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TWO NEW SPECIES OF *PLEUROTHALLIS* (PLEUROTHALLIDINAE) SUBSECTION *MACROPHYLLAE-FASCICULATAE* FROM THE CENTRAL ANDES OF COLOMBIA

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Abstract. Two new species of *Pleurothallis* subsection *Macrophyllae-Fasciculatae* are described and illustrated. Both species were found in the central Andes of Colombia in the department of Tolima. The two species are compared and discussed with *Pleurothallis applanata*, *Pleurothallis ariana-dayanae*, *Pleurothallis paquishae*, and *Pleurothallis scabrilinguis*, which are the morphologically closest species. The two new species differ from their congeners mainly by lip morphology. *Pleurothallis franciana* is distinguished by having an oblong-lanceolate, acute, vesiculous lip with an obovate glenion, and *Pleurothallis petroana* is distinguished by the ovate-lanceolate, verrucose-papillose, slightly pilose lip, with a spathulate glenion.

Resumen. Se describen e ilustran dos nuevas especies de *Pleurothallis* subsección *Macrophyllae-Fasciculatae*, encontradas en los Andes centrales de Colombia en el departamento de Tolima. Las dos especies se comparan y discuten con *Pleurothallis applanata, Pleurothallis ariana-dayanae, Pleurothallis paquishae*, y *Pleurothallis scabrilinguis*, que son las especies morfológicamente más cercanas. Se diferencia de sus congéneres principalmente por la morfología del labelo, *Pleurothallis franciana* se distingue por tener el labelo oblongo-lanceolado, agudo, vesiculoso, con un glenion obovado y *Pleurothallis petroana* se distingue por el labelo ovado-lanceolado, verrucoso-papiloso, ligeramente piloso, con un glenion espatulado.

Keywords / Palabras clave: distribución, distribution, ecología, ecology, Ibagué, Orchidaceae, Tolima, Villahermosa

Introduction. *Pleurothallis* R.Br. is a neotropical genus distributed from southern Mexico to South America, with representation in the Antilles (Ackerman *et al*. 2014). According to Karremans & Vieira-Uribe (2020), 499 species are currently accepted; however, with the publication of new species during the last two years, the number increased to 528 species (Jiménez *et al*. 2021, Karremans *et al*. 2021, Moreno *et al.* 2022, Pupulin *et al*. 2020, 2021, Sierra-Ariza *et al.* 2022, Vélez-Abarca *et al*. 2022, Wilson *et al.* 2022). Colombia, with 236 species, comprises the largest number of species in the neotropics (Karremans *et al.* in prep.).

The *Pleurothallis* subsection *Macrophyllae-Fasciculatae* Lindl. was initially proposed as a section of *Pleurothallis* subgenus *Pleurothallis* by Lindley (1859). This group has undergone several nomenclatural changes over time. For example, Luer (1986) initially recognized the sectional status of the group, however, two years later, he classified the group under *P.* subsection *Macrophyllae-Fasciculatae* (Luer 1988). Finally, Luer (2005) recognized *Acronia* C.Presl, and he treated the members of *Macrophyllae-Fasciculatae* as a section of this genus (for a detailed taxonomic history of the group, see: Pupulin *et al*. 2020, 2021, Wilson *et al.* 2022). Nevertheless, phylogenetic studies suggest that *Acronia* and the *P.* subsection *Macrophyllae-Fasciculatae* belong to a well-supported clade within *Pleurothallis* (Pridgeon *et al*. 2001, Wilson *et al.* 2011, 2018).

Morphologically, the species within the *P.* subsection *Macrophyllae-Fasciculatae* can be recognized by having sessile leaves with a generally cordate base, solitary flowers grouped in a fascicle, lateral sepals connate into a synsepal more or less similar to the dorsal sepal, a bilobed stigma, and a lip lying on or slightly elevated above the synsepal (Lindley 1859, Luer 2005, Wilson *et al.* 2018).

Here, we describe and illustrate two new species of *P.* subsection *Macrophyllae-Fasciculatae* found in the department of Tolima, Colombia, belonging to the informal taxonomic group "*Pleurothallis scabrilinguis*".

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Members of this group are characterized by flowers with linear, falcate petals, large, flattened lip with irregular texture (cellular, verrucous, papillose, pilose, vesicular), and a conspicuous basal glenion (Vélez-Abarca *et al.* 2022).

