New Records of *Lepanthes* Sw. from Ecuador

Part 1: Three New Species

BY ALFONSO DOUCETTE, HUGO MEDINA, AND JOSÉ PORTILLA/ PHOTOGRAPHS AND ILLUSTRATIONS BY ALFONSO DOUCETTE UNLESS OTHERWISE CREDITED

ABSTRACT Three new species of *Lepanthes* are described from Ecuador: *Lepanthes desmondleeana*, *Lepanthes doucettei*, and *Lepanthes pupuliniana*. The new species are compared with the species that are most similar morphologically in the diagnosis and illustrations and photos are provided. Wild material used for the research presented here was gathered under Rescate, conservación, reproducción y manejo ex situ de la flora del Ecuador," authorization No. 004-2016-IC-FLO-DNB/MA del Ministerio del Ambiente and used in accordance with La Codificación a la ley Forestal y de Conservación de Área Naturales y Vida Silvestre, authorized for Ecuagenera Cia. Ltda.

KEY WORDS cool growing orchids, discovered at Ecuagenera, Ecuadorian orchids, miniature orchids, Andean orchids

INTRODUCTION The genus *Lepanthes* Sw. was first recognized in 1799 based on a species previously attributed to *Epidendrum* L., *Epidendrum ovale* Sw. now recognized as *Lepanthes ovalis* (Sw.) Fawc. & Rendle. Since 1799 over 1,400 names have been published representing about 1,100 accepted species from tropical parts of Central and South America and the Caribbean where they are mainly found growing as epiphytes (POWO 2023). Vegetatively *Lepanthes* species are easily recognized by their distinctive stem sheaths termed "lepanthiform sheaths," that are "tubular, ribbed sheaths with more or less dilated ostia, with ribs and rimmed margins of the ostia more or less ciliate or scabrous" (Luer 2012). The species are highly variable in their flower morphology, but most are united morphologically by the flowers produced on racemes with lobed petals that are wider than they are long, a bilobed lip often provided with a small fingerlike appendix at the apex, and a column with a dorsal anther.

Despite the distinctive vegetative and floral morphology of the genus, the species are challenging to identify given the large number of described species and the potentiality of discovering a disjunct population resulting in the superfluous renaming of a new species (i.e., Thoerle & Pfahl 2014). This combined with the rarity and inaccessibility of some of the literature siloed in the libraries of a small number of institutions has resulted in a backlog of undescribed species in the collection at Ecuagenera. Here we begin a multipart effort to identify the unidentified *Lepanthes* species at Ecuagenera and


1

provide additional information on already described species where relevant as we work through the specimens.

Our approach to tackling the identifications of these species was based off of the keys to the *Lepanthes* of Ecuador (Luer 1996), Colombia (Luer 2012), and Bolivia (Luer 2010), a checklist of the species of Peru (Ocupa-Horna et al. 2023), all supplemented by a review of all names published after 1996 in a list generated through IPNI (2023). In each case, a review of all illustrations in each monograph was undertaken to avoid any potential errors in identification resulting from either the incorrect interpretation of the key or aberrations in the morphology of the specimens at hand.

