

A member of series *Multinervia*, *Anthurium penningtonii* ranges from the Amazon slopes of Ecuador to northern Peru on both slopes of the Cordillera Oriental and the Cordillera Central at elevations of (800)1,000 to 2,500 m. The species is ecologically variable. In Ecuador it is known from premontane moist, premontane wet, lower montane moist, and lower montane wet forest life zones, while in Peru it is known from premontane rain and montane rain forest life zones.

This species is distinguished by its broadly elliptic, green-drying leaf blades with sharply raised (knife-edge) major veins, and by its rather remote collective vein (1–1.5 cm from the margin).

Anthurium penningtonii is not confused with any other species on the eastern side of the Andes, but *A. pallatangense*, from the Pacific slope of Ecuador, is very similar, differing mainly in its dark purple to maroon spadix. It occurs in drier life zones as well.

Some material from Morona-Santiago (*Stein* 2826, *Madison et al.* 3457, *Madison* 2605) has sharply triangular petioles. Considering the variation in the vicinity of Baeza alone (petioles terete to flattened adaxially and sometimes sharply 1-ribbed abaxially, sometimes with the margin sharp on one side), these collections are best placed in *A. penningtonii* and agree well in other characters. Another collection from Morona-Santiago (*Steyermark* 53610) differs in having the leaf blades attenuate at the base, rather than acute to narrowly acute. More collections from southern Ecuador and northern Peru are needed to determine the range of variability in this taxon.

The new species is named in honor of T. D. Pennington, a member of the 1960 Oxford University expedition to Ecuador and one of the first collectors of this species.

ECUADOR, MORONA-SANTIAGO: Limón (General Plaza)-Macas, 8 km N of Limon, 1,100 m, 2°57'S, 78°25'W, *Stein* 2826 (B, K, MO, QCNE, US); 7–8 km N of Gualaquiza on road to Indanza, 1,450 m, *Harling & Andersson* 24199 (GB, MO); Tumbéz-Tucumbatz, Km 20 on road Gualaquiza-Indanza, 1,600 m, *Harling & Andersson* 24360 (GB); Cordillera de Cutucu, Rio Chihuasi, 25 km SE of Lagrono, 800–1,000 m, *Madison* 2605 (SEL); Lagrono-Yaupi, 1,600 m, 2°46'S, 78°06'W, *Madison et al.* 3457, 3502 (SEL); Rio Tintas, Campanas-Arenillas, 10 leagues SE of El Pan, 2,195 m, *Steyermark* 53610 (US, NY). NAPO: Lago Agrio-Baeza, 1,940–2,000 m, 0°15'S, 77°45'W, *Oellgaard et al.* 35767 (AAU); Quito-Baeza, S of rd. above jct. of rds. to Baeza & Lago Agrio, 1,800 m, *Croat* 58491 (K, MO, QCA, RSA, US, VEN); Lago Agrio-Baeza, 32.8 km E of Baeza turn-off, 1,840 m, 0°17'S, 77°46'W, *Croat* 58730 (B, CM, MO, QCA); Baeza-jct. of road to Lago Agrio, 2,500 m, *Croat* 49439 (MO, NY, QCA); Baeza-Tena, 37.7 km S of Baeza, 59 km N of Archidona, 1,700 m, 0°36'S,

