



Three new *Lepanthes* species (Pleurothallidinae, Orchidaceae) from Ecuador

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Abstract

The Ecuadorian *Lepanthes calochroma*, *L. peltata*, and *L. spiculifera* are proposed as new species, and are described, illustrated, and compared with the most similar species. A brief history and description of the genus are included. The flowers of *L. calochroma* are similar to those of *L. golbasto*, but the plant is larger and the flowers are brilliantly colored with petals with an upper lobe longer than the lower. The flowers of *L. peltata* have an unusual bladeless lip, resembling that of *L. alticola*, but the latter is distinguished by much larger flowers with long-acuminate sepals. *Lepanthes spiculifera* is distinguished from the similar *L. zettleri* by the unusual blunt-spiculate pedicel bearing smaller flowers with blunt-spiculate sepals, densely pubescent petals, and a lip with long-ciliate margins.

Key words: Epidendreae, Epidendroideae, South America

Introduction

The genus *Lepanthes* Swartz (1799: 85) is one of the largest in the Pleurothallidinae, with more than 800 species known. The genus is most richly and diversely represented in Ecuador and Colombia, each with more than 300 species, with a distribution range from southern Mexico in the north, through Central America and the Antilles, to Bolivia and Brazil in the south (Luer & Thoerle 2010). At the limits of the distribution for the genus, the number and morphological variety of the known species decline.

When Swartz proposed the genus, he gathered together four species from Jamaica with ramicauls with tubular, ribbed sheaths with dilated ostia (Swartz 1799). Lindley described the first species based on an Ecuadorian collection, *Lepanthes monoptera* (Lindley 1834: 10, t. 114) based on a Jameson specimen from near Cuenca. Two years later, he added two more species from Colonel Hall's collections in the valley of Lloa, southwest of Quito: *L. biloba* (Lindley 1836: 356) and *L. mucronata* (Lindley 1836: 356). Between 1850 and 1877, H. G. Reichenbach added about 13 names, all but two based on Jameson specimens from the area of Pichincha. Hooker (1861: t. 5259) added a single name, *L. calodictyon*. Schlechter (1921a) listed a total of 27 Ecuadorian *Lepanthes* species; he had described 9 of them. In the decades between the retirement of these early taxonomic titans and the beginning of C. A. Luer's study of the Pleurothallidinae in the 1970s, only a handful of species typified by Ecuadorian material were proposed. The number of species in the genus attributed to Ecuador has soared in the past four decades, with the current number exceeding 300.

Species of *Lepanthes* are differentiated from several other genera that share these lepanthiform sheaths by the racemose inflorescence, and floral characteristics including the usually transversely bilobed petals and the usually tripartite lip usually with an appendix. Before Luer & Thoerle (2010), *Lepanthes* subsections *Lepanthes* and *Breves* (Luer 1993: 442) Luer (1996: 7) were subdivided into series, based largely on the morphology of the genus in Ecuador. An extensive examination of the genus beyond the borders of Ecuador demonstrated that these series were untenable. Therefore, *L. calochroma* Thoerle & Hirtz and *L. peltata* Thoerle & Hirtz are placed in subsect. *Lepanthes* without further division. *Lepanthes spiculifera* Thoerle & Hirtz, with single-veined lateral sepals, is a member of *Lepanthes* subsect. *Breves*, also without further division.

Materials and methods

The three species were identified as undescribed species by Hirtz, who observed them in cultivation at Ecuagenera, a commercial grower in Gualaceo, Ecuador. In addition to the dried and pressed vegetative material, flowers and

