

Five new species of *Anthurium* Schott (Araceae — Pothoideae) from Panama

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ABSTRACT

Five new species of *Anthurium* are described and illustrated from Panama. These are *Anthurium gallegoanum* da Pena, Croat & O.Ortiz (sect. *Calomystrium*), *A. laetevirens* O.Ortiz, da Pena & Croat (sect. *Cardiolonchium*), *A. mariposense* Croat, da Pena & O.Ortiz (sect. *Calomystrium*), *A. niveospadix* da Pena, Croat & O.Ortiz (sect. *Calomystrium*) and *A. pacoraense* da Pena, Croat & O.Ortiz (sect. *Cardiolonchium*). The first three species are from the Santa Fe region of central western Panama and the last two species are from the Cerro Jefe region of central eastern Panama. Taxonomic notes and comments on habitat and ecology are also presented.

RESUMEN

Se describen e ilustran aquí cinco nuevas especies de *Anthurium* de la República de Panamá. Son estas *Anthurium gallegoanum* da Pena, Croat & O.Ortiz (sect. *Calomystrium*), *A. laetevirens* O.Ortiz, da Pena & Croat (sect. *Cardiolonchium*), *A. mariposense* Croat, da Pena & O.Ortiz (sect. *Calomystrium*), *A. niveospadix* da Pena, Croat & O.Ortiz (sect. *Calomystrium*) y *A. pacoraense* da Pena, Croat & O.Ortiz (sect. *Cardiolonchium*). Las primeras tres especies son de la región de Santa Fé en el centro occidente de Panamá y las últimas dos especies son de la región de Cerro Jefe en el centro oriente del país. Notas taxonómicas y comentarios sobre el habitat y ecología de estas especies también son presentadas.

Key words: *Anthurium*, Panama, new species, Cerro Jefe, Cerro Mariposa, sect. *Calomystrium*, sect. *Cardiolonchium*, Veraguas, Panamá

INTRODUCTION

With the addition of these five new species, the *Anthurium* flora of Panama has reached 303 species. Most species were added with the 1986 revision by Croat (Croat, 1986), but others were added in a series of papers in preparation for the treatment of the Flora of Mesoamerica.

History of the additions to the *Anthurium* flora of Panama was reviewed in Ortiz et al. (2018, 2020) and Vannini et al. (2022).

The five species described here were found in two of the most heavily botanized locations in the Republic of Panama (Ortiz et al., 2019) — Cerro Jefe, Panamá, and Cerro Mariposa/Tute in Santa Fe, Veraguas (**Figure 1**). All species were found a short distance from paved roads in locations known to harbor many endemics. Several of the specimens described here had been observed on numerous occasions but assumed to be known species. Flowering morphology later proved that these were novel.

The fact that new species remain hidden in plain sight in areas that have already been extensively collected is a testament to the great variety of *Anthurium* species and the complexity associated with identifying them. It also underscores the need for continued exploration and increased taxonomic expertise. Several of the specimens here presented were collected in deforested debris piles as habitat destruction remains ongoing.

METHODS AND MATERIALS

Species described here were studied from both living material in the field and herbarium specimens at the University of Panama (PMA) and the Missouri Botanical Garden (MO) as well as in the living collections of the senior author of this paper. Dried material of the new species was compared with type specimens, available at MO and PMA and otherwise from the extensive holdings of images of second author at MO. Plant descriptions follow the format established by Croat & Bunting (1979). Ecological parameters are based on the Holdridge Life Zone system (Holdridge, 1979).

Due to recent poaching events decimating populations of micro-endemic Panamanian aroids, the geographic coordinates for all species described in this article have been omitted.

TAXONOMY

Anthurium gallegoanum da Pena, Croat & O. Ortiz, **sp. nov.** — Type: PANAMA, Veraguas: Distrito de Santa Fe, Cerro Mariposa, 955m, 24 May 2023, *R. da Pena, E. Jiménez & T. Murphy 177* (holotype, PMA; isotypes, K, MO, US).

Diagnosis: The species is characterized by its epiphytic habit, short, thick internodes, persistent intact cataphylls, obtusely sulcate petioles, ovate-sagittate blades, adaxially brown to gray-green drying and abaxially light tan to brown-green drying blades, 1.44–1.46 times longer than wide with a parabolic to obovate sinus, 6 or 7 pairs of basal veins, the 1st and 2nd pairs of which are free to base, collective veins arising from second or third pairs of basal veins and 0–6 mm from margin with 8 or 9 primary lateral veins per side as well as a light green, erect-spreading spathe and a cylindroid-tapered, creamy white spadix, and purple-pink (at tip) and orange (at base) berries.

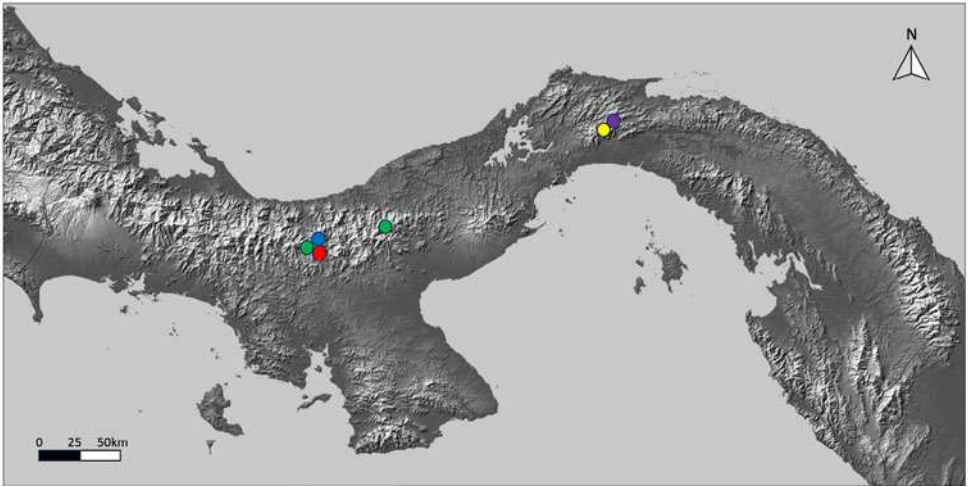


Figure 1: Map of Panama showing the collection locations for *Anthurium gallegoanum* (green), *A. laetevirens* (blue), *A. mariposense* (red), *A. niveospadix* (yellow) and *A. pacoraense* (purple)

