

(RB); Neves Armond, Carmo, *RB 43978* (RB); Mpo. Petropolis, Rodovia Washington Luis, 420 m, *Martinelli 3080* (RB); Reserva do IBDF, Mata do Fação, estrada Fazenda Inglesa para Pati do Alferes, 1,100–1,200 m, *Cavalcante & Marinelli 541* (K); Mpo. de Santo Antônio de Pádua, BR 393, *Pirani et al. 268* (K, MO, SPF); Mpo. Teresopolis, Parque Nacional da Serra dos Orgãos, 1,300 m, *Vidal 5557* (R).

Anthurium solomonii Croat, sp. nov. TYPE: Bolivia. La Paz: Prov. Yungas: 32.1 km N of Yolosa on road to Caranavi, *Solomon & Escobar 12494* (holotype, MO 32475329-30; isotype, LPB). Figures 296, 345, 346.

Planta epilithica aut terrestris; internodia brevina, ad 5 cm diam.; cataphyllum ad 19 cm longum, persistens semi-intactum demum fibris linearis findens; petiolus 7–21 cm longus, 8–10 mm diam., D-formatus, 1-costatus adaxile, 1–2-costatus abaxile; lamina oblanceolata ad oblongo-oblanceolata, (39)65–94 cm longa, (9)18–35 cm lata; pedunculus (4)10–26 cm longus, ca. 5 mm diam.; spatha lanceolata, ultra 6 cm longa, ca. 1.7 cm lata; spadix longeus contractus vel cylindricus, 7.5–19.5 cm longus, 9 mm diam.; baccae laete roseo-purpureae.

Description based on dried material only. Epilithic or terrestrial; stem to 5 cm diam.; roots numerous, gray, finely pubescent, short, 2–4 mm diam.; cataphylls probably subcoriaceous, to more than 19 cm long, brown-gray, persisting semi-intact, eventually as fine linear fibers. *Leaves* with petioles 7–21 cm long, 8–10 mm diam., D-shaped, with an obtuse medial rib and acute, somewhat raised margins adaxially, 1–3-ribbed abaxially; geniculum drying darker than petiole, 0.7–1 cm long; sheath 6 cm long; blades subcoriaceous, oblanceolate to oblong-oblanceolate, acute at apex (the acumen apiculate), narrowly rounded at base, (39)65–94 cm long, (9)18–35 cm wide, broadest above the middle, the margins undulate; both surfaces glossy, matte to glossy, brown to greenish; midrib sharply and prominently acute above, below higher than broad and obscurely 3-ribbed at base, becoming convexly raised toward the apex; primary lateral veins (10)15–19 per side, departing midrib at 40–90° angle, straight, sometimes broadly arcuate, convexly raised on both surfaces; interprimary veins few; tertiary veins raised above and below; reticulate veins raised below; collective vein arising from lower third of the blade or absent in young plants, less prominent than primary lateral veins on both surfaces, 2–7 mm from margin. *Inflorescences* shorter than leaves; peduncle (4)10–26 cm long, ca. 5 mm diam., 0.5–2× as long as petiole; spathe subcoriaceous, presumably lanceolate, more than 6 cm long, ca. 1.7 cm wide, decurrent at base; stipe ca. 2.7 cm long in front, 4 mm long in back; spadix color unknown, long-

tapered to ± cylindroid in small plants, weakly curved, held at 160° angle from peduncle, 7.5–19.5 cm long, 9 mm diam. near base, 4 mm diam. near apex; flowers rhombic, 2.1–2.4 mm long, 1.4–1.7 mm wide, the sides straight to smoothly sigmoid; 9–11 flowers visible in principal spiral, 5–6 in alternate spiral; tepals roughened; lateral tepals 0.9–1.5 mm wide, the inner margins straight to broadly convex, the outer margins 2-sided; stigma linear, 0.5–0.7 mm long; anthers pale yellow, 0.5–0.6 mm long, 0.7–0.8 mm wide, obscuring the pistil; thecae oblong, slightly divaricate. *Infructescence* appearing to be ± erect; spathe deciduous; spadix ca. 21 cm long, 2 cm diam., reddish brown (excluding tepals); berries bright pinkish purple, oblong-ovoid, probably acute and with radial ridges at apex, becoming sunken in on drying, 7.5–8 mm long, 4.6–5 mm diam.; pericarp thickened, with numerous raphide cells; seeds 2 per berry, reddish brown, ± ovoid, flattened, 3.4–3.6 mm long, 2.2–2.4 mm diam., 0.8–1 mm thick, with a gelatinous, translucent, amber appendage at each end.

