

A new species of *Anthurium* (Araceae) from Zamora Chinchipe Province, Ecuador

Ricardo Zambrano C.¹ Rudy Gelis² & Thomas B. Croat^{3*}

¹ Director of Gardens and Botanical Collections, Jardín Botánico de Quito, Pasaje N34, Rumipamba E6 -264 y Av. Shyris, Quito, Ecuador.

² Researcher, Yanayacu Biological Station, Cosanga, Ecuador

³ P.A. Schulze Curator of Botany, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO63166, USA.

*Corresponding author Email: thomas.croat@mobot.org

ABSTRACT

Anthurium alvaroperezii R.Zambrano & Croat (Araceae) is described as new and compared with related species in the genus.

Key words: new species, Araceae, *Anthurium*, Zamora Chinchipe, section *Polyneurium*, Ecuador.

INTRODUCTION

The genus *Anthurium* Schott is a key component of Ecuador's botanical diversity, comprising approximately 600 described and undescribed species (Croat, unpublished data), with more than half expected to be endemic to the country. (Croat 1999, Croat et al. 2011). Within this diversity, section *Polyneurium* stands out for its unique, somewhat unnatural, assemblage (Carlsen & Croat, 2019). Members of this section are characterized by thin leaf blades with numerous, closely parallel primary lateral veins (though the venation is not striate). Internodes vary from short to elongated, and leaf shapes range from cordate to oblong, with bases that may be acute or subcordate. Notable examples include *Anthurium argyrostachyum* Sodirol, *A. pulverulentum* Sodirol, *A. corrugatum* Sodirol, *A. cuspidatum* Mast., and *A. panduriforme* Schott (Croat et al., 2019).

The southeastern region of Ecuador, particularly the Andean slopes in Zamora Chinchipe Province, offers an unparalleled array of ecosystems, including ancient cloud forests of the Cordillera de El Cóndor (Neill, 2005). These forests antedate the Andes and are home to a multitude of endemic species. However, threats such as deforestation and mining are rapidly degrading these habitats (Gelis, personal observation), underscoring the urgent need for exploration and conservation to prevent the extinction of species, many of which remain scientifically undocumented.

Despite its ecological significance, southeastern Ecuador remains largely under-explored in terms of aroid diversity. Notable efforts have been made, including those by David Neill of the

Universidad Estatal Amazónica and by the third author of this paper, who conducted multiple expeditions to the Cordillera del Cóndor between 1980 and 2007. However, systematic collections for much of the region are still scarce.

In recent years, an aroid florula for the Cordillera del Cóndor was published, summarizing the known diversity in parts of the region and describing numerous new species (Delannay & Croat, 2021). Despite this valuable contribution, the area remains under-explored, with significant portions still poorly studied due to the challenges of access.

More recent fieldwork in the Tapichalaca Reserve within the core of the Podocarpus-El Cóndor Biosphere Reserve in Zamora Chinchipe has yielded a previously undescribed species belonging to section *Polyneurium*. This new species, described and illustrated herein, highlights the extraordinary yet vulnerable botanical wealth of the region.

Materials and Methods

This species has been recognized using the *Anthurium* Lucid Key which involves comparing a given unknown species with all known published species. This involves the rejection of all species which are negatively correlated after choosing a series of the most conservative characters, then making detailed studies of all possible candidates to be assured that it is not one of those. The tool we are using is a computer-generated key developed by the Royal Botanic Gardens Kew and the Missouri Botanical Garden that contains all important taxonomic characters of all known *Anthurium* species. It works by a process of elimination using only the most conservative and least variable characters. The Lucid key to *Anthurium* is not yet publicly accessible.

Descriptions follow the standard methodology for species of the genus *Anthurium* (Croat and Bunting, 1979). Life zone ecology mentioned is based on the Holdridge life zone maps (Holdridge, 1967). The IUCN status for these species is designated as “Data Deficient” (DD) due to a lack of comprehensive knowledge regarding the species’ distribution and the absence of additional documented collections (IUCN, 2023).

