

*bach* 45069 (K); Morro do Chapéu, 900 m, *Hatschbach* 42428 (K); Mucugê, 2 km along Andaraí road, 850 m, 12°59'S, 41°21'W, *Harley et al.* 20615 (K); *Hatschbach* 47955 (K); Pasto Guanabara, Faz Morro de Pedra-Itaberaba, *Ferreira* 191 (K); Rio do Contas-Livramento, cachoeira near road, *Storr* 194 (K); Rio Cumbuca, N of Mucugê on Andaraí Road, 850 m, *Harley* 16000 (K, US); Rio Ferro Duido, 19.5 km SE of Morro do Chapéu on BA 052 road to Mundo Novo, 900 m, 11°38'S, 41°02'W, *Harley et al.* 19254 (K, MO), 22865 (K); Rio Itapicuru, Jacobina, 450 m, *Martinelli* 5143 (RB); Rio Paragucu, Andaraí-Mucugê, BA Mucugê, *Pirani et al.* 1625 (K, MO); Serra da Jacobina, Senhor do Bonfim-Juazeiro, BA 130, 12 km N of Senhor do Bonfim, W of Estiva, 850 m, *Harley* 16589 (K); Serra das Almas, NW of Rio de Contas, 1,000–1,200 m, *Mori & Benton* 13536 (NY); Serra do Jatobá, Morro do Couro or Morro São Cristóvão, 500–600 m, 12°54'S, 39°52'W, *Harley* 19427 (K), 19429 (K, MG, MO). Serra do Rio do Contas, Rio do Contas-Mato Grosso, 12–14 km N of Rio do Contas, 1,200 m, 13°28'S, 41°50'W, *Harley* 15196 (K); Serra do Sincorá, 5 km S of Andaraí, road to Mucugê near bridge over Rio Paragucu, 400 m, 12°50'S, 41°19'W, *Harley et al.* 18594 (K, MO); Serra dos Lençóis, Seabra-Itaberaba, 7–10 km, W of Lençóis turnoff, by Rio Mucugezinho, 12°28'S, 41°26'W, *Harley* 22695 (K); Mpo. Jaguaruara, Jaraguara-Milagras, Rodovia BR116, *Silva et al.* 1576 (K); Mpo. Lençóis, NW of Lençóis, Barro Branco road, 630 m, 12°32'S, 41°20'W, *Lewis et al.* 920 (K, MO); Mucugezinho Rodovia BR242, 720–760 m, *Lewis & Carvalho s.n.* (K); Mpo. Livramento do Brumado, Rodovia Liv. do Brumado-Rio do Contas, 600 m, *Mori et al.* 12242 (K, NY); Mpo. de Palmeiras, ca. km 250 na Rodovia BR 242, *de Carvalho & Saunders* 2966 (NY). GOIÁS: Dianópolis, *Pirani et al.* 1965 (K, MO, SPF). MATO GROSSO: cultivated at Floricultura Cam-pineira Hda. Campinas, São Paulo (*Oliveira* 1420), *Hutchinson* 8849 (MO). MATO GROSSO DO SUL: Ituiutaba, (Furma?) de São Vicente, *Macedo* 1237 (RB), 1910 (RB, UC, US), 2185 (UC, US). MINAS GERAIS: Mpo. Diamantina, Diamantina, 1,200 m, *Martinelli* 5900 (RB); Rodovia Guinda-Cons. Mata, *Hatschbach & Kummrow* 49742 (MBM, MO); road to Diamantina, SW of Mendanha and Rio Jequití, 1,150 m, *Anderson* 8841 (F, NY, US); NE of Diamantina, on road to Mendanha, 1,300 m, *Irwin et al.* 22630 (US); Rio Abaite, Rodovia Brasília, *Heringer* 7801 (MG); Rio Jequití, E of Diamantina, 790 m, *Irwin et al.* 27430 (MO, NY, SEL, US); Mpo. Diamantina, Biribiri, *Hatschbach & Pelada* 27550 (K), 27990 (MU), *Zappi et al.* 47358 (MO); Joaquim Felício, Serra do Cabral, *Zappi et al.* 39756 (MO); 1,160 m, 17°42'S, 44°18'W, *Pirani et al.* 2183 (K, MO, SPF). PARÁIBA: *Xavier s.n.* (RB), 42082 (RB); vic. João Pessoa, nos Tubuleiros da Costa, *Xavier* 9191 (K). PERNAMBUCO: Tapera, *Pickel* 2373 (US); Praia do Guaiubá, 35 km S of Recife, 10–30 m, *Tsugaru et al.* B-1377 (MO, OOM); Rio Formoso, Horto Florestal de Salinho, *Falcão et al.* 775 (MO, RB).