Anthurium solomonii is known only from La Paz Dept. in Bolivia at 1,000 to 1,400 m in wet subtropical or wet lower montane subtropical forest life zones (according to the Holdridge Life Zone Map for Bolivia).

This species is distinctive, with its spadix longer than the peduncle, a character otherwise known in the section only in *Anthurium plowmanii*. The petiole of *A. plowmanii* is narrowly sulcate adaxially with blunt margins, whereas in *A. solomonii* there is a prominent medial rib adaxially and prominently raised, acute margins. In Bolivia, *A. plowmanii* is known only from Pando and Santa Cruz departments and occurs at less than 900 m, mostly less than 300 m.

The species is named in honor of James Solomon, who has collected extensively in Bolivia and was involved in making all known collections of *A. solomonii*.

BOLIVIA. LA PAZ: Prov. Murillo. Valle de Zongo, 45 km below the dam at Lago Zongo, Cahua hydroelectric plant, 1,200–1,400 m, 16°3'S, 68°1'W, *Solomon 13000* (MO); Prov. Nor Yungas, Yolosa-Caranavi, 32.1 km N of Yolosa, 1,000 m, 16°2'S, 67°39'W, *Solomon & Escobar 12494* (LPB, MO); 10 km by road N and above Caranavi, 1,400 m, 15°47'S, 67°32'W, *Nee & Solomon 30311* (NY).

Anthurium soukupii Croat, sp. nov. TYPE: Peru. Cuzco: Urubamba, Machupicchu, 0.5 km N of the union of Río Sayamarca and Río Aobamba, 2,370 m, *Peyton & Peyton 1486*

(holotype, MO 3024625-6). Figures 294, 297, 298.

Planta terrestris; caulis elongatus, ad 50 cm longus; internodia 1.5–2.5 cm diam.; cataphyllum lanceolatum, persistens in fibris linearis; petiolus 6.5–11 cm longus, ca. 5–7 mm diam., triangularis; lamina late ad angustate oblanceolato-elliptica, (22.5)28–63 cm longa, (3.8)4.7–10 cm lata; pedunculus 22–40 cm longus, 2–4 mm diam.; spatha lanceolata, 4.5–8 cm longa, 7–14 mm lata; spadix atropurpureus leviter contractus, 3.5–6 cm longus, ca. 4–5 mm diam.; baccae globosae, 3.2–4 mm longae.

Terrestrial; stem elongate, to 50 cm long, 1.5–2.5 cm diam.; roots moderately numerous, dense, white, smooth, thick, \pm elongate; cataphylls lanceolate, probably subcoriaceous, to 11 cm long, acute at apex, drying yellowish tan, persisting as fine linear fibers. *Leaves* spreading; petioles 6.5–11 cm long, ca. 5–7 mm diam., triangular, flattened adaxially with the margins moderately to sharply raised, sides weakly convex, obtusely rounded to acutely angular abaxially; geniculum not at all or only slightly thicker than petiole when dried, 0.7–1 cm long; blades coriaceous, broadly to narrowly oblanceolate-elliptic, acute at apex, acute to obtuse at base, (22.5)28–63 cm long, (3.8)4.7–10.7 cm wide, broadest above the middle, the margins straight to weakly undulate; upper surface semiglossy, medium green, paler below; both surfaces drying matte, occasionally semiglossy below, green to yellowish; midrib convex- to round-raised above, sharply acute below; primary lateral veins numerous, to more than 20 per side, departing midrib at 50–65° angle, \pm straight, obscure to raised and darker than surface above, flat to weakly raised below; interprimary veins numerous, almost as conspicuous as primary lateral veins on both surfaces; tertiary veins not visible on either surface; collective vein arising from near the base, sometimes in the upper third of the blade, equally as prominent as primary lateral veins on both surfaces when dried, 3–12 mm from margin. *Infructescences* erect to spreading; peduncle 22–40 cm long, 2–4 mm diam., 2.6–4.2 \times as long as petiole, apparently ribbed abaxially; spathe reflexed, subcoriaceous, green, lanceolate, 4.5–8 cm long, 0.7–1.4 cm wide, broadest near the base, acuminate at apex, acute at base; stipe to 1 cm long in front, to 3 mm long in back; spadix dark purple, weakly tapered, stipitate to sessile, ca. 3.5–6 cm long, ca. 4–5 mm diam. near base; flowers \pm square 3.1–4.3 mm in both directions, the sides straight to smoothly sigmoid; 5–6 flowers visible in principal spiral, 6–7 in alternate spiral; lateral tepals 2.3–3 mm wide, the inner margins straight, slightly turned up against the pistil, the outer margins

