New Species of Araceae from Colombia

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ABSTRACT

The following taxa from the Colombia, mostly from the Department of Antióquia, are described as new to science: *Anthurium acanthospadix* Croat & Oberle, *A. atramentarium* Croat & Oberle, *A. chrysolithos* Croat & Oberle, *A. hodgei* Croat, Oberle & Mora, *A. johnmackii* Croat & Oberle, *A. licium* Croat & Oberle, *A. macphersonii* Croat & Oberle, *A. modicum* Croat & Oberle, *A. silverstonei* Croat & Oberle, *A. soejartoi* ssp. *soejartoi* Croat & Oberle, and *A. soejartoi* ssp. *ascendens* Croat & Oberle, *A. subaequans* Croat & Oberle, and *Philodendron danielii* Croat & Oberle.

INTRODUCTION

The flora of Colombia is probably the most species-rich of any area in the world for Araceae, with at least 500 species already known to exist there (this total includes a number of species that, though having been studied and described, are not yet published). As all genera of Araceae are fully studied the number of species present in Colombia will probably more than double from what is currently known due to the large numbers of undescribed species, particularly from northwestern Colombia with the highest rainfall. The Department of Antióquia is in turn probably the single richest department in Colombia in terms of the number of species already known from the region. This richness is due to its great phytogeographic diversity which includes portions of the Chocó refugium in northwestern South America, both the eastern and western slopes of both the Cordillera Central and the Western Cordillera, portions of the lowland *Tropical moist forest* (bh-T) that extends into Central America, portions of the Caribbean coastal forest and portions of both the Cauca and the Magdalena River valleys. No other department of Colombia, nor any other region in South America, has such a wide diversity of phytogeographical features. Since the Missouri Botanical Garden, in collaboration with the Universidad de Antióquia, is currently preparing a checklist for the Department of Antióquia, we are describing here a few new species so they can be included in this checklist. We have sorted out many more species, which will remain undescribed, until better, more complete specimens have been collected. With the exception of *A. silverstonei* all occur in Antióquia, but are not necessarily restricted to that department.

Anthurium acanthospadix Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Urrao Municipio, Zona limítrofe del Parque Nacional Las Orchídeas, Vereda Calles, Inventario, margen izquierda del Río Calles, bosque nublado y enano, 6°32'N, 76°19'W, 1,450–1,500 m, 30 Nov. 1993, *J. Pipoly, W. Rodríguez, O. Alverez 17425* (holotype, MO-4639337-40; isotypes, JAUM, MO-4643977-79). Figures 1–4.

Planta terrestris; cataphylla 25–30 cm longa; petiolus 1.4–1.6 cm longa, 1.2–2.0 cm diam.; lamina anguste ovata, sagittata ad basim, 1–1.5 m longa, 55–70 cm lata; lobulas posterioribus 31–46 cm long, 24–

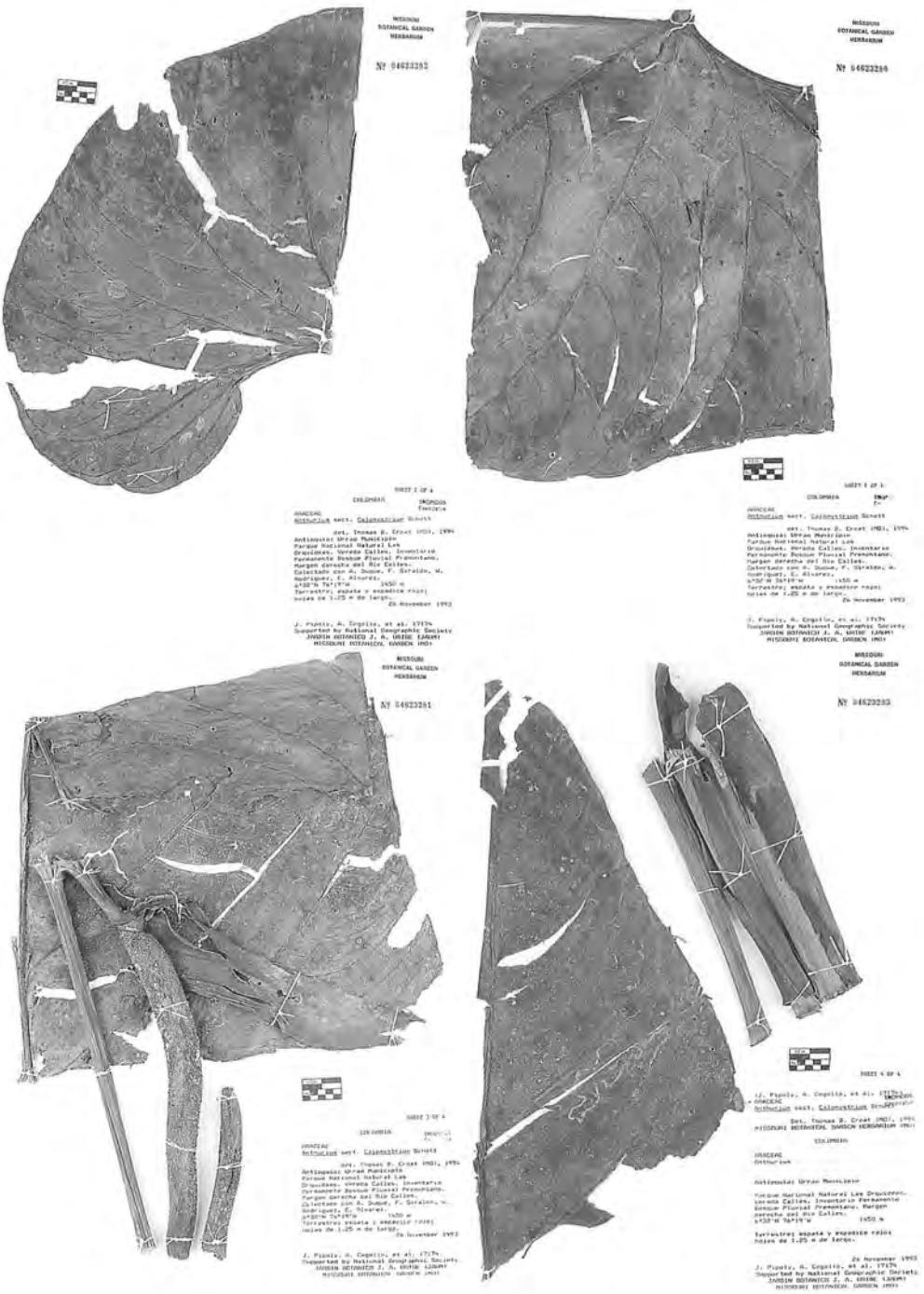
30 cm wide, nervis primariis lateralibus 15–18 utroque; pedunculus 36–49 cm longus, 11–14 mm diam.; spatha 18–25 cm longa, lanceolata, rubellus vel purpurascens, stipitatus 0.5–1 longus; spadix 32–38 cm longus, 1.8–2.4 cm diam., rubellus vel purpurascens.

Terrestrial; **cataphylls** subcoriaceous, 25–30 cm long, acute at apex, drying reddish-brown, persisting semi-intact. LEAVES erect-spreading; **petioles** 1.4–1.6 m long, 1.2–2.0 cm diam., terete to obtusely and broadly sulcate; geniculum drying darker than the petiole, 5 cm or longer; **blades** narrowly ovate, sagittate at base, 1–1.5 m long, 55–70 cm wide, broadest above point of petiole attachment, subcoriaceous; anterior lobe 62–97 cm long; posterior lobes 31–46 cm long, 24–30 cm wide, broadest at point of petiole attachment, directed inward; sinus obovate to rhombic, 29–45 cm deep; upper surface drying matte, dark brown; lower surface usually drying lighter with brown or dark brown punctations; **midrib** drying convex to narrowly convex above, narrowly convex to narrowly rounded below; **basal veins** 8–10 pairs, 2 pairs free to the base, the remaining coalesced to 1.5–2.5 cm, drying narrowly acute below; posterior rib naked 9–13 cm, **primary lateral veins** 15–18 per side, becoming closely spaced towards apex, departing midrib at a 55°–70° angle, ascending to the collective vein, drying narrowly acute below; interprimary veins prominulous; tertiary veins prominulous above and below; collective veins arising from near the base, 1–6 mm from the margin or sometimes nearly contiguous with margin. INFLORESCENCE erect; **peduncle** 36–49 cm, 11–14 mm diam.; **spathe** 18–25 cm long, lanceolate, spreading, subcoriaceous but brittle, reddish to purplish, inserted at a 40°–50° angle on the peduncle, margins meeting at a 70°–90° angle; stipe 1–2 cm long in front, 0.5–1 cm long in back; **spadix** reddish to purplish, substipitate, erect, 32–38 cm long, 1.8–2.4 cm diam., tapered; flowers square to weakly rhombic, 1.8–2.0 mm long, 1.5–2.0 mm wide, edges straight, 15–16 flowers visible in principal spiral, 20–25 flowers visible in alternate spiral, stigma circular; tepals drying matte, dark brown, lateral tepals 1.2–1.5 mm long, 0.5–0.6 mm wide, inner margin straight, outer margin angled; anthers not seen. INFRUCTESCENCE erect; spathe usually deciduous; spadix 35–49 cm long, 3–3.5 cm diam.; **pistils** emerging to 3–5 mm throughout, **berries** red, ovoid-ellipsoid, 8 mm long, 1.9 mm diam.; apex beaked to 5 mm, seeds not seen.

Anthurium acanthospadix is a species of narrow endemism, with all known collections coming from a single population along the Río Calles within Parque Nacional Las Orchídeas, Urrao Municipio, Antióquia Department. This population inhabits an elfin cloud forest within a very narrow range of altitude from 1,390–1,450 m in *Premontane rain forest* (bp-P).

The species is a very distinct one and is placed in *Anthurium* sect. *Belolonchium*. Although no stem material was collected, a possibility that the species may in fact belong to *A.* sect. *Calomystrium* is evident by the sheer size of the blade, which resembles *A. formosum* Schott, a member of *A.* sect. *Calomystrium*, that occurs at lower elevations primarily in the Chocó. However, these two species differ markedly in a variety of floral characters such as the length of the spadix and color of the spathe. The spadix of *A. acanthospadix* is over twice the length of the spadix of *A. formosum*. The spathe of *A. acanthospadix* is reddish purple on both surfaces while the spathe of *A. formosum* has is pale green or violet outside and whitish inside. Another feature that clearly distinguishes this species is the spadix with long, protruding pistils and lends the species its name *acanthospadix* (based on "*acantho*" meaning spiny) referring to the spiny or spiky appearance of the protruding fruits of the spadix of the infructescence. No other species in the region exhibits this characteristic.

Paratypes—COLOMBIA. **Antióquia**: Urrao Municipio, Parque Nacional Las Orchídeas, Vereda Calles, Río Calles, 6°32'N, 76°19'W, 1,450 m, 26 Nov. 1993, *Pipoly*



Figs. 1–4. *Anthurium acanthospadix* Croat & Oberle (*Pipoly 17174*). —1 (top L). Paratype specimen sheet 2 showing posterior lobe of leaf blade, abaxial surface. —2 (top R).

17174 (MO); 6°32'N, 76°19'W, 1,320–1,390 m, 24 Mar. 1988, *Cogollo 2558* (MO).

Anthurium atramentarium Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Salgar, at departmental border (Chocó), km 15 of rd. between Salgar and El Duaro, near stream, 5°59'N, 76°07'W, 2,280 m, 29 Sep. 1987, J. Zarucchi, A. Brant & J. Becantur 5995 (holotype, MO-3489943-44; isotype, HUA-43943-44). Figures 5, 6.

Planta terrestre; internodia ad 4 cm longa, 1.8–2.4 cm diam.; petiolus 65–160 cm long; lamina anuste ovata-sagittata, 48–70 cm longa 32–46 cm lata; nervis primariis lateralibus 8–14 utroque; pedunculus 42–60 cm longus, 4–7 mm diam.; spatha atropurpureus, anguste ovata, 15–22 cm longa, 3.5–7 cm lata; spadix stipitate 3–5 mm, pallide viridis vel pallide luteus, 7–11.5 cm longa, 9–12 mm diam.; pedunculus 36–49 cm longus, 11–14 mm diam.