Materials and methods. *Pleurothallis petroana* was found in July 2019 in one of the expeditions carried out in the research entitled "synthesis of the orchids of the Azufrado River, Tolima-Colombia", project where six new species of orchids have been discovered and described: *Acianthera villahermosae* Sierra-Ariza, Rinc.-González & Karremans, *Oncidium tolimense* Sierra-Ariza & A.Albino-Bohórquez, *Pleurothallis villahermosae* Sierra-Ariza, Rinc.-González & Villanueva, *Epidendrum villahermosaense* Sierra-Ariza & Hágsater and *Epidendrum rioazufrense* Sierra-Ariza, Hágsater & E.Santiago. In addition, *Pleurothallis franciana* was found in June 2022 on the road that connects the urban area of the city of Ibagué with the Municipalities of Ambalá and Carrizales in Tolima, Colombia.

The specimens were photographed with a Nikon D5300 camera and a NIKKOR AF 105 mm f/2.8 D Micro lens. Ecological data and phenology were recorded for *P. franciana* for three months and for *P. petroana* for two years. Type specimens were prepared by storing vegetative structures on newspaper soaked in 75% ethanol. The floral structures were preserved in a concentration of equal parts of glycerin and ethyl alcohol.

The collected material was dried at 75°C for 14 hours and subsequently deposited in the collection of the TOLI Herbarium. Literature on the genus was reviewed, such as monographs on the systematics of *Pleurothallis* section *Macrophyllae-Fasciculatae* (Luer 1988, 2005). In addition, specimens from AMES (www.huh.harvard.edu) and K herbaria (apps.kew.org/herbcat/gotoHomePage.do) were reviewed online. Finally, Lankester composite Digital plates (LCDP) were made with Adobe Photoshop® CS6.

Taxonomic treatment

Pleurothallis franciana Sierra-Ariza ***sp. nov.*** (Fig. 1–2).

TYPE: COLOMBIA. Tolima: Municipio de Ibagué, entre las veredas Ambala y Carrizales, 1976 m, 23 June 2022, *M. A. Sierra-Ariza & A. Albino Bohorquez 430* (holotype: TOLI).

Diagnosis: *Pleurothallis franciana* is similar to *Pleurothallis ariana-dayanae* Vélez-Abarca, M.M.Jiménez & D.Gut. del Pozo from which it differs by having a narrowly ovate-lanceolate dorsal sepal (*vs.* lanceolate), an ovate synsepal (*vs.* broadly ovate) and the lip oblong-lanceolate, acute, vesiculose (*vs.* ovate-elliptic, obtuse, verrucose-papillose), with an obovate glenion (*vs.* slightly bilobed).

Plant 4 to 12 cm tall, epiphytic, caespitose, erect to suberect. *Roots* slender, 1 mm in diameter. *Ramicauls* green, 3.5–11 cm long, with a tubular sheath on the lower third and two other sheaths at the base, papyraceous, light brown. *Leaf* light green, bright, coriaceous, ovate to ovate-lanceolate, acuminate, 3–5 × 2.4–3.5 cm, the base sessile, cordate. *Inflorescence* a fascicle of successive flowers, one flower, rarely with two simultaneous flowers, enclosed at the base by a spathaceous bract ca. 2.8 mm long; peduncle terete, green, 2.0–3.8 mm long; floral bract tubular, papyraceous, acute, 1.5–2.8 mm long. *Pedicel* terete, up to 3.2 mm long. *Ovary* yellow with red tones and some black dots, papillate, pedicellate, cylindrical, longitudinal sulcate, with some black dots, 2.5 mm long. *Sepals* membranaceous, glandular-papillate, margins irregular. *Dorsal sepal* reddish purple, margins slightly yellow, narrowly ovate-lanceolate, rounded, 3.9–4.4 × 1.5–1.9 mm, 3-veined. *Lateral sepals* yellow spotted with reddish-purple, connate into an ovate, acute to bifid synsepal, concave at base, 4.2–4.5 × 2.4–2.7 mm, 4-veined. *Petals* reddish purple, fleshy, linear, slightly glandular-papillose, acute, margins irregular, 2.3–2.6 × 0.3–0.4 mm, 1-veined. *Lip* reddish purple, fleshy, oblong-lanceolate, acute, vesiculose, margin erose, 2.2–2.5 × 1.2–1.4 mm, 3-veined, disc with a small, obovate glenion near the base, the base forming two rounded, pronounced lobes. *Column* reddish purple, short, broad, semiterete, margins irregular, 0.8 × 1.0 mm, with a short foot, thick; stigma apical, bilobed. *Anther cap* yellow, apical, obovate, minutely papillose, 0.6 × 0.4 mm *Pollinia* 2, yellow, obovoid. Capsule not seen.