Epiphytic; stem 50–65 cm long, 2–2.5 cm diam.; internodes short, obscured by cataphylls; cataphylls persisting intact, brown, 5–12 cm long; **petioles** erect-spreading, sulcate or narrowly sulcate at base, obtusely or narrowly sulcate sometimes with marginal ribs at apex, 30–60 cm long, 10–11 mm diam. at base, 6.5–7.4 mm diam. at apex, medium green, semi-glossy; geniculum 3–4.2 cm long, 8–11.3 mm diam., same shape as petiole, sometimes pale orange-red; **blades** ovate-sagittate, coriaceous, 41–47.5 cm long, 28–33 cm wide, 1.44–1.46 times longer than wide, 0.78–1.37 times as long as petioles, acuminate at apex, deeply lobed at base, matte green above, paler and semi-glossy below, drying brown to gray-green above, tan to brownish-green below; anterior lobe 30–33 cm long, 28–30 cm wide; posterior lobes 12–15 cm long, 11–12 cm wide; sinus parabolic to obovate, 8–13 cm deep, 2–10 cm wide midway; **basal veins** raised above, flattening near collective, last few flat in valleys, yellow, 6 or 7 pairs, 1st two pairs free to base; 3rd pair fused to 3 cm, remaining pairs fused to 4 cm; posterior rib naked, straight, yellow, spreading at 35–60° angle, 3–5 cm long; **collective veins** arising from second or third basal veins, flat above, raised below, at 0–6 mm from blade margin; midrib yellow to yellow-green above and below, raised rounded above disappearing toward apex, triangular below along entire length; primary lateral veins yellow-green above and below, 8 or 9 per side, meeting midrib at 40–50°, raised above, flat near collective veins, convex below along entire length; tertiary veins slightly sunken above, slightly raised below, faintly yellow above, green below. INFLORESCENCE erect; peduncle 38–40 cm long, terete; **spathe** light green, persistent, erect-spreading, acuminate, 15–17 cm long, 4.5–5.0 cm wide, rounded at base, narrowly ovate; **spadix** curved, cylindroid-tapered, 16.3–17.5 cm long, bluntly rounded at apex, creamy white at anthesis; **flowers** 7–8 visible in the principal spiral, 8–12 visible in the alternate spiral. INFRUCTESCENCE pendent, tepals creamy white; berries emerging conical, becoming ovoid with long conical tips, 1 cm long, light violet in early development,

then purplish pink at tip, turning orange with crimson tips when mature, exertion sporadic along spadix; seeds 2, yellow, 5 mm long; mesocarp gelatinous, orange. **Figures 2–6.**

Distribution and ecology — *Anthurium gallegoanum* is endemic to Panama. At the type locality in the vicinity of Cerro Mariposa approximately 4.6 km west of Santa Fe town, Veraguas, it occurs in a *Premontane wet forest* life zone, where it grows epiphytically in mossy, closed forest at 900–1200 m. A second collection was made in the vicinity of Zapillon, Coclé at a similar elevation approximately 52 km ENE of the type locality in a dryer setting (*da Pena 196 PMA*). *Anthurium gallegoanum* mostly likely has a distribution along the middle elevations on both slopes of the Eastern section of Panama's Central Cordillera. Fruit development was seen in early October and berries were mature by early November. Additional fruiting seen in late May and early June.

Etymology — The species is named in honor of Father Jesús Héctor Gallego Herrera, a priest who was helping in the social development of local communities in Santa Fe in the 1960s and was killed in 1971 by the military dictatorship. He remains a hero in the Santa Fe Region with several local institutions named after him. The species will be a tribute to his sacrifice.

Comments — *Anthurium gallegoanum* is a member of section *Calomystrium* and is morphologically closest to *A. formosum* Schott and *A. obtusilobum* Schott, due to the similarity in their infructescences which have purple-red tepals and conical exerted berries. *Anthurium formosum* differs in having glossy blades on both surfaces, lilac, purple or pinkish spathes, and purple spadices at anthesis with 10–20 flowers visible in the alternate spiral. *Anthurium obtusilobum* differs by its blades with collective vein arising from one of the lowermost basal veins, few primary lateral veins (up to 6 per side), and oblong-elliptic, reflexed spathes.

Paratype — Panama. Coclé: Distrito de La Pintada, Zapillon, 1043m, 15 September 2023, Ramón da Pena, 196 (PMA).

Anthurium laetevirens O.Ortiz, da Pena & Croat, **sp. nov.** — Type: PANAMA. Veraguas: Distrito de Santa Fe, Cerro Mariposa, 870m, 25 May 2023, R. da Pena, E. Jiménez & T. Murphy 179 (holotype, PMA; isotypes, K, MO, US).

Diagnosis: The species is characterized by its epiphytic habit, short internodes, intact persistent cataphylls at upper parts of the stem, subterete, weakly sulcate petioles, narrowly ovate-triangular, dark green blades which dry green above and light green below, with 7–9 basal veins, 2 or 3 of which are free to the base, 7–12 primary lateral veins per side, the inflorescence with peduncle half the length of petiole, spathe pale green above, green below, erect, the spadix cylindrical, creamy white.

