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A NEW SPECIES OF *LEPANTHES* (PLEUROTHALLIDINAE) FROM THE NORTH OF THE CENTRAL ANDES OF COLOMBIA

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Abstract. A new *Lepanthes* species from the northern end of the Central Andes of Colombia is described, illustrated, and compared with morphologically similar species. *Lepanthes wakemaniae* is most similar to *L. caesariata* but is easily distinguished by its petals with oblong to ovate upper lobes and triangular lower lobes; semi-ovate lip blades, with their inner margins touching above the column; the appendix ligulate and pubescent, and a column with an expanded, orbicular stigma.

Resumen. Una nueva especie de *Lepanthes* del extremo norte de los Andes Centrales de Colombia se describe, ilustra y compara con especies morfológicamente similares. *Lepanthes wakemaniae* es más similar a *L. caesariata* pero se distingue fácilmente por sus pétalos con los lóbulos superiores oblongos a ovados y los lóbulos inferiores triangulares; las láminas del labelo semi-ovadas, con las márgenes internas tocándose por encima de la columna; el apéndice ligulado y pubescente, y una columna con un estigma orbicular y expandido.

Keywords / Palabras clave: Alto de Ventanas, Antioquia, conservation, conservación, *Lepanthes caesariata*, *Lepanthes wakemaniae,* Yarumal

Introduction. The genus *Lepanthes* Sw. is a neotropical genus in the Pleurothallidinae with approximately 1160 accepted species (Restrepo *et al*. 2022), it comprises more than 300 species described in Colombia (Luer & Thoerle 2012), and during the last decade, several new species have been described from different areas and ecoregions in this country (Gutiérrez *et al*. 2021, Moreno *et al*. 2017, 2018, 2020a, 2020b, Restrepo *et al*. 2022, Vieira & Larsen 2014a, 2014b, Vieira & Moreno 2018, 2019, 2020, Vieira-Uribe *et al*. 2021). One of these ecoregions is the Alto de Ventanas, located at the northern end of the central Andes of Colombia, where several *Lepanthes* species have been discovered and described (Vieira & Moreno 2019).

In recent studies of biogeographic regions and diversification of flora and fauna in the Andes (Hazzi *et al*. 2018, Pérez-Escobar *et al*. 2022), the northern Andes in the Central Cordillera are found to have more relation in terms of biodiversity with the Western Cordillera rather than the Central Cordillera which means that probably bioregions like the Pacific, The Chocó and the Western Andes could have a strong influence in this area. These findings could be supported with some events of isolation caused by rivers and others biogeographic boundaries that could drive events of vicariance and dispersal. Also, some of the species that have been found in the Alto de Ventanas have a strong correlation with the Eastern Cordillera, suggesting that environmental factors from several areas may converge into a big biodiverse hotspot.

The idea of a hotspot in the northern Andes could be supported with the high endemism and the description of new plant species like *Columnea antennifera* J.L.Clark & Clavijo (Gesneriaceae) (Clark & Clavijo 2012), *Cyathea toroi* Lehnert, F.Giraldo & A.Tejedor (Cyatheaceae) (Lehnert *et al*. 2019), *Dicksonia lehnertiana* Noben, F.Giraldo, W.D.Rodr. & A.Tejedor (Dicksoniaceae) (Noben *et al*. 2018), *Schefflera brevirama* Jiménez-Mont. & Idarraga (Araliaceae) (Jiménez-Montoya & Idárraga-Piedrahíta 2018), and *Lepanthes gloriae* S.Vieira-Uribe & J.S.Moreno (Orchidaceae) (Vieira & Moreno 2021), and frogs like *Pristimantis carylae* Rivera-Correa, González-Durán, Saldarriaga-Gómez, and Duarte-Marín, and *P. choco-*

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latebari Rivera-Correa, González-Durán, Saldarriaga-Gómez, and Duarte-Marín (Rivera-Corre *et al*. 2021). The area probably could be considered in the future as a new bioregion, compared with the three cordilleras and even, with the Sierra Nevada de Santa Marta.

