

boga Road, Chiriboga-Santo Domingo de Los Colorados, El Volante, 1,900 m, *Asplund 17418* (S); Quito-Santo Domingo de Los Colorados, 19 km S of San Juan, 15 km NE of Chiriboga, 1,710 m, 0°17'S, 78°43'W, *Croat 50621* (MO); Río Alambi, Nono-Tandayapa, km 43-45, 2,000-2,500 m, *Sparre 17016* (S); Quito-Puerto Quito, 13 km NW of Nono, 2,225 m, *Luteyn & Lebrón-Luteyn 6523* (NY); Volcán Pichincha, W side, Tandayapa-Mindo, 2,300 m, 0°2'S, 78°42'W, *Croat 50256* (MO, RSA, USM).

***Anthurium paraguayense*** Engl., Bot. Jahrb. Syst. 25: 361. 1898.

**a. *Anthurium paraguayense* var. *paraguayense*.** TYPE: Paraguay. Central: Asunción, Colonia Elisa, *Lindman A1823* (holotype, B; isotype, S). Figures 226, 227, 231.

*Anthurium rodrigoii* A. Hawkes, Phytologia 3: 27. 1948. TYPE: Argentina. Chaco: Tapenaga, Enrique Urien, *Rodrigo 2690* (holotype, NY).

*Anthurium rusticum* N. E. Br. ex Engl., Pflanzenr. IV. 23B(Heft 21): 82. 1905. TYPE: Bolivia. La Paz: Yungas, Coroico, *Bang 2479* (holotype, NY; isotypes, GH, MO).

Terrestrial or epiphytic; stem to 40 cm long, (1)5-6 cm diam.; roots numerous, dense, descending or ascending, green or tan, smooth to pubescent, blunt, longitudinally fissured when dried, 3-10 cm long, 2-5 mm diam.; cataphylls membranous to subcoriaceous, 3-9.5 cm long, acute and sharply 1-ribbed at apex (apiculate to 1 mm), pale green, drying dark brown to tan (B & K yellow 6/5), persisting as a reticulum of fibers at base. *Leaves* erect to spreading; petioles 3-28.5 cm long, 6-10 mm diam., D-shaped to sometimes nearly quadrangular, shallowly sulcate with a medial rib adaxially, the margins acutely raised, bluntly to sharply 1-3-ribbed abaxially, the surface green sometimes pale-speckled; geniculum thicker and paler than petiole, 0.7-2.5 cm long; sheath 0.9-2.5 cm long; blades subcoriaceous, oblanceolate to oblong-oblanceolate, long-acuminate at apex (the acumen inrolled to flat), acute to obtuse to rounded or truncate at base, 22-100 cm long, 5-19.5 cm wide, broadest above the middle, the margins prominently undulate; both surfaces semiglossy to matte, dark to medium green above, paler or concolorous below; both surfaces drying usually greenish; midrib broadly raised at base with an acute medial rib, diminishing and becoming sunken toward the apex above, slightly raised when dried, convexly raised at base, becoming acute and then narrowly raised toward the apex above, slightly raised when dried; primary lateral veins 4-10 per side, departing midrib at (25)30-70° angle, arcuate-ascending to the

