

THREE NEW SPECIES OF *LEPANTHES*
(ORCHIDACEAE: PLEUROTHALLIDINAE) FROM SAN JOSÉ DEL SALADO,
VALLE DEL CAUCA, IN SOUTHWESTERN COLOMBIA

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Abstract. Three new species of *Lepanthes* from the Western Cordillera of the Colombian Andes are described and illustrated. The new species were found during several botanical expeditions to the mountains in San José del Salado, department of Valle del Cauca, Colombia.

Keywords: taxonomy, Andes, Western Cordillera, Neotropics, systematics, Pleurothallidinae

Resumen. Tres especies nuevas de *Lepanthes* de la Cordillera Occidental de los Andes Colombianos son descritas e ilustradas. Las nuevas especies se encontraron durante varias expediciones botánicas a las montañas en San José del Salado en el Departamento del Valle del Cauca, Colombia.

Palabras claves: taxonomía, Andes, Cordillera Occidental, Neotropico, sistemática, Pleurothallidinae

Lepanthes Sw. is one of the most diverse genera in Orchidaceae, representing 23% of subtribe Pleurothallidinae with 1158 described species (Karremans and Vieira, 2020). In Colombia, since the publications by Carlyle A. Luer (1953–2019) and Rodrigo Escobar (1935–2009), where they described 208 species (Moreno et al., 2018), several new species have been found and described recently (Vieira-Uribe and Larsen, 2014a,b; Moreno et al., 2017, 2018; Vieira-Uribe and Moreno, 2018, 2019, 2020; Moreno, Baquero, et al., 2020; Moreno, Pisso-Florez, et al., 2020; Gutiérrez et al., 2021), and the number keeps increasing year by year as more expeditions to unexplored areas are carried out.

Between the years of 2015 and 2017, eight new species of orchids were described from the mountains of San José

del Salado, department of Valle del Cauca, in southwestern Colombia, including species from the genera *Epidendrum* L., *Camaridium* Lindl., *Pleurothallis* R.Br., and *Lepanthes* (Rodríguez-Martínez and Blanco, 2015; Hágsater et al., 2015, 2016; Rodríguez-Martínez et al., 2015; Karremans et al., 2017; Moreno et al., 2017). This area in the Western Cordillera of Colombia includes the confluence of the Chocó Biogeographic Region and the Tropical Andes, two of world's most biodiverse hotspots, whose great variety of microhabitats promote species richness and endemism within the Orchidaceae family (Karremans et al., 2017).

Here we describe three new species of *Lepanthes* from the mountains of San José del Salado, an orchid biodiversity hotspot.

MATERIALS AND METHODS

Descriptions and Drawings

The descriptions were prepared from living specimens. Specimens were preserved in alcohol and dissected under a stereo microscope (AmScope SM-1TNZ-144A-3M). Digital images were taken with a Nikon D750 with a Nikkor 105 mm f/2.8 macro lens. Sketches from living and preserved specimens were digitalized, and the images were used for diagramming draft composite templates in Adobe Photoshop® CS6. Then, digital drawings were prepared

(using lines and stippling) in Procreate for Apple iPad (6th generation) (Bogarín et al., 2019).

Lepanthes specimens in the following herbaria—AMES, CAUP, ICESI, JAUM, HPUJ, HUA, FMB, VALLE, JBB, CUVC, SEL, MO (online), TOLI, and COL (online)—were consulted, but no additional material was found in these collections to include in the protologues of the new species described herein.

We thank Humberto Dominguez Escobar from El Carare Natural Reserve for allowing us to explore his property in San José del Salado (Dagua) and Argemiro Vargas Rodriguez for providing access to his territory in El Limonar (Dagua, Valle del Cauca). We wish to acknowledge the National Natural Parks of Colombia, especially Luis Carlos Mamian and Alvaro Fierro from the Farallones de Cali National Natural Park. We also thank Mr. Alvaro José Ortiz from Finca Montañita and Martin Cortez from Finca San Martin in the Cerro Tokio locality, as well as the Fundación Grupo Conserva for its logistical support. Finally, the authors are very grateful to José Otocar Reina and his son Juan Fernando Reina for their company and hospitality in the Altos of San José del Salado.

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TAXONOMY

Lepanthes irmae Gal.–Tar., Zuluaga, J.S. Moreno & Mora-Aguilar, *sp. nov.* TYPE: COLOMBIA, Valle del Cauca: municipio de Dagua, corregimiento de San José del Salado, predio El Almorzadero, 1732 m, 15 Sept 2020. *R. Galindo-Tarazona and D.L. Mora 1504* (Holotype: CUVC). Fig. 1–2.

Lepanthes irmae is most similar to *L. licrophora* Luer & B.T. Larsen, by its leaves and habit, but is distinguished by its triangular trilobed petals, lip blades obovate with rounded ends, and oblong pubescent appendix.

