
New Series and Species of *Lepanthes* (Orchidaceae) from Ecuador

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ABSTRACT. Three new series in *Lepanthes* sect. *Lepanthes* are described, and sixteen new species of *Lepanthes* are described from Ecuador.

Prior to 1983, 30 species of *Lepanthes* Swartz had been attributed to Ecuador, mostly by Lindley, Reichenbach, and Schlechter from collections mostly by Jameson and Sodiro. Other better known collectors never bothered to collect a *Lepanthes*. Today, 295 species are known from Ecuador, but many of these have not yet been published. In order to handle this large number of basically similar species, series based on key-characters are employed. Some individuals of a few species fall between series. Therefore, a few species may be listed in more than one series.

The following 16 previously undescribed species are all members of section *Lepanthes*. Fourteen are in *Lepanthes* subsect. *Elongatae* (Luer, 1987) and two are in *Lepanthes* subsect. *Lepanthes*. Four series, two in each subsection, are recognized.

Lepanthes subsect. *Lepanthes* ser. *Lepanthes* is characterized by a congested inflorescence that remains shorter than the leaf. It contains by far the greatest number of species in the genus. *Lepanthes* subsect. *Lepanthes* ser. *Filamentosae* is characterized by a densely flowered inflorescence that is borne beyond the leaf by an elongated peduncle.

Lepanthes subsect. *Elongatae* ser. *Elongatae* is characterized by a "lax" or "loose" (distantly flowered) inflorescence that is longer, or becomes longer than the leaf. *Lepanthes* subsect. *Elongatae* ser. *Breves* is characterized by a loose inflorescence that remains shorter than the leaf. In the Pleurothallidinae a distantly flowered inflorescence is characterized by the exposed portion of the rachis between floral bracts being longer than the pedicels.

***Lepanthes* ser. *Lepanthes*.** TYPE: *Epidendrum ovale* Swartz, Prodr. 125, 1788 = *Lepanthes ovalis* (Swartz) Fawcett & Rendle.

Lepanthes* ser. *Filamentosae Luer, series nov. TYPE: *Lepanthes filamentosa* Luer & Hirtz, Novon 3: ???, 1993.

Racemus congestus quam folio longiore.

Lepanthes* ser. *Elongatae Luer, series nov. TYPE: *Lepanthes elongata* Luer & Hirtz, Lindleyana 2: 99, 1987.

Racemus latus quam folio longiore.

Lepanthes* ser. *Breves Luer, series nov. TYPE: *Lepanthes monoptera* Lindley, J. Bot. 1: 10, 1834.

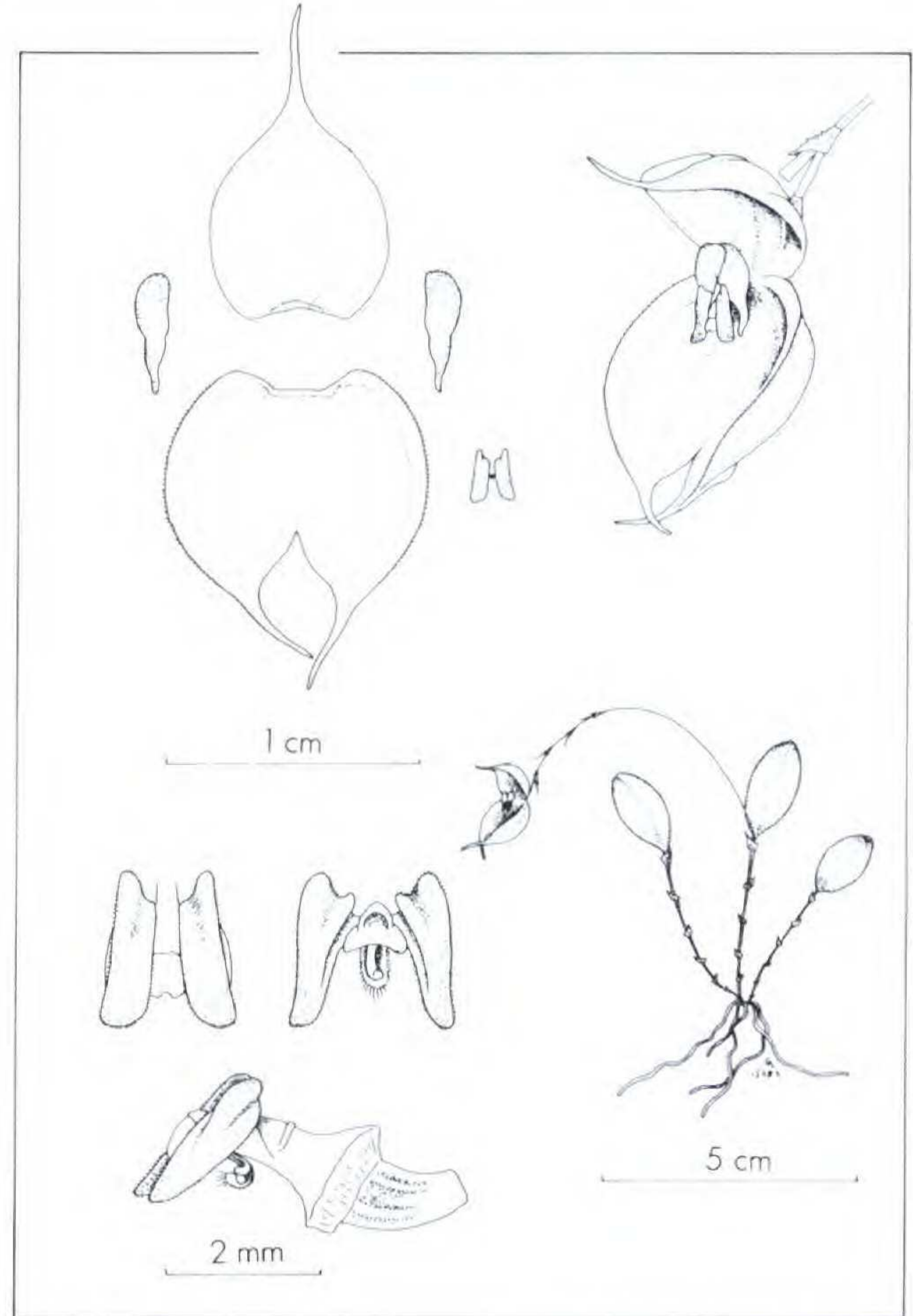
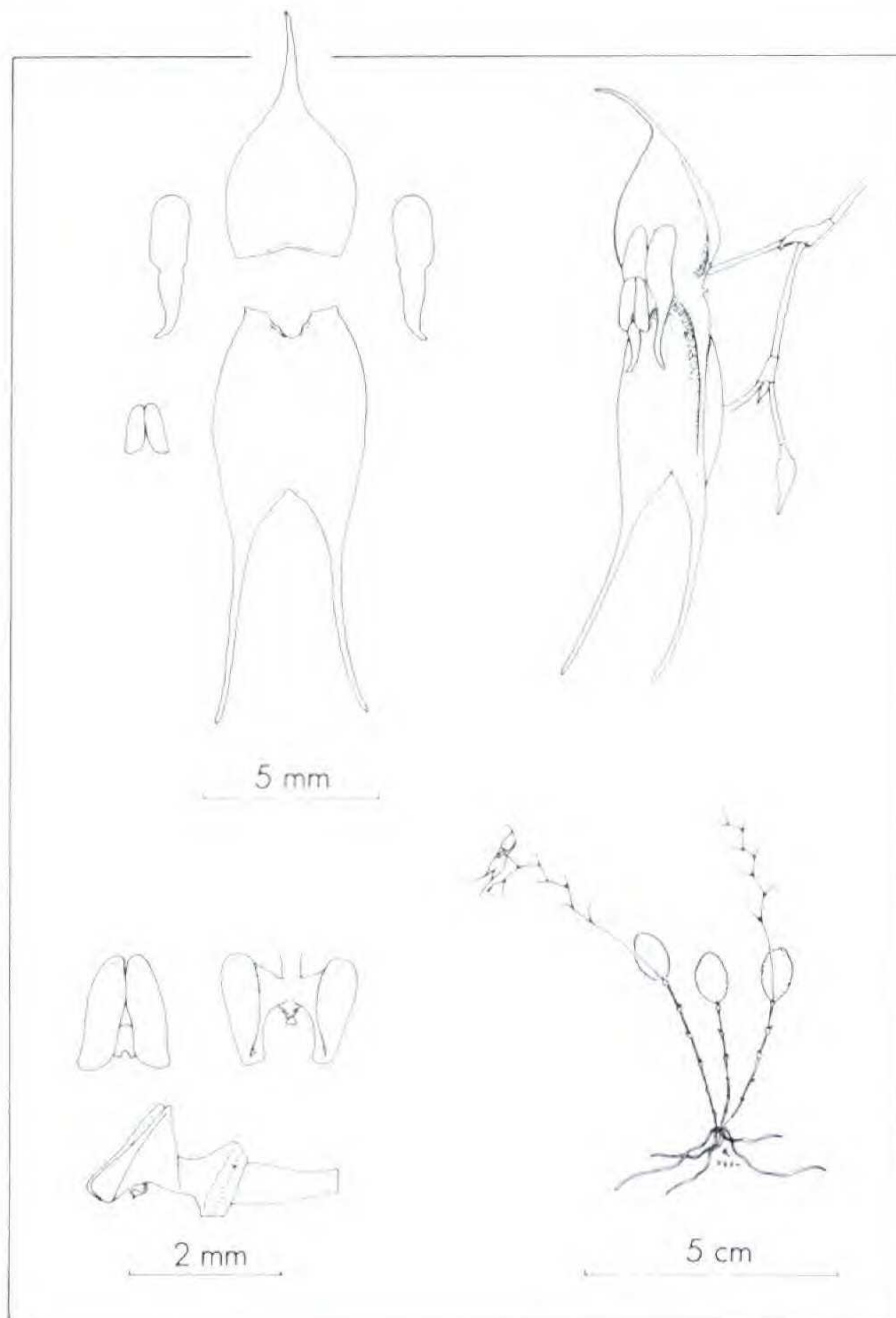
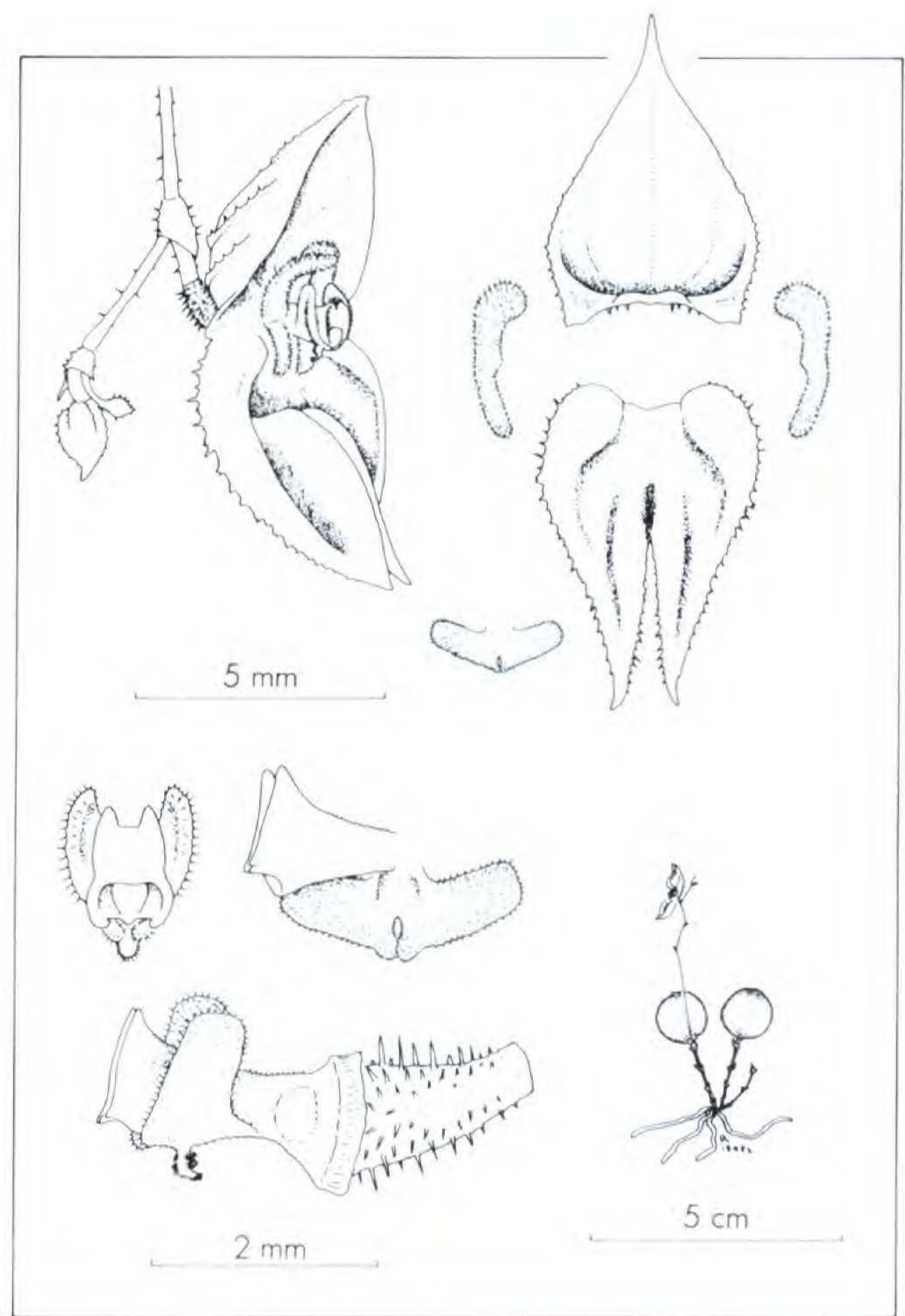
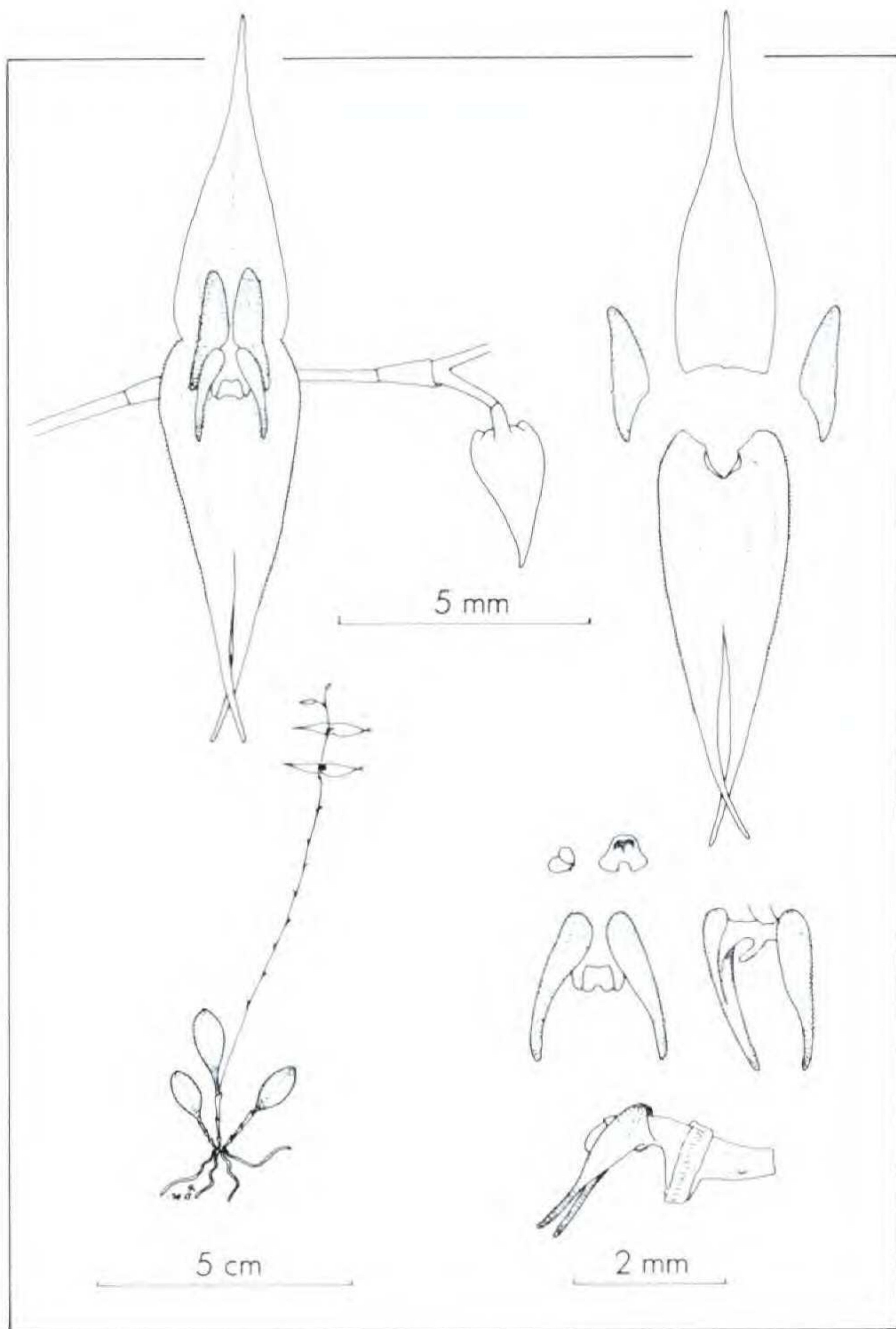
Racemus latus quam folio brevior.

