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PLEUROTHALLIS COP-BIODIVERSITATIS (PLEUROTHALLIDINAE), A NEW SPECIES FROM COLOMBIA

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Abstract. A new species, *Pleurothallis cop-biodiversitatis*, belonging to *Pleurothallis* subsection *Macrophyllae-Fasciculatae*, from the Central Andes of Colombia, is described and illustrated. This new species is compared with *Pleurothallis matudana* and *Pleurothallis tandapiensis*, the most morphologically similar species. *Pleurothallis cop-biodiversitatis* primarily differs from these species in having a lip with erose margins, more pronounced basal lobes, a rounded, apiculate apex, and a sulcate blade with a lanceolate, strongly vesiculate concavity.

Resumen. Una nueva especie, *Pleurothallis cop-biodiversitatis*, perteneciente a la subsección *Macrophyllae-Fasciculatae* de *Pleurothallis*, de los Andes Centrales de Colombia, es descrita e ilustrada. Esta nueva especie se compara con *Pleurothallis matudana* y *Pleurothallis tandapiensis*, que son las especies morfológicamente más similares. *Pleurothallis cop-biodiversitatis* se diferencia principalmente de estas especies por tener un labelo con márgenes erosos, lóbulos basales más pronunciados, un ápice redondeado y apiculado, y una lámina sulcada con una concavidad lanceolada y fuertemente vesiculada.

Keywords / Palabras clave: Andean orchids, COP16, Epidendreae, *Macrophyllae-Fasciculatae*, orquídeas andinas, *Pleurothallis matudana*, *Pleurothallis tandapiensis*, Tolima

Introduction. *Pleurothallis* R.Br. (Brown, 1813) is notable for its remarkable diversity, being the fourth-largest genus in species richness within the subtribe Pleurothallidinae, with more than 528 recognized species (Karremans, 2016; Karremans & Vieira-Uribe, 2020; Sierra-Ariza, 2023). Despite its more refined circumscription (Pridgeon, 2005), the genus' high species diversity and morphological similarity have led to complexes that complicate species delimitation. The monographs on *Pleurothallis* (Luer, 1989, 1998, 1999, 2005) have significantly increased the number of recognized species in recent decades (Karremans & Davin, 2017). However, these works often treated morphological complexes as taxonomic units with consistent morphology and broad geographical ranges, underscoring the need to further clarify species boundaries within the genus (Wilson *et al*., 2017).

Pleurothallis is widely distributed from Mexico to South America, including the Caribbean islands. Colombia is one of the countries with the highest number of species, with 247 recorded (Bernal *et al.*, 2016, Karremans *et al.*, 2023, Ministerio de Ambiente y Desarrollo Sostenible y Universidad Nacional de Colombia, 2015). The genus is generally characterized by epiphytic plants, which are cespitose to creeping, with erect stems—rarely pendant—and sometimes leathery leaves. The inflorescences mostly have an abbreviated peduncle, with single or multi-flowered clusters, either simultaneous or successive, bearing resupinate or non-resupinate flowers (Pridgeon, 2005; Rojas-Alvarado & Karremans, 2024).

The species of the *Macrophyllae-Fasciculatae* subsection are morphologically distinguished by having leaves with rounded or cordate bases, solitary flowers in fascicles, lateral sepals connate into a synsepal similar to the dorsal sepal, a bilobed stigma, and a lip reclined over the synsepal or slightly elevated above it (Lindley, 1859; Luer, 2005; Sierra-Ariza *et al*., 2022; Wilson *et al*., 2018). This subsection is one of the most diverse within the genus and has significantly increased in species numbers in recent decades. Luer (2005) recognized 213 species, and Wilson *et al.* (2018) mentioned between 239 and 309 species depending on the taxonomic treatment.

Here, a new species of the genus *Pleurothallis,* subsection *Macrophyllae-Fasciculatae*, is described and illustrated. It is morphologically similar to *Pleurothallis matudana* C.Schweinf. and *P. tandapiensis*

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(Luer & Hirtz) J.M.H.Shaw. This species was found in a fragment of a highly humid premontane cloud forest in the department of Tolima, Colombia.

Materials and methods. The new species was discovered during an expedition conducted in April 2022 in the municipality of Cajamarca, Tolima, Colombia. During this expedition, a single population of this species was found in its natural habitat. Specimens were photographed in detail to record their morphological characteristics, using a D5300 camera equipped with a NIKKOR AF 105mm f/2.8 D Micro lens. Specimens were stored in a newspaper soaked in 75% ethanol, and floral structures were preserved in 50% glycerol (a mixture of glycerin and 70% alcohol). The collected material was dried in an electric oven at 75°C for 14 hours and deposited into the TOLI Herbarium collection. Floral structures were examined using a Motic Series SMZ 168 LED stereoscope.