Epiphyte to less than 1 m tall; stem 15–20 cm, 17–19 mm diam., matte, pale green in active growing section with few stout roots originating from internodes, roots tan-gray or brown-gray and uniformly wide (2–3 mm) for majority of their length; internodes short, 3 cm diam.; cataphylls to 11 cm long, light brown, persistent in younger leaves, eventually deciduous; **petioles** erect-spreading, matte green, pale-lineate, terete and weakly sulcate at base, subterete, very weakly sulcate to almost flat above near apex, 32–43 cm long, 7.4–10.4 mm diam. at



Figure 2: *Anthurium gallegoanum* Adaxial surface of leaf blade — Photo R. da Pena

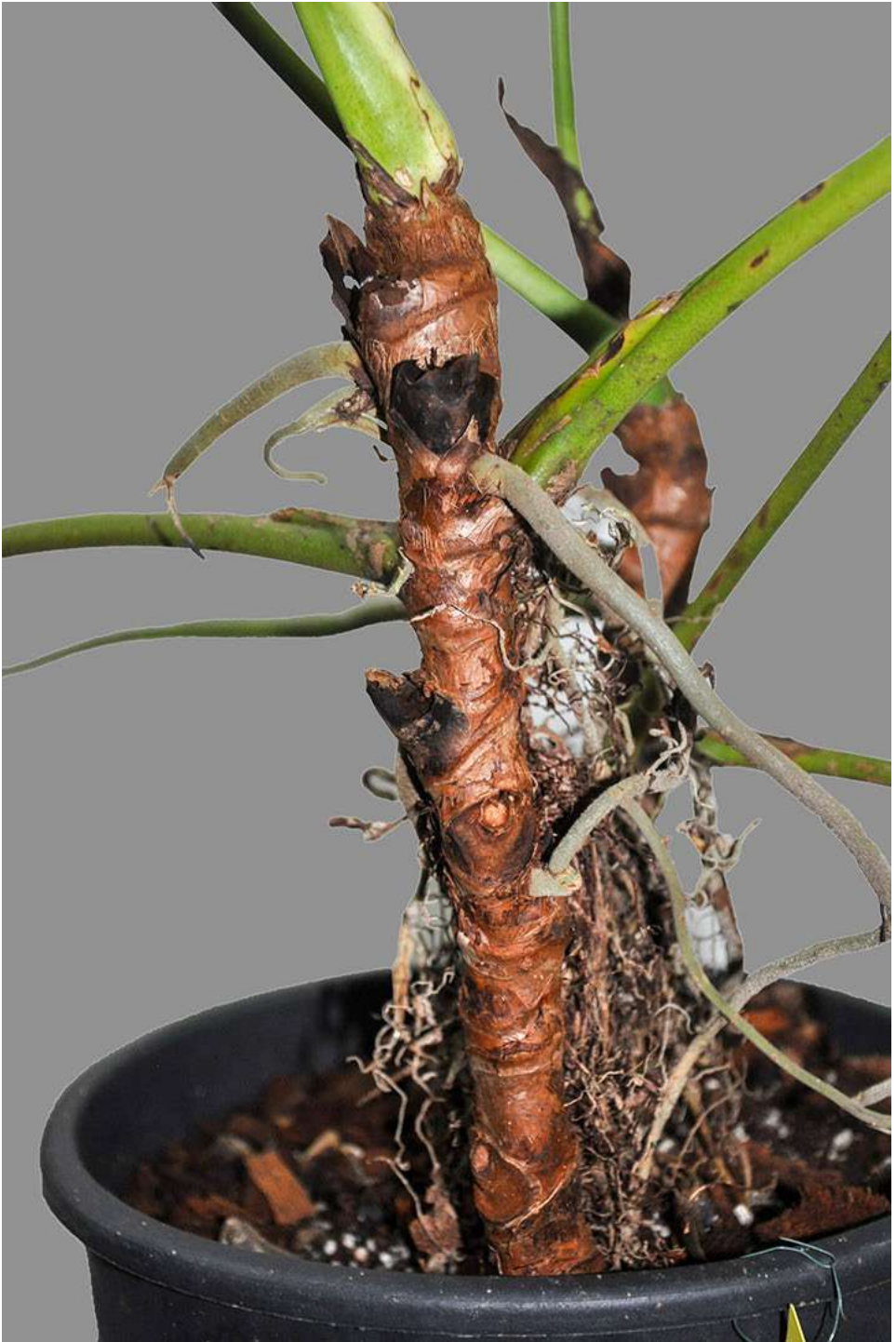


Figure 3: *Anthurium gallegoanum* Stem detail — Photo R. da Pena



Figure 4: *Anthurium gallegoanum* Inflorescence detail — Photo R. da Pena



Figure 5: *Anthurium gallegoanum* Infructescence detail — Photo R. da Pena



Figure 6: *Anthurium gallegoanum* Herbarium type specimen (da Pena et al. 177, PMA) — Photo by Lucila Guillén Reproduced with permission

