

---

# New Taxa of *Anthurium* (Araceae) from the Bajo Calima Region (Valle, Chocó), Colombia and Ecuador

*Thomas B. Croat*

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299.  
thomas.croat@mobot.org

*Dorothy C. Bay*

Department of Biology, Missouri Southern State University, 3950 E Newman Road,  
Reynolds Hall 303, Joplin, Missouri 64801-1595. bay-d@mssu.edu

*Emily D. Yates*

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299.  
Current address: HCR, Box 450, Las Vegas, NV 89124. emilydrewyates@hotmail.com

---

**ABSTRACT.** Twenty-six new taxa (25 species and 1 variety) of *Anthurium* (Araceae) from Bajo Calima, Colombia, are described as new: *Anthurium albertiae* Croat & Bay, *A. arenasense* Croat & Bay, *A. barreranum* Croat & Bay, *A. bayae* Croat, *A. calimense* Croat & Bay, *A. coleorrhiza* Croat & Bay, *A. cordobense* Croat & Bay, *A. cylindratum* Croat & Bay, *A. fragrans* Croat & Bay, *A. hinoideum* Croat & Bay, *A. holquinianum* Croat & Bay, *A. isidroense* Croat & Bay, *A. joaquinense* Croat & Bay, *A. langendoenii* Croat & Bay, *A. lautum* Croat & Bay, *A. lygrum* R. E. Schultes ex Croat & Bay, *A. malagaense* Croat & Bay, *A. monticola* var. *attenuatum* Croat & Bay, *A. oxyanthum* Croat & Bay, *A. perviride* Croat & Bay, *A. phyllobaris* Croat & Bay, *A. remotum* Croat & Bay, *A. rubrivellus* Croat & Bay, *A. verrucosum* Croat & Bay, *A. watii* Croat & Bay, and *A. wintersii* Croat & Bay.

**RESUMEN.** Se describen como nuevos 26 taxones (25 especies y 1 variedad) de *Anthurium* (Araceae) de Bajo Calima, Colombia: *Anthurium albertiae* Croat & Bay, *A. arenasense* Croat & Bay, *A. barreranum* Croat & Bay, *A. bayae* Croat, *A. calimense* Croat & Bay, *A. coleorrhiza* Croat & Bay, *A. cordobense* Croat & Bay, *A. cylindratum* Croat & Bay, *A. fragrans* Croat & Bay, *A. hinoideum* Croat & Bay, *A. holquinianum* Croat & Bay, *A. isidroense* Croat & Bay, *A. joaquinense* Croat & Bay, *A. langendoenii* Croat & Bay, *A. lautum* Croat & Bay, *A. lygrum* R. E. Schultes ex Croat & Bay, *A. malagaense* Croat & Bay, *A. monticola* var. *attenuatum* Croat & Bay, *A. oxyanthum* Croat & Bay, *A. perviride* Croat & Bay, *A. phyllobaris* Croat & Bay, *A. remotum* Croat & Bay, *A. rubrivellus* Croat & Bay, *A. verrucosum* Croat & Bay, *A. watii* Croat & Bay y *A. wintersii* Croat & Bay.

**Key words:** *Anthurium*, Araceae, Bajo Calima, Colombia.

This manuscript describes 25 new species and 1 new variety of *Anthurium* (Araceae) from the Bajo Calima Region of Colombia, an area known to be a center of diversity for Araceae. The Bajo Calima region, covering roughly 80,000 ha., is a part of the Chocó phytogeographic region (Gentry, 1982; Prance, 1982) located between the latitudinal coordinates of 03°50'N and 04°10'N, and the longitudinal coordinates of 76°54'W and 77°48'W, and is classified as *Tropical rain forest* transition to *Premontane* (T-rf/P) (Holdridge, 1967; Holdridge et al., 1971). The area ranges from sea level to 150 m elevation, has a yearly average temperature above 24°C and average annual rainfall between 6000 and 8000 mm. Located on the Pacific Andean slopes of central Colombia, the region is known to be one of the centers of diversity for the family and has proven to have more species of Araceae than any other area ever studied to date. Fieldwork in the region, and the examination of herbarium specimens in three Colombian herbaria (CUVC, VALLE, and TULV), the Smithsonian Institution (US), and the Field Museum (F), as well as specimens at the Missouri Botanical Garden (MO), yielded 137 species of Araceae. Of these, 80 species were new to science at the initiation of this study, and there was one new variety. The largest genera represented in the Bajo Calima region (with numbers of species in parentheses) were *Anthurium* (50), *Philodendron* (47), *Stenospermation* (14), *Monstera* (5), and *Xanthosoma* (4). Other genera were: *Dieffenbachia*, *Rhodospatha*, and *Syngonium* with 3 species each; *Caladium* and *Spathiphyllum* with 2 species

each; and 1 species each of *Chlorospatha*, *Colocasia*, *Dracontium*, and *Homalomena*. Since other floristic projects are under way in the region, it is necessary to make these new species available to other workers. This paper deals with only new species of *Anthurium*. Illustrations of most species will be a part of a complete treatment of the Araceae of Bajo Calima to be published in the near future.

*Anthurium* is a Neotropical genus with well over 1000 species, occurring widely in the Neotropics, but heavily concentrated in the Andean areas, especially the wetter areas such as Bajo Calima and other parts of northwestern South America. The genus is characterized by having net-reticulated venation and bisexual flowers aggregated in spadices and subtended by a persistent spathe (Croat, 1983, 1986; Mayo et al., 1997). Special terminology in descriptions follows that defined by Croat and Bunting (1979).

***Anthurium albertiae*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 31.5, less than 100 m, 6 Feb. 1990, T. B. Croat & J. Watt 70282 (holotype, MO-3784031; isotypes, B, COL, CUVV, K, NY, US).

Planta epiphytica, raro terrestris; internodia 5–10 mm longa, 1–2.2 cm diam., cataphylla 9.5–15.5 cm longa, persistentia ut fibrae paucae grossae; petiolus 9–29.5 cm longus, subteres, subcomplanatus adaxialiter, leniter vel obtuse sulcatus; lamina anguste oblonga-elliptica vel anguste ovato-elliptica, 26–59 cm longa, 4.5–13.5(–18) cm lata, hebentata in superficiebus ambabus; nervis lateralibus I 25 ad 33 utroque; nervis collectivis 3–4 mm a marginibus, a nervis lateralibus I tertiis vel quintis oriundis; pedunculus 10–31.5 cm longus; spatha linear-lanceolata, 6.3–13 cm longa, 8–20 mm lata, virens aut flavoviridis; spadix sessilis, 6–14 cm longus, pallide viridis; baccae virides.

Epiphytic, rarely terrestrial; stems short; internodes 5–10 mm × 1–2.2 cm, semiglossy, medium green; roots few per node; cataphylls 9.5–15.5 cm long, weathering to a few coarse, pale, persistent fibers. LEAVES erect-spreading; petioles 9–29.5 cm × 2–5 mm (dry), subterete, somewhat flattened adaxially, weakly to obtusely sulcate, weakly glossy, medium green, drying pale green; geniculum 1–2 cm long, sharply sulcate, somewhat swollen, drying concolorous; blades 26–59 × 4.5–13.5(–18) cm, subcoriaceous, oblong-narrow elliptic to ovate-narrow elliptic, narrowly to broadly rounded at base, acuminate at apex, (2.7–)4.3–6.6 times longer than wide, (1.7–)2.3–2.6(–3.3) times longer than petioles, usually widest near middle, upper surface matte to lustrous-velvety, dark green, drying dull to semiglossy and medium green, lower surface matte, paler than above, drying

semiglossy and paler; major veins drying concolorous and barely raised in shallow valleys above, paler and acute to round-raised below; midrib convex, slightly paler above, round-raised, paler below; primary lateral veins 25 to 33 per side, departing midrib at a 45°–55° angle, slightly curving to collective veins, sunken above, convex below; collective veins 3–4 mm from blade margin, originating from 3rd to 5th primary lateral vein; tertiary veins reticulate, obscure above, slightly raised, sometimes darker below. INFLORESCENCES erect; peduncle 10–31.5 cm × 2–3 mm (dry), about as long as petiole, light green, drying pale green; spathe spreading to reflexed, linear-lanceolate, 8–20 mm wide, 6.3–13 cm long, medium green or sometimes yellowish green, acuminate, acumen apiculate; spadix sessile, cylindrical, slightly tapered at apex, 6–14 cm × 3–5 mm (dry), semiglossy, pale green. Flowers square, 1.6–1.8 × 1.4–1.6 mm, strongly exerted, margins becoming membranaceous and somewhat undulate in fruit; stigma oval. INFRUCTESCENCE to 16 cm long; berries early-emergent, green (immature), acute at apex.

The species is known only from the Bajo Calima region of Colombia, in the Department Valle, occurring in *Tropical wet forest* transition to *Pre-montane* (T-wf/P) life zone (Holdridge et al., 1971), below 150 m.

*Anthurium albertiae* is a member of section *Polyneurium* Engler and is characterized by oblong-narrow elliptic to ovate-narrow elliptic blades, usually matte on both sides, many primary lateral veins, and pale green spadices.

The species is similar to *Anthurium lygrum*, also occurring in the Bajo Calima region, that differs in having blades that are always oblong-narrow elliptic (never ovate-narrow elliptic) and acute at the base, fewer primary lateral veins (11 to 12 compared to 25 to 33 in *A. albertiae*), and petioles with acutely erect margins adaxially and three acute ribs abaxially.

The species is named in honor of the late American botanist Linda Katherine Albert de Escobar, long a professor at the Universidad de Antioquia, who collected throughout much of northwestern Colombia (especially Antioquia) and made the earliest known collection of the species.

*Anthurium albertiae* was collected in flower in the Bajo Calima region in February, March, and July, and in fruit in February.

*Paratypes*. COLOMBIA. **Valle**: Buenaventura–Málaga rd., km 11, Albert de Escobar et al. 4014 (HUA); km 37, Croat 69369 (CUVC, MO), 69372 (CUVC); km 51.3, Croat & Watt 70398 (CUVC, MO); Croat 71016 (F, JAUM, MO, VEN); km 51.7, Croat & Bay 75791 (CUVC, G, GH, MO, USM), 75796A (MO).

***Anthurium arenasense*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Punta Arenas, N shore of Buenaventura Bay, 2 June 1944, *E. P. Killip & J. Cuatrecasas 38642* (holotype, US).

Planta epiphytica; internodia 2.5–6.5 cm longa, plerumque obtecta fibris cataphyllorum; cataphylla 7.5–8 cm longa, persistentia intacta a nodis superioribus, ut reticulum fibrorum decompositorum a nodis inferioribus; petiolus 5.5–8.5 cm longus, teres, anguste sulcatus adaxialiter; lamina ovata vel rotunda, 7–9 cm longa, 4–6.6 cm lata, minute nigropunctata in superficiebus ambabus; nervis lateralibus 118 ad 25 utroque; nervis collectivis 1 completis, 2 partialibus; pedunculus 15–16 cm longus; spatha 3–4.5 cm longa, atroviridis; spadix stipitatus usque 1–3 mm, 3.5–3.8 cm longus, viridibus; infructescencia ignota.

Epiphytic; stem scandent; *internodes* 2.5–6.5 cm × 5–8 mm (dry), drying smooth, light tan, often covered with cataphyll fibers; roots few per node, drying reddish brown; *cataphylls* 7.5–8 cm long, persisting intact at upper nodes, weathering to a net-like reticulum of fibers at lower nodes, often covering internodes, drying light reddish tan. LEAVES erect-spreading; *petioles* terete, narrowly sulcate adaxially, 5.5–8.5 cm × 1.5–2 mm (dry); *blades* coriaceous, ovate to round, apiculate at apex, attenuate at base, 7–9 × 4–6.6 cm, 1.2–1.9 times longer than wide, 0.9–1.5 times longer than petiole, upper and lower surfaces minutely black-punctate, drying dull and pale olive-green, slightly paler below; *midrib* drying raised, paler on both surfaces; *primary lateral veins* 18 to 25 per side, departing midrib at a 40°–60° angle, straight to innermost collective vein; innermost collective vein 1–1.8 cm from blade margin, second collective vein 3–8 mm from blade margin, third collective vein marginal or 2–3 mm from blade margin in lower 1/3 of blade; tertiary veins parallel. INFLORESCENCES erect; *peduncle* 15–16 cm long, drying pale tan; *spathe* spreading to reflexed, 3–4.5 cm long, deep green, drying olive-green; *spadix* stipitate 1–3 mm, cylindrical, 3.5–3.8 cm × 3–4 mm (dry), greenish white. Flowers square, 1.5 × 1.5 mm; thecae ovoid, ca. 0.15 mm long. INFRUCTESCENCES unknown.

The species is known only from the Bajo Calima region of Colombia in the Department Valle, occurring in the *Tropical wet forest* transition to *Premontane* (T-wf/P) life zone, near sea level. It was collected along the shore of Buenaventura Bay in dense forest.

*Anthurium arenasense* is a member of section *Tetraspermium* Schott and is characterized by its ovate to round blades that are minutely black-punctate on both surfaces with three collective veins, petioles that are usually slightly longer than the blades, and short, greenish white, cylindrical spadices.

*Anthurium arenasense* is most easily confused with *A. trinerve* Miquel, which also occurs in the Bajo Calima region, and *A. scandens* (Aublet) Engler that does not. Both of these differ in having more elliptic blades, only one collective vein at any distance from the blade margin, one marginal collective vein, and a tapering spadix.

*Luteyn & Silverstone-Sopkin 12273* from El Cairo, near the Chocó-Valle border, at 1750 m, is quite similar to *Anthurium arenasense*. However, the *Luteyn & Silverstone-Sopkin* specimen differs in having larger, rather elliptic, blades, and dark maroon spadices.

*Anthurium arenasense* is named for Punta Arenas, the site of the earliest known collection.

It was collected in flower in June.

*Paratype*. COLOMBIA. Valle: dense forest along Buenaventura–Cali hwy., near sea level, 10 June 1944, *Killip & Cuatrecasas 39168* (US).

***Anthurium barreranum*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 49, 17 July 1993, *T. B. Croat & D. Bay 75830* (holotype, MO-4576851; isotype, CUVIC).

Planta epiphytica aut terrestris; internodia usque 1 cm longa; cataphylla 3–10 cm longa, 1-costata, decidua; petiolus 20–31 cm longus, teres, interdum 1-costatus adaxialiter; lamina ovata, cordata basi, 20–28 cm longa, 9.5–11 cm lata, nitida in superficiebus ambabus; nervis basalibus 3 ad 4 utroque, omnibus liberis ad basim; nervis lateralibus 16 ad 7 utroque; nervis collectivis 3–5 mm a marginibus, a nervis basalibus primis oriundis; pedunculus usque 15 cm longus; spatha usque 10 cm longa, pallide virida; spadix atropurpureus; infructescencia ignota.

Epiphytic or terrestrial; stem short; *internodes* to 1 cm long, 5–9 mm diam., semiglossy to glossy, smooth, medium green, drying pale tan; roots few per node; cataphylls 3–10 cm long, 1-ribbed, medium green, drying medium brown, deciduous. LEAVES erect-spreading; *petioles* 20–31 cm × 2–3 mm (dry), terete, sometimes 1-ribbed adaxially, matte, medium green, drying medium brown; geniculum 8–15 mm long, drying darker than petiole; *blades* subcoriaceous, ovate, abruptly long-acuminate at apex, cordate at base, 20–28 × 9.5–11 cm, 2.1–2.7 times longer than wide, 0.8–1 times as long as petiole, upper surface semiglossy to glossy, medium green, drying glossy and medium brown, lower surface semiglossy and slightly paler, drying glossy and slightly paler; anterior lobe 26–18 × 9.5–11 cm, 5.1–10.2 times longer than posterior lobes; posterior lobes 2.6–4 × 2.5–5 cm, rounded; sinus 1.5–3 cm deep; major veins drying concolorous, barely raised above, darker than surface, round-raised below; *midrib* narrowly raised,

paler above, convex, paler below; *primary lateral veins* 6 to 7 per side, departing from midrib at a 35°–45° angle, gradually curving to collective veins, narrowly sunken above, narrowly and acutely raised, paler below; *basal veins* 3 to 4 per side, free to base; collective veins 3–5 mm from blade margin, originating from first basal vein; tertiary veins barely visible above, slightly raised below. INFLORESCENCE erect; *peduncle* to 15 cm × 1–3 mm (dry), terete, medium green, drying brown; *spathe* to 10 cm long, light green; *spadix* lost, described as dark purple. INFRUCTESCENCE unknown.

The species is known only from the Bajo Calima region, occurring in *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 150 m, in regrowth and primary forests.

*Anthurium barreranum* is a member of section *Calomystrium* Schott, and is characterized by terete petioles, small ovate-cordate, acuminate blades, free basal veins, and inflorescences borne on short peduncles with dark purple spadices. All parts of the plants are medium brown upon drying. The species is similar to several other species with deeply cordate blades with non-naked posterior ribs and with petioles more than 20 cm long. It differs from *A. pluvaticum* R. E. Schultes and *A. phyllobaris* by having glossy blades (matte in *A. pluvaticum* and *A. phyllobaris*). As a member of section *Calomystrium*, the species should be compared to two other moderately small species in that section at Bajo Calima. Both *A. fragrans* and *A. obtusifolium* differ from *A. albertiae* in having prominent posterior lobes with the basal veins united in part into a posterior rib.

The species is named in honor of Carlos Barrera, an official of Cartón de Colombia who graciously afforded the authors, Tom Croat and Dorothy Bay, the opportunity to work in the lumber concession and to use their facilities to process and dry plants.

*Anthurium barreranum* was collected in flower in July.

*Paratype.* COLOMBIA. Valle: Buenaventura–Málaga rd., km 51.3, Croat & Watt 70412 (MO).

***Anthurium bayae*** Croat, sp. nov. TYPE: Colombia.

Valle: Bajo Calima region, Buenaventura–Málaga rd., km 51.7, 16 July 1993, T. B. Croat & D. Bay 75798 (holotype, MO-4573844; isotypes, CUV, US).

Planta epiphytica; internodia 5–10 mm longa, 1–3 cm diam.; cataphylla 5.5–18 cm longa, persistentia semi-intacta; petiolus 16.5–32.5 cm, 2–4 mm diam., acute C-formatus, obtuse complanatus adaxialiter, inconspicue sulcatus, interdum inconspicue 1-costatus, hebetatus; lamina triangulari-

ovata, subcordata basi, 32.8–40 cm longa, 10–15 cm lata, leniter nitida vel hebetata supra, hebetata infra; nervis basalibus 3 ad 5 utroque, omnibus liberis ad basim; nervis lateralibus 19 ad 12 utroque; nervis collectivis 3–4 mm a marginibus, a nervis basalibus primis oriundis; pedunculus usque 8 cm longus; spatha viridis; spadix sessilis, usque 19 cm longus, hebetatus, albus; infructescencia ignota.