Terrestrial, sometimes epiphytic; stem to 3 m long; **internodes** to 4 cm long, 1.8–2.4 cm diam.; **cataphylls** chartaceous, 13–27 cm long, apex rounded to apiculate, (apiculum when present 1 mm long), drying light brown; LEAVES erect-spreading, **petioles** 65–160 cm long, terete, drying 1–1.5 cm diam. at base tapering to 0.3–0.6 cm at apex; geniculum 4–5.5 cm long, drying somewhat darker than petiole; juvenile blade shaped as adult; **blades** subcoriaceous, broadly ovate, short-acuminate at apex (acumen 0.7–1.7 cm long), cordate at base, 48–70 cm long, 32–46 cm wide, broadest above point of petiole attachment; both surfaces drying matte and tan to reddish-brown with inconspicuous light brown punctations; anterior lobe 39–47 cm long, the margins entire to concave near middle of blade; posterior lobes 15–24 cm long, 15–24 cm wide, broadest at base; sinus parabolic to spathulate, 12–20 cm deep; **midrib** drying narrowly rounded above, narrow acute below, **primary lateral veins** 9–15 per side, departing midrib at a 50°–70° angle, ascending to collective vein, raised above, narrowly raised below; interprimary veins raised below; tertiary veins prominulous; **basal veins** 7–8 pairs, 1st & 2nd pairs free to base, 3rd pair coalesced to 2–5 mm, the remaining coalesced to 2–3 cm; posterior rib naked to 5–7 cm; collective veins arising from the base, equally as prominent as primary lateral veins, 1–5 mm from margin. INFLORESCENCE erect; **peduncle** 42–60 cm long, terete, drying 4–7 mm diam.; **spathe** erect, subcoriaceous, deep purple, rarely reddish-purple, glossy, narrowly ovate, 15–22 cm long, 3.5–7 cm wide, broadest at or near middle, inserted at a 60°–80° angle on the peduncle, acuminate at apex (acumen 1–2 cm long), acute at base, the margins meeting at 30°–40° angle; stipe 3–5 mm in front; **spadix** pale green to pale yellow, rarely white (*Gentry 24598*), subsessile, cylindroid, erect to curved away from spathe, 7–11.5 cm long, drying 9–12 mm diam.; flowers rhombic to weakly 4-lobed, 1.7–2 mm long, 1.5 mm wide, edges straight to sigmoid, 9–12 flowers visible in principal spiral, 11–15 flowers visible in alternate spiral; tepals drying matte to semiglossy, brown to tan, 1.1 mm long, 0.6 mm wide; anthers drying 0.4 mm long, 0.5–0.6 mm wide; thecae ovoid, contiguous, tan. INFRUCTESCENCE erect to arching; spadix 9–14 cm long, drying 1.5–1.9 cm diam., with berries scattered throughout; **berries** ovoid, apex mammiliform, drying 5 mm long, 2.5 mm diam.

Anthurium atramentarium is endemic to Colombia, occurring in the northern end of the Western Cordillera Department, and probably ranges into the adjacent departments of Chocó and Risaralda. With

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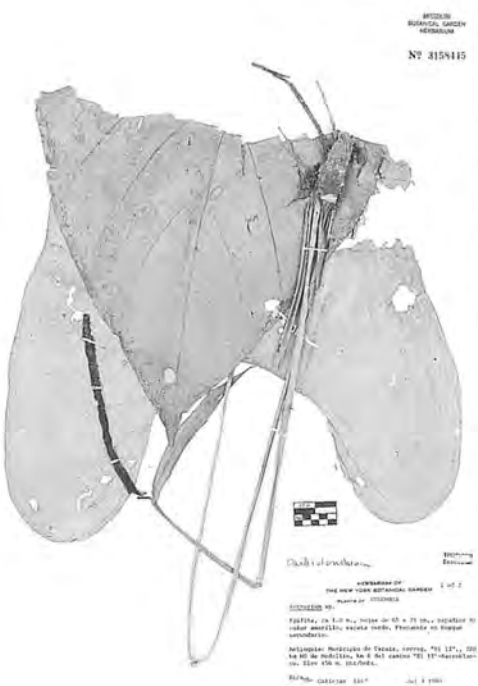
Sheet 1 with leaf blade with petiole attachment, showing basal venation. —3 (bottom L). Sheet 3 showing folded portion of anterior lobe of leaf blade and inflorescence. —4 (bottom R). Sheet 4 showing leaf apex and folded portion of petiole.



Figs. 5–8. 5, 6. *Anthurium atramentarium* Croat & Oberle (*Sanchez 959*). —5 (top L). Paratype specimen showing folded leaf blade. —6 (top R). Sheet 2 showing young leaf

the exception of one specimen from the Paramó Frontino at 2,980–3,680 m (*Renteria 4066* [HUA]), all collections came from middle to high elevation (1,720–2,320 m) *Premontane rain forest* (bp-P) and *Lower montane rain forests* (bp-MB) in the Municipio Frontino or *Lower montane wet forests* (bmh-MB) in the Municipio Salgar.

The species is a distinctive member of *A.* sect. *Calomystrium*. Most conspicuously, the broad spathe of this species is an inky purple, hence the specific epithet, "atramentarium". Also, this species exhibits a distinctive venation pattern with a nearly right-angle formed by the midrib and the 2nd basal vein that is almost bisected by the 1st basal vein, and a collective vein that arises from very near the base. Other diagnostic features of this species are light brown punctations visible on the lower surface of the dried blade and a relatively stubby greenish to yellowish spadix. Another species of *A.* sect. *Calomystrium* from this department, *A. obtusatum* Engl., also has a purplish spathe, but it is much smaller overall, with longer internodes and a stipitate spadix.

Paratypes—COLOMBIA. **Antióquia**: Frontino, Corregimiento Nutibara, cuenca alto del Río Cuevas, 1,800–2,000 m, 16 Mar. 1984, *Sánchez 76* (MEDEL); 1,720 m, 12 July 1986, *Sánchez 357* (MEDEL); 1,880 m, 18 Nov. 1986, *Sánchez 543* (MEDEL); 14 Jan. 1987, *Sánchez 959* (MEDEL); km 17 of road from Nutibara to Murrí, 6°45'N, 76°24'W, 1,750 m, *Zarucchi 5754* (MO); trail from Encarnacíon to Parque Nacional "Las Orchídeas," 1,600–1,800 m, 27 Jan. 1979, *Gentry 24598* (HUA, MO); Urrao, Paramó Frontino, 2,980–3,680 m, 18 May 1985, *Renteria 4066* (HUA); Salgar, at departmental border (Chocó), km 15 of road between Salgar and El Duaro, 5°59'N, 76°07'W, 2,320 m, 30 Sep. 1987, *Zarucchi 6053* (HUA, MO).

Anthurium chrysolithos Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Taraza, Corregimiento "El Doce," 200 km N de Medellín, 6 km del camino "El Doce"- Barro Blanco, 456 m, 3 July 1980, *Ricardo Callejas 1178* (holotype, MO-3158446-49). Figure 7.

Planta epiphytica vel terrestre; internodia 1.5–3 cm longa, 1–2 cm diam.; cataphylla 10–12 cm longa, persistens en fibris; petiolus 75–100 cm longus, 6–12 mm diam.; lamina late ovata, 60–100 cm longa, 30–70 cm lata; lobulas posterioribus 20–30 cm longibus, 17–30 cm latibus; nervis primariis lateralibus 5–8 utroque; pedunculus 30–60 cm longus; spatha viridis, lanceolata, 13–24 cm longa, 1.2–2.3 cm lata; spadix 17–27 cm longus, 4–9 mm diam., viridis, lutescens; baccae rubrae.

Terrestrial or epiphytic, rarely scandent (*Denslow 2443*); stem erect, 1–2 m long; **internodes** 1.5–3 cm long, 1–2 cm diam.; **cataphylls** subcoriaceous, 10–12 cm long, apex acute, drying brown, persisting as coarse linear fibers; LEAVES erect-spreading; **petiole** 75–100 cm long, 6–12 mm diam. 1 cm from base tapering to 3–6 mm at apex, moderately trapezoidal, obtusely and broadly sulcate adaxially, ribbed adaxially; geniculum darker than petiole, 1.5–2.5 cm long; juvenile blade shaped as adult, 35 cm long, 20 cm wide; **blades** broadly ovate, 60–100 cm long, 30–70 cm wide, broadest in lower ⅓, short-acuminate at apex (acumen 1.5–2 cm long), sagittate at base, chartaceous; upper surface drying weakly semiglossy, green, lower surface drying semiglossy, paler than up-

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with petiole and cataphyll, inflorescence and mature petiole base with cataphyll. —7 (bottom L). *Anthurium chrysolithos* Croat & Oberle (*Callejas 1167*). Paratype specimen of whole plant showing stem, leaf and inflorescence. —8 (bottom R) *Anthurium hodgei* Croat, M. Mora & Oberle (*Mora 39 (= Croat 83774)*. Live material showing adaxial surface of blades highlighting margin and basal venation.

per surface; **midrib** drying acutely raised above, narrowly convex below; anterior lobe 40–65 cm long; posterior lobes, 20–30 cm long, 17–30 cm wide, broadest at base, broadly rounded at apex; posterior lobes 20–30 cm long, 17–30 cm wide, broadest at base, broadly rounded at apex; sinus broadly hippocrepiform, 9–25 cm deep; basal veins 5–7 pairs, raised, 2–3 pairs free to base, the remaining coalesced; posterior rib naked to 6–10 cm; **primary lateral veins** 5–8 per side, departing midrib at 35°–45° angle, gradually ascending to collecting vein, prominulous; interprimary veins less prominent than primary lateral veins; tertiary veins weakly visible; collective veins originating from 1st pair of **basal veins**, 2nd pair of basal vein sometimes loop-connected, 1–6 mm from margin. INFLORESCENCE erect; **peduncle** 30–60 cm long, 5–12 mm at base tapering to 2–7 mm at apex; **spathe** spreading to reflexed, chartaceous, green, sometimes with purple striations, lanceolate, 13–24 cm long, 1.2–2.3 cm wide, broadest in lower ⅓, inserted at a 70°–80° on the peduncle, apex acute to long acuminate, acumen 3 cm long (*Callejas 9012*), base acute, margins meeting at a 45° angle; stipe 8–18 mm long in front, 3–15 mm long in back; **spadix** tapered, erect to curved away from spathe, 17–27 cm long, 4–9 mm diam. at base tapering to 2–4 mm at apex, green becoming yellow; flowers rhombic to weakly four-lobed, 5.7–6 mm long shortening to 4.5 mm long towards apex, 3 mm wide, the sides perpendicular to spiral weakly sigmoid, the sides parallel to spiral straight; flowers visible in principal spiral 5–7, flowers visible in alternate spiral 7–9, alternate spiral loosening toward tip; stigma oblong, 1.4 mm long, 0.6 mm wide; tepals drying weakly semiglossy; lateral tepals, 2.7–3.0 mm long, 0.7–0.8 mm wide, inner margin 3-sided, outer margin angled; stamens barely emerging above level of the tepals; anthers tan, 1 mm long, 1.5 mm wide, thecae ovoid, not divaricate. INFRUCTESCENCE arched; spathe persisting, stipe 24 mm long; spadix white; **berries** red.

Anthurium chrysolithos is known to occur at low to middle elevation (120–1,180 m) along the northern and western slopes of the Central Cordillera. Nearly all collections were made in transitional *Tropical moist forest* (bh-T) to *Tropical wet forest* (bmh-T).

The species exhibits all of the characteristic features of *A.* sect. *Cardiolonchium,* including the pale fibrous cataphylls, leaf blades with conspicuously green-drying color and cordate base. In these respects, it closely resembles *A. caperatum* Croat & R. A. Baker, another species from this section that occurs in the Western Cordillera of Antióquia, and *A. panduriforme* Schott, a more widely ranging species from Central and South America, also in *A.* sect. *Cardiolonchium.* However, the obscure minor venation and elongate tapered spadix distinguish *A. chrysolithos* from them. An even more closely related species from Central America, *A. ochranthum* K. Koch, which ranges into adjacent lowland areas of Colombia, differs only in habit, blade shape, berries, and the color of dried blades. *Anthurium ochranthum* is almost primarily terrestrial, while *A. chrysolithos* is mostly epiphytic. The difference in habit is that *A. chrysolithos* is larger in most respects, including blade size and spadix length. Also, while at higher elevation, the often triangular blade of *A. ochranthum* exhibits flared posterior lobes; at all elevations the blade of *A. chrysolithos* is sagittate. The berries of *A. ochranthum* are purple at the apex and white at the base, while the berries of *A. chrysolithos* are bright red. *Anthurium ochranthum,* like the other species mentioned, tends to dry grayish, while *A. chrysolithos* dries a clear yellow-green reminiscent of the semi-precious stone peridot, for which the Latin "*chrysolithos*" lends this species its name.