To confirm the identity of the new species, the specialized literature on the genus was consulted, including monographs on the systematics of *Pleurothallis*, subsection *Macrophyllae-Fasciculatae* (Luer, 1988, 2005; Wilson *et al*. 2011, 2018; Pupulin *et al.*, 2021, Sierra-Ariza, 2023; Sierra-Ariza *et al*., 2022). Additionally, specimens were examined online at the AMES (www.huh.harvard.edu) and KEW (apps.kew.org/herbcat/gotoHomePage.do) herbaria, as well as at the national herbaria TOLI, HPUJ, JBB, and COL (www.biovirtual.unal.edu.co/es/colecciones/búsqueda/plantas/). A Lankester Composite Digital Plate (LCDP) was created using Adobe Photoshop® 2024 (25.3.1), and illustrations were made using the Procreate illustration app on a seventh-generation Apple iPad.

Taxonomic treatment

Pleurothallis cop-biodiversitatis Sierra-Ariza ***sp. nov.*** (Fig. 1).

TYPE: COLOMBIA. Tolima: Municipio de Cajamarca, vereda Bolívar, 2690 m, 13 April 2022, *M. A. Sierra-Ariza & J.C. Pavas 429* (holotype: TOLI).

Diagnosis: Species similar to *Pleurothallis matudana* C.Schweinf., but distinguished by the lip with erose margins, more pronounced basal lobes, rounded apex, and longitudinally sulcate with a lanceolate, strongly vesiculose basal concavity.

Plant 9–28 cm tall, erect, epiphytic, caespitose. *Roots* white, slender, flexuous, 0.8–1.2 mm in diameter. *Ramicauls* green, slender, 8.5–27.5 cm long, with two sheaths at the base, papyraceous, light brown. *Leaf* light green, lustrous, coriaceous, ovate to ovate-lanceolate, acuminate, 8–12 × 4–5.5 cm, the base sessile, cordate, deeply 2-lobed, with slightly imbricate lobes. , Q À R U H V F H Q F H with a reduced peduncle, enclosed by a broad, reclining, 1.2 cm long spathe, producing single-flowered; F R À R U H V F H Q *es* more than 5 at a time; *pseudopeduncle* terete, green, 7–9 mm long; À R U D O tubular, papyraceous, acute, 6–8 mm long. *Ovary* light green with minute black dots, glandular-papillate, cylindrical, longitudinal sulcate, 3.6 mm long, *pedicel* terete, up to 7.5 mm long. *Flowers* resupinate. *Sepals* membranaceous, glandular-papillate on the adaxial surface, margins minutely erose. *Dorsal sepal* yellow with some red hues, broadly ovate, acute, concave, 6.9–7.3 × 3–3.4 mm, 3-veined. *Lateral sepals* yellow, connate into an ovate, rounded, concaves synsepal, 6.0–6.4 × 4.8–5.2 mm, 6-veined. *Petals* yellowish red, linear, slightly glandular-papillose, microscopically denticulate, acute, 3.8–4.2 × 0.5–0.8 mm, 1-veined. *Lip* yellow with white hues due to its texture, oblong-ovate, somewhat curved, papillose, with a subcordate base forming two rounded, prominent defined lobes, slightly concave in the base, margins strongly erose, 3.8–4.2 × 2–2.4 mm; the basal sulcus of the lip forms a lanceolate concavity, which is strongly vesiculated and occupies ¾ of the basal length of the lip, surrounding the glenion; glenion rounded to sub-hexagonal cavity and slightly emarginate at the apex, 0.6 × 0.5 mm. *Column* white with yellow hues, stout, 1.8 ×1.4 mm, the foot thick; stigma apical, bilobed. *Anther cap* red, apical, obovate, minutely papillose, 0.4 × 0.5 mm. *Pollinia* 2, yellow, obovoid. *Capsule* not seen.

Etymology: In commemoration of COP 16, held in Cali, Colombia, in 2024, where the importance and status of biological diversity conservation, the adoption of new environmental policies, habitat conservation, climate change mitigation, and international cooperation for nature protection were discussed. The name also honors the nations and people who participated in this significant conference. The specific epithet is derived from the abbreviation COP (Conference of the Parties) and the Latin genitive *biodiversitatis*, which translates to 'of biodiversity,' reflecting the main theme of the event.

Figure 1. *Pleurothallis cop-biodiversitatis* Sierra-Ariza. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Lip and column lateral view. **E**. Lip. LCDP by Sierra-Ariza based on type.

Phenology: The species has been observed blooming in its natural habitat during April and September.