base, 5.3–5.5 mm diam. at apex; geniculum 1.6–2.3 cm long, 6.5–7.0 mm diam., sulcate, pale green, slightly thicker than petiole; **blades** narrowly ovate-triangular, coriaceous, dark green above, pale semiglossy below, drying green above and pale green below, 38–47 cm long, 24–31 cm wide, 1.5–2.1 times longer than wide, broadest across the posterior lobes, 1.1–1.2 times as long as petioles; anterior lobe 29–31 cm, usually broadly concave, especially toward the base; posterior lobes 10–15 cm long, 8–10 cm wide midway, longer than broad, spreading at 40° from midrib; sinus parabolic, 7.0–8.5 cm deep, 3.5–10.0 cm wide at midpoint; midrib rounded raised above, flat within 5–7 cm of apex, concolorous above, pale yellow-green below; primary lateral veins 7–12 per side, meeting midrib at 40°, slightly bowed toward collective vein, concolorous above, pale yellow-green below, raised above, becoming flat toward apex, raised along entire length below; **basal veins** 7–9 pairs, 2 or 3 pairs free to the base, first pair fused to 2 cm, the remainder at 3 cm, pale green above, pale-lineate, pale yellow-green below, raised above, slightly depressed toward base, the lower basal veins in valleys; posterior ribs 5–6 cm long, naked almost entire length, slightly curved, spreading at 30–50°, green, pale-lineate; tertiary veins very faintly visible as inconspicuous light crease above, slightly raised, green below; **collective vein** arising from the lower basal veins, flat above, raised below, 2–6 mm from margin, loop-connecting. INFLORESCENCE erect; peduncle 20 cm long, green, terete; **spathe** spreading, 8 cm long, 3 cm wide, medium green abaxially at base like peduncle with darker stripes running the length of the spathe, becoming lighter green toward apex, pale green adaxially, narrowly ovate, reflexed-recurved, eventually deciduous; **spadix** 8 cm long, 7 mm diam., cylindrical, 2–3 mm stipe, creamy white, turning yellow-green, matte; **flowers** 7–8 visible on principal spiral, 12–13 on alternate spiral; stamens long exerted. **Figures 7–12.**

Distribution — *Anthurium laetevirens* is endemic to Panama, known only from the area around Cerro Mariposa between 650–1000 m.

Etymology — The epithet comes from the Latin ‘*laete*’ (meaning lightly) and ‘*virens*’ (meaning being green) referring to the lightly green-drying lower leaf blade surfaces.

Comments — This species is probably a member of Sect. *Cardiolonchium* owing to its likely close morphological relationship with *A. ravenii* Croat & R.A. Baker due to the deciduous cataphylls, white spadices and deciduous spathes; but the latter species differs in having yellowish, brown to dark brown drying blades with a spatulate sinus, shorter basal ribs (2.5–4.5 cm long), slightly tapered, thicker and longer spadices (up to 24 cm long), and solid green, oblong-elliptic or ovate-elliptic spathes.

Anthurium mariposense Croat, da Pena & O. Ortiz, **sp. nov.** — Type: Panama. Veraguas: Distrito de Santa Fe, Cerro Mariposa, 849 m, 17 May 2023, *Premontane wet forest* life zone, *R. da Pena 159* (holotype, PMA; isotypes, K, MO, US).

Diagnosis: This species is characterized by its epiphytic habit, short thick internodes, intact persistent cataphylls, terete petioles, ovate-sagittate-subhastate olive-green to olive-brown-drying, gradually long-acuminate blades, which are slightly broader than long and prominently lobed at base with 6 pairs of basal veins, the 1st of which is free to base, the remainder variously united with the posterior rib naked about 1/3 its length, primary lateral veins 4 or 5 per side, the inflorescence short-pedunculate, spathe white, erect-spreading, the spadix cylindroid-



Figure 7: *Anthurium laetevirens* Adult plant in its habit — Photo R. da Pena



Figure 8: *Anthurium laetevirens* Inflorescence pre-anthesis detail — Photo R. da Pena