Epiphytic; stem short; *internodes* 5–10 mm × 1–3 cm, medium green, drying pale white; roots few per node, stout; *cataphylls* 5.5–18 cm long, persisting semi-intact, drying pale tan. LEAVES erect-spreading; *petioles* 16.5–32.5 cm × 2–4 mm (dry), sharply C-shaped, broadly flattened adaxially, faintly sulcate, sometimes with a faint medial rib, matte, light green, drying pale green; geniculum slightly swollen, 1–1.5 cm long, drying concolorous; *blades* subcoriaceous, triangular-ovate, acuminate at apex, subcordate at base, 32.8–40 × 10–15 cm, 2.5–3.5 times longer than wide, 1.1–2.1 times longer than petiole, broadest at base, upper surface weakly glossy to matte, drying semiglossy, pale green, lower surface matte, paler, drying semiglossy and barely paler than above; major veins drying concolorous and barely raised above, round-raised and white below; sinus triangular, shallow, often with nearly straight margins; *midrib* acute, barely paler above, round-raised, paler below; *primary lateral veins* 9 to 12 per side, departing midrib at a 40°–50° angle, ± straight to collective veins, narrow-raised, paler above, convex below; *basal veins* 3 to 5 per side, free to base; the innermost forming a single pair of collective veins 3–4 mm from blade margin, originating from 1st basal vein; tertiary veins reticulate, obscure. INFLORESCENCES erect; *peduncle* to 8 cm long, to 3 mm diam. (dry), shorter than petiole; *spathe* spreading, green; *spadix* sessile, cylindrical, gradually tapered, to 19 cm long, to 5 mm diam. (dry) at base, to 3 mm diam. (dry) at apex, white, matte. Flowers rhombic, 1.6–1.9 × 1.2–1.5 mm; tepals with margins exerted; stigma about 0.1 mm long, linear; thecae oval, to 0.2 mm long. INFRUCTESCENCE unknown. JUVENILE plants with blades oblong-elliptic, 5–6 times longer than broad, acute at base, becoming rounded to truncate to cordulate.

The species is known only from the Bajo Calima region, Valle, Colombia, in *Tropical wet forest* transition to *Premontane* (T-wf/P), below 150 m; it was collected in regrowth forests.

*Anthurium bayae* is a member of section *Belolochium*, and is characterized by triangular-ovate blades, basal veins that are all free to the base and not forming posterior ribs, long cataphylls persisting semi-intact, collective veins originating from the first basal vein, and long white spadices borne on short peduncles.

The species is similar to *Anthurium panamense* Croat, also occurring in the Bajo Calima region, which has pre-adult blades that could easily be confused with *A. bayae*. The former species differs, however, in having adult blades that are much larger and deeply cordate with well-developed naked posterior ribs, and deciduous cataphylls.

The species is named in honor of Dorothy Bay of Missouri Southern State University, Joplin, Missouri, who conducted her Ph.D. studies at St. Louis University on the Araceae of Bajo Calima and personally collected many of the species involved in this project, including the type specimen.

*Anthurium bayae* was collected in flower in July.

*Paratypes.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 22, Carretera Hanz, *Croat 69523* (CUVC, MO); 4.5 km W of km 28, *Bay 238* (CUVC, MO).

***Anthurium calimense*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 52.4, 14 July 1993, *T. B. Croat & D. Bay 75733* (holotype, MO-4577516; isotypes, CUVC, K, US).

Planta epiphytica, interdum terrestris; internodia 5–20 mm longa, 6–15 mm diam.; cataphylla 6–12(15) cm longa, persistentia ut reticulum fibrorum decompositorum; petiolum 4.5–12(14.5) cm longus, C- aut D-formatus, plerumque marginibus acutis, interdum 1-costatus adaxialiter, interdum fuscopunctatus; lamina elliptica aut ovata, plerumque cuneata, interdum attenuata, raro obtusa basi, (13.5)18–30 cm longa, (3.8)6–12.5 cm lata, nitida et minute nigropunctata supra, nitida et minute brunneopunctata, saepe pustulata infra; nervis lateralibus I multis; nervis collectivis I 8–15 mm a marginibus, nervis collectivis II in 1/4–1/2 parte inferiore laminae; pedunculus 13–33 cm longus; spatha 3.5–8 cm longa, virens; spadix sessilis, nitidus, 7.5–13 cm longus, canovirens, tum flavus; infructescencia 12–18 cm longa; baccae violaceorubrae.

Epiphytic or sometimes terrestrial; stem appressed-climbing; internodes short, 5–20 × 6–15 mm, drying gray-brown; roots several per node; cataphylls 6–12(15) cm long, persisting in a net-like reticulum of fibers, drying gray to light brown. LEAVES erect-spreading to spreading; petioles 4.5–12(14.5) cm × 2–5 mm (dry), C- or D-shaped, usually with sharp erect margins, often with a medial rib adaxially, weakly glossy, medium green, sometimes visibly dark-punctate, drying olive-green; geniculum 3–8 mm long, drying slightly swollen, slightly darker than petiole; blades subcoriaceous to coriaceous, elliptic to ovate, abruptly long-acuminate at apex, usually cuneate, sometimes attenuate, rarely obtuse at base, (13.5)18–30 × (3.8)6–12.5 cm, 2.2–3(3.7) times longer than wide, (1.8)2–3.1 times longer than petiole, broadest near middle, upper surface glossy to semiglossy, dark green, minutely and moderately sparsely black-

punctate, drying dull olive-brown, lower surface glossy to semiglossy, moderately paler than above, sometimes yellow-green, minutely dark brown punctate, often pustulate, drying dull or sometimes glossy, barely paler than above; midrib convex, paler above and below; primary lateral veins 12 to 16 per side, departing midrib at a 35°–45° angle, ± straight to innermost collective vein; collective veins 8–15 mm from margin, tapering slightly at apex and base, often a second collective vein in lower 1/4–1/2 of blade, drying more conspicuously raised than primary lateral veins on both surfaces; tertiary veins reticulate. INFLORESCENCES erect; peduncle 13–33 cm × 2–4 mm, longer than petiole, medium green, drying olive-green; spathe reflexed, 3.5–8 cm long, medium green, drying olive-green, acuminate at apex; spadix sessile, cylindrical, glossy, 7.5–13 cm × 3–4 mm, gray-green becoming yellow at anthesis, dark purple in fruit. Flowers usually 4-lobed or sometimes rhombic, 2.6–2.8 × 2.0–2.2 mm; tepals glossy, granular on the surface (under 10 × magnification); pistils square, 4–5 mm long and wide; stigma 2–3 mm long, linear; stamens not exerted beyond pistils. INFRUCTESCENCES 12–18 cm long, often infertile for 1–3 cm at apex; berries subglobose, to 4 mm long, violet-red; seeds 2 per berry.

The species is known only from the Bajo Calima region, occurring in *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 150 m, in regrowth and primary forests.

*Anthurium calimense* is a member of section *Porphyrochitonium* Schott, and is characterized by short petioles, which usually have sharp erect margins and a medial rib adaxially, ovate or elliptic blades that are punctate on both surfaces and pustulate on the lower surface, and especially by the glossy yellow spadices. The species is quite similar to *A. bicollectivum* Croat from Panama, which differs in having blades which are usually matte, subterete petioles that are deeply sulcate and lacking a medial rib, a spadix with matte tepals, and yellow-orange berries.

*Anthurium calimense* is named for the Bajo Calima region, throughout which it occurs.

It was collected in flower in January, February, July, August, and September, and in fruit in February, July, September, and December.

*Paratypes.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 11, *Kennedy 760* (MO), *Monsalve 188* (MO), 290 (CUVC, MO), 1075 (MO), 1193 (MO), 1444 (MO), 1616 (CUVC, MO), 1682 (MO), 1814 (MO), *Gentry 35334* (MO), *Gentry & Juncosa 40525* (MO), *Gentry et al. 40294* (MO), 53874 (CUVC, MO), 57095 (MO), *Juncosa 2124A* (MO), *Croat 69449* (CUVC, MO), 69451 (CUVC, MO), 69452 (CUVC, MO); km 14, *Croat* (CUVC, MO); km 22, Carretera Hanz, *Croat 69526* (CUVC, MO), 69538 (CUVC, MO); km 33.3, *Croat*

61301 (MO), 61356 (COL, CUVV, MO), 61382 (B, CUVV, MO), 61387 (CUVC); km 44, *Croat & Watt 70208B* (MO); km 50.7, *Croat & Bay 75674* (CUVC, MO); km 52.4, *Croat & Bay 75732* (CUVC, MO); km 65–66, *Croat* (CUVC, MO), *Devia 3046* (TULV); San Isidro, *Devia & Prado 2852* (TULV); Bahía Málaga, vic. Base Naval Málaga, along rd. to Buenaventura, ca. 1 km from base ca. km 104, *Croat & Gaskin 80460* (CUVC, MO).

***Anthurium coleorrhiza*** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 11, 14 July 1993, *T. B. Croat & D. Bay 75837A* (holotype, MO-4619383).

Planta terrestri; internodia 1–2 cm longa; cataphylla 15–24 cm longa, persistentia intacta, patentia lateraliter, radices includentia; petiolus 21–37.5 cm longus, teres aut acute C-formatus, anguste sulcatus adaxialiter; lamina ovata, subcordata basi, 18–34 cm longa, 11–22 cm lata, nitida in superficiebus ambabus, minute rubrobrunneopunctata infra; nervis basalibus 2 ad 3 utroque, omnibus liberis ad basim; nervis lateralibus I 8 ad 12 utroque; nervis collectivis 2–3 mm a marginibus, a nervis basalibus secundis aut tertiis oriundis; pedunculus 9.5–13.5 cm longus; spatha usque 9.5 cm longa, pallide viridis aut albidia; spadix 7–7.6 cm longus, pallide viridialbus, tum purpureus in fructescentia; baccae virides, tum purpureae a maturite.

Terrestrial; stem short, decumbent; *internodes* 1–2 cm long, to 1.5 cm diam.; *cataphylls* 15–24 cm long, persisting intact, reddish brown, spreading laterally and enclosing roots. LEAVES erect; *petioles* 21–37.5 cm × 3–5 mm (dry), terete or sharply C-shaped, narrowly sulcate adaxially, light green, drying reddish brown; geniculum 1–2 cm long, swollen, pale green to white; *blades* subcoriaceous, ovate, acuminate at apex, subcordate at base, 18–34 × 11–22 cm, 1.3–1.7 times longer than wide, 0.8–1(1.2) times longer than petiole, upper surface semiglossy to glossy, dark green, drying dull and medium brown, lower surface semiglossy, slightly paler than above, minutely red-brown-spotted (visible with 10 × magnification), drying glossy and paler than above; major veins drying concolorous, barely raised above, dark reddish brown, prominently raised below; *midrib* narrowly convex above, convex and paler below; basal veins 2 to 3 per side, free to base; *primary lateral veins* 8 to 12 per side, departing midrib at a 40°–55° angle, gradually curving to collective veins, sunken above, convex below; interprimary veins parallel, almost as prominent as primary lateral veins; collective veins 2–3 mm from blade margin, originating from 2nd or 3rd basal vein; tertiary veins reticulate. INFLORESCENCES erect; *peduncle* 9.5–13.5 cm × 2–3 mm (dry), pale green to white; *spathe* to 9.5 cm long, long-acuminate, erect at anthesis, pale green to white; *spadix* 7–7.6 cm × 4–6 mm (dry), cylindrical, bluntly rounded at apex, pale greenish white, becoming purple in fruit. Flowers rhombic, 1.7–

4 mm long, 1.9–2.8 mm wide. INFRUCTESCENCE erect; to 7 cm long; *berries* early-emergent, green becoming purple.

The species is known only from the Bajo Calima region in Valle and Chocó Departments, occurring in the *Tropical wet forest* transition to *Premontane* (T-wf/P) life zone, from sea level to 150 m, in regrowth and primary forests.

*Anthurium coleorrhiza* is a member of section *Calomystrum*, and is easily recognized by its long, persistent, reddish brown cataphylls, which spread laterally and enclose the roots. The specific epithet refers to this: “coleo” means sheathed and “rhiza” means root. Also characteristic are slender petioles usually longer than the blades, subcordate ovate blades that are minutely red-brown-spotted (under 10 × magnification), and the blunt white spadices with pale greenish white spathes.

The species is somewhat similar to *A. holquinianum* (described below), also found in the Bajo Calima region, which differs in having cataphylls that become fibrous and remain close to the stem upon drying, shorter petioles, blades that are slightly more elongate and longer than the petioles, and are matte and lacking spots on the lower surface.

*Anthurium coleorrhiza* was collected in flower in April (Chocó) and in fruit in February (Valle).

*Paratypes*. COLOMBIA. **Chocó**: Quibdó–Lloro rd., about 1 km S of ferry over Río Atrato, *Croat 55982* (CUVC, MO); Quibdó–Istmina rd., S of Río Rancherita, km 31–32, *Croat 57363* (CUVC, MO). **Valle**: Buenaventura–Málaga rd., km 9, *Croat 70122A* (CUVC, MO); km 18, *Croat* (CUVC, MO); km 44, *Croat & Watt 70202* (CUVC, MO).

***Anthurium cordobense*** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 50.7, 12 July 1993, *T. B. Croat & D. Bay 75683* (holotype, MO-4572417; isotypes, CUVV, US).

Planta epiphytica; internodia brevia, usque 3 cm diam.; radices ramosissimae, formantes massam densam; cataphylla usque 8 cm longa, persistentia ut fibrae decompositae; petiolus 3.3–15 (19) cm longus, obtuse sulcatus adaxialiter, anguste rotundatus abaxialiter; lamina anguste obovata, obtusa basi, 26–47.5 cm longa, 7–15 cm lata, latissima ultra medium, nitida et obscure punctata supra, leniter nitida, minute fuscopunctata infra; nervis lateralibus I 17 ad 20 utroque; nervis collectivis I 4–6 mm a marginibus, interdum nervis collectivis II in inferiore 1/10–1/5 laminae; pedunculus 23–40 cm longus; spatha 4.5–8 cm longa, plerumque viridis, interdum rubella; spadix sessilis, 9.5–21 cm longus, aureus vel aurantiacus; infructescentia usque 22 cm longa; baccae aurantiacae.

Epiphytic; stem short; *internodes* to 3 cm diam.; roots highly branching, forming a dense mass;

*cataphylls* to 8 cm long, persisting as weathered fibers, drying brown. LEAVES erect-spreading; *petioles* 3.3–15(19) cm × 4–8 mm (dry), D-shaped, obtusely sulcate adaxially, narrow-rounded abaxially, medium green; geniculum to 2.5 cm long, drying darker than petiole; *blades* moderately coriaceous, narrowly obovate, short-acuminate to abruptly short-acuminate at apex, usually obtuse, sometimes attenuate at base, 26–47.5 × 7–15 cm, (2.7)3.1–4.4 times longer than wide, (2.9–3.6)5.4–11 times longer than petiole, broadest beyond middle, upper surface semiglossy, dark green, obscurely punctate, drying dull and light brown, lower surface weakly glossy to matte, paler than above, minutely dark-punctate, drying semiglossy and paler; *midrib* convex and concolorous above, convex and paler below; *primary lateral veins* 17 to 20 per side, departing midrib at a 60°–70° angle, straight to collective veins, sunken above, raised below, drying slightly raised above, raised and darker than surface below; innermost collective veins 4–6 mm from margin, sometimes forming a second collective vein in the basal 1/10–1/5 of the blade; tertiary veins reticulate, less conspicuous than primary lateral veins. INFLORESCENCES pendent; *peduncle* 23–40 cm × 1–3 mm (dry), shorter than petiole, green, drying yellowish brown to reddish brown; *spathe* spreading to reflexed, 4.5–8 cm long, usually green, sometimes reddish, drying olive-green to reddish brown; *spadix* sessile, cylindrical, 9.5–21 cm × 3–7 mm (dry), golden yellow to reddish orange. Flowers rhombic, 2.6–3.3 × 1.8–2.4 mm; *pistils* to 1.5 × 0.8 mm; stigma ca. 0.6 mm long, oval; thecae ovoid, 2–3 mm long. INFRACTESCENCE to 22 cm long; *berries* orange.

The species ranges along the Pacific slopes of Colombia from the Río San Juan in the Chocó Department to the lower Río Mira in the Nariño Department. It occurs in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 200 m. In the Bajo Calima region it was collected in primary forest and from older regrowth forests, usually close to streams.

*Anthurium cordobense* is a member of section *Porphyrochitonium* and is distinguished by its large root mass, narrowly obovate blades, short obtusely sulcate petioles, and yellow-orange spadices with orange berries.

*Anthurium cordobense* is quite similar to *A. filiforme* Engler, which also occurs at Bajo Calima, and differs in having more slender roots, smaller parts, shorter petioles and spadices, and no punctations on the upper surface of the blade.

Another species that is similar to *A. cordobense* is *A. ramonense* Engler ex K. Krause, a species that ranges

from Nicaragua to Colombia, which differs in having longer petioles, peduncles, and spadices, blades elliptic with attenuate bases, and red to purple berries.

Also similar to *A. cordobense* is *A. rodrigueziae* Croat, from Pichincha Province in central Ecuador, which differs in having leaf blades with obvious punctations on the upper surface, less conspicuous primary lateral veins, and purple or violet-spotted petioles and peduncles.

An undetermined specimen, *Croat 70296A* from the Bajo Calima region, differs in having a longer petiole and blade, as well as a spadix which is nearly 70 cm long, and was described as tan in life rather than yellow or orange. *Anthurium cordobense* is named for the village of Córdoba in Valle Department, where the earliest collection was made.

*Anthurium cordobense* was collected in flower in the Bajo Calima region in February, May, July, and November, and in fruit in April.

*Paratypes.* COLOMBIA. **Chocó:** jct. of Río Condoto and Río San Juan, *Killip 35088* (US); Corcovado Region, upper Río San Juan, Yeracui Valley, *Killip 35237* (COL); Río San Juan, *Forero et al. 9508* (MO); Tutunendo–Icho hwy., 60 m, *Juncosa 1217* (MO). **Nariño:** Río Timbiquí, *Lehmann 869* (K); Gorgona Island, “*St. George*” Expedition 321 (K); 564 (K); Río Mira, *Kennedy 195* (DUKE). **Valle:** Buenaventura–Málaga rd., km 11, *van Rooden et al. 407* (MO); *Monsalve 999* (CUVC, MO); km 18, *Croat 61355* (CUVC, MO); km 37, *Croat 69386* (CUVC); km 42–43, *Croat & Watt 70296* (CUVC, MO); km 49, *Croat & Bay 75829* (CUVC, MO); km 50.5, *Croat & Watt 70330* (CUVC, MO); Córdoba, *Killip 5110* (NY); La Trojita, *Cuatrecasas 16479A* (VALLE); Quebrada La Sierpe, near Palestina, *Forero et al. 3972* (MO); Buenaventura Bay, mangrove thickets along coast, *Killip 5232* (G, NY), *11758* (NY); Río Cajambre, Quebrada del Corosal, *Cuatrecasas 17727* (F); vic. of Bahía Málaga, near Base Naval Málaga, along trail along the edge of the bay W of base headquarters, *Croat & Gaskin 80582* (CUVC, MO), *80582A* (CUVC, MO).