2-sided; pistils drying blackened, emergent well above the tepals, green; stigma linear, 0.5–0.6 mm long; anthers pinkish, ca. 0.8 mm long, 1 mm wide; thecae ovoid, slightly divaricate. *Infructescence* with spathe absent; spadix 3–13.5 cm long, 0.8–1 cm diam.; berries globose, rounded at apex, 3.2–4 mm long, 3.7–4.5 mm diam.; pericarp thickened, with numerous pale raphide cells; mesocarp translucent, gelatinous; seeds 2 per berry, reddish brown, ovoid, flattened, dried 3–3.5 mm long, 2.3–2.4 mm diam., 1.1–1.3 mm thick, enveloped by gelatinous, sticky, amber substance.

A member of series *Multinervia*, *Anthurium soukupii* ranges from La Paz in Bolivia to Zamora-Chinchipe in Ecuador, at (1,700) 2,000 to 2,400 m in subtropical lower montane moist forest, lower montane wet forest, subtropical montane wet forest, and high montane wet forest life zones.

This species is characterized by its elongate stem, subtriangular petiole, oblanceolate-elliptic blades with more than 20 primary lateral veins and a collective vein arising from near the base, and by its slightly tapered, purple spadix with 5–6 flowers per spiral.

It is probably most easily confused with *Anthurium fasciale*, also from the Atlantic slope in southern Ecuador. That species, in addition to occurring at elevations below 1,600 m, differs in having 8–11 flowers visible per spiral and pistils which dry yellow-brown, lack raphide cells on the surface and are round (not at all protruding) at the apex.

Anthurium soukupii may also be confused with *A. penningtonii*, another species from the Atlantic slope, but the latter differs in having more broadly elliptic blades with the primary lateral veins sharply elevated. There is an even closer resemblance between *A. soukupii* and *A. angustilaminatum*, from the Pacific slope. See that species for a discussion of the differences.

The new species is named in honor of Jaroslav Soukup, author of a book on vernacular names of Peruvian plants and the first to collect *A. soukupii*.

BOLIVIA. COCHABAMBA: Prov. Chapare, San Onafre, 1,700 m, *Steinbach* 9419 (GH). LA PAZ: Prov. Sud Yungas, Huancane, 13 km toward San Isidro, N of Chulumani, 2,200 m, *Beck* 8756 (MO). ECUADOR. ZAMORA-CHINCHIPE: Loja–Zamora, 13 km E of Loja, 2,220 m, 4°5'S, 79°6'W, *Croat* 50747 (CM, MO). PERU. AMAZONAS: Prov. Bongara, Lago Pomacocha, Moyobamba–Pomacocha, Km 340, 2,200 m, 5°47'S, 77°53'W, *Croat* 58298 (CM, MO, RSA, USM). CAJAMARCA: Prov. Santa Cruz, Dtto. Catache, upper Río Zaña valley, ca. 5 km above Monte Seco on path to Chorro Blanco, 1,500–2,000 m, *Dillon et al.* 4385A, 4905 (F, MO); Prov. Cutervo, Parque Nacional de Cutervo, 2,300–2,400 m, *Díaz et al.* 3964

(MO). CUZCO: Río Lucumayo, La Convención, 6 km from Incatambo, 2,350 m, *Peyton & Peyton 994* (MO); Prov. Urubamba, 2,100 m, *Nuñez 8928* (MO); Machupicchu, on slope 0.5 km N of confluence of Río Sayacmarca and Río Aobamba, 2,370 m, *Peyton & Peyton 1486* (MO); 2.5 km from Machupicchu, above 1st waterfall of Río Mandor, 2290 m, *Peyton & Peyton 455* (MO). JUNÍN: Prov. Oxapampa, *Soukup 2324* (GH). PASCO: Cordillera Yanachaga, trail to summit of Cordillera via Río San Daniel, 2,400 m, 10°23'S, 75°27'W, *Smith et al. 7929* (MO).

Anthurium sparreorum Croat, sp. nov. TYPE: Ecuador. Los Ríos: Centro Científico Río Palenque, W of laboratory & vic. of laboratory clearing, 210–250 m, *Croat 38666* (holotype, MO 2387864-65; isotypes, B, CAS, CM, K, M, NY, QCA, RSA, US). Figures 12, 19, 299, 300–302.