TAXONOMY

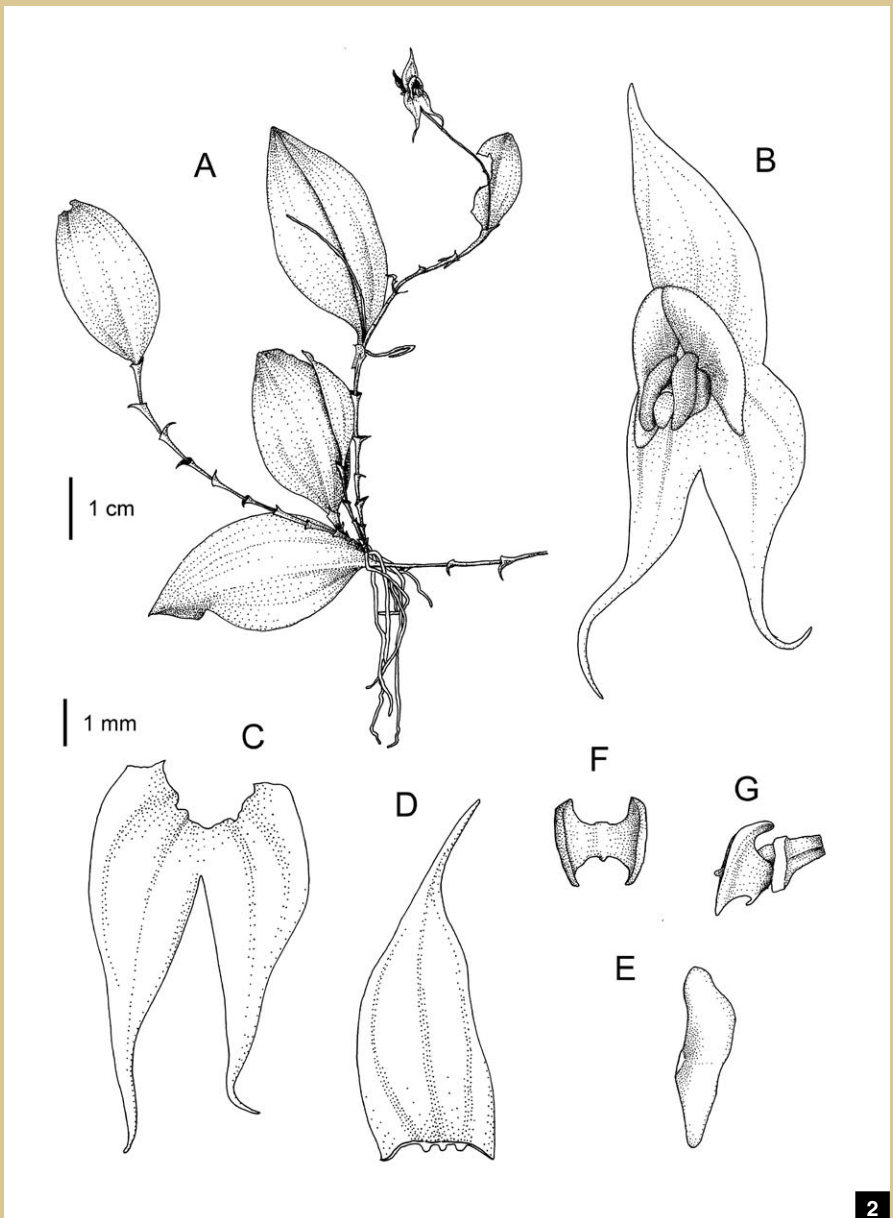
Lepanthes desmondleeana A.Doucette, H.Medina, & J.Portilla *sp. nov.*

TYPE ECUADOR. Azuay: Guarumales, road to Sopladora Repress, ca. 1800 m, the wild plant collected by Hugo Medina, January 2017 [0271]. The holotype Flowered in cultivation at Ecuagenera, Gualaceo, 6 June 2022, *A.Doucette* & *H.Medina 002* (holotype: HA). Figs. 1–2.

DIAGNOSIS The new species is most similar to the Colombian *Lepanthes prolifera* Foldats but can be distinguished by the leaf shape (ovate vs. elliptical), leaf margins (weakly undulate vs. entire), the sepal apices (long-accuminate vs. short-accuminate), petal shape (triangular vs. suboblong), and the degree of lip pubescence (glabrous with sparse pubescence vs. minutely pubescent).