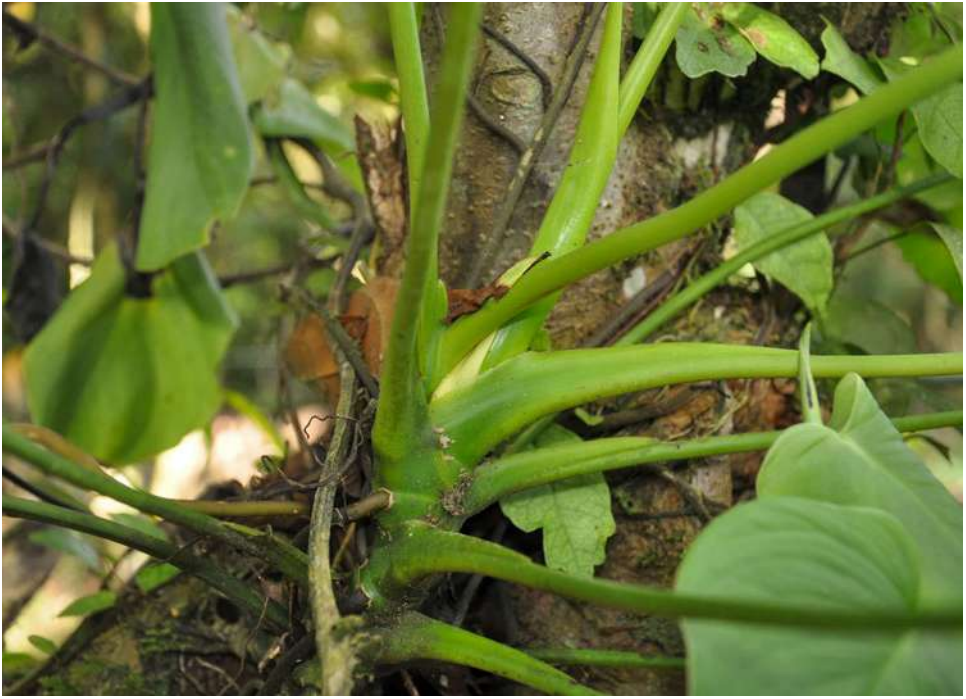


Figure 9: *Anthurium laetevirens* Stem detail — Photo R. da Pena

tapered, creamy white at anthesis with early-emergent pistils, eventually creamy white. Epiphytic; stem 25–50 cm long, 2.5–2.7 cm wide; internodes short, obscured by cataphylls, 2.5 cm diam.; cataphylls persisting intact, red-brown, 8–10 cm long; **petioles** erect-spreading, subterete, shallowly sulcate, 28–54 cm long, 7.8–9.0 mm diam. at base, 5.2–6.0 mm diameter at apex, medium green, semi-glossy; geniculum 1.6–2.7 cm long, 6.9–7.9 mm diam., pale green; **blades** ovate-sagittate to subhastate, subcoriaceous, 27.0–38.5 cm long, 31.5–40.5 cm wide, 0.86–0.95 times longer than wide, 0.71–0.96 times as long as petioles, gradually long-acuminate at apex, prominently lobed at base, dark green and weakly glossy above, paler and semiglossy below, drying olive-green above, olive-brown below with a slight sheen on both sides, broadest at point of petiole attachment; anterior lobe 28–29 cm long, concave along margin; posterior lobes 20 cm long, 15 cm wide, spreading, outward; sinus parabolic, 3–10 cm deep, 6.5–8.0 cm wide midway; **basal veins** 5 or 6 pairs, 1st pair free to base; 2nd pair fused 1.9–3.4 cm, sometimes all basal veins fused together except for first; posterior rib 3–4 cm, naked for 2 cm or not at all, straight, slightly forward-projecting, spreading at 5–10°, concolorous; midrib narrowly rounded and concolorous above, triangular and concolorous below; primary lateral veins 4–7 per side, meeting midrib at 40–50°, weakly quilted-sunken and concolorous above, raised and concolorous below; tertiary veins inconspicuous above, flat to very slightly raised and slightly darker than blade below; **collective veins** arising from the second primary lateral vein, flat, quilted above, raised below, 5.00–6.25 mm from margin. INFLORESCENCE erect; peduncle 3 cm long; **spathe** creamy white, erect-spreading, acuminate, 7 cm long, 2.0–2.5



Figure 10: *Anthurium laetevirens* Adaxial surface of leaf blade — Photo R. da Pena



Figure 11: *Anthurium laetevirens* Inflorescence detail — Photo R. da Pena



Figure 12: *Anthurium laetevirens* Herbarium type specimen (da Pena et al. 179, PMA) — Photo by Lucila Guillén Reproduced with permission

cm wide; **spadix** cylindroid-tapered, 9 cm long, 1 cm diam., bluntly rounded at apex, creamy white at anthesis, eventually faintly pinkish to lavender with early-emergent pistils when fruit is immature; **flowers** 8–9 visible in the principal spiral, 10–12 in the alternate spiral; pistils early-emergent, white; tepals turning dark green post-anthesis, eventually tinged purple-violet, semiglossy. **Figures 13–18.**

Distribution and ecology — *Anthurium mariposense* is endemic to Panama, known only from the type locality on Cerro Mariposa at 849 m elevation in *Premontane wet forest* life zone.

Etymology — The species is named for the type locality at Cerro Mariposa, Veraguas.

Comments — This species is an unusual member of sect. *Calomystrium* due its ovate-sagittate to subhastate blades with a wide parabolic sinus; no other known *Calomystrium* species in Central America has this atypical combination of characters. Due to the wide sinus, this species resembles *Anthurium subsignatum* Schott from Costa Rica but that is the only characteristic these species share, the latter being a member of section *Semaeophyllum* with an epiphytic creeping habit and long internodes and yellow spadices. However, due to the shape and color of the spadix at anthesis, *A. mariposense* could be morphologically related to *A. sanctifidense* Croat, but the latter differs due to its constantly terrestrial habit and generally broadly ovate bullate blades.

Both specimens of this species were found together on the ground but seem to have fallen from a branch as both were in heavy debris and not rooted in the soil. Ongoing searches for this species in the vicinity of Santa Fe have proven unsuccessful indicating it is either not common or was found at the margin of its distribution. Extensive areas of Panama's Central Cordillera remain unexplored and this species may prove to be more abundant in these areas.

Anthurium niveospadix da Pena, Croat & O.Ortiz, **sp. nov.** — Type: PANAMA. Panamá: Cerro Jefe, Carretera a Altos de Pacora, 802 m, 24 September 2023, *R. da Pena & D. Martínez 205* (holotype, PMA, isotypes, K, MO, US).

Diagnosis: This species is a member of sect. *Calomystrium* and is characterized by its epiphytic habit, short stem, short thick internodes, intact persistent cataphylls, terete, weakly sulcate petioles, ovate-triangular to broadly ovate, gradually long-acuminate, coriaceous, glossy blades, which are prominently lobed at the base with 6 or 7 pairs of basal veins, the 1st two of which are free to base, primary lateral veins 6 or 7 per side, the inflorescence which starts with an erect, short-pedunculate, pale green spathe and cylindroid-tapered pale green spadix, then develops a pendent, long white spadix with early-emergent white pistils, that develop into orange, green-tipped berries and a persistent coriaceous spathe.

Epiphytic; stem 10–12 cm long, 6–7 cm wide; internodes short, obscured by cataphylls; cataphylls persisting intact, 16–18 cm long, 3–4 cm wide, brown; **petioles** erect-spreading, subterete, very weakly sulcate at base and apex, 52–66 cm long, 9.9–10.4 mm diam. at base, 6.6–7.5 mm diam. at apex, pale green, sometimes slightly darker above; geniculum 4–6 cm long, 7.4–8.3 mm diam., very weakly sulcate to terete, pale green like petiole; **blades** ovate-



Figure 13: *Anthurium mariposense*. Adult plant in its habit. — Photo R. da Pena



Figure 14: *Anthurium mariposense* Adaxial leaf blade sinus detail — Photo R. da Pena