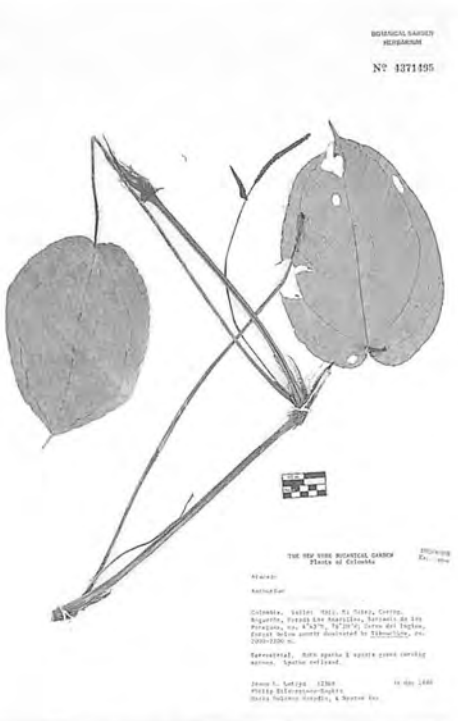
Paratypes—COLOMBIA. **Antióquia**: Taraza, Corregimiento El Doce, along the Quebrada Purí, 215 km N of Medellín, 300 m, 29 Apr. 1977, *Callejas 199* (HUA); 6 km N of El Doce, along the rd. to Barro Blanco, 456 m, 3 July 1980, *Callejas 1167* (MO); Anorí, Río Anorí valley near Planta

Providencia, 350–600 m, 31 Mar. 1976, *Shepherd 319* (MO, WIS); 7°13′N, 75°03′W, 400–700 m, 4 Nov. 1974, *Denslow 2443* (WIS); along rd. from Dos Bocas to Providencia, near the Río Nechí, 7°26′N, 74°56′W, 100–120 m, 9 July 1987, *Callejas 4485* (HUA); Veredas Chorritos, La María, Montebello, km 15–35 along the rd. to Los Monos, SNE of Amalfí, 6°40′–45′N, 74°52′–75°00′W, 1,180–1,550 m, 6 Dec. 1989, *Callejas 9012* (NY); *Callejas 9048* (NY); Valdivia, Corregimiento Pto. Valdivia, Río Pescado, 5 km NE of Puerto Valdivia, sobre la troncal al caribe, 300–400 m, 6 Jan. 1994, *Callejas 11061* (HUA); San Luis, La Loma, right bank of the Río Claro before bridge, *Renteria 5066* (HUA); km 100–125 along rd. from Medellín to Bogotá, near the Río Tebaida, 6°10′N, 75°25′W, 990–1,030 m, 4 Apr. 1987, *Callejas 3430* (HUA).

Anthurium hodgei Croat, M. Mora & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Villa Arteaga, along path to sea, 150 m, 4 Aug. 1947, *W. H. Hodge 7042* (holotype, US-1950713; isotype, P-15478). Figures 8, 9.

Planta epiphytica; internodia 3–10 mm longa, 7–14 mm diam.; cataphylla 4–14 cm longa, persistens intactum; petiolus 22.5–38 cm longus, 4–6 mm diam.; lamina cordata, 28.7–46.7 cm longa, 21–40.5 cm lata; lobula posterioribus, 10–17.2 cm longa, 7.6–14.4 cm lata; nervis primariis lateralibus 8–12 utroque; pedunculus 1.3–2.5 cm longus; spatha viridis vel brunea, oblanceolata, 5–10 cm longa, 7–17 mm lata; spadix plerumque rubeus, stipitatus, 4–10.5 cm longus, 4–13 mm diam.; baccae rubrae, 2–2.5 mm longae, 1.3–1.7 mm diam.

Understory epiphyte in deep shade; stems 10–70 cm long; **internodes** short, 3–10 mm long, 7–14 mm diam., green, matte, drying grayish, with irregular minute ridges and folds; **cataphylls** subcoriaceous, 4–22 cm long, acute at apex, drying yellowish to brown, fibers sparse, pale, antrorse, persisting at base for 2–6 nodes. LEAVES erect-spreading; **petioles** 22.5–64 cm long, 4–9 mm diam. at base tapering to 2–4 mm diam. at apex, obtusely sulcate adaxially, semiglossy, light green, short-lineate, drying grayish-green, matte; geniculum 2.2–3.1 cm long, drying same width and slightly darker than rest of petiole; JUVENILE PLANTS with petioles 12–22 cm long, 1–2 mm diam.; blade cordate, 19–29 cm long, 11–15 cm wide, broadest at base; ADULT PLANTS with **blades** cordate, 28.7–61 cm long, 21–50 cm wide, broadest at first primary lateral vein, gradually acuminate at apex (acumen 1–2 cm long); subcoriaceous dark green and matte-subvelvety above, much paler and matte below, drying matte, medium gray-green above, slightly paler and medium yellowish gray-green below; anterior lobe 26–46 cm long; posterior lobe 10–18 cm long, 7.6–14.4 cm wide; sinus narrowly parabolic, 6–16 cm deep, 5–10 cm wide; **midrib** narrowly rounded at base, sharply acute by middle of blade above, narrowly rounded below, weakly paler than surface above and below; basal veins 6–10 pair, 2–4 pair free to base, 3–5 coalesced for 1.5–3.5 cm from base of lobe, 3rd or 4th **basal vein** often weakly coalesced for 4–7 mm from the base, posterior ribs naked to 4 cm; **primary lateral veins** 8–12, departing midrib at a 45°–60° angle from midrib, ascending to the collective vein, bluntly quilted-sunken above, narrowly raised and slightly paler than surface below, drying prominulous below, interprimary veins present; tertiary veins visible; collective veins arising from 2nd or 3rd basal vein, as prominent as primary lateral veins, 1–4 mm from margin. INFLORESCENCE short, erect to erect-spreading; **peduncle** 2–4.5 cm long, 1 cm diam.; **spathe** spreading, rolled under, ca. 21.4 cm long, 4 cm wide when flattened, brittle, pale green; **spadix** red, rarely pinkish to purplish (*Hodge 7016, Brand 34*) short-tapered, stipitate, erect, 4–10.5 cm long, 4–13 mm diam. at base tapering to 4–9 mm diam. at tip, drying reddish -brown; flowers square, 1.5–2.1 mm long in both directions, edges barely visible, 5–7 flowers visible in principal spiral, 7–9 flowers visible in alternate spiral; tepals weakly semiglossy, papillate, drying dark brown, 0.5–0.9 mm long,



Figs. 9–12. —9 (top L). *Anthurium hodgei* Croat, M. Mora & Oberle (*Mora 391 (= Croat 83774)*) Live material showing infructescent spadix. —10–12, *Anthurium licium*

0.25–0.45 mm wide, inner margin convex; **pistils** oblong, 0.2–0.4 mm long, 0.1–0.2 mm wide; anthers drying brown, 0.15 mm long, 0.2 mm wide; thecae oblong, divaricate; **berries** to 1.1 cm long, 5–5.5 mm diam., acute at apex, medium red apically, greenish white basally; seeds 2, somewhat flattened, 5 mm l × 2.5 mm w × 1.5 mm deep, pale greenish white.

Anthurium hodgei is known from northwestern Antióquia Department, and adjacent Chocó Department. The species occurs in *Tropical rain forest* (bp-T) in the lowlands and in *Premontane rain forest* (bp-P) at middle elevation in the western slopes of the Western Cordillera. The species potentially occurs in bordering regions of Panamá.

The species is a member of *A.* sect. *Cardiolonchium* and is characterized by its greenish-drying, ovate, deeply basally lobed blades which are markedly bicolorous and matte-subvelvety above as well as by its red spadix, short peduncle, and red berries. It is especially characterized by having an infructescence with a spadix almost ten times longer than its peduncle, and by short white cellular inclusions usually visible on the lower surface. The species is somewhat similar to *A. panamense* Croat. However, that species differs by having matte, circumferentially ribbed petioles, which are flattened adaxially, whereas *Anthurium hodgei* has semiglossy smooth, terete petioles.

In one or more of these respects, this species closely resembles two other species from *A.* sect. *Cardiolonchium* that occur in the same general region, *A. rotundistigmatum* Croat and *A. soejartoi* Croat and Oberle sp. nov. A chiefly Panamanian species, *A. rotundistigmatum* ranges into Antióquia (*Brand 34,* MO) and its short spadices often dry a similar red color. However, the blades of *A. rotundistigmatum* are conspicuously triangular and have fewer primary lateral veins. Moreover, the peduncles of *A. rotundistigmatum* are invariably 3–4 times longer than those of *A. hodgei. Anthurium soejartoi,* which ranges widely in Antióquia, also has very short peduncles, but its spadix is yellow and dries a cream-yellow as opposed to the red spadix and dark red drying color of *A. hodgei.*

While preserving the characteristic features of the species, collections from middle elevation forests tend to vary in other respects. For instance, the blades of these plants tend to be narrower with more sparse venation. One collection (*Pipoly 16625* (MO)) from high elevation in Parque Nacional Las Orchídeas shares the spadix color, peduncle length and white cellular inclusions of *A. hodgei* but its blade is over 80 cm long, and its infructescence is almost 60 cm long. Furthermore, the lower surface dries semiglossy and not matte like all other specimens described as *A. hodgei.* For this reason it is taken to represent another closely related species pending further collection of potential intermediates.

The species is named in honor of Dr. Walter H. Hodge, author of *Flora of Dominica* and a World War II quinine explorer in Peru, who collected the type specimen. During his long and varied career he served at Harvard University, the University of Colombia in Medellín, the University of Massachusetts, the United States Department of Agriculture, Longwood Gardens, the National Science Foundation, and the Bailey Hortorium at Cornell.

Paratypes—COLOMBIA. **Antióquia**: Mutatá, Hacienda El Darién along the Río Chontadural, 200–400 m, 27 July 1978,

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Croat & Oberle. —10 (top R). (*Luteyn 12368*) Paratype specimen showing stem, leaves and inflorescence. —11, 12 (*Croat 80648*). —11 (bottom L). Close-up of live material showing leaf blade, adaxial surface. —12 (bottom R). Close-up showing inflorescence and node.

Fonnegra 913 (HUA); Villa Arteaga, along path to sea, 150 m, 4 Aug. 1947, *Hodge 7010* (US); *Hodge 7016* (PARIS, US); Frontino,
corregimiento Nutibara, cuenca Alta del Río Cuevas, 1,300 m, 9 July 1985, *Sanchéz 236* (MEDEL) ; Región Murrí, camino hacia La Blanquita, 1,300 m, 9 July 1986, *Acevedo 1156* (HUA); **Chocó**: 11 km E. of Tutunendo on Quibdo-Medellin rd., 100–200 m, 12 Aug.
1976, *Gentry 17579 A* (COL, MO); Río Tagachi, ca. 12 km W of Río Atrato, 6°15′N, 76°50′W, 100 m, 19 June 1982, *Gentry 37070* (MO); Nuquí, Corregimiento Arusí, vic. Arusí, along Río Arusí, 5°35′47″N, 77°28′31″W, 5–10 m, 26 June 2000, *Croat 83774* (*Mora 391 (= Croat 83774)* (MO).

Anthurium licium Croat & Oberle, **sp. nov.** Type: COLOMBIA, Valle: Municipio Cali, Finca Zingara, km 18, carretera al Mar o Simón Bolivar, vía a Dapa, 1,900 m, 4 Apr. 1994 *Jorge Giraldo Gensini 258* (holotype, MO-05071720; isotype, MO-05089972). Figures 10–12.

Planta hemiepiphytica; internodia 5–16.5 cm longa, 3–4 mm diam.; petiolus 9–25 cm longus, 0.9–1.7 mm diam., teres; lamina anguste ovata, 9–15 cm longa, 5–10 cm lata; pedunculus 6–13 cm longus; spatha virida, ovata, 3.5–4.5 cm longa, 1.2–2.3 mm lata; spadix stipitatus 3–11 mm, aurantiacus, 4 cm longa, 1 cm diam.