Eponymy: Named to honor Francia Elena Márquez Mina, Vice-president of the Republic of Colombia (2022–2026), social leader, environmental activist,

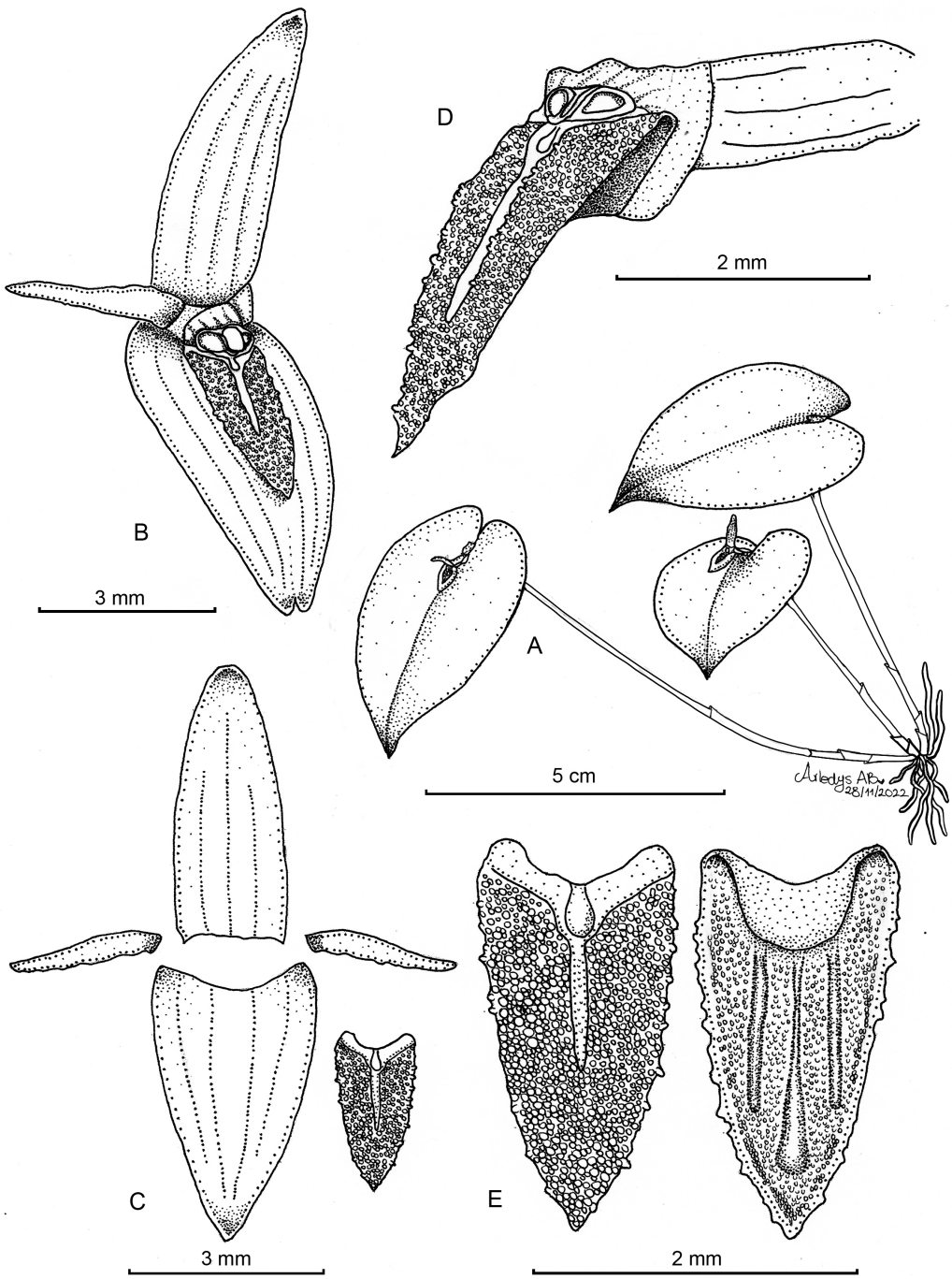

Figure 1. *Pleurothallis franciana* Sierra-Ariza. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Lip and column, ¾ view. **E**. Lip, adaxial and abaxial views. Illustration by A. Albino Bohorquez, based on the plant that served as the holotype.