Planta plerumque epiphytica, subinde terrestis; cataphyllum late lanceolatum, persistens semi-intactum, demum in reticulum fibris tenuis; petiolus (11.5)15–38 cm longus, 6–15 cm diam., D- ad U-formatus complenatus ad sulcatus ad leviter sulcatus; lamina oblongo-elliptica ad anguste oblanceolata ad oblongo-lanceolata, 46–96 cm longa, (9.5)15–25 cm lata; pedunculus 11–34 cm longus, 5–10 mm diam.; spatha lanceolata vel ovata, (9)12–16 cm longa, 2.8–4.5 cm lata; stipes 5 mm longus; spadix atropurpureus ad violaceus, cylindricus, 5.8–20 cm longus, 8 mm diam.; baccæ rubrae.

Usually epiphytic, occasionally terrestrial; stem short and thick, 5.5–15 cm long, 2.5–5 cm diam.; roots numerous, descending, bright green to greenish white, densely pubescent, elongate, 3–5 mm diam.; cataphylls subcoriaceous, broadly lanceolate, conspicuously 1-ribbed, 9–18 cm long, acute at apex with subapical apiculum, green, drying pale yellow-tan (B & K yellow-red 9/7.5), persisting semi-intact, eventually dilacerating into reticulum of fine fibers. *Leaves* erect to spreading; petioles (11.5)15–38 cm long, 6–15 mm diam., D- to U-shaped, flattened and sulcate to weakly convex with the margins bluntly to sharply raised adaxially, rounded to 1–3-ribbed abaxially, the surface densely pale-speckled; geniculum thicker and paler than petiole, 1–2.5 cm; blades coriaceous, oblong-elliptic to narrowly oblanceolate to oblong-lanceolate, acuminate to obtuse-rounded at apex (the acumen weakly apiculate), acute to obtuse or cuneate at base, 46–96 cm long, (9.5)15–22 cm wide, broadest at or near the middle, the margins slightly undulate; upper surface matte to semiglossy, medium to dark green, lower surface glossy to semiglossy, paler; both surfaces drying matte, green to pale yellow; midrib above prominently convex at base, becoming 1-ribbed toward the apex, paler than surface and somewhat speckled, below ob-

tusely raised at base, becoming prominently convex toward the apex and paler than surface, drying convex on both surfaces; primary lateral veins (15)20–30 per side, departing midrib at 40–70° angle, straight or arcuate, prominently convex and paler than surface above, less convex to flat and slightly darker than surface below; interprimary veins almost as conspicuous as primary lateral veins, raised above, flat to weakly raised below; tertiary veins obscure above and below, slightly raised when dried on both surfaces; collective vein arising from near the base, occasionally in the upper third of the blade, weakly sunken and less prominent than primary lateral veins above, raised and equally as prominent as primary lateral veins below, 4–15 mm from margin. *Inflorescences* erect to erect-spreading to spreading, shorter than leaves; peduncle 11–34 cm long, 5–10 mm diam., 0.5–2 × as long as petiole, medium green, terete, sometimes 1-ribbed below the spathe; spathe reflexed-spreading, slightly twisted, subcoriaceous, green (B & K green 6/2.5), broadly to narrowly lanceolate or ovate, 9–16 cm long, 2.8–4.5 cm wide, broadest near the base, inserted at 60° angle on peduncle, acuminate at apex (the acumen inrolled), obtuse at base, the margins meeting at 110° angle; stipe 7–10 mm long in front, to 5 mm long in back; spadix dark purple to reddish violet (B & K purple 3/2.5), cylindroid to short-tapered at apex, ± erect, 5.8–20 cm long, ca. 8 mm diam. near base, 4–5 mm diam. near apex; flowers irregularly 4-lobed to rhombic, 1.8–2.6 mm long, 1.8–2.8 mm wide, the sides jaggedly sigmoid to straight; 9–13 flowers visible in principal spiral, 8–10 in alternate spiral; tepals matte, densely and minutely punctate and papillate; lateral tepals 1–1.2 mm wide, the inner margins straight; pistils scarcely emergent, glossy, papillate, with exposed portion ± rectangular, green; stigma linear, dark purple, 0.4–0.6 mm long; stamens emerging ± regularly and promptly from the base, laterals emerging throughout, or at least to midway, before alternates emerge, borne at the edge of tepals; filaments translucent to greenish, minutely purple-spotted, soon retracting, 0.9 mm wide; anthers pale orange with purple punctations, 0.5–0.7 mm long, 0.7–0.8 mm wide; thecae oblong-ovoid, scarcely divaricate; pollen bright orange fading to lavender or pinkish white, faintly yeasty-scented. *Infructescence* with spathe persisting; spadix 20–22 cm long, ca. 2 cm diam.; berries red, exserted slightly beyond the tepals, subglobose, ca. 5 mm diam.; tepals becoming fleshy, white, enlarged, elongate and 3-sided in cross section with the outer angle of the apex raised and acute.