DESCRIPTION **Plants** semi-erect, herbaceous epiphytes under 15 cm tall; **roots** whitish, with a green tip, filiform, occasionally produced along the stem at major nodes between prolific shoots, 0.7 mm in diameter; **stems** terete, erect to semi-erect, prolific, 14.4–65.3 long, 0.4–0.6 mm in diameter, enveloped by 6–11, papery, infundibular sheaths, microscopically pubescent, 1.6–10.4 mm long, 0.8–3.9 wide; **leaf** spreading, coriaceous, ovate, acute, sessile, margins weakly undulate, 17.2–38.7 mm long, 9.0–17.3 mm wide; **inflorescence** a congested, successively flowered raceme, held away from the leaf, producing up to five flowers in a slow succession, peduncle terete, 18.3–25.8 long, 0.4 mm in diameter, enveloped by membranous, ovate, acute, truncate bracts, 0.9–1.8 mm long, 0.3–0.6 mm wide, the rachis terete, 1.9 long mm, 0.3 mm in diameter, **pedicel** terete 2.1 mm long, 0.3 mm in diameter; **ovary** terete, 0.8 mm long, 0.5 mm in diameter, **fruit** not seen; **flowers** without a detectable odor, resupinate, **dorsal sepal** yellow suffused with reddish-brown toward the base, gradually contracted into a tail, three–veined, 7.3 mm long, 2.3 mm wide, the lateral sepals similar in color to the dorsal sepal, free for most of their length, connate at the base to the dorsal sepal and each other, narrowly ovate, long-accuminate, two-veined, 7.2 mm long, 2.0 mm wide, **petals** yellow-orange, suffused with reddish brown toward the base, the upper lobe transversely oblong, the lower lobe triangular, subacute, 0.8 mm long, 3.8 mm wide, **lip** pinkish ruby in color, mostly glabrous with sparse pubescence along the apex of the lower lobe, bilobed, each lobe enveloping the column and meeting on either side to form a flattened shieldlike structure, the face of each lobe oblong, the base fused to the column foot, when expanded 0.6 mm long, 2.0 mm wide, **column** pinkish coral, semiterete, the apex dilated, 1.3 mm long, 0.5 mm wide, the dorsal anther cap red, shallowly cucullate, housing two narrowly clavate pollinia.

EPONYMY The new name is formed using the given name Desmond and surname Lee, combined with the honorific



[1] *Lepanthes desmondleeana* flower detail. Photograph by Hugo Medina.

[2] Illustration of *Lepanthes desmondleeana* based on the material used to prepare the holotype. A. Plant habit drawn to 1 cm scale. Figs B–G drawn to 1 mm scale. B. Flower. C. Lateral sepals. D. Dorsal sepal. E. Petal. F. Lip, upper surface, expanded. G. Lip in profile attached to the column and ovary with petals and sepals removed.

suffix -ana, to honor Mr. Desmond Lee, Minister for National Development of Singapore.

DISTRIBUTION *Lepanthes desmondleeana* is only known from the Azuay province of Ecuador where it is found growing as an epiphyte around 1,800 m.

PHENOLOGY In cultivation the plants have been observed flowering freely throughout the year.

DISCUSSION In key "Inflorescence congested, as long as or longer than the leaf with the peduncle elongate" in "*Lepanthes* of Ecuador" (Luer 1996) points to a couplet including *Lepanthes alopex* Luer & Hirtz and *Lepanthes zygion* Luer, but the new species can be distinguished from both by the prolific habit, weakly undulate leaf margins (vs. entire), and the long-accuminate lateral sepals. In "Key VI" in "*Lepanthes* of Colombia" (Luer 2012) the species keys out to a couplet including *Lepanthes prolifera* and *Lepanthes oreibates* Luer & R.Escobar. The new species appears morphologically most similar to *Lths. prolifera* but can be distinguished both vegetatively and florally. The diagnosis above provides a detailed breakdown of the differences. Two of the same traits provided by Luer (2012) that distinguish *Lths. prolifera* from *Lths. oreibates* can be used to distinguish the new species from *Lths. oreibates* as well: elliptical leaf reaching 6 cm in length (vs. ovate leaf less than 4 cm in length) and a clinandrum protruding beyond the blades of the lip (vs. clinandrum not protruding beyond the blades of the lip). In the key to the *Lepanthes* species of Bolivia (Luer) the new species keys out to *Lepanthes herzogii* Luer from which it can be distinguished by the ovate, acute leaves (vs. broadly elliptical, obtuse), narrowly diverging sepal apices (vs. widely diverging), entire sepals (vs. spiculate), the long-accuminate sepals (vs. caudate), and a clinandrum protruding beyond the blades of the lip (vs. clinandrum not protruding beyond the blades of the lip).