77°51'W, *Croat* 58781 (CAS, MO, QCA); Cantón Archidona, Carretera Hollín-Loreto, Km 50, Guagua Sumaco, 1,000 m, *Cerón & Hurtado* 6565 (MO); Km 25, Challua Yacu, 1,200 m, *Cerón & Hurtado* 6455 (MO); Baeza-Lago Agrio, 19.7 km NE of El Chaco, 39 km NE of jct. of road to Tena, 1,750 m, *Croat* 58529 (MO, QCA); Rio Oyacachi, 1,620 m, 0°20'S, 77°55'W, *Croat* 50297 (M, MO); Km 142, 1,800 m, *Croat* 49454 (IBE, MO, NY); Cerro Antisana, 1 mi. NE of Borja, NE of Baeza, 1,850 m, 0°25'S, 77°50'W, *Grubb et al.* 1267c (K); Cordillera de Guacamayos, S slope, Baeza-Tena, above Jondachi, 1,500 m, *Harling & Andersson* 16342 (AAU, MO); Volcán Sumaco, Cotundo-Coca, 15 km E of Baeza-Tena road, 1,300 m, 0°40'S, 77°40'W, *Palacios & Neill* 1559 (MO). TUNGURAHUA: Rio Negro, 1,200 m, 1°24'S, 78°13'W, *Harling & Andersson* 17240 (GB). ZAMORA-CHINCHIPE: La Saquea-Yacuambi, 1 km N of Chapintza road, 1,100 m, *Harling & Andersson* 23868 (GB). PERU. AMAZONAS: Serranía de Bagua, 17 km E of La Peca, 1,850–1,900 m, *Gentry et al.* 22969 (MO); Prov. Bagua, 20 km on trail E of La Peca, 2,190 m, *Barbour* 2735, 2746 (MO). CAJAMARCA: Cutervo, San Andrés de Cutervo, Parque Nacional de Cutervo, between Saucedal and Chorro Blanco, 2,250 m, *Díaz & Osorio* 2932 (MO, USM); between Saucedal and Pajonal, 2,300 m, *Díaz & Osorio* 2979 (MO, USM). SAN MARTÍN: Moyabamba-Chachapoyas, Km 380, E of Rio Nieva, 1,750 m, 5°44'S, 77°32'W, *Croat* 58215 (MO, USM); Rioja-Pomacocha, Km 291, Venceremos, 1,850 m, 5°45'S, 77°40'W, *Gentry et al.* 45504 (MO).

Anthurium plowmanii Croat, *Candollea* 42(2): 811–813. 1987. TYPE: Brazil. Amazonas: Mpo. Manaus, Chacaras de Taruma, 16 km NW of Manaus, 60 m, 2°51'S, 59°50'W, *Croat & Nelson* 53563 (holotype, INPA; isotypes, B, G, K, IBE, MO, NY, RSA, US). Figures 237–239, 240, 258.

Epiphytic or epilithic; stem 10–30 cm long, 2.5–6 cm diam.; leaf scars ca. 4 cm wide; roots dense, ascending or descending, whitish green, shortly pubescent, short or elongate, tapered, 4–6 mm diam.; cataphylls coriaceous, 5–20(27) cm long, obtuse to acute at apex, drying reddish brown (B & K yellow-red 4/5), persisting as a reticulum of fibers, the epidermis drying thin and flaking off, revealing the thin, reddish brown, hairlike fibers beneath. *Leaves* erect to spreading, reported to 2 m long; petioles (7.5)10–40(50) cm long, 4–20 mm diam., U- to C-shaped, narrowly and obtusely sulcate adaxially with the margins blunt, rounded to rarely 1–2-ribbed abaxially, the surface pale-speckled; geniculum thicker than petiole, becoming fissured transversely with age, 0.5–2 cm long; sheath ca. 3 cm long; blades coriaceous, obovate to oblanceolate or elliptic to broadly elliptic, acuminate to obtuse at apex (the acumen inrolled or downturned), acute to attenuate (rarely long-attenuate), or obtuse at base, (24)40–125(200) cm