NEW SPECIES DESCRIPTION

Anthurium alvaroperezii R.Zambrano & Croat, **sp. nov.** — Type: ECUADOR. Zamora Chinchipe: Palanda Cantón, Tapichalaca Reserve, collections along the Tangaras Trail, 04°29'43"S 79°07'55"W, 2500 m, 21 June 2014, *Álvaro J. Pérez, Katya Romoleroux, Nicolás Zapata & Washington Santillán* 7154 (holotype QCA236023).

Diagnosis: The species is a member of *Anthurium* section *Polyneurium* and is characterized by its epiphytic habit, long internodes, and deciduous cataphylls, matte green petioles with non-glandular trichomes, narrowly ovate-sagittate blades with bullate texture above, non-glandular puberulence restricted to the lower surface, and prominent posterior lobes, 4–6 pairs of basal veins, with the first pair free to the base, short posterior rib, weakly turned inward, naked ca. 2/3 its length, collective veins arising from the 3rd or 4th pair of basal veins, erect inflorescence with a narrowly ovate, green spathe and a cylindroid, sessile, reddish-purple spadix.

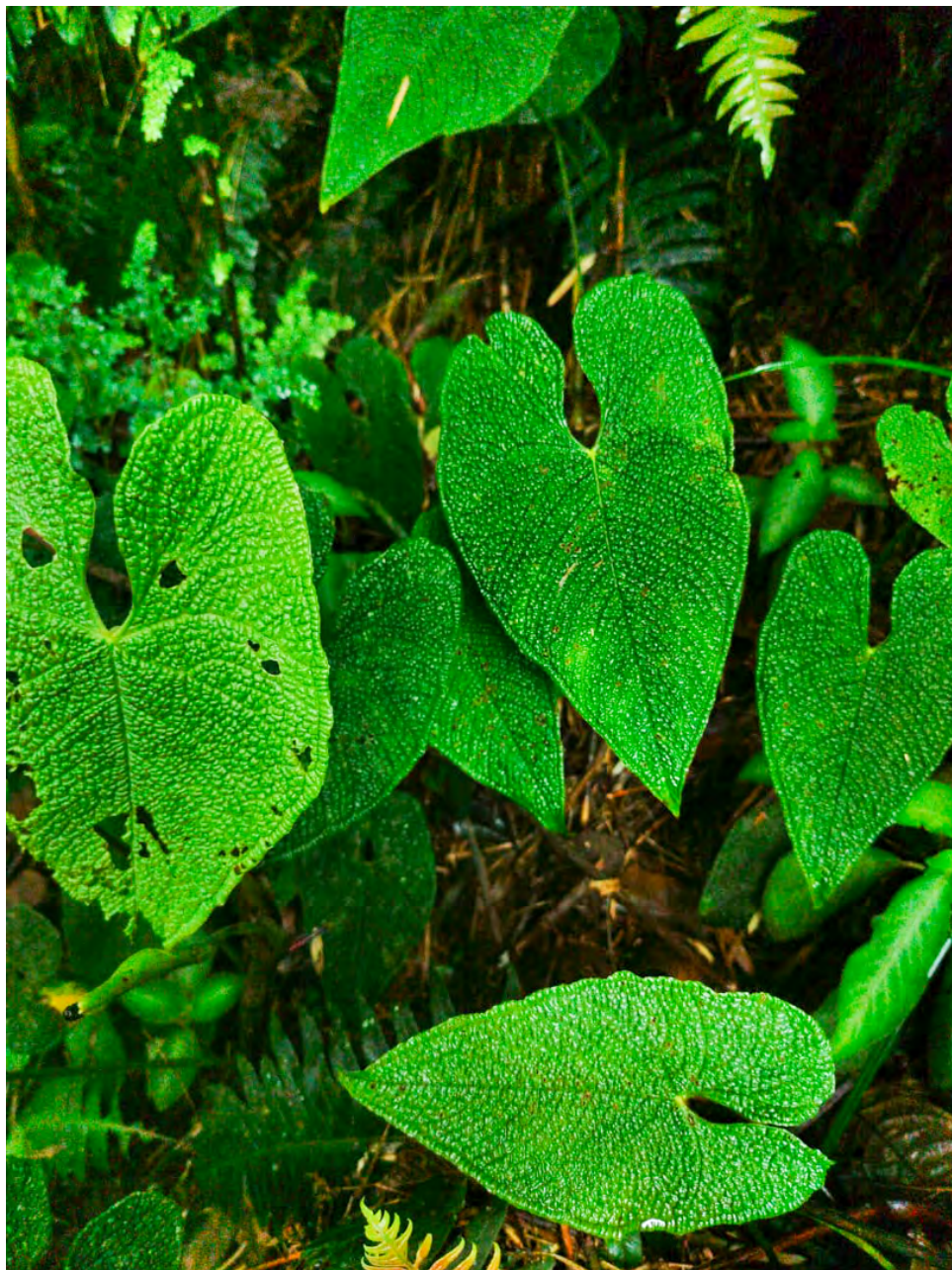


Figure 1: *Anthurium alvaroperezii* — Habit, showing leaves — Photo Fanny Hidalgo.



Figure 2: *Anthurium alvaroperezii* — Abaxial surface of the blade, highlighting non-glandular trichomes along all veins. — Photo Fanny Hidalgo.



Figure 3: *Anthurium alvaroperezii* — Section of the stem showing long internodes with deciduous cataphylls. — Photo Ricardo Zambrano C.



Figure 4: *Anthurium alvaroperezii* — Immature infructescence with early-emergent berries and inflorescence showing a green spathe and a reddish-purple spadix in male phase. — Photo Ricardo Zambrano C.



Figure 5: *Anthurium alvaroperezii* — Type herbarium specimen (Pérez 7154). It displays one infructescence along with two leaves: one showing the adaxial surface and the other, the abaxial surface.

Epiphyte, internodes elongated, terete, 3–4 cm long, 5–8 mm diam., weakly glossy in age, drying medium gray-brown; cataphylls 11.8–13.5 cm long, 0.9–1.2 cm wide, deciduous. LEAVES with petioles 20.5–64.0 cm long and 4–9 mm diam., terete, matte, green with non-glandular trichomes present, becoming brownish when dry; geniculum subterete, 1.0–1.9 cm long, 3–5 mm diam., nearly unrecognizable when dry; blades narrowly ovate-sagittate, 22.0–30.4 cm long, 9.5–18.4 cm wide, broadest between petiolar plexus and the middle of the blade, ca. 1.6–1.8 times longer than broad, 0.4–1.4 times as long as the petiole, abruptly short-acuminate at apex, deeply lobed at base, dark green, semiglossy and bullate on upper surface, pale green and matte below, non-glandular