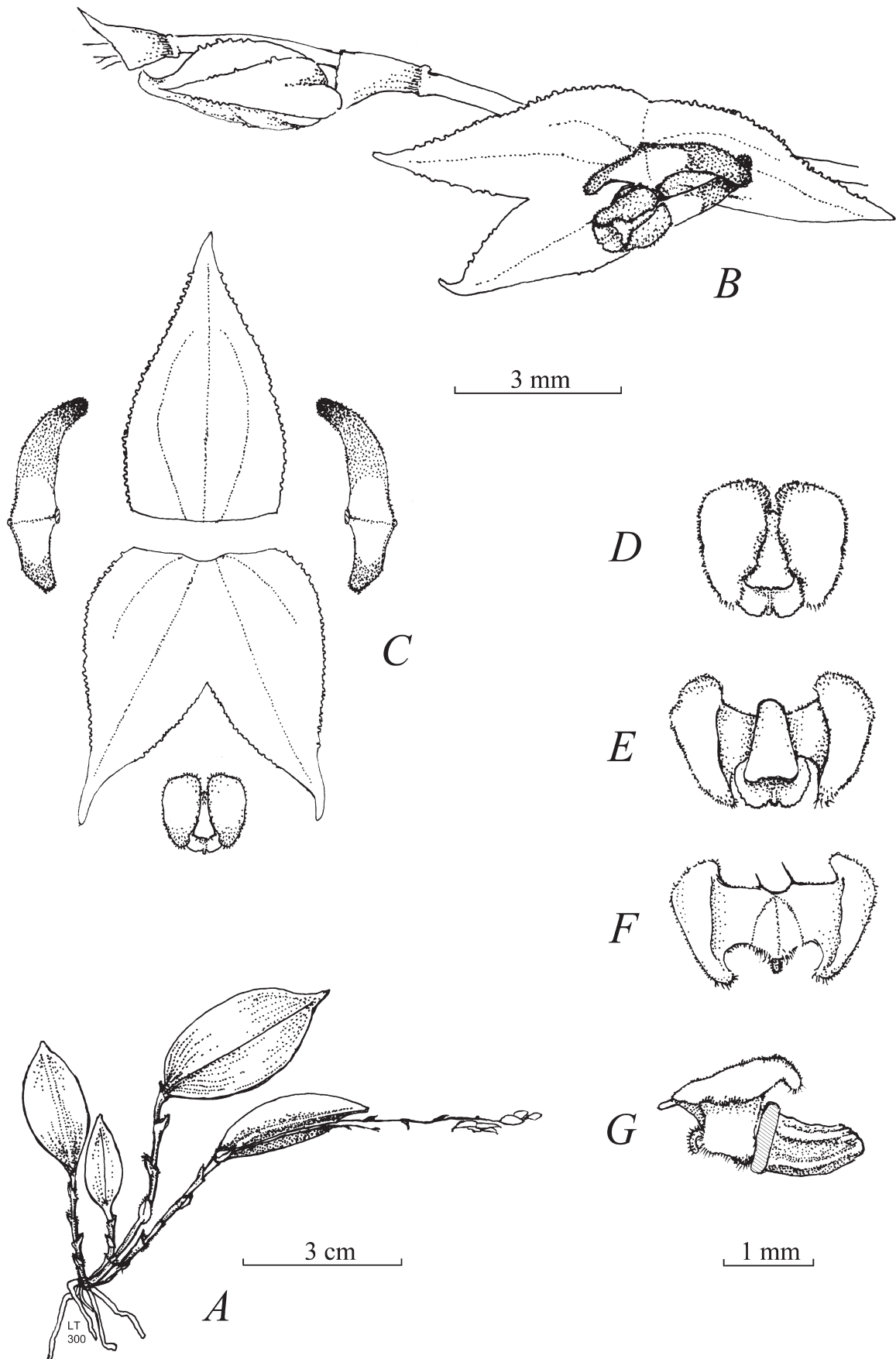


FIGURE 1. *Lepanthes calochroma*. **A.** Habit. **B.** Flower with partial inflorescence. **C.** Dissected flower. **D.** Lip with column, dorsal view. **E.** Lip expanded with column, dorsal view. **F.** Lip expanded with column lifted. **G.** Ovary, lip, and column, profile. Drawn by L. Thorerle from the holotype, *Hirtz 10397* (MO).

leaves were preserved in a mixture of alcohol and glycerin. Thoele examined the flowers preserved in spirits under an American Optical 570 stereo microscope, and recorded the dissections and measurements with a Dino-Lite Pro USB microscope as the basis for the drawings and descriptions.

The three proposed species are based on single specimens. While this would be unusual for species of many other genera, it is not rare to find that the entire population of a newly discovered species of *Lepanthes* is limited to 1–5 individuals, often restricted to a few trees or shrubs, sometimes only one, in a small area (Pupulin & Bogarín 2012).

To ascertain that these species were indeed novelties, they were compared with those species in the literature for the genus in South America: Bennett & Christenson (2001); Foldats (1970); Luer (1993, 1996, 2009, 2011); Luer & Thoele (2010, 2011, 2012a, 2012b, 2013); Reichenbach (1858, 1877, 1886); Romero-González & Fernández-Concha (2000); Schlechter (1920, 1921a, 1921b, 1922, 1924, 1929, 1930); and Schweinfurth (1958). In addition, Luer's illustration archives (unpublished data) were consulted for similar species.

Taxonomy

Lepanthes calochroma Thoele & Hirtz, *sp. nov.*, Figs. 1, 2.

Type:—ECUADOR. Collecting data otherwise unknown, flowered in cultivation by Mario Portilla at Ecuagenera, Gualaceo, Ecuador, November 2010, *Hirtz 10397* (holotype: MO!), L. Thoele illustr. 300.

Diagnosis:—*Lepanthes calochroma* is similar to *L. golbasto* Luer & Hirtz (1985: 164), but the plant is larger; the flowers are brilliantly colored with bright yellow and red petals with an upper lobe longer than the lower; and the lip with irregular margins is broadly ovate, with a ligulate, descending appendix. It is distinguished from *L. imposita* Luer & R.Escobar (1985: 56) by much smaller flowers that are brightly colored, held closely against the rachis by shorter pedicels.



FIGURE 2. *Lepanthes calochroma*. Flower from a cultivated plant. Photographed by A. Hirtz from the plant that provided the holotype specimen.

Plant medium in size for the genus, presumably epiphytic, caespitose; roots slender. *Ramicauls* stout, erect to suberect, 2–4 cm long, enclosed by 6–7 minutely ciliate-spiculate lepanthiform sheaths. *Leaf* erect to nearly horizontal, thinly coriaceous, elliptical, apex shortly acuminate, triapiculate, 3–3.5 × 1–1.6 cm dried, the base rounded, contracted into a petiole 3–5 mm long. *Inflorescence* a more or less horizontal, loose, flexuous, gradually lengthening, successively single-flowered raceme with up to at least 8 flowers, to at least 6 cm long including the filiform peduncle 4–15 mm long, borne behind the leaf; *floral bracts* acuminate, ca. 2 mm long; *pedicels* 1 mm long, ca. 5 mm apart; *ovary* with ribs thick, irregular, 1 mm long; *flowers* held close to the rachis, *sepals* dull pink with translucent greenish-yellow margins, minutely papillose with denticulate margins, externally carinate-verrucose, the dorsal sepal ovate, acute, shortly acuminate, 5 × 3 mm, 3-veined, connate to the lateral sepals for 1 mm, the lateral sepals diverging, ovate, oblique, acute, shortly acuminate, 5 × 2 mm, 2-veined, connate 2 mm; *petals* with central portion bright yellow, apical portions bright red with apex of upper lobe darker red, minutely pubescent, transversely bilobed, 1 mm × 3.8 mm, with a small, marginal obtuse angle between the lobes, the upper lobe oblong, slightly narrowed below the rounded, incurved apex, 2.3 mm long, the apices of the opposite petals overlapping above the column, the lower lobe obliquely triangular, obtuse, incurved, 1.5 mm long; *lip* dark red, densely pubescent, bilaminate, the blades broadly ovate, irregular, with obtuse ends, the apical margin with long cilia, bases recurved, 1.3 × 2.2 mm expanded, the connectives broadly cuneate, the body connate to the base of the column, the sinus obtuse with a small, ligulate, descending, ciliate appendix rising from a cluster of cilia; *column* purple, 1.25 mm long, with the anther apical and the stigma ventral, *anther cap* lavender, *pollinia* yellow.