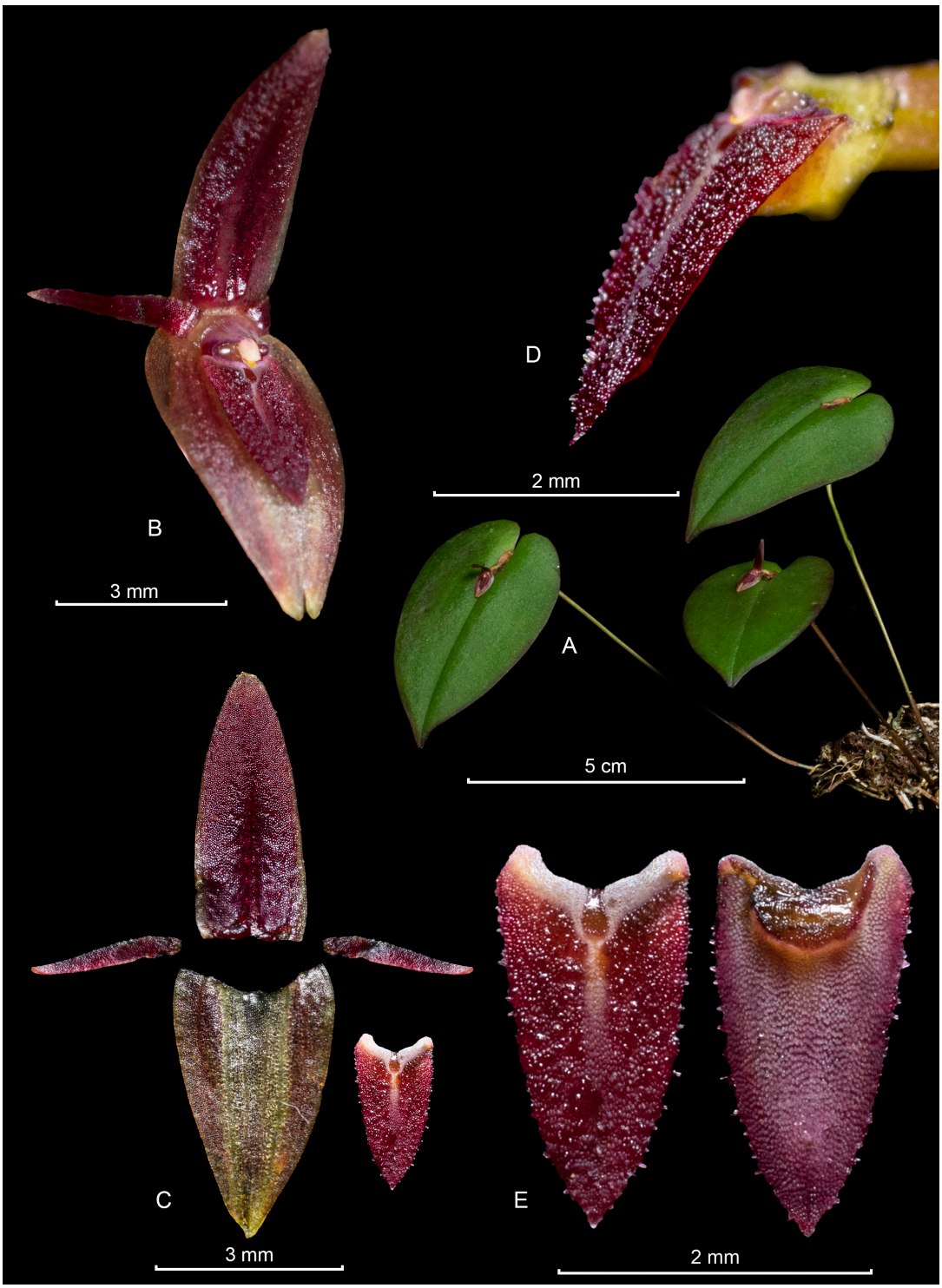

FIGURE 2. *Pleurothallis franciana* Sierra-Ariza. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Lip and column, ¾ view. **E**. Lip, adaxial and abaxial views. LCDP by M. A. Sierra-Ariza, based on the plant that served as the holotype.

and Goldman Prize winner (2018), her work has been of vital importance in the social struggles in Colombia. She carried out activities supporting the conservation of rivers, customs, and the territory of the Afro-Colombian people. She is a tireless fighter against indiscriminate mining.

Distribution and ecology: *Pleurothallis franciana* was discovered in the Central Cordillera of Colombia, in a fragment of wet premontane forest, in the department of Tolima, at 1976 m of elevation.

This species was found on the edge of a public road near the urban center of Ibagué, in a relict of very degraded forest, surrounded by crops and pastures. It grows as an epiphytic on thin branches and among a sparse covering of bryophytes in dark and humid areas. It has been observed flowering in July.

Discussion. *Pleurothallis franciana* belongs to the morphological group "*P. scabrilinguis*" and it has probably the smallest flowers (less than 1 cm long) of the group. The most similar species is *P. ariana-dayanae* but differs from it by having the dorsal sepal narrowly ovate-lanceolate, rounded, 3.9–4.4 ×1.5–1.9 mm (*vs*. lanceolate, acute, 6.5–7.8 × 2.3–2.4 mm); the synsepal ovate, acute to bifid, 2.4–2.0 × 4.2–4.5 mm (*vs*. broadly ovate, acute, 5.8–6.5 × 4.3–4.5 mm); the lip oblong-lanceolate, acute, 2.2–2.5 × 1.2–1.4 mm, vesiculose (*vs*. ovate-elliptic, obtuse, 3.2 × 2.0–2.2 mm, verrucose-papillose) and the glenion obovate (*vs*. slightly bilobed).