puberulent trichomes present only below across all veins, drying dark green to brown and matte above, olive-green and matte below; anterior lobe 16–22 cm long, entire; posterior lobes weakly overlapping when flattened, 6.0–8.5 cm long, 4–7 cm wide, rounded at apex; sinus open, hippocrepiform 4.0–8.5 cm deep, 1.0–1.9 cm wide; basal veins 4–6 pairs, 1st pair free to base, 2nd pair fused 7–8 mm, 3rd–6th pair fused 1–3 cm; posterior ribs short, 2.5–3.0 cm long, weakly turned inward, naked ca. 2/3 their length; midrib adaxially sunken, more or less flat, medium green, glabrous, prominently raised below, rounded with puberulent non-glandular trichomes, pale green, drying slightly acute and concolorous above, rounded and brown below; primary lateral veins 8–12 per side, departing midrib at 45°, brownish when dry, slightly raised above, prominently raised with non-glandular trichomes below; interprimary veins sunken above, prominently raised below, drying slightly raised above and prominently raised below; secondary veins visible and sunken above, prominently raised below, drying slightly raised above and prominently raised below; tertiary veins visible and sunken above, prominently raised below, drying slightly raised above and prominently raised below; fine reticulate veins slightly visible above, well differentiated below, drying slightly raised above and raised below; collective veins arising from the 3rd or 4th pair of basal veins, 6.0–7.3 mm from the margin. **INFLORESCENCE** erect, long-pedunculate; peduncle 19–25 cm long, 2.5–6.0 mm diameter, 0.3–1.2 times as long as the petiole, terete, puberulent with non-glandular trichomes, pale green, matte, becoming brown when dry; spathe green, narrowly ovate, 7.0–11.2 cm long, 0.9–2.1 cm wide, semiglossy, erect in nearly the same orientation as peduncle, later spreading-reflexed, drying olive green; spadix sessile, cylindroid, weakly tapered at both ends, 12.5–14.0 cm long; flowers 4–5 visible in the principal spiral, ca. 1.5–2.0 mm long, ca. 1.8–2.0 mm wide; tepals matte, red-purplish, drying black with a purplish hue; lateral tepals 0.7–1.0 mm wide, inner margin straight to weakly concave; pistils not seen fully mature; stamens minute, appressed to the pistil, held at level of tepals; thecae cream-white, 1.5 mm wide and 2.2 mm long, pollen white. **INFRUTESCENCE** 14.0–15.5 cm long, 1.1–1.4 cm diam., green-purplish, drying brown; berries not seen fully mature, early emergent, turbinate to obovoid, medium green to dark green at the tip; seeds two, somewhat discoidal, 3–3.7 mm in diam.