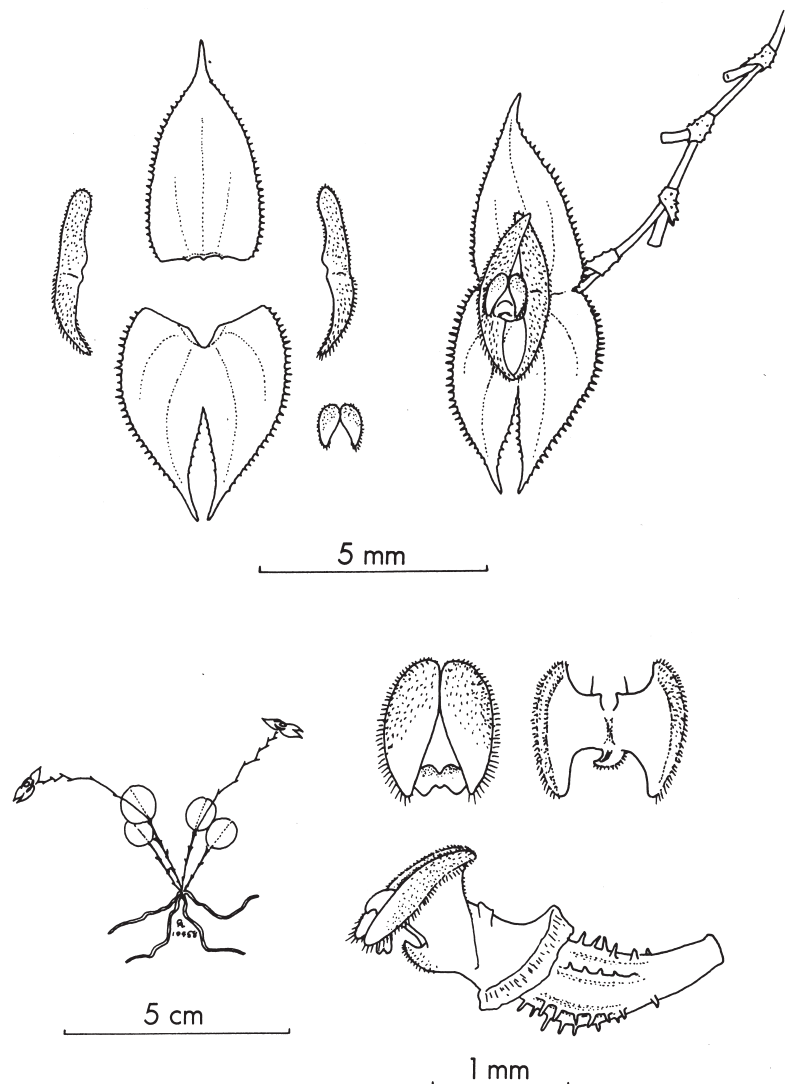


FIGURE 3. *Lepanthes golbasto*. Drawn by C.A. Luer from the holotype, *Hirtz 1692* (MO). Reprinted with the kind permission of C.A. Luer and the American Orchid Society.

Distribution:—Known only from the type collection.

Etymology:—From the Greek *calo*, “beautiful,” and *chroma*, “color,” for the beautiful colors of the flowers.

Discussion:—The robust ramicauls of *Lepanthes calochroma*, clad in lepanthiform sheaths with dilated, shortly ciliate-spiculate ostia, support elliptical leaves with a short, acuminate apex. The centimeter-long flowers are borne by a lengthening, loose raceme, with about 5 mm between floral bracts. The usually horizontal flower is held close to the rachis. The ovate sepals have decoratively denticulate margins forming a narrow border of yellow-green surrounding the dull pink blades. The central area of the brilliantly colored petals flanking the deep red blades of the lip is bright yellow, with the apices of both lobes bright red.

This species resembles the tiny Ecuadorian *Lepanthes golbasto* (Fig. 3), with the elongate raceme of both species bearing similarly sized and shaped flowers with pink sepals and bicolored petals overlapping above the column. *Lepanthes calochroma* is distinguished by the larger plant, which can reach a height of at least 4 cm rather than 2.5 cm; flowers with more brilliantly colored petals with the upper lobe longer than the lower lobe, rather than subequal in length; and a lip with blades broadly ovate rather than ovate, and with a narrow, recurved, descending appendix, rather than a thick, uncinatate, incurved appendix. The Colombian *L. imposita* (Fig. 4), has similarly shaped petals surrounding a lip with somewhat similar blades, but is readily distinguished by a flower nearly twice as large, with a natural height of 17 mm, and a more uniform palette of purple and red.