margin or loop-connecting to the primary lateral vein above it, raised above near the midrib, weakly sunken at the margin, raised below; interprimary veins obscure above, visible below; collective vein arising from near the apex, weakly sunken above, bluntly raised below, prominent when dried, 5-9 mm from margin. *Inflorescences* erect or spreading, shorter than leaves; peduncle 14-65 cm long, 8-9 mm diam., ca. 2-6× as long as petiole, dark green, terete to subterete; spathe spreading to reflexed with the margins rolled under, coriaceous, dark green tinged with purple (B & K yellow-green 4/7.5), lanceolate to ovate-lanceolate, (2)6-15 cm long, (0.7)1.7-3 cm wide, broadest in the lower third, inserted at 40-50° angle on peduncle, acute to acuminate at apex (the acumen inrolled), acute to decurrent at base, minutely verruculose on inner surface; spadix green tinged with purple or gray-brown (B & K yellow 5/7.5), tapered, (2.4)5-15 cm long, 4-15 mm diam. near base, ca. 3-8 mm diam. near apex; flowers 4-lobed to rhombic, (1.7)2.5-4 mm long, (2.2)2-4 mm wide, the sides jaggedly sigmoid; 5-8 flowers visible in principal spiral, 7-10 in alternate spiral; tepals matte, sometimes appearing punctate and papillate; lateral tepals 0.9-1.5 mm wide, the inner margins convex or straight, the outer margins smoothly 3-4-sided; pistils not emergent or scarcely emergent, green tinged with purple; stigma ellipsoid to slit-like, 0.2-0.5 mm long; stamens emerging in a regular sequence, emerging shortly above the tepals, the laterals preceding the alternates by 10-12(21) spirals, the 3rd stamen preceding the 4th by 3-4 spirals; filaments translucent, with raphides, 1-1.5 mm long; anthers yellowish to red-purple (B & K red-purple 7/5), 0.5-0.7 mm long, 0.8-0.9 mm wide, inclined over and obscuring the pistil; thecae oblong-obovoid to oblong-ellipsoid, slightly or not at all divaricate; pollen pale yellow to cream, scented like grass. *Infructescence* spreading-pendent; spathe persisting; spadix 17.5-20 cm long, to 3.5 cm diam.; berries reddish to maroon (B & K red-purple 2/7.5), obovoid, rounded at apex, 5-10 mm long, 3-6 mm diam.; pericarp moderately thickened, with raphide cells at base; mesocarp translucent to milky, thick-gelatinous; seeds 2 per berry, white, streaked with reddish or maroon, ovoid, flattened, 5-6.2 mm long, 2.5-3.4 mm diam., 1-2 mm thick, with a gelatinous appendage at both ends.

*Anthurium paraguayense* is a common terrestrial, occasionally epiphytic species of southern Brazil (Mato Grosso Sul), Bolivia, Paraguay, and northern Argentina. It is mostly reported from dry

areas, on steep slopes and sandy or rocky soils at 150 to 1,700 m. In Bolivia it occurs in subtropical moist and lower montane subtropical wet forest life zones.

This species is distinguished by its long, narrow blade with undulate margins and by its petiole that is bluntly 1–3-ribbed abaxially and shallowly sulcate adaxially, with a prominent medial rib. Also characteristic is the peduncle, which is usually 2–6 times longer than the petiole, and its persistent, coriaceous spathe, which is verruculose on the inner surface, appearing to have minute grains of sand spread across it. Other diagnostic features include the presence of raphides in both vegetative and floral structures (including the blade, petiole, peduncle, spathe, filaments, tepals, berry, and seed coats).

*Anthurium paraguayense* var. *paraguayense* is similar to var. *coroicoanum*, with which it may occur, but has a proportionally longer peduncle compared to the petiole, and a persistent spathe that appears rather verruculose adaxially. Both taxa are represented by an unusually high proportion of fruiting specimens in herbaria. The var. *coroicoanum* is distinguished by its broadly elliptic leaf blades with reflexed basal primary lateral veins, while var. *paraguayense* has lanceolate to oblanceolate blades lacking any reflexed venation. The two taxa occur in similar habitats and elevations in close geographic proximity.

A noteworthy collection is Beck 6996, from the Department of Beni, Bolivia, which has the lowermost primary lateral veins spreading at a ca. 90° angle from the midrib, but otherwise demonstrates all the characteristics of the typical variety.