Corporación Salvamontes is a Colombian NGO dedicated to conserving threatened species and their habitat in the Alto de Ventanas, currently owning three nature preserves where 1300 acres of land are protected. Some of their land acquisitions were funded by auctioning the names of new species, like the three *Lepanthes* species described in 2019: *Lepanthes cissyana* S.Vieira-Uribe & J.S.Moreno, *L. dougdarlingii* S.Vieira-Uribe & J.S.Moreno and *L. sabinadaleyana* J.S.Moreno & S.Vieira-Uribe (Vieira & Moreno 2019), an excellent example of what is possible with the cohesion of conservation and taxonomy and the benefits that this can bring for the biodiversity in Colombia. Here, we describe another new species of *Lepanthes* discovered recently in the Los Magnolios Natural Reserve during explorations and documentation of its orchid flora. We name it to the memory of the mother of a generous donor who partially funded the expansion of the protected area where the new species can be found.

Materials and methods. The type specimen was collected in Colombia while conducting research in Los Magnolios Natural Reserve to improve knowledge of its orchid flora, and as part of the ongoing research on the orchids of Antioquia, under permit Resolución No. 01711. Vouchers were preserved as dried or spirit specimens for future reference at JAUM.

Living and preserved specimens were examined for morphological and taxonomic comparisons. In addition, the monograph of *Lepanthes* from Colombia (Luer & Thoerle 2012), other original descriptions from related species were reviewed, and compared, specimens from the following herbaria: AMES, COL, CUVC, FMB, HUA, ICESI, JAUM, JBB, TOLI, and MO (online) were consulted, and no additional material of the new species was found.

The description and drawings were prepared from living specimens dissected under a Barska AY11234 trinocular stereo microscope. Digital images were taken with a Canon 7d Mark II with a Canon 100 mm f/2.8L macro lens. Sketches from living and preserved specimens were digitized, and the images were used for diagramming a draft composite plate in Adobe Photoshop® 2020. In addition, a digital composite line drawing was made in the Procreate illustration application with an iPad 8th generation tablet. The Botanical terminology used in the manuscript was consulted in Beentje (2012) and Stearn (1992).

Taxonomic treatment

Lepanthes wakemaniae S.Vieira-Uribe & J.S.Moreno, ***sp. nov.*** (Fig. 1–2).

TYPE: Colombia. Antioquia: Municipio de Yarumal, vereda Corcovado, Reserva Natural Los Magnolios, 1540 m, 8 Nov 2021, *S.Vieira 027 & L.F. Pérez* (holotype: JAUM-Spirit; isotype: HUA-Spirit).

Diagnosis: *Lepanthes wakemaniae* is most similar to *L. caesariata* Luer & R.Escobar but is easily distinguished from the latter by having petals with oblong to ovate upper lobes and triangular lower lobes (*vs*. oblong and oblique lobes) that are microscopically pubescent (*vs*. densely long pubescent, ciliate); semi-ovate lip blades (*vs*. oblong sub-truncate) longer than the lower lobes of the petals (*vs*. of similar length), with their inner margins touching above the column (*vs*. adherent above the column), the appendix ligulate and pubescent with the pubescence longer at the apex toward the sides (*vs*. oblong, short and pubescent appendix) and an expanded, orbicular stigma (*vs*. bilobed stigma).

Plant medium in size for the genus, epiphytic, caespitose, 10–14 cm tall. *Roots* slender, flexuous, filiform, 0.5–0.7 mm in diameter. *Ramicauls* slender, suberect to horizontal, 2.4–7.6 cm long, enclosed by 5–9 acuminate, ribbed, ciliate along the ribs lepanthiform sheaths, with ciliate dilated margins. *Leaves* occasionally suffused with purple along the veins on the adaxial surface, abaxially speckled with purple and suffused with purple along the veins, more or less horizontal, coriaceous, acrodromous and reticulate-veined, ovate to lanceolate, the apex attenuate, 4.6–6.2 × 1.9–2.0, the rounded base contracted into a *ca*. 1.5 mm long petiole. *Inflorescence* a congested, distichous raceme successively many-flowered, up to ¾ the length of the leaf, 4.1 cm long including the peduncle, held ap-

