

9.2 km SE of Miches, along Río Yeguada Arroyo Santiago, 100 m, 18°55'N, 69°9'W, *Croat* 68550 (MO); Arroyo Las Cabirnas, 5 km S of Miches-Nisibon Hwy., on road to Las Cabirnas, 18°55'N, 69°01'W, 100 m, *Zanoni et al.* 15946 (JBSD); El Salado-Otrabanda, Higüey, *Ekman* 12243 (GH, K, US); Hato Mayor del Rey, 400–500 m, *Allard* 13632 (US); Hato Mayor-Sabana del Mar, Guamira, *Jimenez et al.* 4129 (NY); Hato Mayor del Rey, 18°49.5'N, 69°19'W, *Zanoni et al.* 11966X (JBSD); Higüey, *Howard & Howard* 9790 (BM, GH, NY, US); 11.7 km W of El Valle, trail to Trepadora Alta, 18°58'N, 69°28'W, *Zanoni et al.* 21283 (JBSD). HAWAII. Oahu, cultivated at Foster Gardens, Wahiawa, *Croat* 45013 (MO), 45016 (B, MO). PUERTO RICO. Adjuntas, Las Cruces, *Sintenis* 4205 (MO, NY, P); Arecibo-Utuado, *Britton & Cowell* 345 (NY, US), *Eggers* 1142 (P), *Underwood & Griggs* 846 (NY, US); Bayamon, *Arsene et al. s.n.* (B, NY), *Stevenson* 384 (US), *Underwood & Griggs* 908 (NY, US); Bayamon, Finca Sánchez, *Hioram s.n.* (NY, P); Finca Nevares, 50 m, *Acevedo & Chinea* 2143 (NY); Hato Tejas, 50–100 m, *Webster & Miller* 8607 (US); Candelaria, *Goll et al.* 279 (NY, US); W of Candelaria, Km 21.5 on Route 2, 80 m, 18°24'N, 66°14'W, *Solomon* 5762 (MO, SEL); Cayey-Guayama, *Underwood & Griggs* 336 (NY, US); Coamo Springs, *Britton et al.* 5971 (NY); Coco Beach, 18°22'N, 65°48'W, *Boom* 8013 (NY); Guayama Road, Quebrada Arriba, *Goll et al.* 632 (US); Juana Díaz, Peñas de las Cuevas, *Britton & Marble* 2296 (NY, US); Laguna Tortuguero, *Wagner* 286 (U); 2 mi. N of Mameyes, 50 m, *Hartley* 13373 (U, US); Maricao, *Sintenis* 479 (BM, GH, K, US); Mayagüez, *Heller* 6283 (E, GH, MO, NY, P, US); Morovis, 300 m, *Liogier* 30065 (MO); Palmer-Florida Road, *Wagner* 203 (GH); San Juan, *Hioram* (Rose) 7 (11.298) (NY, US), *Hornbeck s.n.* (W), *Krebs s.n.* (C, W), *Kuntze s.n.* (K, NY), *Riedel s.n.* (P); San Narciso, *Britton & Britton* 7270 (NY); Santurce, *Heller & Heller* 1267 (NY, US); Utuado, *Britton* 5224 (NY); Yauco, *Garber* 104 (GH, K, NY); Dorado Beach Forest, Dorado, Dorado Beach Hotel, 10 m, *Croat* 60851 (B, CM, MO, RSA); El Dorado forest, N coast, 18°28'N, 60°16'W, *Luteyn & Luteyn* 11466 (NY); Río Abajo State Forest, Hwy. 621, near end of asphalt road, 360–390 m, 18°19'N, 66°40'W, *Croat* 60860 (MO, US); Río Piedras, *Johnston* 151, 901 (NY); Sierra de Luquillo, Mt. Jimenes, *Sintenis* 1582 (K); Sierra de Naguabo, 210–675 m, *Shafer* 3392 (NY). CULEBRA: *Britton & Wheeler* 114 (NY, US). MANATI: 2 mi. NE of Manati, *Hansen et al.* 9068 (MO, USF). VIEQUES: *Eggers s.n.* (GH), *Groszourdy* 13 (P); Isabel Segunda-Capo Cielo, *Shafer* 2377 (NY, US). U.S. VIRGIN ISLANDS ST. JOHN: Bethania-Rosenberg, *Britton & Shafer* 225 (NY, US); Bordeaux, 330 m, *Britton & Shafer* 545 (NY, US). ST. THOMAS: Bourne Resolution, *Britton & Marble* 428 (NY); above Cinnamon Bay, road to Herman Farm, 60–120 m, *Mori & Woodbury* 16999 (MO); Pearl-Bourne Resolution, *Britton & Marble* 1320 (NY, US), *Eggers* 307 (GH, NY), *Friedrichthal s.n.* (K, W), *Krebs s.n.* (K, W), *s.n.* (NY), *Raunkiaer s.n.* (P, US), *Richard s.n.* (P); Signal Hill, 500 m, *Eggers* 308 (K, P), 475 (US), 814 (P), *Eggers s.n.* (Engl. Arac. no. 191) (GH, K, P, US).