Figure 15: *Anthurium mariposense* Stem detail in cultivation — Photo R. da Pena

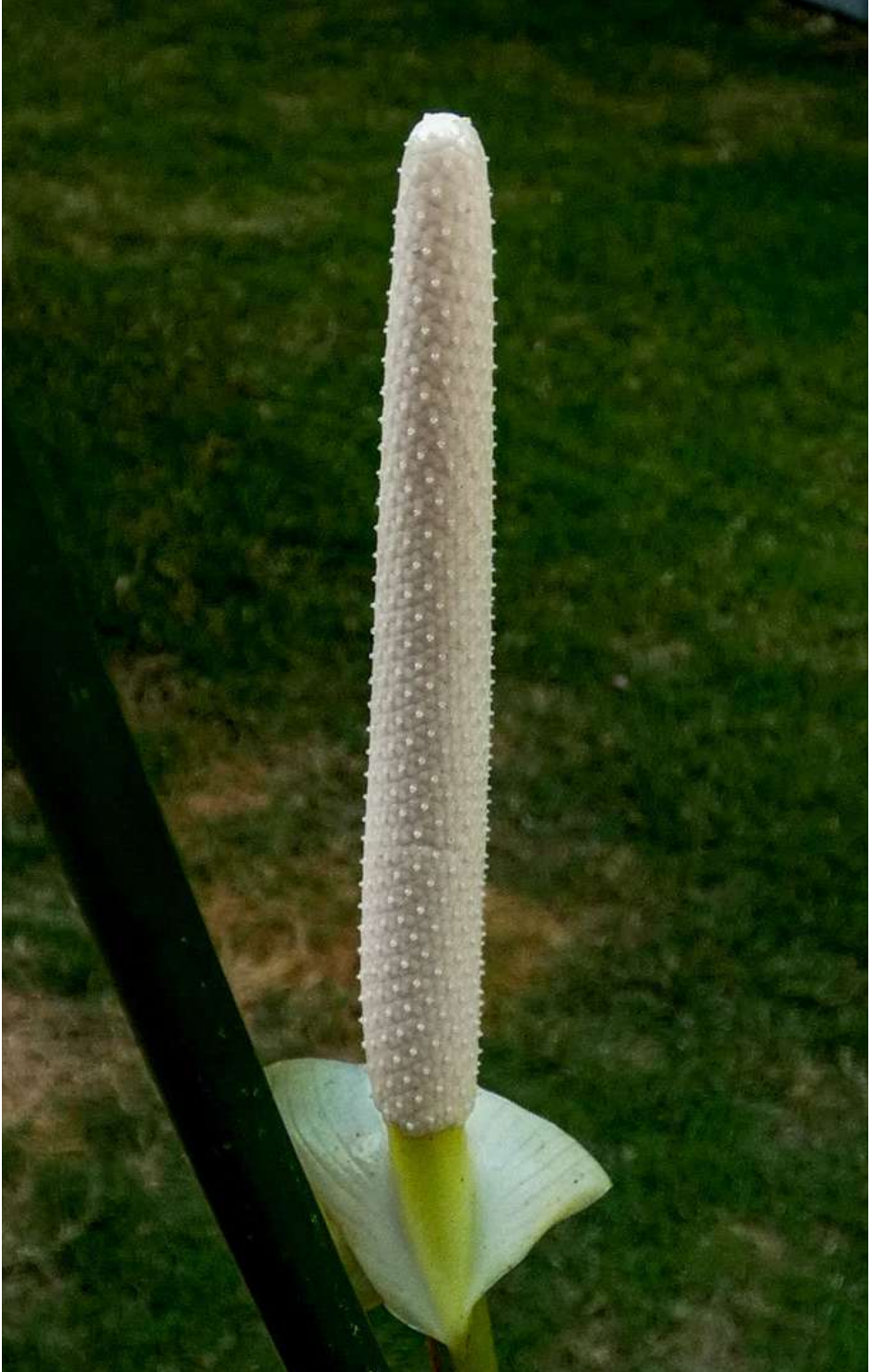


Figure 16: *Anthurium mariposense* Inflorescence detail — Photo R. da Pena



Figure 17: *Anthurium mariposense* Inflorescence post-anthesis detail — Photo R. da Pena



Figure 18: *Anthurium mariposense* Herbarium type specimen (da Pena et al. 159, PMA). — Photo by Lucila Guillén Reproduced with permission

triangular to broadly ovate, coriaceous, 42–49 cm long, 27–33 cm wide, 1.48–1.56 times longer than wide, 0.74–0.88 times as long as petioles, acuminate at apex, prominently lobed at base, glossy green above, short pale-lineate, paler glossy green below, becoming bullate in larger plants, drying tan below, brownish green above; anterior lobe 31–35 cm long, convex on margins; posterior lobes 16–18 cm long, 13.5–14 cm wide; sinus parabolic to spathulate, obovate in larger plants; **basal veins** 6 or 7 pair, 1st two pairs free to base, 3rd pair fused 2 cm, 4th pair fused 4 cm, raised at base and flat toward apex above and below, pale green above, pale yellow-green below, drying orange-tan below **collective veins** arising from the first basal vein, yellow-green above, green below, flat above, slightly raised below, at 6.4–9.8 mm from blade margin; posterior ribs slightly curved, yellow, spreading at 45–60°, 3–4 cm long, naked entire length; midrib pale yellow-green above and below, round-raised entire length flattening near apex above, triangular along entire length disappearing toward apex below; **primary lateral veins** 6 or 7 per side, raised, pale green above flattening toward collective vein, raised, pale yellow-green below, meeting midrib at 40–50°; tertiary veins flat above and below, pale green above, visible as green lines below. INFLORESCENCE erect; peduncle 32.0–32.5 mm, half as long as petiole, 7 mm diam. at base and apex; **spadix** 17.5 cm long, stout, slightly tapered at apex, creamy white to pale green; **spathe** pale green, persistent, spreading, decurrent, 17 cm long, 5 cm wide. INFRACTESCENCE pendent; spadix 26–39 cm long, 27.7–32.4 mm wide at base, 24.2–27.4 mm wide near apex, tepals white; spathe green, coriaceous, spreading, slightly reflexed, persisting, acuminate; post anthesis flowers (with immature berries) 13–16 visible on principal spiral, 12–14 visible on alternate spiral, with early-emergent, white pistils; berries 12 mm long, 5 mm wide, orange with green tip, exertion sporadic along spadix; seeds 2, yellow, 5 mm long, 2 mm wide; mesocarp gelatinous light orange. **Figures 19–24.**

Distribution and ecology — *Anthurium niveospadix* is endemic to Panama, known only from the collection site near Cerro Jefe, along the road to Altos de Pacora. Flowering has been observed in January and May.