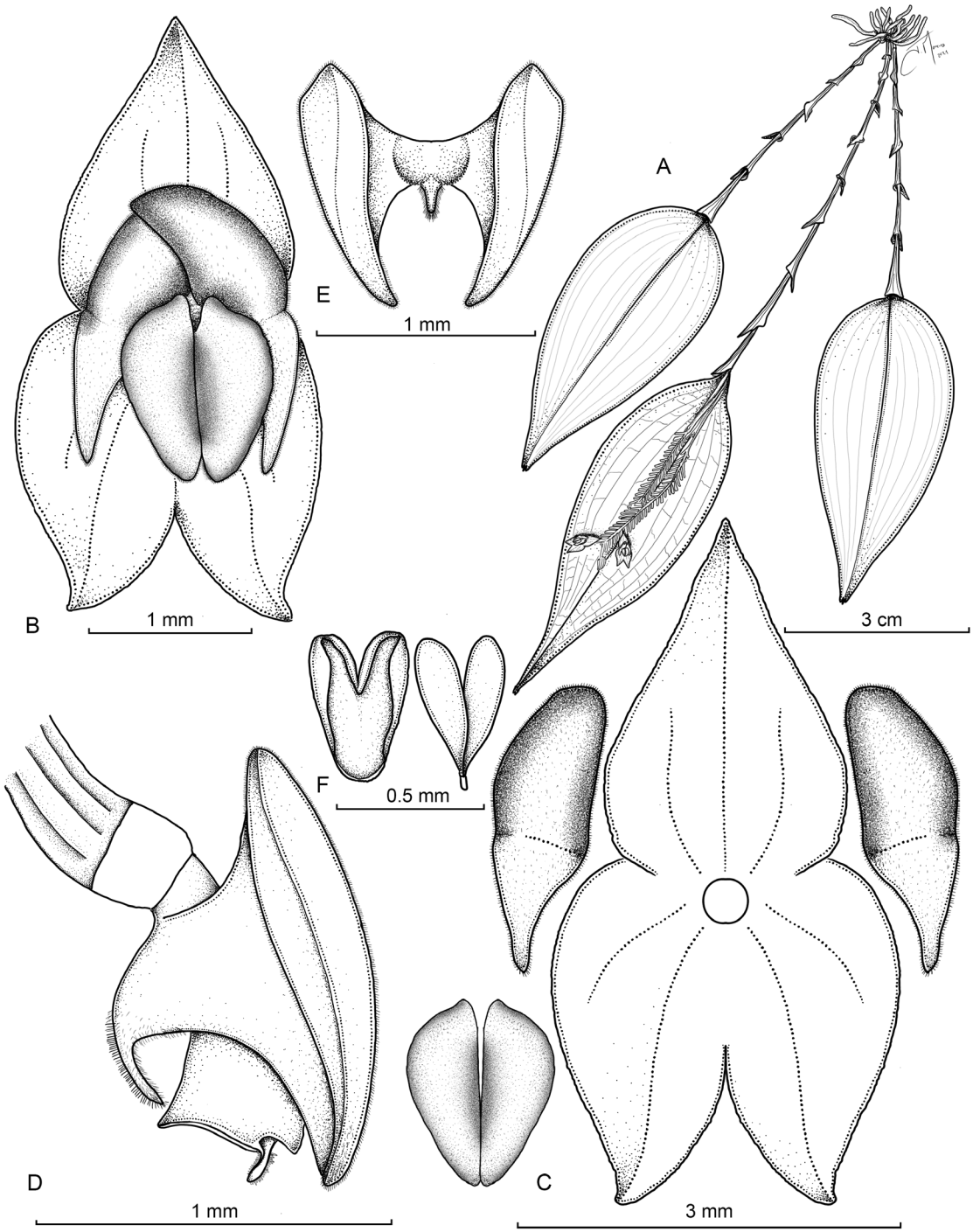

FIGURE 1. Illustration of *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno. **A**. Habit, as seen from below. **B**. Flower. **C**. Dissected perianth. **D**. Ovary, column and lip, side view. **E**. Lip expanded. **F**. Anther cap and pollinia. Drawn by J. S. Moreno from *S.Vieira 027 & L.F. Pérez*.