Distribution — The species is endemic to Ecuador, specifically in Zamora Chinchipe, where it inhabits a Premontane wet forest life zone at elevations ranging from 2470 to 2600 meters. It is located in the Tapichalaca Reserve, which functions as a crucial ecological corridor between Yacurí National Park and Podocarpus National Park.

Etymology — The species is named in honor of Álvaro Pérez, a distinguished Ecuadorian botanist, who first collected the species in 2014 during fieldwork in the Tapichalaca Reserve. He has contributed significantly to the study of Ecuador's diverse flora. He works extensively on the taxonomy of the genus *Magnolia*, and his contributions, as well as his collections, have

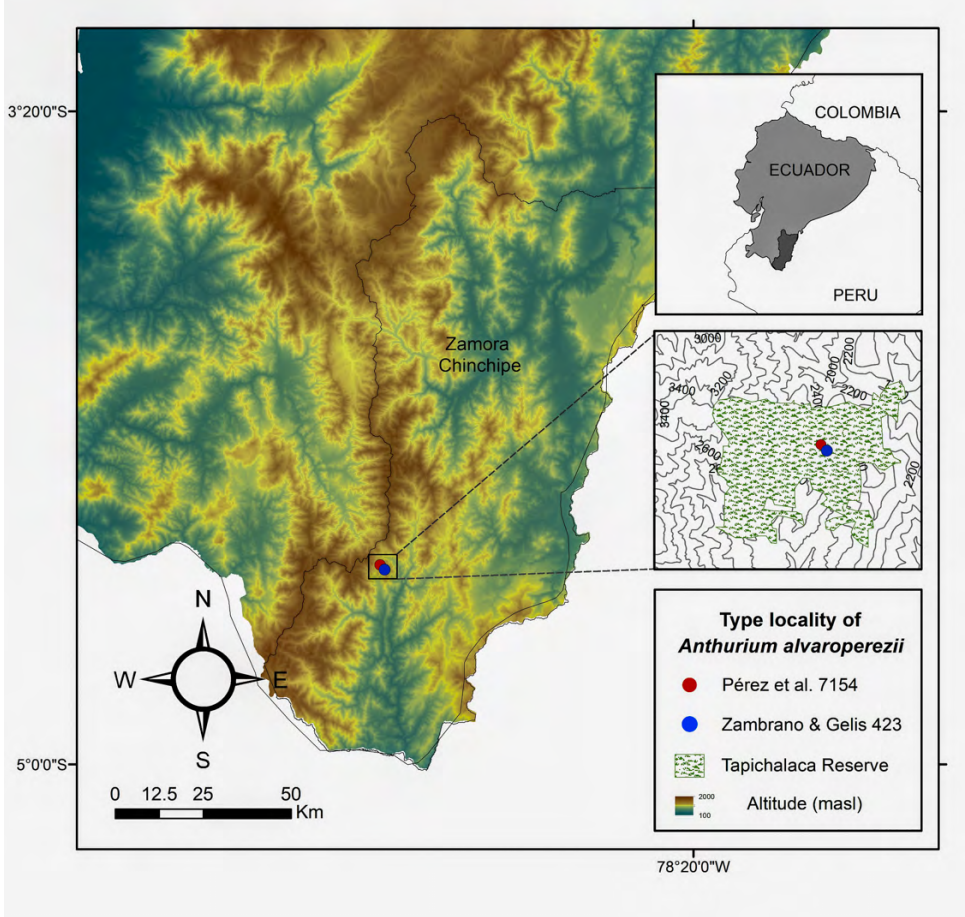


Figure 6: Map showing the Type locality of *Anthurium alvaroperezii* on the southeastern slopes of the Andean Cordillera in Zamora Chinchipe Province. — Map: Ricardo Zambrano C. and A. Villarreal.

been instrumental in the determination of new species. He is a professor at the Pontificia Universidad Católica del Ecuador and curator of the QCA herbarium.