Plant medium in size, epiphytic, caespitose, 4.1–5.9 cm tall. *Roots*, slender, flexuous, filiform, 0.8–1.0 mm in diam. *Ramicauls* slender, suberect to horizontal, 2.9–4.4 cm long, enclosed by 8–14 acuminate, furrowed and microscopically pubescent lepanthiform sheaths, with a dilated and ciliate ostia. *Leaves* dark green, more or less horizontal, coriaceous, reticulate-veined, with 8 main veins, corrugate, lanceolate, acute, 3.5–3.6 × 1.0–1.4 cm, the apex emarginate with an abaxial apiculum in the middle, 3.5–3.6 × 1.0–1.4 cm, the base cuneate contracted into a petiole 2.0–3.2 mm long. *Inflorescence* a congested, distichous raceme, 6–12, successively several flowered, shorter than the leaf, up to 1.4–2.1 cm long including the peduncle, borne on top of the leaf by a filiform, terete peduncle 0.9–1.2 cm long, from near the apex of the ramicauls; *floral bracts* acuminate, 1.0–1.5 mm long; *pedicels* terete, longer than the floral bracts, 2.1 mm long. *Ovary* costate, 2.3 mm long. *Flowers: sepals* saffron yellow orange; *petals* fulvous yellow, tawny with ferruginous-rust color in the middle; *lip* ferruginous-rust colored. *Sepals* glabrous, shortly ciliate along the margins, similar in size. *Dorsal sepal* ovate, acute, 3-veined, 3.5–4.0 × 2.3–2.5 mm, connate at the base to the lateral sepals for ca. 0.9 mm. *Lateral sepals* ovate, oblique, acuminate, 2-veined, 3.5–4.2 × 1.5–2.2 mm, connate for 1.5 mm. *Petals* microscopically pubescent, transversely trilobed, 3-veined, 2.0 × 3.2–3.5 mm; the upper lobe oblong, sharply truncate, triangular in the exterior angle; the middle lobe linear, arcuate, triangular; the lower lobe narrowly triangular, acute. *Lip* bilaminate, the blades obovate with rounded ends, glabrous, 1.44 × 0.57 mm long, the connectives short, cuneate, the body broad, connate to the base of the column, the sinus obtuse, with an oblong, pubescence at the tip and narrowly elliptical appendix. *Column* scarlet, thin, terete, slender, 1.4 mm long, the anther dorsal and the stigma ventral; *stigma* trilobed with smaller and apiculate central lobe. *Anther cap* pink, cordate, cucullate, 0.5 mm wide. *Pollinia* yellow, 2, pyriform, 0.5 mm long.

Eponymy: the name honors Irma Tarazona Rubio, mother of Robinson Galindo-Tarazona.

Habitat and ecology: *Lepanthes irmae* was found in a very humid area in a secondary forest, growing close to the ground in a small creek that flows into the Quebrada Española (Map 1), sharing habitat with *L. aciculifolia* Luer, *L. aff. carunculigera*, *L. lycocephala* Luer & R. Escobar, *L. posadae* Luer & R. Escobar, and *L. satyrica* Luer & Hirtz.

Conservation status: *Lepanthes irmae*, *L. fimbriatilabia*, and *L. pogonochila* are known only from their type locality

(Map 1). *Lepanthes fimbriatilabia* is the only species that was found in a protected area, the National Natural Park Farallones de Cali. The IUCN classification is data deficient (DD) because we lack adequate distribution and population information to make an assessment (IUCN Standards and Petitions Subcommittee, 2017; IUCN, 2021).

Lepanthes irmae resembles a group of species with similar habit and reticulate leaves, such as *L. licrophora* (Fig. 3), *L. silverstonei* Luer, and *L. antennata* Luer & R. Escobar, but the flower is entirely different from the last species and does not resemble any other described species so far. It can be easily recognized by the combination of dark green reticulate and corrugate leaves, transversely bilobed petals with a middle lobe, and the ovate blades of the bilaminate lip.

Lepanthes fimbriatilabia J.S. Moreno, Gal.–Tar., Zuluaga, *sp. nov.* TYPE: Colombia. Valle del Cauca: municipio de Dagua, corregimiento de San José del Salado, en proximidades de un pequeño afluente que da a la Quebrada La Española, 1776 m, 10 Jan 2021. *R. Galindo-T and D. L. Mora 1548* (Holotype: CUVC). Fig. 4–6.

Lepanthes fimbriatilabia resembles *L. pecunialis* Luer & Hirtz, but it can be recognized by the transversely bilobed petals with the lower lobe pubescent and fimbriate, as well as the bilaminate lip strongly fimbriate along the margins with the blades oblong and falcate.

Plant small in size, epiphytic, caespitose, up to 14.8 cm tall. *Roots* slender, flexuous, 0.6 mm in diam. *Ramicauls* slender, erect to suberect, 10.8 cm long, enclosed by 10 dark brown, tightly fitting, lepanthiform sheaths, with a minutely acuminate, ciliated ostia. *Leaves* coppery, erect, thickly coriaceous, ovate, obtuse, 3.4–3.6 × 2.3–2.7 cm, the base rounded and contracted into a petiole 1.0–1.5 cm long. *Inflorescence* a very congested, successively, distichous, long-pedicellate, many-flowered raceme, up to 2.5 cm long including the peduncle, borne beneath the leaf by a filiform peduncle 1.8–2.5 cm long; *floral bract* acuminate, scabrous, 1.3 mm long; *pedicel* terete, persistent, longer than the floral bract, 1.0–1.7 mm long. *Ovary* costate, 2.4 mm long. *Flowers: sepals* beige, very pale creamy brown with fawn, light yellowish brown, similar in shape and size. Glabrous, ovate, obtuse. *Dorsal sepal* 3-veined, 3.0–3.1 × 2.1–2.3 mm, connate to the lateral sepals for 0.5 mm. *Lateral sepals* oblique, 2-veined, 2.6 × 1.4 mm, connate for 1.5 mm. *Petals* saffron, yellow-orange with maroon, dark red margins, transversely bilobed, 1-veined, 1.6 × 4.1–4.2 mm, the upper lobe larger than the lower lobe, ovate, obtuse, the lower lobe narrowly triangular, obtuse, pubescent, fimbriate. *Lip* peach, light pink, strongly fimbriate, bilaminate, the blades oblong, falcate with rounded ends, 1.5–1.8 × 0.5 mm long, the connectives cuneate, connate to the base of the column, the appendix bisegmented, the apical portion subquadrate, pubescent. *Column* buff, dull yellow-brown, terete, 1.2 mm long, the anther dorsal and stigma ventral. *Anther cap* not seen. *Pollinia* not seen.