FIGURE 2. *In-situ* photos of *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno. **A**. Flower, ¾ view. **B**. Abaxial view of a leaf with three open flowers. **C**. Habit. Photographed by S. Vieira-Uribe from *S.Vieira 027 & L.F. Pérez*.

pressed to the abaxial surface of the leaf by a filiform, terete peduncle up to 2.0 cm long borne near the apex of the ramicaul; *floral bracts* conical, acuminate, ciliate, up to 1.5 mm long; *pedicels* terete, up to 1.9 mm long. *Ovary* terete, costate, *ca*. 1.9 mm long. *Flowers* sepals translucent cream; petals dull yellow-brown, the upper lobe with deep purple-red external margins and magenta inner margins; the lip with the body magenta, the connectives and blades tawny tinted with magenta in the apex, the appendix cream; the column cream suffused with magenta. *Dorsal sepal* ovate, with repand margins, acute, 3-veined, 2.8 × 1.9 mm, connate at the base to the lateral sepals for *ca*. 0.7 mm. *Lateral sepals* ovate, oblique, with repand margins, the apex attenuate and oblique, pointing away from the flower axis, 2-veined, 2.5 × 1.4 mm, connate at the base for *ca*. 0.9 mm. *Petals* transversally bilobed, microscopically pubescent, slightly convex, 0.8 × 2.2–2.3 mm, 1 veined; the upper lobes imbricate, oblong to ovate, the inner margin straight, rounded to sub-truncate, 1.2–1.3 × 0.8 mm; the lower lobes triangular, oblique, obtuse, 0.9–1.0 × 0.7 mm. *Lip* bilaminate, microscopically pubescent, the blades semi-ovate, the base subacute, the apex obtuse, the inner margins touching above the column, 1.4 × 0.5 mm, supported by cuneate connectives from near the middle, the body elliptic, adnate to the base of the column, the sinus rounded, with a ligulate, pubescent appendix, the pubescence longer at the apex toward the sides. *Column* conical, terete, microscopically pubescent, arcuate, *ca*. 1.3 mm long, the anther dorsal, the stigma expanded, orbicular, ventral, the rostellum minutely fimbriate. *Anther cap* white suffused

