and there is no appendix.

Lepanthes cyrtostele Luer & Hirtz, sp. nov.

Fig. 269.

Ety.: From the Greek *kyrtostele*, "bent column," referring to the curved column.

Planta mediocris vel grandis, racemis subaxe successivifloris folio angustissime elliptico-ovato plus minusve leviter brevioribus, sepalis acutis minute denticulatis, lateralibus 1-nervis, petalis transverse bilobis, lobis triangularibus, lobo superiore leviter majore, labelli laminis oblongis convexis longiciliatis, connectivis brevibus obliquis, appendice triangulari apice ciliata, columna arcuata stigmatibus bilobis.

Plant medium to large, epiphytic, caespitose; roots coarse. Ramicauls stout, erect, 10-25 cm long, enclosed by 10-14 glabrous, gray, ribbed lepanthiform sheaths with oblique, non-dilated ostia. **Leaf** suberect, coriaceous, more or less suffused with purple, narrowly elliptical-ovate, acute, 6-9 cm long, 1-1.6 cm wide, the base cuneate into a petiole 5-6 mm long. **Inflorescence** a subax, distichous, successively many-flowered raceme, 3-7 cm long, borne by a slender peduncle 1-1.5 cm long, along the back of the leaf, occasionally 2 flowers open simultaneously; floral bracts narrowly infundibular, 2-2.5 mm long; pedicel 1-1.5 mm long; ovary 2.5 mm long, papillose along ribs; **sepals** denticulate, carinate, the dorsal sepal purple with yellow-green margin, ovate, acute, 7 mm long, 4 mm wide, 3-veined, connate 1.5 mm to the lateral sepals, the lateral sepals microscopically cellular-glandular, purple on inner half, yellow on outer half, ovate, acute, 7 mm long, 3 mm wide, 1-veined, connate 1-1.5 mm; **petals** yellow, minutely pubescent, transversely bilobed, 1.8 mm long, 4 mm wide, the lobes triangular, narrowly obtuse, the upper lobe larger; **lip** white, purple medially, bilaminate, the blades narrowly elliptical-falcate, 3 mm long, long-ciliate, the apices narrowly rounded, the bases broader, convex and obliquely acute, the connectives broad, oblique, the body broad, connate to the base of the column, the appendix small, oblong, ciliate at the tip; **column** slender, arcuate, 2.5 mm long, the anther apical, the stigma transversely bilobed.

ECUADOR: **Carchi**: Bolívar, above La Paz, epiphytic in cloud forest, alt. 3300 m, 18 Feb. 1998, C. Luer, J. Luer, A. Hirtz & J. del Hierro 18748 (Holotype: MO; Isotype: QCNE). **Imbabura**: Mariano Acosta, El Tambo, alt. 3500 m, 21 Feb. 1998, A. Hirtz & J. del Hierro s.n. (MO, QCNE); Mariano Acosta, alt. 3300 m, Aug. 1997, A. Hirtz, X. Hirtz & E. Sánchez 6586 (Holotype MO), C. Luer illustr. 18689.

This species occurs at an altitude over 3300 meters above sea level. It is apparently endemic in northern Ecuador. By virtue of the subax racemes shorter than the leaves, and with the lateral sepals one-veined, it falls into section *Lepanthes* subsection *Breves* series *Breves*. It is distinguished by the pale, non-dilated, ribbed, lepanthiform sheaths that cover a tall ramicaul; narrowly elliptical-ovate leaves; and a successively flowered inflorescence the eventually approaches the length of the leaves. The sepals are acute and minutely denticulate; the laterals are single-veined. The lobes of the transverse petals are triangular and obtuse. The protruding column is arcuate and covered by narrow, long-ciliate blades of the lip.

***Lepanthes exserta* Luer & Hirtz, sp. nov.**

Fig. 270.

Ety.: From the Latin *exsertus*, "protruding," referring to the projecting column and lip.

Planta parva, inflorescentia cum racemo congesto longipedicellato folio ovato acuto breviori, sepalis obtusis glabris, petalis transverse bilobis, lobis anguste anguste triangularibus minute pubescentibus, lobo superiore duplo majore, labelli laminis oblongis pubescentibus, connectivis brevibus supra medium, corpore ad columnam supra medium connato, appendice crasso truncato.

Plant small, epiphytic, caespitose; roots slender. Ramicauls very slender, erect, 3-4.5 cm long, enclosed by 10-12 ciliate, lepanthiform sheaths with acuminate ostia. **Leaf** spreading, thinly coriaceous, ovate, acute, 2-2.5 cm long, 0.8-1 cm wide, the base broadly cuneate into a petiole less than 1 mm long. **Inflorescence** a congested, secund, long-pedicellate, successively flowered raceme up to 6 mm long, borne on top of the leaf by a slender peduncle 3-10 mm long; floral bracts 0.5 mm long, glabrous; pedicels 1.5-2 mm long; ovary 1 mm long; **sepals** light green, glabrous, the dorsal sepal ovate, obtuse, 2.5 mm long, 1.75 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals connate 1.5 mm into a broadly ovate, bifid lamina, with apices obtuse, very shortly acuminate, 2.25 mm long, 2.5 mm wide, each sepal 2-veined; **petals** pink, minutely pubescent, transversely bilobed, 0.5 mm long, 2.5 mm wide, the lobes narrowly triangular, acute, the upper lobe twice larger than the lower lobe; **lip** pink, bilaminate, the laminae oblong, convex, 1.5 mm long, pubescent, with the bases and apices rounded, the connectives short, from above the middle, the body broad, connate to the column above the middle, the appendix thick, truncate; **column** 1.75 mm long, the anther and the stigma ventral.

ECUADOR: **Carchi**: south of Chical, Cerro Oscuro, alt. 2100 m, May 1997, A. Hirtz 6552 (Holotype: MO), C. Luer illustr. 18688.

A member of subsection *Lepanthes* series *Lepanthes*, this species, apparently endemic in northwestern Ecuador, is distinguished by the small, horizontal, ovate leaf with the inflorescence borne on top. The raceme is long-pedicellate; the sepals are obtuse; the lobes of the transverse petals are narrowly triangular; and the column protrudes forward bearing the blades of the lip horizontally and from above the middle of the column. The appendix is thick and truncate.

***Lepanthes generi* Luer & Hirtz, sp. nov.**

Fig. 271.

Ety.: From the Latin *gener, generi*, "of the son-in-law," referring to the close relationship of the sympatric *L. gloris*, the "sister-in-law."

Planta parva, inflorescentia cum racemo congesto disticho longipedicellato folio anguste ovato acuminato breviori, sepalis anguste ovatis minute pubescentibus, petalis transverse bilobis, lobis anguste triangularibus, lobo superiore duplo longiore, labelli laminis oblongis minute pubescentibus, connectivis late obliquis, appendice concava pubescenti.

Plant small, epiphytic, caespitose; roots slender. Ramicauls very slender, erect, 3-5.5 cm long, enclosed by 9-10 ciliate, lepanthiform sheaths with acuminate ostia. **Leaf** erect, thinly coriaceous, ovate, acute, acuminate, 3-5 cm long, 1.2-1.5 cm wide, the base broadly cuneate into a petiole 1 mm long. **Inflorescence** a congested, distichous, long-pedicellate, successively flowered raceme up to 5 mm long.

borne on top of the leaf by a slender peduncle 20-30 mm long; floral bracts 0.75 mm long, glabrous; pedicels 2-2.5 mm long; ovary 1 mm long; sepals dark red, minutely ciliate-pubescent, the dorsal sepal narrowly ovate, acute, 4 mm long, 1.5 mm wide, 3-veined, connate to the lateral sepals for 0.2 mm, the lateral sepals narrowly ovate, acute, 4 mm long, 1.25 mm wide, 2-veined, connate 1.5 mm; petals dark red, minutely pubescent, transversely bilobed, 0.5 mm long, 4 mm wide, the upper lobe narrowly oblong-triangular, obtuse at the tip, twice longer than the lower lobe, the lower lobe triangular, oblique, acute; lip dark red, bilaminate, the laminae oblong, convex, 1.5 mm long, minutely pubescent, with the bases and apices rounded, the connectives broad, oblique with the anterior margin short, connate to the column above the base, the appendix broadly concave, pubescent; column 0.75 mm long, the anther apical, the stigma ventral.

ECUADOR: Carchi: south of Chical, Cerro Oscuro, alt. 2100 m, May 1997, A. Hirtz 6558 (Holotype: MO), C. Luer illustr. 18685.

Also a member of subsection *Lepanthes* series *Lepanthes*, this species, apparently endemic in northwestern Ecuador, is similar to another sympatric species from which it is distinguished by broader leaves; long-pedicellate, distichous racemes; narrower sepals and petals; and a lip with the anterior margin of the connectives much shorter than the posterior margin.

***Lepanthes gloris* Luer & Hirtz, sp. nov.**

Fig. 272.

Ety.: From the Latin *glor*, *gloris*, "of the sister-in-law," referring to the close relationship of the sympatric *L. generi*, the "brother-in-law."

Planta parva, inflorescentia cum racemo congesto disticho brevipedicellato folio angustissime ovato acuminato brevior, sepalis ovatis acutis minutissime pubescentibus, petalis transverse bilobis, lobo superiore oblongo anguste obtuso lobo inferiore longiore, lobo inferiore angustissime triangulari, labelli laminae oblongis minute pubescentibus, connectivis late cuneatis, appendice concava pubescenti.