Epiphytic or terrestrial; stem short, to 3 cm diam.; roots dense, ascending, green when young, becoming gray, pubescent at base, becoming smooth, tapered or ending abruptly, ca. 5–10 cm long, 3–5(8) mm diam.; cataphylls subcoriaceous, lanceolate, (4)10–22 cm long, narrowly acuminate at apex, drying reddish brown (B & K yellow-red 4/10), persisting ± intact, weathering into coarse linear fibers and persisting around stem. *Leaves* erect; petioles (4)6–16(36) cm long, (2)5–12 mm diam., C-shaped to D-shaped, broadly sulcate adaxially, rounded to obscurely flattened abaxially; geniculum slightly thicker than petiole, 0.5–1.5 cm long; sheath (1)3–8 cm long; blades subcoriaceous, usually oblanceolate-elliptic, sometimes ± elliptic, short to long-acuminate at apex, usually obtuse at base, sometimes acute or weakly rounded, (20)33–95 cm long, (5.5)13–38 cm wide, broadest at or near the middle, the margins conspicuously undulate; upper surface semiglossy, medium green (B & K green 5/2.5), lower surface matte, slightly paler, both drying grayish; midrib flat to convexly raised at base, becoming obtusely raised toward the apex above, broadly angular to 3-ribbed below; primary lateral veins 6–11 per side, departing midrib at 30–50° angle, ± straight to the margin, convexly raised above and below, slightly paler than surface; tertiary veins obscure, weakly raised to prominent when dried; reticulate veins visible, darker than surface, obscure when dried; collective vein arising in the upper 1/3 to upper 1/4 of the blade or absent, equally as prominent as primary lateral veins when present. *Inflorescences* erect, rarely spreading, usually several at different stages of development per plant; peduncle (5.5)8–33 cm long, (2)5–10 mm diam., 0.4–1.2× as long as petiole, green tinged violet, terete; spathe reflexed at anthesis, rarely recurled, subcoriaceous, green tinged with violet-purple, ovate to lanceolate, (2.5)5–16 cm long, (0.6)1–5 cm wide, broadest near the base, acute to acuminate at apex, rounded at base; stipe to 2 cm long in front, to 1 cm long in back; spadix purplish (B & K purple 4/5) to pale violet-purple (B & K purple 6/7.5), cylindrical, slightly tapered toward both ends, (2.5)8–19 cm long, (4)6–10 mm diam. near base, (3)5–9 mm diam. near apex; flowers rhombic to 4-lobed, (1.3)2.1–2.6 mm long, (1.7)2–2.6 mm wide, the sides weakly sigmoid, sometimes straight; 9–12 flowers visible in principal spiral, (9)14–16 in alternate spiral; tepals matte, pale punctate, slightly roughened; lateral tepals 0.7–1.4 mm wide, the inner margins straight to weakly convex, the outer margins 2-sided; pistils weakly raised, greenish, darker than tepals; stigma linear, 0.4 mm long; stamens emerging in a scattered pattern through-