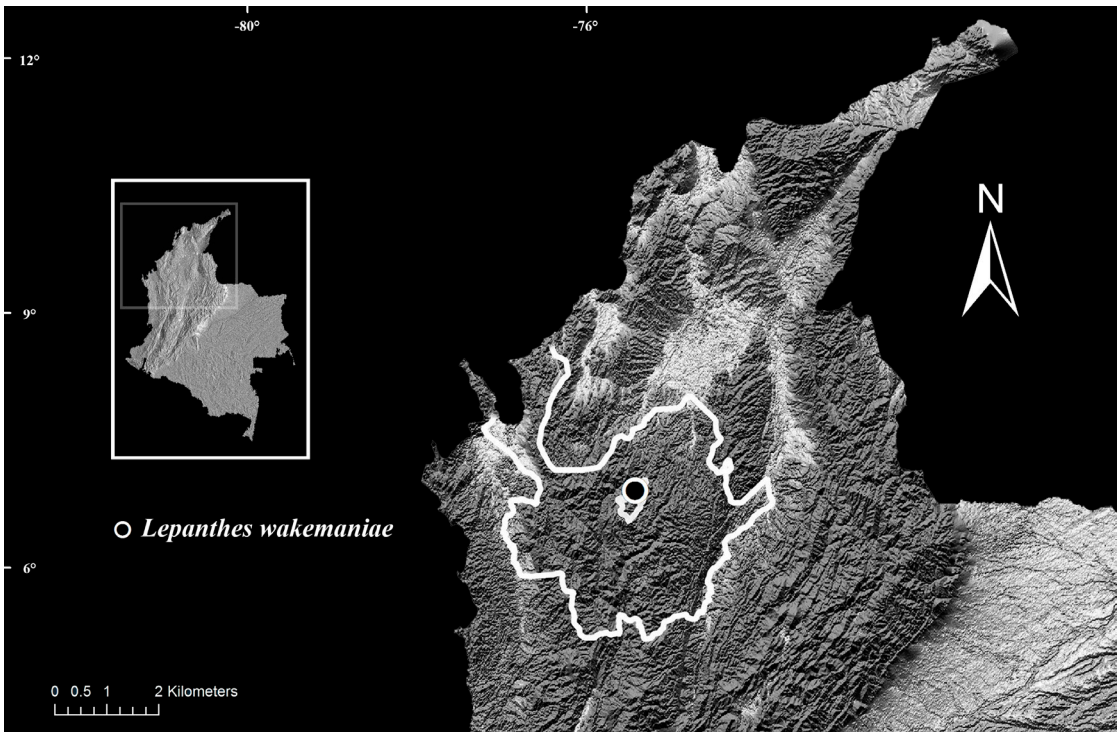

FIGURE 3. Map showing the locality where *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno was found. Prepared by J. S. Moreno.

with magenta and tawny, narrowly cordate, cucullate, smaller than the clinandrium cavity, 0.5 mm long. *Pollinia* 2, yellow, narrowly obovoid, 0.45 mm long, attached to a drop like viscidium.

EPONYMY: The name of the new species memorializes Elizabeth "Betty" Wakeman (Eshbaugh) Henderson from the USA, who lived from 1916 to 1997, an ardent lover of the natural world and everything botanical.

HABITAT AND ECOLOGY: The new species has been found only at a single locality inside Los Magnolios Natural Reserve, a privately owned nature preserve in Alto de Ventanas, Yarumal. A highly biodiverse spot located at the northern end of the Central Andes of Colombia (Fig. 3). There, *Lepanthes wakemaniae* grows as an epiphyte in moss-covered twigs and trunks near the border of a well preserved and orchid-rich mature forest along a river (Fig. 4). It grows together with several other orchid species, such as *Dracula chimaera* (Rchb.f.) Luer, *Houlletia lowiana* Rchb.f., *Lepanthes agglutinata* Luer, the recently described *L. gloriae*, *L. golondrina* Luer & R.Escobar, and *Phragmipedium schlimii* (Rchb.f.) Rolfe.

CONSERVATION STATUS: *Lepanthes wakemaniae* is known only from its type locality, located inside a privately owned nature preserve. The proposed IUCN categorization is data deficient (DD) because adequate population and distribution information to assess the species is unavailable.

Discussion. *Lepanthes wakemaniae* (Fig. 1, 2, 5A) can be uniquely recognized from all other species of the genus by the following combination of characters: medium sized plants with leaves ovate to lanceolate, acrodromous and reticulate-veined, the veins tinted with purple abaxially, sometimes also adaxially; the flowers resting on the abaxial surface of the leave with microscopically pubescent petals and lip; the petals transversally bilobed with the upper lobes imbricate, oblong to ovate, slightly longer than the oblique, triangular lower lobes and a bilaminate lip with semi-ovate blades longer that the lower lobes of the petals, with

FIGURE 4. Habitat of *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno. Photographed by L. F. Pérez at the type locality.