*Anthurium angustilaminatum* Engl., Bot. Jahrb. Syst. 25: 411. 1898.

a. *Anthurium angustilaminatum* subsp. *angustilaminatum*. TYPE: Ecuador. Pichincha: Guallea, *Sodirol s.n.* (holotype, B; isotypes, P, Q). Figure 31.

*Anthurium angustilaminatum* var. *album* Sodirol, Anales Univ. Centr. Ecuador 22(156): 21. 1906. TYPE: Ecuador. Imbabura: Guallepe, *Sodirol s.n.* (n.v.).

*Anthurium angustilaminatum* var. *brevipetioles* Sodirol, Anales Univ. Centr. Ecuador 22(156): 21. 1906. TYPE: Ecuador. Imbabura: between Paramba and Guallepe, *Sodirol s.n.* (n.v.).

*Anthurium angustilaminatum* var. *crassum* Sodirol, Anales Univ. Centr. Ecuador 22(156): 20. 1906. TYPE: Ecuador. Pichincha: Nanegal, *Sodirol s.n.* (n.v.).

*Anthurium angustilaminatum* var. *gladiatum* Sodirol, Anales Univ. Centr. Ecuador 22(156): 20. 1906. TYPE: Ecuador. Imbabura: between Coajara and Paramba, *Sodirol s.n.* (n.v.).

Based on dried material only. Terrestrial; stem short, 1.8–2.5 cm diam.; roots moderately numerous, grayish brown, puberulent, slender, elongate, 2–3 mm diam.; cataphylls 9.5–20 cm long, acuminate to short-acuminate at apex, light brown, persisting semi-intact as fine linear fibers; petioles 8–15 cm long, 5–8 mm diam., D-shaped to subtriangular, broadly rounded to sulcate adaxially, the margins thin, prominently raised, appearing winged, rounded and acutely to obtusely 1-ribbed abaxially; geniculum slightly thicker than petiole, (0.5)1.5–2 cm long; blades coriaceous, narrowly to broadly oblong-elliptic, acute, sometimes shortly acuminate at apex, acute to narrowly acute (rarely rounded) at base, 40–94 cm long, 6–12 cm wide, broadest at or near the middle, the margins narrowly undulate; upper surface green, slightly paler below, both surfaces matte to semiglossy, yellowish brown, sometimes greenish; midrib convexly raised above, prominently raised and 1-ribbed at base, becoming narrowly acutely raised toward the apex below; primary lateral veins darker than surface, 25–35 per side, departing midrib at 30–55° angle, straight to weakly arcuate to the collective vein, prominently raised above; interprimary veins numerous, almost as conspicuous as primary lateral veins; tertiary veins prominulous; collective vein arising from the base, raised above and below, equally as prominent as primary lateral veins, 5–10 mm from margin. *Inflorescences* apparently spreading; peduncle 15–55 cm long, 5–8 mm diam., 2.2–3.1× as long as petioles, green, sharply angular, rarely terete; spathe erect to reflexed, subcoriaceous, yellowish green, lanceolate to ovate-lanceolate, 5–9 cm long, 1–1.3 cm wide, acuminate at apex (the acumen inrolled), narrowly acute at base; spadix dark purple, cylindroid, subsessile, 6–12 cm long, 5–12 mm diam.; flowers rhombic, 1.9–2.4 mm long, 1.5–2.1 mm wide, 4–6 flowers visible in principal spiral, 9–12 in alternate spiral; tepals minutely papillate, lateral tepals 1.4–2 mm wide, the inner margins straight, sometimes broadly convex, occasionally turned up against the pistil,

the outer margins 2-sided; pistils slightly raised; stigma slitlike, 0.5–0.7 mm long; filaments prominently exerted, holding anthers above tepals, the exerted part 0.5–0.7 mm long; anthers yellow, 0.4–0.5 mm long, 0.5 mm wide; thecae oblong-ovoid, not divaricate. *Infructescence* with spathe persisting; spadix ca. 15 cm long, 1 cm diam.; berries drying 2.5–4 mm diam., probably orange.

A member of series *Multinervia*, *Anthurium angustilaminatum* is comprised of two subspecies, the typical one known only from the slopes north of Volcán Pichincha in Pichincha Province in northern Ecuador, and subsp. *cibuserpentis*, from Cotopaxi and El Oro further to the south. Subspecies *angustilaminatum* occurs in a premontane wet forest life zone at ca. 1,200 m.

The species is distinguished by its coriaceous, oblong-elliptic leaf blades with numerous primary lateral and interprimary veins, and its dark purple spadix.