long, (6)20–55(66) cm wide, broadest at or near the middle, the margins prominently and broadly undulate; upper surface matte to semiglossy or weakly glossy, dark green, lower surface matte to weakly glossy, concolorous with the upper surface or slightly paler; midrib flat to angular at base, becoming prominently and convexly raised (almost round-raised, with narrow sulcus along each side) and narrowly angular toward the apex above, prominently thicker than broad to weakly 2–3-ribbed at base, becoming prominently and convexly raised toward the apex below; primary lateral veins (4)7–15 per side, departing midrib at (30)45–65° angle, ascending \pm straight to the margin or slightly arcuate-ascending, prominently and convexly raised above and below, more so below; interprimary veins obscure; collective vein arising from near the apex or absent, if present flat to weakly sunken above, flat to weakly raised below, 4–6 mm from margin. *Inflorescences* erect to erect-spreading; peduncle (2)6–32 cm long, 3–9 mm diam., 0.2–0.3 \times as long as petiole, plain green or heavily to slightly tinged with red, purple, or maroon, terete to ribbed abaxially; spathe semi-erect to spreading to reflexed or rolled up, subcoriaceous to coriaceous, violet purple or green tinged with purple, lanceolate to broadly lanceolate, (4)5–26(29) cm long, (0.5)1–3.5 cm wide, broadest near the base, inserted at 40–55° angle on peduncle, acute to long-acuminate at apex (the acumen inrolled), obtuse to acute or sometimes slightly decurrent at base, the margins meeting unequally, thick, rolling down at edges; stipe 1–20 mm long in front, 1–3 mm long in back; spadix green to dull maroon to green tinged with violet to violet-purple, tapered to cylindroid, longer than peduncle, (7)10–46 cm long, 10–20 mm diam. near base, 3–10 mm diam. near apex, broadest at the base; flowers square to rhombic, 1.5–2.5 mm long, 1.1–2.5 mm wide, the sides \pm straight to jaggedly sigmoid; (8)10–16(18) flowers visible in principal spiral, 6–10 in alternate spiral; tepals matte, minutely and densely papillate; lateral tepals 0.6–1.2 mm wide, the inner margins straight to convex, the outer margins 2-sided; pistils emergent, weakly raised before the stamens emerge, reddish to dark purple; stigma linear, 0.2–0.6 mm long; stamens emerging in a regular sequence from the base, the laterals preceding the alternates by ca. 5 spirals; filaments holding anthers above the tepals; anthers orange, ca. 0.6–0.8 mm long, 0.8–0.9 mm wide, inclined over and obscuring the pistil; thecae ellipsoid to obovoid, not divaricate; pollen yellow to orange fading to cream, yeasty-scented. *Infructescence* erect to pendent; spathe deciduous, leaving a coarse scar; spadix 5–25 cm long, 1–3

cm diam., the apical $\frac{1}{3}$ withered, fruits developing in the lower $\frac{2}{3}$ only; berries red, oblong-obovoid, slightly rounded at apex (the stigma button-shaped), 8–12 mm long, 3–6 mm diam.; mesocarp juicy, sweet, translucent; seeds 1–2 per berry, brown, densely speckled with translucent dots in rehydrated specimens, oblong to ovoid, 5–6 mm long, 2–3 mm diam., 1.5–2 mm thick, with sticky appendage at the apex (forked in rehydrated specimens).

Anthurium plowmanii ranges from Brazil (Acre, Amazonas, Mato Grosso, and Rondônia) to Bolivia (La Paz, Pando, and Santa Cruz), Paraguay (Amambay) and Peru (San Martín) at 50–900 m, typically in the dry forest life zones of Peru and the varzea and terra firme habitats of Brazil.

A large epiphytic or epilithic species, *A. plowmanii* is unusual in sect. *Pachyneurium* by virtue of its spadix, which is longer than (or rarely as long as) the peduncle. This feature is shared only with *A. solomonii* (see discussion under the latter for distinctions from *A. plowmanii*). Also distinctive are the C- to U-shaped petioles with blunt adaxial margins, otherwise of rare occurrence in the section. Typical of *A. plowmanii* is the gradual disintegration of the distal (presumably unpolinated) portion of the spadix in the fruiting stage with, at most, only the weathered axis remaining. Fruiting spadices are thus regularly much shorter than flowering spadices, quite opposite the normal situation in the section.

Some atypical material of cultivated origin is included here under *A. plowmanii*, such as *Casari 165*, which differs in its unusually coriaceous leaf blades that are oblong-attenuate (vs. usually acute to attenuate) at the bases. The infructescence and other features are, however, typical. *Croat 53701*, received from and cultivated at the sitio of Roberto Burle-Marx in Rio de Janeiro, Brazil, has lanceolate (vs. obovate to elliptic) leaf blades with unusually prominent venation and notably olive-green coloration on drying. Photos of this collection taken in Brazil closely resemble typical material, however.