#### *Anthurium cylindratum* Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 33.3, 6 July 1986, *T. B. Croat 61294* (holotype, MO-3434992; isotypes, CUVC, US).

Planta epiphytica; internodia brevia, usque 3 cm diam.; cataphylla persistentia fibrae tenuae decompositae; petiolus 35–37 cm longus, teres; lamina ovata, subcordata basi, 34.5–36 cm longa, 20–21.5 cm lata, subnitida supra, subnitida, minute nigropunctata infra; nervis lateralibus I 14 ad 16 utroque; nervis intralateralibus paene tam prominentibus quam nervis lateralibus I; nervis collectivis I 1.8–2.5 cm a marginibus a basi; 7–8 mm a marginibus in parte superiore; nervis collectivis II 5–10 mm a marginibus nonnisi a basi; pedunculus usque 10.5 cm longus; spathe usque 4.5 cm longa; spadix sessilis, cylindricus, hebetatus, usque 15 cm longus, pallide virens; infructescencia ignota.

Epiphytic; stem short; *internodes* short, to 3 cm diam.; *cataphylls* persisting as thin fibers, reddish brown. LEAVES erect to spreading; *petioles* 35–37 cm × 4–6 mm (dry), terete, stiff, light green, drying pale tan; geniculum 1.5–2 cm long, drying dark brown; *blades* coriaceous, ovate, obtuse-apiculate at apex, subcordate at base, 34.5–36 × 20–21.5 cm, 1.6–1.8 times longer than wide, 0.9–1 times longer than petiole, upper surface semiglossy, moderately bicolorous, drying dull and pale tan, lower surface semiglossy, minutely black-punctate, punctations infrequent, drying semiglossy and barely paler than above; major veins drying concolorous on both sides, slightly raised above, prominently raised below; *midrib* convex, paler on both sides; *primary lateral veins* 14 to 16 per side, departing *midrib* at a 55°–65° angle, gradually curving to collective veins; interprimary veins nearly as prominent as primary lateral veins; collective veins 1.8–2.5 cm from blade margin in lower 1/4 of blade, 7–8 mm from blade margin in upper 3/4 of blade, second collective vein 5–10 mm from blade margin in basal lobes; tertiary veins obscure. INFLORESCENCE spreading; *peduncle* 10.5 cm × 3–4 mm (dry); *spathe* reflexed, 4.5 cm long; *spadix* cylindrical, matte, to 15 cm long, pale to medium green, drying golden tan. Flowers square to rhombic, 2.2–2.7 × 2.0–2.4 mm; stigma linear, 0.1–0.2 mm long. INFRUCTESCENCE unknown.

The species is known only from the Bajo Calima region in the Valle Department, occurring in the *Tropical wet forest* transition to *Premontane* (T-wf/P) life zone, from sea level to about 100 m. It was collected in primary forest and near the Río Calima.

*Anthurium cylindratum* is a member of section *Porphyrochitonium* and is characterized by terete petioles, subcordate ovate blades which are minutely black-punctate on the lower surface, and stout, light green, cylindrical spadices (hence the name “cylindratum”).

The species is closest to *Anthurium caucanum* Engler var. *maximum* Engler in terms of its blade shape and glandular punctations, but that taxon has proportionately more elongated, dark reddish brown-drying blades that are more conspicuously glandular-punctate, and a much longer, more slender spadix. In addition, it occurs at 450–2256 m elevation.

It was collected in flower in June and July.

*Paratype*. COLOMBIA. **Valle**: La Granja Agroforestal, Cabrera 16225 (CUVC).

***Anthurium fragrans*** Croat & Bay, sp. nov. TYPE:

Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 50.7, 12 July 1993, T. B.

Croat & D. Bay 75699 (holotype, MO-4575787; isotypes, B, CAS, COL, CUVC, F, K, NY, PMA, QCNE, US, VEN).

Planta epiphytica aut terrestris; internodia 1–6(10) cm longa, 0.5–3 cm diam.; cataphylla 11–30 cm longa, persistentia intacta basi aut fibrae tenuis; petiolus 33–68.5 cm longus, teres, anguste sulcatus; lamina ovata, cordata basi, 34–61 cm longa, 12–34 cm lata, subnitida, subbullata supra; sinus plerumque hippocrepiformis; nervis basalibus 5 ad 6 utroque; nervis lateralibus I 8 ad 13 utroque; nervis collectivis 3–5 mm a marginibus in dimidio inferiore laminae usque 1–3 mm a marginibus in dimidio superiore laminae, a nervis basalibus quintis aut sextis oriundis; pedunculus 21–42 cm longus; spatha 8–15.3 cm longa, 1.5–4 cm lata, plerumque viridis vel flavoviridis; spadix stipitatus usque 1–2 cm, 8–15 cm longus, albocanis, tum lavendulus; baccae purpureoviolaceae.

Epiphytic or terrestrial; stem short or scandent; *internodes* 1–6(10) × 0.5–3 cm, semiglossy, medium green, drying medium brown; roots few per node; *cataphylls* 11–30 cm long, persisting at bases or as short thin fibers, drying dark brown. LEAVES erect; *petioles* 33–68.5 cm × 3–9 mm (dry), terete, weakly and narrowly sulcate, sometimes obtusely flattened adaxially, semiglossy, medium green, drying light brown; geniculum swollen, paler than petiole, 1–1.5 cm long, drying slightly swollen, dark brown; *blades* subcoriaceous, ovate, abruptly acuminate at apex, deeply cordate at base, 34–61 × 12–34 cm, 1.6–2.2(2.9) times longer than wide, 0.8–1.1 times longer than petiole, broadest below middle; anterior lobe 26–48 × 12–34 cm, 2.6–3.6 times longer than posterior lobes; posterior lobes 8–14.5 × 6–17.5 cm, rounded at apex; sinus hippocrepiform or sometimes spatulate to parabolic, 5–13.5 cm deep; upper surface semiglossy to glossy, somewhat bullate, dark green, drying semiglossy and olive-green to olive-brown, lower surface glossy, paler, drying glossy and paler than above; *midrib* narrowly raised, paler above, acute and paler below, drying concolorous, acutely raised above, round-raised and darker below; *primary lateral veins* 8 to 13 per side, departing *midrib* at a 50°–60° angle, slightly curving to collective veins, narrowly raised in valleys, paler above and below, drying concolorous, flat above, prominently raised, darker below; *basal veins* 5 to 6 per side, 1st one free to base, 4 to 5 coalesced for 1.5–4.5 cm, posterior ribs naked to 5 cm; collective veins 3–5 mm from blade margin in lobes and lower 1/2 of blade, 1–3 mm from blade margin in upper 1/2 of blade, originating from 5th or 6th basal vein; tertiary veins reticulate, obscure to darker above, slightly raised below. INFLORESCENCES erect; *peduncle* 21–42 cm × 4–6 mm (dry), shorter than petiole, medium to light green, drying light olive-brown; *spathe* reflexed, 8–15.3 × 1.5–4 cm, tapered at apex, green to yellow-green,



sometimes white; *spadix* stipitate 1–2 cm, cylindrical, slightly tapered at apex, 8–15 cm × 7–10 mm (dry) near base, 4–5 mm diam. (dry) near apex, glossy, grayish white, becoming lavender to violet-purple. Flowers square, 2.2–2.4 × 2.4–2.5 mm; tepals papillose on surface, margins exerted; stigma 3–4 mm long, linear. INFRUCTESCENCE to 18 cm long; *berries* purplish violet, early-emergent.

The species is known only from the Bajo Calima region in the Valle Department, occurring in *Tropical wet forest* transition to *Premontane* (T-wf/P), below 150 m. It was collected in primary and regrowth forests.

*Anthurium fragrans* is a member of section *Calomystrium*, and is characterized by its terete, narrowly sulcate petioles, glossy, ovate-cordate, slightly bullate blades usually with a hippocrepiform sinus, and with collective veins originating from the fifth or sixth basal vein. The inflorescences have acuminate spathes and grayish white spadices, which become dark purple after anthesis. At anthesis the spadices are quite fragrant with a sweet odor similar to an Easter lily, (*Lilium longiflorum* var. *eximium* (Cortois) Baker Liliaceae) hence the name “*fragrans*.” This species is often infected with a pathogen, which causes yellow pustules to form on the surface upon drying; any or all parts of the plant may be infected. Though this condition is not restricted to *A. fragrans*, it is more severely exhibited in *A. fragrans* than any other species observed at Bajo Calima.

The glossiness and slightly bullate appearance of the blades, which lack punctations or obvious raphides even under magnification, the hippocrepiform sinus, the spathes that are more acuminate than apiculate, and the lavender spadices distinguish this species from all other section *Calomystrium* species in the Bajo Calima region.

*Croat & Bay 75723*, from Bajo Calima, appears to be *Anthurium fragrans*; however, it differs slightly in having a very narrow collective vein (1–2 mm from the blade margin throughout the blade length), a C-shaped petiole, and upon drying has obvious raphides on the upper blade surface as well as a reddish brown color. It may be a hybrid between *A. fragrans* and *A. obtusilobum* Schott, also occurring in the Bajo Calima region.

*Anthurium flavidum* N. E. Brown, a poorly known species from an unspecified location in Colombia, is quite similar to *A. fragrans*, but differs in having blades that are punctate on the lower surface.

It was collected in February, May, July, September, and October, and in fruit in May, July, and August.

*Paratypes*. COLOMBIA. **Valle**: Buenaventura–Málaga rd., km 11, *Monsalve 327* (MO), *886* (CUVC, MO), *1049*

(CUVC, MO), *3067* (CUVC), *Croat & Monsalve 61391* (CUVC, MO), *Croat 62772* (CUVC, MO), *69304* (CUVC, MO); km 22, Carretera Hanz, *Croat 69485* (CUVC, MO), *61296* (MO), *61360* (COL, GH, MO, QCNE, UB, USM); km 49, *Croat & Bay 75816* (CUVC, MEXU, MO, SEL, TEX); km 50.5, *Croat & Watt 70334* (G, HUA, MO); km 51.7, *Croat & Bay 75776* (CUVC, MO); km 55.7, *Croat 70991* (CUVC, MO); Córdoba, *Killip 5107* (NY).

***Anthurium hinoideum* Croat & Bay, sp. nov.** TYPE: Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 51.7, 16 July 1993, *T. B. Croat & D. Bay 75770* (holotype, MO-4576798; isotypes, B, COL, CUVC, K, US).

Planta terrestris, interdum epiphytica; internodia 5–30 mm longa; cataphylla 14–20 cm longa, persistentia ut fibrae pallidae a nodus superioribus; petiolus 36–108 cm longus, teres, obtuse vel anguste sulcatus adaxialiter, interdum multostriatus; lamina ovata, profunde cordata basi, 38–77 cm longa, 18.5–46 cm lata, leniter nitida vel velutina vel hebetata supra, hebetata infra; nervis basalibus 7 ad 9 utroque, 2–4 liberis ad basim; nervis lateralibus I 19 ad 37 utroque; nervis collectivis 2–5 mm a marginibus, a nervis basalibus quintis aut sextis oriundis; pedunculus 31–50 cm longus; spatha 12.5–19 cm longa, virens; spadix sessilis, 12.8–34.5 cm longus, venetus vel viridis; baccae virides (immaturae).

Terrestrial or occasionally epiphytic; stem short; *internodes* semiglossy, 5–30 × 7–30 mm, medium yellow-green, becoming light brown, drying pale tan; roots few to several per node; *cataphylls* 14–20 cm long, firm, medium green, persisting as pale fibers at upper nodes. LEAVES erect-spreading; *petioles* 36–108 cm × 5–11 mm (dry), terete, bluntly to narrowly sulcate adaxially, sometimes many-striate, matte, brittle, medium yellow-green, drying light olive-green; geniculum 1–1.5 cm long, slightly swollen, paler than petiole, drying shrivelled; *blades* subcoriaceous, ovate (juvenile blades oblong-elliptic, subcordate base), acuminate at apex, deeply cordate at base, 38–77 × 18.5–46 cm, 1.8–2.2 times longer than wide, 0.7–1.1 times longer than petiole, broadest beyond middle, upper surface weakly glossy to velvety to matte, dark green, drying semiglossy and light olive-green with numerous white raphides (visible with 10 × magnification) on both surfaces, lower surface matte, paler; anterior lobe 30–59 × 18.5–46 cm, 2.5–3.4 times longer than posterior lobes; posterior lobes 10.8–22.5 × 9.8–20.3 cm, rounded at apex; sinus spatulate to hippocrepiform, 5.5–15 cm deep; major veins drying concolorous, sunken above, paler, prominently raised below; *midrib* narrowly to acutely raised, concolorous or paler above, round-raised, paler below; basal veins 7 to 9 per side, 2 to 4 free to base, 4 to 6 coalesced to 5.5 cm, posterior ribs naked to 3.5 cm; *primary lateral veins* 19 to 37 per side, departing midrib at a 55°–65° angle, straight to collective veins, narrowly sunken

above, narrow-raised below; interprimary veins nearly equal in prominence to primary lateral veins; collective veins 2–5 mm from blade margin, originating from 5th or 6th basal vein; tertiary veins reticulate, slightly sunken above, slightly raised below. INFLORESCENCES erect to erect-spreading; *peduncle* 31–50 cm × 3–4 mm (dry), shorter than petiole, drying light olive-green; *spathe* reflexed, 12.5–19 cm long, brittle, medium green, with margins rolled under; *spadix* sessile, cylindrical, gradually tapered at apex, 12.8–34.5 cm × 4–7 mm (dry) at base, to 3 mm diam. (dry) at apex, bluish green to green. Flowers rhombic, 2.2–2.4 × 1.4–1.6 mm; thecae oval, to 0.3 × 0.3 mm; pollen white. INFRUCTESCENCE to 25 cm long; *berries* early-emergent, pointed at apex, green (immature).

*Anthurium hinoideum* is known from the Pacific Andean slopes of Colombia in the Departments of Chocó and Valle occurring in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), usually from sea level to 500 m. It was collected in primary and regrowth forests.

*Anthurium hinoideum* is a member of section *Polyneurium* and is characterized by its ovate blades that are deeply cordate at base, numerous primary lateral and interprimary veins (hence the name “hinoideum,” meaning with all primary lateral veins parallel), petioles which are equal to or nearly as long as the blades, and bluish-green spadices.

*Anthurium pulverulentum* Sodiro, a species occurring at higher elevations than Bajo Calima and in Ecuador differs from *A. hinoideum* in having blades where the anterior lobe is broadly convex and broadest mostly at the point of the petiole attachment, whereas *A. hinoideum* has blades that are proportionately more elongated with the anterior lobe straight or concave along its margin and usually broadest toward the apex. In addition, the internodes of *A. pulverulentum* are noticeably elongated and with longitudinal ribbing, whereas in *A. hinoideum* they are proportionately shorter and lack conspicuous longitudinal ribbing.

*Anthurium hinoideum* is also similar to *A. argyrostachyum* Sodiro from Ecuador, which differs in having larger and more angular basal lobes, red cataphylls, and usually occurs at high elevations (500–2300 m). *Anthurium panduriforme* Schott from Panama is also similar; however, it has orbicular basal lobes that flare outward and a golden yellow spadix.

It was collected in flower and in fruit in Valle in July and in flower in the Chocó in April.

*Paratypes.* COLOMBIA. **Chocó:** Medellín–Quibdó rd., 5.5 km E of Tutunendo, *Croat 56235* (CUVC, MO); Quibdó–Medellín rd., km 175.5, 24 km E of Tutunendo, *Croat 56322*

(MO). **Valle:** Buenaventura–Málaga rd., *Croat 70161* (CUVC, MO); km 51.3, *Croat & Wait 70382* (CUVC, MO); km 55.7, *Croat 70992A* (CUVC, MO); along old Cali–Buenaventura rd., 1.1 km S of entrance to Quereal, 52.7 km N of Agua Clara, *Croat & Bay 75578* (CUVC, MO); El Chanco, CVC Project Calima III, *Devia 1251* (MO); vic. of Bahía Málaga, Base Naval Málaga; Río Bongito, *Croat & Gaskin 80527* (CUVC, MO), *80569* (CUVC, MO).

***Anthurium holquinianum* Croat & Bay, sp. nov.**

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 11, about 100 m, 4 Aug. 1993, *D. Bay 280* (holotype, MO-4601422; isotypes, CUVC, K, US).

Planta epiphytica aut terrestris; internodia 2–13 cm longa, 8–13 mm diam.; cataphylla 15–20 cm longa, persistentia intacta a nodis superioribus, persistentia ut fibrae pallidae decompositae a nodis inferioribus cum frustris epidermidis rebrobrunnae intactis apice cataphyllorum; petiolus 11–23 cm longus, acute U-formatus; geniculum cum marginibus nonnihil undulatum; lamina ovata, subcordata vel cordata basi, 20–35.5 cm longa, 11.5–21 cm lata, subnitida vel subvelutina supra, hebetata infra; nervis omnibus atropureo-brunneis infra in sicco; nervis basalibus 3 ad 5 utroque, omnibus liberis ad basim; nervis lateralibus I 10 ad 14 utroque; nervis collectivis 4–6 mm a marginibus, a nervis basalibus primis oriundis; pedunculus 13.5–21 cm longus; spatha 6.5–14 cm longa, 10–12 mm lata, virens; spadix sessilis vel stipitatus 1–3 mm, 10–18 cm longus, cremalbus aut hinnuleus aut bubalinus, tum atrolivaceus vel vinaceus in frutescentia; baccae mature emergentes, purpureae vel vinaceae.