Plant small, epiphytic, caespitose; roots slender. Ramicauls very slender, erect, 3-6 cm long, enclosed by 10-11 minutely ciliate, lepanthiform sheaths with acuminate ostia. Leaf suffused with purple, erect, thinly coriaceous, very narrowly ovate, acute, acuminate, 2.5-5 cm long, 0.5-0.9 cm wide, the base cuneate into a petiole 1 mm long. Inflorescence a congested, distichous, short-pedicellate, successively many-flowered raceme up to 15 mm long, borne on top of the leaf by a slender peduncle 5-15 mm long; floral bracts 0.5 mm long, glabrous; pedicels 0.9 mm long; ovary 0.8 mm long; sepals light green, minutely ciliate, the dorsal sepal broadly ovate, subacute, 2.75 mm long, 2 mm wide, connate to the lateral sepals for 0.5 mm, the lateral sepals broadly ovate, oblique, subacute, 2.75 mm long, 1.5 mm wide, connate 0.75 mm; petals brown, minutely pubescent, transversely bilobed, 0.5 mm long, 3 mm wide, the upper lobe oblong, narrowly obtuse at the tip, slightly longer than the lower lobe, the lower lobe narrowly triangular, acute; lip brown, bilaminate, the laminae oblong, convex, 1 mm long, minutely pubescent, with the bases and apices rounded, the connectives broad, with the anterior margin as long as the posterior margin, connate to the base of the column, the appendix broadly concave, pubescent; column 1 mm long, the anther apical, the stigma ventral.

ECUADOR: Carchi: south of Chical, Cerro Oscuro, alt. 2100 m, May 1997, A. Hirtz 6551 (Holotype: MO), C. Luer illustr. 18686.

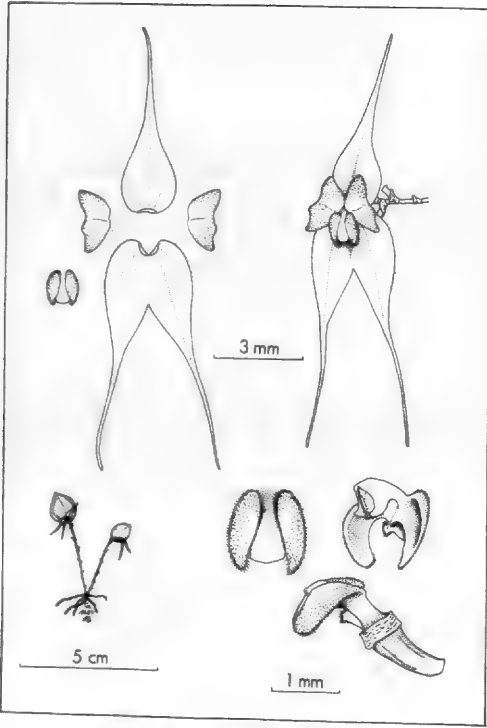
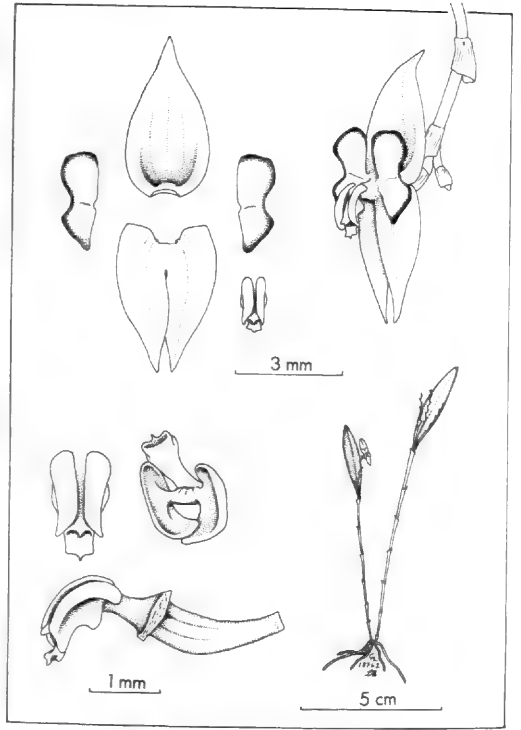
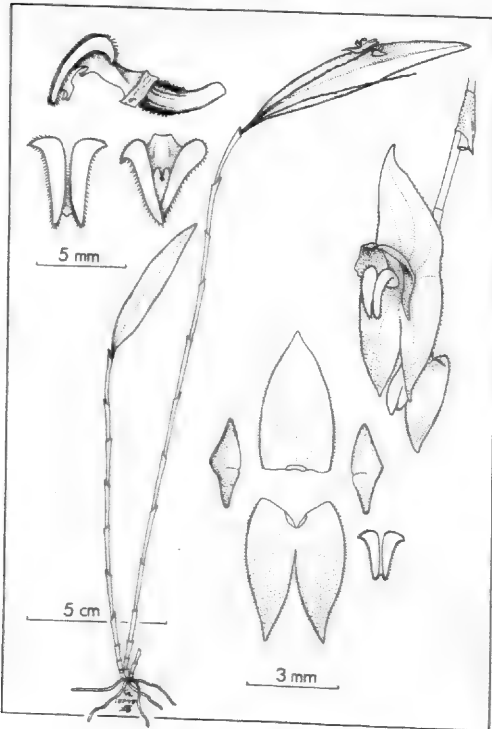
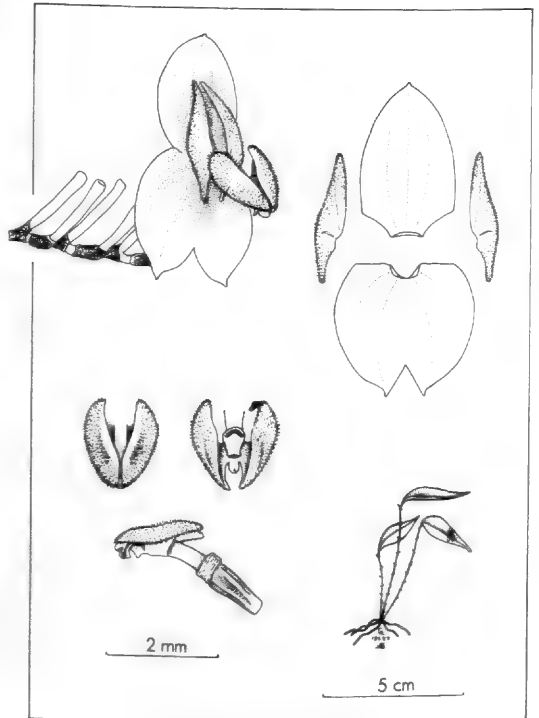
This species is a member of subsection *Lepanthes* series *Lepanthes*. It is apparently endemic in northwestern Ecuador, is similar to another sympatric species from which it is distinguished by very narrow leaves; short-pedicellate, distichous racemes; broader sepals and petals; and a lip with the anterior margins of the connectives as long as the posterior margins.

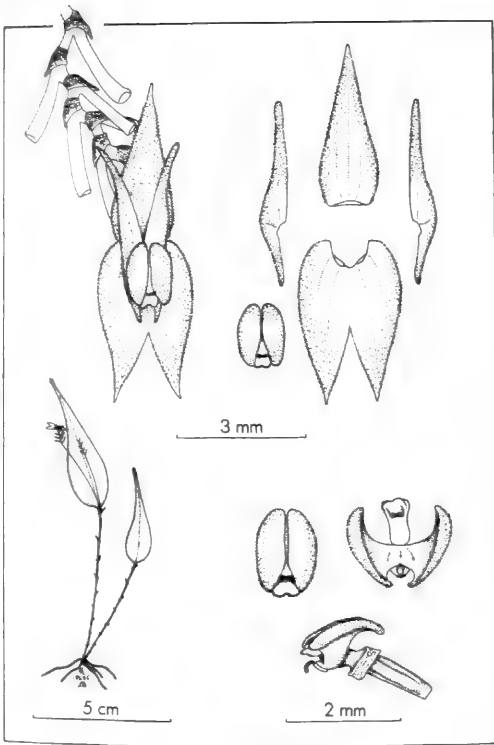
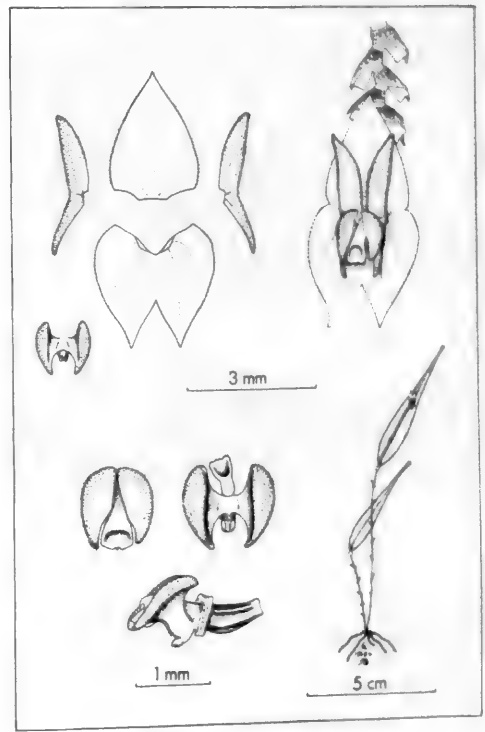
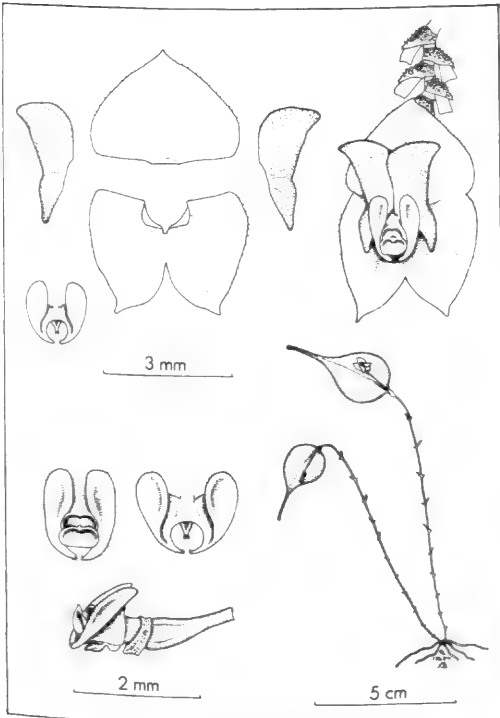
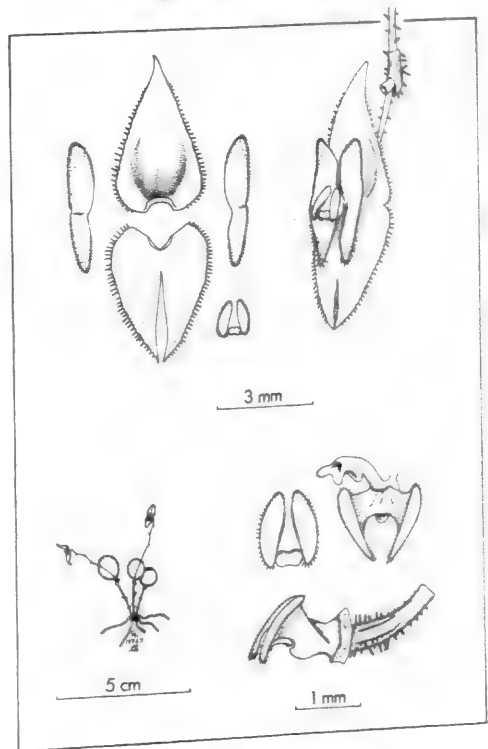
***Lepanthes longiacuminata* Luer & Hirtz, sp. nov.**

Fig. 273.