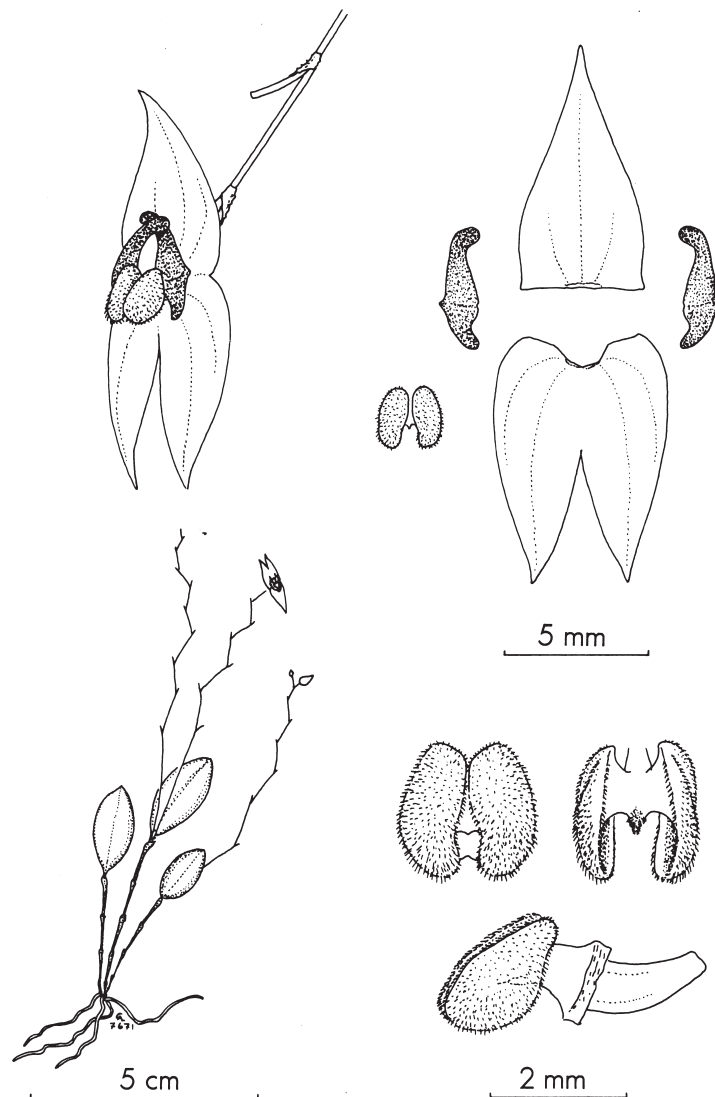


FIGURE 4. *Lepanthes imposita*. Drawn by C.A. Luer from the holotype, *Luer et al.* 7671 (SEL). Reprinted with the kind permission of C.A. Luer and the American Orchid Society.

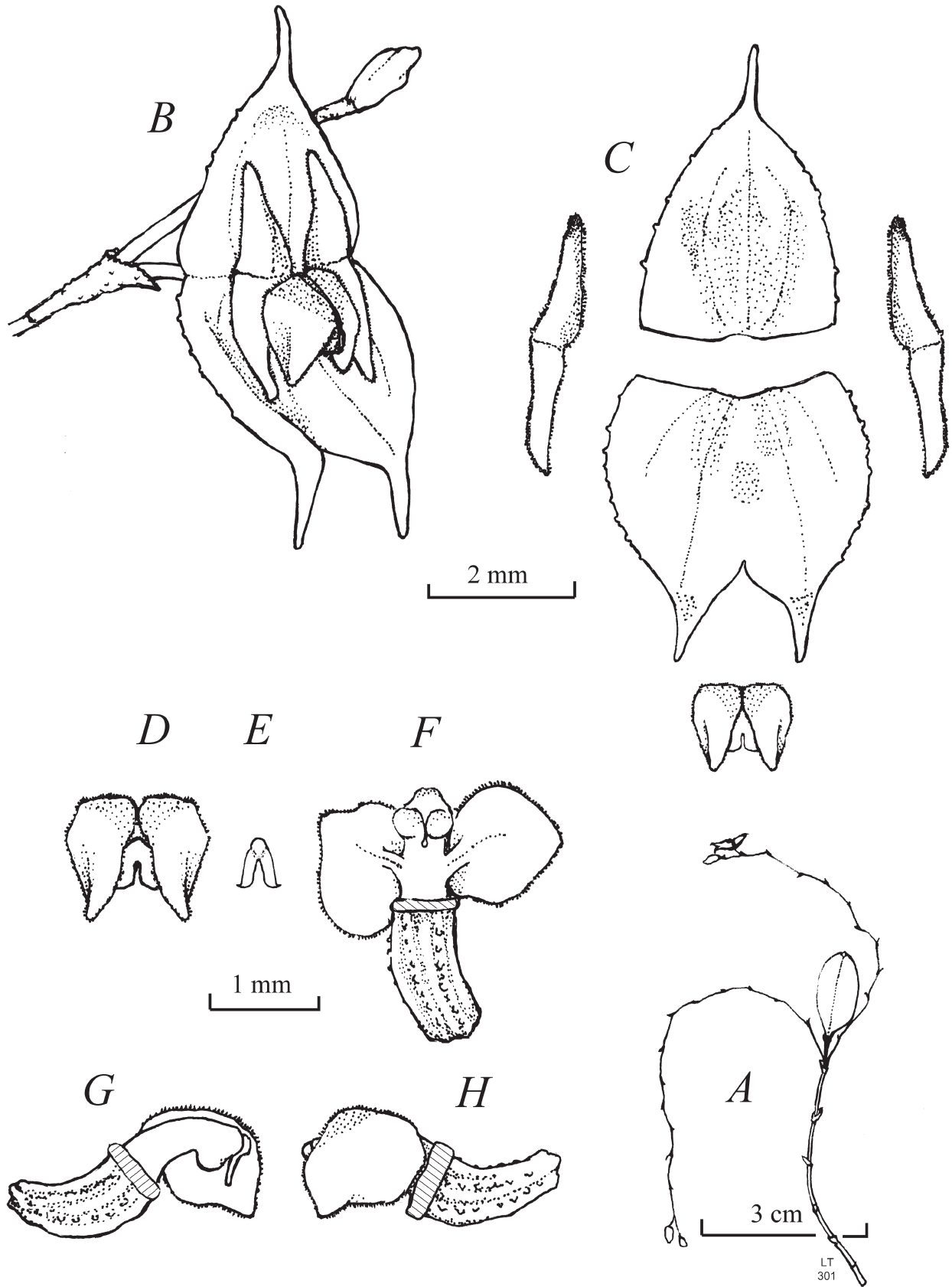


FIGURE 5. *Lepanthes peltata*. **A.** Habit. **B.** Flower with partial inflorescence. **C.** Dissected flower. **D.** Lip and column with anther cap, front view. **E.** Anther cap. **F.** Ovary, lip expanded, and column, ventral view. **G.** Ovary, column with anther cap, lip with foreground lamina removed, profile. **H.** Ovary, lip, and column, profile. Drawn by L. Thoerle from the holotype, *Hirtz 10341* (MO).