The new species appears to have been previously misidentified as *Lepanthes scalaris* Luer, which is an Ecuadorian species reported from ca. 3,300 m that also displays prolific shoots. The new species can be distinguished from *Lths. scalaris* by the ovate leaves (vs. elliptical) and long-accuminate sepals (vs. shortly-accuminate).

A review of the species in the checklist of the *Lepanthes* species of Peru (Ocupa-Horna et al. 2023) and *Lepanthes* published after 1996 (IPNI 2023) failed to yield a

3

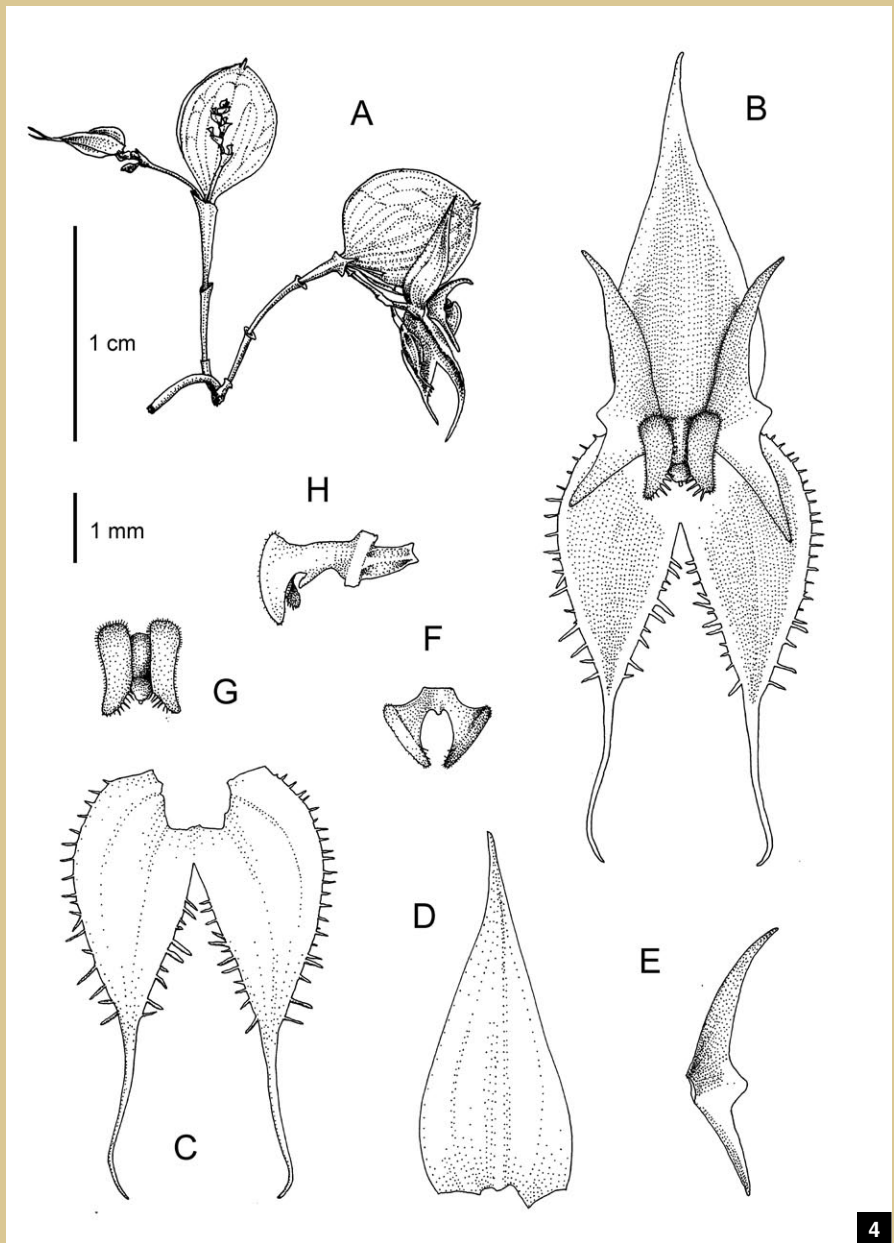
match.