This species is also similar to *Pleurothallis scabrilinguis* Lindl., which has larger flowers (1.5 to 2.0 cm long). However, the new species also differs by having the dorsal sepal dorsal narrowly ovate-lanceolate, rounded, 3.9–4.4 ×1.5–1.9 mm (*vs*. elliptic-ovate, subacute to obtuse, 6–10 × 2.5–7.0 mm); the synsepal ovate, acute to bifid, 2.4–2.7 × 4.2–4.5 mm (*vs*. broadly ovate, obtuse, shallowly concave, 5–10 × 4–8 mm); the petals linear, acute, 2.3–2.6 × 0.3–0.4 mm (*vs*. narrowly linear-triangular, acute, 3–7 × 0.50–1.25 mm); the lip oblong-lanceolate, acute, 2.2–2.5 × 1.2–1.4 mm, vesiculose (*vs*. triangular, oblong, subacute or rounded, 3–7 × 2–4 mm, papillose) and the glenion obovate (*vs*. obovate, slightly bilobed).

Another similar species is *Pleurothallis applanata* Luer & Dalström, but the new species differs mainly by having the dorsal sepal narrowly ovate-lanceolate, 3.9–4.4 × 1.5–1.9 mm (*vs*. narrowly elliptical-ovate, 10 × 3.6 mm); the petals linear, 2.3–2.6 × 0.3–0.4 mm (*vs*. narrowly linear-triangular, 6.75 × 1.00 mm); the lip oblong-lanceolate, acute, 2.2–2.5 ×1.2–1.4 mm, vesiculose (*vs*. oblong-ovate, obtuse, 4.5 × 2.2 mm cellular-verrucose) and the glenion obovate (*vs*. orbicular).

Pleurothallis petroana Sierra-Ariza, ***sp. nov.*** (Fig. 3–4).

TYPE: COLOMBIA. Tolima: municipio de Villahermosa, vereda Entrevalles, 3100 m, 25 July 2019, *M. A. Sierra-Ariza & A. Albino Bohorquez 194* (holotype: TOLI).

Diagnosis: *Pleurothallis petroana* is similar to *P. scabrilinguis*, but the new species differs by an oblong-lanceolate dorsal sepal (*vs*. oblong-ovate), an ovate synsepal (*vs*. broadly ovate), linear, acuminate petals (*vs*. narrowly linear-triangular, acute) and a lip ovate-lanceolate, verrucose-papillose, slightly pilose (*vs*. oblong-triangular, subacute or rounded, papillose), with a spathulate glenion (*vs*. obovate, slightly bilobed).

Plant 15 to 26 cm tall, epiphytic, occasionally terrestrial, caespitose, erect to suberect. *Roots* slender, 1.3 mm in diameter. *Ramicauls* yellow-green, 12–24 cm long, with a sheath located at the first basal third and two other sheaths at the base, tubular, broad, papyraceous, brown. *Leaf* light green, bright, coriaceous, minutely papillate, ovate-lanceolate, acuminate, 7–10 × 4.0–5.5 cm, the base sessile, cordate. *Inflorescence* a fascicle of successive single-flowers, rarely with two simultaneous flowers, enclosed at the base by a spathaceous bract ca. 12 mm long; peduncle terete, green, 9–11 mm long; floral bract tubular, papyraceous, acute, 9–11 mm long. *Pedicel* terete, up to 13 mm long. *Ovary* light green, papillate, pedicellate, cylindrical, longitudinal sulcate, covered with black dots, 6 mm long. *Sepals* membranaceous, glandular-papillate, margins irregular. *Dorsal sepal* dark red, margins pale yellow, oblong-lanceolate, acute, 14–16 × 3.0–4.2 mm, 3-veined. *Lateral sepals*, connate into an ovate, acute synsepal, dark red with a central yellow stripe and pale yellow margins, concave at the base, 13.5–15.0 × 8.5–9.2 mm, 4-veined. *Petals* dark red, margins pale