ARGENTINA. CHACO: Tapenanga, Enrique Urien, *Rodrigo* 2690 (NY); General Vedia, Meyer 2406 (GH). CORRIENTES: Dpt. San Ignacio, San Ignacio, *Schinini* 20961 (K, MO); Dpt. San Luis del Palmar, 65 km SE of San Luis del Palmar, Ruta 5, *Schinini et al.* 21647 (K). FORMOSA: *Jorgensen* 2349 (MO), 2347 (GH, US); Dpto. Pilcomayo, Parque Nacional Pilcomayo, *Charpin & Eskuche AC* 20316 (MO, US). BOLIVIA. WITHOUT LOCALITY: *Bang* 1660 (F), 2581 (NY); *Rusby* 2479 (F, NY, US). BENI: Prov. Ballivian, Río Yacuma, Espíritu, 200 m, *Beck* 3296 (B, K, MO, TEX); Serranía de Pilon Lajas, 75 km from La Paz, San Borja, 950 m, *Beck* 6996 (MO). LA PAZ: Canamina, 1,500 m, *Rusby* 375 (NY); Prov. Larecacha, Caranavi–Guanay, 27.8 km N of Caranavi, 865 m, 15°33'S, 67°45'W, *Croat* 51646A (MO); Prov. Loayza, Chulumani–Circuata, Km 9, Miquilla, 1,530 m, *Besse et al.* 1852 (SEL), *Christenson* 1533 (MO); Prov. Morillo, Valle de Zongo, along trail from end of rd. at Kahua Power Plant, 1,660–1,690 m, *Croat* 51406 (MO); Prov. Nor Yungas, Corico, *Bang* 2479 (GH, MO, NY); Corico, Polo-Polo, 1,100 m, *Buchtien* 3654, 4516 (US); Millaguaya, 1,300 m, *Buchtien* 4284 (NY, US); Chuspipata–Yolosa, 20 km NE of Chus-

pipata, 10.2 km SW of Yolosa, 1,700 m, 16°12'S, 67°47'W, *Solomon & Uehling* 12252 (MO); Unduavi–Caranavi, 82.6 km NE of Unduavi, 1,300 m, *Croat* 51559 (MO); Río Huarinilla, 4.5 km below Yolosa, then 10 km W on rd. up Río Huarinilla, 1,450 m, 16°12'S, 67°50'W, *Solomon* 8560 (MO); Prov. Sud Yungas, 22 km toward new bridge on Río La Paz, Irupana, 1,100 m, *Beck* 2962 (MO). SANTA CRUZ: Concepción–San Javier, *Eurard* 8483 (BR); Chavez, El Carmen, 40 km S of Concepción on road to Lomerio, 750 m, *Killeen* 1447 (MO); Río Ichilo, Valle Grande, Vallecito, 1,300 m, *Cárdenas* 4006 (US). BRAZIL. MATO GROSSO SUL: near Bela Vista on road to Caracol, *Hatschbach & Silva* 51585 (MBM, MO). PARAGUAY. WITHOUT LOCALITY: *Palmer s.n.* (US); Cerro San Bernardino, *Chodat* 345 (G); Cordillera de Los Altos, *Fiebrig* 348 (G, MO), *Hassler* 1170, 1503, 3264 (G); Cerro de Tabatí, *Schinini* 21254 (CTES); Co. de Caacupe, *Schinini* 23882 (CTES). AMAMBAY: Parque Nacional Cerro Cora, *Schinini & Bordas* 20315 (CTES, K); Cerro Muralla, 1.5 km N of administración, *Brunner et al.* 977 (MO); 7 km SW of administración, paso Nandajara, 250–300 m, *Simonis et al.* 132 (U); Cerro Muralla, 300–350 m, 22°39'S, 56°03'W, *Casas & Molero* 3960 (NY), 6061 (G, MO), *Solomon et al.* 6782 (MO), *Zardini et al.* 4120 (MO, PY); peñasco Guaiyug Hog, *Casas & Molero* 4045 (NY); Río Aquidaban Nigui, Sierra de Amambay, *Hassler* 11157 (G). ASUNCIÓN: Colonia Independencia, *Schinini* 5644 (CTES), *Schinini & Bordas* 21238, 21234, 21235 (CTES); Río Paraguay, *Balansa* 578 (K). CAZAPÁ: Río Tebicuary, *Kuntz* 1492 (NY). CENTRAL: Asunción, Colonia Elisa, *Lindman* 1823 (B); Río Paraguay, Villa Elisa, *Pedersen* 58 (BR), 3150 (GH, US); Cerro Yaguaron, Yaguaron, *Arenas* 953 (CTES). CORDILLERA: Caacupe, 25°20'S, 57°10'W, *Hahn* 2028 (MO); Cerro Tabatí, *Zardini & Degen* 3688 (MO, PY), 3692 (G, MO, PY); Serranía de Tobatí, Meseta Ybytú Silla, 297 m, 25°12'S, 57°07'W, *Zardini* 8283 (CTES, FCQ, G, MO); Colonia Rosado, Tobatí, 200 m, 25°16'S, 57°07'W, *Schinini & Bordas* 24882 (CTES). NEEMBUCÚ: Pilar, *Schulz* 7865 (CTES). PARAGUARI: Cerro Achay, 25°54'S, 57°09'W, 370 m, *Brunner* 1249 (MO); Achay, *Chodat* 346 (G); Parque Nacional Ybycuí, *Duré* 414 (MO). PRESIDENTE HAYES: Estancia La Colondrina, Villa Hayes, 24°55'S, 57°40'W, *Hahn* 698 (MO); Trans-Chaco Hwy., Km 127, 150 m, *Gentry et al.* 51990 (MO). SAN PEDRO: Río Apa-Aquidabán, Alto Paraguay, *Fiebrig* 4149 (G, K); Río Tapiracuá, Alto Paraguay, 20–28°N, 59–63°W, *Woolston* 1074 (K, NY, U, US); Dto. Lima, Jejuí, Estancia “Carumbe,” *Pederson* 9417 (K).