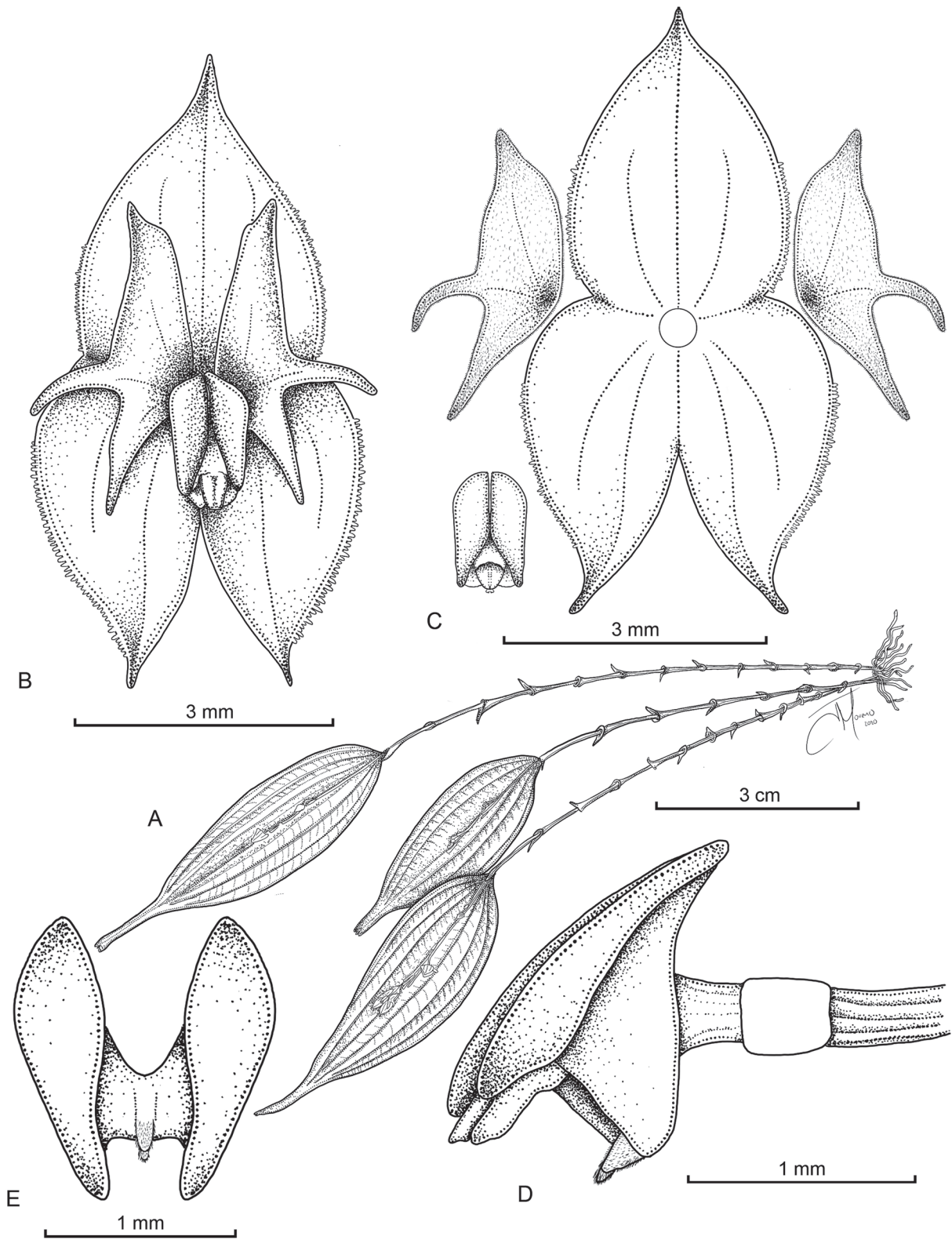


FIGURE 1. Illustration of *Lepanthes irmae* Gal.-Tar., Zuluaga, J.S. Moreno & Mora-Aguilar. **A**, habit; **B**, flower; **C**, dissected perianth; **D**, column and lip, lateral view; **E**, lip. Drawn by J. S. Moreno, based on R. Galindo-T. & D. L. Mora 1504.