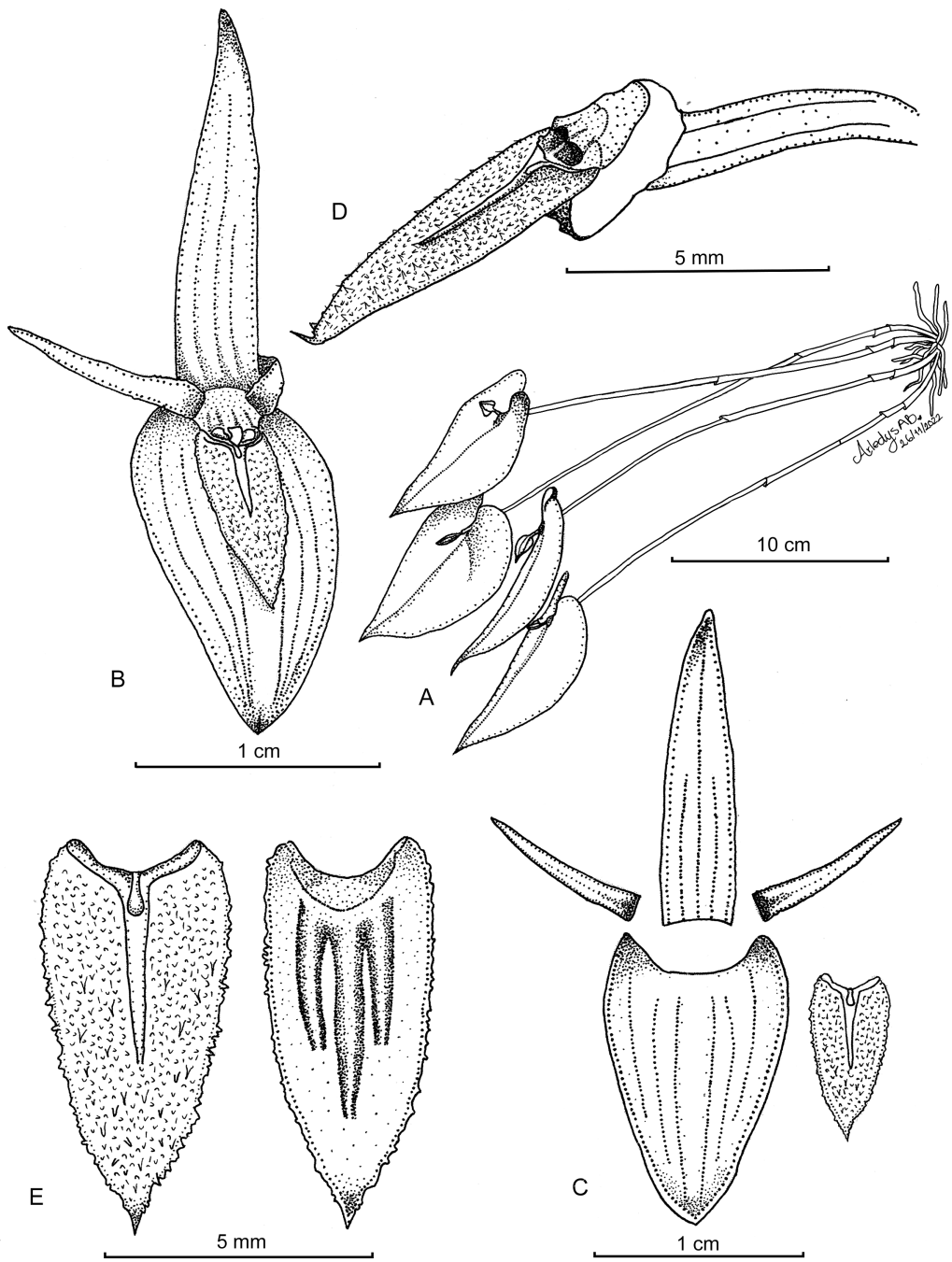

Figure 3. *Pleurothallis petroana* Sierra-Ariza. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Lip and column, ¾ view. **E**. Lip, adaxial and abaxial views. Illustration by A. Albino Bohorquez, based on the plant that served as the holotype.