Epiphytic or terrestrial; stem scandent or decumbent; JUVENILE plants differ in having blades, which are ovate, rounded to truncate at the base, becoming subcordate; *internodes* semiglossy, 2–13 cm × 8–13 mm, longer than wide, yellow-green to dark brown or purple-brown, drying smooth, reddish brown; roots few per node; *cataphylls* 15–20 cm long, pale to medium green, bluntly acute at apex, persisting intact at upper nodes, weathering to pale fibers with most of apical epidermis intact at lower nodes, fibers drying pale whitish with reddish brown apical epidermis and wide paler margins. LEAVES erect-spreading; *petioles* 11–23 cm × 2–4 mm (dry), sharply U-shaped with erect margins, somewhat flattened adaxially and sulcate, medium green, drying olive-brown; geniculum 1–1.5 cm long, somewhat undulate along margins, drying darker than petiole; *blades* subcoriaceous, ovate, acuminate at apex, subcordate to cordate at base, 20–35.5 × 11.5–21 cm, 1.5–2 times longer than wide, (1.2)1.5–2(2.3) times longer than petiole, broadest below middle, upper surface semiglossy to subvelvety, dark green, drying dull, dark green to gray-green or olive-brown, lower surface matte, paler, drying glossy, paler than above; major veins drying concolorous and barely raised above, dark purplish brown and prominently raised below; *midrib* acutely

raised, paler above, round-raised, paler below; *primary lateral veins* 10 to 14 per side, departing midrib at a 45°–50° angle, curving slightly to collective veins, narrowly sunken and paler above, convex and paler below; *basal veins* 3 to 5 per side, free to base; collective veins 4–6 mm from blade margin, originating from first basal vein; tertiary veins reticulate, raised below. INFLORESCENCES erect; *peduncle* 13.5–21 cm × 2–3 mm (dry), slightly longer than petiole, medium green, drying olive-brown; *spathe* spreading to reflexed, 6.5–14 cm × 10–12 mm, acuminate, medium green, drying medium brown; *spadix* sessile to stipitate 1–3 mm, cylindrical, 10–18 cm × 4–8 mm (dry), usually cream to creamy white or tan, becoming dark olive-green to wine-red in fruit. Flowers square, 1.5–2.3 × 1.3–1.8 mm; stigma oval; thecae ellipsoid, to 3 mm long. INFRUCTESCENCE to 14 cm long; *berries* early-emergent, purple to wine-red.

The species ranges along the Pacific Andean slopes of Colombia to the Province of Esmeraldas, Ecuador, occurring in *Premontane wet forest* (P-wf), *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 530 m. In the Bajo Calima region it was collected in primary and regrowth forests.

*Anthurium holquinianum* is a member of section *Xialophyllum* Schott, and is characterized by cataphylls that weather to pale fibers with most of the epidermis remaining intact and drying reddish brown with wide pale margins, and ovate subcordate leaf blades with free basal veins and most of the veins usually drying dark purple on the lower surface. Also distinctive are the cream-colored inflorescences, which become wine-red in fruit with reddish purple berries.

*Anthurium holquinianum* is easily confused with *A. multinervium* Engler, a species from the western Andes of Colombia and also occurring in the Bajo Calima region, which differs in having blades with a more deeply cordate base, 6 to 8 basal veins, several of which are coalesced to form naked posterior ribs, collective veins originating from the fifth to seventh basal vein, and a yellow spadix.

*Croat & Watt 70455* from 270 m in the Valle Department (not within the Bajo Calima region), may also be this species; however it differs slightly in having somewhat more well-developed basal lobes.

*Anthurium holquinianum* was named in honor of Oliverio Holquin, an employee of Cartón de Colombia at Bajo Calima, who assisted our work in many ways from providing transportation to building a plant dryer.

*Anthurium holquinianum* was collected in flower in the Bajo Calima region in February, March, July, and

August and in fruit in July and August. Other Colombian material was collected in flower in April, June, and December.

*Paratypes.* COLOMBIA. **Chocó:** Medellín–Quibdó rd., 78 km W of Bolívar, *Croat 49293* (MO); Quibdó–Istmina rd., 14 km S of Quibdó, *Croat 52213* (MO); km 4, *Croat & Cogollo 52236* (MO), *52237* (MO); Quibdó–Medellín rd., 25 mi. E of Quibdó, *Croat 52302* (CUVC, MO); km 175, 24 km E of Tutunendo, *Croat 56314* (CUVC, MO); Quibdó–Las Ánimas rd., 1 km N of Las Ánimas, *Croat 55951* (MO); Las Ánimas–Pato rd., Río Pato, *Croat 56173* (MO); Quibdó, near Atrato, *Mena et al. 005* (MO); Bolívar–Quibdó rd., 44.8 mi. W of Bolívar, *Croat & Cogollo 52127* (CUVC, MO); Tadó–Istmina, 3.5 km W of bridge over Río San Juan at Tadó, 5.0 km, *Croat & Gaskin 80780* (CHOCO, COL, MO). **Nariño:** Tumaco, Alto Albí, *González 136* (MO). **Valle:** Buenaventura–Málaga rd., km 9, *Croat 70119* (CUVC, MO); km 11, *Killip & Cuatrecasas 39030* (F, US); *Croat 69312* (CUVC, MO); *Monsalve 1010* (MO); *Bay 231* (CUVC, MO), 279 (CUVC, MO); km 14, *Croat 57540* (CUVC, MO); km 18, *Croat 61317* (MO); km 31.5, *Croat & Watt 70244* (CUVC, MO); vic. of Bahía Málaga, near Base Naval Málaga, along trail along the edge of the bay W of base headquarters, *Croat & Gaskin 80573* (B, MO, VEN). ECUADOR. **Esmeraldas:** 2–4 km SE of San Lorenzo, along railroad track, 10 m, *Boom 2605* (NY).

***Anthurium isidroense*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 51.7, 16 July 1993, *T. B. Croat & D. Bay 75769* (holotype, MO-4576803; isotypes, B, COL, CUVC, K, US).

Planta epiphytica aut terrestris; internodia 3–4 cm longa, 1.5–3 cm diam.; cataphylla 14–36 cm longa, persistentia ut fibrae pallidae decompositae a nodis superioribus, decidua; petiolus 81–95 cm longus, 1–1.3 cm diam., teres vel subteres, obtuse sulcatus; lamina ovata vel late ovata, profunde cordata basi, 63–104.5 cm longa, 42–64 cm lata, nitida supra, subnitida infra; nervis basalibus 8 ad 9 utroque, 2 liberis ad basim; nervis lateralibus 1 9 ad 14 utroque; nervis collectivis 3–5 mm a marginibus, a nervis basalibus quartis aut quintis oriundis; pedunculus usque 31 cm longus; spathe 19–25 cm longa, usque 3 cm lata, pallide viridis; spadix sessilis, 16–47 cm longus, hebetatus, virens, albus, aut flavus, tum atroviolaceopurpureus; baccae virides, tum rubrae in maturitate.

Epiphytic or terrestrial; stem short; *internodes* 3–4 × 1.5–3 cm; roots several per node, reddish brown; *cataphylls* 14–36 cm long, unribbed, medium green, weathering to pale fibers, persisting at upper nodes, deciduous. LEAVES erect; *petioles* 81–95 × 1–1.3 cm (dry), terete to subterete, weakly and obtusely sulcate, semiglossy, medium green, drying smooth, reddish brown; 2–4 cm long, drying darker than petiole; *blades* subcoriaceous, ovate to broadly ovate, acuminate at apex, deeply cordate at base, 63–104.5 × 42–64 cm, 1.5–3.2 times longer than wide, 0.8–1.1 times longer than petiole, upper surface glossy, dark green, drying semiglossy and olive-green

to olive-brown, lower surface semiglossy, paler, drying glossy and barely paler than above; anterior lobe 47–75 × 42–64 cm, 2.2–2.3 times longer than posterior lobes; posterior lobes 21.5–32 × 21–30 cm; sinus hippocrepiform, 12–24.5 cm deep; major veins drying concolorous to slightly darker on both sides, barely raised above, prominently raised below; *midrib* narrow-rounded, paler above and below; *primary lateral veins* 9 to 14 per side, departing *midrib* at a 50°–60° angle, ± straight to collective veins, narrow-raised, paler above, convex, paler below; *basal veins* 8 to 9 per side, 2 free to base, 6 to 7 coalesced 9–11 cm, posterior ribs naked 9–11 cm; collective veins 3–5 mm from blade margin, originating from 4th or 5th basal veins; tertiary veins reticulate, drying raised below. INFLORESCENCES spreading-erect; *peduncle* to 31 cm long, to 5 mm diam. (dry), medium green, drying dark brown; *spathe* spreading, 19–25 cm long, to 3 cm wide, acuminate, pale green; *spadix* sessile, cylindrical, slightly tapered toward apex, 16–47 cm long, to 9 mm diam. (dry) near base, to 5 mm diam. (dry) near apex, matte, medium green, white, or yellow, becoming dark violet-purple at anthesis, often drying blackened. Flowers rhombic, 1.8–2.3 mm long, to 1.3 mm wide; thecae ellipsoid, to 3 mm long. INFRUCTESCENCE 32–69 cm long; *berries* pointed at apex, green becoming red at maturity.

The species is known only from the Bajo Calima region in *Tropical wet forest* transition to *Premontane* (T-wf/P), up to 150 m. *Anthurium isidroense* was collected in older regrowth and primary forests.

*Anthurium isidroense* is a member of section *Polynurium*, characterized by large, glossy, deeply cordate blades with a hippocrepiform sinus, long terete petioles, long deciduous cataphylls, and dark violet-purple inflorescences. The species is most easily confused with *A. dolichostachyum* Sodiro, but that species differs in having the cataphylls thin and deciduous and the spathe thin and promptly deciduous. It also resembles *A. ravenii* Croat & Baker, but that species differs in having the cataphylls mostly deciduous, a cylindroid spadix with much smaller flowers, and stamens that emerge promptly throughout the entire spadix. One of the first collections was from near San Isidro, hence the species epithet.

*Anthurium isidroense* was collected in flower in January, March, July, and December, and in fruit in January, March, July, August, September, and December.

*Paratypes*. COLOMBIA. **Valle**: Buenaventura–Málaga rd., km 11, *Monsalve 345* (CUVC), *931* (CUVC, MO), *1096* (CUVC, MO), *1695* (CUVC, MO); km 33.3, *Croat 61385*

(CUVC, F, G, HUA, JAUM, MO, VEN); km 37, *Croat 69383* (CUVC); km 51.3, *71018* (MO, NY); Dindo area, *Gentry et al. 53754* (MO); near San Isidro, *Gentry 35462* (MO, NY); Palestina, 5 m, *Foreiro et al. 4065* (MO); vic. of Bahía Málaga, Base Naval Málaga, Río Bongito, *Croat & Gaskin 80525* (CUVC, GH, MO, NY).

***Anthurium joaquinense*** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 11, Pulpapel Camp, ca. 100 m, 4 July 1986, T. B. Croat 62782 (holotype, MO-3431997; isotypes, B, COL, CUVC, K, US).

Planta plerumque terrestris, raro epiphytica; internodia brevia, 1–2.5 cm diam.; cataphylla 7–10 cm longa, persistentia ut fibrae porphyreae decompositae; petiolus (12)23–46 cm longus, teres, interdum anguste sulcatus adaxialiter, virens, interdum purpureus atroviridiguttatus; lamina oblongo-elliptica vel ovata, attenuata vel cuneata basi, (27.5)30.5–47.5(53) cm longa, 6.6–14.5(20) cm lata, hebetata in superficiebus ambabus, minute sparsimque fuscopunctata supra, minute fuscopunctata infra; nervis lateralibus I 17 ad 27 utroque; nervis collectivis I pro maxima parte 4–12 mm a marginibus, nervis collectivis II marginalibus; pedunculus 18–37(50) cm longus, virens aut purpurascens, interdum viridiguttatus; spatha 4–8.2 cm longa, 7–13 mm lata, virens; spadix sessilis, 6.3–11.5 cm longus, nitidus, virellus, tum flavus vel cremalbus sub anthesi, tum olivaceus, purpureus in fructescentia; infructescentia erecta; baccae maroninae vel purpureae.

Usually terrestrial, rarely epiphytic; stem short; *internodes* short, 1–2.5 cm diam.; *cataphylls* 7–10 cm long, weathering to reddish brown fibers, often with pieces of reddish brown epidermis attached, persistent. LEAVES erect-spreading; *petioles* (12)23–46 cm × 4–6 mm (dry), semiglossy, terete, sometimes narrowly sulcate adaxially, medium green, sometimes purple with dark green speckles, drying light olive-green; geniculum swollen, 1–2.2 cm long, drying dark brown; *blades* moderately coriaceous, oblong-elliptic to ovate, abruptly long-acuminate at apex, attenuate to cuneate at base, (27.5)30.5–47.5(53) × 6.6–14.5(20) cm, 2.4–4.5(5) times longer than wide, 0.9–1.5(2.3) times longer than petiole, broadest near middle or slightly below, upper surface matte, dark green, minutely and sparsely dark-punctate, drying dull, light olive-green or sometimes slightly yellowish green, lower surface matte, paler than above, minutely dark-punctate, drying slightly semiglossy, paler than above, sometimes yellowish green; *midrib* convex, paler than surface above, bluntly acute, paler than surface below; *primary lateral veins* 20 to 34 per side, departing *midrib* at a 55°–60° angle, curving slightly to collective veins, weakly sunken above, raised, darker below; collective veins 4–12 mm from margin at base, tapering to 2–3 mm from margin near apex, 2nd collective vein marginal, more deeply sunken than primary lateral

veins above, prominently raised below; tertiary veins reticulate. INFLORESCENCES erect; *peduncle* 18–37(50) cm × 3–5 mm (dry), medium green or purple, sometimes green-speckled, drying olive-green or olive-brown; *spathe* erect-spreading, 4–8.2 cm × 7–13 mm, acute at apex, medium green, drying light olive-green; *spadix* sessile, cylindrical, barely tapering toward apex, 6.3–11.5 cm long, to 7 mm diam. (dry), glossy, green pre-anthesis, becoming yellow to creamy white at anthesis, becoming olive-green to purple in fruit; drying medium to dark golden brown. Flowers rhombic; stigma to 3 mm long, linear; anthers barely raised above tepals; thecae ovoid. INFRUCTIONS erect; *berries* obovoid, to 4 mm long, maroon to purple.

*Anthurium joaquinense* ranges along the Pacific Andean slopes of Colombia in the Departments of Chocó and Valle, in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), with most collections made from below 150 m, but two collections are from 850 m and 1430 m. At Bajo Calima it has usually been collected in areas of early regrowth forests, but also occurs in older regrowth forests and occasionally in primary forest.

*Anthurium joaquinense* is a member of section *Porphyrochitonium*, and is characterized by oblong-elliptic to ovate blades that are matte on both surfaces, terete petioles that are narrowly sulcate, a geniculum markedly swollen and drying dark brown, and cataphylls weathering to reddish brown fibers. The glossy yellow spadix is also distinctive.

*Anthurium joaquinense* is quite similar to *A. marginellum* Sodirol, from elevations of about 100 m in Esmeraldas Province of Ecuador, and *A. aureum* Engler, which occurs at 1200–1700 m in the Frontino region, Antioquia Department, Colombia. Both of the latter species, however, differ in having blades that are glossy on both surfaces, and innermost collective veins that are very near the margin from base to apex. In addition, *A. marginellum* has a reddish brown spadix and spathe that apparently is reflexed at anthesis compared to an erect-spreading spathe in *A. joaquinense*; and *A. aureum* is glandular-punctate on only the lower blade surface and has pale tan cataphyll fibers that lack any persistent pieces of epidermis.

The species most easily confused with *Anthurium joaquinense* is *A. vallense* Croat, a species ranging from Panama to Colombia and also occurring in the Bajo Calima region. However, the latter species differs in having blades that are glossy on both surfaces and proportionately longer than the petioles (1.1–3.1 times for *A. vallense* compared to 0.9–1.5 times for *A. joaquinense*), petioles that are deeply

sulcate with sharp erect margins, and longer cataphylls that dry paler brown.

*Anthurium joaquinense* is also similar to *A. magnifolium* Croat & J. Rodriguez, known only from Pichincha Province in Ecuador. These two species share similar shapes and proportions, appearing much alike especially when dry. However, the latter species differs in occurring as a trunk epiphyte, having blades that are weakly glossy below, and in having a longer spadix. When dry, the two can also be differentiated by the more profuse punctations on the upper surface of the blade of *A. magnifolium*.

*Forero et al. 3959* and *Croat 71120*, both from the Bajo Calima region, have much longer, narrower blades that dry somewhat darker than all the other collections of *Anthurium joaquinense*. Another collection, *Croat 70152* (sterile), also from the Bajo Calima region, differs in having exceedingly prominulous venation upon drying. One other sterile collection, *Croat & Watt 70290*, may be *A. joaquinense*; however, the blades dry somewhat darker, and the petiole is sharply sulcate.

Several collections (*Croat 55971, 56161, 57394, 57397*, and *Croat & Cogollo 52105*), all from the Chocó Department, may also be *Anthurium joaquinense*; however, they differ in drying much glossier on the lower blade surface, and having collective veins that are closer to the margin throughout the blade length.

*Anthurium joaquinense* is named for the Quebrada de San Joaquín, within the Bajo Calima region, where the earliest collection studied was made.

The species has been collected in flower in February, March, April, July, and September, and in fruit in February and July.

**Paratypes.** COLOMBIA. **Chocó:** Río Atrato, Samurindó, *Cuatrecasas & Llano 24107* (COL); San José del Palmar, Río Torito, *Forero et al. 7338* (MO); San José del Palmar-Cartago, La Bella, *Croat 56700* (CUVC, MO); Quibdó-Las Ánimas rd., ca. 1 km N of Las Ánimas, *Croat 55968* (CUVC, MO); Quibdó-Lloro rd., ca. 1 km S of ferry over Río Atrato, *Croat 55985* (CUVC, MO); Serranía de Baudó, Las Ánimas-Pato rd., Río Pato, *Croat 56091* (CUVC, MO), *56160* (CUVC, MO); Quibdó-Istmina, S of Río Rancherita, between km 31 and 32, *Croat 57365* (CUVC, MO); Quibdó-Bolívar, between km 175 and 176, *Croat 57514* (CUVC, MO). **Valle:** Buenaventura-Málaga rd., km 11, *Kennedy & Andrews 1316* (SEL), *1330* (SEL), *Gentry & Juncosa 40533* (COL, MO), *Monsalve 336* (MO), *62786* (MO), *69311* (CUVC, MO); km 12.5, *Croat 70152* (CUVC, MO), *70154* (CUVC, MO), *70156* (CUVC, MO); km 14, *Croat 57545* (CUVC, MO); km 22, Carretera Hanz, *Croat 69524* (CUVC, MO), *69528* (CUVC), *71120* (MO); 1 km W of Carretera Gasolina, 6 km S of Buenaventura-Málaga rd., *Croat 69410* (CUVC, MO), *69429* (CUVC, MO); Buenaventura-Málaga rd., km 50.7, *Croat & Bay 75681A* (CUVC); km 51.3, *Croat & Watt 70374* (MO); km 52.4, *Croat & Bay 75730* (CUVC, HUA, MO); km 55.7, *Croat 70993* (MO, NY); between km 65 and 66, *Croat*

71033A (CUVC); Quebrada La Sierpe, near Palestina, *Forero et al.* 3959 (MO); rd. to Juanchaco Palmeras, *Gentry et al.* 48033 (MO); Bahía de Buenaventura, Quebrada de San Joaquín, *Cuatrecasas* 19889 (VALLE).

***Anthurium langendoenii*** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Bajo Calima region, Dindo area, 50 m, 7 Feb. 1989, *A. Gentry, A. Martínez & L. González* 65537 (holotype, MO-4064466; isotype, CUVC).