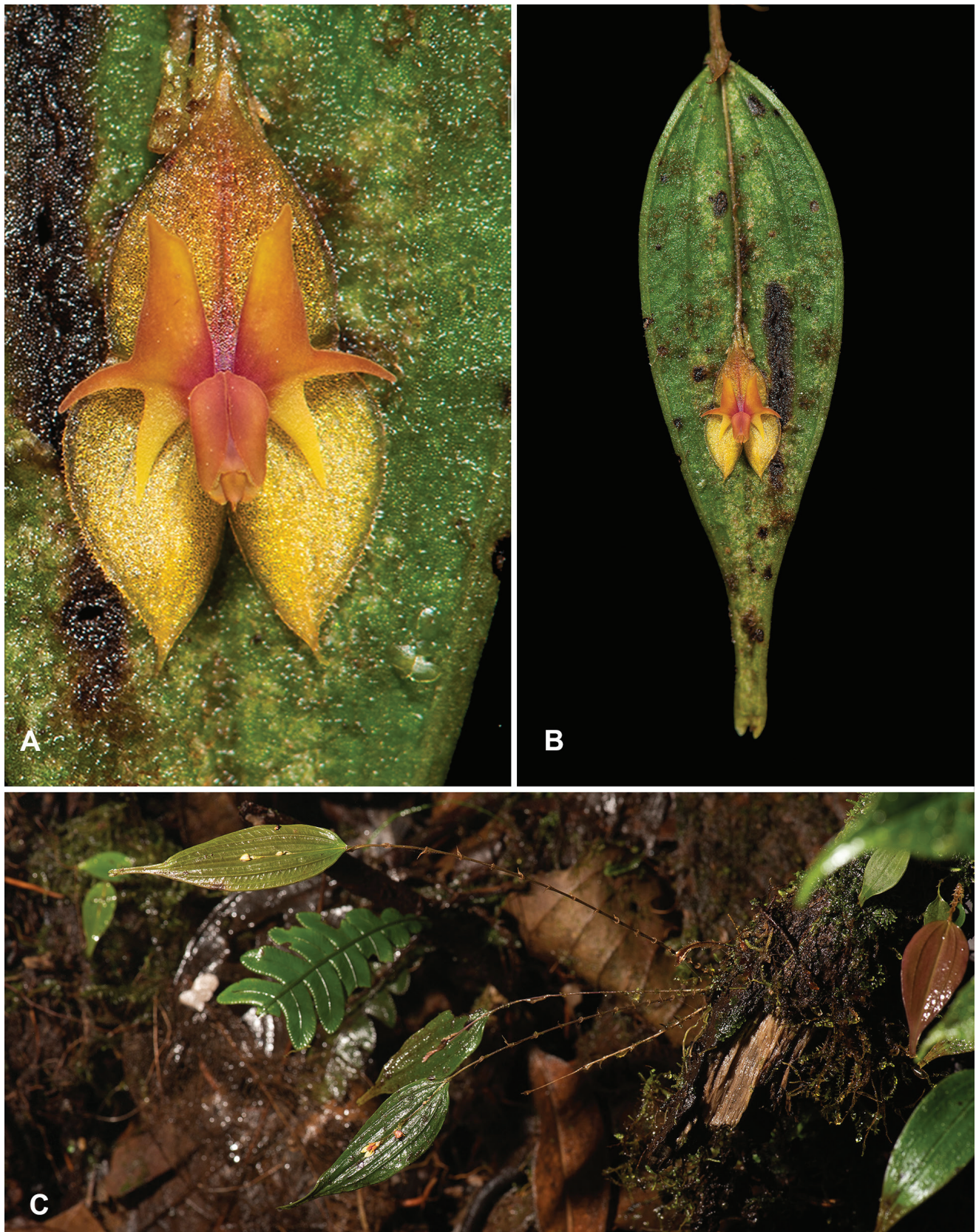
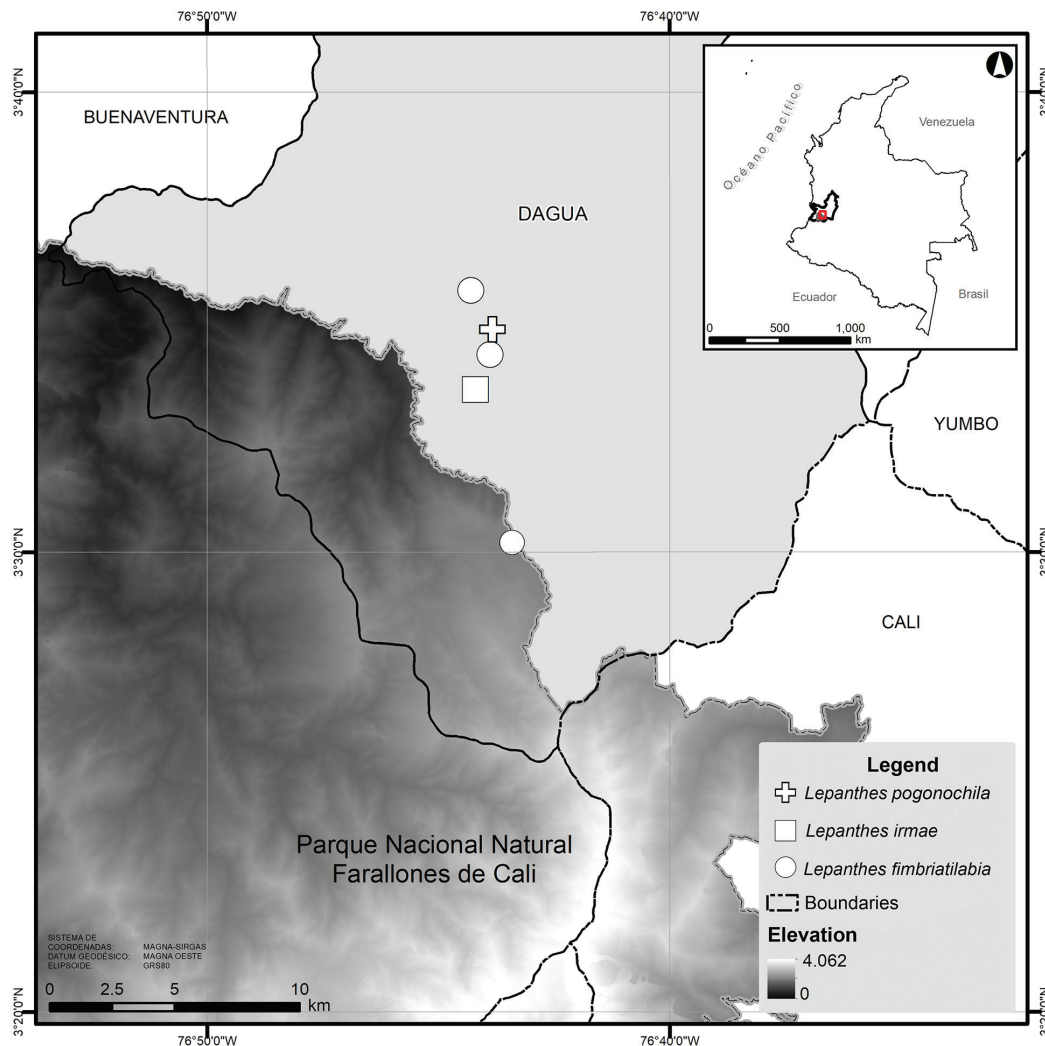