Lepanthes doucettei H.Medina & J.Portilla *sp. nov.*

TYPE ECUADOR. Azuay: Guarumales, road to Sopladora Repress, ca. 2000 m. The wild plant collected by Hugo Medina, January 2017 [0272]. Flowered in cultivation at Ecuagenera, Gualaceo, 6 June 2022, *A.Doucette & H.Medina 002* (holotype: HA). Figs. 3–4.

DIAGNOSIS The new species is most similar to *Lepanthes disjuncta* Luer & Hirtz but can be distinguished by shorter stems (6.1–8.1 mm vs. 15.0–33.0 mm long); orbicular, obtuse leaves (vs. ovate, subacute); caudate dorsal sepal (vs. ecaudate); acuminate petal apices (vs. subacute), and the lip with broader lobes.

DESCRIPTION **Plants** erect, herbaceous epiphytes 1.2–1.6 cm tall; **roots** whitish, with a green tip, filiform, 0.4 mm in diameter; **stems** terete, erect, 6.1–8.1 mm long, 0.3 mm in diameter, enveloped by 3–4, papery, trumpet-shaped sheaths with trichomes along the margin of the ostium, 0.6–2.9 mm long, 0.4–1.4 wide; **leaf** spreading, coriaceous, orbicular, obtuse, apiculate, the rounded base abruptly contracted into a short petiole, 6.7–7.8 mm long, 4.6–6.3 wide; **inflorescence** a congested, successively flowered raceme, held away from the stem, producing up to four flowers in a slow succession, peduncle terete, 2.3–3.4 mm long, 0.2–0.3 mm in diameter, enveloped by membranous, ovate, acute, truncate bracts, 0.6–0.9 mm long, 0.2–0.4 wide, the rachis terete, 0.2–0.5 mm long, 0.1–0.3 mm in diameter, **pedicel** terete 1.1–1.2 mm long, 0.4 mm in diameter; **ovary** terete, 0.7 mm long, 0.4 mm in diameter, **fruit** not seen; **flowers** without a detectable odor, resupinate, **dorsal sepal** dark magenta with yellow margins, narrowly triangular, acuminate, margins spiculate, three–veined, 5.0 mm long, 1.9 wide**, lateral sepals** crimson with cream margins and base, connate at the base to the dorsal sepal and connate to one another for less than half their length, contracted into yellow tails, narrowly ovate, two–veined, 5.2 mm long, 1.4 mm wide, **petals** microscopically papillate, transversely bilobed, the upper lobe dark magenta, weakly falcate, acute, the lower lobe yellow with crimson along the lower margin, triangular, acuminate, with a minute triangular extension at the apex, 3.6 mm long, 0.8 mm wide, **lip** crimson, microscopically pubescent, bilobed, each lobe enveloping the column and meeting on either side to form a flattened shieldlike structure, the face of each lobe subreniform, the base fused to the column foot, when expanded 1.1 mm long, 1.2 mm wide, **column** red, semiterete, weakly arcuate, 1.2 mm long, 0.3 mm wide, the dorsal anther cap reddish-orange, shallowly cucullate, housing two narrowly clavate pollinia.



[3] *Lepanthes doucettei* flower detail.