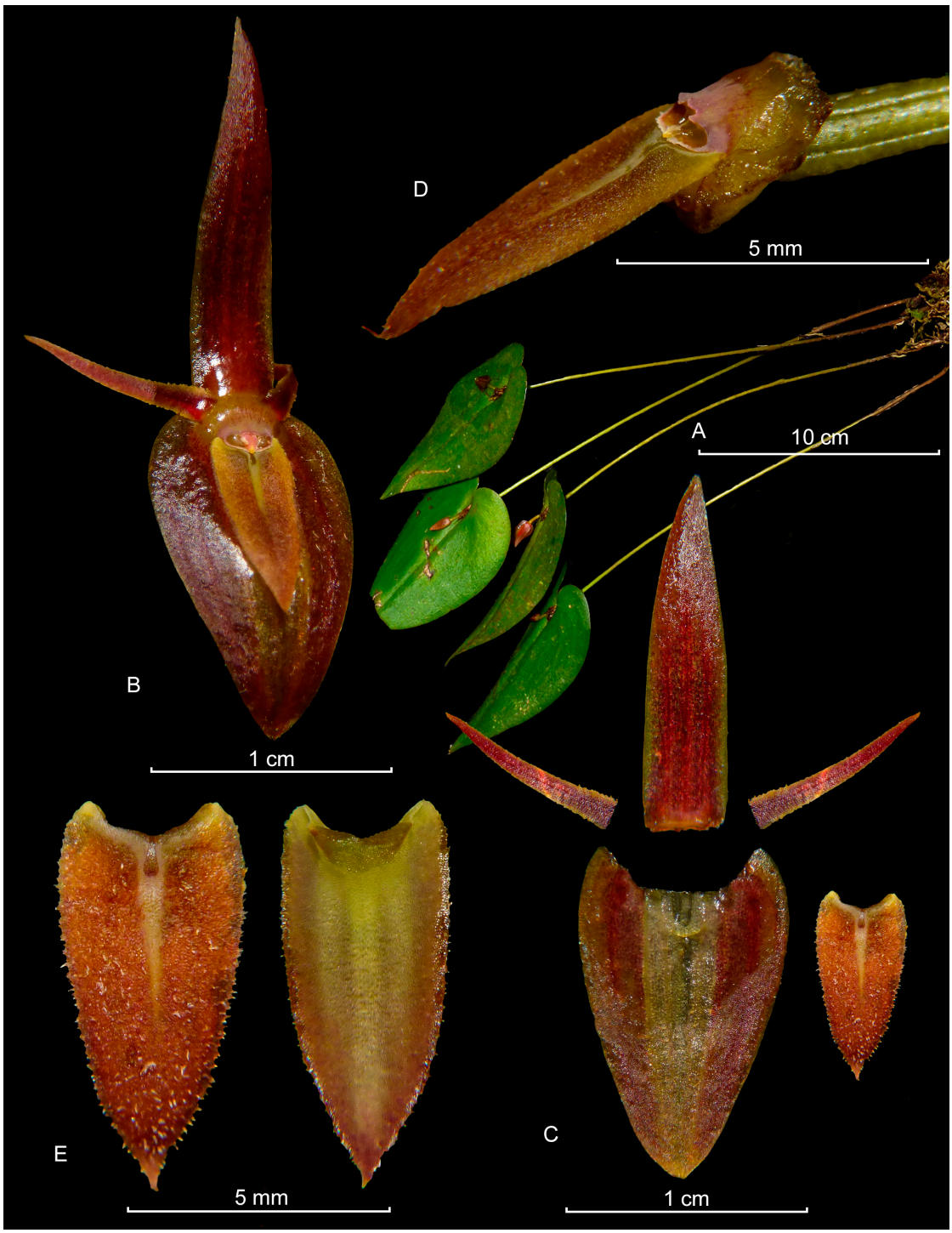

Figure 4. *Pleurothallis petroana* Sierra-Ariza. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Lip and column, ¾ view. **E**. Lip, adaxial and abaxial views. LCDP by M. A. Sierra-Ariza, based on type.

Figure 5. Photographs of the new species *in situ*. **A**. *Pleurothallis franciana*. **B**. *Pleurothallis petroana.* by M. A. Sierra-Ariza.

yellows, fleshy, linear, acuminate, microscopically verrucose-papillose on the dorsal surface, margins irregular, minutely denticulate, 7.8–9.0 × 1.2–1.5 mm, 1-veined. *Lip* yellow-red, fleshy, oblong-lanceolate, acuminate, verrucose-papillose, slightly pilose abaxially, margins irregular, denticulate-ciliate, 7.5–8.6 × 3.4–4.2 mm, 3-veined, the disc with a small, spathulate glenion near the base, the base truncate forming two pronounced lobes, subacute. *Column* light red, short, broad, semiterete, margins irregular, 1.5 × 1.2 mm, with a short, thick; stigma apical, bilobed. *Anther cap* light red, apical, obovate, minutely papillose, 0.6 × 0.5 mm *Pollinia* 2, yellow, obovoid. *Capsule* not seen.

Eponymy: In honor of Gustavo Francisco Petro Urrego, President of the Republic of Colombia (2022–2026), in commemoration of his political career; winner of the Letelier-Moffitt Human Rights Award (2007); tireless supporter of social causes and interest in caring for the environment and mitigating climate change.

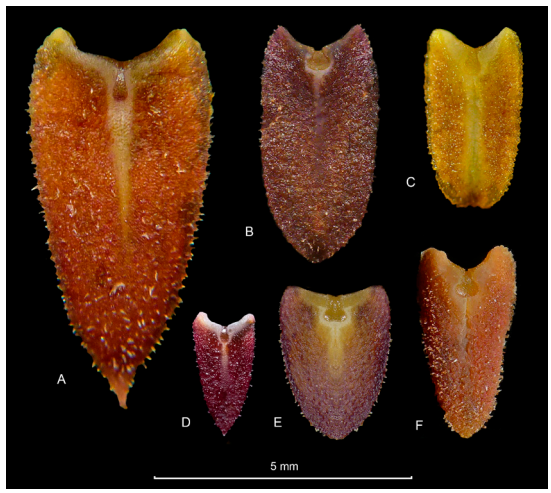

Figure 6. Adaxial view of the lip in morphologically similar species of *Pleurothallis*. **A**. *P. petroana*. **B**. *P.* aff *paquishae*. **C**. *P.* aff. *applanata*. **D**. *P. franciana*. **E**. *P. ariana-dayanae*. **F**. *P. scabrilinguis*. Photographs by M. M. Jiménez (B, C, E, F) and M. A. Sierra-Ariza (A, D). Prepared by M. A. Sierra-Ariza.