FIGURE 2. Photographs of *Lepanthes irmae* Gal.-Tar., Zuluaga, J.S. Moreno & Mora-Aguilar. **A**, flower; **B**, leaf and inflorescence; **C**, plant and habit, in-situ. (Photos: R. Galindo-T. from the type specimen).



MAP 1. Distribution map of *Lepanthes irmae* Gal.–Tar., Zuluaga, J.S. Moreno & Mora-Aguilar (square); *L. fimbriatilabia* J.S. Moreno, Gal.–Tar., Zuluaga (circle); and *L. pogonochila* Zuluaga, Alegria-Valencia., J.S. Moreno & Gal.–Tar. (cross) in the Department of Valle del Cauca, Colombia.

Additional specimen examined: COLOMBIA. Valle del Cauca: Corregimiento El Queremal, Parque Nacional Natural Farallones de Cali, Cerro Tokio, en cercanías de la Finca del Sr. Alvaro, Municipio de Dagua, 1800 m, 8 Dec 2020, *R. Galindo-T, V. Varón, and D. L. Mora 1536* (CUVC). Municipio de Dagua, Corregimiento de San José del Salado, *Altos de San José del Salado, Finca Totogol*, 1860 m, 20 Nov 2021, *J. S. Moreno and A. L. Erazo 525* (CAUP).

Etymology: from the Latin *fimbriatus*, “fringed,” and *labium*, “lip, labellum,” in reference to the fringed margins of the lip in the new species.

Habitat and ecology: plants were found growing as epiphytes in *Andesanthus lepidotus* (Bonpl.) P.J.F. Guim. & Michelang Baill. (Melastomataceae) trees along the edge of a pasture in close proximity to a very well preserved forest. It shares habitat with *Lepanthes elata* Rchb.f. and *L. agglutinata* Luer.

Conservation status: see *Lepanthes irmae*.

Lepanthes pogonochila Zuluaga, Alegria-Valencia., J.S. Moreno & Gal.–Tar., *sp. nov.* TYPE: Colombia. Valle del Cauca: municipio de Dagua, corregimiento El Limonar, Quebrada La Española, 1700 m, 27 Sept 2020. *R. Galindo-T, V. Varón and D. L. Mora 1523* (Holotype: CUVC). Fig. 7–9.

Lepanthes pogonochila is most similar to *L. impotens* Luer & R. Escobar from Colombia, but it can be recognized mainly by its lip’s obovate blades, with the apex of each blade provided with conspicuous, dense bristles and a subquadrate, bilobed, concave appendix.

Plant medium in size, epiphytic, weak, caespitose, 4.3–6.7(–9.9) cm tall. *Roots* slender, flexuous 0.5–0.7 mm in diam. *Ramicauls* slender, suberect, 2.2–6.0 cm long, enclosed by 7–10 lepanthiform sheaths, furrowed, with a dilated, ciliated, ostia long acuminate. *Leaves* pendent, thinly coriaceous, ovate, acute, long acuminate, the apex emarginate with an abaxial apiculum in the middle, 1.7–3.6 × 0.8–1.1 cm, the base cuneate contracted into a petiole



FIGURE 3. Leaves and habit of *Lepanthes licrophora* Luer & B.T. Larsen, the species most similar to *Lepanthes irmae* Gal.–Tar., Zuluaga, J.S. Moreno & Mora-Aguilar.

