

near the middle, lateral stamens emerging to midway before alternates appear; anthers yellow-orange, ca. 1 mm long, 1.2 mm wide, inclined over the pistil; thecae oblong-ellipsoid, scarcely divaricate; pollen yellow-orange (B & K yellow-red 8/5). *Infructescence* pendent; spathe twisted; spadix 24–26 cm long, 2.3–2.5 cm diam.; berries bright orange, obovoid, flattened at apex, 0.8–1.5 mm long; pericarp thin, \pm transparent; mesocarp fleshy, orange, with minute raphide cells; seeds 1–2 per berry, pale yellow, ovoid, with a somewhat flattened appendage at both ends, enveloped by somewhat dry, sac-like structure.

Anthurium validifolium is known from Chiriquí Province in Panama and adjacent Puntarenas Province in Costa Rica. Most collections have been made in lower montane rain forest, from 1,200 to 2,300 m.

This species is characterized by its large, moderately thick, lanceolate leaf blades, lavender to purple spadix, and bright orange, obovoid berries.

Anthurium validifolium is probably most closely related to *A. seibertii* and *A. protensum*, which share a similar inflorescence and orange berries. It differs from both in having broader and thicker leaf blades. Its subquadrangular petiole is somewhat intermediate between the terete petiole of *A. protensum* and the sharply quadrangular petiole of *A. seibertii*. Although this suggests *A. validifolium* may be a hybrid between *A. protensum* and *A. seibertii*, its thicker, proportionately shorter blades are not a feature of those species.

The specimen from Puntarenas was cultivated at Las Cruces Tropical Botanical Garden, but was reported to have been collected locally by Robert Wilson, founder of the garden.

COSTA RICA. PUNTARENAS: Cantón de Coto Brus, Las Cruces Tropical Botanical Garden, 6 km W of San Vito de Java, *Croat* 44445, 57258, 57279 (MO). PANAMA. CHIRIQUÍ: 2 mi. N of El Hato del Volcán, *Croat* 10667 (B, F, GH, K, MO, NY, PMA, RSA, US); Cerro Pelota, 2,300 m, 8°54'N, 82°43'W, *Knapp* 1513 (F, MO); Cerro Pelota, lower slopes, 1,800–2,000 m, 8°53'N, 82°43'W, *Knapp* 1497 (K, MO); ridge S of Cerro Pelota, 1,700–2,200 m, 8°53'N, 82°43'W, *Knapp* 1522, 1523, 1526, 1528, 1529 (MO); Cerro Punta, 4.7 mi. E of Volcán, 1,600 m, 8°49'N, 82°38'W, *Croat* 66204 (MO); Volcán-Río Sereno, 1,520 m, *Croat* 66321 (MO); Bambito-Cerro Punta, *Croat* 10553 (MO); *Croat* 10554 (F, MO); Boquete Region, 9 km WNW of Boquete, 1,870 m, *Davidse & D'Arcy* 10309 (MO, PMA); Cerro Pando, NW side, *Croat* 15971 (MO, NY); Río Colorado, 1,200–1,400 m, 8°50'N, 82°43'W, *Hamilton & Stockwell* 3532 (MO); Río Ladrillo, El Boquete, 1,200–1,300 m, *Pittier* 3052 (US).

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

Colombia. Vaupés: vic. Mitú, 2–3 km below Urania, Río Vaupés, *Zarucchi & McElroy* 1172 (holotype, GH; isotype, COL). Figures 329, 330.

Planta epiphytica; internodia brevia, 1–2 cm diam.; cataphyllum lanceolatum; petiolus 4–9 cm longus, 3–5 mm diam., complanatus et obtuse costatus adaxile, abaxile rotundatum ad trinervis; lamina coriacea-subcoriacea, oblanceolata-obovata, abrupte attenuate in dimidio inferiore, 20–62 cm longa, 9–26 cm lata; nervis primariis lateralibus 6–12 utroque; pedunculus (16)36–70 cm longus; spatha oblonga-linearis, viridis-olivacea, 9–20 cm longa, 0.6–1.5 cm lata; spadix brunneo-rubellus aut virellus, sessilis vel stipitatus, ad 3.5 cm, longe contractus, 20–35 cm longus, 3–4 mm diam.; baccae violaceae.