Etymology — The species name comes from ‘*niveus*’ the Latin for snowy, and spadix, in reference to the large white infructescence of this species.

Comments — This species had previously been categorized as *Anthurium curvispadix* Croat, a species it morphologically resembles due to the characteristics of its leaf blades and massive infructescences. However, *A. curvispadix* differs by having a blade with a semiglossy upper surface, subcoriaceous spathe, infructescences with early-emergent white pistils, green tepals and smaller white berries (up to 7 mm long). *Anthurium niveospadix* is also be easily confused with *A. kamemotoanum* Croat (which differs in having a cupulate, deep red-violet spathe and a deep red spadix), *A. horridum* Croat (which has a short peduncle and erect, green, boat-shaped spathe), and *A. guanghuae* Croat (which has a short-tapered, pale green spadix which turns purplish with age), which are all found in the Cerro Jefe area. This species also resembles other relatives such as *A. cascajalense* Croat (which has a deeply ribbed, D-shaped peduncle) and *A. hoffmanii* Schott (a primarily terrestrial species from Western Panamá with red ovoid berries).

With so many similar anthuriums in close proximity, it should not be a surprise that this species has remained overlooked in such a well-botanized area.



Figure 19: *Anthurium niveospadix* Adult plant in its habit — Photo R. da Pena



Figure 20: *Anthurium niveospadix* Inflorescence detail — Photo R. da Pena



Figure 21: *Anthurium niveospadix* Mature berries — Photo R. da Pena

Anthurium pacoraense da Pena, Croat & O.Ortiz, **sp. nov.** — Type: PANAMA, Panamá Province: Cerro Jefe, carretera a Altos de Pacora, 901m, 25 September 2023, *R. da Pena 206* (holotype, PMA; isotypes, K, MO, US).

Diagnosis: The species is a member of sect. *Cardiolonchium* and is characterized by its epiphytic habit, short internodes, intact persistent cataphylls, essentially terete, sharply, shallowly sulcate petioles, ovate-triangular-sagittate, matte, sub-velvety blades, infructescence peduncles consistently thicker than petioles, creamy white inflorescence turning black with red berries.

Epiphytic: stem 17–23 cm long, 2.5–3.0 cm wide; roots green, few, thick; internodes short, leaf scars 2.0–2.5 cm wide; cataphylls persisting only on upper petiole(s) as fragments, disappearing beyond 3rd petiole, approx. 10 cm long, 3–4 cm wide, brown; **petioles** erect-spreading, sharply shallow-sulcate, 38–46 cm long, 7.70–8.25 mm diameter at base, 6.1–7.0 mm diameter at apex, pale green; geniculum 3–4 cm long, 8.2–9.2 mm diam., same shape and color as petiole;