Lepanthes peltata Thorerle & Hirtz, *sp. nov.*, Figs. 5, 6.

Type:—ECUADOR. Probably Zamora-Chinchipe: around Zamora, elev. 800 m, flowered in cultivation by Mario Portilla at Ecuagenera, Gualaceo, Ecuador, November 2010, *Hirtz 10341* (holotype: MO!), L. Thorerle illustr. 301.

Diagnosis:—*Lepanthes peltata* is similar to *L. alticola* Schweinfurth (1942: 121, t. 16), but with much smaller flowers, with shortly acuminate sepals, and petals with lobes subequal in size.

Plant medium in size for the genus, presumably epiphytic, caespitose; roots slender. *Ramicauls* erect to horizontal, 4–4.5 cm long, enclosed by 6–7 ribbed lepanthiform sheaths, ribs and dilated ostia minutely verrucose. *Leaf* with underside irregularly speckled with darker green, erect to nearly horizontal, thinly coriaceous, elliptical-obovate, apex minutely retuse with a minute apiculum, 12–17 × 8 (dried)–10 mm, the base cuneate into a petiole ca. 4 mm long. *Inflorescence* 1–3 suberect to arching to more or less horizontal with increasing length, loose, flexuous, successively single-flowered racemes with up to at least 15 flowers, to at least 8 cm long including the filiform peduncle 6–10 mm long, borne behind or in front of the leaf; *floral bracts* minutely verrucose, acuminate, 1.5–2 mm long; *pedicels* 2 mm long, ca. 5 mm apart; *ovary* with ribs verrucose, 1.25 mm long; *sepals* yellow with reddish suffusion centrally and below the apices of the lateral sepals, denticulate, externally carinate, the dorsal sepal concave, ovate, acute, shortly acuminate, 4 × 2.5 mm, 3-veined, connate to the lateral sepals for 1 mm, the lateral sepals ovate, oblique, subacute, shortly acuminate, 4 × 3.75 mm together, 2-veined, connate 2.25 mm into a concave synsepal; *petals* yellow with inner margin of upper lobe red, pubescent-setaceous, transversely bilobed, 0.6 × 3.5 mm, lobes narrowly, obtusely triangular-ovate, subequal in size; *lip* cream, lavender toward the base, densely pubescent, bilobate without forming blades, broadly ovate, obtuse, 1.2 × 1.2 mm, connectives short, narrow, connate to the column near the middle without forming a body; *column* white, 1.2 mm long, with the anther apical and the stigma ventral, *anther cap* pale yellow, shape approximating an upside-down V, 0.4 mm long, *pollinia* yellow.



FIGURE 6. *Lepanthes peltata*. Flower from a cultivated plant. Photographed by A. Hirtz from the plant that provided the holotype specimen.

Distribution:—Known only from the type collection.

Etymology:—From the Greek *peltatus*, “shield shaped,” for the shape of the laminae of the lip.

Discussion:—*Lepanthes peltata* would be unremarkable if not for the bladeless lip, with pubescent, shield-shaped laminae draped over the column, the lobes hanging on either side. Other species share a gradually lengthening, elongate inflorescence bearing a more or less concave flower with ovate, shortly acuminate sepals, and narrowly triangular petals. The lip of the widespread *L. alticola* (Fig. 7), is similar, but the sepals are long-acuminate rather than shortly acuminate and up to 7 mm in length rather than 4 mm, and the upper lobe of the petals is larger than the lower.