Ety.: From the Latin *longiacuminatus*, "long-acuminate," referring to the apex of the leaf.

Planta mediocris, inflorescentia cum racemo congesto disticho folio longiacuminato brevior, sepalis late ovatis obtusicaudatis sparsim minute ciliatis, petalis transverse bilobis minute pubescentibus, lobo superiore obtusicaudato truncato, lobo inferiore triangulari minore, labelli laminae ovatis minute pubescentibus, connectivis late cuneatis, corpore ad basim columnae connato, appendice ovata concava ciliata.

Fig. 267. *Lepanthes caudigera*Fig. 268. *Lepanthes conchilabia*Fig. 269. *Lepanthes cyrtostele*Fig. 270. *Lepanthes exserta*

Fig. 271. *Lepanthes generi*Fig. 272. *Lepanthes gloris*Fig. 273. *Lepanthes longiacuminata*Fig. 274. *Lepanthes ornifera*

Masdevallia manoloi Luer & Arias, sp. nov.

Plate 33.

Ety.: Named for Victor Mannel Arias, "Manolo," son of Manuel Arias Silva of Lima, Peru.

Inter species *Masdevalliae* subsect. *Caudatae* sepalis longissime caudatis, lateralibus ad medium in mentum profundo connatis, lateralorum marginibus supra medium incurvis et labello apice longissime lobulato distinguitur.

Plant medium in size, caespitose; roots slender. Ramicauls blackish, stout, erect, 1-2 cm long, enclosed by 2-3 loose, tubular sheaths. **Leaf** erect, coriaceous, long-petiolate, 5-8.5 cm long including the petiole 2-3 cm long, the blade elliptical, obtuse, 1.3-2.2 cm wide, cuneate below into the petiole. **Inflorescence** a single flower, borne by a slender, erect to suberect peduncle up to 12 cm long, with a bract near the base, from near the middle of the ramicaul; floral bract tubular, 12-15 mm long; pedicel 12-15 mm long; ovary 7 mm long; **sepals** yellow, with borders and veins blackish brown, the dorsal sepal erect, shallowly concave, 25-30 mm long, 12-14 mm wide, connate to the lateral sepals for 5 mm to form a short, shallow, sepaline cup, the apex obtuse, contracted into a slender tail 7.5 cm long, the lateral sepals ovate, oblique, 24 mm long, connate 13-14 mm into a deep cavity below the column-foot, 22 mm wide together, with the sides above the middle incurved, with the apices acute, in apposition, contracted into slender tails ca. 7 cm long; **petals** white, cartilaginous, ovate-triangular, 7 mm long, 3 mm wide, the apex acute with the upper margin incurved, the labellar margin with a thick callus ending in an incurved process extending beyond the base; **lip** subobovate, erect, arcuate, 7 mm long, 3.5 mm wide, with the margins thin, irregular above the middle, contracted in the distal quarter into a narrow lobule 1.5 mm long with a minute, rounded callus at the tip, the disc thickened toward the truncate base, hinged beneath to the column-foot; **column** thick, semiterete, 5 mm long, the foot equally long including the slender, incurved extension.

PERU: **Huánuco**: Huánuco, Acomayo, Zingo Monte, alt. 2500 m, collected by Saul Ruiz Pérez, 13 Sept. 1997, flowered in cultivation at Vivero Manuel Arias Silva, Lima, Peru, Nov. 1997, *C. Luer 18671* (Holotype: MO).

Among the species of section *Masdevallia* subsection *Caudatae*, this spectacular species is distinguished by the blackish stripes on yellow sepals with very long, slender tails. The margins above the middle of the lateral sepals are incurved with the apices in apposition. Below the middle, the lateral sepals are connate into a deep mentum below the column-foot. The petals are acute at the apex with a thick, basal process. The arcuate lip stands erect from the tip of a long, incurved column-foot to which it is loosely hinged. Above the middle, the lip is contracted with irregular margins into a narrow lobule with a minute, rounded callus.

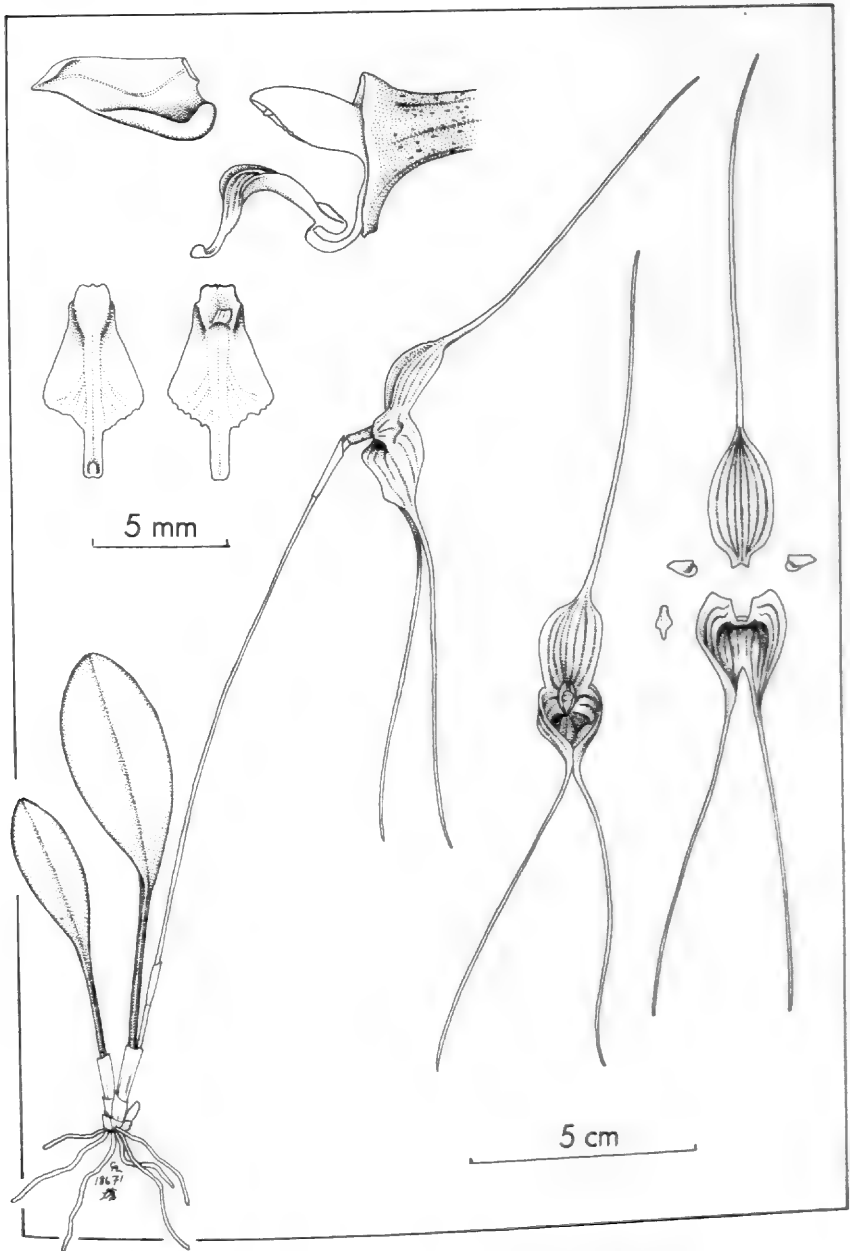
Masdevallia martiniana Luer, sp. nov.

Plate 34.

Ety.: Named in honor of Martin del Hierro, co-collector of this species.

Inter species *Masdevalliae* subsect. *Alaticaulium* sepalo dorsali longicaudato, sepalis lateralibus profunde connatis in synsepalum oblongum bifurcatum cum apicibus triangularibus acutis non-caudatis et labello subpandurato apice convexo rotundo distinguitur.

Plant medium in size, caespitose; roots fleshy. Ramicauls stout, erect, 1.5-2.5 cm long, enclosed by 2-3 loose, tubular sheaths. **Leaf** erect, coriaceous, narrowly obovate, obtuse, 10-15 cm long, 2-2.5 cm wide, gradually narrowed below into the petiole. **Inflorescence** a very congested raceme of successive flowers, borne by an erect triquetrous peduncle 20-25 cm long, with a bract near the base of a ramicaul; floral bracts imbricating, 10 mm long; pedicel 10 mm long; ovary 4 mm long; **sepals** light green, glabrous, the dorsal sepal obovate, 18-20 mm long, 9 mm wide, connate to the lateral sepals for 12 mm to form a campanulate, sepaline tube, the apex subacute, acuminate into a slender, erect, green tail ca. 35 mm long, the lateral sepals light green suffused with pale rose centrally and along veins centrally, connate 33 mm into an oblong, bifid synsepal, 35-45 mm long, 20-23 mm wide, with the apices triangular, acute; **petals** green, cartilaginous, oblong, 7 mm long, 2.5 mm wide, the apex obscurely tridentate, with a low, longitudinal callus within the labellar margin, ending in a low, rounded callus above the base; **lip** dull white, covered with minute purple dots, oblong-subpandurate, 7 mm long, 3 mm wide, with the margins incurved above the middle, the disc with a pair of folds within the margin above the middle, the apex rounded, convex, minutely verrucose, the base thick, subcordate, hinged beneath to the column-foot; **column** semiterete, 5 mm long, the foot equally long including a thick, incurved extension.