**b. *Anthurium paraguayense* var. *coroicoanum*** *Croat*, var. nov. TYPE: Bolivia. La Paz: between Caranavi and Guanay, 28.1 km N of Caranavi, near bridge over Río Coricoico, 15°27'S, 67°50'W, 820 m, *Croat* 51704 (holotype, MO 2825694; isotypes, B, K). Figures 228, 229, 232.

Differt a var. typicum per laminum ellipticum, nervis primarii lateralis reflexis.

Terrestrial to epiphytic; stem to 20 cm long, 1–4 cm diam.; roots dense, greenish, pubescent, short, thick and blunt at apex, 2–5 cm long, 4–5 mm



diam.; cataphylls subcoriaceous, lanceolate, unribbed, 2.5–10 cm long, acute at apex, green (B & K yellow-green 9/2.5), drying dark to medium brown (B & K yellow 3/2.5), persisting semi-intact, eventually as coarse linear fibers or as a reticulum of fibers. *Leaves* erect to spreading; petioles 5.5–26 cm long, 4–5 mm diam., D-shaped to C-shaped, flattened with blunt to sharp margins adaxially, sometimes with a medial rib, rounded abaxially; geniculum paler than petiole, up to 11 cm remote from the base of the blade, 0.6–1 cm long; blades subcoriaceous, elliptic to ovate-elliptic, acute at apex, acute to prominently attenuate at base, 24–43 cm long, 8–25 cm wide, broadest at or near the middle, the margins broadly undulate; upper surface semiglossy to glossy, lower surface weakly glossy to semiglossy, both drying matte, brownish to brownish green; midrib sharply and acutely raised above, conspicuously paler than surface, convexly to obtusely raised at base below, becoming flat toward the apex, paler than surface; primary lateral veins 4–9 per side, departing midrib at 55–85° angle, weakly arcuate in the middle of the blade,  $\pm$  reflexed at base, prominently raised above, raised below; interprimary veins weakly visible; tertiary veins visible; reticulate veins obscure; collective vein arising from about the middle of the blade, flat above and below, slightly darker than surface below, 1–7 mm from margin. *Inflorescences* erect-spreading, shorter than leaves; peduncle 12.5–26 cm long, 4 mm diam. when fresh, 1–2 mm diam. when dried, 0.8–3.8 $\times$  as long as petiole, green (B & K yellow-green 8/7.5), terete; spathe reflexed to recurved, subcoriaceous, medium green, sometimes tinged with purple at margins (B & K yellow-green 6/7.5), lanceolate, 3–5 cm long, 0.8–2 cm wide, broadest near the base, inserted at 30–60° angle on peduncle, acute to short-acuminate at apex (the acumen inrolled, ca. 2 mm long), acute at base, the margins meeting at 45° angle; spadix greenish tinged with reddish to pale pink, also reported as becoming purplish post anthesis, long-tapered to nearly cylindrical, erect, 4.5–6.5 cm long, 4–8 mm diam. near base, 3–5 mm diam. near apex, broadest at the base; flowers rhombic to 4-lobed, 1.6–2.5 mm long, 1.8–2.2 mm wide, the sides jaggedly sigmoid; 7–9 flowers visible in principal spiral, (6)14–15 in alternate spiral; tepals semiglossy to matte, with droplets; lateral tepals 1–1.2 mm wide, the inner margins straight to convex, the outer margins usually 2-sided (meeting at ca. 90° angle), occasionally 3–4-sided; pistils weakly exserted, dark brownish purple; stigma slit-like, 0.5–0.6 mm long; stamens emerging rapidly in a regular sequence from the