Epiphytic; stem to 9 cm long, 1–2 cm diam.; roots dense, ascending, fuzzy, soon glabrous, 3–4 mm diam.; cataphylls subcoriaceous, lanceolate, 3–5 cm long, acuminate at apex, drying dark reddish brown, semi-intact, persisting briefly. *Leaves* erect-spreading; petioles 4–9 cm long, 3–7 mm diam., D-shaped, flattened and conspicuously and obtusely ribbed adaxially, rounded to weakly angulate or weakly 3-ribbed abaxially; geniculum thicker than petiole, 0.5–1 cm long; sheath 3–7 cm long; blades coriaceous to subcoriaceous, oblanceolate-obovate, acute at apex, narrowly attenuate, ending narrowly acute to obtuse at base, 20–62 cm long, 9–26 cm wide, broadest above the middle, the margins usually flat, sometimes weakly and broadly undulate; upper surface semiglossy, medium green, lower surface weakly glossy, paler; both surfaces drying grayish to grayish brown; midrib convexly raised at base, becoming sharply raised (knifelike) toward the apex above, acutely raised at base, becoming convex toward the apex below; primary lateral veins 6–12 per side, departing midrib at 30–50° angle, straight to arcuate-ascending to the margin, raised in shallow grooves above; tertiary veins conspicuously sunken above, conspicuously raised below; collective vein arising from near the apex or absent, sunken above, raised below, 6–12 mm from margin. *Inflorescences* erect to pendent, \pm equaling leaves; peduncle (16)36–70 cm long, (1)3–4 mm diam., (2.7)4–7.7 \times as long as petiole, terete; spathe spreading to reflexed, subcoriaceous, green to brownish green, sometimes mottled purple, oblong-linear, 9–20 cm long, 0.6–1.5 cm wide, inserted at 40° angle on peduncle, acute at apex, attenuate at base; spadix brown to reddish to greenish or gray-brown (once reported as white), long-tapered, sessile or stipitate to 3.5 cm, somewhat curved, 20–38 cm long, drying 3–4 mm diam.

midway, 2 mm diam. near apex; flowers rhombic, 1.4–1.8 mm long, 1.2–1.4 mm wide, the sides straight to smoothly or jaggedly sigmoid; 3–5 flowers visible in principal spiral, 3 in alternate spiral; tepals semiglossy, minutely papillate; lateral tepals 0.7–0.9 mm wide, the inner margins straight to rounded, the outer margins 2-sided; anthers 0.4 mm in both directions, inclined over and obscuring the pistil; thecae ellipsoid, slightly divaricate. *Infructescence* with spathe persisting \pm intact; spadix 0.9 cm diam.; berries violet.

Anthurium vaupesianum is endemic to southern Colombia in Vaupés (hence the name) and Amazonas departments, where it is an epiphyte at 130–250 m in tropical premontane wet forest.

This species is characterized by its small size, short petioles, obovate-oblancoolate leaf blades drying grayish-brown and usually rather abruptly attenuate in the lower half with conspicuously concave margins, and by its very slender, long-tapered spadix. It is probably most closely allied to *A. anorianum* from Antioquia Dept. in northern Colombia. Although it has a similar long, slender spadix, the latter has larger leaves that have convex margins in the lower half and are obtuse to acute at the base, and peduncles that dry reddish. It occurs at 300 to 750 m, in a region separated from *A. vaupesianum* by two major mountain ranges.