Distribution: To date, this species has only been recorded on the eastern slope of the Central Andes mountain range in Colombia (Pinilla & Pino, 2002), specifically in the forests of the Cajamarca municipality, in the department of Tolima.

Habitat and ecology: The new species was discovered at elevations ranging between 2650 and 2800 m, growing as an epiphyte. It inhabits small remnants of highly humid premontane cloud forests (bmh-PM) (Holdridge, 1967), which are heavily degraded and surrounded by agricultural lands used for livestock and crops. The area has been designated for open-pit gold mining (Contreras-Santos *et al*., 2022; Molina Ríos & Rodríguez Nuñez, 2020; Sánchez-García, 2013).

This zone is characterized by predominantly mountainous terrain, with steep slopes exceeding a 50% gradient. Environmental conditions include annual precipitation of 2500 to 2800 mm, an average yearly temperature of 12 to 18 °C, and an average relative humidity of 83% (Pinilla & Pino, 2002). The higher mountain areas are covered by a fog belt for most of the year, significantly contributing to condensation water and influencing drainage flow and perennial streams. The vegetation is rich in bryophytes and other epiphytic plants (Contreras-Santos *et al.*, 2022; Molina Ríos & Rodríguez Núñez, 2020).

Discussion. *Pleurothallis cop-biodiversitatis* is morphologically similar to *P. matudana* but differs in having sepals with erose margins (*vs*. entire); the dorsal sepal is elliptical, concave, and significantly wider than the synsepal, measuring 3.0–3.4 mm wide (*vs*. ovate, more concave, nearly as wide as the synsepal, 4.0–5.7 mm wide); the petals are straight, inclined toward the ovary, with minutely denticulate margins, measuring 3.8–4.2 × 0.5–0.8 mm (*vs*. falcate, inclined downward, running parallel to the margins of the synsepal, minutely crenulate, 5–7 × 0.5–0.9 mm). The lip is slightly curved, extending parallel to the synsepal, 3.8–4.2 × 2–2.7 mm (*vs*. strongly curved, with the apex directed toward the synsepal, 4–6 × 2.0–2.7 mm), with prominent and well-defined basal lobes (*vs*. short and poorly defined), erose margins (*vs*. minutely crenulate), a rounded apex (*vs*. acute), and a lanceolate, strongly vesiculate sulcus occupying ¾ of the basal length of the lip (*vs*. an oblong, papillose sulcus reaching the apex), and a small, suborbicular glenion (*vs*. larger, oblong).

Pleurothallis cop-biodiversitatis also shares morphological characteristics with *Pleurothallis tandapensis*, but differs in having linear petals that are straight, with microscopically denticulate margins, measuring 3.8–4.2 × 0.5–0.8 mm (vs. linear-oblong, falcate, with strongly denticulate margins, 5.5 × 1 mm); a lip that is the same length as the petals, ovate-oblong, and rounded, measuring 3.8–4.2 × 2–2.7 mm (vs. shorter than the petals, ovate, obtuse, 3.8–4.2 × 2.0–2.7 mm); and a lanceolate sulcus occupying ¾ of the basal length of the lip (vs. subpandurate and partial) (Fig. 2).

Taxonomic note: *Pleurothallis cop-biodiversitatis* belongs to a poorly known species complex characterized by distinctive morphological traits, of which only two species are currently recognized: *P. matudana* and *P. tandapiensis*. The new species could be mistaken for other morphologically distinct species from the Andes, such as *Pleurothallis coriacardia* Rchb.f., *P. phyllocardioides* Schltr., and *P. cordata* (Ruiz & Pav.) Lindl., among others. However, it is distinguished by its lip with erose margins, more pronounced basal lobes, a rounded apex, and a longitudinally sulcate blade with a lanceolate, strongly vesiculate basal concavity.

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Figure 2. Morphological comparison of the flower (A), sepals and petals (B), and lip (C), between *Pleurothallis copbiodiversitatis* Sierra-Ariza (A1, B1, C1), *Pleurothallis matudana* C.Schweinf. (A2, B2, C2–3), and *Pleurothallis tandapiensis* (Luer & Hirtz) J.M.H.Shaw (A3, B3, C4). Redrawn by Sierra-Ariza: A1, B1, and C1 based on the holotype (TOLI [*M. A. Sierra-Ariza 429*]); A2, B2, and C2 based on a drawing by Rolando Jiménez (AMO [*Soto Arena 3230*]); C3 based on the holotype (AMES [*E. Matuda 1577*]); and A3, B3, and C4 based on a drawing of the holotype by C. Luer (MO [*C. Luer, J. Luer & A. Embree 12066*]).