base, held shortly above the tepals, the laterals preceding the alternates by 13–14 spirals, the 3rd stamen preceding the 4th by ca. 2 spirals; anthers orange to reddish purple, 0.4–0.5 mm long, 0.6–0.8 mm wide, inclined over and obscuring the pistil; thecae oblong, 0.3–0.4 mm wide; pollen yellow fading to white, weakly fruity-scented. *Infructescence* with purple berries.

*Anthurium paraguayense* var. *coroicoanum* is known only from the vicinity of the type locality in La Paz Department, Bolivia, at 700 to 900 m in subtropical moist and subtropical wet forest life zones, and from Cusco, Peru, at 800 m in a subtropical rainforest life zone.

*Anthurium paraguayense* var. *coroicoanum* differs from the typical variety in its more or less elliptic rather than oblanceolate leaf blades, and by having the lowermost primary lateral veins directed at an almost 90° angle from the midrib to prominently reflexed, vs. prominently ascending in the typical variety. Another character distinguishing the two taxa is berry color: purple in var. *coroicoanum*, dark red in var. *paraguayense*.

The new variety is named for the type locality, near the Río Coroico.

BOLIVIA. LA PAZ: Caranavi–Guanay, 27.8–28.1 km N of Caranavi, near bridge over Río Coroico, 820–865 m, 15°27'–33'S, 67°45'–50'W, Croat 51657 (MO), 51704 (B, K, MO, NY). SANTA CRUZ: Prov. Ichilo, Parque Nacional Amboro, 15 km SE up the Río Pitasama from Río Surutú, 700 m, 17°44'S 63°40'W, Solomon & Urcullo 14159 (MO). PERU. CUZCO: Prov. Paucartambo, Río Tono, N of Patria, Cosnipata Valley, 800 m, 13°07'S, 71°12'W, Wachter et al. 141 (F, MO).

*Anthurium pendulifolium* N. E. Br., Gard.

Chron. 36: 362. 1904. TYPE: unknown locality, possibly Colombia, *Kew H* 457/83 (holotype, K). Figures 9, 230, 233, 234, 255.

Epiphytic, rarely terrestrial; stem pendent, 20–30 cm long, 1.5–3.5 cm diam.; leaf scars reported as conspicuous, ca. 2.8 mm wide; roots moderately dense, descending, brown, 6 mm diam.; cataphylls moderately coriaceous, broadly lanceolate, scarcely 1-ribbed, 4–19 cm long, acuminate at apex with subapical apiculum, green, drying brown (B & K yellow-red 9/2.5), persisting as coarse linear fibers, the apex remaining intact. *Leaves* spreading-pendent to pendent; petioles 27–65 cm long, 5–10 mm diam., terete to subterete or thicker than broad, slightly flattened adaxially, rounded abaxially, the surface minutely pale-speckled; geniculum paler and thicker than petiole, 1.5–3.5 cm long; sheath 2.5–12 cm; blades coriaceous to subcoriaceous, oblong to oblanceolate, acuminate at apex, acute