[4] Illustration of *Lepanthes doucettei* based on the material used to prepare the holotype. A. Plant habit drawn to 1 cm scale. Figs B–H drawn to 1 mm scale. B. Flower. C. Lateral sepals. D. Dorsal sepal. E. Petal. F. Lip, upper surface, expanded. G. Lip blades in natural position flanking the column. H. Lip in profile attached to the column and ovary with petals and sepals removed.

EPONYMY The new name is formed using the surname of Alfonso Doucette, a passionate student of the Pleurothallidinae, for his assistance in this *Lepanthes* identification project.

DISTRIBUTION *Lepanthes doucettei* is known only from the type locality in the Azuay province of Ecuador where it is found growing as an epiphyte around 2,000 m.

PHENOLOGY In cultivation the plants have been observed flowering freely throughout the year.

DISCUSSION In Key "Inflorescence short, congested; plant small" to the *Lepanthes* of Ecuador (Luer 1996) the species keys out to *Lths. disjuncta* and

appears similar in many regards but can be distinguished by the smaller plant size and the floral morphology (see diagnosis for detailed comparison). The new species is quite distinctive and the *Lepanthes* of Colombia (Luer 2012) and the *Lepanthes* of Bolivia (Luer 2010) did not yield any close matches. In Luer (2012) the new species keyed out to a couplet in Key V containing *Lepanthes chocoensis* Luer & Thoerle and *Lepanthes eucerca* Luer & Thoerle. In Luer (2010) the new species keyed out to line 18' but could immediately be excluded from the three possible options left by the orbicular, obtuse leaves: *Lepanthes oxyphylla* Luer & R.Vásquez, *Lepanthes orchestris* Luer & R.Vásquez, and *Lepanthes serriola* Luer & R.Vásquez.

A review of the species in the checklist of the *Lepanthes* species of Peru (Ocupa-Horna et al. 2023) and *Lepanthes* published after 1996 (IPNI 2023) failed to yield a match.

Lepanthes pupuliniana A.Doucette, H.Medina, & J.Portilla *sp. nov.*

TYPE ECUADOR. Zamora-Chinchipe, road from El Zarza to El Condor mountain range, ca. 1800 m. The wild plant collected by Ivan Portilla, November 2016 [0078]. The holotype gathered from material that flowered in cultivation at Ecuagenera, Gualaceo, 6 June 2022, *A.Doucette & H.Medina 001* (holotype: HA). Figs. 5–6.

DIAGNOSIS The new species is similar to *Lepanthes peridita* Luer & Hirtz but can be distinguished by the sepals, which in *Lths*. *peridita* are connate for a proportionately shorter length (vs. greater relative length), the petals, which in *Lths*. *peridita* are yellow with a red border (vs. no red border), wider (3.8 vs. 2.5 mm), weakly cleft towards the center (vs. with a small mucro), the lip, that in *Lths*. *peridita* is microscopically pubescent (vs. glabrous) with an acute apex (vs. obtuse).


5

DESCRIPTION **Plants** erect, herbaceous epiphytes 6.0–11.0 cm tall; **roots** whitish, with a green-yellow tip, filiform, 0.5–1.3 mm in diameter; **stems** terete, erect, 54.7–92.1 mm long, 0.3–0.4 mm in diameter, enveloped by 10–12, papery, trumpet-shaped sheaths lacking well-developed trichomes along the margin of the ostium, 1.4–7.4 mm long, 0.3–1.3 mm wide; **leaf** spreading, coriaceous, ovate, acute, apiculate, the rounded base abruptly contracted into a short petiole, 12.8–18.5 mm long, 6.6–9.2 mm wide; **inflorescence** a congested, successively flowered raceme, held on the upper surface of the leaf, producing up to 35 flowers in a slow succession, **peduncle** terete, 4.0–15.9 mm long, 0.2 mm in diameter, enveloped by membranous, ovate, acute, truncate bracts, 0.5–0.9 mm long, 0.3 mm wide, **rachis** terete, 0.3–1.6 mm long, 0.2 mm in diameter, **pedicel** terete 0.7–1.9 long, 0.2 mm in diameter; **ovary** terete, 0.6 mm long, 0.4 mm in diameter, **fruit** not seen; flowers without a detectable odor, resupinate, **dorsal sepal** translucent yellow suffused with purple toward the base, transversely ovate, obtuse, margins entire, three–veined, 2.4 mm long, 2.6 mm wide, **lateral sepals** also translucent yellow not suffused with purple, connate partially to the dorsal sepal and connate to one another for more than half their length, oblique-ovate, two–veined, 1.7 mm long, 1.7 mm wide, **petals** dark red suffused with yellow-orange, transversely bilobed, the upper lobe ovate with the apex rounded, the lower lobe triangular, acute, with a minute mucro at the center, 0.7 mm long, 2.5 mm wide, **lip** lighter red than the petals, bilobed, each lobe enveloping the column and meeting on either side to form a flattened shieldlike structure, the face of each lobe oval, the base fused to the column foot, when expanded 0.6 mm long, 1.2 mm wide, **column** dark red becoming lighter red toward the apex, terete, 1.0 mm long, 0.3 mm wide, the dorsal anther cap light yellow-orange, shallowly cucullate, housing two narrowly clavate pollinia.