Scandent terrestrial or epiphytic herb; stem to 50 cm or longer; **internodes** terete, slender and elongate, 5–16.5 cm long, 3–4 mm diam., dark green, semiglossy, smooth; **cataphylls** 2.5–3.5 cm long, acute at apex, drying brown, persisting intact at upper nodes, the basal portion persisting as linear fibers. LEAVES erect-spreading; **petioles** 9–25 cm long, 0.9–1.7 mm diam., terete; geniculum 1.4–2 cm long, drying only slightly thicker and darker than petiole; **blades** subcoriaceous, ovate, gradually acuminate at apex, acumen 6–11 mm long, weakly subcordate at base, 9–15 cm long, 5–10 cm wide, broadest below middle; sinus 2–10 mm deep, acute at apex; upper surface dark green and semiglossy, drying matte, brown to greenish brown; lower surface moderately paler and semiglossy, drying paler, matte, with conspicuous black or brown glandular punctations; **midrib** sunken above, drying raised, prominently acute and reddish below; **basal veins** 2–3 pairs, all free to the base; **primary lateral veins** 3–5 per side, departing midrib at a 45°–60° angle, weakly ascending to collecting vein, weakly etched above, prominulous below, scarcely more prominent than interprimary veins; tertiary veins prominulous; collective veins arising from first basal vein, prominulous below, 3–13 mm from margin gradually diminishing toward apex. INFLORESCENCE erect-spreading; **peduncle** 6–13 cm long, drying 0.4–0.9 mm diam.; **spathe** green, often with reddish rays, ovate-lanceolate, 3.5–4.5 cm long, 1.2–2.3 mm wide, reflexed, membranous, acute at the apex, cordate at base; **spadix** stipitate 3–11 mm, green becoming reddish, erect, 1.5–3 cm long, 1.4–2.1 mm diam.; flowers square to weakly rhombic, 1.7–2 mm long, 1.4–1.6 mm wide both directions, about 2 flowers visible in either primary or secondary spiral; tepals matte with droplets, lateral tepals 0.7–1.0 mm wide, inner margin broadly rounded, outer margins rounded; stamens exerted just above tepals; anthers 0.2 mm long and 0.3 mm wide, thecae scarcely divergent. INFRUCTESCENCE erect, spathe sometimes falling, the spadix becoming reddish, 4 cm long, 1 cm diam. with berries scattered throughout, the stipe 10 mm long; **berries** green, seeds not seen.

Anthurium licium is a rare new species that appears to be endemic to a narrow altitudinal range (1,900–2,000 m) in the Western Cordillera of Colombia. At present, it is known to occur in Valle Department, where the majority of specimens from which the description is based were collected, and in Antióquia Department, based on a single collection. Although, the precise distribution is unclear, pending additional collections, it almost certainly occurs in the neighboring departments between the two from which it was de-

scribed. All collections were made in *Lower montane rain forest* (bp-PM).

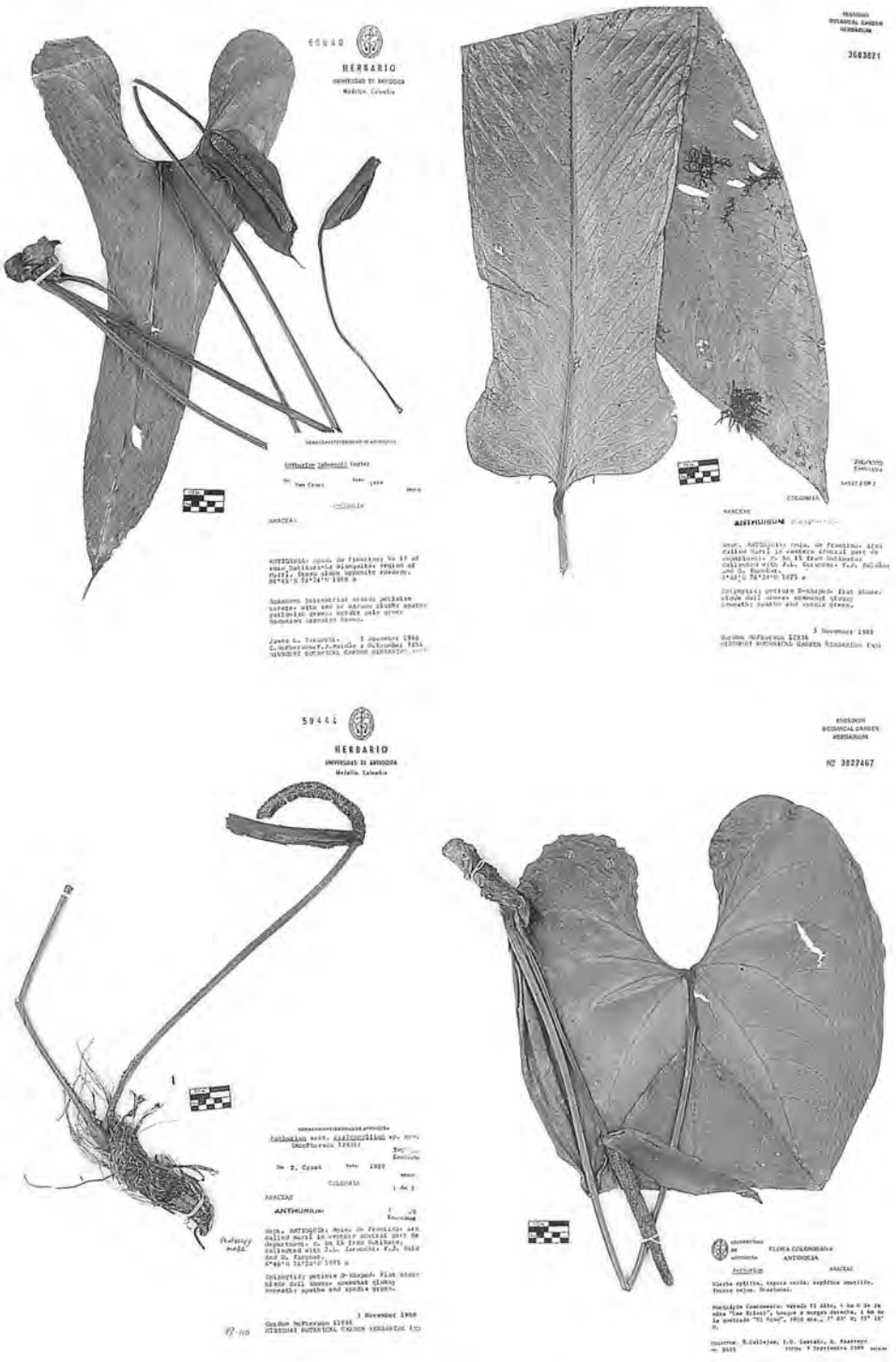
The species is a member of *A.* sect. *Tetraspermium*. Within the section it very closely resembles *A. tonduzii* Engl., a species described from Costa Rica, based on similar long internodes, the similar drying color, general venation pattern and small inflorescence. However, the cataphylls of *A. licium* persist as fibers, while those of *A. tonduzii* are rather quickly and completely deciduous. The blades of *A. licium* are much broader, always cordate at the base, even if only by a few millimeters, and dries matte rather than semiglossy. Also, the collective vein of *A. licium* clearly arises from the first basal vein, while the collective vein in *A. tonduzii* arises from what appears to be the first primary lateral veins. Finally, even though the peduncle of *A. tonduzii* is very thin, that of *A. licium* is even thinner, hence its name "licium" from a Latin word meaning thread. Otherwise, the species differs from other scandent *A.* sect. *Tetraspermium* species from the region including, *A. scandens* (Aubl.) Engl., *A. obtusum* (Engl.) Grayum, and *A. subaequans* Croat & Oberle, by its brown drying color.

Paratypes—COLOMBIA. **Antióquia**: Municipio de Frontino, Corregimiento Nutibara, cuenca alto del Río Cuevas, 1,800 m, 17 Mar. 1984, *Sánchez 150* (MEDEL); **Valle**: Municipio El Cairo, Corregimiento Boquerón, Vereda Las Amarillas, Serrania de los Paraguas, Cerro del Ingles, below summit, 4°45'N, 76°20'W, 2,000–2,200 m, 14 May 1988, *Luteyn 12368* (MO); Finca Zingara, km 18, carretera al mar o Simón Bolívar, vía a Dapa, bosque de niebla, 1,900 m, 13 Mar. 1994, *Gensini 227* (MO); 12 Mar. 1995, *Gensini 622* (MO); Finca Zingara, 4 km N of main highway, 3°32.35'N, 76°36'W, 1,900–2,100 m, 5 Aug. 1997, *Croat 80648* (MO).

Anthurium johnmackii Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Frontino, rd. between Nutibara and la Blanquita, area called Murrí, ca. 9 km below and W of high point on rd., or 20 km from Nutibara, 6°42'N, 76°24'W, 1,280–1,380 m, 7 Feb. 1989, *J. M. MacDougal, D. Restrepo & D. S. Sylva 3704* (holotype, MO-4369955-56; isotype, HUA-62774). Figure 13.

Planta hemiepiphytica; internodia brevia, 1.2–1.5 cm long, 1.7–2.2 cm diam.; cataphylla persistens intactum; petiolus 40–44 cm longus; lamina subtriangularis vel hastata, 26–39 cm longa, 13–24 cm lata; pedunculus 54–66 cm longus; spatha primulinus, oblanceolata, 9–11 cm longa, 3.5–4.4 cm lata; spadix pallide viridis, cylindroideus, 5–7.5 cm longus, 5–7 mm diam.

Scandent terrestrial; **internodes** shorter than broad, 1.2–2.7 cm long, 1.4–2.2 cm diam.; **cataphylls** subcoriaceous, 6–10 cm long, apex acute, drying reddish-brown, persisting intact, eventually as coarse liner fibers; LEAVES erect-spreading; **petioles** 28–44 cm long, 3–5 mm diam., terete with red or maroon blush, geniculum drying darker than petiole, 1–15 cm long, sometimes bearing two apical petiolar glands 1.5–3 mm from junction with blade, 1.2–1.7 mm long, sheathing in the lowermost portion of the petiole; **blades** subcoriaceous, subtriangular to hastate, acuminate at apex (acumen 1–2 cm long), cordate to hastate at base, 26–39 cm long, 10–24 cm wide, broadest at or near base; anterior lobe, 20–33 cm long, 7–15 cm wide, broadest at the base, the margins moderately to deeply concave; posterior lobes, 7–13 cm long, 5–11 cm wide, broadest at apex, directed outward; sinus parabolic to broadly hippocrepiform, 7–9 cm deep; upper surface glossy, drying brown, matte; lower and upper surface concolorous, bearing brown punctations; **midrib** narrowly rounded above, narrow acute below, **basal veins** 5–6 pairs, 2 pairs free to base, the remaining coalesced to 4–14 mm; posterior rib curved, naked to 2.5–5.1 cm; **primary lateral veins** 3–5 per side, departing midrib at a 30°–40° angle, ascending to the collective vein, prominulous; tertiary veins as prominent as interprimary veins; collective vein arising from 1st pair of basal veins, 2nd pair of basal



Figs. 13–16. —13 (top L). *Anthurium johnmackii* Croat & Oberle (*Zarucchi 7054*). Paratype specimen of whole plant showing stem, leaf blade and two inflorescences. —

veins sometimes loop connected, equally as prominent as primary lateral veins, 1.5–4 mm from margin. INFLORESCENCE erect; **peduncle** 35–66 cm long, 5–12 mm diam. at base, tapering to 3–5 mm at apex, 1.2–1.5 times longer than the petiole; **spathe** erect, subcoriaceous, greenish yellow, drying reddish brown, ovate to oblanceolate, 6–11 cm long, 1.5–4.4 cm wide, broadest in lower third, inserted at a 50° angle on the peduncle, apex caudate, acumen 7–12 mm long, base obtuse, margins meeting at a 100° angle, stipe 3 mm long in front, 1 mm long in back; **spadix** pale green becoming greenish-brown, stipitate, cylindroid, erect, 3.5–7.5 cm long, 5–7 mm diam.; flowers weakly 4-lobed, 2.7–2.7 mm in both directions, edges straight, 6–7 flowers visible in principal spiral, 7–8 flowers visible in secondary spiral, tepals matte, 1.1 mm in both directions, inner margin angled, 5-sided. INFRUCTESCENCE erect, spathe persisting, spadix, 13–14.5 cm long, 2–2.5 cm diam., bearing berries throughout; **berries** orange, oblong, apex acute, 5 mm long, 3 mm diam.

Anthurium johnmackii is endemic to Colombia, known only from *Premontane rain forest* (bp-P) in the northern ends of the Western and Central Cordilleras in Antióquia Department.

The species is a member of *A.* sect. *Calomystrium* and is recognized by its very thick spathe and thick cylindric spadix. The species is characterized by its constricted margin near the petiolar junction, sometimes resulting in a nearly hastate blade shape (*Macdougal 3704,* MO–4369955). Also, many specimens exhibit gland-like petiolar growths born on the geniculum, a very peculiar feature. Finally, few species featured spathes with a pronounced caudate apex. The species resembles a highly variable complex that occurs at high elevation across South America consisting of *A. lehmannii* Engl., and *A. oxybelium* Schott which occasionally exhibits constrictions along the margin and a thick spadix. However, the blades of the later species are never as thick as those of *A. johnmackii.* Furthermore, the spadix of *A. johnmackii* is much thicker with a much shorter stipe. Another collection from the same region (*Cogollo 4126,* MO) shares the pronounced constriction along the margin that characterizes *A. johnmackii,* but has much more pronounced venation and dries semiglossy. In addition to these differences, this specimen is sterile and cannot yet be included here.