*Anthurium cubense* Engl., Bot. Jahrb. Syst. 25: 364. 1898. TYPE: Cuba. Monte Toro, 300 m, *Eggers* 5402 (holotype, B; isotype, K). Figures 1, 112, 113, 116, 117.

out the spadix, laterals emerging almost to apex before alternate emerge, held just above tepals and against pistil, obscuring the latter at anthesis; anthers white tinged with red-violet; thecae oblong, not divaricate; pollen white. *Infructescence* spreading or erect; spathe persisting, brown; spadix ca. 14–27 cm long, 2–2.5 cm diam. (not including exerted berries), with the berries scattered throughout; berries orange-red (B & K yellow-red 5/2.5), ellipsoid, subtruncate and subapiculate at apex, 9–14 mm long, 4.5–6 mm diam.; mesocarp juicy; usually 1, sometimes 2 seeds per berry, yellow (B & K yellow 9/5), oblong to ellipsoid, 5–7 mm long, 3–3.4 mm diam., with a gelatinous, sticky, transparent appendage.

*Anthurium cubense* is found in Cuba and drier parts of eastern Guatemala and Yucatan on the Atlantic slope, and in Nicaragua, Costa Rica, and Panama on the Pacific slope. In South America, it extends along the Caribbean coast from western Venezuela to Colombia, with one outlying collection known from the Río Patía in southern Colombia. It occurs in tropical dry forest, drier parts of tropical moist forest, and premontane wet forest from sea level to 700 m. It is most common in Cuba and Nicaragua.

This species is recognized by its short petioles, short inflorescences (much shorter than the leaves), its stubby, purplish to pale violet-purple spadix that is tapered toward the apex (or sometimes toward both ends), and by its bright red berries. It has no apparent close relatives and is not easily confused with any other species.

Engler (1905) also recognized material of this species under the name *Anthurium recusatum* Schott from Cuba. That name, however, has been misapplied and is probably synonymous with *A. fendleri* from South America. *Anthurium fendleri* is not closely related to *A. cubense*, though it has a similar rosulate habit. It differs chiefly in having a long-pedunculate inflorescence, narrowly tapered spadix, promptly withering spathe, and purple berries.

COLOMBIA. Isla de Providencia, Smooth Water Road, Torres-Romero 295 (COL). ATLÁNTICO: Barranquilla, *Elis* 1295 (F, US), 1404 (F). BOLÍVAR: Turbaco, Torrecilla, *Killip & Smith* 14656 (GH, NY, US); Mpo. San Juan Nepomuceno, Santuario Nacional de los Colorados, 230–250 m, 9°58'N, 75°10'W, *Cuadros & Keating* 60679 (MO). MAGDALENA: Dibulla, *Seifriz* 263 (US); Santa Marta, *Smith* 2763 (GH, K, NY); Quebrada El Cedro, 350–400 m, *Moreno* 415 (COL). COSTA RICA. GUANACASTE: 5 km S of Peñas Blancas, 15 km N of La Cruz, 1.5 km E of main road, 0–300 m, 11°11'N, 85°37'W, *Liesner* 4652 (MO). PUNTARENAS: Cabo Blanco Nature Reserve, *Burger & Liesner* 6627 (F, MO). CUBA: without locality,