The vast majority of the species of *Lepanthes* from Ecuador that have come to my attention since 1978 have been discovered by Alexander C. Hirtz, a mining engineer in Quito, Ecuador. Not only does he have the enthusiasm to hunt them and an uncanny ability to find them, but he knows them by name, habitat, and locality, far better than I. He has also had the perseverance to photograph nearly every one. For these reasons I do not consider him merely the collector. I am pleased to include his name with mine in the following new descriptions.

Lepanthes andreettae Luer, sp. nov. TYPE: Ecuador. Morona-Santiago: without locality, collected by A. Andreetta, probably in the vicinity E of Paute, ca. 1,800 m, flowered in cultivation at Paute by A. Andreetta, C. Luer 13855 (holotype, MO). Figure 1.

Planta parva; inflorescentia racemosa laxa folio elliptico multilongiore; floris sepalis purpureis late luteomarginatis, sepalo dorsali synsepaloque anguste ovatis acuminatis, synsepalo supra medium inciso, petalis transverse bilobis, lobis triangularibus, superiore ter majore, labelli lamina duabus anguste ovatis acuminatis, corpore angusto, appendice digitiformi pubescenti.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5–8 mm long, enclosed by 2–3 loose, microscopically ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, obtuse, 12–16 mm long, 6–8 mm wide, the base cuneate into a petiole 2–3 mm long. Inflorescence a loose, distichous, successively several-to many-flowered raceme up to 9 cm long, borne by a slender peduncle 15–20 mm long; floral bract 2 mm long; pedicel 1.5–2 mm long; ovary 1 mm long; sepals purple



Figures 1-4. —1 (Top left). *Lepanthes andreettae* Luer. —2 (Top right). *Lepanthes campodostele* Luer & Hirtz. —3 (Bottom left). *Lepanthes corkyae* Luer & Hirtz. —4 (Bottom right). *Lepanthes delhierroi* Luer & Hirtz.

with broad, yellow margins, the dorsal sepal narrowly ovate, acute, acuminate, 7 mm long, 2 mm wide, connate to the lateral sepals for 0.5 mm, the lateral sepals microscopically denticulate, narrowly ovate, acute, acuminate, oblique, 8 mm long, 3 mm wide together, connate 3 mm, the apices in apposition; petals pale rose, microscopically pubescent, transversely bilobed, 0.75 mm long, 2.6 mm wide, the lobes triangular, the upper lobe larger; lip pale rose, bilaminate, the laminae narrowly ovate, 2 mm long, the bases rounded, the apices acute, long-acuminate, microscopically pubescent, the connectives narrow, from the base of the blades, the body narrow, connate to the base of the column, the appendix pubescent, narrowly linear, incurved in the natural position and in contact with the stigma; column 1 mm long, the anther dorsal, the stigma ventral.

Etymology. Named in honor of Father Angel Andreetta, an Italian-born Salesian Padre at Paute, Ecuador, who discovered this species.

This species was collected by Father Andreetta, probably east of Paute, and cultivated by him at the mission near Paute. It is distinguished by the small habit and a successively flowered raceme much longer than the leaves. The flowers are comparatively large but narrow with acuminate sepals, the laterals in apposition. The blades of the lip are very narrowly ovate with the connectives arising at the base. The appendix is narrow and curved up to be intimately associated with the stigma.

Lepanthes campodostele Luer & Hirtz, sp. nov.

TYPE: Ecuador. Zamora-Chinchipe: Cordillera del Condor, epiphytic in cloud forest E of Los Encuentros, 1,550 m, 18 May 1988, C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13472 (holotype, MO). Figure 2.

Planta parva caespitosa; inflorescentia racemosa laxa foliis orbicularibus longiore; floris sepalis ovatis longiciliatis, petalis pubescentibus transverse lobatis oblongis, labello pubescenti bilobo, lobis oblongis erectis, appendice externa pubescenti, columna grandi cylindrica apice truncato bicornuto.

Plant very small, epiphytic, caespitose; roots comparatively fleshy. Ramicauls erect, slender, 12–15 mm long, enclosed by 4 long-ciliate, lepanthiform sheaths. Leaf erect, coriaceous, orbicular, 10 mm long, 10 mm wide, the rounded base contracted into a petiole 1.5 mm long. Inflorescence a loose, distichous, successively few-flowered raceme up to 30 mm long including the filiform peduncle 15 mm long, sparsely pubescent; floral bracts 1.5 mm long, spiculate; pedicels 1.5 mm long; ovary 1.5 mm long; sepals carinate-spiculate, the margins erose-ciliate,

the dorsal sepal translucent, suffused with purple, ovate, deeply concave, acuminate, acute, 5 mm long, 4 mm wide unexpanded, connate to the lateral sepals for 1 mm, the lateral sepals purple, ovate, oblique acute, 6.5 mm long, 2.25 mm wide, connate 3.5 mm, deeply concave medial to the midveins, convex lateral to the midveins, convex along the medial margins in apposition; petals green pubescent, transversely bilobed, 0.5 mm long, 3 mm wide, the lobes subequal, oblong with rounded ends, the apex of the upper lobe incurved; lip green, ciliate, bilobed, the lobes oblong with rounded apices, 1 mm long, erect to either side of the column, the body cleft anteriorly, connate to the base of the column, the appendix external, oblong, recurved, pubescent; column comparatively large, cylindrical, 2 mm long, the apex truncate and flat with a pair of erect angles on the upper margin, the clinandrium on the lower half of the apical surface, separated from the subapical stigma by the rostellar flap along the lower margin.

Etymology. From the Greek *campodes*, “like a caterpillar,” and *stela*, “the column,” referring to the unusual shape of the column.

The flower of this species is large for the tiny plant with orbicular leaves. The sepals are carinate spiculate externally with ciliate-erose margins. The dorsal sepal is deeply concave, while the lateral sepals are concave centrally between convex margins. The convex medial margins are in apposition except basally, where the lateral sepals are connate and deeply concave. This unusual configuration is seen in the Bolivian *L. nycteris* Luer & Vásquez.

Most unusual is the comparatively large column. The oblong lobes of the lip are held erect to either side. The column is cylindrical with the apex flat. Two erect angles are present on the upper margin of the flat apical end. The clinandrium with the anther occupies most of the lower half of the end. The stigma is located along the lower margin. Although unrelated, the apex of the column is reminiscent of *Salpistele* Dressler.