BOLIVIA. WITHOUT LOCALITY: collected by F. Fuchs of Homestead, Florida, *Croat 53542* (GH, MO, UCLA). COCHABAMBA: Río Grande, *Velasco 7192* (NY). LA PAZ: Prov. Iturralde, *Solomon 16940* (MO); Luisita, 180 m, 13°05'S, 67°15'W, *Haase 266* (MO). PANDO: Lago Bay, black water lake formed by Río Arroyo, upstream from junction with Río Manuripi, 11°57'S, 68°40'W, *Sperling & King, 6564* (MO); Río Madeira, Cachoeiras Miseri-cordia-Madeira, *Prance et al. 6598* (NY); 4 km above Abuña, *Prance et al. 6271* (INPA); Río Madre de Dios, Federico Roman, Loma Alta, 110 m, *Solomon 17068* (MO); Manuripi, upstream from Riberalta, 220 m, 10°55'S,

66°8'W, *Daly et al.* 2042 (NY). SANTA CRUZ: *Weddell* 3518 (P); Andres Ibanez, 12 km E of Santa Cruz-Cotoca, 375 m, 17°46'-47'S, 63°04'W, *Nee* 34009 (NY); ca. 40 km S of Asunción dos Guarayos, Nufles de Chaves, 15°55'S, 63°05'W, *Hopkins et al.* 218 (MO); Serranía de Santiago, N slope, Chiquitos, 10 km ENE of Santiago de Chiquitos, 900 m, 18°20'S, 59°28'W, *Daly et al.* 2243 (MO). BRAZIL. ACRE: Mpo. Sena Madureira, Rio Iaco, *Cid & Nelson* 2757 (INPA). AMAZONAS: cultivated, INPA campus, Manaus, *Nelson* 1335 (MO); N of Coreiro, 10 km downstream from Manaus, *Leppard* 1645 (K); Solimões, Mamia, *Kuhlman* 1191 (RB); Lago do Janauari, Manaus, *Coelho* 638 (INPA); Manaus, 50 m, *Croat* 53563 (B, G, IBE, INPA, K, MO, NY, RSA, TEX, US); Rio Acre, behind Santa Maria, W bank of Rio Acre, Boca do Acre, *Prance et al.* 2361 (INPA), 2371 (INPA, NY, US); Rio Madeira basin; Humayta, near Livramento, on Rio Livramento, *Krukoff* 6767 (NY). MATO GROSSO: Aripuanã, Cidade Humboldt, 10°12'S, 59°21'W, *Rodrigues* 9816 (INPA); Chapada dos Guimarães, *Hutchinson* 8553 (UEC); Porto Espiridião-Porto Velho, 286 km NW of Porto Esperidião, on BR-364-MT, *Hutchinson* 8602 (MO, UEC); Urucum, Corumba, 19°00'S, 57°35'W, *Pereira, Egler & Graziela* 447 (RB); Serra Ricardo Franco, 350 m, 15°S, 60°W, *Windisch* 1514 (K). RIO DE JANEIRO: cultivated, Rio de Janeiro, base of Pedra Bonita, Rue Elviro Niemeyer 14, *Casari* 165 (GUA); cultivated by Burle Marx, San Carlos, *Croat* 53701, 53710 (MO). RONDÔNIA: Rio Madeira, Riberão, Cachoeira Misericórdia, *Prance et al.* 6721 (INPA, NY, US); Abunã-Penha Colorado, *Prance et al.* 8725 (INPA, NY, US); Mpo. Costa Marques, ca. 5 km NW of Costa Marques, 150 m, 12°25'S, 64°14'W, *Nee* 34548 (NY). PARAGUAY. AMAMBAY: Cerro Chanchito, 22°26'S, 56°3'W, *Schinini & Borda* 20398 (K); Cerro Memby, cultivated in Asunción, *Krapovickas & Schinini* 28533 (K); Sierra de Amambay, Montes Barrantes, Piedra Esperanza, *Hassler* 10640 (G); Parque Nacional Cerro Cora, 300 m, 22°39'S, 56°03'W, *Solomon et al.* 6987 (MO); summit of Cerro Muralla, *Casas* 3955 (NY). PERU. WITHOUT LOCALITY: cultivated at SEL, #81-76-10, and at MO, *Plowman* 6011 B (MO, NY, TEX). SAN MARTÍN: Tarapoto-Juanjui, Km 24-25, 300-500 m, 6°40'S, 76°20'W, *Croat* 50987 (F, MO), *Plowman* 6044 (GH); Rio Huallaga, 29-31 km S of Tarapoto, near El Abra, 450-540 m, 6°40'S, 76°20'W, *Gentry & Smith* 45091 (MO); 350 m, 6°35'S, 76°25'W, *Gentry et al.* 37733 (MO); Rio Mayo, 6 km S of Tarapoto-Moyobamba Rd. at Km 15, Cunumbigue village, 350 m, 6°23'S, 76°39'W, *Croat* 51094 (CM, F, K, MO, RSA).