Comments — In the *Anthurium* Lucid Key the species tracks to *A. argyrostachyum* Sodiro which differs in having a much larger, proportionately narrower blade with the anterior lobe constricted and the spadix long-tapered and bluish green-glaucous; to *A. bullosum* Sodiro from the western slope of the Andes which differs by having much larger leaves with petioles 60–80 cm long, much larger blades with up to 10 pairs of basal veins, two of which are free to the base and a broader more open sinus; and to *A. corrugatum* Sodiro, differing by having a broader sinus, 7–8 pairs of basal veins, with the tertiary veins more deeply sunken above.

Paratype: ECUADOR. Zamora Chinchipe: Palanda Cantón, Tapichalaca Reserve. 4°29'35.24"S 79°7'8.96"W, 2480 m, 1 August 2024, *Ricardo Zambrano C. & Rudy Gelis 423* (Paratype QCA252047).

ACKNOWLEDGEMENTS

We thank Pat Croat for his invaluable contribution to the final editing of this work, which greatly improved its quality. Special thanks to Karla Ayala and Ariatna Villarreal of the Jardín Botánico de Quito for their assistance in preparing herbarium specimens and collecting data. We also acknowledge the Jocotoco Foundation and its Tapichalaca Reserve, where several specimens were detected during an iNaturalist workshop, and Fanny Hidalgo for providing some of the photographs included in this paper. We are also grateful to Mayra Nacimba and the QCA Herbarium for their ongoing support. Finally, we thank the Ministerio de Ambiente, Agua y Transición Ecológica (MAATE) for issuing the scientific permits necessary for specimen collection.

REFERENCES

- Croat, T.B. & G.S. Bunting. (1979). Standardization of *Anthurium* descriptions. *Aroideana* 2: 15–25.
- Croat, T.B. (1999). Araceae. In: Jørgensen, P.M. & León-Yáñez, S. (Eds.) *Catalogue of the vascular plants of Ecuador*. Monographs in Systematic Botany from the Missouri Botanical Garden 75: 227–246.
- Croat, T.B., Benavides, G. & Santiana, J. (2011). Araceae. Pp. 99–125 in S. León-Yáñez, R. Valencia, N. Pitman, L. Endara, C. Ulloa Ulloa & H. Navarrete (eds) *Libro Rojo de las plantas endémicas del Ecuador*, 2da. Edición. Publicaciones del Herbario QCA, Pontificia Universidad Católica del Ecuador, Quito.
- Carlsen, M. M., & Croat, T. B. (2019). An analysis of the sectional classification of *Anthurium* (Araceae): comparing infrageneric groupings and their diagnostic morphology with a molecular phylogeny of the genus1. *Annals of the Missouri Botanical Garden*, 104(1), 69–82.
- Croat, T.B., J. Teisher, L.P. Hannon & C.V. Kostelac (2019). Araceae of the Lita–San Lorenzo region (Esmeraldas Province, Ecuador)—Part 1: *Anthurium* Sect. *Polyneurium*. *Annals of the Missouri Botanical Garden* 104(1): 105–168.
- Delannay, X. & T.B. Croat. (2021). Florula of Araceae from the Cordillera del Cóndor (Ecuador and Peru). *Aroideana*. 44(2): 4–580.
- Holdridge, L.R. (1967). *Life Zone Ecology*. Tropical Science Center, San José, Costa Rica.
- IUCN (2023). IUCN Red List of Threatened Species, Version 2023-1. Retrieved from <http://www.iucnredlist.org>.
- Neill, D. (2005). Cordillera del Cóndor: Botanical treasures between the Andes and the Amazon. *Plant Talk* 41: 17–21.