Lepanthes corkyae Luer & Hirtz, sp. nov. TYPE:

Ecuador. Carchi: epiphytic in cloud forest between Tulcán and Maldonado, 2,300 m, 2 Apr. 1984, C. Luer, S. Dalström & T. Höijer 9934 (holotype, MO). Figure 3.

Species haec *Lepanthis schizicis* Luer similis, sed sepalis glabris, synsepalo concavo cum apicibus brevibus acutis differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 20–30 mm long, enclosed

by 5–6 close, minutely ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, obtuse, 10–12 mm long, 5–8 mm wide, the base cuneate into a petiole 1 mm long. Inflorescence a loose, flexuous, successively several-flowered raceme up to 6 cm long, including the slender peduncle 1–2 cm long; floral bract 1 mm long; pedicel 2–3 mm long; ovary 1.5 mm long; sepals orange to red-brown, carinate, glabrous, the dorsal sepal ovate, obtuse, concave, 5 mm long, 3.5 mm wide unexpanded, the apex abruptly acuminate into a slender tail 2–3 mm long, the lateral sepals 11–12 mm long including the slender tails 5–6 mm long, the blades connate 4.5 mm into an oblong, bifid lamina 6 mm long, 4 mm wide, the free portions acute, contracted into non-approximate tails; petals yellow-orange to brown, transversely bilobed, 0.8 mm long, 4 mm wide, the upper lobe oblong with the apex rounded, the lower lobe narrowly triangular with the apex acute, lightly recurved; lip yellow-orange to brown, bilaminate, the blades oblong, lightly concave, glabrous, 1.5 mm long, with the apices subtruncate, the connectives cuneate, the body narrow, connate to the column above the base, the appendix small, triangular, concave, with an uncinata, apical segment; column 1 mm long, the anther dorsal, the stigma ventral.

Etymology. Named for Corky, Skeeix's sister, a character from Frank King's *Gasoline Alley*.

This species is very similar to *L. schizix*, and for years was considered to be the same. However, a recent collection and re-examination of pickled flowers reveal subtle differences. The sepals of *L. corkyae* are not ciliate; the synsepal is proportionately shorter and broadly concave with short, acute apices contracted into longer tails. *Lepanthes corkyae* occurs on the western slopes of northern Ecuador in the provinces of Carchi and Imbabura. *Lepanthes schizix* occurs on the western slopes of Pichincha.

Paratypes. ECUADOR. **Carchi:** cloud forest between Tulcán and Maldonado, 2,050 m, 2 Apr. 1984, C. Luer, S. Dalström & T. Höijer 9919 (MO), 2,300 m, 17 Mar. 1991, C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15147 (MO). **Imbabura:** Selva Alegre, 1,400 m, May 1989, A. Hirtz & X. Hirtz 4250 (MO).

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

TYPE: Ecuador. Napo: epiphytic in cloud forest between El Carmelo and La Bonita, 2,400 m, Aug. 1990, A. Hirtz, X. Hirtz, J. del Hierro & F. Sarmiento 4965 (MO), C. Luer illustr. 15282. Figure 4.

Planta parva caespitosa; racemo paucifloro foliis ellipticis crassis multilongiore; floris grandis sepalis late ovatis concavis obtusis acuminatis, petalis transverse bilobis, la-

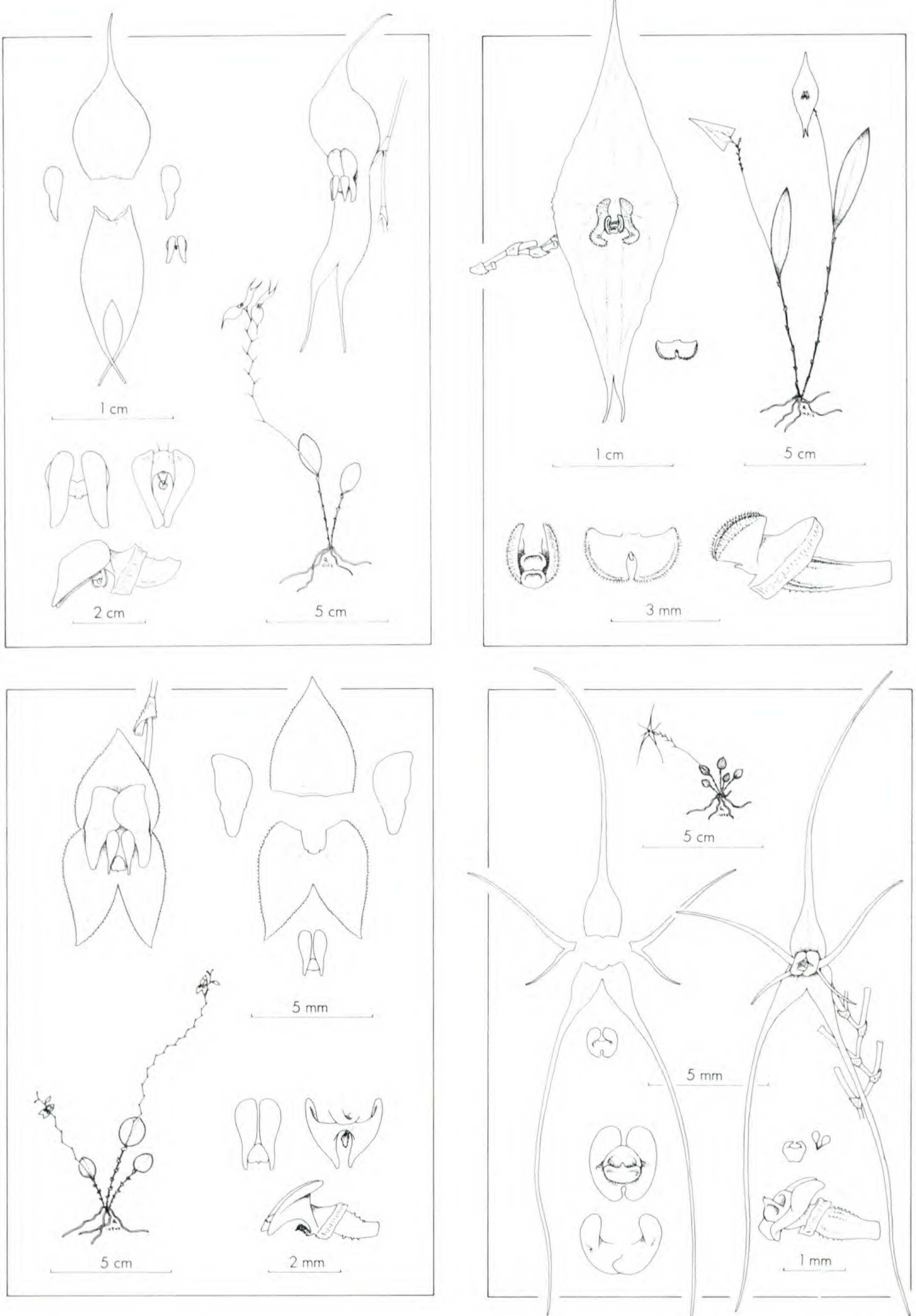
belli laminis duabus oblongis longitudinaliter callosis, connectivis cuneatis, appendice cupulata processum stigmaticum amplectenti.

Plant small, epiphytic, caespitose, roots slender. Ramicauls slender, erect, 2–4 cm long, enclosed by 5–7 minutely ciliate-scabrous, lepanthiform sheaths. Leaf erect, thickly coriaceous, \pm suffused with purple beneath, elliptical, subacute to obtuse, 17–28 mm long including a 2–4-mm-long petiole, 7–12 mm wide, the base cuneate into the petiole. Inflorescence a loose, flexible, successively few-to several-flowered raceme, up to 6 cm long including the slender peduncle 2–4 mm long; floral bract ciliate, 1.5–2 mm long; pedicel 2–3 mm long; ovary costate, 1–2 mm long; sepals red, sometimes with yellow stripes along the veins, glabrous, the dorsal sepal ovate, broadly ovate to suborbicular, concave, the blade 8–10 mm long, 5–8 mm wide, unexpanded, connate to the lateral sepals for 1 mm, the apex subacute to obtuse, acuminate into a slender tail 3–5 mm long, the lateral sepals connate 6 mm into an ovate to broadly ovate, bifid lamina, 10–11 mm long, 7–12 mm wide, with the subacute apices contracted into tails 2–4 mm long; petals red to orange-brown, minutely pubescent, transversely bilobed, 1 mm long, 4.5 mm wide, the upper lobe oblong, obtuse, the lower lobe smaller, narrowly triangular; lip red to orange-brown, bilaminate, the laminae oblong with obtuse ends, minutely pubescent, longitudinally callous below the middle, 2 mm long, the connectives short, cuneate, from near the base, the body connate to the base of the column, with a membranous, ciliate, slinglike appendix with a knoblike apex that holds an elongate process from the stigma; column terete, 1 mm long, the anther apical, the stigma ventral with a process grasped by the appendix.

Etymology. Named in honor of Juan del Hierro of Quito, Ecuador, co-discoverer of this species.

This showy species is distinguished by a loose, flexible, successively few-flowered raceme much longer than the elliptical leaf. The large, red flower with yellow veins is characterized by broad, concave sepals that are abruptly acuminate into short tails. The red, bilobed petals are not remarkable. The red blades of the lip are longitudinally callous toward the base. Most remarkable is the membranous, slinglike appendix with a knoblike apex that holds a long, curved process that descends from the stigma. A form with narrower sepals occurs farther south.

Paratypes. ECUADOR. **Morona-Santiago:** epiphytic in cloud forest, Valle del Paute, 2,200–2,400 m, collected by M. Portilla, flowered in cultivation by A. Andreetta at Paute, 16 May 1988, C. Luer 13366 (MO).



Figures 5-8. —5 (Top left). *Lepanthes drymocharis* Luer & Hirtz. —6 (Top right). *Lepanthes echo* Luer & Hirtz. —7 (Bottom left). *Lepanthes exogena* Luer & Hirtz. —8 (Bottom right). *Lepanthes filamentosa* Luer & Hirtz.

Lepanthes drymocharis Luer & Hirtz, sp. nov.

TYPE: Ecuador. Carchi: epiphytic in cloud forest E of Maldonado, 2,300 m, 17 Mar. 1991, C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15152 (holotype, MO). Figure 5.

Species haec *Lepanthis schizicis* Luer similis, sed floribus duplomagioribus, sepali dorsalis vix concavi cauda recurva, synsepalo proportione brevior, et labelli lamina duabus lateribus deflexis differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 20–30 mm long, enclosed by 5–6 ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, obtuse, 10–20 mm long, 6–9 mm wide, the base cuneate into a petiole 1 mm long. Inflorescence a loose, flexuous, successively several-flowered raceme up to 9 cm long, including the slender peduncle 2–3 cm long, 2 flowers often produced simultaneously; floral bract 1.5 mm long; pedicel 1.5 mm long; ovary 1 mm long; sepals red-brown, striped with yellow along the veins, carinate, minutely ciliate, the dorsal sepal broadly obovate, obtuse, 8–9 mm long, 6.5 mm wide, the apex acuminate into a slender, recurved tail 4–5 mm long, the lateral sepals 15 mm long including the slender tails 5–6 mm long, the blades connate 7 mm into an obovate, bifid lamina 5 mm wide, the free portions acute, tapered into nonapproximate tails; petals yellow, minutely pubescent, transversely bilobed, 1 mm long, 4.5 mm wide, the upper lobe oblong with the apex rounded, the lower lobe narrowly triangular; lip white, suffused with brown medially, bilaminate, the blades oblong, lightly concave on the upper surface, with deflexed sides, microscopically pubescent, 2 mm long, with the apices rounded, the connectives broad, short, the body broad, connate to the column at the base, the appendix pubescent, oblong, with an incurved, truncate apical segment; column 1 mm long, the anther dorsal, the stigma ventral.

Etymology. From the Greek *drymocharis*, “a woodland grace,” referring to the beauty of the flowers.