The species in named in honor of Dr. John MacDougal, who collected the type species, for his fine botanical efforts in Antióquia. Since the name *A. macdougallii* Matuda already exists, to honor another naturalist and collector in Mexico, we chose to use an abbreviated form of the name for this new species, one that properly fits, because around the Missouri Botanical Garden, where John conducts research on Passifloraceae, he is affectionately referred to as "Johnny Mack".

Paratypes—COLOMBIA. **Antióquia**: Municipio Frontino, rd. between Nutibara and la Blanquita, area called Murrí, 17 km from Nutibara, 6°45′N, 76°24′W, 1,860 m, 3 Nov. 1988, *Zarucchi 7054* (HUA, MO, NY); km 17 of rd. Nutibara Murrí, 6°45′N, 76°24′W, 1,750 m, 24 Sep. 1987, *Zarucchi 5706* (HUA, MO); Antadó, Valley of the Río San Jorge, Paramillo National Park, 7°15′N, 75°55′W, 1,550 m, 2 Mar. 1993, *Gentry 78955* (MO).

Anthurium macphersonii Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Frontino, area

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14, 15. *Anthurium macphersonii* Croat & Oberle (*McPherson et al. 12936*). —14 (top R). Type specimen showing folded leaf blade. —15 (bottom L). Stem and inflorescence. —16 (bottom R). *Anthurium modicum* Croat & Oberle (*Callejas et al. 8403*). Type specimen of whole plant showing stem, leaf blade and inflorescence.

called Murrí, Corregimiento Nutibara, ca. km 15 from Nutibara, 6°40'N, 76°20'W, 1,875 m, 3 Nov. 1988. *G. McPherson, J. L Zarucchi, F. J. Roldán & O. Escobar 12936* (holotype, MO-3683821-22; isotype, HUA-59444-46). Figures 14, 15.

Planta epiphytica vel terrestris; internodia 1–1.5 cm longa, 1–1.5 cm diam.; cataphylla persistens in fibris; petiolus 24–34 cm longus, D-formatus; lamina ovato-lanceolata, truncata vel debilis cordata, 40–60 cm longa, 9–16 cm lata; nervis primariis lateralibus 17–20 utroque; pedunculus 24–29 cm longus; spathe viridis, 6–10 cm long, 0.7–1.1 cm wide; spadix luteus, sessile, 9–12 cm longus, 6–8 mm diam.

Usually epiphytic or sometimes terrestrial; stem erect to reclining; **internodes** of more or less uniform length, 1–1.5 cm long, 1–1.5 cm diam., drying tan, matte; **cataphylls** 7–17 cm long, acute at apex, drying brown, persisting as tan to reddish brown coarse linear fiber. LEAVES erect to erect-spreading; **petioles** 17–34 cm long, 3–7 mm diam., D-shaped, flattened adaxially, rounded abaxially; geniculum drying darker than petiole, 1–2 cm long; **blades** chartaceous, ovate-lanceolate, long-acuminate at apex, acumen 1–2 cm long, usually truncate at base, sometimes obtuse in narrow blades, rarely sub cordate especially in larger blades, 34–70 cm long, 7–16 cm wide, broadest below middle; anterior lobes 34–68 cm long, weakly to moderately concave along margin near base; posterior lobes when developed, 6–8 cm long, 5–8 cm wide, widest at or near apex, directed outward, sinus arcuate with blade decurrent on petiole, sinus 0.5–2 cm deep; upper surface matte, lower surface semiglossy, drying matte and greenish above, paler and semiglossy below; **midrib** drying raised above and darker than surface, acutely raised below; **basal veins** 3–4 pairs, free to base, weakly raised, **primary lateral veins** 17–20 per side, departing midrib at a 30° to 50° angle, straight or moderately ascending to the collective vein, sharply prominulous and drying darker than the lower surface, interprimary veins prominulous, tertiary veins prominulous; collective vein arising from the 2nd basal vein, with the 3rd basal vein sometimes loop connected, equally as prominent as primary lateral veins, 3–6 mm from margin; INFLORESCENCE erect, peduncle 24–29 cm long, 3–5 mm diam.; **spathe** spreading, green, 6–10 cm long, 0.7–1.1 cm wide, broadest at or near middle, cordate on the peduncle; **spadix** green becoming yellow, sessile, erect, 9–12 cm long, 6–8 mm diam.; flowers square to rhombic, 2–2.2 mm in both directions, sides straight to weakly sigmoid, 4–6 flowers visible in principal spiral, 5–7 flowers visible in alternate spiral, tepals matte, stigma circular, 0.2–0.4 mm diam., lateral tepals 1.7–1.8 mm wide, inner margin straight to weakly convex, outer margin angled; stamens not seen. INFRUCTESCENCE not seen.

Anthurium macphersonii is endemic to *Premontane rain forest* (bp-P) of the Western Cordillera of north western Colombia. Within the department of Antióquia, all collections occurred in the adjacent municipios of Frontino and Urrao. This species might range further to the south into the Municipio Salgar and beyond, but collections from that area begin to diverge in a variety of features and might represent other species or hybrids.

Anthurium macphersonii is placed in *A.* sect. *Xialophyllium* owing to its thin, veiny blades and greenish inflorescence. First the venation is extremely prominent down to the tertiary veins. Veins always dry sunken and darker than the upper surface and may be either darker or lighter than the upper surface. Second, the cataphylls persist as coarse tan linear fibers. Finally, all plants exhibit some constriction of the margin near the base, although in many narrow blades, this constriction is rather moderate. In comparison to other members of this section that occur in Antióquia, especially *A. amoenum* Kunth & Bouché and *A. microspadix* Schott, *A. macphersonii* is considerably larger and its venation more prominent. However, irregular specimens that appear closely related to *A. macphersonii* from higher elevation *Lower*

montane rain forest (bp-MB) further to the south in the Municipo Salgar might represent hybrids with either one of the other more common species of *A.* sect. *Xialophyllium* (*Zarucchi 4736* (MO), *Zarucchi 5963* (MO), and *Zarucchi 6048* (MO)). These specimens are smaller than typical *A. macphersonii* and barely exhibit weak constriction of the margin. Also, the spathes of these specimens are described as reddish or pinkish while those of *A. macphersonii* are always green to yellowish.

The species is named in honor of Dr. Gordon McPherson of the Missouri Botanical Garden who collected the type species. His collecting career began in Panama and he is renowned for collecting many interesting high quality specimens, including many new species.

Paratypes—COLOMBIA. **Antióquia**: Municipio Frontino, Corregimiento Nutibara, area called Murrí, Alta del Río Cuevas, 1,800–2,000 m, 16 Mar. 1984, *Sánchez 90* (MEDEL); km 17 of rd. Nutibara-Murrí, 6°45′N, 76°24′W, 1,750 m, 24 Sep. 1987, *Zarucchi 5734* (MO); 10 km W of Blaquita, 12 km W of Nutibara, 1,710 m, 4 Mar. 1992, *Gentry 76180* (MO); Finca El Palmar, sitio El Llano, 6°40′N, 76°24′W, 2,080 m, 16 Feb. 1991, *Callejas 10046* (HUA, NY); Urrao Municipio, Parque Nacional Las Orchídeas, Vereda Calles, Margen derecha del Río Calles, 6°32′N, 76°19′W, 1,450 m, 27 Nov. 1993, *Pipoly 17194* (MO); Quebrada Honda, en el filo al NW de La Cabaña Calles, 6°29′N, 76°14′W, 1,330 m, 8 Dec. 1992, *Pipoly 16827* (MO); trail from Encarncíon to Parque Nacional Las Orchídeas, 1,600–1,800 m, 27 Jan. 1979, *Gentry 24594* (MO).

Anthurium modicum Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Campamento, Vereda El Alto, 4 km oeste de la mina "Las Brisas," bosque a margen derecha, 1 km from quebrada "El Niño," 7°03′N, 75°19′W, 1,810 m, 9 Sep. 1989, *Ricardo Callejas, I.D. Castaño, H. Restrepo 8403* (holotype, MO-3827467; isotype, NY). Figure 16.

Planta terrestris, interdum epiphytica; internodia 1.2–2.2 cm longa, 2 cm diam.; cataphylla persistens intactum; petiolus 48–68 cm longus, teres; lamina ovato-cordata, 33–50 cm longa, 34–36 lata; lobulas posterioribus 12.5–18.5 cm longus, 12–18 cm lata; nervis lateralibus 3–5 utroque; pedunculus 17–30 cm longus; spatha viridis, lanceolata, 11–20 cm longa; spadix subsessilis, 10–16 cm longus, albus, viridis, lutescens; baccae rubrae, 1.1 mm diam.

Terrestrial, sometimes epiphytic, especially at higher altitudes; **internodes** terete, 1.2–2.2 cm long, 2 cm diam.; **cataphylls** subcoriaceous, 15–22 cm long, acute at apex, drying reddish-brown, persisting intact, eventually weathering into coarse linear fibers. LEAVES erect-spreading; **petioles**, 48–68 cm long, 6–8 mm diam., terete; geniculum drying somewhat darker than petiole, 2–3 cm long; **blades** subcoriaceous, ovate-cordate, apex acuminate (acumen 1.5–2 cm long), cordate at base, 33–50 cm long, 24–36 cm wide, broadest above point of petiole attachment; anterior lobe 23–37 cm long, margins entire; posterior lobes 12.5–18.5 cm long, 12–18 cm wide, broadest at point of petiole attachment, weakly directed inward, rounded at apex; sinus hippocrepiform to spathulate, 10–16 cm deep; upper surface drying matte, brown, lower surface drying matte to weakly glossy, brown with conspicuous glandular punctations; **midrib** convex above, narrowly rounded below; 5–7 pairs **basal veins**, 1–2 pairs free to base, the remaining coalesced at 1–2 cm; posterior ribs naked 3.5–6 cm, **primary lateral veins** 3–5 per side, departing midrib at a 35°–55° angle, ascending to primary collective vein, raised above, acutely raised below; interprimary veins less conspicuous than primary lateral veins; tertiary veins prominulous; reticulate veins visible; collective veins arising near base, 2–6 mm from margin. INFLORESCENCE erect, **peduncle** 17–30 cm long, drying 3–5 mm diam.; **spathe** erect, eventually spreading, chartaceous, green, lanceolate, 12–20 cm long, 1.4–2.2 cm wide, broadest in lower third, inserted at

a 20°–30° angle on the peduncle, acuminate at apex (acumen 1.5–2 cm long), acute at base, the margins meeting at a 30° angle; **spadix** white or green becoming yellow and eventually brown, subsessile, cylindric, weakly curved away from spathe, 10–16 cm long, drying 6–8 mm diam.; flowers rhombic 3 mm long, 2.1 mm wide, edges perpendicular to spiral weakly sigmoid, 6–7 flowers visible in principal spiral, 7–9 flowers visible in alternate spiral; stigma circular; tepals matte, lateral tepals 1.5 mm wide, the inner margin narrowly convex; anthers not seen. INFRUCTESCENCE erect; spathe persistent; spadix 15–18 cm long with berries scattered throughout; **berries** red, subglobose, 1.1 mm diam.

Anthurium modicum is endemic to Colombia in the Central Cordillera of Antióquia. Within that region, the species is known to occur only within a narrow range of elevations (1,510–1,830 m) that corresponds to either *Premontane wet forest* (bmh-P) or *Premontane rain forest* (bp-P) life zones.

With its persistent cataphylls and cylindroid spadix, *A. modicum* is a representative member of *A.* sect. *Calomystrium*. It resembles *A. tolimense* Engl., *A. lactiflorum* Engl., and *A. subcaudatum* Engl., which also feature similar blade shape, spathe shape, and collective vein emergence point, but differs by showing conspicuous glandular punctations. Another group of species from this section typified by *A. formosum* Schott also exhibit conspicuous glandular punctations, but are much larger. Apart from this, the species could represent many other species of cordate *Anthurium* hence the specific epithet "modicum" from the Latin meaning ordinary or undistinguished.