ETYMOLOGY The new name is formed using the surname of Franco Pupulin, combined with the honorific suffix -ana, to honor Franco for his contributions

to research on the orchid flora of Ecuador and for his mentorship to countless students of the Orchidaceae.

DISTRIBUTION *Lepanthes pupuliniana* is only known from the type locality in the Zamora-Chinchipe province of Ecuador where it is found growing as an epiphyte around 1,800 m.

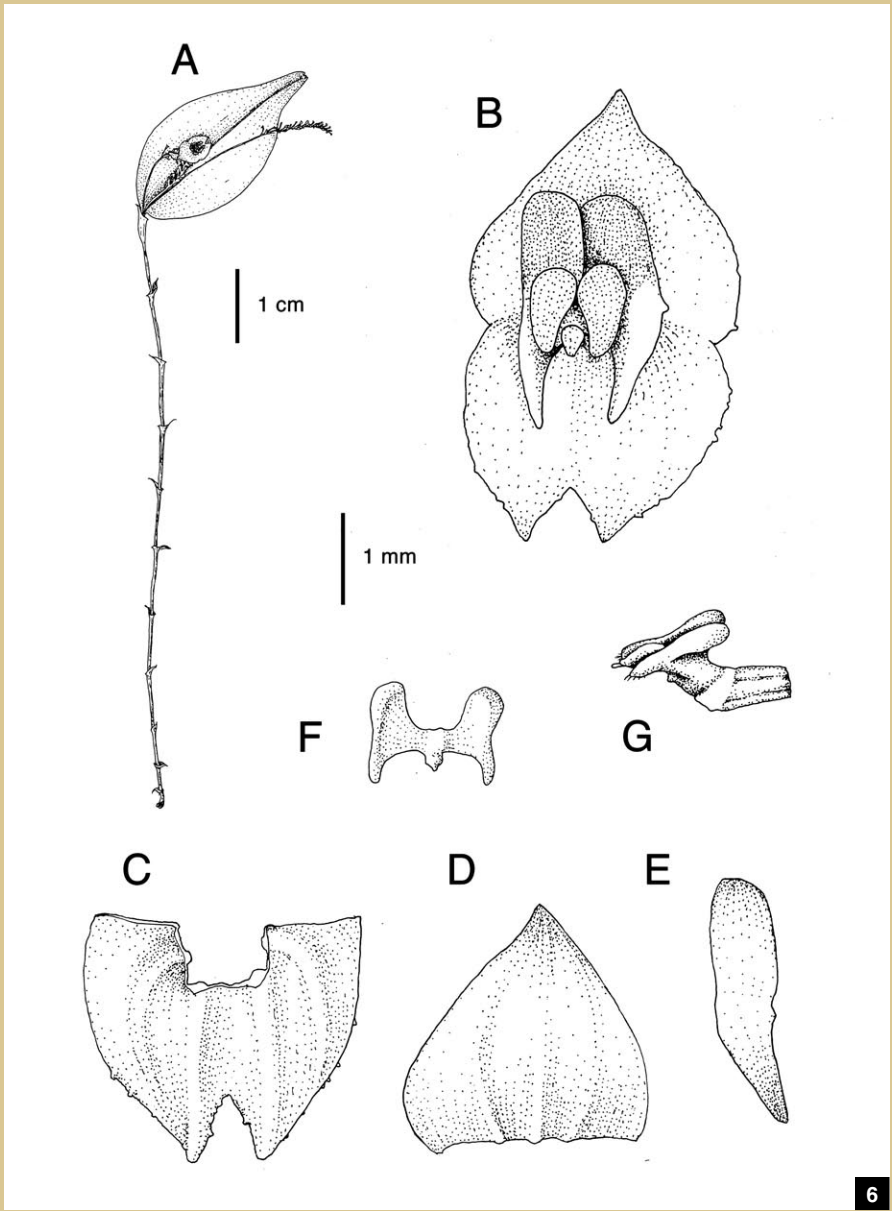
PHENOLOGY In cultivation the plants have been observed flowering freely throughout the year.