The typical subspecies appears to be most closely allied to *A. soukupii*, which ranges from southern Ecuador to Bolivia, and is very similar morphologically. *Anthurium angustilaminatum* subsp. *angustilaminatum* occurs on the Pacific slope of Ecuador at ca. 1,200 to 1,600 m in a premontane wet or lower montane moist forest life zones, whereas *A. soukupii* occurs on the other side of the Andes at over 2,000 m in various montane forest life zones. Neither species has been studied in cultivation, and for the present, it is felt that the two taxa should be recognized as distinct based on phytogeography, and that study of further collections can be expected to reveal more definitive morphological features for both species. Both subspecies of *A. angustilaminatum* differ from *A. soukupii* in having short, compact (rather than elongate) stems. The habit is epiphytic in at least subsp. *cibuserpentis*, rather than terrestrial as for *A. soukupii*.

A new subspecies, subsp. *cibuserpentis*, is described in the present paper and is distinguished from the typical subspecies mainly by its smaller overall size and abruptly obtuse to truncate leaf bases. It occurs further to the south in Cotopaxi and El Oro provinces, at higher elevations in drier life zones. Like the typical subspecies, it is known only from the Pacific slope of the Andes in Ecuador.

Three of the four varieties described by Sodiro (1906) were collected in the same area in Imbabura Province, not far from the type locality of var. *crassum* and also the typical subspecies. All collections are from the same life zone. Although the type specimens of all four varieties described by

Sodiro have not been seen and probably no longer exist (except for a photograph of the type of var. *crassum*), the differences given by Sodiro are slight, and no key is given to distinguish between the varieties. In view of the fact that Sodiro's species concept was often quite liberal, and that the type of var. *crassum* can scarcely be distinguished from material of the typical variety, it seems best to reduce all four varieties to synonymy.

ECUADOR. PICHINCHA: Guala, ca. 1,200 m, Sodiro 18 (B, P); Sodiro s.n. (G, MO, SI, US); Parroquia Calacali, Reserva geobotánica del Pululahua, Sta. Rita, 0°05'N, 78°30'W, 1,600 m, Ceron et al. 4763 (MO, QCNE).

**b. *Anthurium angustilaminatum* subsp. *cibuserpentis*** Croat, subsp. nov. TYPE: Ecuador. Cotopaxi: Pilalo, Km 80 on Quevedo–Latacunga road, 2,500 m, Dodson 15397 (holotype, MO 3247505). Figure 32.

Differt a subsp. typicum petiolo breviori; lamina oblonga, basi rotundata vel truncata, nervis primariis lateralis numerosis.

Based on dried material only. Epiphytic; stem short, ca. 2 cm diam.; roots dense, numerous, ascending to spreading, whitish, velutinous, short, tapered, ca. 3 mm diam.; cataphylls subcoriaceous, to at least 8 cm long, yellowish tan, persisting as fine linear fibers. *Leaves* erect; petioles 3.5–7 cm long, ca. 3–6 mm diam., D-shaped, flattened with the margins raised adaxially, rounded abaxially; geniculum 0.3–1 cm long; blades subcoriaceous, oblong-lanceolate to oblong-elliptic, acute at apex, truncate to narrowly rounded at base, 32–61 cm long, 5–9 cm wide, broadest at or near the middle, the margins slightly undulate; both surfaces matte to semiglossy and yellowish green; midrib convexly raised, becoming acute toward the apex above, higher than broad at base, becoming convexly raised toward apex below; primary lateral veins numerous, to more than 20 per side, departing midrib at 50–70° angle,  $\pm$  straight to the collective vein, raised above and below; interprimary veins numerous, almost as conspicuous as primary lateral veins; tertiary veins raised; collective vein arising from near the base, equally as prominent as primary lateral veins, 3–8 mm from margin. *Infructescences* erect; peduncle 17–23 cm long, ca. 3 mm diam., 3.9–4.2 $\times$  as long as petioles, terete; spathe spreading, subcoriaceous, green, at least 7 cm long, 1–1.5 cm wide, acute at base; spadix (post-anthesis) green, slightly tapered, ca. 8 cm long; flowers apparently  $\pm$  square, 5–6 flowers visible in principal spiral, 6–9 flowers visible in alternate spiral, lateral tepals 2–2.5 mm wide, the

inner margins  $\pm$  straight, becoming turned up against pistil, the outer margins 2-sided; stigma ellipsoid, 0.4–0.5 mm long; anthers 0.5–0.6 mm long, 0.5–0.7 mm wide; thecae oblong, slightly divaricate. *Infructescence* erect; spathe persisting and withered or absent; spadix ca. 12 cm long, ca. 1.2 cm diam., with berries scattered throughout; berries greenish (immature), oblong, mammilliform at apex, 5.5–6 mm long, 3.2–3.6 mm diam.; pericarp thickened, with raphide cells present; seeds 2 per berry, orange-brown when dried, ca. 3 mm long, 2.2–2.4 mm diam., ca. 1 mm thick.

*Anthurium angustilaminatum* subsp. *cibuserpentis* is known from the provinces of El Oro and Cotopaxi in Ecuador, where it occurs at 2,135 to 2,500 m in lower montane moist and lower montane dry and/or montane moist (undeterminable from map) forest life zones.