4.9–8.4 mm long. *Inflorescence* a congested, successively flowered raceme, up to 1.7–2.0 cm long including the peduncle, borne on top of the leaf by a filiform peduncle 4.4–7.0 mm long; floral bract acuminate, 0.7–1.1 mm long; pedicel terete, persistent, longer than floral bract, 1.1–2.2 mm long. *Ovary* costate, 1.1 mm long. *Flowers*: *sepals* khaki, dull brownish yellow, similar in shape and size; *petals* russet, reddish brown with cinnabar, vermilion, blood-red in the middle; *lip* russet, reddish brown. *Sepals* convex, glabrous, ciliate along the margins, similar in size. *Dorsal sepal* ovate, acute, 3.3×2.5 mm, 3-veined, connate to the lateral sepals for 0.6 mm. *Lateral sepals* ovate, oblique, acute, $3.1\text{--}3.2 \times 1.6$ mm, 2-veined, connate for 1.4 mm. *Petals* transversely bilobed, 3-veined, $0.9\text{--}1.0 \times 4.4\text{--}4.5$ mm, the upper lobe subquadrate, obliquely truncate, short pubescent in the base; the lower lobe longer than the upper lobe, narrowly triangular, acute, attenuate, long pubescent from the base toward the apices. *Lip* glabrous, bilaminar, the blades obovate, with rounded ends, the apex of each lobe provided with conspicuous bristles, 1.6×0.6 mm, the connectives short, broadly cuneate, the body thick, rounded, connate to the base of the column, the sinus obtuse, the appendix bisegmented, the apical portion thick, subquadrate, bilobed, the basal portion concave, pubescent. *Column* terete, slender, 0.9 mm long, the anther dorsal and

stigma ventral. *Anther cap* pink, cordate, cucullate, 0.5 mm wide. *Pollinia* yellow, 2, pyriform, 0.3 mm long.

Etymology: from the Greek words *pōgōn*, “beard,” and *kheilōs*, “lip,” in reference to the long bristles found at the apex of the lip blade.

Conservation status: see *Lepanthes irmae*.

Lepanthes pogonochila (Fig. 7A) shares many traits with *L. impotens* (Fig. 7B). Both species have caespitose and weak habit with the ramicauls slender to suberect; the leaves ovate, pendent, coriaceous with an apex long acuminate, like most of the species in the series *Mucronatae* proposed by Luer and Thorerle in 2011. The new species could be distinguished from the latter by its lip’s obovate blades covered by numerous dense, conspicuous bristles at the apex, a pubescent bisegmented appendix with the apical portion subquadrate and bilobed, and the basal portion concave (vs. the lip blades elliptical, with short trichomes, and an appendix reduced to a ciliate margin of the body of the lip) (Luer and Thorerle, 2012). Finally, the new species is also similar to *L. oscillifera* Luer & R. Escobar (Fig. 7C), but the apex of the blades are minutely ciliate (vs. covered by numerous dense and conspicuous bristles at the apex), the appendix broadly hinged from the center, flap-like, and the apical portion concave and ciliate with a minutely bilobed apex (vs. appendix with the apical portion subquadrate, bilobed, and the basal portion concave).