Plate 33. *Masdevallia manoloi* Luer & Arias

ECUADOR: **Sucumbíos**: Lago Imuya, epiphytic in a tree overhanging the water, alt. 230 m, Aug. 1995, collected by Martin and Juan del Hierro, cultivated by Juan del Hierro in Quito, 15 Feb. 1998, *C. Luer 18702* (Holotype: MO). **Napo**: Aguarico, Reserva Etnica Huaorani, near Río Yasuní, alt. 230 m, 19 Mar. 1994, *Milton Aulestia 1887* (MO, QCNE); Parqué Nacional Yasuní, lagunas de Garza Cocha, alt. 200 m, 22 Sept. 1988, *C.E. Cerón & N. Gallo 4940* (MO, QCNE).

This species occurs in the hot, lowlands of Amazonian Ecuador, usually found growing on limbs of trees overhanging water. Among the species of section *Masdevallia* subsection *Alaticaulae*, this species is distinguished by the light green flowers with a pale rose suffusion on the deeply connate synsepal. The apices are triangular and acute, noncaudate. The petals are oblong. The lip is subpandurate with a pair of folds just within the margins at the constriction above the middle. The apex is rounded, convex and minutely verrucose.

Masdevallia martiniana is superficially similar to *M. vargasii*, also found in the lowlands of Ecuador to Bolivia and Brazil, but not at the very low altitude of less than 300 meters above sea level. The latter is distinguished by short, sepaline tails and a proportionately larger, non-pandurate lip.

***Masdevallia niesseniae* Luer, sp. nov.**

Plate 35.

Ety.: Named for Andrea Niessen de Uribe of Orquídeas del Valle, Cali, Colombia.

Inter species *Masdevalliae* subsect. *Coccineae* sepalis aureis longissime caudatis, lateralibus in synsepalum expansum sulcatum connatis, et labello oblongo leviter bicarinato distinguitur.

Plant medium in size, caespitose; roots coarse. Ramicauls erect, channeled, 3-5 cm long, enclosed by 2-3 white, loose, tubular sheaths. Leaf erect, coriaceous, 10-15 cm long including the petiole 2-3 cm long, the blade elliptical, subacute, 2-2.5 cm wide, gradually narrowed below into the petiole. **Inflorescence** a single flower, borne by a slender, erect peduncle up to 23 cm long, with a bract below the middle, from 1.5-3 cm above the base of the ramicaul; floral bract thin, tubular, 2.5 cm long; pedicel 3 cm long; ovary 7-8 mm long; **sepals** golden yellow, glabrous, the dorsal suffused with rose along the midvein, obovate, 30 mm long, 25 mm wide, connate to the lateral sepals for 20 mm to form a funnel-shaped, sepaline tube, the apex broadly rounded, abruptly contracted into a slender tail 5.5 cm long, the lateral sepals 40 mm long, connate 30 mm into a broadly expanded synsepal 35 mm wide, longitudinally sulcate with the surface convex between grooves, with the apices acute, contracted into slender tails 4 cm long; **petals** white, cartilaginous, ovate-subtriangular, 7.5 mm long, 3.5 mm wide above the base, the apex obliquely obtuse, the labellar margin with a marginal callus ending in a broadly rounded margin above the base; **lip** white, suffused with rose, oblong, 7 mm long, 2.75 mm wide, with the margins thin, the apex obtuse, recurved, the disc thickened centrally with a pair of low calli near the middle, sulcate between, the base truncate, hinged beneath to the column-foot; **column** white, suffused with rose, thick, semiterete, 6 mm long, the foot 2 mm long, with a short, incurved extension.

COLOMBIA: **Valle del Cauca**: near Lago de Calima, alt. 1500-1600 m, collected by Ishmael Miranda, March 1997, cultivated by Orquídeas del Valle, Cali, by Andrea Niessen & Juan Carlos Uribe, *C. Luer 18789* (Holotype: MO).

The large, long-tailed, golden yellow flowers of this member of section *Masdevallia* subsection *Coccineae* are larger and more spectacular than the golden yellow flowers of coveted *M. davisii* Rchb.f. Some yellow color-forms of *M. coccinea* Linden ex Rchb.f. share the same intense color that is not approached by any other member of the subsection, except perhaps *M. veitchiana* Rchb.f.

Although coriaceous, the leaves are not as thick as those of many other species of the subsection. The erect peduncle bears the showy flower above the leaves. From a funnel-shaped, sepaline tube the rounded dorsal sepal curves upward while the broadly expanded, longitudinally sulcate synsepal arches below. Between depressed veins the surface is convex. The petals are white with the labellar margin callous. The lip is oblong as in other members of the subsection, but in the center there is a shallow concavity between a pair of low calli.