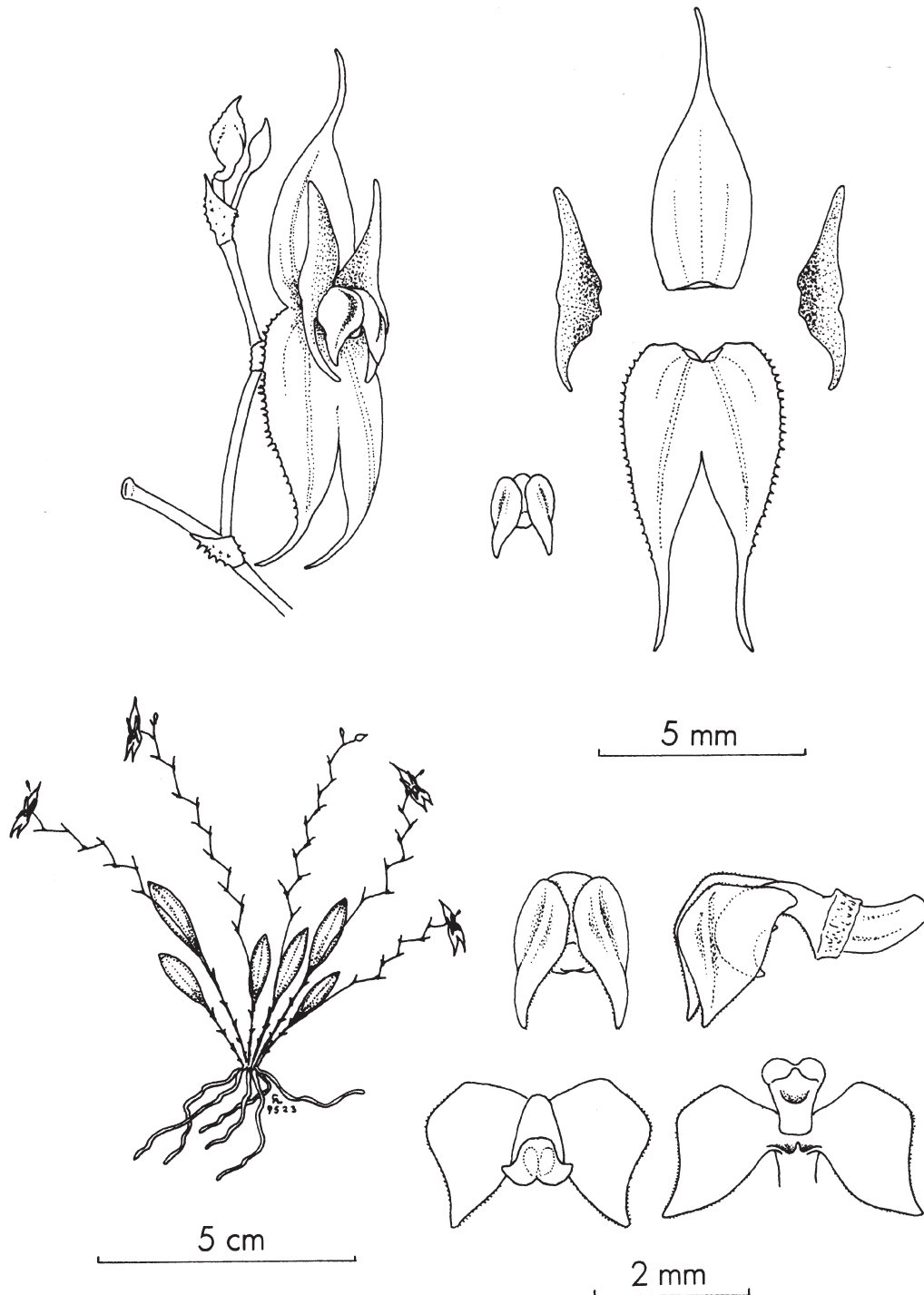


FIGURE 7. *Lepanthes alticola*. Drawn by C. A. Luer from *Luer et al.* 9523 (MO). Reprinted with the kind permission of C. A. Luer and the Missouri Botanical Garden Press.

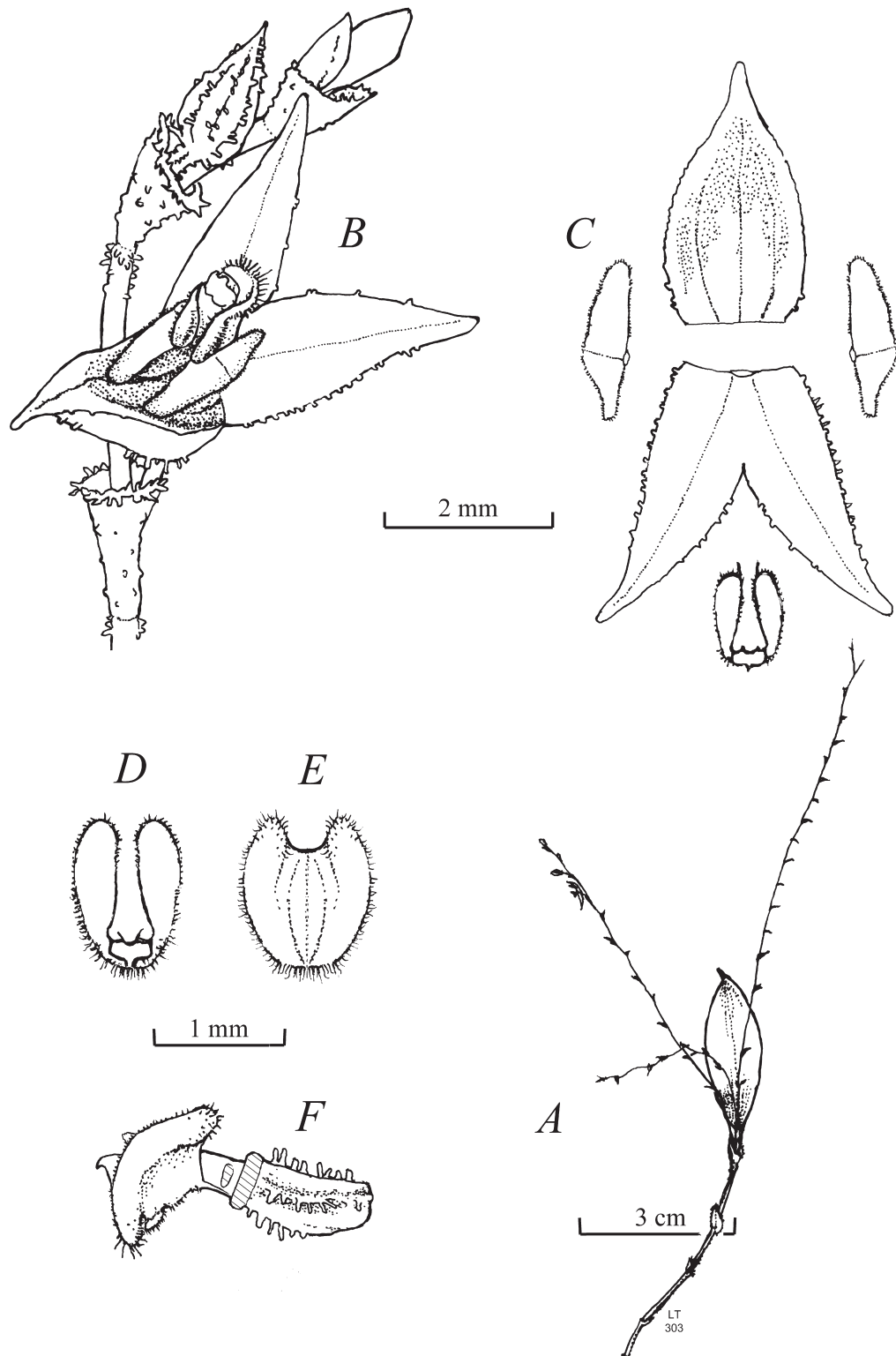


FIGURE 8. *Lepanthes spiculifera*. **A.** Habit. **B.** Flower with partial inflorescence. **C.** Dissected flower. **D.** Lip and column, dorsal view. **E.** Lip expanded. **F.** Ovary, lip, and column, profile. Drawn by L. Thoerle from the holotype, *Hirtz 10310* (MO).