This handsome species is related to *L. corkyae*, with which it is sympatric, and *L. schizix* from farther south. *Lepanthes drymocharis* is distinguished by the larger flowers with a broad, minimally concave dorsal sepal with a recurved tail. The sepals are minutely ciliate. The blades of the lip differ from those of the two related species in the broad, deflexed sides.

Lepanthes echo Luer & Hirtz, sp. nov. TYPE:

Ecuador. Zamora-Chinipe: epiphytic in for-

est near Nambija, 1,300 m, Feb. 1987, A. Hirtz 3315 (holotype, MO), C. Luer illustr. 14712. Figure 6.

Planta mediocris, inflorescentia cum racemo grandifloro subcongesto disticho cum pedunculo gracili folio anguste elliptico duplolongiore, sepalo dorsali synsepaloque triangularibus acutis leviter acuminatis, petalis transverse bilobis, lobo superiore ovato obliquo, lobo inferiore suboblongo incurvato apice incrassato, labello bilobo, lobis flabellatis marginis incrassatis, appendice parva pubescenti.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 3–7 cm long, enclosed by 4–7 ciliate, lepanthiform sheaths. Leaf erect, coriaceous, narrowly elliptical, acute, 2.5–4.5 cm long, 0.8–1 cm wide, the base cuneate into a petiole 2–4 mm long. Inflorescence a subcongested, distichous, successively few-flowered raceme up to 10 mm long, borne beyond the leaf by a slender peduncle 4–5 cm long; floral bract 1.5–2 mm long, lightly muriculate; pedicel 1.5–2 mm long; ovary 2.5 mm long; sepals glabrous, the dorsal sepal triangular, acute, lightly acuminate, 17 mm long, 11 mm wide, connate to the lateral sepals for 4 mm, the lateral sepals connate 12 mm into a triangular synsepal 18 mm long, 11 mm wide, the apices in apposition, acute, lightly acuminate, free for 4 mm; petals minutely pubescent, transversely bilobed, 1 mm long, 4 mm wide, the upper lobe ovate, oblique, acute, the lower lobe suboblong, incurved near the middle with the incurved apical portion thickened, the lower lobe thrice longer than the upper lobe; lip red, bilobed, pubescent, the lobes flabellate with rounded, thickened margins as rudimentary blades, 1.9 mm long, 3.6 mm wide expanded, the lobes (connectives) cuneate to form the narrow body, connate to the base of the column, the appendix small, oblong, pubescent; column 1.5 mm long, the anther dorsal, the stigma apical.

Etymology. Named for the mythological nymph Echo. The large, gaping flower is reminiscent of *L. dalessandroi* Luer.

This species is known only from the type collection by Alexander Hirtz. It is similar to *L. dalessandroi*, known from nearby localities, but it is easily distinguished by the short, more or less congested, instead of loose, raceme (subsect. *Lepanthes*) borne by a peduncle beyond the leaf (ser. *Elongatae*). The flower is large, with the triangular, noncaudate dorsal sepal and synsepal spreading widely in opposite directions. The incurved, apical portion of the lower lobe of the petal is thickened. The blades of the lip consist merely of the thickened margins of fan-shaped lobes of the lip.

Lepanthes exogena Luer & Hirtz, sp. nov. TYPE: Ecuador. Zamora-Chinchipe: epiphytic in cloud forest S of Yangana above Valladolid, 2,450 m, 23 Mar. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 10944 (holotype, MO). Figure 7.

Planta parva; inflorescentia laxe multiflora folio late ovato multilongiore; floris sepalis acutis minute denticulatis, petalis transverse bilobis, lobo superiore oblongo quam lobo inferiore obtuse triangulari majore, labelli laminis duabus anguste ovatis, connectivis brevibus cuneatis, corpore angusto, appendice stipitata pubescenti ex pagina externa corporis orienti.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 10–30 mm long, enclosed by 5–8 ciliate, lepanthiform sheaths with dilated ostia. Leaf erect, coriaceous, broadly ovate to orbicular, 7–13 mm long, 7–12 mm wide, the apex subacute, obtuse to rounded, the base broadly cuneate into a petiole 1.5–2 mm long. Inflorescence a loose, flexuous, successively several-flowered raceme up to 12 cm long, including the slender peduncle 1.5 cm long; floral bract 1.25–2 mm long; pedicel 1 mm long; ovary 1 mm long; sepals dark red with narrow, green margins, carinate, minutely denticulate, the dorsal sepal ovate, acute, 4–5 mm long, 2.5–3.25 mm wide, connate to the lateral sepals for 0.5 mm, the lateral sepals ovate, acute, oblique, 4–5 mm long, 1.5–2 mm wide, connate 1 mm; petals orange, microscopically pubescent to glabrous, transversely bilobed, 0.5–1 mm long, 3–3.5 mm wide, the upper lobe oblong, oblique, the apex obtuse, the lower lobe smaller, triangular, with the apex rounded; lip white or yellow, suffused with red medially, bilaminar, the blades ovate, microscopically pubescent to glabrous, 2 mm long, with the apices acute and bases rounded, the connectives short, cuneate, the body narrow, connate to the column at the base, the appendix ovoid, pubescent, stipitate, originating from the external surface of the body at the attachment to the column; column 2 mm long, the anther dorsal, the stigma ventral.

Etymology. From the Latin *exogenus*, “formed on the outside,” referring to the position of the appendix.

This little species is distinguished by the flexuous raceme that becomes much longer than the broadly ovate to orbicular leaves. The red sepals with thin, green margins are acute and minutely denticulate. The petals are bilobed and broad. The blades of the lip are narrowly ovate with short connectives that form a narrow body. The stipitate appendix originates from the external surface.

Paratypes. ECUADOR. **Zamora-Chinchipe:** cloud forest S of Yangana above Valladolid, C. Luer, J. Luer, A. Hirtz & W. Flores 10852 (MO).

Lepanthes filamentosa Luer & Hirtz, sp. nov. TYPE: Ecuador. Esmeraldas: epiphytic in cloud forest W of Lita, 750 m, 18 Jan. 1987, C. Luer, J. Luer, C. H. Dodson, A. Hirtz, D. Benzing & D. Bermudes 12378 (holotype, MO). Figure 8.

Planta minutissima caespitosa; inflorescentia racemosa subdensa folio elliptico microscopice ciliato longiore; floris sepalis ovatis apice longissime filamentosis, petalis bifurcatis apicibus filamentosis, labello bilobo, lobis auriculatis superne laminas indistinctas formantibus, inferne apicibus incurvatis, appendice nulla.

Plant minute, epiphytic, caespitose; roots comparatively thick. Ramicauls erect, slender, 4–10 mm long, enclosed by 3–5 microscopically ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, 3–7 mm long, 2.5–5 mm wide, the apex obtuse to subacute, prominently apiculate, the margins microscopically cellular-ciliate, the base cuneate into a petiole up to 1 mm long. Inflorescence a subdense, distichous, successively several-flowered raceme up to 7 mm long, borne by a filiform peduncle 10–18 mm long; floral bracts 1–1.5 mm long, muriculate; pedicels 1.5–2.5 mm long; ovary 1 mm long, with the ribs cellular-papular; sepals yellow to white suffused with purple centrally, carinate, ovate, with the acute apices extremely long-attenuate, the dorsal sepal 10–17 mm long, 1.25–1.5 mm wide, connate to the lateral sepals for 0.5 mm, the lateral sepals oblique, 10–16 mm long, 1–1.25 mm wide, connate 0.5 mm; petals yellow, bifurcate 1 mm above the base, the divisions filiform, 3–5.5 mm long; lip yellow, glabrous, bilobed, the lobes auricular, 1.25 mm long, with the half above the column thickened to form an ill-defined lamina, the half below the middle falcate with broadly rounded, incurved, overlapping apices, without an appendix, the body connate to the base of the column; column 1 mm long, the anther and the stigma apical.

Etymology. From the Latin *filamentosus*, “filamentous,” referring to the long-acuminate sepals and lobes of the petals.

Mature plants of this species are some of the smallest known in the genus. The flowers are also minute, but the lengths of the exceedingly long, filamentous tails of the sepals and the filamentous lobes of the petals create dimensions comparable to flowers of much larger species.

Lepanthes filamentosa grows relatively frequently in the wet, lowland forest of northwestern Ecuador where it is nevertheless difficult to find. It grows buried in thick layers of moss on small branches of trees. Sometimes only the minute, spiderlike flowers are visible at a distance of 2 or 3 cm from the hidden plant. Although the racemes are congested (subsect.

Lepanthes), they are borne far beyond the leaves by hairlike peduncles (ser. *Elongatae*).

Paratypes. ECUADOR. **Esmeraldas**: cloud forest W of Lita, color forms, C. Luer et al. 12377, 12408 (MO).

Lepanthes grossiradix Luer & Hirtz, sp. nov.

TYPE: Ecuador. El Oro: epiphytic in forest remnant W of Pacha, 2,250 m, 23 May 1988, C. Luer, A. Hirtz, W. Flores, A. Andretta & W. Teague 13613 (holotype, MO). Figure 9.

Planta mediocris caespitosa; radicibus crassissimis; inflorescentia racemosa laxe multiflora foliis ellipticis multilongiore; floris sepalis ovatis acutis sparse ciliatis, petalis transverse lobatis, lobo superiore oblongo, lobo inferiore triangulari, labelli laminis duabus pubescentibus lunatis, connectivis late cuneatis, corpore lato, appendice minuta fissa.

Plant medium in size, epiphytic, caespitose; roots purple, coarse, thick. Ramicauls erect, slender, 3–6 cm long, enclosed by 6–8 ciliate, lepanthiform sheaths dilated at the ostia. Leaf erect, coriaceous, elliptical-ovate, acute, slightly acuminate, 2.5–4 cm long, 0.9–1.2 cm wide, the base cuneate into a petiole 2–4 mm long. Inflorescence a loose, distichous, successively many-flowered raceme up to 6 cm long including the slender peduncle ca. 1 cm long; floral bracts 1.5 mm long; pedicels 1.5 mm long; ovary 0.5 mm long; sepals brown with yellow margins, sparsely ciliate, the dorsal sepal ovate, concave, acute, 3 mm long, 2 mm wide expanded, connate to the lateral sepals for 0.5 mm, the lateral sepals ovate, oblique, acute, 3 mm long, 1.2 mm wide, 1-veined, connate 1 mm; petals brown, minutely pubescent, transversely bilobed, 0.5 mm long, 1.9 mm wide, the upper lobe oblong, obtuse, the lower lobe triangular; lip brown, minutely pubescent, bilaminiate, the laminae lunate with indistinct blades, 1.5 mm long, the connectives broadly cuneate, the body broad, connate to the base of the column, the appendix minute, oblong, cleft down the middle; column terete, 1.5 mm long, the anther dorsal, the stigma apical.

Etymology. From the Latin *grossiradix*, “a thick root,” referring to the thick, coarse, purplish roots.

Most remarkable of this species are the roots that are extremely thick for the size of the plant. The racemes are loosely flowered, beginning much shorter than the leaf, but eventually lengthening to about twice the length of the leaf. The sepals are acute and sparsely ciliate, the laterals with only one vein. The lobes of the lip are lunate, surrounding the apex of the column with a dorsal anther and apical stigma. The appendix is a minute, oblong structure with a cleft down the center.

Lepanthes illinizae Luer & Hirtz, sp. nov. TYPE:

Ecuador. Pichincha: epiphytic in wet forest, W flank of Volcán Illiniza, Cerro Azul, 2,900 m, 23 Jan. 1987, C. Luer, J. Luer & A. Hirtz 12478 (holotype, MO). Figure 10.