Planta epiphytica; internodia brevia, usque 2 cm diam.; radices tenues, ramosae; cataphylla 3–6 cm longa, persistentia semi-intacta ut fibrae sparsae decompositae; petiolus 4.5–15 cm longus, acute triangularis; lamina obovata, attenuata basi, 28–35.5 cm longa, 9.5–15.4 cm lata, fuscopunctata in superficiebus ambabus; nervis lateralibus I 12 ad 13 utroque; nervis collectivis 3–5 mm a marginibus tenuis apice; pedunculus 12–14.5 cm longus, viridis suffusus rubellus; spathe 3.3–4.8 cm longa, viridis; spadix sessilis, 3.6–4.5 cm longus, hebetatus, pallide flavoviridis vel cremeus; infructescentia 6.5–7 cm longa; baccae maroninae aut purpurascens.

Epiphytic; stem short; *internodes* to 2 cm diam.; roots slender, branched; *cataphylls* 3–6 cm long, weathering to sparse fibers, dark reddish brown, persisting semi-intact. LEAVES erect; *petioles* 4.5–15 cm long, ca. 5 mm diam. (dry), sharply triangular, medium green; geniculum 5–8 mm long, swollen, yellowish green, drying slightly darker than petiole; *blades* subcoriaceous, obovate, abruptly short-acuminate or obtuse-apiculate at apex, attenuate at base, 28–35.5 × 9.5–15.4 cm, 2.2–2.7(3.5) times longer than wide, (1.9)3.7–5.9(6.7) times longer than petiole, broadest beyond middle, upper surface weakly glossy, dark green, dark punctate with moderately large punctations, drying semiglossy and dark brown, lower surface semiglossy, paler than above, dark punctate with moderately large punctations, drying glossy and paler than above; *midrib* convex, paler above, acutely angular, paler below, drying darker than surface on both sides; *primary lateral veins* 12 to 13 per side, departing midrib at a 45°–55° angle, straight to collective veins, sunken above, convex below, drying barely visible above, raised and darker than surface below; innermost collective veins evenly 3–5 mm from margin, meeting midrib at apex, drying equal to primary lateral veins; tertiary veins reticulate, less conspicuous than major veins. INFLORESCENCES erect; *peduncle* 12–14.5 cm × 2–4 mm (dry), longer than petiole, green tinged red, drying reddish brown; *spathe* spreading to reflexed, 3.3–4.8 cm long, obtuse-apiculate at apex, green; *spadix* sessile, cylindrical, 3.6–4.5 cm long (6.5–8 cm long in Ecuador), 4–5 mm diam. (dry), matte, pale yellow-green to cream. Flowers square, to 2 mm long and wide; tepals granular; stigma 0.2–0.3 mm long, linear. INFRUC-

TESCENCE erect, 6.5–7 cm × 12–20 mm (dry); *berries* maroon or purple; seeds 8 per berry.

The species is known from the Pacific coast of the Departments of Chocó and Valle, and in Colombia the Provinces of Esmeraldas and Cotopaxi, Ecuador, occurring in *Tropical wet forest* (T-wf) and *Tropical wet forest* transition to *Premontane* (T-wf/P) below 150 m in Colombia, to 250 m in the Province of Esmeraldas, and up to 750 m in the Province of Cotopaxi.

*Anthurium langendoenii* is a member of section *Porphyrochitonium*, and is characterized by obovate blades with 12 to 13 distinct primary lateral veins, drying dark brown, petioles that are short and sharply triangular, and small pale yellow-green spadices with purple berries.

*Anthurium langendoenii* is somewhat similar to *A. quinquesulcatum* Sodiro, from Ecuador, which differs in having petioles with five ribs. Material from the Province of Cotopaxi, Ecuador, differs slightly in having blades that are acuminate rather than short acuminate or obtuse-apiculate. *MacDougal & Betancur* 4100 and *Betancur et al.* 895, specimens representing some unknown species, both collected near Amalfi in the Antioquia Department, are remarkably similar to *A. langendoenii*. They differ, however, in having elliptic blades that are widest near the middle or below, long petioles (to 29 cm long), and very long peduncles (up to 48 cm long).

*Anthurium langendoenii* is named in honor of Donald Faber-Langendoen, who collected the species in the Bajo Calima region, and also conducted research on the effects of the methods of lumber extraction employed by Cartón de Colombia at Bajo Calima.

In the Bajo Calima region it was collected in areas of regrowth forests in flower in February, and in fruit in February and April.

*Paratypes*. COLOMBIA. **Chocó**: Río Mecana, about 10 km E of Mecana, *Gentry & Juncosa* 41094 (COL, MO). **Valle**: Buenaventura–Málaga rd., km 11, *Gentry & Juncosa* 40528 (MO); km 22, Carretera Hanz, *Croat* 71095 (CUVC, MO); km 37, *Croat & Gaskin* 79787 (CUVC, MO); km 40, *Croat* 70165A (MO); km 44, *Croat & Watt* 70180 (MO); Dindo, *Gentry et al.* 56756 (MO). ECUADOR. **Cotopaxi**: Tenefuerste, Río Pilalo, km 52–53, Quevedo, Latacunga, *Dodson & Gentry* 12796 (MO, SEL); *Dodson & Gentry* 12923 (MO). **Esmeraldas**: San Lorenzo, Res. Etnica Awá, Alto Tambo, Río Mira, *Aulestia & Aulestia* 1235 (MO).

***Anthurium lautum*** Croat & Bay, sp. nov. TYPE:

Colombia. Valle: Buenaventura–Málaga rd., km 49, 17 July 1993, *T. B. Croat & D. Bay* 75815 (holotype, MO-0573841; isotypes, CUVC, K, US).

Planta terrestris aut epiphytica; internodia brevia, 6–30 mm diam.; cataphylla usque 7 cm longa, persistentia semi-intacta a nodis superioribus, ut fibrae tenuae decompositae a nodis inferioribus; petiolus 15.5–47.5 cm longus, teres vel subteres, interdum obtuse complanatus, anguste sulcatus adaxialiter; lamina ovata, profunde cordata basi, 27–69 cm longa, 11.5–35 cm lata, nitida, bullata supra, subnitida infra; nervis basalibus 6 ad 8 utroque, 1 ad 2 liberis ad basim; nervis lateralibus 1 7 ad 9 utroque; nervis collectivis 2–3 mm a marginibus, a nervis basalibus primis oriundis; pedunculus usque 3 cm longus; spatha usque 8 cm longa, pallide viridis; spadix sessilis, usque 10.5 cm longus, hebetatus, cremalbus; infructescencia ignota.

Terrestrial or epiphytic; juvenile plants similar to adults; adult stems short, scandent; *internodes* 6–30 mm diam., semiglossy, dark green; *cataphylls* to 7 cm long, persisting semi-intact at upper nodes, weathering to thin fibers at lower nodes, drying light reddish brown. LEAVES erect; *petioles* 15.5–47.5 cm × 2–4 mm (dry), terete to subterete, sometimes obtusely flattened and narrowly sulcate adaxially, semiglossy, medium green, firm, flexible, drying pale green; geniculum swollen, 1–2 cm long; *blades* subcoriaceous, ovate, acuminate at apex, deeply cordate at base, 27–69 × 11.5–35 cm, 1.9–2.3 times longer than wide, 1.1–1.7 times longer than petiole, broadest near middle, upper surface glossy to semiglossy, somewhat bullate, dark green, drying semiglossy, medium green, lower surface semiglossy, paler, drying glossy, paler than above; anterior lobe 30–48 × 11.5–35 cm, 2.2–2.6 times longer than posterior lobes; posterior lobes 11.5–21.5 × 10–17 cm, rounded at apex; sinus hippocrepiform, 7–21 cm deep; major veins drying concolorous, slightly raised above, pale yellow to white, prominently raised below; *midrib* narrowly convex, paler both sides; *primary lateral veins* 7 to 9 per side, 2–3.5 cm apart, departing midrib at a 50°–70° angle, curving to collective veins, deeply sunken above, narrowly raised below; *basal veins* 6 to 8, 1 to 2 free to base, 5 to 7 coalesced for 2–9 cm, posterior ribs naked 1.5–7 cm; collective veins 2–3 mm from blade margin, originating at first basal vein; tertiary veins prominent below. INFLORESCENCES erect; *peduncle* to 3 cm long, shorter than petiole; *spathe* spreading-reflexed, to 8 cm long, pale green; *spadix* sessile, cylindrical, to 10.5 cm × 3–4 mm (dry), matte, creamy white. Flowers square, 1.4–1.5 × 1.2–1.5 mm. INFRUCTESCENCE unknown.

The species is known only from the Bajo Calima region of Colombia in the Valle Department, occurring in *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to about 100 m; collected only in primary forest.

*Anthurium lautum* is a member of section *Polyneurium*, and is characterized by slender petioles, ovate blades that are deeply cordate at the base appearing somewhat quilted or puckered above, glossy and green both in life and when dry, with the collective veins originating from the first basal vein, few primary lateral veins that are rather far apart, and a hippocrepiform sinus. The species is closest in appearance in dried condition to *A. angamarcanum* Sodiro, but that species differs in having a velvety matte blade upper surface and often with the areas along the major veins on the upper surface paler than the remainder of the surface. The latter species is known principally from Ecuador, but probably also occurs in the same region as Bajo Calima at higher elevations on the eastern slope of the Cordillera Occidental near the Continental Divide on the Cali to Buenaventura highway at km 18. See Croat & Gaskin 79947.

Two sterile collections representing unknown species, *Croat 50178* from Estación Microondas Tokio in the Valle Department, and *Croat & Cogollo 52177* from 6.6 km S of Quibdó in the Chocó Department, are similar to *Anthurium lautum*, but both of the former plants differ in having somewhat wider, rounder blades that dried quite flat (therefore, may not have been puckered in life), and in having more primary lateral veins. These two collections also differ in having nearly all of basal veins joining the collective veins, a character shared with *Croat 55983* from the Chocó Department, and *Croat 61335A* from the Bajo Calima region. The latter two collections do not differ in any other way from *A. lautum*. Another collection from the Valle Department, close to Queremal (*Croat & Bay 75579*), is also quite similar to *A. lautum*, but differs in having blades that are velvety above (noticeably different under 10 × magnification), and a spadix reported as green and drying dark brownish black.

The glossy deep green blades inspired the specific epithet *lautum*, meaning appearing freshly washed or elegant.

*Anthurium lautum* has been collected in flower in July.

*Paratypes*. COLOMBIA. **Chocó**: Along road between Quibdó and Lloró, ca. 5 km S of ferry crossing over Río Atrato, 5°29'N, 76°35'W, 150 m, *Croat 55983* (MO). **Valle**: Buenaventura–Málaga rd., km 22, Carretera Hanz, *Croat 71064* (CUVC, MO); km 40, *Croat 70163* (CUVC, MO); km 50.5, *Croat & Watt 70335* (MO); Bahía Málaga, vic. Base Naval Málaga, along rd. to Buenaventura, ca. 1 km from base ca. km 104, *Croat & Gaskin 80465* (B, CUVC, MO); Bajo Calima, 6.3 km N of Frente La Brea, km 18 on main road, ca. 6 km SE of village of San Isidro on Río Calima; ca. 50 m, 40°02'N, 77°03'W, 7 July, 1986, *Croat 61335A*.

**Anthurium lygrum** R. E. Schultes ex Croat & Bay, sp. nov. TYPE: Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 35.2, 100 m, 15 July 1993, *T. B. Croat & D. Bay 75753* (holotype, MO-4573853; isotypes, B, COL, CUV, K, NY, US).

Planta epiphytica; internodia brevia, usque 1 cm diam.; radices crassae; cataphylla 6–7.5 cm longa, persistentia non nisi a nodis superioribus ut fibrae tenuae pallidae decompositiae; petiolus 11–26 cm longus, acute sulcatus adaxialiter, acute 3-costatus abaxialiter; lamina anguste oblongo-elliptica, acuta basi, 37–50 cm longa, 5–7.5 cm lata, nitida in superficiebus ambabus; nervis lateralibus 10 ad 12 utroque; nervis collectivis 2–8 mm a marginibus, a basi oriundis; pedunculus 14.5–28.5 cm longus, acute vel obscure 5-alatus; spatha 4–8 cm longa, viridis; spadix stipitatus 2–3 mm, 7.8–13 cm longus, hebetatus, atroviridis; baccae globosae vel ellipsoideae, 3.8–4 mm longae, virides.

Epiphytic; stem short; *internodes* short, to 1 cm diam.; roots 2 to 3 per node, stout, drying pale tan; *cataphylls* 6–7.5 cm long, weathering to scant, thin, pale fibers, persisting only at upper nodes. LEAVES erect-spreading; *petioles* 11–26 cm × 2–3 mm (dry), sharply sulcate with erect margins adaxially, sharply 3-ribbed abaxially, glossy; geniculum 5–8 mm long, drying concolorous; *blades* subcoriaceous, oblong-narrow elliptic, long-acuminate at apex, acute at base, 37–50 × 5–7.5 cm, 6–7.2(8.3) times longer than wide, 1.7–4.2 times longer than petiole, broadest near middle, upper surface glossy, blackish green, drying dull, medium green, lower surface weakly glossy, slightly paler, drying semiglossy, paler; major veins drying concolorous, barely raised above, paler, yellowish, round-raised below; *midrib* narrow-raised, concolorous above, acute, slightly paler below; *primary lateral veins* 10 to 12 per side, departing *midrib* at a 40°–60° angle, straight or curving to collective veins, sunken above, narrow-raised below; collective veins 2–8 mm from blade margin, originating at base; tertiary veins reticulate, obscure above, raised below. INFLORESCENCES erect; *peduncle* 14.5–28.5 cm × 1–2 mm (dry), longer than petiole, sharply to obscurely 5-winged, drying medium green; *spathe* reflexed, 4–8 cm long, green, acuminate; *spadix* stipitate 2–3 mm, 7.8–13 cm × 2–4 mm (dry), cylindrical, matte, dark green. Flowers rhombic, 1.8–2 × 1.3–1.5 mm; stigma round, to 0.2 mm wide. INFRACTESCENCE with *berries* early-emergent; globose to ellipsoid, 3.8–4 mm long, green.

The species is known only from the Bajo Calima region in Valle, Colombia, in *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 150 m. It was collected in primary and older regrowth forests.

*Anthurium lygrum* is a member of section *Polyneurium*, and is characterized by slender petioles,

peduncles that are 5-ribbed, dark green, glossy, oblong-narrow elliptic blades with few primary lateral veins, and dark green spadices.

*Anthurium albertiae*, also occurring in the Bajo Calima region, is similar to *A. lygrum* but differs in having blades that are often ovate-narrow elliptic, only sometimes oblong-narrow elliptic, and broadly to narrowly rounded at the base, many primary lateral veins (25 to 33, in contrast to 10 to 12 in *A. lygrum*), and subterete petioles that are sulcate adaxially.

The specific epithet *lygrum* means harmful (probably only when consumed), and was suggested by Schultes on the label of *Schultes & Villarreal 7391*.

*Anthurium lygrum* was collected in flower and in fruit in February, March, May, and July.

*Paratypes*. COLOMBIA. Valle: Buenaventura–Málaga rd., km 11, *Albert de Escobar et al. 4008* (HUA); Quebrada La Brea, *Schultes & Villarreal 7391* (US); 18 km E of Buenaventura, *Killip & García 33249* (US); Bahía Málaga, vic. Base Naval Málaga, along rd. to Buenaventura, ca. 1 km from base ca. km 104, *Croat & Gaskin 80478* (CUVC, MO).

**Anthurium malagaense** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Bajo Calima, Buenaventura–Málaga rd., km 11, 9 July 1986, *T. B. Croat & M. Monsalve 61410* (holotype, MO-3490647; isotypes, CUV, US).

Planta epiphytica aut terrestris; internodia brevia, 1–2 cm diam.; radices paucae, tenues; cataphylla 7–10 cm longa, persistentia semi-intacta; petiolus 28.5–46 cm longus, acute C- vel U-formatus, sulcatus, interdum inconspicue 1-costatus; lamina ovata, late rotundata basi, 36–44 cm longa, 14–17.5 cm lata, subnitida vel hebetata in superficiebus ambabus, brunneopunctata infra; nervis lateralibus I 14 ad 18 utroque; nervis interlateralibus paene tam prominentibus quam nervis lateralibus I; nervis collectivis I 10–15 mm a marginibus basi, 3–5 mm a marginibus apice, nervis collectivis II marginalibus; pedunculus 28–51.5 cm longus; spatha plus quam 9–12 cm longa, pallide viridis vel viridis; spadix stipitatus usque 2 mm, 17–30 cm longus, cremeoviridis vel viridis; baccae virides.

Epiphytic or terrestrial; stem short; *internodes* 1–2 cm diam.; roots few, slender; *cataphylls* 7–10 cm long, persisting semi-intact, drying reddish brown. LEAVES erect-spreading; *petioles* 28.5–46 cm × 4–5 mm (dry), sharply C- to U-shaped, sulcate, sometimes with faint medial rib adaxially, medium green, drying dark olive-green; geniculum 1–1.5 cm long, slightly swollen, paler than petiole, drying darker than petiole; *blades* coriaceous, ovate, acuminate at apex, broadly rounded at base, 36–44 × 14–17.5 cm, 2.1–2.8 times longer than wide, 0.8–1.4 times longer than petiole, broadest near middle, upper surface weakly glossy to matte, dark green, drying dull, olive-green, lower surface weakly glossy to matte, brown-punctate, paler than above,



drying semiglossy, paler; *midrib* convex, slightly paler above, convex to acutely convex, paler below; *primary lateral veins* 14 to 18 per side, departing *midrib* at a 55°–65° angle, weakly sunken above, raised below, drying concolorous on both sides, barely raised above, prominently raised below; interprimary veins nearly as prominent as primary lateral veins; collective veins 10–15 mm from blade margin at base, 6–7 mm from blade margin midway, 3–5 mm from blade margin at apex, second collective vein forming close to blade margin near base; tertiary veins reticulate, obscure both sides. INFLORESCENCES erect; *peduncle* 28–51.5 cm × 3–5 mm (dry), shorter or longer than petiole, drying olive-green to brown; *spathe* spreading to reflexed, 9–12+ cm long (all were broken off), pale green to green; *spadix* stipitate to 2 mm, cylindrical, 17–30 cm × 3–4 mm (dry), creamy green to green. Flowers rhombic, 2.5–2.6 × 1.1–1.4 mm. INFRUDESCENCE with *berries* early-emergent; berries green (immature).

The species is known only from the Bajo Calima region in Valle, Colombia, occurring in *Tropical wet forest* transition to *Premontane* (T-wf/P) below 150 m.

*Anthurium malagaense* is a member of section *Porphyrochitonium* and is characterized by ovate blades usually matte on both sides and punctate on the lower surface, petioles nearly as long as the blades, and inflorescences, spathe, and spadix green.