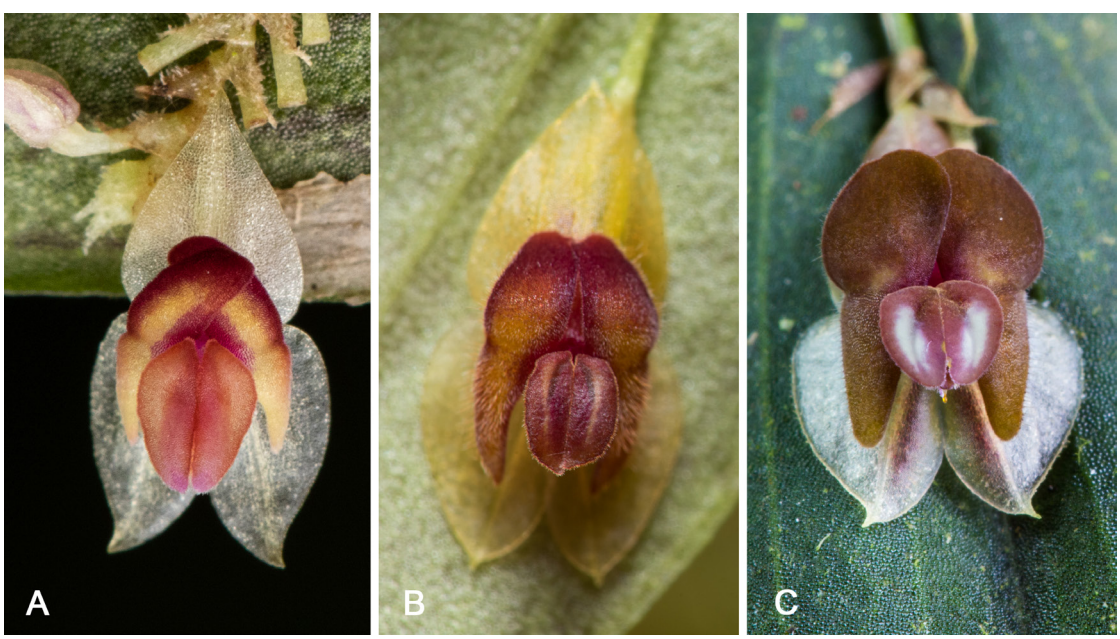

FIGURE 5. Comparative plate showing photos of the species most similar to *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno. **A**. *Lepanthes wakemaniae*. **B**. *Lepanthes caesariata*. **C**. *Lepanthes hymenoptera*. Photgraphed by S. Vieira-Uribe.

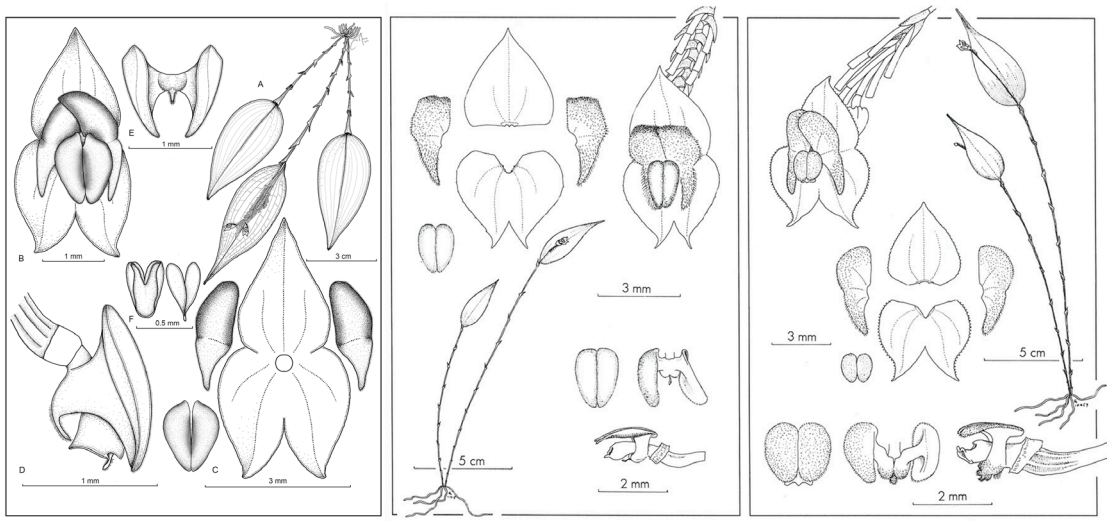

FIGURE 6. Comparative plate showing drawings of other species similar to *Lepanthes wakemaniae* S.Vieira-Uribe & J.S.Moreno. **A**. *Lepanthes wakemaniae*. **B**. *Lepanthes reventador*. **C**. *Lepanthes tectorum*. Prepared by S. Vieira-Uribe. Drawing A by J. S. Moreno from *S.Vieira 027 & L.F. Pérez*, drawings B and C, Courtesy of Missouri Botanical Garden.

the inner margins touching above the column but not adherent, and the lip appendix ligulate, pubescent, with the pubescence longer at the apex toward the sides.