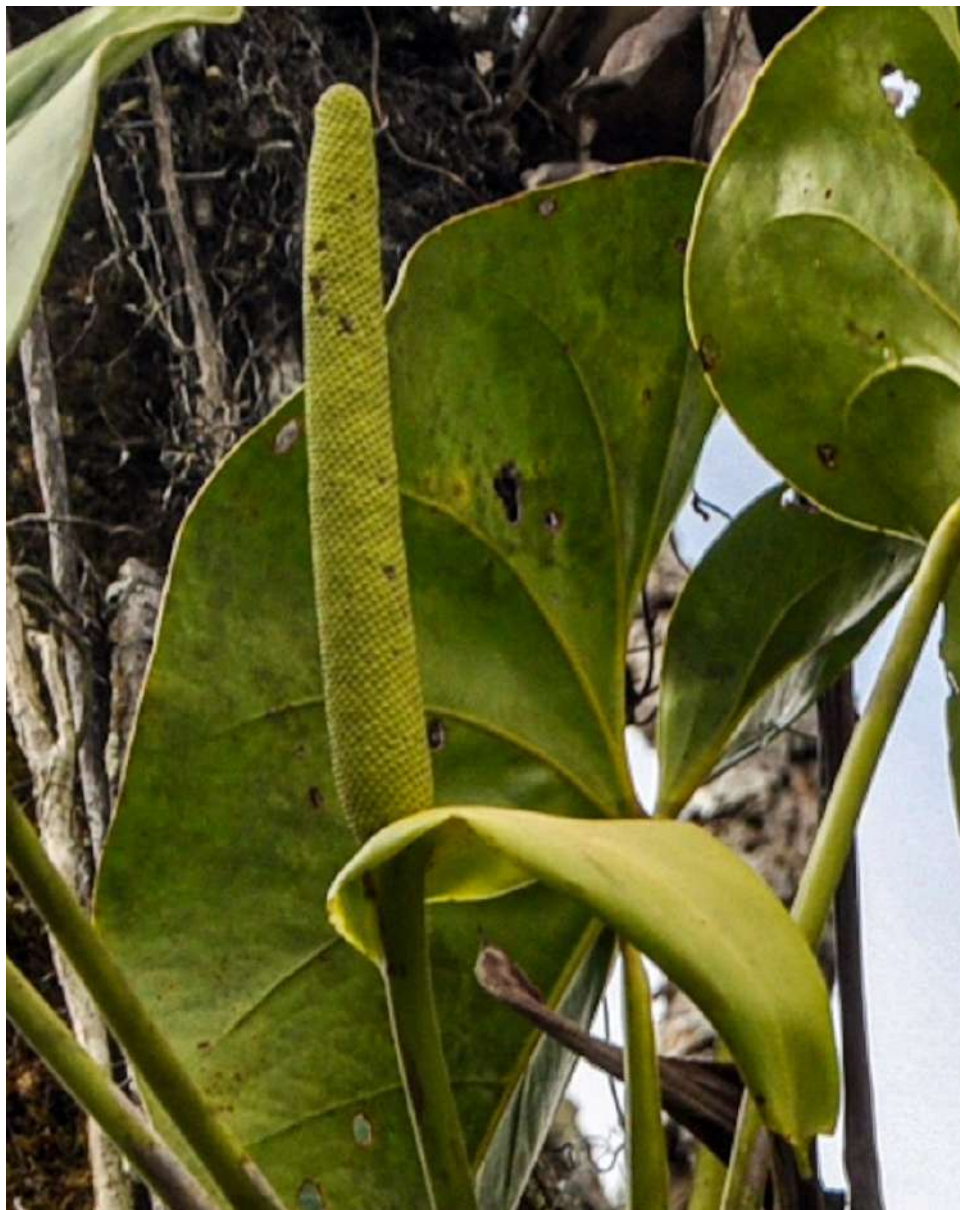


Figure 22: *Anthurium niveospadix* Inflorescence detail — Photo R. da Pena



Figure 23: *Anthurium niveospadix* Adaxial surface of leaf blade — Photo R. da Pena



Figure 24: *Anthurium niveospadix* Herbarium type specimen (da Pena et al. 205, PMA) — Photo by Lucila Guillén Reproduced with permission

blades ovate-triangular, 52–60 cm long, 30.5–33.0 cm wide, 1.7–1.8 times longer than wide, 1.3–1.4 times as long as petioles, acuminate at apex, deeply lobed at base, coriaceous, matte, sub-velvety, some individuals observed in the field were consistently pale green adaxially with others dark green adaxially, pale green below, bullate in larger specimens, drying tan or light green below and brownish green above; anterior lobe 38–43 cm long; posterior lobes 17–19 cm long, 13–14 cm wide; sinus parabolic to obovate-rhombic; **basal veins** 7 or 8 pairs, 1 or 2 pairs free to base, slightly raised and pale green above, sharply raised and pale yellow-green below; posterior ribs stout, slightly curved, pale yellow-green, spreading at 40–50°, 3–5 cm long; **collective veins** arising from first basal or second primary lateral vein, sometimes starting from asymmetrical veins on the same blade; midrib pale green above, slightly raised at base, flattening toward apex, pale yellow-green and sharply raised below; **primary lateral veins** pale green above and below, 8–10 per side, meeting midrib at 40–50°, relatively straight to very lightly arching, slightly sunken above, raised below; tertiary veins raised or sunken above, some raised below, concolorous to slightly paler green above, concolorous below. INFLORESCENCE erect; peduncle 14–20 cm long, 8 mm wide; **spadix** 5.5–8.0 cm long, cylindric, creamy white; **spathe** white to very pale green with pale green stripes to the apex, sometimes tinged purple, 5.0–6.5 cm long, 2.0–2.5 cm wide, reflexed-recurved; **flowers** 12–15 visible on the principal spiral, 12–15 visible on the alternate spiral. INFRUCTESCENCE pendent; peduncle 21–31 cm, 10.7–11.9 mm at base, 9.8–11.1 mm at apex, 1.3–1.6 times as wide as petiole, minor sulcation at point of spathe insertion disappearing toward base, pale green (same as petioles); spadix 23–35 cm long, 20–26 mm wide at base, 12–14 mm wide near apex, black along the entirety of the spadix except for red berries; spathe 18–19 cm long, 5–6 cm wide, pale green (same as petiole and peduncle) with slight overlap at point of insertion, persisting, acuminate, decurrent, rounded at base; berries 8.5 mm long, 4 mm wide, dark red with white base, exertion uniform along spadix; seeds 2, white with a green dot at apex, 4 mm long, 2.5 mm wide; mesocarp gelatinous colorless. **Figures 25–31.**

Distribution and Ecology — *Anthurium pacoraense* is endemic to Panama, known only from the type locality in Panama Province on Cerro Jefe. Based on limited observation, there seems to be a peak of berry development in September which coincides with the start of the highest rainfall season in Panama. Further observation is required to determine if seasonality indeed occurs.

Etymology — The species name comes from the type locality near Altos de Pacora, Panama.

Comments — *Anthurium pacoraense* resembles *A. ravenii*, a widespread species from Honduras to Ecuador, which may ultimately represent a complex rather than a single species. *Anthurium pacoraense* differs from *A. ravenii* in the matte blades (glossier in *A. ravenii*), the consistently thicker peduncles relative to petioles (thinner in *A. ravenii*), the longer spadix (up to 35 cm long) with numerous flowers in the principal spiral (12–15), and the persisting spathes after anthesis (deciduous in *A. ravenii*). The otherwise close resemblance to *A. ravenii* may explain why *A. pacoraense* had remained unnoticed to date.



Figure 25: *Anthurium pacoraense* Adaxial surface of leaf blade — Photo R. da Pena



Figure 26: *Anthurium paconense* Inflorescence detail — Photo R. da Pena



Figure 27: *Anthurium pacoraense* Adult plant in its habit with infructescence — Photo R. da Pena



Figure 28: *Anthurium pacoraense* Infructescence detail — Photo R. da Pena



Figure 29: *Anthurium pacoraense* Mature berries. — Photo R. da Pena



Figure 30: *Anthurium pacoraense* Stem detail — Photo R. da Pena



Figure 31: *Anthurium pacoraense* Herbarium type specimen (da Pena et al. 206, PMA) — Photo by Lucila Guillén Reproduced with permission

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