Distribution and ecology: *Pleurothallis petroana* was found in a fragment of montane rainforest in the municipality of Villahermosa, Tolima, between 3000 and 3200 m of elevation. It inhabits ecosystems that have been heavily disturbed by the expansion of the agricultural frontier. It grows as epiphytic in small forest fragments, on tree branches among bryophytes and constant shade. It is also a terrestrial on roadside ravines with high solar radiation. It flowered in June and July (Fig. 5).

Discussion. *Pleurothallis petroana* belongs to the "*P. scabrilinguis*" group showing big flowers, up to 3 cm long. It is similar to *P. scabrilinguis*, but it shows larger flowers (*vs*. 1.5 to 2.0 cm long). Also, *Pleurothallis petroana* differs from it by the dorsal sepal oblong-lanceolate, acute, 12–15 × 3.2–4.0 mm (*vs*. elliptic-ovate, subacute to obtuse, 6–10 × 2.5–7.0 mm); the ovate, rounded, synsepal 12.3–14.0 × 8.3–9.0 mm (*vs*. broadly ovate, obtuse, shallowly concave, 5–10 × 4–8 mm); the petals linear, acuminate, 7.2–8.3 × 1.2–1.4 mm (*vs*. narrowly linear-triangular, acute, 3–7 × 0.50–1.25 mm); the lip oblong-lanceolate, acuminate, 7.5–8.2 × 3.0–3.4 mm, verrucose-papillose, slightly pilose (*vs*. triangular, oblong, subacute or rounded, 3–7 × 2–4 mm, papillose) and the spathulate glenion (*vs*. obovate, slightly bilobed).

Figure 7. Flower morphology of similar species of *Pleurothallis*. **A**. *P.* aff. *applanata*. **B**. *P. ariana-dayanae.* **C**. *P. franciana.* **D**. *P.* aff. *paquishae.* **E**. *P. petroana.* **F**. *P. scabrilinguis*. Photographs by M. M. Jiménez (A, D, F), L. Vélez-Abarca (B), and M. A. Sierra-Ariza (C, E). Prepared by M. A. Sierra-Ariza.

This species is also similar to *Pleurothallis paquishae* Luer, but it differs in the oblong-lanceolate dorsal sepal, 12–15 × 3.2–4.0 mm (*vs*. narrowly elliptic, 9.5–3.3 mm); the synsepal elliptical, acute to acuminate, 13 × 6 mm (*vs*. ovate acute, 9.4 × 5.6 mm); the petals linear, acuminate, 7.2–8.3 × 1.2–1.4 mm (*vs*. narrowly linear-oblong, acute, 9 × 0.8 mm); the lip oblong-lanceolate, acuminate, 7.5–8.2 × 3.0–3.4 mm, verrucose-papillose, slightly pilose (*vs*. oblong, acute, 6.2 × 2.7 mm, verrucose-spiculated) and the glenion spathulate (*vs*. oblong, slightly bilobed).

Another similar species is *P. applanata*, but *P. petroana* differs by the dorsal sepal oblong-lanceolate, acute, 12–15 × 3.2–4.0 mm (*vs*. narrowly elliptical-ovate, 10.0 × 3.6 mm); the petals linear, acuminate, 7.2–8.3 × 1.2–1.4 mm (*vs*. narrowly linear-triangular, 6.75 × 1.00 mm); the lip oblong-lanceolate, acuminate, 7.5–8.2 × 3.0–3.4 mm, verrucose-papillose, slightly pilose (*vs*. oblong-ovate, obtuse, 4.5 × 2.2 mm cellular-verrucose) and the spathulate glenion (*vs*. orbicular) (Fig. 6–7).

Acknowledgements. I thank Arledys Albino Bohórquez for participating in the field trips where the new species were discovered and for the illustrations. I also thank Mark Wilson and Patricia Harding for their support in writing this manuscript, Leisberth Vélez-Abarca and Marco M. Jiménez for the loan of the photographs used in the comparison figure, and to the staff of TOLI herbarium, Dendrology section of the University of Tolima, for allowing to deposit the type specimens in their collection under the collection permit 2191 of 2018 by the Autoridad Nacional de Licencias Ambientales (ANLA).

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