Species haec *L. bilobae* Lindley affinis, sed sepalis denticulatis et petalorum lobis apice rotundatis differt.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, stout, 5–12.5 cm long, enclosed by 10–14 dark, loose, ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical-ovate, acute, acuminate, 4–6.5 cm long, 1.5–2 cm wide, the base cuneate to rounded, contracted into a petiole ca. 4 mm long. Inflorescence an elongating, loose, distichous, lightly flexuous, successively many-flowered raceme up to 14 cm long including the pedicel 1.5–2.5 cm long; floral bracts 3 mm long, pedicels 1.5 mm long; ovary 2 mm long; flowers yellow to orange-brown; sepals ovate, acute, lightly acuminate, carinate, denticulate, the dorsal sepal 7 mm long, 3.5 mm wide, connate to the lateral sepals for 1 mm, the lateral sepals oblique, 7 mm long, 2.25 mm wide, connate 2.5 mm; petals microscopically pubescent, transversely bilobed, 1 mm long, 3 mm wide, the upper lobe oblong with the end rounded, the lower lobe triangular with the end rounded, shorter than the upper lobe; lip microscopically pubescent, bilaminiate, the blades narrowly oblong with rounded ends, 2.25 mm long, the connectives cuneate, the body narrow, connate to the base of the column, the appendix small, ovoid, pubescent; column 2 mm long, the anther dorsal, the stigma ventral.

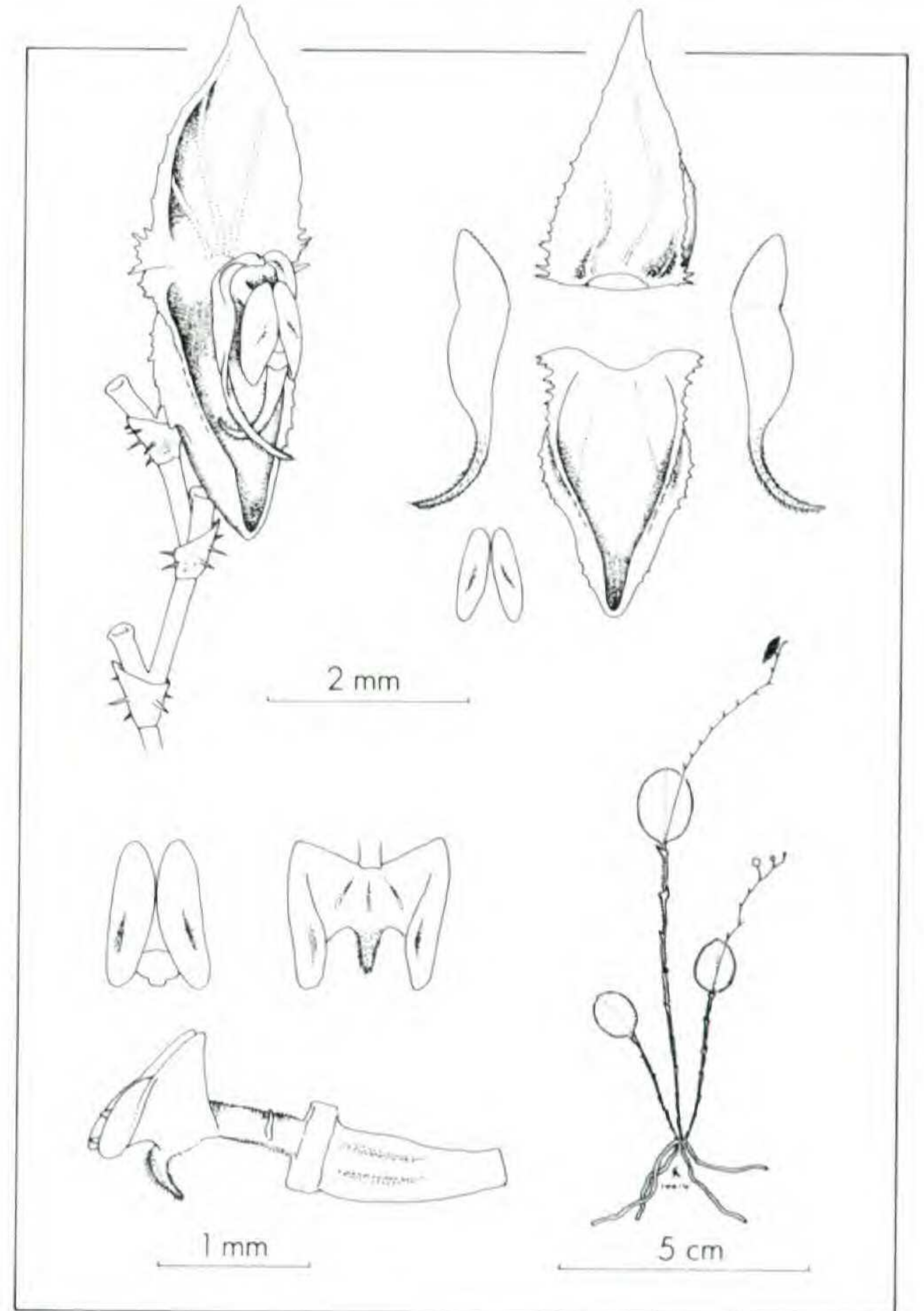
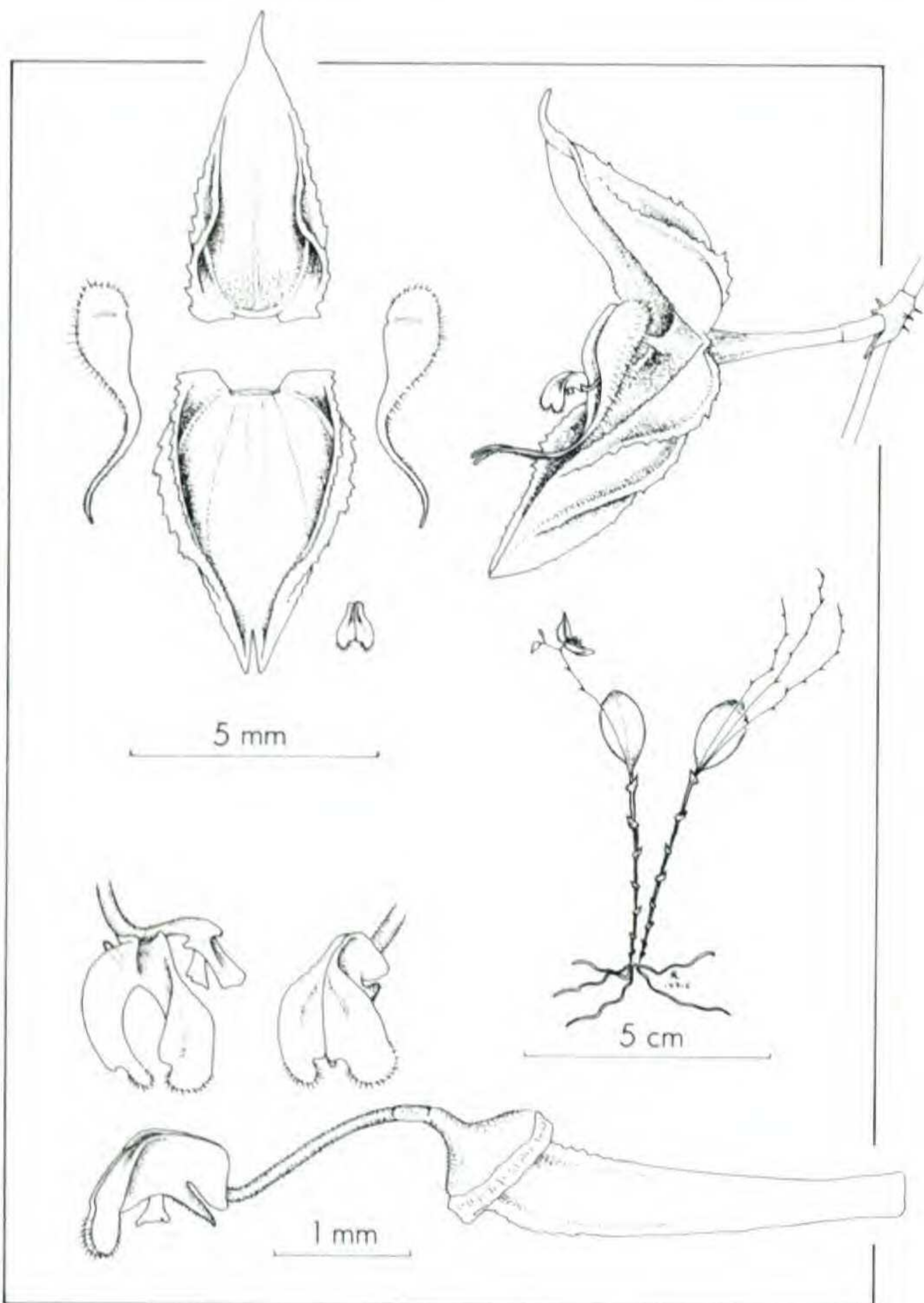
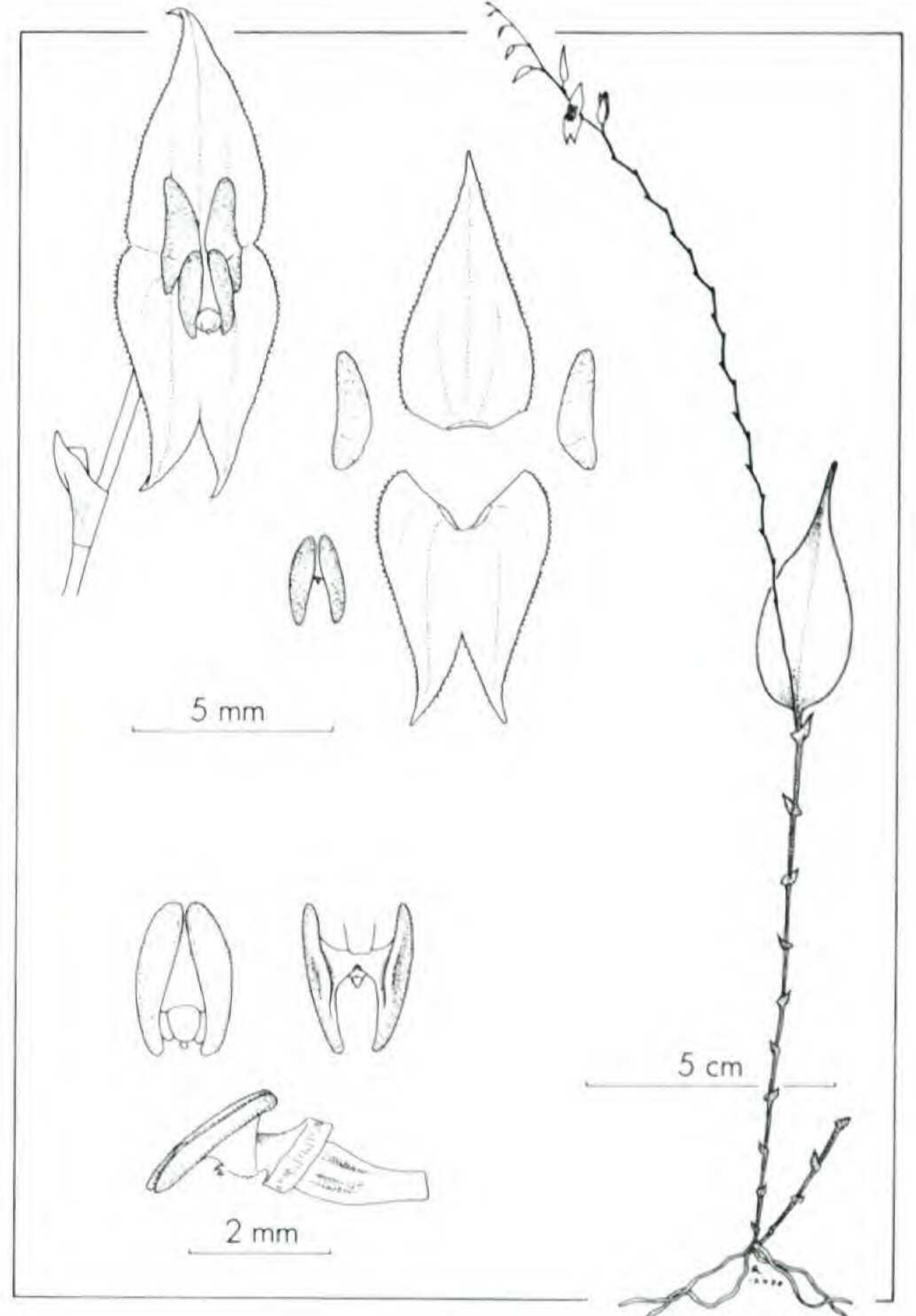
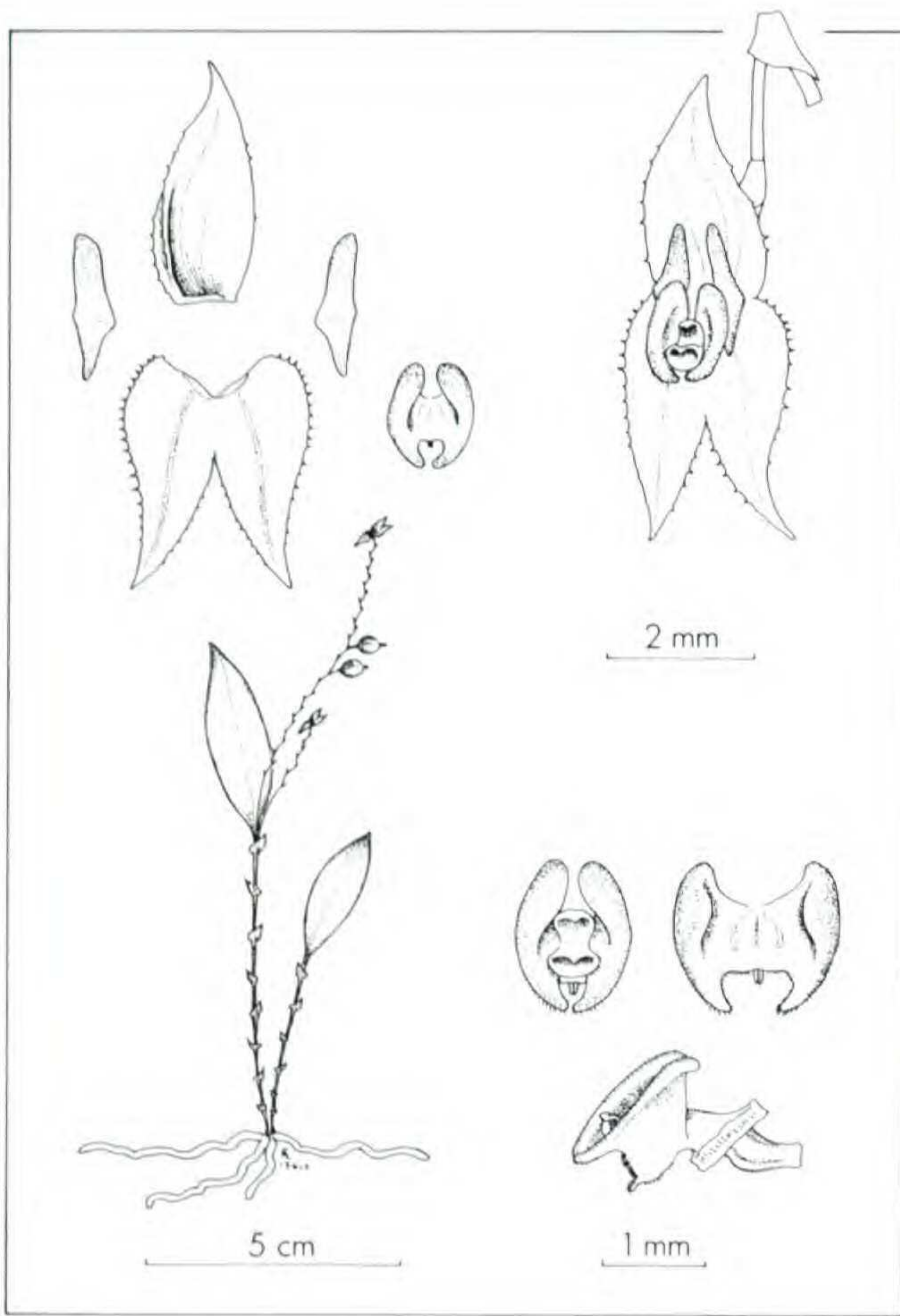
Etymology. Named for Volcán Illiniza, on which this species was discovered.