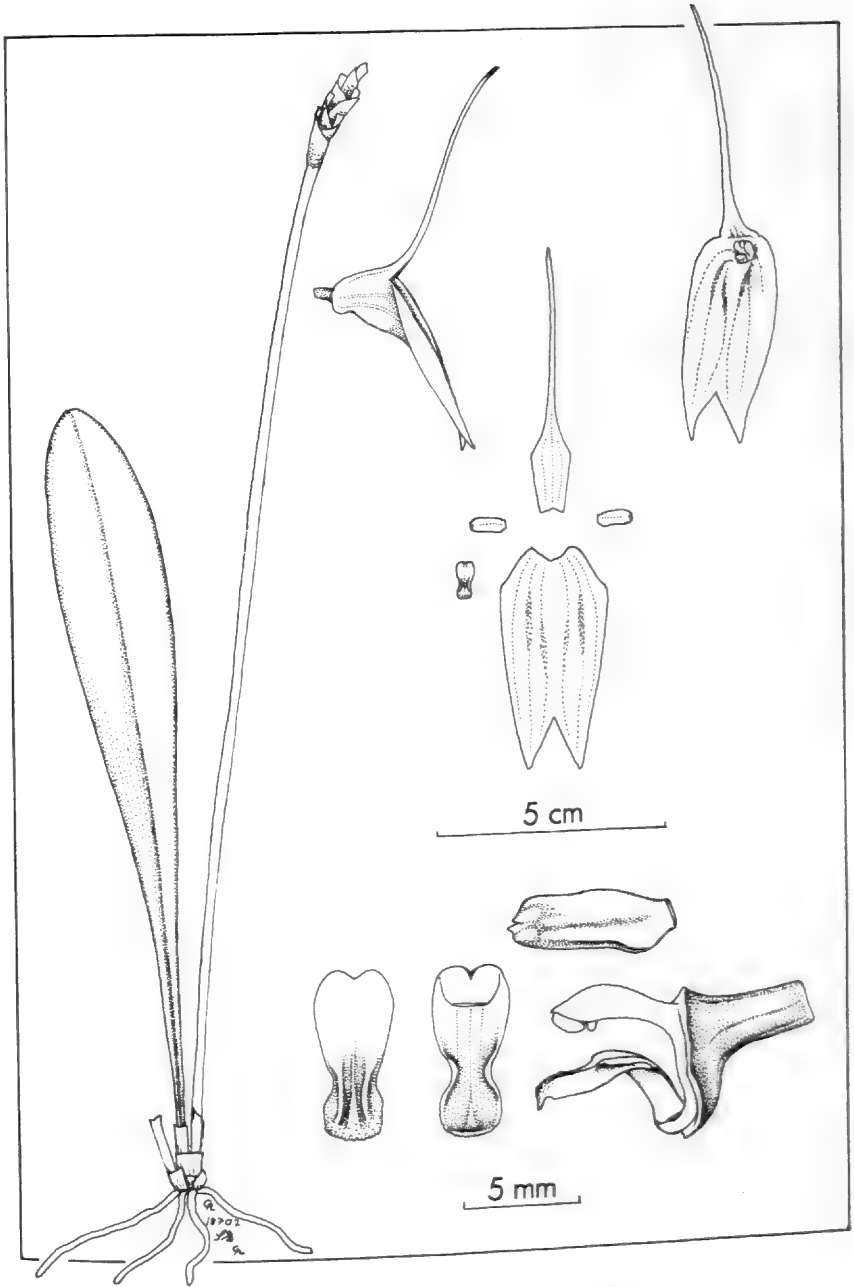


Plate 34. *Masdevallia martiniana* Luer

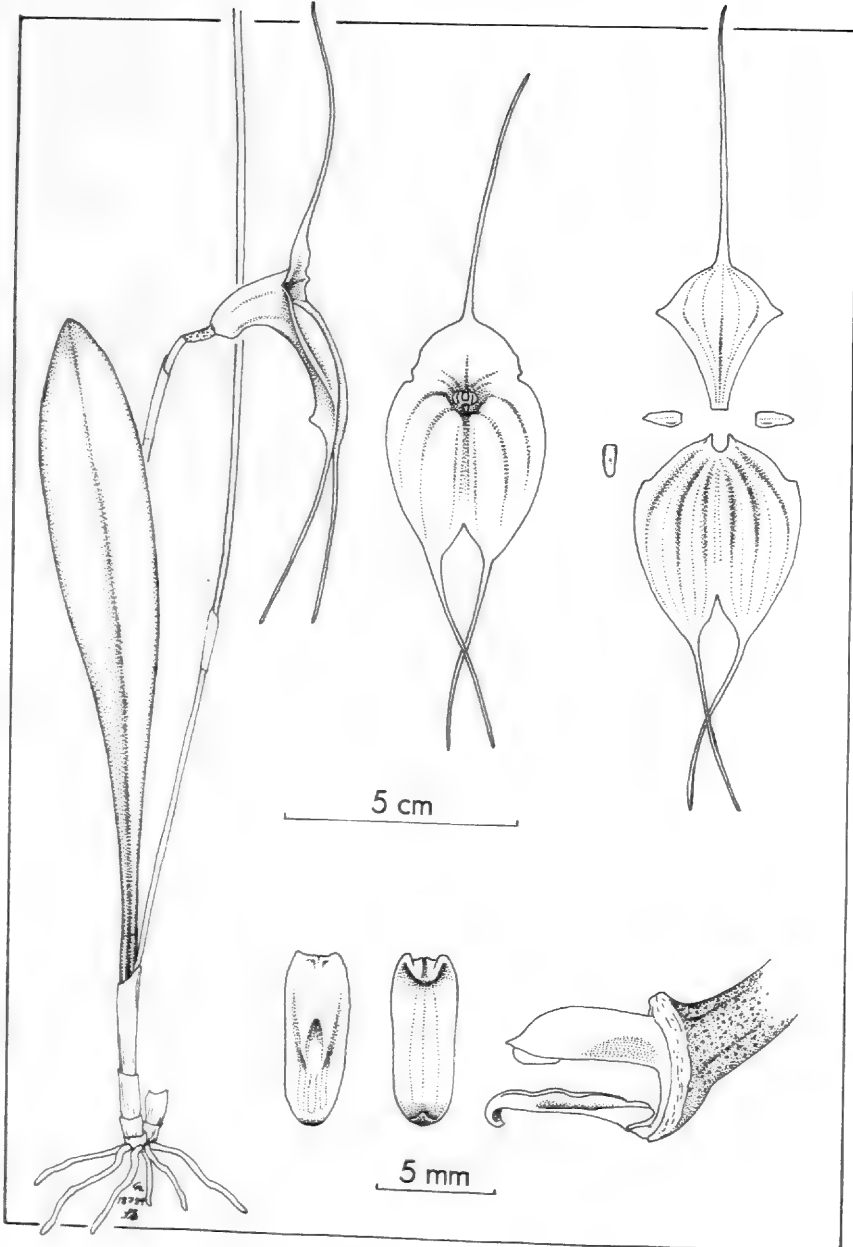


Plate 35. *Masdevallia niesseniae* Luer

Masdevallia regina Luer, sp. nov.

Plate 36.

Ety.: From the Latin *regina*, "queen," alluding to the smaller flower similar to that of *M. princeps*.

Species haec *M. princeps* Luer persimilis, sed flore leviter minore, sepalis lateralibus acutis cum caudis non reflexis, synsepalo ad centrum abrupte convexo et labello apice noninflexo differt.

Plant medium in size to large, caespitose; roots coarse. Ramicauls stout, erect, 2-3 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, thickly coriaceous, narrowly obovate, obtuse, 15-20 cm long, 3-3.5 cm wide, gradually cuneate below into the base. **Inflorescence** a congested, successively few-flowered raceme borne by a terete, ascending peduncle up to 30 cm long, with 3-4 close bracts below the middle, from low on the ramicaul; floral bract thin, tubular, 15 mm long; pedicel thick, 20 mm long; ovary 10-12 mm long, 4 mm thick; **sepals** rigidly fleshy, glabrous externally, minutely glandular-pubescent within, the blade of the dorsal sepal narrowly triangular-ovate, ca. 20 mm long, 14 mm wide at the base, the acute apex attenuated into a slender, erect, green tail 10-11 cm long, connate to the lateral sepals for 9 mm to form a short, campanulate tube, the lateral sepals yellow-orange with dark purple flecks, as rows of bars toward the center surrounding a central, rounded convexity ca. 1 cm wide, connate across the convexity for 20 mm into a broadly ovate synsepal, ca. 40 mm long, 38 mm broad, the apices acute, approximate, shortly attenuated into slender, non-retroflexed tails 10-11 cm long; **petals** cartilaginous, ivory, dotted with purple, minutely subverrucose, oblong, shortly unguiculate, 6 mm long, 3 mm wide, the apex truncate, obscurely trilobed, both halves callous, shallowly sulcate centrally; lip orange, dotted with red-purple, thick, oblong, 7 mm long, 2.5 mm wide, with the apex obtuse, verrucose, nondeflexed, the disc shallowly sulcate on either side of a central callus above the middle, the base subcordate, concave to either side of the channel, hinged on the end; **column** greenish white, stout, semiterete, 4 mm long, the foot thick with a very short, incurved extension.

PERU: **San Martin**: near Tarapoto, obtained from M. Arias, ca. 1997, cultivated by A. Hirtz in Quito, Ecuador, 15 Feb. 1998, *C. Luer 18701* (Holotype: MO).

This species is very closely allied to *M. princeps*, with which it is reported to have been collected. It is readily distinguished from the latter by the acute apices of the lateral sepals with long, approximate tails that are not reflexed. In the center of the synsepal a well-circumscribed, round convexity is present. Whether or not this convexity is peculiar only to this clone is not possible to say at the present time. The lip is narrower with the apex obtuse without a deflexed callus.

Platystele hampshireae Luer, sp. nov.

Plate 92.

Ety.: Named in honor of Rachel J. Hampshire, co-collector of this species.

Species haec *P. oxyglossae* (Schltr.) Garay affinis, sed sepalis glabris, petalis anguste attenuatis ciliatis et labello suborbiculari apice rotundo abrupte brevicaudato differt.

Plant very small, epiphytic, caespitose; roots fleshy, thicker than the ramicauls. Ramicauls erect, slender, 1-1.5 mm long, enclosed by a thin, loose, tubular sheath. **Leaf** erect, coriaceous, elliptical, subpetiolate, subacute to obtuse, apiculate, 7-10 mm long, 1.5-2.5 mm wide, cuneate below into the petiole. **Inflorescence** an erect, loose, distichous, flexuous, successively few-flowered raceme, up to 2.5 cm long, borne by a capillary peduncle 1-2 cm long, emerging laterally from the ramicaul; floral bracts thin, 0.5 mm long; pedicels 2.5-3.5 mm long; ovary 0.5 mm long; **sepals** pale translucent greenish, membranous, glabrous, the dorsal sepal narrowly ovate, acute, attenuate, 3 mm long, 0.8 mm wide, 1-membraned, the lateral sepals free, ovate, concave, oblique, acute, acuminate above the middle, 2.75 mm long, 1 mm wide expanded, 1-veined; **petals** translucent pale green, membranous, ciliate, narrowly ovate, acute, attenuate, 2.25 mm long, 0.5 mm wide; **lip** crimson, glabrous (microscopically cellular), suborbicular, 1 mm long, 0.8 mm wide, the disc slightly longitudinally concave from a glenion at the suborbicular, featureless, the apex rounded, abruptly contracted into an apiculum 0.25 mm long, the base truncate, flattened on the end, firmly hinged to the rudimentary column-foot; **column** broadly cucullate, 0.5 mm long and broad, the stigma bilobed, the foot rudimentary.

PANAMA: **Chiriquí**: wet forest between Fortuna Lake and Chiriquí Grande, 1 km south of the continental divide, alt. 1200 m, 10 Mar. 1985, *Rachel J. Hampshire & Caroline Whitefoord 414* (Holotype: BM), *C. Luer* illustr. 18606.

This little species is distinguished from its numerous allies by the very small, caespitose habit; a lax, flexuous, few-flowered raceme about thrice longer than the leaves; attenuate, glabrous sepals; attenuate, ciliate petals; and a suborbicular lip with the rounded apex minutely short-caudate.