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

Brazil. Acre: Rio Moa between Cachoeira Grande and Serra de Moa village, *Prance et al.* 12640 (holotype, INPA; isotypes, F, K, NY, U, US). Figure 241.

Planta terrestris; internodia brevia, 1-1.5 cm diam.; cataphyllum lanceolatum, persistens semi-intactum; petiolus 35-65 cm longus, 4-8 mm diam., subteres, adaxile sulcatus; lamina ovato-elliptica ad ovata, 40-70 cm longa, 17-26 cm lata; geniculum 4-20 cm remotum; pedunculus 24-40 cm longus; spatha lanceolata, violaceus, ca. 4 cm longa, 1.2 cm lata; stipes 1-10 cm longus; spadix violaceus, ca. 5 cm longus, 5-6 mm diam.

Description based on dried material only. Terrestrial; stem 1-1.5 cm diam.; roots densely and finely pubescent, ca. 2-4 mm diam.; cataphylls subcoriaceous, lanceolate, ca. 10 cm long, acute at apex, reddish brown, persisting semi-intact. Leaves with petioles 35-65 cm long, 4-8 mm diam., subterete, sulcate adaxially, rounded abaxially; geniculum slightly darker than petiole, ca. 1 cm long, appearing remote from base of blade by 4-20 cm; blades moderately coriaceous, ovate-elliptic to ovate, shortly acuminate at apex, broadly rounded then abruptly attenuate at base, 40-70 cm long, 17-26 cm wide, broadest at or below the middle, lower surface dark glandular-punctate; both surfaces green to yellowish green; midrib convexly raised above, acutely raised below; primary lateral veins 6-9 per side, departing midrib at 50-60° angle, \pm straight, becoming arcuate near the margin, apparently convexly raised above and below; tertiary veins weakly raised; collective vein arising from about the middle of the blade, apparently sunken above, raised below, less prominent than primary lateral veins, 7-24 mm from margin. Inflorescences erect, shorter than leaves; peduncle 24-40 cm long; ca. 2-5 mm diam., about half as long as petiole, terete; spathe recurled, membranous, violet, lanceolate, ca. 4 cm long, ca. 1.2 cm wide, broadest near the base, narrowly acute at base; stipe 15-28 mm long in front, 1-10 mm long in back; spadix violet, weakly tapered, ca. 7.7 cm long, 5-6 mm diam. near base, ca. 3 mm diam. near apex; flowers rhombic, ca. 2 mm in both directions, the sides \pm straight to smoothly sigmoid; 4-6 flowers visible in either spiral; tepals smooth when dried; lateral tepals 1 mm wide, the inner margins straight, the outer margins 2-sided. Inflorescence not seen.

Anthurium pranceanum is known only from the type collection made near the Rio Moa in Acre, Brazil, below 300 m.

This species is distinguished by its ovate to ovate-elliptic leaf blades which are dark glandular-punctate below and have the geniculum situated 4-20 cm below the base of the blade.

Anthurium pranceanum is apparently most closely related to *A. krukovii*, which also has a remote geniculum but lacks dark glandular punctations on the lower surface of the leaf blade. It also bears some resemblance to *A. bonplandii* subsp. *bonplandii*, which occurs further north in the Amazon basin and often has similar dark glandular punctations. The latter differs in its proportionately narrower leaf blades which are acute to