DISCUSSION In Key "Inflorescence short, congested; plant medium-sized 10–20 cm tall excluding inflorescence" of the *Lepanthes* of Ecuador (Luer 1996) the species keys out to a couplet containing *Lepanthes wageneri* Rchb.f. and *Lths. perdita* Luer & Hirtz. The new species appears superficially similar to *Lths. peridita* in Luer (1996) but can be distinguished by the floral morphology (see diagnosis above for detail). From *Lths. wageneri*, the species is easily distinguished by the petal morphology, which in *Lths. wageneri* is described by Luer (1996) as having "the upper lobe ovate-triangular to oblong, obtuse, sometimes acute, the lower lobe usually similar," compared to the dissimilar lobes of the new species which in the upper lobe are obtuse and in the lower lobe are acute.

In Key VI to *Lepanthes* of Colombia, "Inflorescence congested; plants medium in size, ramicauls [stems] 5–10 cm long" (Luer 2012), the new species keys out to *Lepanthes escifera* Luer & R.Escobar, but the new species can be distinguished vegetatively by the acute (vs. long-acuminate) leaves, the sepals with an entire (vs. cellular-ciliate) margin, and petals whose upper portions of the lobes are obtuse (vs. angular-truncate).

In Key 3 to *Lepanthes* of Bolivia (Luer 2010) the species keys out to *Lepanthes microphallica* Luer, which can be distinguished by the inflorescences held under (vs. on top of) the leaf, the lateral sepals that are freer for a greater relative proportion of their length, the entire petals (vs. with a small mucro), and the lip with an appendix bearing a terminal gland (vs. absent).

A review of the species in the checklist to the *Lepanthes* species of Peru (Ocupa-Horna et al. 2023) and *Lepanthes* published after 1996 (IPNI 2023) failed to yield a match.



[5] *Lepanthes pupuliniana* flower detail. Photograph by Hugo Medina

[6] Illustration of *Lepanthes pupuliniana* based on the material cultivated at Ecuagenera. A. Plant habit drawn to 1 cm scale. Figs B–G drawn to 1 mm scale. B. Flower. C. Lateral sepals. D. Dorsal sepal. E. Petal. F. Lip, upper surface, expanded. G. Lip in profile attached to the column and ovary with petals and sepals removed.

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— Alfonso Doucette, PhD, received a doctorate in botany from the University of Wisconsin–Madison and completed a bachelor of plant sciences at Cornell University (email: adoucette@wisc.edu). Hugo Medina is a research assistant and has described numerous new Ecuadorian orchid species (email: produccionqye@ecuagenera.com). José (Pepe) Portilla is the CEO, founder and President of Ecuagenera CIA Ltda. (email: pepe@ecuagenera.com).