This species is another in the hoard belonging to the *L. biloba* and *L. elongata* complexes. The loosely flowered racemes begin flowering shorter than the leaves, but eventually attain lengths exceeding the leaves several times. *Lepanthes illinizae* is distinguished from the species included in the above complexes by the following combination of features: peduncles shorter than the leaves; sepals acute and lightly acuminate, glabrous but denticulate; lobes of the petals rounded; blades of the lip narrowly oblong, and the appendix small and ovoid.

Lepanthes nematostele Luer, sp. nov. TYPE:

Ecuador. Carchi: epiphytic in wet, mossy forest E of Maldonado, 1,900 m, 15 Feb. 1989, S. Dalström & T. Höijer 1234 (holotype, MO), C. Luer illustr. 14715. Figure 11.

Planta parva; racemo laxo successive plurifloro folio elliptico ter longiore; floris sepalo dorsali synsepaloque



Figures 9-12. —9 (Top left). *Lepanthes grossiradix* Luer & Hirtz. —10 (Top right). *Lepanthes illinizae* Luer & Hirtz. —11 (Bottom left). *Lepanthes nematosteale* Luer & Hirtz. —12 (Bottom right). *Lepanthes phrixothrix* Luer & Hirtz.

crístatis concavis ovoideis, petalis transverse bilobis, lobo inferiore longissime acuminato hirsuto, labelli minuti connectivis corporeque ad columnam circa apicem adnatis, laminis duabus arcuatis inter se agglutinatis apice rotundatis ciliatis, appendice triangulari retrorsa, columna longissima gracillima.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 3–5 cm long, enclosed by 7–8 long-ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, subacute, 10–15 mm long excluding the petiole 1–1.5 mm long, 8–10 mm wide, the base cuneate into the petiole. Inflorescence an erect, loose, successively several-flowered raceme up to 5 cm long including the slender peduncle 2–2.5 cm long; floral bract 1.5 mm long; pedicel 1.5–2 mm long; ovary 3.5 mm long, lightly ribbed; sepals dark red, concave, crested along the veins and margins, the dorsal sepal ovoid, acute, 6 mm long, 2.5 mm wide unexpanded, connate to the lateral sepals for 1 mm, the lateral sepals connate 5 mm into an ovoid synsepal similar to the dorsal sepal, 6 mm long, 4 mm wide unexpanded, the apices free for less than 1 mm; petals transversely bilobed, long-pubescent on the back surface, 1 mm long, 5 mm wide, the upper lobe short, semicircular, the lower lobe triangular, acute, long-acuminate; lip bilaminate, the laminae glabrous, arcuate, firmly agglutinated to each other below the middle over the column, 1.25 mm long, the apices everted, rounded, ciliate, the connectives and body short, adnate to the column near the apex, the appendix triangular, retrorse; column weak, proportionately very long and very slender, 3.5 mm long, the anther dorsal, the stigma ventral with a prominent, descending process.

Etymology. From the Greek *nematostele*, “a threadlike column,” referring to the column.

This remarkable species is characterized by the small vegetative habit with long-ciliate, lepanthiform sheaths; a loose inflorescence longer than the leaves; concave, crested sepals; petals with a long-acuminate lower lobe and arising from the shaft of the column; and a long, slender column bearing near the tip a tiny lip. The blades of the lip are adherent over the column. A prominent stigmatic process as large as the retrorse appendix descends from between the blades.

Lepanthes phrixothrix Luer & Hirtz, sp. nov.

TYPE: Ecuador. Morona–Santiago: Cordillera del Condor, epiphytic in forest E of Guismé, 1,650 m, 20 Jan. 1989, *C. Luer, J. Luer, P. Jesup & A. Jesup 14014* (holotype, MO). Figure 12.

Planta parva; ramicaulium vaginis longipubescentibus; racemo laxo folio suborbiculato multilongiore; floris sepalis

crístatis, synsepalo cymbiformi, petalis transverse bilobis, lobo superiore triangulari, lobo inferiore majore longicaudato, labelli laminis duabus oblongis, corpore latissimo ad columnae gracilis medium adnato, appendice triangulari pubescenti.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 1.5–6 cm long, enclosed by 5–8 densely and coarsely long-ciliate, lepanthiform sheaths. Leaf erect, coriaceous, suborbicular, obtuse to rounded, 7–15 mm long, 7–11 mm wide, the rounded base contracted into a 1-mm-long petiole. Inflorescence an arching, loose, successively many-flowered raceme, up to 5 cm long including the slender peduncle 10–15 mm long; floral bract 0.5 mm long; pedicel 0.75 mm long; ovary 1 mm long, lightly ribbed; sepals costate-crested, the dorsal sepal red, triangular, acute, concave, 3 mm long, 1.5 mm wide, connate to the lateral sepals for 1 mm, the lateral sepals completely connate into an ovoid, boat-shaped synsepal, 3 mm long, 1.5 mm wide unexpanded, the apex narrowly obtuse; petals yellow, minutely pubescent, transversely bilobed, 0.5 mm long, 3 mm wide, the upper lobe triangular, the lower lobe oblong, the acute apex attenuate into an equally long, slender tail, the lower lobe much longer than the upper lobe; lip red, bilaminate, the laminae glabrous, oblong, 1 mm long, the apices rounded, the connectives broad, quadrate, forming a broad body, adnate to the middle of the slender column, the appendix triangular, protuberant and decurved, pubescent; column 1.5 mm long, the anther apical, the stigma ventral.

Etymology. From the Greek *phrixothrix*, “with bristling hair,” referring to the lepanthiform sheaths.

This little species is known only from the Cordillera del Condor. It is characterized by the small vegetative habit with long-ciliate, lepanthiform sheaths; a loose, successively flowered raceme eventually reaching much longer than the small, round leaf; the costate-crested sepals, the laterals connate into a boat-shaped synsepal; the petals with the lower lobes long-tailed; the glabrous oblong blades of the lip with a pubescent, protruding, triangular appendix. Although the inflorescence is “loose” by definition, it approaches being “dense.”

Paratypes. ECUADOR. Morona–Santiago: E of Chuchumbletza, 1,650 m, 21 May 1988, *C. Luer, A. Hirtz, W. Flores, W. Teague & A. Andreetta 13539* (MO).

Lepanthes sigsigensis Luer & Hirtz, sp. nov.

TYPE: Ecuador. Morona–Santiago: epiphytic in cloud forest E of the pass E of Sigsig, 2,700 m, 15 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13350* (MO). Figure 13.

Planta mediocris caespitosa; inflorescentia racemosa laxissima disticha foliis ovatis multilongiore; floris sepalis ovatis acutis minute denticulatis, petalis transverse lobatis, lobis oblongis obtusis, lobo superiore longiore, labelli laminis duabus glabris anguste ovatis, connectivis cuneatis, appendice gracili sigmoidea minute pubescenti.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 3–7.5 cm long, enclosed by 7–10 ciliate, lepanthiform sheaths dilated at the ostia. Leaf erect, coriaceous, ovate, acute, slightly acuminate, 3–4 cm long, 1.3–1.7 cm wide, the rounded base contracted into a petiole 2–3 mm long. Inflorescence a loose, distichous, successively several-flowered raceme up to 10 cm long including the slender peduncle 2–2.5 cm long; floral bracts 2.5–3 mm long, crested; pedicels 3.5–4.5 mm long; ovary alate, 1 mm long; sepals light yellow, minutely denticulate, the dorsal sepal with a broad, central, purple stripe, triangular-ovate, acute, 8 mm long, 4 mm wide, connate to the lateral sepals for 1.5 mm, the lateral sepals ovate, oblique, acute, 8 mm long, 3 mm wide, connate 2 mm; petals orange, suffused with purple medially, microscopically cellular-glandular, transversely bilobed, 1.25 mm long, 5.5 mm wide, the lobes oblong, obtuse, the upper lobe longer; lip red-orange, essentially glabrous, bilaminar, the laminae narrowly ovate, with the apex narrowly rounded, 3 mm long, the connectives shortly cuneate, the body narrow, connate to the base of the column, the appendix slender, sigmoid, minutely pubescent; column terete, 2 mm long, the anther dorsal, the stigma ventral.