*Anthurium malagaense* can be confused with *A. verrucosum* and *A. wattii*; both are common in the Bajo Calima region. Both of the latter species differ from *A. malagaense* in having elliptic to ovate-elliptic blades several times longer than wide [(3.3–4.9(5.6), in contrast to 2.1–2.8 times longer than wide for *A. malagaense*], and usually longer than the petioles, and that dry glossy to semiglossy rather than matte. In addition, the latter species have spadices that are some shade of gray, yellow, or tan (except *A. wattii*, which often has a green spadix that becomes dark purple as the berries begin to emerge) and red to dark purple berries.

*Anthurium malagaense* is named for the Bahía Málaga, of the Pacific Ocean, which is surrounded by the Bajo Calima region.

*Anthurium malagaense* was collected in flower in February and July, and in fruit in February.

*Paratypes*. COLOMBIA. Valle: Buenaventura–Málaga rd., km 11, *Croat 57560* (CUVC, MO); km 18, *Croat 61316* (K, MO); km 51.3, *Croat & Watt 70375* (CUVC, MO).

***Anthurium monticola*** Engler var. ***attenuatum*** Croat & Bay, var. nov. TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 9, 3 Feb. 1990, *T. B. Croat 70122* (holotype, MO-3784810; isotypes, B, COL, CUVC, F, K, NY, PMA, US).

Haec varietas differt a varietate typica lamina angustiore, late rotundata et abrupte attenuata basi; spadice saepe aliquantum longiore.

Epiphytic or terrestrial; stem short; *internodes* to 2 cm × 1.5–3 mm, green to gray-green; roots several per node; *cataphylls* 8–9 cm long, mostly deciduous, with a few pale cataphyll fibers persisting at upper nodes. LEAVES erect; *petioles* 19.5–45(49) cm × 3–4 mm (dry), subterete, obtusely flattened adaxially, narrowly sulcate, medium green, drying olive-green to olive-brown; geniculum 5–10 mm long, swollen, paler than petiole, drying dark brown; *blades* moderately coriaceous, ovate, abruptly long-acuminate at apex, broadly rounded and abruptly attenuate at base, 19.5–39.5 × 9–20 cm, (1.7)2–2.9 times longer than wide, 0.7–1.5(1.8) times longer than petiole, upper surface semiglossy or rarely matte, dark green, drying semiglossy, olive-green to olive-brown, lower surface weakly glossy, paler, drying glossy, paler than above; major veins drying concolorous, barely raised above, darker than surface, often reddish brown, prominently raised below; *midrib* convex, slightly raised above, prominently raised, paler below; basal veins 3 to 4 per side, free to base; *primary lateral veins* 7 to 12 per side, departing *midrib* at a 35°–55° angle, curving gradually to collective veins, narrowly sunken above, convex below; collective veins 5–9 mm from blade margin, loop-connecting at primary lateral veins, originating from first basal vein; tertiary veins reticulate, moderately obscure above, slightly raised below. INFLORESCENCES erect; *peduncle* 7.5–22 cm long, shorter than petiole, terete, medium green to greenish brown, drying olive-brown; *spathe* reflexed, 4.5–11 cm long, acuminate, medium green, often tinged with purple or maroon; *spadix* sessile or stipitate to 5 mm long, cylindrical, blunt at apex, 5.5–16 cm × 4–5 mm (dry), glossy, dark purple. Flowers rhombic to square, 2.8–3.2 × 1.7–2.5 mm; tepals slightly exerted; *pistils* strongly exerted. INFRUDESCENCES erect, 6.5–16 cm long, often sterile in distal 1/3 to 1/2; *berries* early-emergent, narrowly ovate to oblong-ellipsoid, 1.2–1.7 mm long, about 8 mm diam., green becoming red.

*Anthurium monticola* ranges along the Pacific slopes of Colombia (Chocó and Valle) to Esmeraldas Province of Ecuador, in *Tropical wet forest* (T-wf), *Premontane wet forest* (P-wf), and *Tropical wet forest* transition to *Premontane* (T-rf/P), from sea level to 1200 m. The species is a member of section *Polyneurium* and has two varieties, both of which occur together at Bajo Calima. The variety *attenuatum* is newly described here. The variety *attenuatum* ranges along the Pacific Andean slopes of Colombia in the Departments of Chocó, Nariño, and Valle

occurring in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 600 m. In the Bajo Calima region it was collected in primary and regrowth forests.

*Anthurium monticola* var. *attenuatum* is characterized by ovate (pear-shaped) blades that are broadly rounded and abruptly attenuate (hence the epithet *attenuatum*) at the base, basal veins free to the base, slender petioles, deciduous cataphylls, and dark purple inflorescences borne on short peduncles. Also distinctive are the flowers with exerted tepals, strongly exerted pistils, and early-emergent green berries.

Variety *attenuatum* differs from *Anthurium monticola* var. *monticola* in having blades that are narrower, (1.7)2–2.9 times longer than wide compared to 1.2–1.8 times longer than wide in variety *monticola*, broadly rounded and abruptly attenuate at the base (compared to sub-cordate), and spadices that are often somewhat longer.

*Anthurium monticola* var. *attenuatum* was collected in flower and in fruit every month of the year in the Bajo Calima region, individual plants often bearing both an inflorescence and infructescence at the same time.

*Paratypes.* COLOMBIA. **Chocó:** Yuto–Lloro rd., *Gentry & Fallen 17835* (MO); Nóvita, N of Cerro Torrá, Camino al Alto del Oso, *Forero et al. 3197* (MO); Río Atrato, Loma del Sapo–Bocas del Guayabal, *Forero et al. 9437* (MO); Quibdó–Guayabal, *Moreno et al. 12* (MO); Quibdó–Lloro rd., ca. 1 km S of ferry over Río Atrato, *Croat 55978* (CUVC, MO); Quibdó–Yuto rd., 12 km S of Quibdó, *Croat 56256* (CUVC, MO). **Nariño:** Barbacoas, 15 km above the Río Telembi, *Hammel & Bernal 15782* (MO). **Valle:** Buenaventura–Málaga rd., km 11, *Kennedy & Andrews 1317* (SEL), *1336* (SEL), *Gentry et al. 40408* (MO), *Gentry & Juncosa 40531* (MO), *Monsalve 230* (CUVC, MO), *347* (CUVC, MO), *690* (MO), *889* (MO), *896* (MO), *1154* (CUVC), *van der Werff & Monsalve 9692* (MO), *Croat & Monsalve 61402A* (MO), *Croat 62787* (CUVC, MO), *69301* (CUVC, MO), *Bay 217* (CUVC, MO), *225* (CUVC, MO); km 11.5, *Croat & Gaskin 79775* (CUVC, MO); km 14, *Croat 57541* (CUVC, MO); km 17.5, *Croat & Bay 75644* (CUVC, MO), *Croat 61319* (MO, QCNE, USM); km 37, *Croat 69384* (CUVC, MO); km 51.7, *Croat & Bay 75786A* (CUVC, G, GH, MO, USM); Dindo, *Gentry 35645* (MO); San Isidro, *Gentry 35605* (MO); La Trojita, *Cuatrecasas 16267* (VALLE), *16548* (VALLE), *16864K* (VALLE); Córdoba, *Pittier 586* (US), *Killip 5108* (NY, US), *11803A* (GH), *Killip & García 33323* (US), *33456A* (US), *Cuatrecasas 19851* (F); Quebrada La Brea, *Schultes & Villarreal 7389* (US); El Tambo, *Cuatrecasas 21019* (F); Anchicayá, *Koie 4944* (C); Río Cajambre, *Cuatrecasas 17430* (VALLE).

***Anthurium oxyanthum*** Croat & Bay, sp. nov.

TYPE: Colombia. Valle: Buenaventura–Málaga rd., vic. of km 50.7, about 50 m, 12 July 1993, T. B. Croat & D. Bay 75673 (holotype, MO-

4572424; isotypes, B, COL, CUVC, F, K, NY, PMA, QCNE, US).

Planta epiphytica; internodia brevia, 1–3 cm diam.; radices ramosae; cataphylla 5–7 cm longa, persistentia aliquantum intacta ut reticulum decompositum; petiolus 15–28 (33) cm longus, triangularis, interdum sulcatus, 1-costatus adaxialiter; lamina elliptica, acuta vel obtusa basi, 27–35 (38) cm longa, 8–15(21) cm lata, subnitida in superficiebus ambabus, fuscopunctata infra; nervis lateralibus I 20 ad 25 utroque; nervis collectivis I 3–10 mm a marginibus, interdum nervis collectivis II in 1/5 parte inferiore laminae; pedunculus 22–43 cm longus, virens, interdum suffusus ruber; spatha 5–8 cm longa, virens, interdum aliquantum rubella; spadix sessilis, 22–30 cm longus, nitidus, virens, raro flavoviridis vel cremeus; infructescencia 22–24 cm longa, maronina aut aurantiaca; baccae clare rubrae.

Epiphytic; stem short; internodes 1–3 cm diam.; roots branched; cataphylls 5–7 cm long, weathering to a reddish brown net-like reticulum, persisting somewhat intact. LEAVES erect to erect-spreading; petioles 15–28(33) cm × 3–6 mm (dry), triangular, sometimes somewhat sulcate adaxially, sometimes with a medial rib adaxially, medium green; geniculum 1–1.5 cm long, drying darker than petiole; blades moderately coriaceous, elliptic, acuminate to obtuse-apiculate at apex, acute to obtuse at base, 27–35(38) × 8–15(21) cm, (1.8)2.2–3.5(3.7) times longer than wide, 1–1.5(1.7) times longer than petiole, upper surface usually semiglossy, sometimes glossy, lacking punctations, dark green, sometimes tinged reddish, drying semiglossy, olive-green, sometimes medium brown, lower surface semiglossy, dark brown-punctate, paler than above, drying glossy, medium brown, sometimes slightly reddish brown; midrib convex and paler than surface above, sharply acute and paler than surface below, drying concolorous and raised on both sides; primary lateral veins 20 to 25 per side, departing midrib at a 55°–65° angle, straight to innermost collective veins, weakly sunken above, convex, darker below, drying barely visible above, raised below; collective veins 3–10 mm from margin, sometimes a second collective vein present in basal 1/5 of blade; tertiary veins reticulate. INFLORESCENCES erect; peduncle 22–43 cm × 3–7 mm (dry), usually longer than petiole, medium green, sometimes slightly reddish, drying reddish brown or olive-green; spathe stiffly spreading, 5–8 cm long, coriaceous, medium green, sometimes slightly reddish, inrolled; spadix sessile, long-tapered, 22–30 cm × 8–11 mm (dry) at base, 1–3 mm diam. (dry) at apex, glossy, medium green, rarely yellow-green to cream, drying dark brown. Flowers rhombic; tepals granular, dark green, semiglossy, lateral tepals overlapping at pre-anthesis, inner margin of tepals acutely curved upward (dry); pistils early and strongly exerted, pale

green; stamens emerging above tepals; thecae obovoid, acute at apex of each pair. INFRUCTESCENCE 22–24 cm long, usually maroon, rarely reddish-orange; *berries* bright red, globose to ovoid, usually sparsely scattered in basal 1/3 of spadix.

The species ranges along the Pacific coast of Colombia in the Departments of Chocó and Valle, in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), from sea level to 150 m. In the Bajo Calima region it was collected in primary forest and regrowth forests.

*Anthurium oxyanthum* is a member of section *Porphyrochitonium*, and is easily distinguished by its elliptic leaf blades, sharply triangular petioles, and stiffly spreading spathe. The long-tapered spadix with sharply exerted pistils, tepals, and anthers is especially characteristic, giving it a “prickly” appearance, hence the name “oxyanthum” meaning having pointed flowers.

The species is similar to three other species, *A. malagaense*, *A. verrucosum*, and *A. wattii*, in having blades less than three times longer than the petioles and glandular-punctate only on the upper surface. It differs from all of these by having petioles triangular in cross section and in having prominently protruding pistils.

*Albert de Escobar & Folsom 4031*, from the Bajo Calima region, is a mixed collection having a leaf that is probably *Rhodspatha oblongata* Poeppig and an inflorescence of *Anthurium oxyanthum*.

*Anthurium oxyanthum* was collected in flower in the Bajo Calima region in January, February, March, April, June, July, and August, and in fruit in June and July. One collection from the Chocó Department was in flower in November.

*Paratypes*. COLOMBIA. Chocó: Quibdó–Lloro rd., about 1 km S of ferry over Río Atrato, *Croat 55986* (MO); Tutunendo–Icho rd., N of Tutunendo, *Juncosa 1185* (MO). Valle: Buenaventura–Málaga rd., km 11, *Albert de Escobar & Folsom 4031* (HUA), *Bay 215* (CUVC, MO), *Gentry et al. 40407* (COL, MO), *Gentry & Juncosa 40528A* (MO), *Gentry et al. 53875* (MO), *Kennedy 781* (F), *Killip & Cuatrecasas 39024* (US), *39166* (US), *Monsalve 190* (CUVC, MO), *191* (MO), *239* (MO), *1667* (MO), *3162* (CUVC), *Croat 69330* (CUVC, MO); km 14, *Croat 57535* (CUVC, MO); km 22, Carretera Hanz, *Croat 69497* (CUVC, MO), *71083* (MO), *71125* (MO); km 33.3, *Croat 61298* (CUVC, G, GH, HUA, JAUM, MO, VEN); km 40, *Croat 70165* (MO); Dindo area, *Gentry 48421* (CUVC, MO); rd. to Juanchaco Palmeras, *Gentry et al. 48003A* (MO), *48028* (CUVC), *Gentry et al. 48029* (MO); San Isidro, *Devia & Prado 2369* (TULV); La Trojita, *Cuatrecasas 16479* (VALLE); Bajo Calima, *Croat 69758* (MO); mouth of Río Naya to mouth of Río Yurumanqui, *Gentry & Juncosa 40703* (MO).

***Anthurium perviride*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Buenaventura–Málaga rd.,

4.5 km W of km 28, 3 Aug. 1993, *D. Bay 249* (holotype, MO4585216; isotypes, CUVC, K, US).

Planta epiphytica; internodia brevia, usque 1.5 cm diam.; cataphylla 5–10 cm longa, persistentia semi-intacta ut reticulum fibrorum decompositorum; petiolus 14.5–27 cm longus, acute C-formatus, sulcatus, pallide viridis; lamina ovato-elliptica, attenuata vel obtusa basi, 22.5–33 cm longa, 8.3–14.5 cm lata, velutina vel subnitida, minute sparsimque fuscopunctata supra, subnitida, minute fuscopunctata, verrucosa, saepe pustulata infra; nervis lateralibus 14 ad 16 utroque; nervis intralateralibus paene tam prominentibus quam nervis lateralibus 1; nervis collectivis 7–9 mm a marginibus; pedunculus 20.5–51 cm longus, pallide viridis, aliquantum angularis; spatha 6.5–12 cm longa, viridis, interdum suffusa rubella vel flavida; spadix sessilis, 13.5–20.3 cm longus, viridis, tum flavus vel aureus; infructescencia ignota.

Epiphytic; stem short; *internodes* to 1.5 cm diam.; *cataphylls* 5–10 cm long, persisting semi-intact, reddish brown, weathering to a net-like reticulum of fibers. LEAVES erect to spreading; *petioles* 14.5–27 cm × 3–4 mm (dry), sharply C-shaped, sulcate adaxially, pale green, drying light olive-green; geniculum 1–1.5 cm long, drying slightly darker than petiole; *blades* coriaceous, ovate-elliptic, acuminate at apex, attenuate to obtuse at base, 22.5–33 × 8.3–14.5 cm, 2.2–3 times longer than wide, 1.2–1.9 times longer than petiole, upper surface velvety to semiglossy, dark green, minutely and sparsely dark brown punctate, sometimes obscurely punctate, drying dull, light olive-green, lower surface semiglossy, paler than above, minutely dark brown-punctate, finely verrucose and often with larger pustules, drying semiglossy, pale green; *midrib* convex, paler above, sharply acute, paler below; *primary lateral veins* 14 to 16 per side, departing midrib at a 40°–50° angle, slightly curving out to collective veins, weakly to narrowly sunken above, convex to narrowly raised below, drying concolorous both sides, raised below; interprimary veins almost as prominent as primary lateral veins, drying with a stitched appearance below; collective veins 2, rarely 1 pairs 7–9 mm from blade margin; tertiary veins reticulate. INFLORESCENCES erect; *peduncle* 20.5–51 cm × 3–4 mm (dry), longer than petiole, pale green, somewhat angular, drying light tan; *spathe* spreading to reflexed, 6.5–12 cm long, green, sometimes tinged reddish or yellowish, acuminate; *spadix* sessile, gradually tapering, 13.5–20.3 cm × 6–7 mm (dry) at base, 2–3 mm diam. (dry) at apex, green becoming yellow to orange-yellow, drying light golden brown. Flowers rhombic, 3.3–4.0 × 2.0–3.2 mm; stigma oval to round; thecae ellipsoid, widely divaricate, barely emergent above tepals. INFRUCTESCENCE not seen.

The species is known only from the Bajo Calima region, in *Tropical wet forest* transition to *Premontane*

(T-wf/P), up to 150 m. In the Bajo Calima region it was collected from primary and older regrowth forests.

*Anthurium perviride* is a member of section *Porphyrochitonium*, and is characterized by cataphylls that persist in a net-like reticulum of reddish brown fiber and ovate-elliptic blades that are deep green, almost velvety on the upper surface (hence the name “perviride” meaning intensely green and dark-punctate on both sides). Also distinctive are the long, tapered, bright yellow spadices.

The species is somewhat similar to *Anthurium joaquinense*, which differs in having longer petioles, blades that are matte on both surfaces, and spadices that are short and cylindrical (i.e., not tapering).

*Anthurium perviride* is also similar to *A. sagawae* Croat, from Panama at 800 m, which differs in having a triangular petiole and spadices that are cylindrical (not tapering) and are dark brown upon drying.

*Anthurium perviride* was collected in flower in July, August, and November.

*Paratypes.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 11, *Monsalve 910* (CUVC, MO); km 33.3, *Croat 61302* (MO).

***Anthurium phyllobaris*** Croat & Bay, sp. nov. TYPE:

Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 17.5, 11 July 1993, *T. B. Croat & D. Bay 75831* (holotype, MO-4579217; isotypes, B, CUVC, US).

Planta epiphytica, interdum terrestris; internodia usque 4 cm longa, 2–4 cm diam., hebetata; cataphylla 4.5–16 cm longa, persistentia intacta in nodis superioribus, ut fibrae decompositae in nodis inferioribus, denique decidua; petiolus 28.5–57 cm longus, subteres vel D-formatus, anguste complanatus adaxialiter, interdum anguste sulcatus; lamina ovata, ovata-elliptica, vel rarius ovata-triangularis, cordata basi, 35–60 cm longa, 14.5–32 cm lata, hebetata in superficiebus ambabus; nervis basalibus 5 ad 7 utroque, 3 liberis ad basim; nervis lateralibus I 15 ad 16 utroque; nervis collectivis 4–5 mm a marginibus, a nervis basalibus quintis aut sextis oriundis; pedunculus 11–20 cm longus, olivaceus, interdum suffusus purpureus; spatha 8–9 cm longa, viridis, suffusa purpurea cum nervis atropurpureis; spadix sessilis, 10.5–15.8 cm longus, flavoviridis vel olivaceus vel violaceo-purpureus; infructescentia ignota.