Paratypes—COLOMBIA. **Antióquia**: Municipio Anourí, Vereda La Travesia, 3 km from Anourí, on the rd. to Municipio de Campamento 7°8′N, 75°20′W, 1,510 m, 20 Nov. 1989, *Callejas 8835* (NY); Sitios El Río y Bramadero, km 1–9 above the rd. to Anourí, 7°5′N, 75°10′W, 1,290–1,510 m, 16 Nov. 1989, *Callejas 8713* (NY); Municipio Amalfi, 8–15 km from Amalfi to Rumazón, sitios "Salazar" y "La Playa," 6°56′N, 75°4′W, 1,550 m, 28 Sep. 1988, *Betancur 757* (MO); Vereda La Virborita, 4 km N de Amalfi, via La Mina, 6°55′N, 75°4′W, 1,500–1,510 m, 8 Dec. 1989, *Callejas 9188* (MO); Municipio Cocorna, main hwy Medellín-Puerto Triunfo, ca. 5 km E of Cocorna Peaje, Quebrada El Biadal 6°N, 75°10′W, 1,830 m, 20 Nov. 1983, *Junecosa 1395* (MO).

Anthurium silverstonei Croat & Oberle, **sp. nov.** Type: COLOMBIA, Chocó: Municipio San José del Palmar, Cerro del Torrá helipuerto, vegetación arbustiva secundaria, 1,920 m, 11 Aug. 1988, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos, A. Henao 4291* (holotype, CUVC-22023; isotype, MO-3789482-84). Figures 17, 18.

Planta terrestris; internodia 5–11 cm longa, 2.7–3.5 cm diam.; cataphylla 38–61 cm longa, persistens intacta; petiolus 95–130 cm longus, 12–18 cm diam., ovato-cordata, 66–92 cm longa, 45–54 cm lata; lobulas posterioribus 20–26 cm longa, 20–25 cm lata; nervis lateralis primariis 10–15 utroque; pedunculus 58–102 cm; spatha 17.5–31 cm longa, 5–10 cm lata, oblanceolata, spadix 20–40 cm longus, 2.1–3.8 cm diam., viridis, erubescens vel purpurascens, subsessilis; baccae lutea-viridia, 6.5–8.0 mm longae, 3.7–3.7 mm diam.

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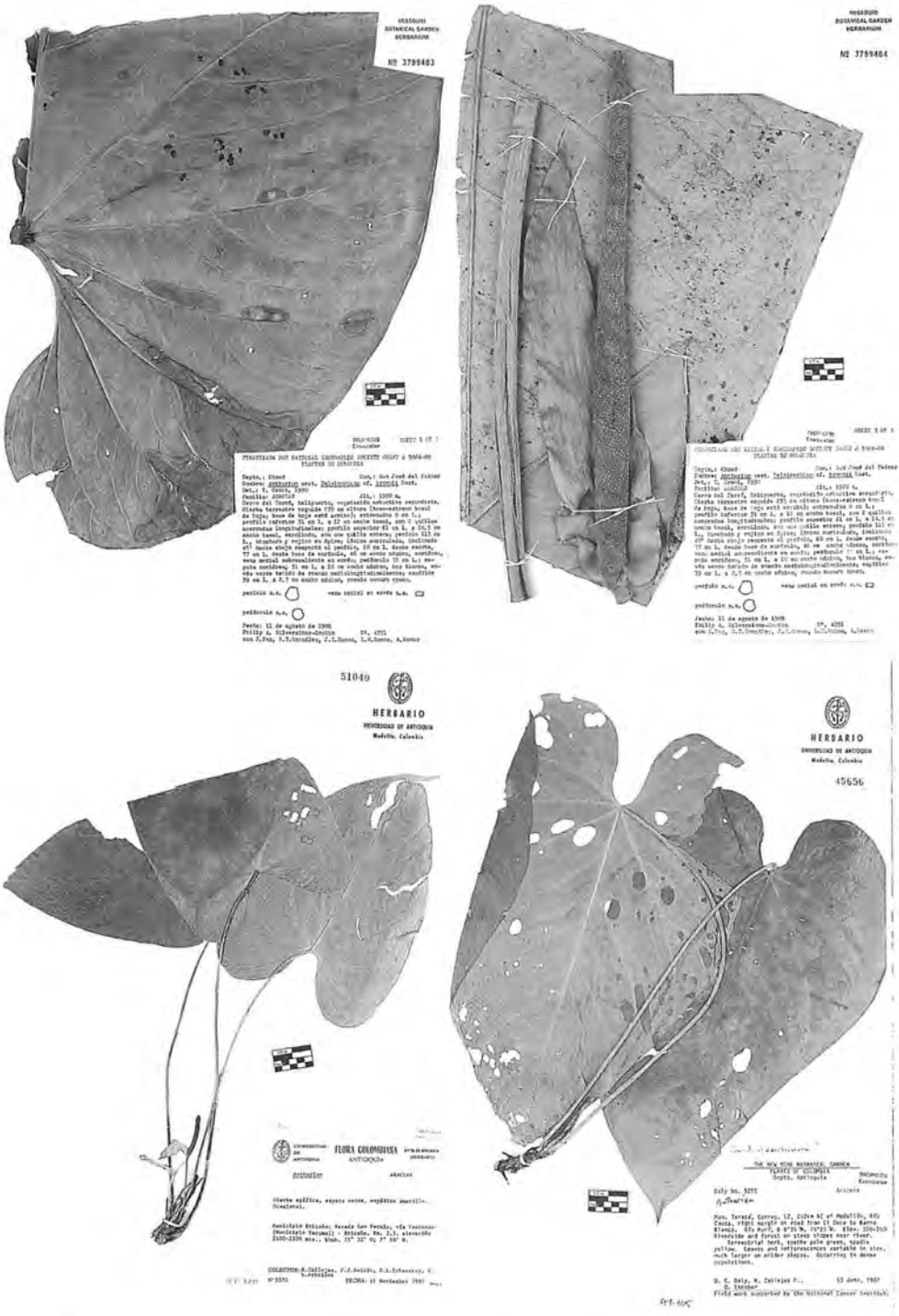
Figs. 17–20. 17, 18. *Anthurium silverstonei* Croat & Oberle (*Silverstone-Sopkin et al. 4291*). —17 (top L). Type specimen sheet 1 showing posterior lobe and petiole attachment of leaf blade abaxial surface. —18 (top R). Type sheet 3 showing folded anterior lobe of leaf blade and inflorescence. —19 (bottom L). *Anthurium soejartoi* ssp. *ascendens* Croat & Oberle (*Callejas 5570*). Paratype specimen of whole plant showing stem, leaves



and inflorescence. —20 (bottom R). *Anthurium soejartoi* ssp. *soejartoi* Croat & Oberle (*Daly 5255*). Paratype specimen of whole plant showing stem, leaves and inflorescence.

Erect or repent terrestrial herb, rarely epiphytic; stem 1.7–2.5 m long, interior of the stem tissue pinkish white; leaf scars obscured by cataphylls; **internodes** terete, longer than broad, 5–11 cm long, 2.7–3.5 cm diam.; **cataphylls** coriaceous, 1-ribbed, 38–61 cm long, 7–14.5 cm wide at base when flattened, drying tan to reddish brown, persisting intact. LEAVES erect-spreading; **petioles** 95–130 cm long, 12–18 mm diam., subterete, shallowly sulcate adaxially; geniculum swollen, sometimes reddish, 3–6 cm long; **blades** emerging brown with green venation, mature blade ovate-cordate, 66–92 cm long, 45–54 cm wide, broadest in lower third, coriaceous, short-acuminate at apex (acumen 5–10 mm long); anterior lobe 50–70 cm long; posterior lobe 20–26 cm long, 20–25 cm wide, broadest at point of petiole attachment, directed inward; sinus obovate, 18–22 cm deep; upper surface green, drying semiglossy, silvery-gray, with sparse brown punctations and linear cellular inclusions, lower surface green, drying darker, appearing more silvery-purplish, with dense brown punctations; **midrib** yellowish green, drying narrowly convex above, nearly round-raised below with 3–5 ridges; **basal veins** 7–8 pairs, 2 pairs free to the base, third pair weakly coalesced at 7–15 mm, drying etched above, sharply acute below; posterior rib naked to 5–7 cm; **primary lateral veins** 10–15 per side, departing midrib at a 50°–60° angle, ascending to the collective vein, drying raised or etched above, acutely raised below; interprimary veins drying less prominent than primary lateral veins; tertiary veins drying prominulous; collective vein arising from the base, equally as prominent as primary lateral veins, 1–3 mm from margin. INFLORESCENCE erect; peduncle 58–102 cm, 6–12 mm diam., purplish-green, terete to shallowly sulcate; **spathe** 17.5–31 cm long, 5–10 cm wide, oblanceolate, broadest in lower third, coriaceous, erect to erect-spreading, bicolorous, greenish or whitish on outer surface, green to purple on inner surface, often with pinkish to purplish veins visible on either surface, inserted at a 30°–40° angle on the peduncle, acuminate at apex (acumen to 15 mm long) acute at base, margins meeting at a 50°–75° angle; **spadix** 20–40 cm long, 2.1–3.8 cm diam. at anthesis, green becoming pink or purple, subsessile, weakly tapered, erect to curved away from spathe, held erect to at 35° angle from the peduncle; flowers rhombic to weakly 4-lobed, 2.1–2.5 mm long, 1.9–2.1 mm wide, edges weakly sigmoid, 14–15 flowers visible in principal spiral, 19–20 flowers visible in alternate spiral; stigma purplish-brown, ellipsoid, 0.4 mm long; tepals matte, drying pinkish, lateral tepals 1–1.1 mm wide, inner margins straight to weakly rounded, outer margins angled; anthers white at dehiscence, drying yellow or pinkish, 0.4 mm long, 0.5 mm wide, thecae ovoid, not divaricate. INFRUCTESCENCE spreading; spathe becoming brittle, sometimes deciduous; spadix, 39–55 cm long, 3–4.5 cm diam., with berries scattered throughout; **berries** yellowish-green, ellipsoid, apex rounded, dark brown, 6.5–8.0 mm long, 3.7–3.7 mm diam., base often pinkish; seeds not seen.

Anthurium silverstonei, pending additional extensive collection, is endemic to a single mountain, Cerro del Torrá, that is rather isolated in the Western Cordillera of the Chocó Department. Populations of the species inhabit a range of life zones along an altitudinal gradient from *Premontane rain forest* (bp-P) at 1,000–1,150 m along the northern slopes of the mountain, up to elfin *Montane rain forest* (bp-M) at 2,500–2,700 m approaching the summit. This wide altitudinal distribution on the mountain suggests it might range further north and east into the rest of the Cordillera Occidental and to the Departments Risaralda and Valle.

Anthurium silverstonei is a distinctive species but can resemble members of other sections of *Anthurium.* It is provisionally placed in *A.* sect. *Cardiolonchium* due to the ridges on its midrib, cordate blade shape, and relatively long-tapered spadix. Several characters make *A. silverstonei* a rather atypical member of *A.* sect. *Cardiolonchium,* including the very coriaceous, silvery drying blade, prominent venation,

and punctations, which might suggest an affinity with several smaller members of *A.* sect. *Digitinervium*. The inflorescence is similar to *A. formosum*, a member of *A.* sect. *Calomystrium*, although these species differ markedly in the size of the spadix, with that of *A. formosum* being only about a quarter of the length of *A. silverstonei*, among other characters. *Anthurium silverstonei* also resembles a newly described species that has been placed in *A.* sect. *Belolonchium*, *A. acanthospadix*. While both *A. silverstonei and A. acanthospadix* share a long, spiky infructescence, they differ in other features including drying color of the blade.

Anthurium silverstonei is named in honor of botanist-herpetologist Dr. Phillip Silverstone-Sopkin, Curator of the Universidad del Valle in Cali Colombia, who collected the type specimen during his floristic studies of the Cerro Torrá. Silverstone-Sopkin has made many interesting and new collections of Araceae and includes excellent descriptive notes.

Silverstone-Sopkin (pers. comm.) notes that the CUVC sheet of *Silverstone-Sopkin 4403* differs from other specimens cited by drying light brownish rather than silvery and by a different shaped petiole cross-section and midrib. It is tentatively placed here.

Paratypes—COLOMBIA, **Chocó**: Municipio San José del Palmar, Cerro del Torrá, western slope, 2,500–2,700 m, 15 Aug. 1993, *Silverstone-Sopkin 4403* (CUVC, MO); NW slope, 1,875–1,905 m, 6 Jan. 1984, *Silverstone-Sopkin 1582* (CUVC, MO); slopes of Río Negro, 1,800 m, 14 Aug. 1988, *Ramos 1250* (CUVC, MO); Municipio Novita, Vereda Llanadas, N slope of Cerro Torrá, ridge W of Río Surama, Alto del Oso, 1,000–1,150 m, 22 Feb. 1977, *Forero 3266* (COL, MO).