Lepanthes spiculifera Thorerle & Hirtz, *sp. nov.*, Figs. 8, 9.

Type:—ECUADOR. Probably Zamora-Chinchi: around Zamora, elev. 1000 m, flowered in cultivation by Mario Portilla at Ecuagenera, Gualaceo, Ecuador, November 2010, *Hirtz 10310* (holotype: MO!), L. Thorerle illustr. 303.

Diagnosis:—*Lepanthes spiculifera* is similar to *L. zettleri* Foldats (1961: 261), differing in an inflorescence with blunt-spiculate pedicels, bearing smaller flowers with blunt-spiculate sepals, densely pubescent petals, and a lip with long-ciliate margins.

Plant medium in size for the genus, presumably epiphytic, caespitose; roots slender. *Ramicauls* erect to suberect, 4.5–6 cm long, enclosed by 8–9 lepanthiform sheaths, ribs and dilated, acuminate ostia minutely spiculate. *Leaf* erect to nearly horizontal, thinly coriaceous, elliptical, apex triapiculate, 3–3.5 × 1 (dried)–1.3 cm, the base cuneate into a petiole ca. 4 mm long. *Inflorescence* 1–3 suberect to more or less horizontal or arching with increasing length, loose, flexuous, successively single-flowered racemes with up to at least 20 flowers, to at least 13 cm long including the filiform peduncle 8–12 mm long, borne behind or in front of the leaf; *floral bracts* minutely verrucose, ostia dilated, minutely spiculate, acuminate, ca. 2 mm long; *pedicels* blunt-spiculate toward apex, 2–3 mm long, ca. 4 mm apart; *ovary* with ribs blunt-spiculate, 0.8 mm long; *sepals* yellow, dorsal with reddish suffusion more or less along the veins, externally carinate, the carinae with blunt spicules, the dorsal sepal with margins sparsely blunt-spiculate, minutely irregular, concave, ovate, acuminate, 3 × 1.6 mm, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals diverging, margins blunt-spiculate, narrowly ovate, oblique, acuminate, 3.25 × 1 mm, 1-veined, connate 1 mm; *petals* orange-brown, densely pubescent, transversely bilobed, 0.5 × 2 mm wide, connate above the base of the column, upper lobe larger, oblong, rounded, 1.25 mm long, lower lobe obliquely triangular, obtuse, 0.75 mm long; *lip* red, paler toward apex, pubescent with ciliate margins, cordate with weakly developed convex blades toward the base, absent toward the apex, 1.1 × 1 mm expanded, the narrowly rounded basal lobes embracing the column, attached with a claw to the base of the column, claw adnate to the column, appendix external, small, oblong, pubescent-ciliate; *column* reddish, 1.2 mm long, with the anther and stigma apical, *anther cap* and *pollinia* unknown.

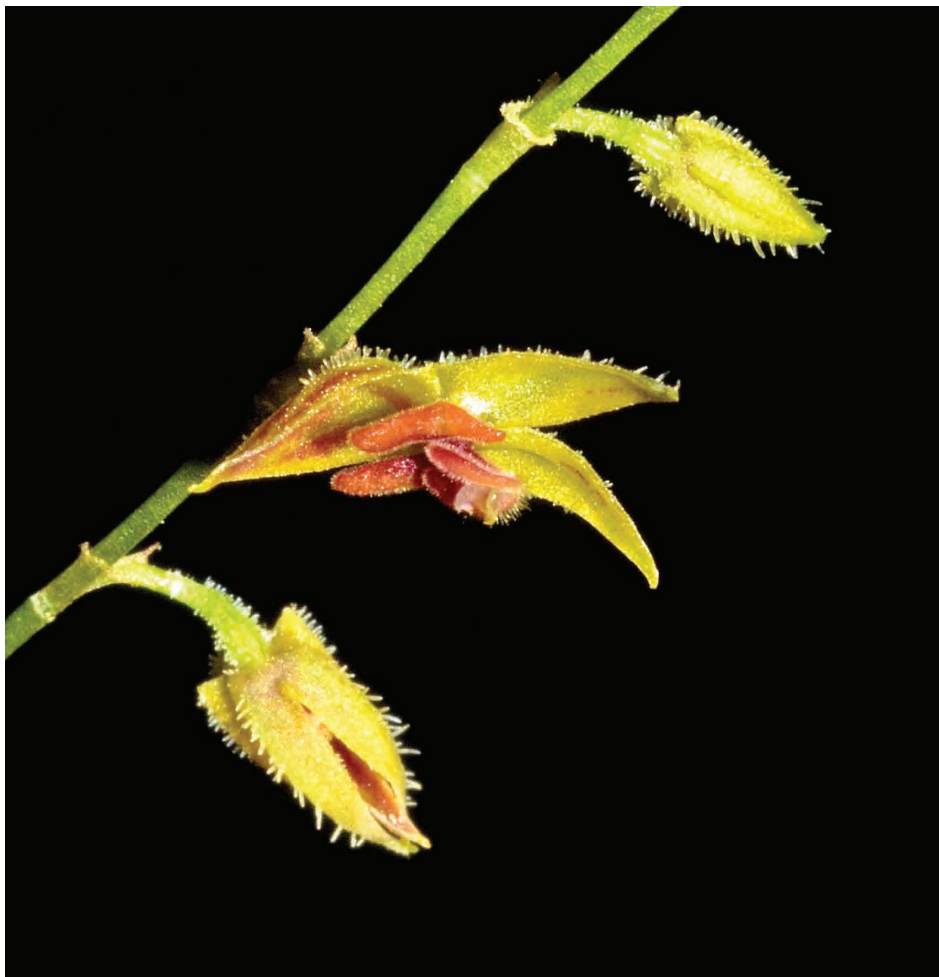


FIGURE 9. *Lepanthes spiculifera*. Flower and buds from a cultivated plant. Photographed by A. Hirtz from the plant that provided the holotype specimen.