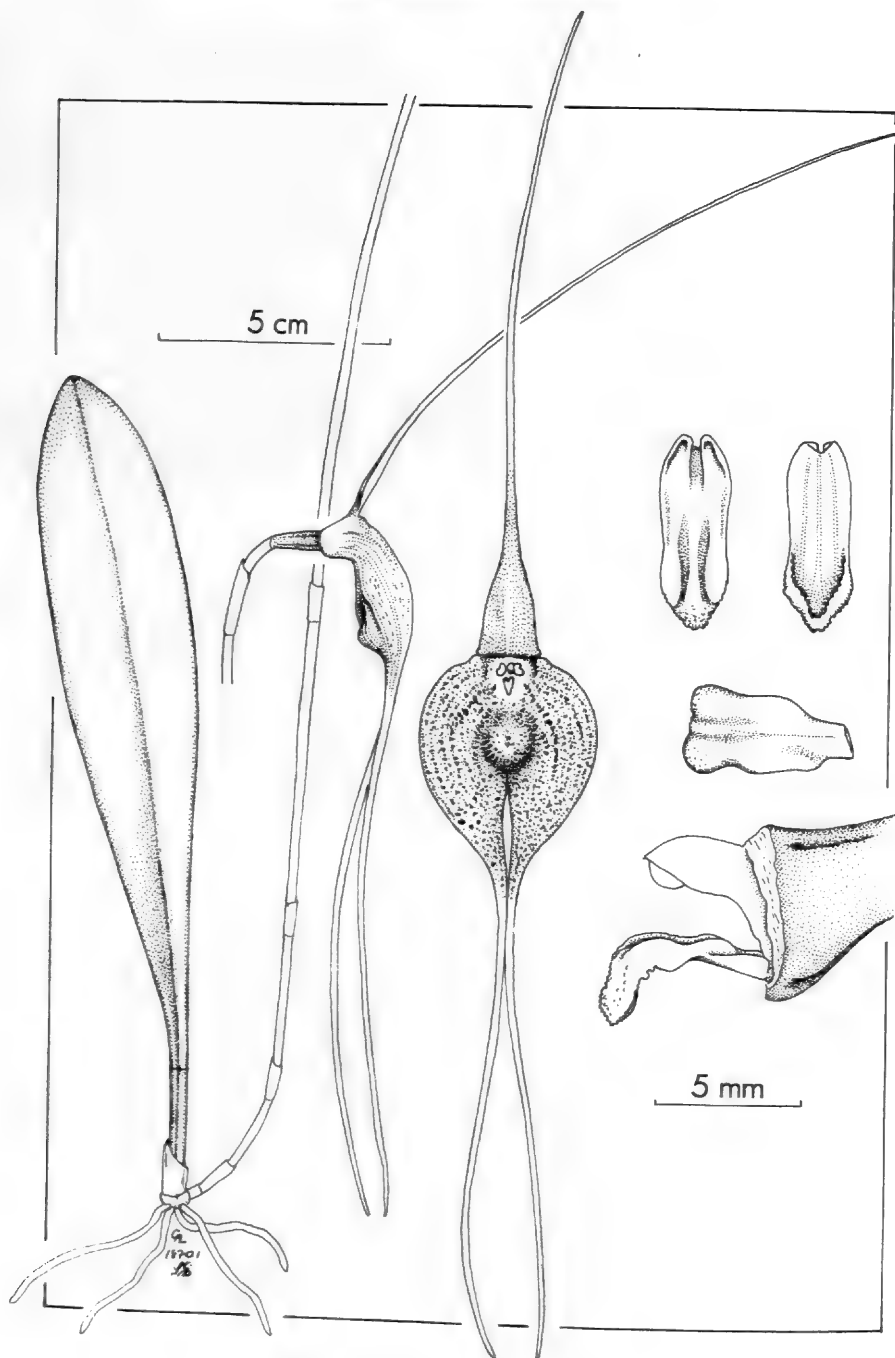


Plate 36. *Masdevallia regina* Luer

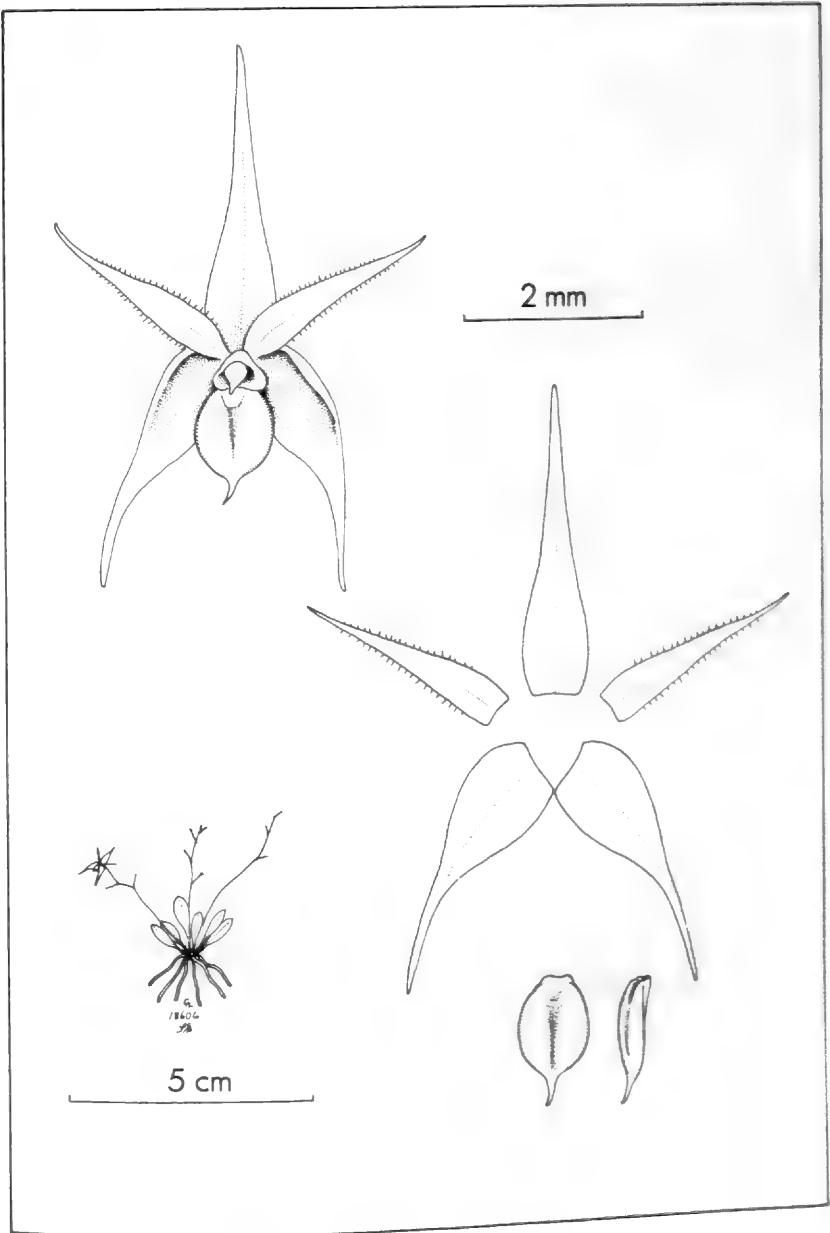


Plate 92. *Platystele hampshireiae* Luer

Pleurothallis atrohiatus Dod, *Moscoso* 5: 226, 1989, as *atrohiata*.

Plate 9.

Ety.: From the Latin *atrohiatus*, "a dark opening," referring to the darkly colored interior of the flower.

Plant small, epiphytic, shortly repent, the rhizome ca. 5 mm long between ramicauls; roots slender. Ramicauls slender, erect, 2-3 cm long, enclosed by a tubular sheath to above the middle and 2-3 other sheaths at the base. **Leaf** erect, coriaceous, elliptical, obtuse, petiolate, the blade 3-5.5 cm long, 1.2-1.4 cm wide, cuneate below into a slender petiole 1-1.5 cm long. **Inflorescence** a loose, simultaneously 2- to 4-flowered raceme, to ca. 7 cm long including the slender peduncle 2-3 cm long, borne from a slender, erect spathe 8-10 mm long, near the apex of the ramicaul; floral bracts tubular, 5 mm long; pedicels 4-8 mm long; ovary 3 mm long; **sepals** glabrous, membranous, pale green, dotted with purple along the veins, the dorsal sepal free, ovate, slightly acuminate, acute, slightly concave, 12 mm long, 5 mm wide, 3-veined, the lateral sepals connate into an ovate, concave synsepal similar to the dorsal sepal, 13 mm long, 9 mm wide expanded, 6-veined; **petals** glabrous, purple, ovate in lower basal half with thick and attenuate in the distal half, acute, 10 mm long, 2.5 mm wide, 3-veined; **lip** purple, ovate-trilobed, 8 mm long, 3 mm wide, the apex ovate, subacute, the lateral lobes below the middle, erect, obtuse, antrorse, the disc shallowly concave between a pair of low, longitudinal calli at the middle third, the base truncate, hinged to the base of the column-foot; **column** semiterete, 4 mm long, the anther, rostellum and stigma ventral, the foot thick.

HAITI: Massif de la Hotte, Camp Perrin, by Riviere Glace, alt. 800 ft., 23 Apr. 1982, flowered in cultivation 10 Feb. 1983, *D. D. Dod 1026* (Holotype: JBSD; Isotypes: AMES, NY, SEL, US); flowered in cultivation 18 Apr. 1986, *C. Luer 12158* (MO).

This species is the only member of the subgenus *Elongatia* found in the Antilles. It is very rare, being endemic in only a small area on the island of Hispaniola. It has features in common with both the Central American and Andean species of the subgenus. It is distinguished by the small, shortly repent habit; a petiolate leaf; and a loose, few-flowered raceme. The dorsal sepal and synsepal are similar: ovate, acute and concave. The petals terminate with a thick, subulate apex. The lip is three lobed with a pair of low calli on the middle third of the disc.

Pleurothallis phrynoglossa Luer & Hirtz, sp. nov.

Plate 10.

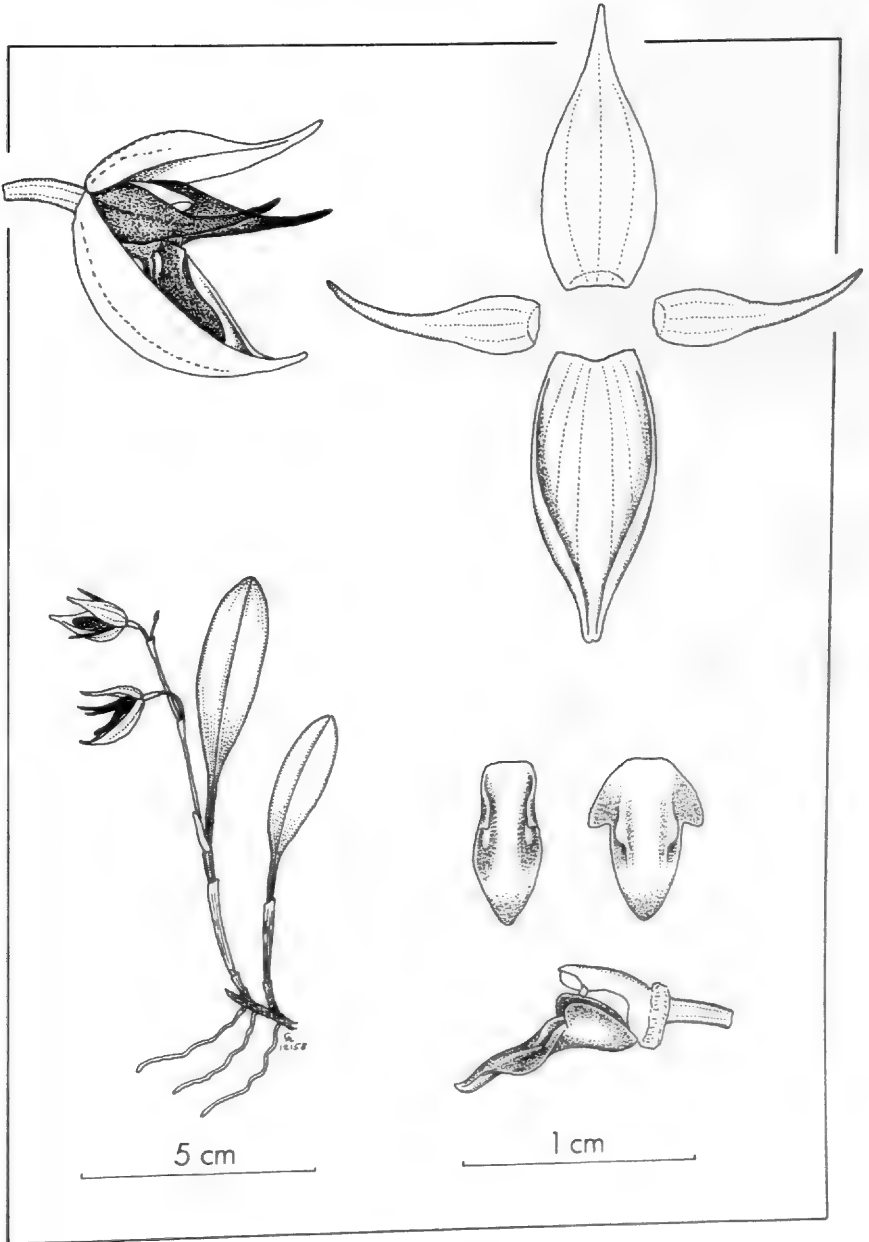
Ety.: From the Greek *phrynos*, "a toad," and *glossa*, "a tongue," referring to the warty lip.