Epiphytic or occasionally terrestrial; stem short; *internodes* to 4 cm long, 2–4 cm diam., matte, medium green, drying light gray; roots few per node, 2–4 mm diam. (dry), drying dark brown; *cataphylls* 4.5–16 cm long, thick, drying light gray, persisting  $\pm$  intact at upper nodes, becoming fibrous below, finally deciduous. LEAVES erect-spreading; *petioles* 28.5–57 cm  $\times$  5–9 mm (dry), subterete to D-shaped, narrowly flattened adaxially, sometimes narrowly sulcate, matte, olive-gray to pale gray-green, drying light olive-green to olive-tan; *geniculum* swollen,

slightly scurfy, 1–2 cm long, drying concolorous; *blades* subcoriaceous, ovate to ovate-elliptic rarely ovate-triangular, acuminate at apex, deeply cordate at base, 35–60  $\times$  14.5–32 cm, 1.7–2.4(3) times longer than wide, 0.7–1.2(1.9) times longer than petiole, upper surface matte, rarely velvety, with profuse druse crystals (under 40  $\times$  magnification) on both sides, dark green, drying dull, pale olive-green to pale olive-brown, lower surface matte, paler than above, drying dull, slightly paler than above; anterior lobe 31–46  $\times$  14.5–32 cm, 2.8–4.2(5.2) times longer than posterior lobes; posterior lobes 6–16.5  $\times$  6–15.2 cm, rounded at apex; sinus spatulate to obovate, 4.3–13.5 cm deep; *midrib* acutely raised and concolorous above, convex to round-raised and paler below, drying concolorous, prominently raised on both sides; *primary lateral veins* 15 to 16 per side, departing midrib at a 35°–45° angle, gradually curving to collective veins, weakly and narrowly sunken above, narrowly and prominently raised below, drying concolorous and barely raised above, paler to white and round-raised below; *basal veins* 5 to 7 per side, 3 free to base, the rest coalesced for 1–3 cm, not naked to barely naked 1–1.5 cm; collective veins 1 to 2 pairs, 4–5 mm from blade margin, originating from lower 5th or 6th basal veins; tertiary veins reticulate, obscure above, darker and raised below. INFLORESCENCES erect; *peduncle* 11–20 cm  $\times$  3–4 mm (dry), shorter than petiole, olive-green, sometimes tinged purple, drying pale yellowish tan; *spathe* reflexed, 8–9 cm long, brittle, inrolled along margins, green tinged purple with darker veins; *spadix* sessile, cylindrical, semiglossy, 10.5–15.8 cm  $\times$  5–7 mm (dry), yellow-green to olive-green, violet-purple (post-anthesis), drying green to golden tan. Flowers rhombic, 2.5–2.8  $\times$  2.4–2.7 mm; tepals glossy;  *pistils* weakly emergent; thecae ellipsoid, 0.4–0.5 mm long; pollen pale yellow. INFRUCTESCENCE unknown. JUVENILE plants differ in having elliptic-ovate blades, rounded at base, becoming cordulate.

The species is known only from the Bajo Calima region, in *Tropical wet forest* transition to *Premontane* (T-wf/P), up to 150 m. In the Bajo Calima region it was collected from primary and older regrowth forests.

*Anthurium phyllobaris* is a member of section *Belonchium* Schott emend. Engler, and is characterized by grayish, matte stems and petioles, dark green, ovate, matte blades with numerous druse crystals on both sides (visible under 40  $\times$  magnification), deciduous cataphylls, and the short-pedunculate, olive-green, glossy spadices. The specific epithet refers to the blade that is shaped like the bottom of a rowboat (“phyllo” meaning leaf and “baris” meaning a flat-bottomed boat).

*Anthurium phyllobaris* is most easily confused with *A. panamense* Croat, which also occurs in the Bajo Calima region. That species differs in having weakly ridged petioles, and blades lacking obvious druse crystals and widest well below the middle, with well-developed, naked posterior ribs.

*Anthurium phyllobaris* was collected in flower in February, March, and July.

*Paratypes.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 11, *Gentry & Juncosa 40527* (MO); km 18, *Croat 61321* (COL, CUV, HUA, K, MO, NY); km 22, Carretera Hanz, *Croat 71112* (MO); km 33.3, *Croat 61293A* (MO); km 37, *Croat 69381* (CUVC), *69382* (CUVC, MO); km 44, *Croat & Watt 70233* (MO, JAUM); 6 km S of Buenaventura–Málaga rd. on Carretera Gasolina, then 1 km W, *Croat 69421* (CUVC, MO).

***Anthurium remotum* Croat & Bay, sp. nov. TYPE:** Colombia. Valle: Buenaventura–Málaga rd., km 22, Carretera Hanz, less than 100 m, 1 Mar. 1990, *T. B. Croat 71082* (holotype, MO-3780463; isotypes, CUVC, US).

Planta epiphytica; internodia brevia, 5–14 mm diam.; cataphylla usque 9 cm longa, persistentia ut fibrae pallidae flavalbae decompositae; petiolus 14–35 cm longus, subteres, obtuse et anguste complanatus adaxialiter; lamina ovata, late obtusa ad basim, 26–35.5 cm longa, 11.5–19 cm lata, permitida in sicco; nervis basalibus 3 ad 4 utroque; nervis lateralibus 1 7 ad 8 utroque; nervis collectivis 1 a nervis basalibus primis oriundis, usque 6 cm a marginibus, nervis collectivis 2 a nervis basalibus secundis oriundis, nervis collectivis 3 a nervis basalibus tertiis oriundis; pedunculus 17.5–22.5 cm longus; spatha 4–5.3 cm longa, 1.3–1.8 mm lata, virens; spadix stipitatus 6–7 mm, 3.5–4.4 cm longus, atroviridis; baccae rubrae.

Epiphytic; stem short; internodes 5–14 mm diam.; cataphylls to 9 cm long, persisting at upper nodes as pale yellowish white fibers. LEAVES erect; petioles 14–35 cm long, moderately glossy, subterete, obtusely and narrowly flattened adaxially, drying pale olive-green; blades moderately coriaceous, ovate, elongate-acuminate at apex, broadly obtuse at base, 26–35.5 × 11.5–19 cm, 1.8–2.2 times longer than wide, 1–1.1(1.8) times longer than petiole, upper surface weakly glossy, dark green, conspicuously bicolorous, drying glossy, light olive-green, almost silvery or platinum, lower surface semiglossy, paler, drying glossy, paler than above; major veins drying concolorous, prominently raised on both surfaces; midrib bluntly acute, concolorous above, round-raised and paler below; primary lateral veins 7 to 8 per side, departing midrib at a 35°–50° angle, curving to inner collective vein, often joining reticulate veins, scarcely visible above, darker than surface and flat below; basal veins sunken above, 3 to 4 per side; inner collective veins originating from the first basal vein,

up to 6 cm from blade margin at widest point, 2.5 cm from blade margin near middle, about 1 cm from blade margin near apex, second and third collective veins originating from each of the other basal veins, joining the blade margin about halfway; tertiary veins sometimes darker than surface above. INFLORESCENCES erect; peduncle 17.5–22.5 cm × 2–3 mm (dry), drying pale olive-green; spathe reflexed, 4–5.3 cm × 1.3–1.8 mm, acuminate, medium green; spadix stipitate 6–7 mm, bluntly cylindrical, 3.5–4.4 cm × 5–7 mm (dry), semiglossy, dark green. Flowers rhombic, 1–1.7 × 0.9–1.4 mm; tepals strongly exerted; thecae oval, 0.4 × 0.4 mm. INFRUCTESCENCES with red berries.

The species is known only from the Bajo Calima region, in *Tropical wet forest* transition to *Premontane* (T-wf/P), below 150 m; it was collected in areas of older regrowth forests.

*Anthurium remotum* belongs to section *Xialophyllum* and is characterized by thick ovate leaf blades that are broadly rounded at the base and dry very glossy on the lower surface, by the subterete petioles, and particularly by several collective veins that are quite remote from the leaf blade margin and from each other (hence the name, “remotum” meaning distant). Also distinctive are the short, blunt, dark green, long-stipitate inflorescences.

*Anthurium coclense* Croat is similar to *A. remotum*, but differs in having thinner blades, widest beyond the middle, narrower near the base, and never having collective veins so remote from the blade margin. In addition, it has more primary lateral veins, no basal veins, and is a darker green upon drying.

*Monsalve 887*, from the Bajo Calima region, is very similar to *Anthurium remotum*, but differs in having longer narrower blades. It remains undetermined.

*Anthurium remotum* was collected in flower in January and March, and in fruit in January.

*Paratype.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 11, *Monsalve 2057* (CUVC, MO).

***Anthurium rubrivellus* Croat & Bay, sp. nov. TYPE:** Colombia. Valle: Bajo Calima region, Buenaventura–Málaga rd., km 35.2, 100 m, 15 July 1993, *T. B. Croat & D. Bay 75754* (holotype, MO-4573852; isotypes, B, COL, CUVC, F, K, NY, PMA, QCNE, US).

Planta epiphytica vel raro terrestris; internodia 1–4 cm longa, 1.5–4 cm lata, interdum 2–3-porcata; cataphylla 9–29 cm longa, intacta a nodis superioribus, persistentia ut fibrae pallidae grossae decompositae a nodis inferioribus; petiolus (34)47–80 cm longus, 5–12 mm diam., acute C-formatus, subcomplanatus adaxialiter, cum 2-costatis tenuis; geniculum 2–3 cm longum; lamina triangulari-ovata vel

ovata, profunde cordata basi, 43–80.5 cm longa, 14–46 cm lata, nitida supra, hebetata infra; nervis basalibus 7 ad 10 utroque, 2 ad 3 liberis ad basin; nervis lateralibus 122 ad 26 utroque; nervis collectivis 4–5 mm a marginibus, a nervis basalibus quartus aut quintus oriundis; pedunculus 13–44 cm longus; spatha 14–33.5 cm longa, viridis vel flavoviridis, suffusa purpurea; spadix sessilis, 14–38.5 cm longus, albus, tum purpureoruber; infructescencia usque 54 cm longa; baccae rubrae.

Epiphytic or rarely terrestrial; stem appressed-climbing; *internodes* 1–4 × 1.5–4 cm, unridged or sometimes 2- to 3-ridged; *cataphylls* 9–29 cm long, weakly glossy, olive-green, intact at upper nodes, weathering to pale fibers, persisting as coarse pale tan fibers at lower nodes. LEAVES erect-spreading to spreading; *petioles* (34)47–80 cm × 5–12 mm (dry), sharply C-shaped, somewhat flattened adaxially with 2 slender ribs, brittle, matte, medium green, drying olive-green to olive-brown; geniculum swollen, 2–3 cm long, drying concolorous; *blades* triangular-ovate to ovate, acuminate at apex, deeply cordate at base, 43–80.5 × 14–46 cm, 1.6–2.6(3.1) times longer than wide, 0.9–1.3 times longer than petiole, broadest near middle or slightly beyond, sometimes below middle; upper surface semiglossy to glossy, dark green, drying dull, pale green to pale olive-brown, lower surface matte, paler than above, drying dull to barely semiglossy, slightly paler than above; anterior lobe 33.5–64 × 14–46 cm, 2.6–3.1(4.8) times longer than posterior lobes; posterior lobes 11–23 × 10–21 cm, rounded at apex; sinus obovate to hippocrepiform, 11–18 cm deep; major veins drying concolorous, barely raised above, prominently round-raised and white to yellow below; *midrib* bluntly to sharply acute or convex and paler above, round-raised to convex and paler below; *primary lateral veins* 22 to 26 per side, departing midrib at a 55°–65° angle, ± straight to collective veins, weakly raised in valleys above, narrow-raised below; *basal veins* 7 to 10 per side, 2 to 3 free to base, 5 to 7 coalesced to 6 cm, naked to 6 cm; collective veins 4–5 mm from blade margin, originating from fourth or fifth basal vein; tertiary veins reticulate, sunken above, raised below. INFLORESCENCES erect-spreading; *peduncle* 13–44 cm × 5–7 mm (dry), shorter than petiole, medium green; *spathe* reflexed to spreading, 14–33.5 cm long, brittle, matte, margins and sometimes apex inrolled, green to yellow-green, tinged purple; *spadix* sessile, cylindrical, barely tapered at apex, 14–38.5 cm × 5–6 mm near base (dry), 7–13 mm diam. near apex (dry), slightly glossy, white at anthesis, becoming purplish red. Flowers rhombic, 1.6–2.1 × 1.2–1.5 mm; tepals strongly exerted in fruit; *pistils* early-emergent; stigma oval, 0.1–0.2 mm long; thecae ellipsoid, to 0.2 mm long. INFRUCTESCENCE to 54 cm long, violet-purple; *berries* red, to 1.8 mm long.

The species ranges along the Pacific coast of Colombia in the Departments of Chocó and Valle, occurring in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), below 150 m; it was collected from primary and regrowth forests.

*Anthurium rubrivellus* is a member of section *Polyneurium*, and is characterized by large triangular-ovate blades that are glossy above and matte below, long cataphylls persisting intact at the upper nodes then weathering to coarse pale fibers, and petioles that are sharply sulcate and about as long as the blades. The long inflorescences are also distinctive, having white spadices at anthesis that become violet-purple, with red berries at maturity. The small flowers with strongly exerted tepals that surround each berry give the infructescence a chenille-like appearance; the specific epithet *rubrivellus*, meaning deep red wool, refers to this.

The species is somewhat similar to *Anthurium panamense* Croat, commonly occurring in Panama and known from the Colombian Chocó Department, which differs in having deciduous cataphylls, petioles with many ridges, blades that are widest well below the middle and punctate on the lower surface, and fewer basal and primary lateral veins per side.

*Monsalve 1105*, from the Bajo Calima region, differs slightly in having somewhat smaller blades; however, it is probably this species.

*Anthurium rubrivellus* was collected in flower and in fruit in the Bajo Calima region only in July. Another collection from the Chocó Department was in flower in March.

*Paratypes*. COLOMBIA. **Chocó**: Río Iró, about 10 km S of Istmina, *Croat 57383* (CUVC, MO). **Valle**: Buenaventura–Málaga rd., km 11, *Bay 222* (CUVC, MO), *Croat & Monsalve 61403* (CUVC, MO), *Croat 62779* (CUVC, MO), *69345* (CUVC, MO); km 12.5, *Croat 70134* (MO); km 14, *Croat 57538* (CUVC, MO), *57555* (CUVC, MO); km 22, Carretera Hanz, *Croat 71124* (CUVC, MO); km 33.3, *Croat 61293* (G, GH, HUA, JAUM, MO, UB, VEN); km 51.3, *Croat & Watt 70372* (MO); 6 km S of Buenaventura–Málaga rd. on Carretera Gasolina, then 1 km W, *Croat 69425* (CUVC, MO); Juanchaco Palmeras, *Gentry et al. 48030* (CUVC, MO); Río Calima, near San Isidro, *Gentry 35602* (COL, MO); Cali–Buenaventura rd., near Sabaletas, *Croat 38572* (MO).

***Anthurium verrucosum* Croat & Bay, sp. nov.**

TYPE: Colombia. Valle: Buenaventura–Málaga rd., km 52.4, *T. B. Croat & D. Bay 75731* (holotype, MO-4577754; isotypes B, CAS, COL, CUVC, F, GH, K, NY, M, UB, US).

Planta epiphytica aut terrestris; internodia brevia, 1–2.5 cm diam.; radices 1–3 mm diam., ramosae; cataphylla 4.5–15 cm longa, persistentia ut fibrae decompositae, saepe ut reticulum; petiolus 9–38 cm longus, acute C-formatus vel

subteres, interdum inconspicue 1-costatus; lamina oblongo-elliptica vel elliptica, plerumque obtusa, interdum cuneata basi, 24–57 cm longa, 5–19 cm lata, subnitida, profuse verrucosa, interdum sparsim pustulata supra, minute sparsimque fuscopunctata, interdum cum pustulis fasciculatis infra; nervis lateralibus I 13 ad 18 utroque; nervis interlateralibus paene tam prominentibus quam nervis lateralibus I; nervis collectivis I 3–6(2.5) cm a marginibus, saepe nervis collectivis II in 1/4–1/3 parte inferiore laminae; pedunculus 19–54 cm longus, pallide viridis, interdum ruber; spatha 5–15 cm longa, nitida, virens, interdum suffusa rubella aut flavida; spadix sessilis, 9.2–26.5 cm longus, plerumque hebetatus, griseus, grisalbus, griseoviridis, flavus, cremeoflavus, flavoviridis, aut hinnuleus; infructescencia 22–30.5 cm longa; baccae rubrae vel rubraurantiacae.

Epiphytic or terrestrial; stem short; *internodes* 1–2.5 cm diam.; roots 1–3 mm diam., branched; *cataphylls* 4.5–15 cm long, persisting as weathered fibers, often in a net-like reticulum with apical epidermis intact, drying reddish brown to light tan. LEAVES erect to erect-spreading; *petioles* 9–38 cm × 3–6 mm (dry); sharply C-shaped to subterete, sharply to obtusely flattened adaxially, often narrowly to obtusely sulcate, sometimes with a faint medial rib, semiglossy, medium green, drying olive-green; geniculum to 1 cm long, swollen, drying darker than petiole; *blades* moderately coriaceous, oblong-elliptic to elliptic, long acuminate at apex, usually obtuse or sometimes cuneate at base, 24–57 × 5–19 cm, (2.7)3.3–4.5(5.4) times longer than wide, 1–2.4(2.9) times longer than petiole, broadest near middle, upper surface semiglossy, dark green, evenly and profusely verrucose (with 10 × magnification), sometimes with sparse pustules, drying dull, dark olive-brown to brown, lower surface weakly glossy, paler than above, minutely and sparsely dark-punctate, sometimes with clustered pustules, drying glossy and reddish brown; *midrib* convex to narrowly convex, paler to concolorous above, narrowly rounded to acute, paler than surface below; *primary lateral veins* 13 to 18 per side, departing midrib at a 50°–60° angle, slightly curving to innermost collective veins, sunken, drying concolorous and barely raised above, weakly raised, drying prominently raised and darker than surface below; *interprimary veins* nearly as prominent as primary lateral veins; *collective veins* 1 to 2 pairs, 3–6 mm from blade margin, on broadest blades as much as 2.5 cm from blade margin in lower 1/4 of blade, a second collective vein often forming in lower 1/4–1/3 of blade; *tertiary veins* drying raised below. INFLORESCENCES erect to spreading; *peduncle* 19–54 cm × 3–6 mm (dry), longer than petiole, terete, medium to pale green, sometimes reddish, drying dark reddish brown; *spathe* spreading to reflexed, 5–15 cm long, glossy, medium green, occasionally tinged red or yellow, lanceolate; *spadix* sessile, cylindrical, slightly tapering toward apex, 9.2–26.5 cm × 3–7 mm (dry)

at base, 2–5 mm diam. (dry) at apex, weakly glossy to matte, gray, grayish white, gray-green, yellow, creamy yellow, yellowish green, or tan. Flowers rhombic, 2.5–3 × 1.8–2 mm; tepals granular on the surface; stigma 2–3 mm long, oval; thecae ellipsoid, weakly emergent. INFRUCTESCENCE erect, 22–30.5 cm long; *berries* globose, red to red-orange.