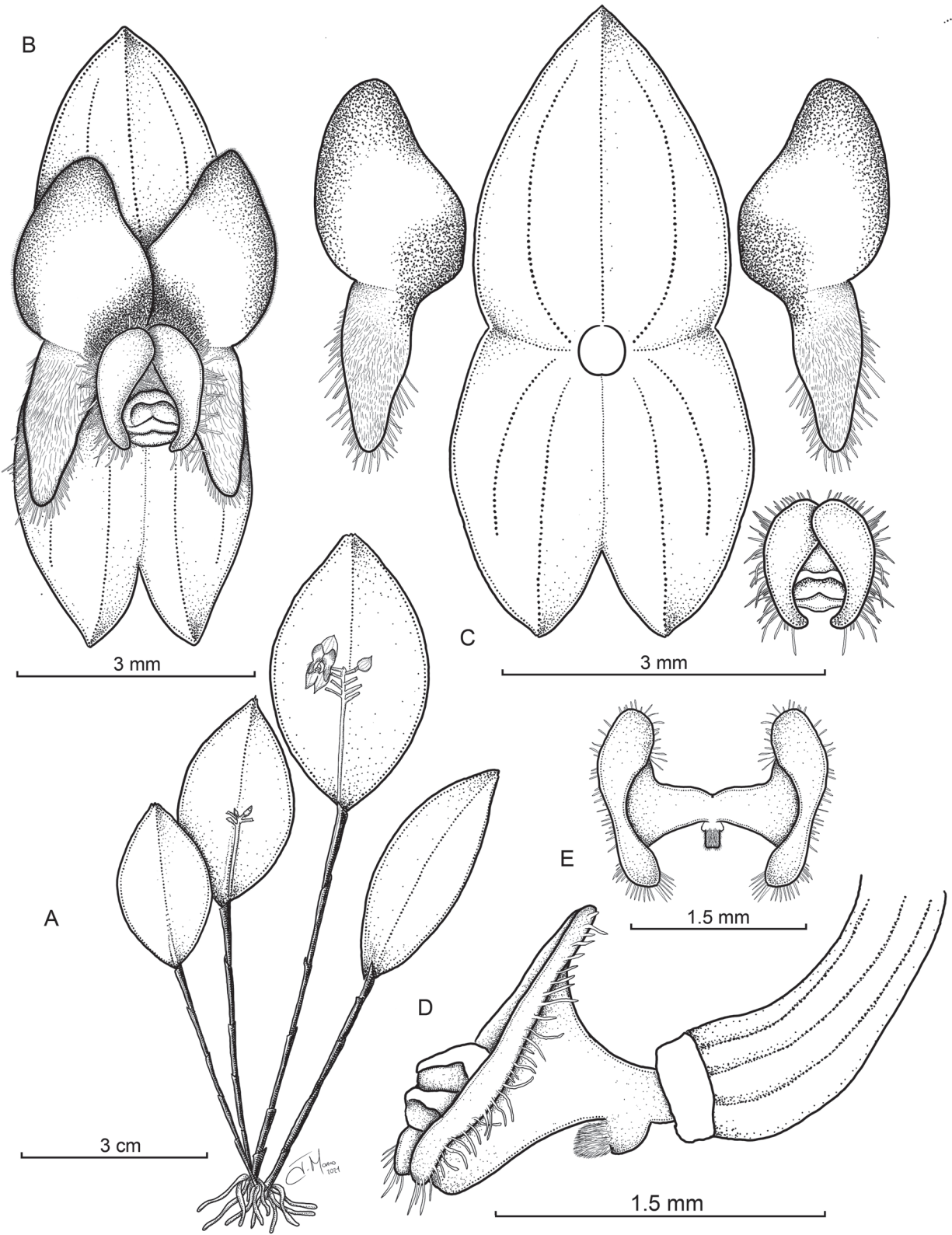


FIGURE 4. Illustration of *Lepanthes fimbriatilabia* J.S. Moreno, Gal.–Tar., Zuluaga. **A**, habit; **B**, flower; **C**, dissected perianth; **D**, column and lip, lateral view; **E**, lip. Drawn by J. S. Moreno, based on *R. Galindo-T. & D. L. Mora 1548*.



FIGURE 5. Photographs of *Lepanthes fimbriatilabia* J.S. Moreno, Gal.–Tar., Zuluaga. **A**, flower, frontal view; **B**, leaf and inflorescence; **C**, plant and habit, in-situ. (Photos: J. S. Moreno from the type specimen).



FIGURE 6. Comparison of the most similar species. **A**, *Lepanthes fimbriatilabia* J.S. Moreno, Gal.–Tar., Zuluaga; **B**, *Lepanthes pecunialis* Luer & Hirtz.



FIGURE 7. Comparison of the most similar species. **A**, *Lepanthes pogonochila* Zuluaga, Alegria-Valencia., J.S. Moreno & Gal.–Tar.; **B**, *Lepanthes impotens* Luer & R. Escobar; **C**, *Lepanthes oscillifera* Luer & R. Escobar.