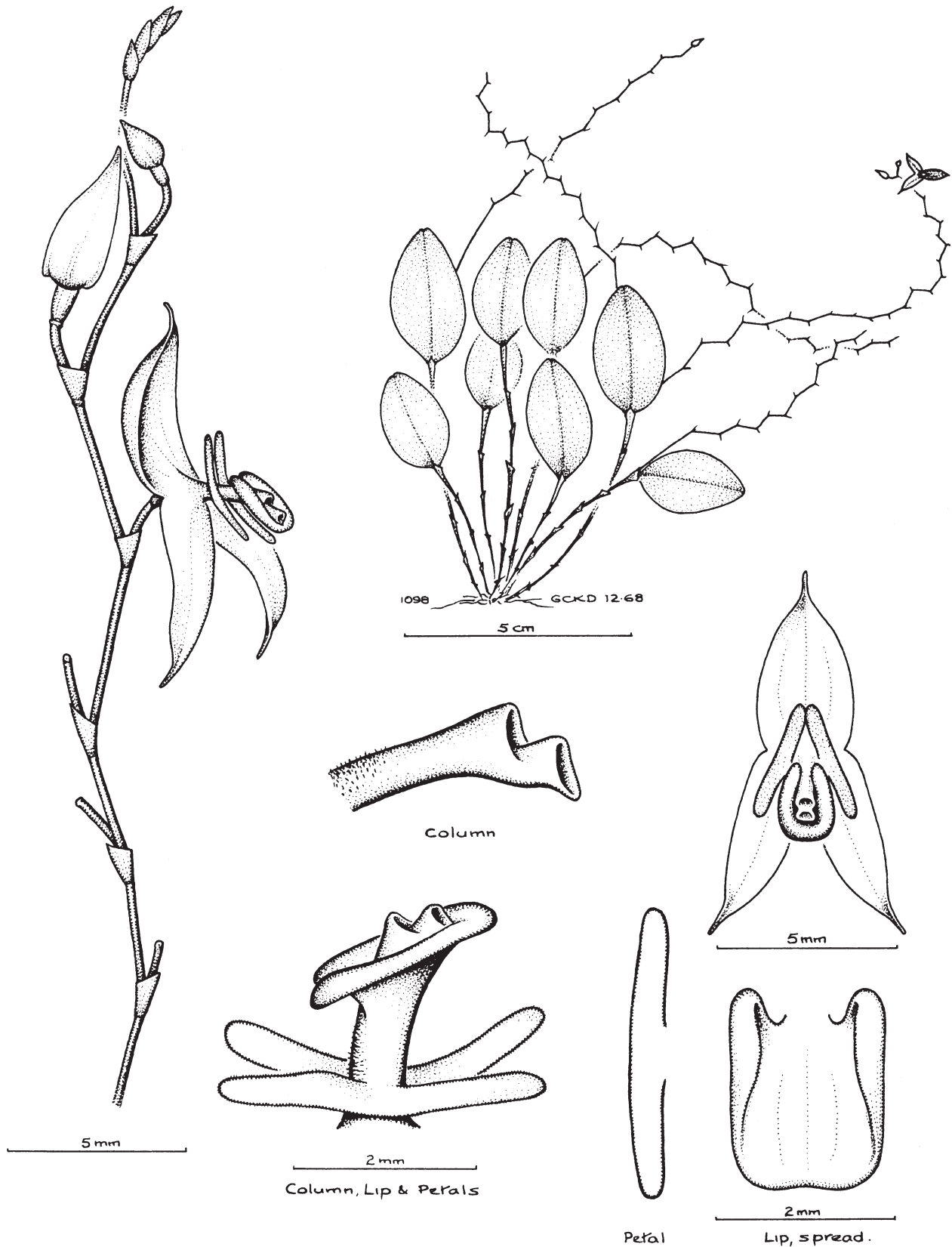


FIGURE 10. *Lepanthes zettleri*. Drawn by G.C.K. Dunsterville, from *Dunsterville 1098*. Reprinted with the kind permission of the Orchid Herbarium of Oakes Ames, Harvard University Herbaria.

Distribution:—Known only from the type collection.

Etymology:—From the Latin *spicula*, “small spike,” and *-fer*, “bearing,” for the spicules on most of the flowering parts.

Discussion:—*Lepanthes spiculifera* bears small, mostly yellow flowers appearing singly and sequentially on a gradually lengthening raceme that can eventually reach a length of 13 cm or more. The apex of the pedicel and the ribs of the ovary are blunt-spiculate; blunt-spiculate carinae mark the veins on the exterior of the sepals; the sparsely blunt-spiculate ovate dorsal sepal is concave; the single-veined lateral sepals are narrowly ovate-triangular with notably blunt-spiculate margins; the upper lobe of the pubescent petals is oblong, the lower lobe is obliquely, obtusely triangular; and the lip is pubescent with ciliate margins, cordate, with ill-defined blades embracing the column.

The Venezuelan *Lepanthes zettleri* (Fig. 10), may be the most similar to *L. spiculifera*, with an elongated raceme bearing flowers of a superficially similar shape, with single-veined lateral sepals and a lip with weakly developed blades. *Lepanthes zettleri* lacks the unusual pedicels with a blunt-spiculate apex, and the larger flowers have sepals 4–5 mm long, with smooth margins; glabrous petals; and a subquadrate lip only shortly pubescent.

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