The subspecies is distinguished by its short petioles and more or less oblong leaf blades with numerous primary lateral veins, which are rather abruptly and shortly rounded to truncate at the base. The color of the spadix at (or even near) anthesis is unknown.

*Anthurium angustilaminatum* subsp. *cibuserpentis* differs from the typical subspecies principally by its abruptly ending leaf bases and by occurring in drier life zones at higher elevations (2,135–2,500 vs. 1,200–1,500 m) to the south, rather than north, of the equator. The new subspecies is smaller in overall size as well. See discussion under subsp. *angustilaminatum* for distinguishing both subspecies from *A. soukupii*.

The name is taken from “cibus” (Latin, meaning food) and “serpentis” (Latin, meaning snake) in reference to label data stating that the fruits of the plant are eaten by snakes.

ECUADOR. COTOPAXI: Km 80 on road Quevedo–Latacunga, 2,500 m, *Dodson 15397* (MO). EL ORO: Pampa de los Cedros, S of Cerro Chivo–Turco, 2,135–2,285 m, *Steyermark 53764* (US, NY).

***Anthurium anorianum*** Croat, sp. nov. TYPE: Colombia. Antioquia: between Segovia and Cañaverales, vic. Río Bagre, 300 m, *Croat 56757* (holotype, MO 3116672-74). Figures 30, 33, 34

Planta epiphytica; internodia brevissima, 2–4 cm diam.; cataphyllum lanceolatum, persistens semi-intactum; petiolus 4–9 cm longus, 9–17 mm diam., obtuse D-formatus, late sulcatus; lamina late oblanceolata, basi attenuata, 36–100 cm longa, (12)20–60 cm lata; spatha lanceolata, 7.5–9(35) cm longa, 1–1.3 cm lata; spadix purpureus, leniter contractus, 14–23 cm longus, 5–6 mm diam.

Epiphytic; stem short, 2–4 cm diam.; roots numerous, very dense, spreading, green to whitish, grayish brown on drying, moderately thick, 6–24 cm long, 3–5 mm diam. when fresh, drying 1–2 mm diam.; cataphylls subcoriaceous, lanceolate, 2–3 cm long, acute at apex, green, drying brown (B & K yellow-red 4/10), persisting semi-intact. *Leaves* spreading; petioles 4–9 cm long, 9–17 mm diam., obtusely D-shaped, broadly convex adaxially with the margins shortly and sharply raised, rounded to 3–5-ribbed abaxially, surface pale-speckled, reddish when young; geniculum thicker and slightly paler than petiole, 1–1.5 cm long, prominently and transversely fissured with age; blades subcoriaceous, broadly oblanceolate, acute to acuminate at apex (the acumen apiculate), attenuate at base, 36–100 cm long, (12)20–60 cm wide, broadest above the middle, the margins broadly and shallowly undulate; both surfaces glossy to semiglossy, medium green above, slightly paler below, drying brown to greenish brown; midrib flat to obtusely raised at base, becoming acutely raised toward the apex and slightly paler than surface above, obtusely raised below and slightly paler than surface, pale short-lineate; primary lateral veins 12–16 per side, departing midrib at 40–55° angle, straight or weakly ascending to the margin, sunken above, prominently convex and slightly paler than surface below; tertiary veins obscure above, prominent and slightly darker than surface below, drying raised on both surfaces; collective vein arising in upper third or fourth of the blade, sunken above, raised below, less prominent than primary lateral veins, raised above and below on drying, 4–20 mm from margin. *Inflorescences* probably erect-spreading; peduncle 69–105 cm long, 5–15 mm diam. when dried, 6–9× as long as petioles, green, drying brown to pinkish brown, terete; spathe spreading, slightly recurved, subcoriaceous, green, tinged with purple near the apex, lanceolate, 7.5–9(35) cm long, 1–1.3 cm wide, broadest near the base, acuminate at apex (the acumen inrolled), acute to almost decurrent at base; stipe 1.5–1.8 mm long in front; spadix purple to dark purple, long-tapered, 14–23 cm long, 5–6 mm diam. near base, 3–4 mm diam. near apex; flowers  $\pm$  rhombic, 3–3.3 mm long, 2.8–3 mm wide, the sides straight, 4–5 flowers visible in principal spiral, 7–8 in alternate spiral; tepals smooth, pale-punctate, lateral tepals 2.1–2.4 mm wide, the inner margins straight to broadly convex, the outer margins 2-sided; pistils green; stigma ellipsoid, 0.4–0.6 mm long; anthers 0.3–0.4 mm long, 0.4–0.5 mm wide; thecae oblong, not divaricate. *Infructescence* with the spathe persisting withered; spadix (12)18–41(100) cm