*Sagra s.n.* (P); Finca Olimpo, *Hioram* 3937 (US); Managua, *Baker* 316 (NY, US); Matanzas, *Meisner s.n.* (NY); Monte Toro, 400 m, *Eggers* 5402 (B, K), *Wright* 3208 (BM, GH, K); Orientali, *Wright* 601 (GH, K); San Diego de los Baños, *Britton et al.* 6854 (NY), *León* 4233 (NY, P). LA HABANA: La Guácima, *Abarca & O'Donovan* 4688 (GH, NY); San Antonio, *Hitchcock s.n.* (F), *Van Hermann* 822 (F, NY); Vento, *Curtiss* 647 (BM, F, GH, K, MO, NY, P). LAS VILLAS: Hanabanilla Falls, *Britton et al.* 4838 (NY); Santa Clara, *Rowe* 8643 (GH), 8644 (NY). MATANZAS: Matanzas, *Britton & Shafer* 377 (NY). ORIENTE: Bayate, *Ekman* 6202 (NY); Firmeza-Gran Piedra, *Shafer* 8936 (GH, K, NY); Paso Estancia, *Shafer* 1573 (NY); San Luis, *Britton* 2324 (NY); Río Guama, upper part, 300 m, *Taylor* 195 (NY). PINAR DEL RÍO: El Guama, *Palmer & Riley* 317 (US); Río Mestanza, *Britton et al.* 10152 (NY, US); Sierra de Anafe, *Britton et al.* 9608 (NY), *Wilson* 11492 (NY, US); Sierra Guayaba, *Shafer* 13851 (A, NY); Mpo. Vinales, Sierra del Infierno, across Hwy. from Granja "Moncada," 18°14'N, 68°39'W, 150 m, *Proctor et al.* 39314 (JBSD); Pasco Real, *Van Hermann* 988 (GH). SANTIAGO: El Cobre, *Pollard & Palmer* 389 (GH, MO, NY, US, F). GUATEMALA. ALTA VERAPAZ: Cubilgüitz, *Tuerckheim* 8606 (US). GUAYANA: Demerara, cultivated at Glasgow Bot. Gard., *Hooker s.n.* (K). NICARAGUA. BOACO: Boaquito-Sta. Lucia, 4 km E of Boaca, Hacienda Peñas Blancas, 400–600 m, *Grijalva & Soza* 4197 (MO, SAR). CHONTALES: *Vincelli* 86, 87 (MO); Acoyapa-Río Oyate, 0.4 km SE of bridge over Quebrada Niscale, 50 m, 11°47'N, 85°01'W, *Henrich & Stevens* 161 (MO); 1.9 km S of La Libertad, 530 m, 12°12'N, 85°10'W, *Stevens & Montiel* 17513 (MO); 5.3 km W of Puente Lovago, Km 160.1, 150–170 m, 12°00'N, 85°12'W, *Stevens & Henrich* 20524 (MO); 1.5 km E of San Pedro de Lovago, 260–280 m, 12°07'N, 85°07'W, *Moreno* 16047 (MO); 2 km S of Acoyapa, *Nichols* 1723, 1725 (MO); 2 km N of Santo Tomás, rd. to San Domingo, 340–380 m, 12°04'N, 85°06'W, *Moreno* 16208 (MO); 2.8 km N of Cuapa, 400–500 m, 12°17'N, 85°23'W, *Pipoly* 1571 (CAS); N of Cuapa, *Stevens* 3662, 6107 (MO); Río El Bizcocho, Juigalpa-La Libertad, 17.4 km NE of Río Mayales, 350–400 m, 12°12'N, 85°17'W, *Stevens* 4030 (MO); Río Oyate, Acoyapa-Morrito, 50 m, 11°44'N, 84°59'W, *Stevens* 21631 (MO). ESTELI: Kukamonga, km 167, Belén, 660–800 m, 13°15'N, 86°21'W, *Moreno* 21822 (MO). GRANADA: road to Cutirre, 10–13 km NE of Granada, 350–400 m, 11°50'N, 86°56–57'W, *Moreno* 1471, 1516 (MO); Granada, 40 m, *Levy* 88 (P); Isla Zapatera, NE of Hacienda El Cerro, 400–525 m, 11°40'40"N, 85°45'45"W, *Grijalva* 1936 (MO); Isletas de Granada, Isla El Carraco, 35 m, *Martínez & Rivière* 1543 (MO, MEX); Volcán Mombacho, *Neill* 2730 (cult. at Kew) (B, K, M, MBM, MO, PMA, US); NE side, *Atwood & Neill* AN82 (MO); 10 km S of Granada, finca "Las Delicias," 340–360 m, 11°51'N, 85°57'W, *Moreno & Henrich* 8447 (MO); Finca Cutirre, 300–400 m, 11°59'N, 85°55'W, *Guzmán & Castro* 2152 (MO); S of Hacienda Cutirre, 300–400 m, 11°49'N, 85°55'W, *Moreno* 16442 (MO); Las Delicias-Hda. Cutirre, 400–500 m, 11°50'N, 85°56'W, *Moreno* 16478 (MO); las Fincas María Auxiliadora-El Cacao, 400–500 m, 11°51'N, 85°56'W, *Moreno* 442 (MO). MANAGUA: Managua, *Maxon et al.* 7538 (US); Managua, cultivated, *Araquistain* 398 (MO); Centro de Managua, cult. in garden at Sears dept. store, 120 m, *Araquistain* 40 (L, MO). MASAYA: Volcán Masaya National Park, *Stevens* 4444 (B, MO). RÍO SAN JUAN: San