Etymology. Named for the town of Sigsig, near the area where this species was discovered.

Although superficially similar to other medium-sized species with relatively large flowers borne in a long, loose raceme (e.g., *L. capitanea* Reichenbach f. and *L. effusa* Schlechter), this species is distinguished by the ovate leaves, minutely denticulate sepals, simple petals and blades of the lip, but with a slender, sigmoid appendix borne in the sinus.

Lepanthes splendida Luer & Hirtz, sp. nov.

TYPE: Ecuador. Morona-Santiago: epiphytic in wet forest along the new road W of Macas toward Guamote, 1,900 m, 16 Jan. 1989, C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13937 (holotype, MO). Figure 14.

Planta parva; racemo laxo simul florenti folio elliptico ter longiore; floris purpurei grandis sepalo dorsali triangulari acuminato, synsepalo ovato breviter bifurcato multijugato, petalis transverse bilobis, lobis ovoideis, lobo inferiore multiminore, labelli laminis duabus anguste fal-

catis acutissimis, connectivis brevibus, appendice bipartita.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 10–15 mm long, enclosed by 3–4 minutely ciliate, lepanthiform sheaths. Leaf erect, coriaceous, elliptical, subacute, 17–22 mm long excluding the petiole 2 mm long, 6–8 mm wide, the base cuneate into the petiole. Inflorescence an erect, loose, simultaneously flowered raceme of 5–6 large, red-purple flowers, up to 9.5 cm long including the slender peduncle 3 cm long; floral bract 2 mm long; pedicel 3–4 mm long; ovary 1 mm long, lightly ribbed; sepals red-purple, glabrous, the dorsal sepal triangular, acute, acuminate, 9.5 mm long, 3.5 mm wide, connate to the lateral sepals for 1 mm, the lateral sepals connate 8 mm into a broad lamina 13 mm long, 7 mm wide, the apices free for 3 mm, subacute, shortly apiculate; petals yellow-white, microscopically cellular pubescent, transversely bilobed, 1 mm long, 2.25 mm wide, the upper lobe ovoid, obtuse, the lower lobe triangular, obtuse, much smaller than the upper lobe; lip rose, bilaminar, the laminae glabrous, subfalcate, 1.25 mm long, the bases rounded, the apices narrowly acuminate, the connectives short, forming a narrow body with a two-parted appendix beneath the column; column 1.5 mm long, the anther apical, the stigma ventral.

Etymology. From the Latin *splendidus*, “splendid, elegant,” referring to the beauty of the species.

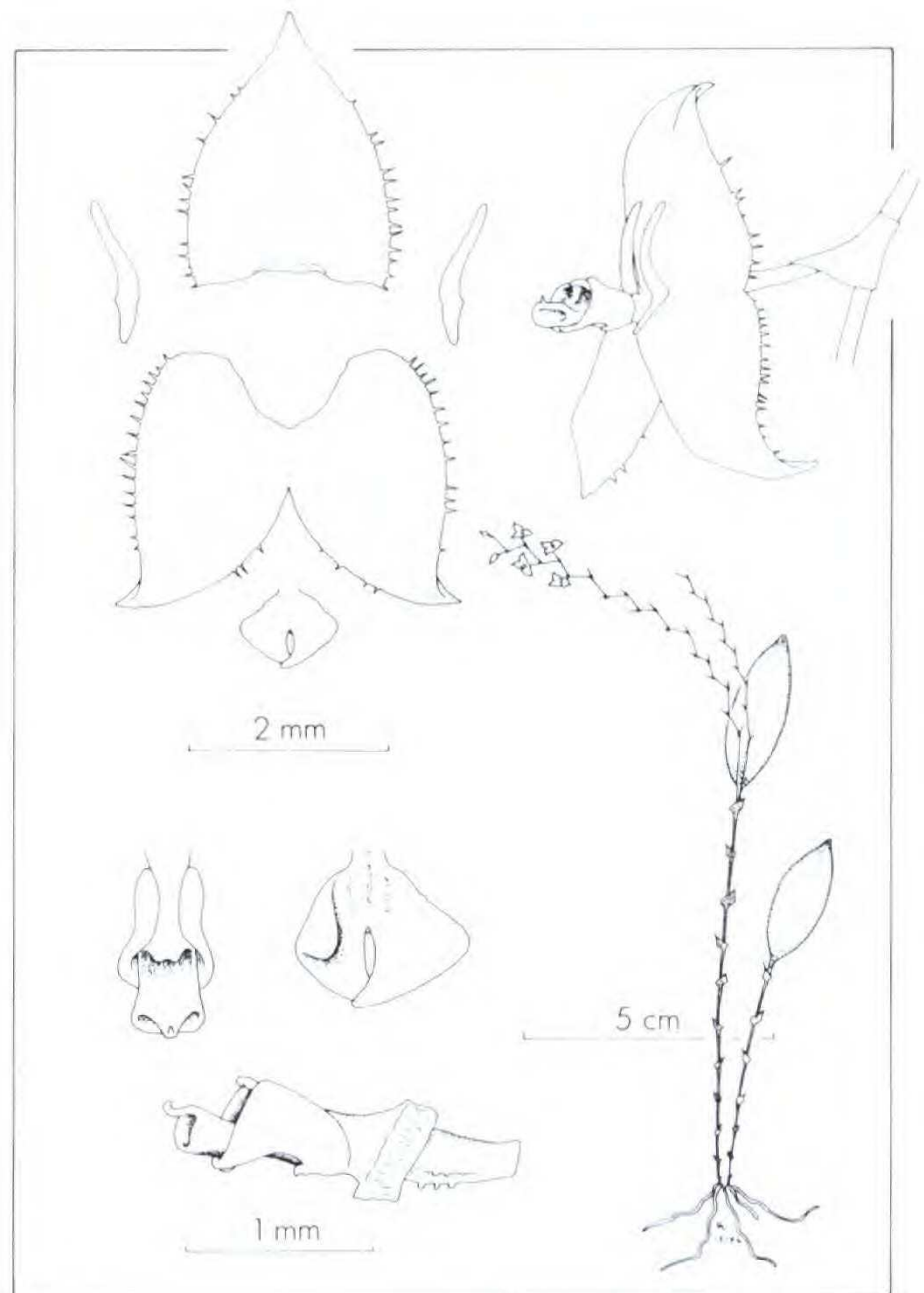
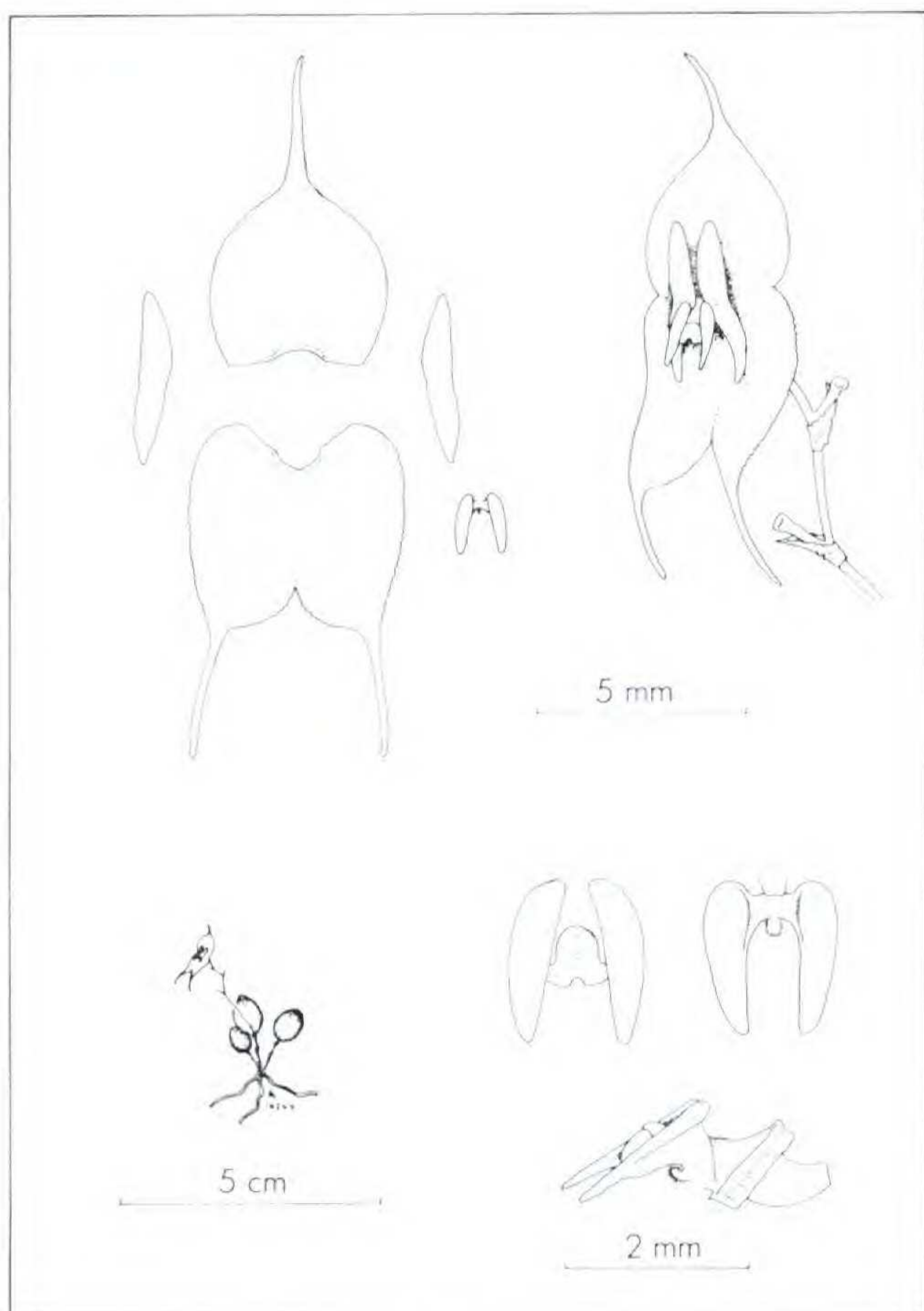
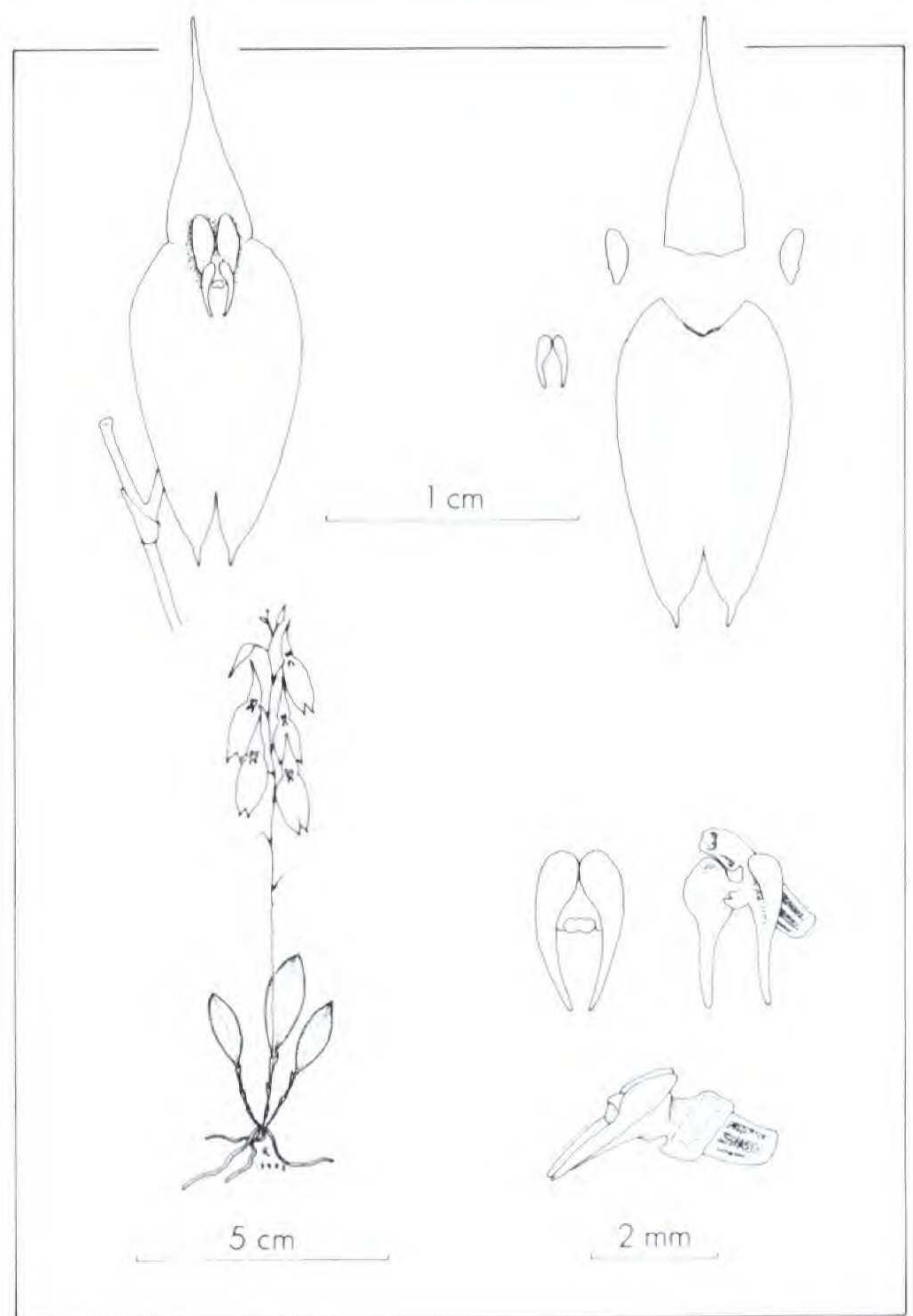
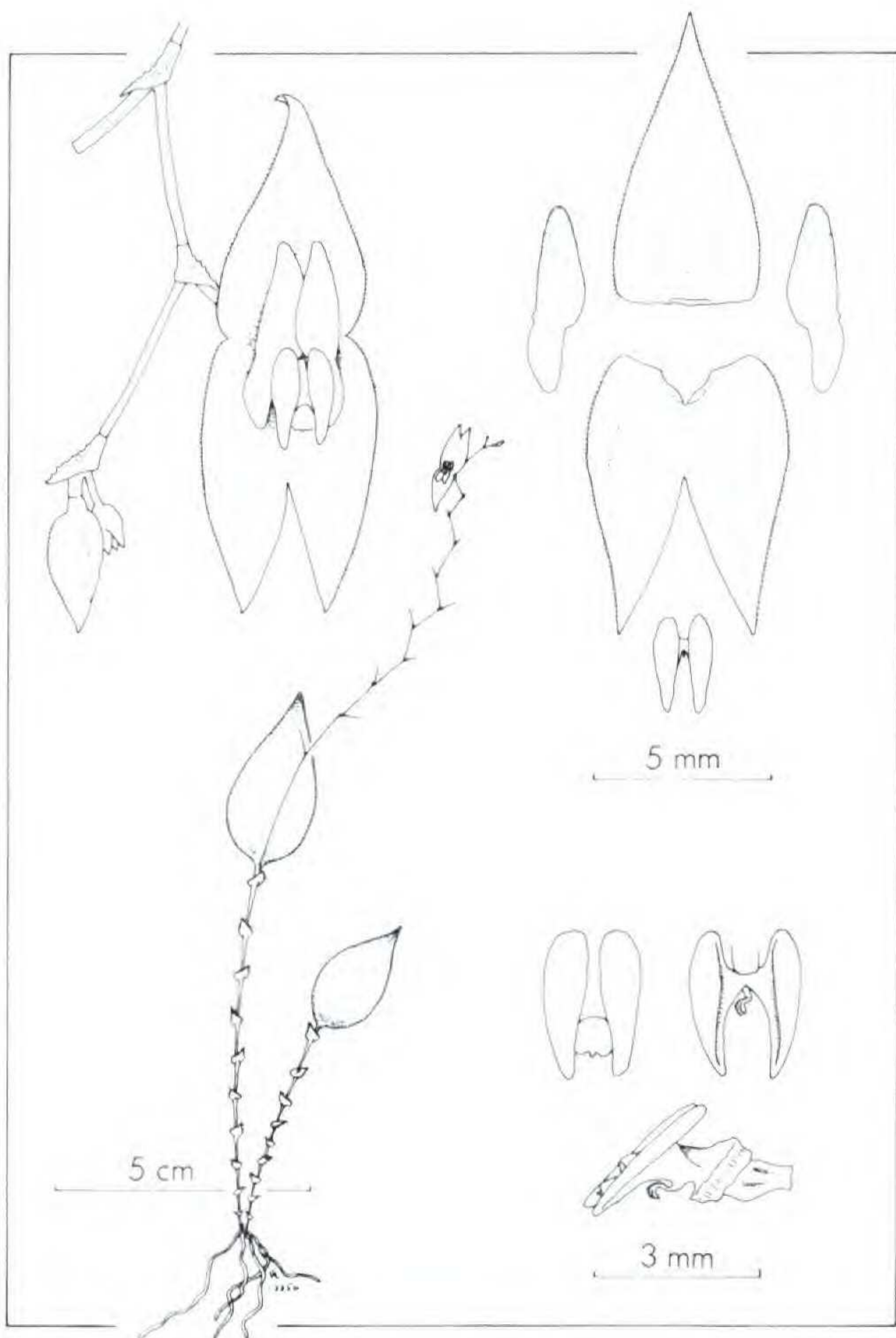
This remarkable species is characterized by the small vegetative habit and an imposing, erect inflorescence of several large, simultaneous, purple flowers. Unfortunately, the only plant found failed to survive. It was discovered by Santiago Ortega in the forest along the road under construction between Macas and Guamote.