Anthurium soejartoi ssp. ***soejartoi*** Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio Remedios, 17 km N of Remedios along the rd. to Zaragoza, Cerro Cabeza region, on metamorphic rock, 7°20′N, 74°20′W, 340–380 m, 16 Sep. 1987, *R. Callejas, F. J. Roldán, J. Becantur 5215* (holotype, MO-3604829; isotype, HUA). Figure 19.

Planta epiphytica, rarius terrestre; internodia brevia, 5–8 mm diam.; cataphylla 5.5–8 cm longa, decidua; petiolus 12–30 cm longus; lamina ovato-cordata, 18–35 cm longa, 12–25 cm lata; nervis primariis lateralibus 6–8 utroque; pedunculus 1–3 cm longus; spatha viride, 2.4–5 cm longa, 4–8 mm lata; spadix 2.5–6 cm long, 2–3 mm diam., viridis vel luteus, sessilis.

Terrestrial herb, sometimes rock-epiphytic; **internodes** short, 4–6 mm long, 9–13 mm diam.; leaf scars conspicuous, 2–4 mm high, 9–12 mm high; roots spreading, drying brown, moderately velutinous, 10–40 cm long, 0.8–1.7 mm diam. on drying; **cataphylls** 5–12 cm long, acute at apex, drying straw-colored, quickly deciduous. LEAVES erect to erect spreading; **petioles** 25–45 cm long, 2–4 mm diam., terete; geniculum concolorous with petiole, 1–2.5 cm long; **blades** cordate, chartaceous on drying, gradually acuminate at apex, acumen 1–1.5 cm long, 30–37 cm long, 17–25 cm wide, broadest point in lower ⅓, anterior lobe 22–29 cm long, posterior lobes 7–13 cm long, 9–12 cm wide, broadest at the base, rounded at apex, sinus parabolic to moderately hippocrepiform, 5–9 cm deep; upper surface drying matte, medium green, lower surface slightly paler, with white linear cellular inclusions visible under magnification; **midrib** acute above, bluntly acute below, drying paler than surface; **basal veins** 5–6 pairs, first 1–2 pairs free to base, the remaining coalesced to 5–15 mm, prominulous above, rounded below, posterior rib naked to 0.7–2 cm; **primary lateral veins** 6–8 per side, departing midrib at a 45°–55° angle, weakly ascending to the collective vein; interprimary veins weakly prominulous below; tertiary veins visible; collective vein arising from 1st basal vein, equally prominent as primary lateral veins, 1.5–4 mm from the margin. INFLORESCENCE erect-spreading; peduncle 7–13 mm long, 0.9–1.6 mm diam., weakly striate; **spathe** spreading-reflexed, chartaceous, green,

oblanceolate, 2.4–5 cm long, 4–8 mm wide, broadest at or near middle, apiculate at apex (apiculum 1–2 mm long), inserted at a 60°–80° angle on the peduncle, margins meeting obtusely base; stipe 0.7–2 mm long; **spadix** greenish to yellowish, cylindric, stipitate, 3.5–8 cm long, 2–3 mm diam.; flowers 6 visible in principal spiral, 8 flowers visible in alternate spiral, rhombic to weakly 4-lobed, 2–2.2 mm long, 2.5–2.7 mm wide, edges angled; stigma circular, 0.7 mm diam.; tepals with droplets, 0.9 mm long, both margins rounded; anthers drying yellow or tan, 0.5 mm long, 0.6 mm wide, thecae obovoid, cream, 0.5 mm long, 0.8 mm wide, contiguous. INFRUCTESCENCE spreading, peduncle 14 cm long, spathe absent; spadix 6 cm long, 1 cm diam. 1 cm from base narrowing to 0.7 cm diam. 1 cm from apex, with berries scattered throughout; **berries** red, oblong, 3–4 mm long, 2–3 mm diam., apex rounded.

Anthurium soejartoi appears to consist of two morphologically and geographically distinct subspecies. Jointly, *A. soejartoi* is endemic to Colombia and is only known from Antióquia with the exception of one specimen (*Gentry 17439*) from adjacent Chocó Department. However, it ranges widely within the department and probably occurs elsewhere. The species was collected at altitudes as low as 300 m in the western lowlands and up to 2,100 m in the Western Cordillera and 1,850 m in the Central Cordillera. Plants collected at low elevations (300–500 m) along the northern end and western slopes of the Cordillera Central tend to have a terrestrial habit, larger blade size, and quickly deciduous cataphylls. These are placed in *A.* ssp. *soejartoi*. Most collections were from riverbanks in *Tropical moist forest* (bh-T) to *Tropical wet forests* (bmh-T).

The species is recognized by its relatively small stature, short internodes, ovate-cordate, green-drying leaves, very short peduncle and short, slender, greenish-yellow spadix. The blades of this species resemble those of the Panamanian species *A. rotundistigmatum,* as does its venation which dries lighter than the lower surface. Yet the blade of *A. rotundistigmatum* dries more gray-green and its tertiary venation is more prominent. The species is similar to other *A.* sect. *Cardiolonchium* species from Antióquia, particularly, *A. hodgei*. In contrast to *A. hodgei,* which is restricted to the northwestern part of Antióquia and in lowland Chocó Department and has a distinctly red spadix (also red-drying), *A. soejartoi* has a short yellowish spadix that always dries cream-yellow in color. Other comparable *A.* sect. *Cardiolonchium* species from the department, *A. caperatum* Croat & R. A. Baker and *A. chrysolithos* Croat & Oberle, dry a similar color with comparable venation patterns, but have much larger blades and much longer peduncles.

A very closely related specimen from Municipio Frontino (Callejas 6608 (MO)), has a strikingly similar, but larger inflorescence. Likewise, its blade, though similar in proportion, color and venation, is well over 60 cm long. Without collections of intermediate inflorescence and blade size, this specimen can not yet be included with *A. soejartoi*. Another, more distantly related specimen (*Zarucchi 5573* (MO)), from Frontino, has a similarly proportioned inflorescence with very short peduncles but diverges in several other characters, especially a much longer, purple spadix and long posterior lobes.

Anthurium soejartoi is named in honor of its collector, D. D. Soejarto, one time Curator of the Herbarium at the Universidad de Antióquia and currently at the Field Museum in Chicago, who made the first collection of the species as well as many other excellent collections in Antióquia.

Paratypes—COLOMBIA. **Antióquia**: Tarazá, right margin along rd. from El Doce to Barro Blanco, Río Purí, 8°35'N, 75°25'W, 300–350 m, 13 June 1987, *Daly 5255* (HUA); Anorí, Corregimiento de Providencia, 500–600 m, 6 June 1971, *Soejarto 2883* (HUA); Río Anorí valley, between Anorí and Dos Bocas, 400–900 m, 23 May 1976, *Fonnegra 544* (HUA); San Luis, Corregimiento Río Claro, Cañon del

Río Claro, right bank, 5°59'N, 74°54'W, 300 m, 14 Aug. 1987, *Daly 5369* (HUA).

Anthurium soejartoi ssp. ***ascendens*** Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Guatapé, ca. 8 km NNE of Guatapé, Vereda Santa Rita, Finca Montepinar, 6°17'N, 75°08'W, 1,850 m, 20 Nov. 1986, *J. Zarucchi 4157* (holotype, HUA-033461; isotype, MO-3431902). Figure 20.

Planta epiphytica; internodia brevia, 4–15 mm longa, 9–10 mm diam.; cataphylla 7–10 cm longa, persistens in fibris; petiolus 20–45 cm longus; lamina cordata, 17–32 cm longa, 12.5–23 cm lata; nervis primariis lateralibus 5–7 utroque; pedunculus 2–4.5 cm longus; spatha viride, 2.4–5 cm longa, 4–8 mm lata; spadix 2.5–6.5 cm longus, 2–3 mm diam., viridis vel luteus, sessilis.

Epiphytic herb; **internodes** short, 4–15 mm long, 9–10 mm diam.; **cataphylls** 7–10 cm long, acute at apex, drying straw-colored, persisting as coarse linear fibers for 5–6 nodes; juvenile LEAVES erect to erect spreading; **petioles** 20–45 cm long, 2–3 mm diam., terete; geniculum concolorous with petiole, 0.7–1.5 cm long; preadult internodes 4–5 mm long, 9–12 mm diam., petiole 9–11 cm long, 1 mm diam., **blades** cordate, 11.5–13 cm long, 6.5–7 mm wide; adult blades cordate, chartaceous on drying, long acuminate at apex, acumen 1.5–2.5 cm long, 17–32 cm long, 12.5–23 cm wide, broadest point in lower ⅓, anterior lobe 15–24 cm long, posterior lobes 6–10 cm long, 6–10 cm wide, broadest at the base, rounded at apex, sinus parabolic to moderately hippocrepiform, 4–10 cm deep; upper surface drying matte, medium green, lower surface slightly paler, with raphid cells visible under magnification; **midrib** acute above, bluntly acute below, drying paler than surface; basal veins 4–5 pairs, first 1–2 pairs free to base, the remaining coalesced to 5–15 mm, prominulous above, rounded below, posterior rib naked to 0.7–2 cm; **primary lateral veins** 5–7 per side, departing midrib at a 45°–55° angle, weakly ascending to the collective vein, etched below; interprimary veins weakly prominulous below; tertiary veins visible; collective vein arising from 1st basal vein, 2nd basal vein sometime loop-connected, equally prominent as primary lateral veins, 1.5–4 mm from the margin. INFLORESCENCE erect-spreading; peduncle 2–4.5 cm long, 0.9–1.6 mm diam., weakly striate; **spathe** spreading-reflexed, membranous, green, oblanceolate, 2.4–5 cm long, 4–8 mm wide, broadest at or near middle, apiculate at apex (apiculum 1–2 mm long), inserted at a 60°–80° angle on the peduncle, margins meeting obtusely at base; **spadix** greenish to yellowish, cylindric, sessile, 2.5–6.5 cm long, 2–3 mm diam.; flowers 6 visible in principal spiral, 8 flowers visible in alternate spiral, rhombic to weakly 4-lobed, 2–2.2 mm long, 2.5–2.7 mm wide, edges angled; stigma circular, 0.7 mm diam.; tepals with droplets, 0.9 mm long, both margins rounded; anthers drying yellow or tan, 0.5 mm long, 0.6 mm wide, thecae obovoid, cream, 0.5 mm long, 0.8 mm wide, contiguous. INFRUCTESCENCE spreading, peduncle 14 cm long, spathe absent; spadix 6 cm long, 1 cm diam., 1 cm from base narrowing to 0.7 cm diam. 1 cm from apex, with berries scattered throughout; **berries** red, oblong, 3–4 mm long, 2–3 mm diam., apex rounded.

Anthurium soejartoi ssp. *ascendens* consists of high-elevation plants (900–2,100 m) from both the Central and Western Cordilleras that tend to be epiphytic, with smaller blades, and cataphylls that persist as linear fibers. In addition to the features mentioned above that separate the subspecies, several aspects of the reproductive morphology reinforce the distinction. Although *A. soejartoi* ssp. *ascendens* is smaller in general than the typical subspecies, its peduncles are considerably longer. Also, the spadix of *A. soejartoi* ssp. *ascendens* is sessile and its spathe is thinner. Despite these differences, they seem much more closely related to each other than either is related to similar species from the region.

Paratypes—COLOMBIA. **Antióquia**: Frontino, Corregimiento Nutibara, cuenca

alta del Río Cuevas, 1,500–1,600 m, 11 July 1986, *Sánchez 299* (MEDEL); Murrí, 15–16 km from Alto del Río Cuevas, 6°45'N, 76°25'W, 890–900 m, 13 July 1988, *Callejas 6730* (HUA); Briceño, Vereda San Fermín, rd. from Ventanas to Briceño, 7°10'N, 75°32'W, 2,100–2,300 m, 11 Nov. 1987, *Callejas 5570* (HUA); Guatapé, ca. 8 km NNE of Guatapé, Vereda Santa Rita, Finca Montepinar, 6°17'N, 75°08'W, 1,850 m, 22 Oct. 1987, *Escobar 7994* (HUA); 3 Mar. 1988, *Escobar 8201* (HUA); **Chocó**: N Ridge of Alto de Buey, above Dos Bocas del Río Mutatá, tributary of Río El Valle, ESE of El Valle, 200–500 m, 8 Aug. 1976, *Gentry 17439* (MO).

Anthurium subaequans Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: Municipio de Frontino, km 12 of rd. Nutibara-Murrí, 6°45'N, 76°22'W, 2,010 m, 23 Sep. 1987, *J. Zarucchi, A. Brant, C. J. Castaño 5702* (holotype, MO-3489214; isotypes, HUA-43848, COL-377919). Figure 21.