Carlos, *Atwood 2028* (MO); W of San Carlos, 30–35 m, 11°08'N, 84°47'W, *Sandino 1773* (MO). RIVAS: Isla de Ometepe, Volcán Concepción, Altagracia "La Sabana," 200–500 m, 11°32'N, 85°35'W, *Robleto 133* (MO); N side of Volcán Concepción, 300–1,000 m, 11°33'N, 85°37'W, *Moreno 19827* (MO); NE of Volcán Concepción, 140–160 m, 11°33'N, 85°35'W, *Sandino 4240* (MO); Volcán Maderas, Mérida, vic. "Las Abejas," 500–700 m, 11°26'N, 85°32'W, *Robleto 293* (MO); NE side of Volcán Maderas, 600–900 m, 11°27'N, 85°29'W, *Moreno 19580, 19600B* (MO); Volcán Masearas, Santa Cruz, *Stevens 6626* (MO). ZELAYA: Caño Majagua, *Stevens 6894* (MO). PANAMA: CHIRIQUI: 1 km E of Remedios, 8°14'N, 81°50'W, *Nee 10104* (MO, PMA); Río Estí, Gualaca-Fortuna, 0.6 km E of Gualaca, 700 m, *Croat 48793* (FTC, MO). VENEZUELA: FALCÓN: Dto. Silva, Golfe de Guare, "La Penita," S of Chichiriviche, 10–100 m, 10°54'N, 68°16'–17'W, *Steyermark & Manara 110434* (MO). ZULIA: Quebrada Perayra, SE of Machiques, *Steyermark 99847* (MY); Serranía de Perijá, Río Palmar, *Chitty & Benkowski 3061* (VEN); SE of Machiques, *Steyermark & Fernandez 99638* (K, MY, NY, US); headwaters of Río Guasare, 280 m, *Gentry 41141* (B, MO); 6 km W of main road and 2 km S of Río Catatumbo, 20–100 m, 9°06'N, 72°142'W, *Liesner & Gonzalez 13274* (MO); Dto. Colón, Laguna de Congo, *Lescarboura 55* (MY); Dto. Mara, El Palmar, *Medina 902* (MY); Caño Indio, Hacienda Caño Azul-Base of Cerro Yolanda, *Steyermark et al. 122640* (VEN); Cerro Negro, SE of Río Guasare, *Steyermark et al. 122687, 122690* (MO, VEN); Río Socuy, W of Cerro Caracas, SW of Corpozulia Campamento Socuy, *Steyermark et al. 123115* (VEN); Dto. Perijá, La Villa de Rosario, foot of Sierra de Perijá (via Arimpia), 20–25 km W of La Villa, 225–350 m, *Bunting et al. 8800* (MO, NY); Quebrada Cosira, SW of Los Angeles de Tucuco, *Davidse et al. 18531* (MO, VEN).

***Anthurium curtispadix* Croat, sp. nov. TYPE:**

Ecuador. Pastaza: Puyo; originally collected by Mickey Carmichael, *Croat 55207* (holotype, MO 3104658; isotypes, AAU, B, K, M, NY, RSA, U, US; cult. at MO). Figures 114, 118, 123.