Planta mediocris, pedunculo racemoque folio crasso brevioribus, sepalis angustissime acutis, petalis anguste ellipticis acutis, et lamina labelli anguste ovata verrucosa unguiculata distinguitur.

Plant medium in size, shortly repent, the rhizomes 6-7 mm thick, ca. 1 cm long between ramicauls; roots coarse. Ramicauls stout, erect, 1.5 cm long, enclosed by thin, tubular sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 6-7 cm long, 2.5-3 cm wide, cuneate below to the sessile base. **Inflorescence** a subcongested, successively few-flowered raceme, up to 3 cm long, borne by a peduncle 1.5-2 cm long, from the apex of the ramicaul at the base of the leaf; floral bracts oblique, 5 mm long; pedicel 7 mm long; ovary papillose, 6 mm long, 5 mm broad; **sepals** fleshy, narrowly ovate-triangular, very acute, the dorsal sepal 30 mm long, 10 mm wide, 9-veined, free from the lateral sepals, the lateral sepals 33 mm long, 10 mm wide, 8-veined, carinate with the carina suberose, free to the base, from the sides of the column, forming a small broad mentum; **petals** narrowly elliptical, acute, 11 mm long, 2 mm wide; **lip** unguiculate, ovate, acute, 17 mm long, 5 mm wide, with undulate margins, the disc with a pair of verrucose, oblique calli at the middle, scattered verrucae below the middle, and verrucae in a central strip above the middle, the claw 2 mm long, concave; **column** stout, semiterete, minutely erose at the elongated tip, 9 mm long, the foot stout, 8 mm long.

ECUADOR: **Azuay**: south of Cuenca, collected by Boris Goercke, *A. Hirtz 6580* (Holotype: MO), *C. Luer* illustr. 18683.

Among the members of subgenus *Kraenzlinella*, this species is most similar to *P. lappago* Luer in habit, but perhaps with a shorter ramicaul. The specimen in hand is scanty. The flowers, however, are larger with the sepals and the petals sharply acute. Most distinctive is the large, unguiculate, warty lip.

Plate 9. *Pleurothallis atrohiatus* Dod

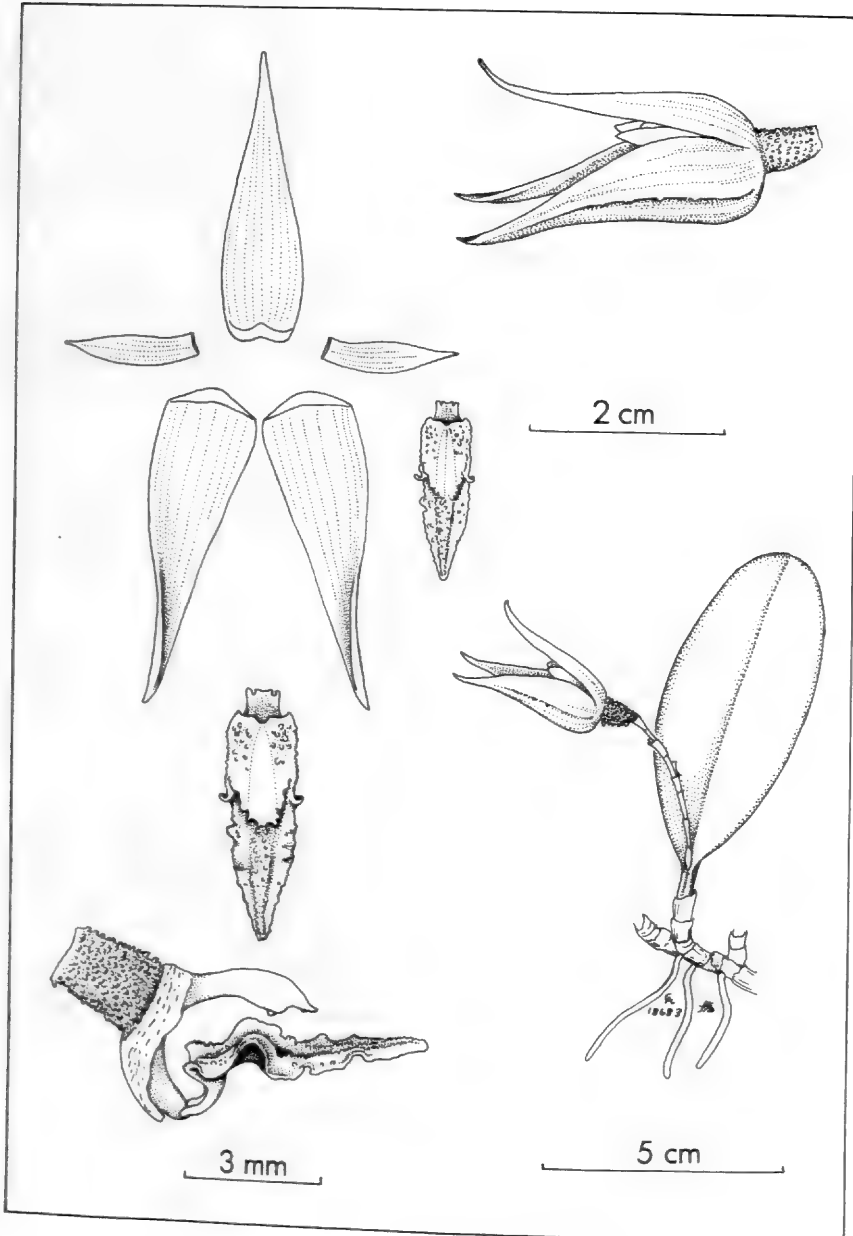


Plate 10. *Pleurothallis phrynoglossa* Luer & Hirtz

Restrepia piperitosa Luer, sp. nov.

Plate 64.

Ety.: Named for *Mentha piperita* of the mint family, in allusion to the red-striped synsepal resembling peppermint candy.

Species haec *R. brachypodi* Rchb.f. affinis sed flore minore, synsepalo late purpureo striato striis infra medium confluentibus, et labello parvo maculato distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, 5-9 cm long, enclosed by 6-7 loose, compressed, imbricating sheaths, with the lower sheaths spotted with dark purple. **Leaf** erect, suffused with purple, coriaceous, elliptical, subacute to obtuse, 3.5-4.5 cm long, 2-2.3 cm wide, the base broadly cuneate, contracted into a twisted, subpetiolate base. **Inflorescence** a solitary flower, produced successively in a fascicle behind the leaf; peduncle slender, 3-4.5 cm long; floral bract tubular, 5 mm long; pedicel stout, 2.5 mm long, with a slender filament; ovary 3 mm long; **sepals** membranous, the dorsal sepal free, erect, translucent white with the midvein purple-brown, narrowly ovate in the lower third, attenuated above with the apex markedly clavate, 12.5 mm long, 2 mm wide above the base, 5-veined, the lateral sepals connate to near the apex into a concave, elliptical-obovate, very shortly bifid lamina, white on the distal fourth, heavily striped with red-purple to the basal fourth where the stripes are confluent, 12 mm long, 6 mm wide, multiple-veined, the apices obtuse; **petals** membranous, narrowly linear-ovate, the margins smooth except for 1-2 microscopic trichomes on the lower fourth, attenuated above the middle with the apex clavate-thickened, 8.5 mm long, 1 mm wide above the base; **lip** yellow, spotted with purple, oblong, 5 mm long, 1.8 mm wide, the epichile oblong, subtruncate, diffusely echinate, the hypochile subquadrate, concave with thin, erect margins toward the base, each side with a thin, uncinat process, the disc with a pair of carinae extending forward from the sides of the hypochile onto the epichile, the base subtruncate, connected to the column-foot by a short, thick neck; **column** greenish white, slender, clavate, 3 mm long, the base pedestal-like with a pair of small, obtuse calli.

PERU: without collection data, received by A. Hirtz from M. Anias of Lima, Peru, flowered in cultivation in Quito, Ecuador by A. Hirtz, 15 Dec. 1998, *C. Luer 18775* (Holotype: MO).

With flowers among the smallest of the genus, this species is most similar to *Restrepia brachypus*, although it resembles several other species. The broadly striped synsepal, pure white toward the apex and solid purple toward the base is distinctive. Except for the striped synsepal it resembles *R. echinata* and *R. elegans* with spotted synsepals. From striped *R. iris* it is distinguished by smaller flowers and a verrucose lip.

Restrepia piperitosa is characterized by a small or medium-sized habit with the lower sheaths of the ramicaul spotted. The small flower is borne near the apex of the leaf. The stripes of the synsepal that is white near the apex are reminiscent of peppermint candy. The petals are without lobes or processes. The lip is oblong with the spotted epichile diffusely spiculate-verrucose.