COLOMBIA. AMAZONAS: Río Caqueta, La Padraera, 240 m, *García-Barriga* 14605 (COL). AMAZONAS-VAUPÉS: Río Apaporis, Río Pacoa–Río Cananari, Soratama, 250 m, *Schultes & Cabrera* 13535, 13796 (ECON), 12772, 13621 (US); Jinogoje, mouth of Río Piraparana, 230 m, 0°15'S, 70°30'W, *Schultes & Cabrera* 19820 (US). VAUPÉS: 2 km SE of Mitú, 200 m, 1°14'N, 70°14'W, *Croat* 56795 (AAU, COL, F, JAUM, K, M, MO, NY, RSA, US); Río Kubiuyu, vicinity of Mitú, *Zarucchi & Davis* 1185 (COL, GH); Río Piraparana, middle course, *Schultes & Cabrera* 17128 (US); Río Vaupés, Mitú, 2–3 km below Urania, *Zarucchi & McElroy* 1172 (COL, GH).

Anthurium venosum Griseb., Cat. Pl. Cub. 219. 1866. TYPE: Cuba. Westindische Province, *Wright* 3209 (holotype, MO 2058854; isotypes, NY, US). Figures 328, 349, 350.

Terrestrial or epilithic. Stem short, ca. 1.5–2 cm diam.; roots dense, grayish, moderately to densely velutinous, moderately elongate, ca. 3–5 mm diam.; cataphylls subcoriaceous, lanceolate, 3–6 cm long, acute at apex, brown (B & K yellow 4/2.5), persisting semi-intact, eventually as a re-

ticulum of fibers. *Leaves* with petioles (5)15–40 cm long, ca. (3)6–10 mm diam., terete to weakly sulcate, medium green; geniculum 1 cm long; blades coriaceous to subcoriaceous, oblong-ovate, acute to shortly acuminate at apex (the acumen shortly apiculate), \pm rounded to subcordate or weakly cordate at base, (17)24.5–46 cm long, (12.5)15.7–21.5 cm wide, broadest at or near the middle, the margins broadly undulate; anterior lobe (15)22.5–40 cm long; the posterior lobes (3.5)5–6 cm long, (4)5–6 cm wide, directed downward and rounded at apex; sinus mostly triangular, rarely arcuate with the blade decurrent on petiole to shallowly triangular, 1–3 cm deep; both surfaces glossy, moderately bicolorous, drying yellowish brown to yellowish green; midrib convexly raised above, paler than surface, more prominently raised below; basal veins 3–4 pairs, all free to base, raised above and below; primary lateral veins 5–9 per side, departing midrib at 40–65° angle, straight to broadly arcuate, prominently raised and paler than surface above and below; interprimary veins almost as conspicuous as primary lateral veins; tertiary veins prominulous; reticulate veins raised; collective vein arising from near the apex or absent. *Inflorescences* spreading; peduncle 12–84 cm long, ca. 3–8 mm diam., 1.4–2.9 \times as long as petiole; spathe reflexed, subcoriaceous, green, lanceolate to linear-lanceolate, 3–10 cm long, 1–1.5 cm wide, broadest near the base, acuminate at apex (the acumen sometimes cuspidate, 6–7 mm long), acute to decurrent at base; stipe 15–17 mm long in front, 5 mm long in back; spadix brownish green to purplish brown, tapered, \pm erect to curved, 2–15 cm long, 5–6 mm diam. near base, 2–3 mm diam. near apex; flowers rhombic, 2.5–2.9 mm long, 1.4–2 mm wide, the sides straight to smoothly sigmoid; 5–6 flowers visible in principal spiral, 8–9 in alternate spiral; tepals weakly roughened; lateral tepals 1.3–1.7 mm wide, the inner margins broadly convex, the outer margins 2-sided; pistils pale green; stigma \pm ellipsoid, 0.3–0.4 mm long; anthers 0.3–0.4 mm long, 0.5–0.7 mm wide; thecae \pm ovoid, not at all or only slightly divaricate. *Infructescence* with spathe persisting; spadix to 17 cm long, to 2 cm diam.; berries orange-red, \pm ovoid to obovoid, 6–6.5 mm long, 4.5–6.2 mm diam.; seeds 1–2 per berry, brown with numerous pale raphide cells on the surface, 3.7–4 mm long, 1.7–2.8 mm diam., 1.2–1.8 mm thick.

Anthurium venosum is known only from Cuba and is apparently restricted to Piñar del Río Prov-