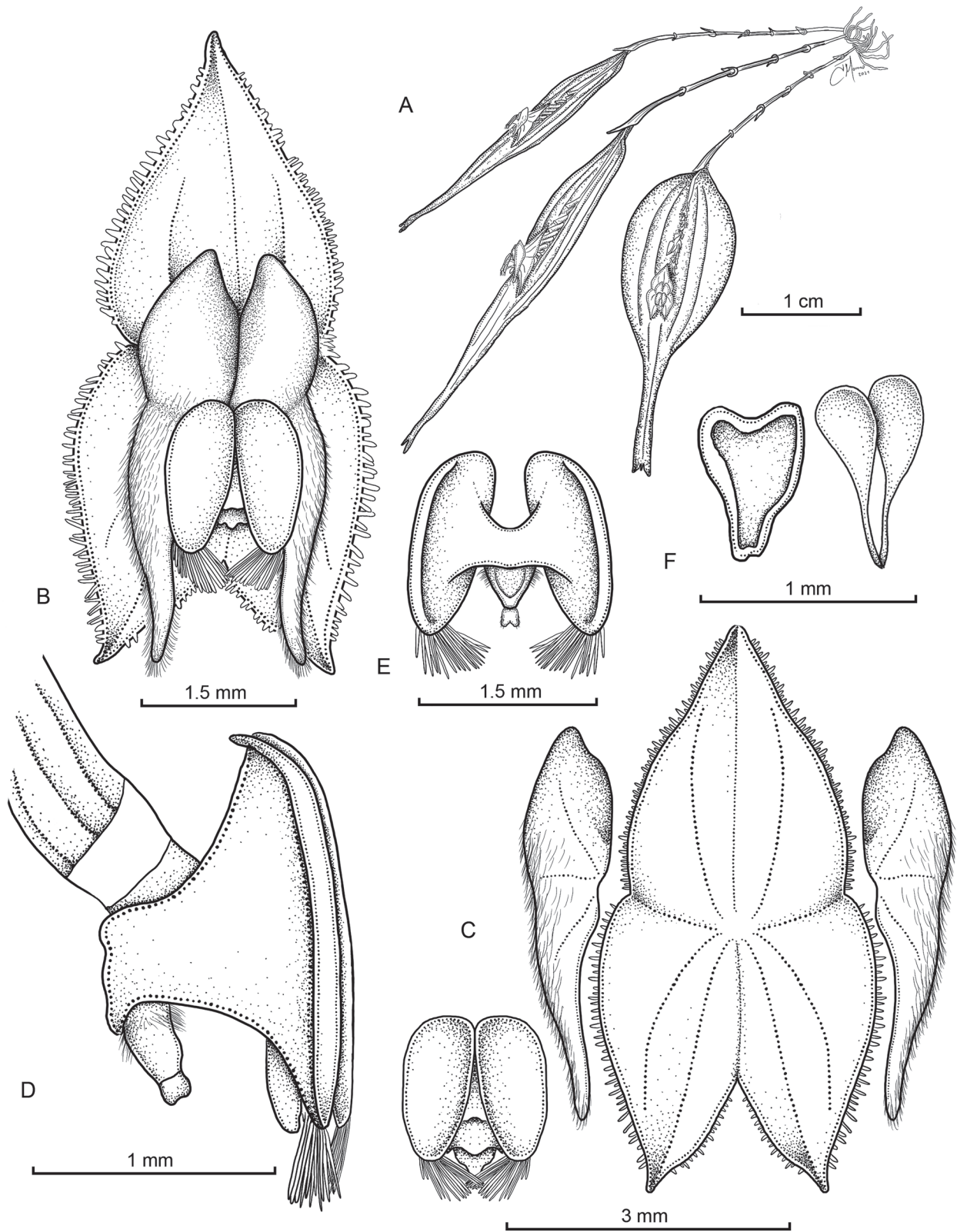


FIGURE 8. Illustration of *Lepanthes pogonochila* Zuluaga, Alegria-Valencia., J.S. Moreno & Gal.-Tar. **A**, habit; **B**, flower; **C**, dissected perianth; **D**, column and lip, lateral view, **E**, lip; **F**, anther cap and pollinia. Drawn by J. S. Moreno, based on R. Galindo-T., V. Varón & D. L. Mora 1523.

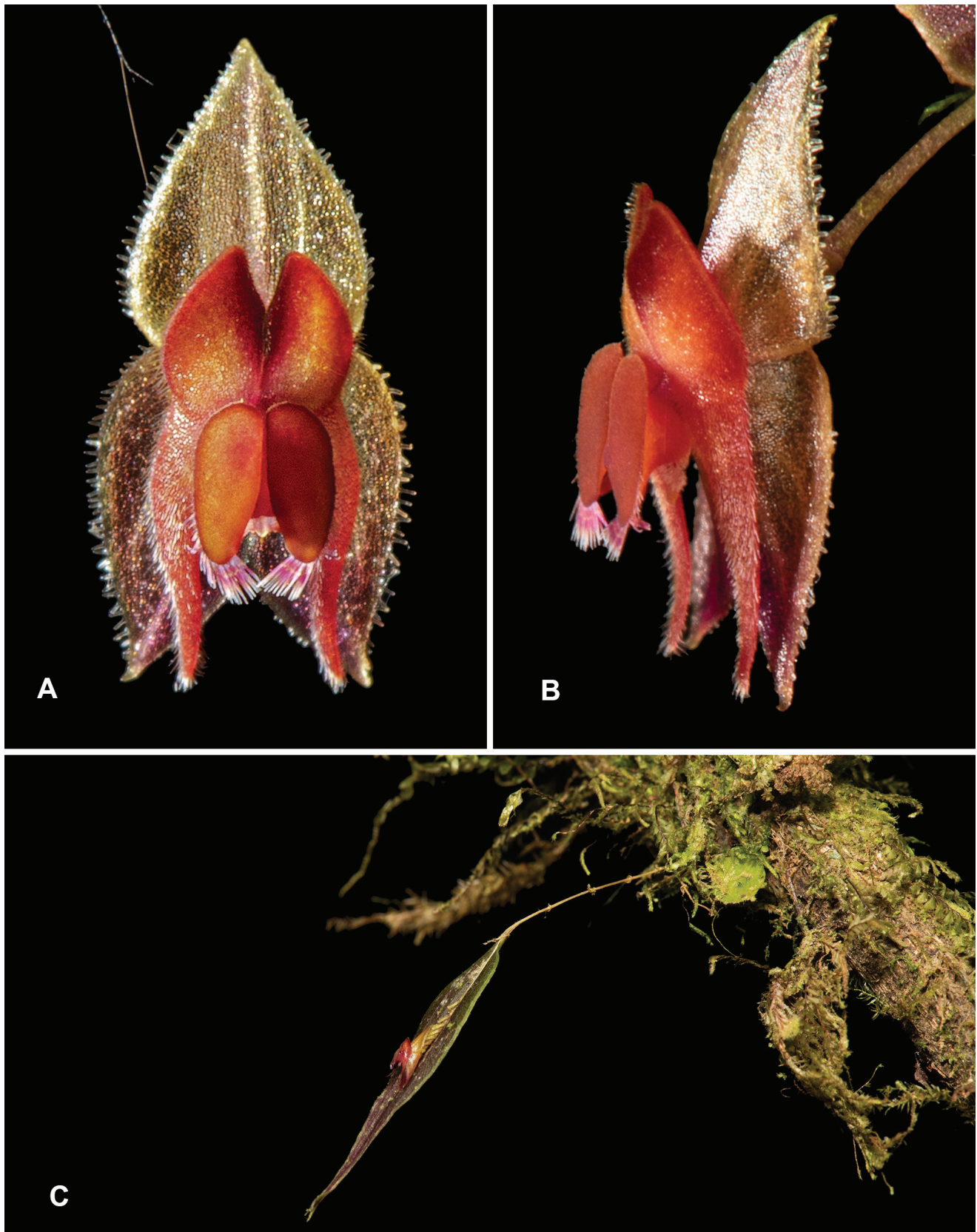


FIGURE 9. Photographs of *Lepanthes pogonochila* Zuluaga, Alegria-Valencia., J.S. Moreno & Gal.-Tar. **A**, flower, frontal view; **B**, flower, 3/4 view; **C**, plant and habit, in-situ. (Photos: R. Galindo-T. from the type specimen).

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