The species is known from the Pacific coast of Colombia in the Departments of Chocó, Nariño, and Valle, and Esmeraldas Province in Ecuador, in *Tropical wet forest* (T-wf), and *Tropical wet forest* transition to *Premontane* (T-wf/P), usually at elevations below 150 m, occasionally up to 940 m. In the Bajo Calima region it was collected in primary and regrowth forests, and in coastal thickets.

*Anthurium verrucosum* is a member of section *Porphyrochitonium*, and is characterized by long cataphylls persisting in a net-like reticulum of fibers, moderately coriaceous elliptic blades that are profusely verrucose (under 10 × magnification) on the upper surface (hence the epithet *verrucosum*, meaning warty), and sparsely dark-punctate on the lower surface, drying dark olive-brown to brown, and having interprimary veins and reticulate veins that are nearly as prominent as the primary lateral veins upon drying. Also distinctive are the cylindrical, slightly tapering spadices, which are usually shades of gray, yellow, or tan, and the infructescences with globose red to red-orange berries.

*Anthurium verrucosum* is quite similar to *A. wattii*, also known in the Bajo Calima region, but *A. wattii* differs in having cataphylls that weather to semi-organized fibers (rather than in a net-like reticulum), blades that are granular on the upper surface and usually obtuse at the base, interprimary veins that are only weakly raised below, and infructescences with burgundy to purplish red berries.

Another similar species is *Anthurium fragrantissimum* Croat, known from Panama and the Pacific slopes of Colombia, which differs from *A. verrucosum* in having blades that are usually longer and narrower, with more primary lateral veins departing from the midrib at a more acute angle (about 35° compared to 50°–60° for *A. verrucosum*), and a green spadix.

*Anthurium verrucosum* was collected in flower in February, March, and July, and in fruit in January, February, May, June, July, August, and October.

*Paratypes*. COLOMBIA. **Chocó**: Río Mutata, Alto de Buey-mouth of river, *Gentry & Fallen* 17322 (MO); Trail from Tutunendo–Quibdó rd. to Tubadó, 14 km NE of Quibdó, *Gentry & Rentería* 24503A (MO); Mecana, *Juncosa* 1933 (MO); Quibdó–Las Ánimas, 1 km N of Las Ánimas, *Croat* 55971 (CUVC, MO); Quibdó–Lloro rd., 1 km S of ferry over Río Atrato, *Croat* 56013 (CUVC, MO), 56020 (CUVC, MO); Serranía de Baudó, Las Ánimas–Pato, Río Pato, 4 km SW of

Pato on property of Sr. Gutiérrez, *Croat 56162* (CUVC, MO); Las Animas–Pato rd., *Croat 56172* (CUVC, MO); Quibdó–Yuto rd., 12 km S of Quibdó, *Croat 56260* (CUVC, MO); Quibdó–Bolívar rd., km 175–176, 117–118 km E of Quibdó, *Croat 57507* (CUVC, MO). **Nariño:** Junín–Barbacoas rd., 18.1 km NE of Junín, *Croat 72452* (CUVC, MO). **Valle:** Buenaventura–Málaga rd., km 11, *Kennedy 755* (F), *Kennedy & Andrews 1338* (SEL), *Gentry et al. 40410A* (MO), *Gentry & Juncosa 40505* (COL, MO), *40529* (COL); km 12.5, *Croat 70155* (CUVC, MO); km 22, Carretera Hanz, *Croat 69529* (CUVC, MO), *69543* (CUVC, MO), *71131* (CUVC, MO); 4.5 km W of km 28, *Bay 250* (CAS, CHOCO, CUVC, F, MO); km 40, *Croat 70174* (CUVC, MO); km 42–43, *Croat & Watt 70291* (COL, HUA, JAUM, MO); km 49, *Croat & Bay 75820* (CUVC, MO), *75826* (CUVC, MO), *75827* (CUVC, G, HUA, JAUM, MO), *75828* (CUVC, MO); km 50.5, *Croat & Watt 70314* (CUVC, MO), *70336* (MO); km 50.7, *Croat & Bay 75677* (CUVC, MO), *75680* (CUVC, MO), *75681* (CUVC, MO); km 51.3, *Croat & Watt 70377* (CUVC, MO); km 51.7, *Croat & Bay 75764* (CUVC, MO, VEN); km 51.7, 16 July 1993, *Croat & Bay 75793*, (CUVC, MO); km 65–66, *Croat 71048* (CUVC, MO); Dindo, *Murphy & Mazuera 566* (COL), *Gentry & Monsalve 48449* (MO); Juanchaco Palmeras, *Gentry et al. 48028* (MO); Córdoba, *Killip 11803* (NY); Buenaventura, coastal thickets, *Killip 11724* (NY), *11743* (NY); Buenaventura Bay, mangrove swamp, *Killip 34981* (US); Río San Juan, near Palestina, *Cuatrecasas 21349* (VALLE). ECUADOR. **Esmeraldas:** San Lorenzo Canton, Reserva Etnica Awá, *C. Aulestia et al. 282* (MO).

***Anthurium wattii*** Croat & Bay, sp. nov. TYPE:

Colombia. Valle: Buenaventura–Málaga rd., km 51.3, *T. B. Croat & J. Watt 70373* (holotype, MO); isotypes, B, COL, CUVC, F, GH, HUA, K, M, TULV, NY, S, US, USB, VEN).

Planta epiphytica, interdum terrestri; internodia brevia, 1–3 cm lata; cataphylla 4–15 cm longa, ut fibrae decompositae, persistentia semi-intacta ut fibrae decompositae; petiolus 18–36(45) cm longus, acute C- vel U-formatus, plerumque inconspicue 1-costatus, virens, interdum suffusus purpureus; lamina ovata-elliptica, elliptica vel oblanceolata, plerumque attenuata, raro obtusa basi, 30.5–55(64) cm longa, 7–14(17) cm lata, leniter nitida, raro hebetata, subtiliter granularis supra, leniter nitida, interdum hebetata, minute sparsimque fuscopunctata infra; nervis lateralibus I 20 ad 25 utroque; nervis collectivis I 5–10 mm a marginibus basi, 2–4 mm a marginibus apice, nervis collectivis II propinque basim; pedunculus 16.5–39(58) cm longus, virens, raro suffusus purpureus; spatha 8–14.5 cm longa, viridis; spadix sessilis, 17–25(33) cm longus, plerumque virens, raro viridiflavus, viridibus, griseoviridis, pallide aurantiacus, aut pallide ochraceus, tum atropurpureus in fructescentia; infructescentia 22–27.5 cm longa; baccae vinaceae vel purpureorubrae.

Epiphytic or occasionally terrestrial; stem short; internodes 1–3 cm wide; cataphylls 4–15 cm long, weathering to semi-organized fibers, reddish brown, persisting semi-intact. LEAVES erect-spreading to spreading; petioles 18–36(45) cm × 3–5 mm (dry), sharply C- to U-shaped, flattened adaxially with erect margins, broadly to narrowly sulcate, usually with a faint medial rib, weakly glossy to matte, usually

medium green, rarely tinged with purple, drying dark olive-green to brown; geniculum 1–1.5 cm long, swollen, usually lighter, sometimes darker, drying thicker and darker than petiole; blades moderately coriaceous, ovate-elliptic to elliptic or oblanceolate, long-acuminate at apex, attenuate or rarely slightly obtuse at base, 30.5–55(64) × 7–14(17) cm, 3.4–4.9(5.6) times longer than wide, (1.3)1.5–2.6 times longer than petiole, broadest near middle, upper surface weakly glossy or semiglossy, rarely matte, dark green, finely granular (with 10 × magnification), drying dull olive-green to light olive-brown, lower surface weakly glossy, sometimes matte, paler than above, rarely yellow-green, with minute, sparse, dark punctations, often somewhat obscure, drying semiglossy, paler; midrib convex, usually paler, sometimes concolorous above, acute or narrowly rounded, paler below; primary lateral veins 20 to 25 per side, departing midrib at a 45°–55° angle, ± straight to collective veins, narrowly sunken above, raised below, drying obscure above, prominently raised below; interprimary veins usually weakly raised below; collective veins 5–10 mm from blade margin at base, 2–4 mm from blade margin at apex; second collective vein sometimes forming close to base of blade; tertiary veins reticulate, drying barely raised. INFLORESCENCES erect; peduncle 16.5–39(58) cm × 3–5 mm (dry), longer than petiole, medium green, rarely tinged purple, drying usually olive-green to brown; spathe erect-spreading to reflexed, 8–14.5 cm long, weakly glossy, green; spadix sessile, cylindrical, slightly tapering, 17–25(33) cm × 4–6 mm near base (dry), 3–4 mm diam. near apex (dry), weakly glossy, usually medium to dark green, rarely greenish yellow, greenish white, gray-green, pale orange, or pale golden brown (cultivated spadix), becoming dark purple in fruit. Flowers rhombic, 2.5–3.8 × 1.1–1.8 mm; surface of tepals finely granular; pistils weakly emergent; stigma oval; thecae ovoid, widely divaricate, 3–3.5 mm long; pollen white to golden yellow. INFRUCTESCENCE spreading, 22–27.5 cm long; berries burgundy to purplish red.

The species is known only from the Bajo Calima region in Valle, Colombia, in *Tropical wet forest* transition to *Premontane* (T-rf/P), below 150 m. It was collected in areas of primary or older regrowth forests.

*Anthurium wattii* is a member of section *Porphyrochitonium*, and is characterized by long cataphylls that persist as semi-organized reddish brown fibers, ovate-elliptic blades that are usually attenuate at the base, granular on the upper surface (with 10 × magnification), dark-punctate on the lower surface, drying olive-green to light brown, having interprimary veins less prominent than the primary lateral veins,



and having tertiary veins barely raised upon drying. In addition, the dark purple infructescence with burgundy berries is distinctive.

*Cuatrecasas 17266B*, from the Río Cajambre, Valle Department, Colombia, may be this species; however, it is in poor condition and the infructescence appears to have rather orange berries (dry). The collection information states only that it was epiphytic. A sterile, undetermined collection from Esmeraldas Province, Ecuador, (*Croat 72316*) may be *A. watti*.

*Anthurium watti* is quite similar to *A. verrucosum*, which differs in having cataphylls that weather to a net-like reticulum of fibers, blades that are profusely verrucose on the upper surface and usually attenuate at the base (compared to usually obtuse at the base in *A. watti*), more prominent interprimary lateral veins, and infructescences with red to red-orange berries (compared to dark purple berries in *A. watti*).

Another similar species is *Anthurium fragrantissimum* Croat, known from Panama and the Pacific Andean slopes of Colombia. It differs from *A. watti* in having blades that are not profusely verrucose on the upper surface, usually longer and narrower, with more primary lateral veins departing from the midrib at a more acute angle (about 35° compared to 45°–55° for *A. verrucosum*), and red berries.

An undetermined specimen, *Forero et al. 3880*, from the banks of Quebrada La Sierpe near Palestina, may also be this species; however, it differs in drying quite dark green, and having blades that are rather thin and very smooth on the upper surface (with 10× magnification), with many short white raphides.

*Anthurium watti* is named in honor of horticulturist Jonathan Watt, formerly of the Missouri Botanical Garden, who assisted Tom Croat on a collection expedition in 1990 when many specimens of this species were collected.

*Anthurium watti* was collected in flower in February and July, and in fruit in February, April, and July.

*Paratypes.* COLOMBIA. **Valle:** Buenaventura–Málaga rd., km 11, *Croat 69450* (CUVC, MO); km 12.5, *Croat 70153* (CUVC, MO); km 22, *Croat 69456* (CUVC, MO), *69482* (CUVC, MO), *69508* (CUVC, MO), *69531* (CUVC, MO); 1 km W of Carretera Gasolina, 6 km S of Buenaventura–Málaga rd., *Croat 69430* (CUVC, MO); km 31.5, *Croat & Watt 70238* (CUVC, MO), *70279* (MO); km 40, *Croat 70164* (CUVC, MO); km 50.5, *Croat & Watt 70332* (CUVC, MO), *70333* (CUVC, MO), *70337* (B, HUA, JAUM, MO, NY), *Croat 71011* (MO, NY); km 51.3, *Croat & Watt 70371* (CUVC, MO), *Croat 71011* (MO, NY); km 52.4, *Croat & Bay 75729* (CUVC, MO, NY, UB), *70995* (MO, QCNE); km 55.7, 27 Feb. 1990, *Croat 70992* (COL, CUVC, K, MO, US); Juanchaco Palmeras, *Gentry 48031* (CUVC, MO), *Gentry 57096* (CUVC, MO); Bajo Calima, *Gentry et al. 53877* (MO); Bahía Málaga, vic. Base Naval Málaga, along rd. to Buenaventura, ca. 1 km from base, ca. km 104, *Croat & Gaskin 80466* (CUVC, MO), *80468* (CUVC, F, MO), *80477*

(CUVC, MO), *80479* (CUVC, MO), *80480* (CUVC, F, G, GH, MO, USM, VEN); vic. of Bahía Málaga, near Base Naval Málaga, along trail along the edge of the bay W of base headquarters, *Croat & Gaskin 80572* (MO, VEN), *80593* (CUVC, MO), *80594* (AAU, MO, G, GH, QCNE, TEX, UB, USM).

***Anthurium wintersii*** Croat & Bay, sp. nov. TYPE: Colombia. Valle: Calima, region about 40 km from Pacific Ocean, 100 m, *H. F. Winters 9890* (holotype, US).

Caulis ignota; petiolus 11.5 cm longus, 2.5 mm diam.; lamina anguste-elliptica, 16.3 cm longa, 6.3 cm lata; nervis primariis lateralibus 9 ad 10 utroque; pedunculus 15.5 cm longus; spatha 4.7 cm longa, 6 mm lata; spadix viridis, sessilis, 5.5 cm longus.

Stem unknown, but presumably short with short internodes. *Petioles* 11.5 cm long, drying grayish brown, 2.5 mm diam., minutely ribbed (under magnification) with the ribs intermittent, weakly and obtusely sulcate adaxially; *blade* narrowly elliptic, 16.3 cm long, 6.3 cm wide, 2.5 times longer than wide, 1.4 times longer than petioles, weakly acuminate at apex, narrowly acute at base, drying medium gray-green and matte above, medium yellowish brown and weakly glossy below; margin drying in part closely undulate; *midrib* drying narrowly raised to acute and slightly darker above, narrowly raised, yellowish brown and ± concolorous, weakly ribbed below, sometimes acute toward the apex; *primary lateral veins* 9 to 10 pairs, arising from midrib at 35°–40° angle, scarcely more prominent than the interprimary veins, drying undulate and paler above, undulate and darker below, slightly darker than surface; collective veins, single pair arising from near the base, weakly loop-connecting the primary lateral veins and ca. 2 mm from the margins, about as prominent as the primary lateral veins; minor veins weakly raised; upper surface eglandular, lower surface minutely dark-speckled with gland-like dots 0.25 mm wide. INFLORESCENCE erect; *peduncle* 15.5 cm long, drying ca. 2 mm diam., *spathe* 4.7 cm long, 6 mm wide, spreading-reflexed, drying reddish brown, acuminate; *spadix* green, sessile, 5.5 cm long, drying 4 mm wide. Flowers rhombic, 1.4–1.8 mm long, 1.4–1.6 mm wide, 4 to 6 visible per spiral; lateral tepals 0.8–1.0 mm wide, conspicuously granular on surface, broadly rounded on inner margin, 2- to obscurely 3-sided on outer margin.

*Anthurium wintersii* is known only from the type specimen made at Calima, a small village on the Río Calima on the eastern edge of the study area at 100 m elevation. It occurs in *Tropical wet forest* transition to *Premontane* (T-wf/P), in regrowth forests.

The species is characterized by its small stature, small, elliptic, brownish-drying, weakly dark-speckled blades and apparent lack of glands typical of section *Porphyrochitonium*. It is a member of section *Calomystrium*.

Owing to its blade shape and relatively short petioles, the species resembles members of *Anthurium* sect. *Porphyrochitonium*, but the gland-like structures it has on the lower blade surface are easily removed, not deeply imbedded as those of section *Porphyrochitonium* (and apparently too regular and too frequent to be insect-caused). The species is most similar to *A. guayaquilense* Engler, which differs in having blades that dry somewhat blackened and are much longer, mostly more than 3.5 times longer than wide. Both *A. antioquiense* and *A. antrophyoides* differ in having 3 to 4 pairs of collective veins on either side, versus with only a single pair of collective veins for *A. wintersii*.

*Acknowledgments.* Special thanks to Dan Nicolson, Eleanor Sauer, and Roy Gereau for help with Latin descriptions. Thanks also to the herbarium curators of CUCV, TULV, and VALLE for providing space to make studies in their herbaria. Finally thanks to Missouri Botanical Garden staff Mike Grayum and Charlotte Taylor for important reviews of the manuscript and to Carla Kostelac for final

editing. Research resulting in the discovery of these new species was supported by a grant from the National Geographic Society to Tom Croat (#5421-95) and a research assistantship from Saint Louis University (D. Bay).

#### Literature Cited

- Croat, T. B. 1983. A revision of the genus *Anthurium* (Araceae) of Mexico and Central America. Part 1: Mexico and Middle America. *Ann. Missouri Bot. Gard.* 70: 211–417.
- . 1986. A revision of the genus *Anthurium* (Araceae) of Mexico and Central America. Part 2: Panama. *Monogr. Syst. Bot. Missouri Bot. Gard.* 14: 1–204.
- & G. S. Bunting. 1979. Standardization of *Anthurium* descriptions. *Aroideana* 2: 15–25.
- Gentry, A. H. 1982. Phytogeographic patterns as evidence for a Chocó refuge. Pp. 112–136 in G. T. Prance (editor), *Biological Diversification in the Tropics*. Columbia Univ. Press, New York.
- Holdridge, L. R. 1967. *Life Zone Ecology*. Tropical Science Center, San José, Costa Rica.
- , W. H. Hatheway, T. Liang & J. A. Tosi. 1971. *Forest Environments in Tropical Life Zones*. Pergamon Press, New York.
- Mayo, S. J., J. Bogner & P. C. Boyce. 1997. *The Genera of Araceae*. Royal Botanic Gardens, Kew.
- Prance, G. T. 1982. Forest refuges: Evidence from woody angiosperms. Pp. 137–158 in G. T. Prance (editor), *Biological Diversification in the Tropics*. Columbia Univ. Press, New York.