Scaphosepalum manningii Luer, sp. nov.

Plate 50.

Ety.: Named in honor of Steven Manning of Tarporley, England, co-collector of this species.

Species haec *S. clavellato* Luer similis, sed racemo pedicellisue multilongioribus, sepalorum calli grandibus bene evolutis, petalis acutis, et labelli apice rotundato differt.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 0.5-0.8 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, coriaceous, 5-7 cm long including a petiole ca. 1 cm long, the blade narrowly elliptical, subacute, 0.8-1 cm wide, gradually narrowed below into the slender petiole. **Inflorescence** a distichous, flexible, subflexuous, successively many-flowered raceme, loosely flowered below becoming congested above, up to 25 cm long, borne by slender, smooth peduncle, 5-8 cm long, from low on the ramicaul, floral bracts acute, 3 mm long; pedicels 6-10 mm long; ovary ribbed, 3 mm long; **sepals** yellow, the middle sepal suffused with brown, erect, narrowly linear, 14 mm long, 2.5 mm wide, narrowly ovate and concave below the middle, fleshy and semiterete above the middle with the tip rounded, the lateral sepals connate 7 mm into a bifid, oblong lamina 10 mm long, 5 mm wide, concave above the base, each lateral sepal carinate with a brown vein, each filled with an oblong-ovate cushion 7 mm long, 2.5 mm wide, the apices rounded, with slender tails 1.5 mm long;

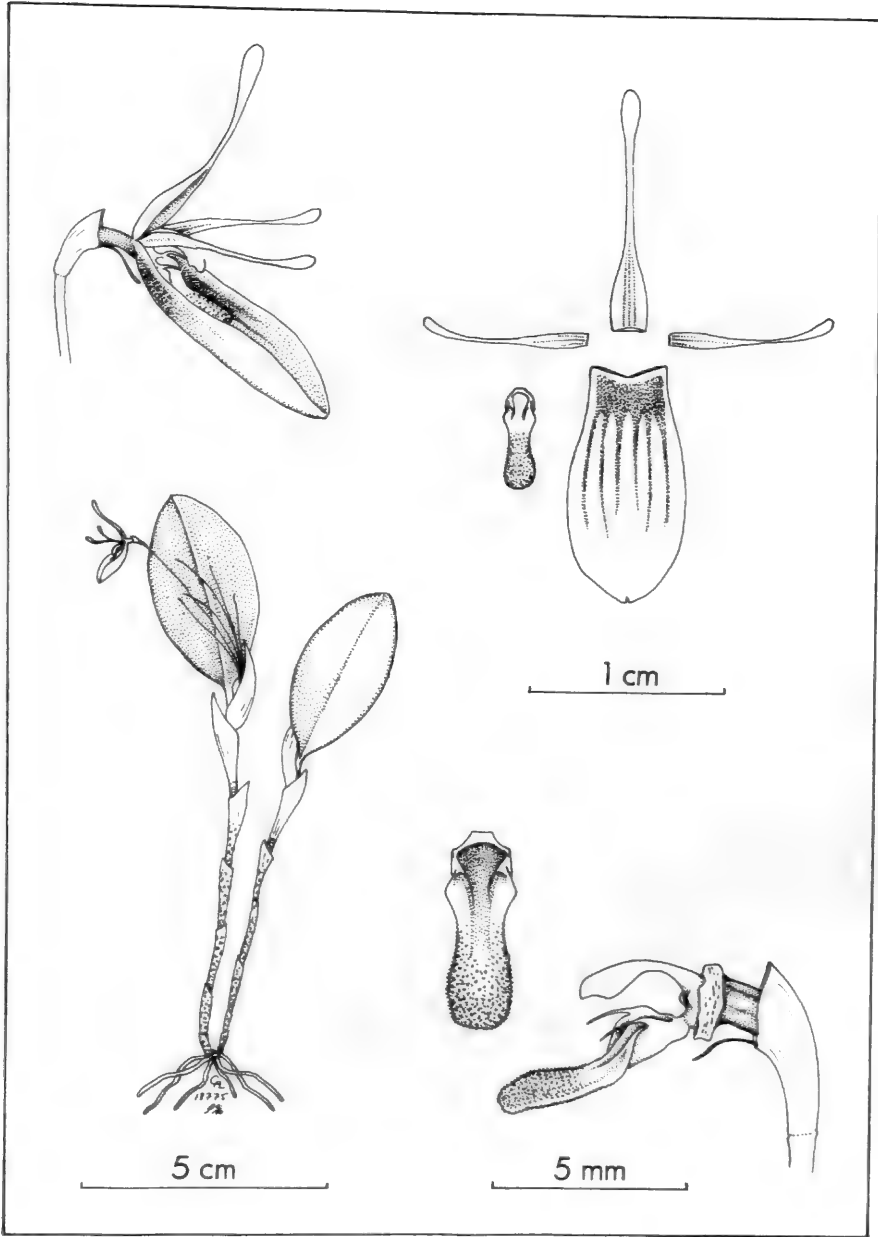
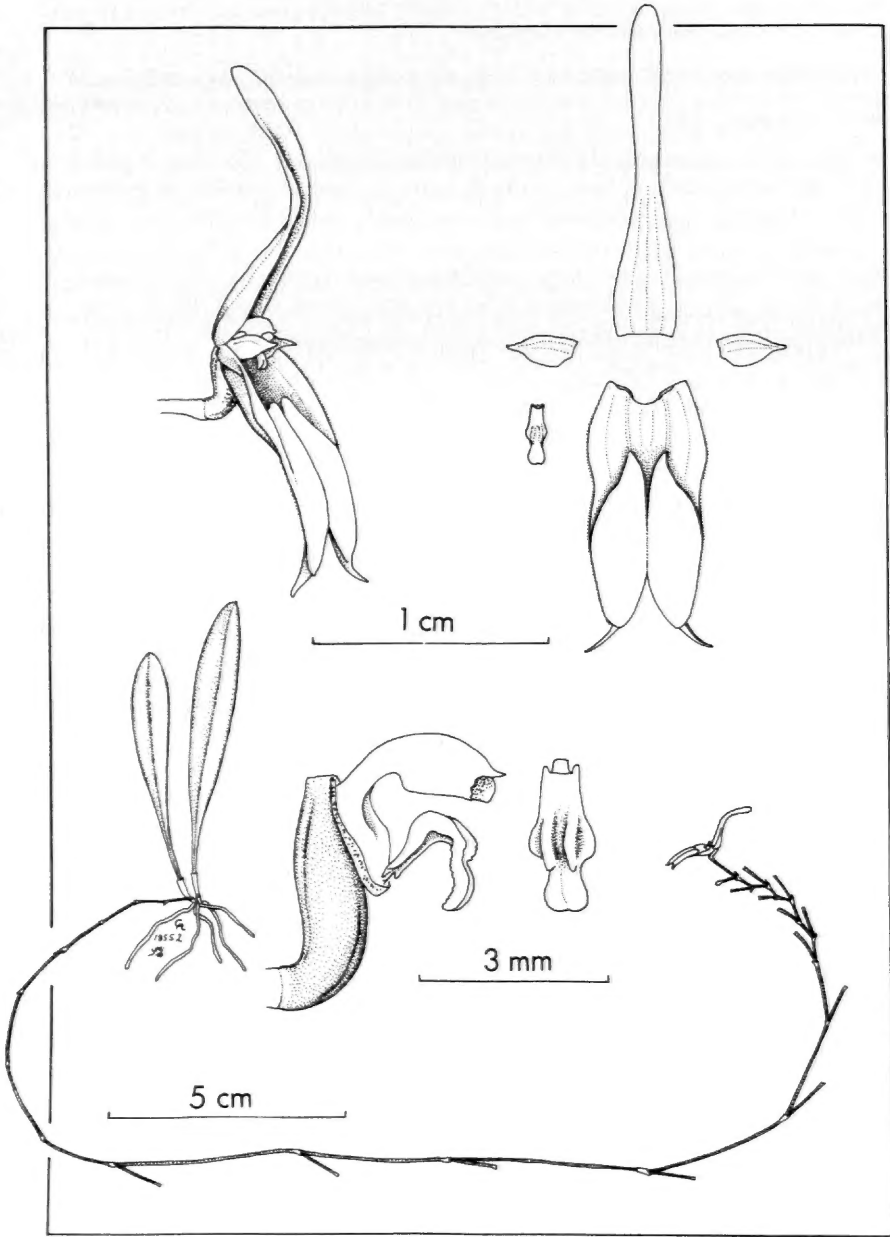


Plate 64. *Restrepia piperitosa* Luer

petals yellow, ovate, oblique, 3 mm long, 1.3 mm wide, with the apex acute, shortly acuminate; **lip** yellow, oblong-pandurate, reflexed near the middle, 2.5 mm long, 1 mm wide, slightly dilated in the middle third with a pair of erect, minutely denticulate lamellae, the epichile rounded, minutely denticulate, the hypochile oblong, the base truncate, minutely bilobulate; **column** red, semiterete, broadly winged, 2.5 mm long, with a thick foot 1.5 mm long.

VENEZUELA: Edo. Aragua: near Colonia Tovar, collected by S. Manning and Carlos García, 1995, flowered in cultivation at Estover, Tarporley, England, 19 July 1997, *S. Manning 95-0723* (Holotype: MO), C. Luer illustr. 18552.

This species is closely allied to the Central American *S. clavellatum*, but it is easily distinguished from the latter by the well-developed cushions of the lateral sepals. Although vegetatively not distinctive, the flexible, long-pedicellate raceme eventually attains a length of 25 centimeters. The flowers superficially resemble those of *S. clavellatum* with a long, erect, dorsal sepal that is thickened and semiterete above the middle. Most distinctive is the large pair of well-developed cushions of the sepals that are smaller and indistinct in *S. clavellatum*.

Plate 50. *Scaphosepalum manningii* Luer

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