The broad synsepal is considerably larger than the acute dorsal sepal. The lower lobe of the petals is minute. The blades of the lip are falcate, and the short, two-parted appendix is held between the blades beneath the column.

Lepanthes synema Luer & Hirtz, sp. nov. TYPE:

Ecuador. Zamora-Chinchipec: epiphytic in elfin forest E of the pass E of Loja, 2,750 m, 21 Mar. 1985, C. Luer, J. Luer, A. Hirtz & W. Flores 10724 (holotype, MO). Figure 15.

Planta parvula; racemo laxo folio suborbiculato multilongiore; floris sepalis obtusis abrupte caudatis, petalis transverse bilobis, labelli laminis duabus planis oblongis, corpore angusto appendice oblonga pubescenti munito.



Figures 13–16. —13 (Top left). *Lepanthes sigsigensis* Luer & Hirtz. —14 (Top right). *Lepanthes splendida* Luer & Hirtz. —15 (Bottom left). *Lepanthes synema* Luer & Hirtz. —16 (Bottom right). *Lepanthes vaginans* Luer & Hirtz.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 2–7 mm long, enclosed by 2–4 minutely ciliate, lepanthiform sheaths. Leaf erect, coriaceous, suborbicular, obtuse to rounded, 6–8 mm long, 4.5–6 mm wide, the rounded base contracted into a 1-mm-long petiole. Inflorescence a loose, successively few-flowered raceme, up to 2 cm long including the slender peduncle 8–10 mm long; floral bract 1.5 mm long; pedicel 1.5 mm long; ovary 0.5 mm long; sepals yellow, subcarinate, the dorsal sepal suffused with red centrally, suborbicular, 4.5 mm long, 4.5 mm wide, with the rounded apex abruptly contracted into a slender tail 2.5 mm long, connate to the lateral sepals for 1 mm, the lateral sepals oblong, oblique, connate 3 mm into an oblong, bifid lamina, 5 mm long, 5 mm wide together, the apices obtuse, contracted into slender tails 3 mm long; petals yellow, cellular-glandular, transversely bilobed, 0.75 mm long, 4 mm wide, the lobes subequal, oblong, narrowly obtuse; lip yellow, bilaminate, the laminae glabrous, oblong, 1.8 mm long, the apices rounded, the connectives cuneate, forming a narrow body, connate to the base of the column, the appendix small, oblong, incurved, pubescent; column 1 mm long, the anther apical, the stigma ventral.

Etymology. From the Greek *synaimos*, “a kinsman,” referring to the similarity to some other small species.

This tiny twig-epiphyte of subparamo, elfin forests is closely related to several other minute, sympatric species, e.g., *L. caudata* Luer & Escobar, *L. floresii* Luer & Hirtz, *L. jimburae* Luer & Hirtz, *L. paradoxa* Luer & Hirtz, and *L. vermicularis*. From all of them *L. synema* is distinguished by the smaller habit; round, abruptly caudate sepals; and flat, oblong blades of the lip with a small, oblong appendix.

Lepanthes vaginans Luer & Hirtz, sp. nov. TYPE: Ecuador. Carchi: epiphytic in cloud forest E of Maldonado, 2,300 m, 17 Mar. 1991, C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. del Hierro 15156 (holotype, MO). Figure 16.

Planta mediocris; racemo laxo flexuoso folio elliptico brevior ad multilongior; floris sepalis late ovatis ciliatis, lateralibus uninerviis, petalis minutis angustis, labello bilobo, lobis obtusis deflexis columnam vaginantibus.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5–8 cm long,

enclosed by 8–11 microscopically scabrous, lepanthiform sheaths with dilated ostia. Leaf erect, coriaceous, elliptical, narrowly obtuse, 3–3.5 cm long, 1–1.3 mm wide, the base cuneate into a petiole ca. 3 mm long. Inflorescence a loose, flexuous, successively several-to many-flowered raceme up to 9 cm long, including the slender peduncle ca. 1 cm long, 2–4 flowers often produced simultaneously; floral bracts 1.25 mm long; pedicel 2–2.5 mm long; ovary 0.75 mm long; sepals yellow, suffused with rose medially, carinate, coarsely ciliate, broadly ovate, subacute, lightly acuminate, the dorsal sepal 2–2.5 mm long, 2 mm wide, 3-veined, adnate to the lateral sepals for 0.5 mm with the sides reflexed, the lateral sepals 2–2.5 mm long, 1.5 mm wide, 1-veined, connate 0.5 mm; petals rose, cellular glandular, transversely bilobed, 0.25 mm long, 1.4 mm wide, the upper lobe narrowly oblong, obtuse, the lower lobe similar but much shorter; lip rose, bilobed, the lobes obliquely subtruncate, 1 mm long, surrounding the column, with cuneate connectives forming a broad body, adnate to the base of the column, the sinus narrow with a small, oblong, pubescent appendix; column 1 mm long, the anther and the stigma apical.

Etymology. From the Latin *vaginans*, “sheathing,” referring to the column covered by the lip.

This species has features that seem to ally it with several diverse groups. The loose, flexuous, successively flowered racemes begin flowering while much shorter than the leaf, but continue to flower until much exceeding the leaf. As many as four or five flowers are often produced simultaneously. The small sepals are coarsely dentate, and the laterals are one-veined. The petals are minute and slender. The lip is bilobed without any development of marginal blades. The lobes are obtuse and sheathe the gynostemium. A rudimentary appendix is present in the sinus between the lobes. The lip suggests section *Haplocheilus*.

Acknowledgment. I thank Dan H. Nicolson for constructive criticism.

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