Caulis ad 21 cm longus, 3 cm diam.; cataphyllum persistens semi-intactum; petiolus 3.5–14 cm longus, 4–9 mm diam., D-formatus ad C-formatum, adaxialiter sulcatus; lamina elliptica ad oblanceolata, 17–57 cm longa, 7.5–20 cm lata; nervis primariis lateralis 5–7 utroque. Pedunculus 5–10 cm longus, 4 mm diam., effusus; spathe pallida viridis, oblongo-lanceolata, 3–3.5 cm longa, 1.5–2 cm lata; spadix erectus, cylindricus, 3.5–4.7 cm longus, 6–7 mm diam., pallide viridis. Baccae ignotae.

Stem to 21 cm long, ca. 3 cm diam.; leaf scars conspicuous or obscured by root mass, 0.5–1 cm high, 0.6–0.8 cm wide; roots ascending to spreading to descending, green to light brown (B & K yellow-red 9/7.5), smooth to sometimes weakly pubescent, tapered, elongate, 4–7 mm diam.; cataphylls subcoriaceous, weakly 1-ribbed near the apex, 5–8 cm long, narrowly acute and apiculate at apex, drying tan to reddish brown, persisting semi-intact,

eventually as a reticulum of fibers with the apex remaining intact. *Leaves* erect to spreading; petioles 3.5–14 cm long, 4–9 mm diam., D-shaped to C-shaped, slightly sulcate adaxially, with the margins sharply to obtusely raised, rounded to sometimes obscurely 1–2-ribbed abaxially, the surface obscurely short-lineate; geniculum paler and thicker than petiole, becoming minutely and transversely fissured and scurfy abaxially, (0.7)1–2.2 cm long; blades subcoriaceous, elliptic to oblanceolate, gradually acuminate at apex (the acumen apiculate), narrowly acute to obtuse to weakly rounded at base, 17–57 cm long, 7.5–20 cm wide, broadest at or above the middle, the margins weakly undulate; upper surface semiglossy, medium green, lower surface matte to weakly glossy, paler, drying greenish to yellowish green; midrib flat at base with blunt medial rib, narrowing and acute toward the apex above, convexly raised and paler than surface below; primary lateral veins 5–7 per side, departing midrib at 30–45° angle, ± straight, raised and weakly paler than surface above, convex below; interprimary veins absent; tertiary veins obscure above, visible below; reticulate veins obscure above, darker than surface below; collective vein arising from near the apex, weakly sunken above, prominent below, 2–9 mm from margin. *Inflorescences* spreading, usually several present at once; peduncle 5–10 cm long, 4 mm diam., equaling to usually ca. 0.5× as long as petioles, green (B & K yellow-green 6/7.5), terete; spathe reflexed-spreading, coriaceous, pale green, sometimes weakly tinged with red (B & K yellow-green 8/10), oblong-lanceolate, 3–3.5 cm long, 1.5–2 cm wide, broadest in the lower 1/3, inserted at 75° angle on peduncle, gradually to abruptly acuminate at apex (the acumen inrolled, hooked), acute to decurrent at base, the margins strongly downturned, meeting at 60–80° angle; spadix pale, dull green, somewhat tinged with brown, sessile, cylindroid to sometimes weakly clavate, erect, held at ca. 90° angle from peduncle, 3.5–4.7 cm long, 6–7 mm diam. near base, 3–4 mm diam. near apex, broadest at the base; flowers rhombic to 4-lobed, 1.7–2.3(2.6) mm long, 1.3–2.3 mm wide, the sides straight to jaggedly sigmoid; 13–15 flowers visible in principal spiral, 9 in alternate spiral; tepals matte, minutely papillate; lateral tepals 1.5–1.8 mm wide, the inner margins broadly rounded, the outer margins irregularly 3-sided; pistils weakly emergent, purplish violet; stigma linear, slitlike, 0.3 mm long; stamens emerging in a prompt, erratic sequence, the laterals extending to the apex in a scattered pattern before the 3rd stamen emerges, laterals followed by alternates in a rapid succession but very irregularly