Planta epiphytica; internodia 5–15 cm longa, 4–6 mm diam.; cataphylla 5–7 cm longa; petiolus 1–7 cm longus; lamina anguste ovata, truncata, rotundata vel subcordata ad basim, 8–15 cm longa, 3–6 cm lata; nervis primariis lateralibus 6–9 utroque; pedunculus 6–15 cm longus; spatha viride, reflexa, 2–4 cm longa, 1.5–9 mm lata; spadix viridis purpurascens; baccae laete purpurea, globosa, 3–4 mm longae, 4–5 mm diam. (siccae).

Scandent or appressed climber; stems to 4 m, sometimes red; **internodes** terete, slender and elongate, 5–15 cm long, drying 4–6 mm diam.; **cataphylls** 5–7 cm long, caudate at apex, drying brown, usually persisting as linear fibers. LEAVES erect-spreading; **petioles** 1–7 cm long, 0.9–1.6 mm diam., subterete, flattened adaxially; geniculum 7–10 mm long, only slightly thicker and darker than petiole; **blades** subcoriaceous, narrowly ovate, gradually acuminate at apex (acumen 6–18 mm long), truncate to rounded or subcordate at base, variable, 8–15 cm long, 3–6 cm wide, broadest at lower ⅓; upper surface dark green, semi-glossy, drying grayish green, matte; lower surface yellowish green, drying paler, weakly semiglossy with conspicuous black glandular punctations; **midrib** drying acutely raised above, prominently acute below; **primary lateral veins** 6–9 per side, departing midrib at a 35°–50° angle, straight to collecting vein, prominulous above and below, scarcely more prominent than interprimary veins; tertiary veins weakly prominulous; collective veins arising from base, sunken above, prominulous below, 2–6 mm from margin. INFLORESCENCE erect-spreading; peduncle often tinged reddish, terete, 6–15 cm long, drying 0.9–1.9 mm diam.; **spathe** green becoming reddish to purplish, ovate, 2–4 cm long, 1.5–9 mm wide, reflexed, chartaceous, apiculate at the apex (apiculum 0.5–1.7 mm long), margins almost meeting then decurrent at base; **spadix** green becoming deep purple, sub-stipitate, elongate, erect or held at up to 90° angle from peduncle, 3.5–7.5 cm long, drying 1.5–3 mm wide; flowers rhombic, 2.5 mm long, 1.8 mm wide, about 2 flowers visible in principal spiral, about 3 flowers visible in alternate spiral; stigma oblong; tepals matte with droplets, lateral tepals 0.6 mm wide, inner margin straight, outer margins 3-sided; anther oblong, 0.6 mm long, 0.4 mm wide, thecae contiguous. INFRUCTESCENCE with berries mainly in lower portion or scattered throughout; **berries** light purple, globose, apex rounded, drying 3–4 mm long, 4–5 mm diam., seeds not seen.

Anthurium subaequans is endemic to Colombia, occurring widely in Antióquia

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Figs. 21–24. —21 (top L). *Anthurium subaequans* Croat & Oberle (*Zarucchi et al. 5702*) type specimen showing nodes leaf blades and 2 inflorescences. —22–24 *Philodendron danielii* Croat & Oberle (*Rodriguez et al. 1033*). —22 (top R). Live material showing

habit. —23 (bottom L). Close-up of live material showing leaf blade, abaxial surface. —24 (bottom R). Close-up of live material showing two inflorescences, one open.

Department. With populations in both the Western and Central Cordilleras, this species probably ranges further to the south into the departments of Chocó, Risaralda, and Caldas. Despite its broad range it only occurs within a relatively narrow range of elevations (1,700–2,280 m) in Antióquia Department mostly in disturbed *Lower montane wet forest* (bmh-MB) and *Premontane rain forest* (bp-P).

Anthurium subaequans is a member of *A.* sect. *Tetraspermium* and closely resembles *A. scandens* (Aubl.) Engl. and *A. obtusum* (Engl.) Grayum, two common and extremely wide-ranged species that also occur in Antióquia. Similar features are a greenish drying blade color and cataphylls that persist as linear fibers. *Anthurium subaequans* differs from these close relatives by having internodes 5–10 cm long, as opposed to generally less than 5 cm in length in *A. scandens* and *A. obtusum*. Additionally, the spadix of *A. subaequans* is considerably longer than the latter two species and often is almost as long as either the petiole, the peduncle, or both. The unusual proportionality, along with the internode length approximately equaling the length of the blade, lends the species its name "subaequans" meaning subequal.

While these features distinguish *A. subaequans* from other species in *A. sect. Tetraspermium* in Antióquia, another member of this section is known only from Ecuador, *A. citrifolium* Sodiro. It shares similar characteristics of long internodes and relatively long inflorescences. The spadix of *A. subaequans* is narrower, always less than 3 mm diam., which differs from the spadix of *A. citrifolium,* which is about 4 mm in diam. Also, the flowers of *A. subaequans* are larger, about 2.5 mm long with only about 2 visible in either spiral, in contrast to the flowers of *A. citrifolium* which are only 2 mm long and have at least 3 or 4 visible in the alternate spiral.

Paratypes—COLOMBIA. **Antióquia**: Municipio Frontino, corregimiento Nutibara, cuenca Alto del Río Cuevas, 1,850 m, 12 Jan. 1987, *Sánchez 873* (COL); Murrí, rd. to La Blanquita, Finca Palmers, 1,700 m, 15 July 1986, *Acevedo 1348* (HUA, MO); Altos de Cuevas, 6°45'N, 75°20'W, 1,500–1,880 m, 16–18 Oct. 1987, *Luteyn 11720* (HUA, NY); rd. to Murrí, 15 km W of Nutibara, ca. 1 km S of rd., 1,850 m, 6°45'N, 76°23'W, *Brant 1360* (HUA, MO); Nutibara-La Blanquita, km 13, Alto de Cuevas, 6°44'N, 76°23'W, 1,990 m, 6 Nov. 1988, *Zarucchi 7226* (HUA, MO); Municipio Urrao, Corregimiento Santa Isabel, vía a la Finca La Palma, 15 km E de Urrao en la Troncal a Medellín, 6°10'N, 76°15'W, 2,020 m, 10 Apr. 1989, *Callejas 7922* (HUA); Municipio Salgar, at Chocó border, km 15 of rd. Salgar-El Duaro, 5°59'N, 76°07'W, 2,280 m, 29 Sep. 1987, *Zarucchi 5952* (MO); Municipio Briceño, Desvio a Vereda Manzanares, 4 km W de la Troncal del Caribe sobre la vía Ventanas-Briceño, 7°15'N, 75°30'W, 1,800–2,000 m, 21 Mar. 1988, *Callejas 6105* (HUA); Vereda San Fermín vía Ventanas-Briceño, km 2.5, 7°10'N, 75°32'W, 2,100–2,300 m, 11 Nov. 1987, *Callejas 5564* (HUA); Municipio Yarumal, 1–5 km along rd. to San Fermin de Briceño, ca. 25 km N of Yarumal, 7°01'N, 75°35'W, 1,830–1,900 m, 4–5 June 1989, *Luteyn 13274* (HUA, MO); Municipio Guatapé, Vereda Santa Rita, 1,900 m, 20 May 1988, *Bernal 192* (COL); Vereda Santa Rita, Finca Montepinar, 1,850 m, 31 Mar. 1983, *Escobar 3349* (HUA); ca. 8 km NNE of Guatapé, Vereda Santa Rita, Finca Montepinar, 6°17'N, 75°08'W, 1,840 m, 4 Dec. 1986, *Zarucchi 4409* (COL, MO); Municipio Granada, Granada-San Carlos, 8.2 km E of Granada, 13.8 km W of San Carlos, 6°10'N, 75°05'W, 1,900 m, 7 Nov. 1987, *Brant 1740* (COL, HUA, MO); Municipio San Luís, Vereda Maizales, Finca Ramón Jaramillo, 1,460–1,760 m, 1981, *Orozco 530* (COL); Piedra de Castrillón, 3–4 hours on foot S of town, 6°01'N, 75°01'W, 1,500–1,750 m, 9 May 1989, *Daly 5927* (CAS, HUA, JUAM, MO).

Philodendron danielii Croat & Oberle, **sp. nov.** Type: COLOMBIA, Antióquia: S. of Medellín, SE of Caldas, Altos de Morrogil, 2,560 m, 23 Oct. 1983, *A. Juncosa & G. Misas 1043* (JAUM, MO). Figures 22–24.

Planta hemiepiphytica, interdum terrestris; internodia brevia, 1–2 cm longa, 2–4 cm diam.; cataphylla 2-costata, 16–25 cm longa, persistens in fibrous; petiolus subteres, 51–67 cm longus; lamina ovata-sagittata vel ovata-elliptica-sagittata, 34–43 cm longa, 18.5–34.5 lata; lobula posterioribus 10–17.5 cm longa, 7.5–13.5 cm lata; nervis primariis lateralibus 5–6 utroque; inflorescentia 1–2 per quoque axila; pedunculus 5–7.5 cm longus; spatha 11.5–12.7 cm longa, 2.5 cm diam.; tubo atropurpurea extus; lamina rubra intus.

Hemiepiphytic appressed-climber to 2–3 m high, sometimes terrestrial; **internodes** short, 1–2 cm long, 2–4 cm diam., drying medium orange-brown, matte; **cataphylls** sharply 2-low-ribbed (the ribs red), medium green, persisting semi-intact at upper nodes, soon with large fragments of yellow-brown epidermis with a paler network of fibers; **petioles** 51–67 cm long, 1.2–1.7 cm diam., subterete, with medial rib, drying dark brown, matte, weakly glossy, sometimes with bladdery portions; **blades** broadly ovate-sagittate to ovate-elliptic-sagittate, 34–43 cm long, 18.5–34.5 wide, 1.2–1.8 cm times longer than wide, broadest near the middle or in the lower ⅓, well above the point of petiole attachment, medium green and weakly glossy above, slightly paler and glossy below (sometimes maroon-tinged beneath), drying gray to yellow-brown and matte above, slightly paler, weakly glossy and grayish yellow-brown to yellowish brown beneath; anterior lobe 23.5–30 cm long, gradually long-acuminate, broadly rounded along the margins; posterior lobes 10–17.5 cm long, 7.5–13.5 cm wide, broadly to narrowly rounded at apex; sinus spathulate, 9.7–14.5 cm long, sometimes closed on fresh material; **basal veins** 6–8 per side, 1st and or 2nd free to the base, 3rd–4th fused to 2.7–4 cm; posterior ribs weakly curved, naked 1–3 cm along sinus; **midrib** weakly raised and moderately paler above, narrowly raised and darker below, heavily tinged violet-purple, drying concolorous above, dark brown below; **primary lateral veins** 5–6 pairs, departing midrib at an acute angle, spreading at 60–70(90)°; upper surface weakly quilted-sunken and concolorous above, narrowly raised and slightly paler below, especially near midrib, drying bluntly acute and paler or darker than surface below; interprimary veins usually present; minor veins drying narrowly and prominently raised on both surfaces. INFLORESCENCES 1–2 per axil; peduncle 5–7.5 cm long, clearly demarcated from spathe, medium red, drying dark brown, matte; **spathe** 11.50–12.7 cm long, 2.5 cm diam., semiglossy, acuminate at apex; spathe tube dark violet-purple outside (color within unknown), flattening to 5.5 cm; spathe blade somewhat paler violet-purple outside, bright red within; **spadix** 11–11.7 cm long; pistillate portion 3.7 cm long; staminate portion 7.3 cm long; sterile staminate portion 2 cm long, 1 cm diam. on drying. INFRUCTESCENCE not seen.

Philodendron danielii is known only from Colombia in Antióquia Department at 2,250–2,560 m elevation in areas of *Lower montane moist forest* (bh-MB).

The species was first collected in 1947 by Brother Daniel, a Catholic monk. It is named in his honor.

Paratypes—COLOMBIA. **Antióquia**: Las Palmas, Aug. 1947, *Bro. Daniel 4043* (F, US); Municipio Medellín, Vereda Aguas Frias, Corregimiento Altavista, Microcuenca Picacha, Alto El Cedro, 6°13′57″N, 75°39′45″W, 2,420–2,450 m, 15 May 1997, *Rodríguez et al. 763* (JAUM); 23 Jan. 1998, *Rodríguez & Duque 1008* (JAUM), 1012, 1015, 1016, 1017 (JAUM); 18 Feb. 1998, *Rodríguez et al. 1033* (JAUM); S. of Medellín, SE of Caldas, Altos de Morrogil, 2,560 m, 23 Oct. 1983, *Juncosa & Misas 1074* (JAUM, MO).