It is most similar in plant and flower to the Colombian species *Lepanthes caesariata* (Fig. 5B), both with medium sized plants, a congested, distichous inflorescence borne resting on the abaxial surface of the leaf, light colored and fully spread sepals, transversely bilobed and pubescent petals with purple-red margins and upper lobes overlapping and slightly larger than the lower lobes, and a bilaminate lip with thin, microscopically pubescent blades with their inner margins touching above the column, but *L. wakemaniae* is easily distinguished by having petals with the upper lobes oblong to ovate and the lower lobes triangular (*vs*. oblong and oblique) that are microscopically pubescent (*vs*. densely long pubescent, ciliate); a lip with semi-ovate blades (*vs*. oblong subtruncate) with their inner margins touching above the column (*vs*. adherent above the column) and the appendix ligulate and pubescent with the pubescence longer at the apex toward the sides (*vs*. oblong, short and pubescent).

The new species is also florally similar to the three Ecuadorean species *L. hymenoptera* Luer (Fig. 5C), *L. reventador* Luer & Hirtz (Fig. 6B), and *L. tectorum* Luer & Hirtz. (Fig. 6C), sharing with them fully spread ovate sepals, pubescent petals with the upper lobes oblong and overlapping and the lower lobes triangular, and a bilaminate lip with the inner margins of the flat blades touching above the column.

Lepanthes wakemaniae can be distinguished from *L. hymenoptera* and *L. reventador* by producing the inflorescence on the abaxial surface of the leaves (*vs*. on the adaxial surface), the petals microscopically pubescent (*vs*. short pubescent, *L. reventador* with long pubescent lower lobes), with the upper lobe oblong to ovate with the apex rounded to sub-truncate (*vs*. oblong, truncate), the lip blades barely touching above the column (*vs*. adherent medially) and the appendix ligulate (*vs*. ovoid in *L. hymenoptera* and filiform in *L. reventador*).

Lepanthes tectorum also produces its inflorescence on the abaxial surface of the leaf, but it can be easily separated from *L. wakemaniae* by the lip blades broadly ovate (*vs*. semi-ovate) that are adherent medially above the column (*vs*. barely touching above the column) and a pubescent, longitudinally tripartite appendix (*vs*. ligulate appendix).

A summary of differences between *Lepanthes wakemaniae* and already mentioned similar species is found in Table 1.

TABLE 1. Summary of the main differences between *Lepanthes wakemaniae* and morphologically similar species.

Trait	*L. caesariata*	*L. hymenoptera*	*L. reventador*	*L. tectorum*	*L. wakemaniae*
Lip blades	Oblong with subtruncate ends, adherent medially.	Minutely erose, oblong with the ends obtuse, adherent medially.	Ovate with rounded ends, adherent medially.	Broadly ovate with rounded ends, adherent medially.	Semi-ovate, barely touching above the column.
Lip connectives	Oblong, supporting the blades from the basal third.	Oblong, supporting the blades from the middle.	Narrowly oblong, supporting the blades from the basal third.	Narrowly oblong, supporting the blades from near the middle.	Cuneate, supporting the blades from the near the middle.
Lip appendix	Short, oblong, pubescent.	Ovoid, bilobulate, pubescent.	Filiform, ciliate on the underside.	Pubescent, longitudinally tripartite.	Ligulate, pubescent, the pubescence longer at the apex toward the sides.
Petals (pubescence)	Densely long pubescent-ciliate.	Shortly pubescent.	Upper lobe short pubescent, lower lobe long pubescent.	Microscopically pubescent.	Microscopically pubescent.
Petals (upper lobe)	Oblong, oblique, imbricate, apex obtuse.	Oblong, truncate, imbricate.	Oblong, truncate.	Oblong, oblique, obtuse.	Oblong to ovate, imbricate, the inner margin straight, apex rounded to sub-truncate.
Petals (lower lobe)	Oblong, oblique, apex obtuse.	Triangular, obtuse.	Triangular.	Oblong-triangular, obtuse.	Triangular, oblique, apex obtuse.

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