

flowers visible in principal spiral, 8–20 in alternate spiral; tepals matte, conspicuously punctate, minutely papillate; lateral tepals 0.8–1.6 mm wide, the inner margins broadly convex to concave when dried, the outer margins straight; pistils not emergent except when dried, green tinged with violet-purple; stigma linear, slitlike, 0.5–1 mm long; stamens emerging from the base, lateral stamens followed by alternates in rapid succession, the laterals preceding the alternates by 5–8 spirals, the 3rd stamen preceding the 4th by 6–8 spirals, held over and obscuring pistil; filaments red-violet, 1.4–1.6 mm long; anthers yellow, 0.4–0.7 mm long, 0.5–0.9 mm wide; thecae narrowly oblong to ovoid-oblong, weakly or not at all divaricate; pollen orange fading to tan or white. *Infructescence* spreading to pendent; spadix to 50 cm long, to 5 cm diam.; berries orange, oblong-ellipsoid to oblong-ovoid, acute at apex, the tip relatively blunt, to 14 mm long, 3.5 mm diam.; mesocarp with linear to punctiform raphide cells; seeds 2 per berry, oblong-ellipsoid to ellipsoid, somewhat flattened, 4.5–5 mm long, 2.7–3.2 mm diam., 1–1.5 mm thick, with a thin appendage at apex only.

Anthurium nervatum is endemic to Panama in Bocas de Toro, Coclé, Chiriquí, and Veraguas provinces at (130)500 to 2,100 m in tropical wet, premontane rain, and lower montane wet forest life zones.

This species is recognized by its long, triangular, shallowly lobed to subcordate, moderately thick leaf blades with numerous primary lateral veins, its usually long-tapered, green to maroon spadix, and by its lanceolate, coriaceous spathe that is deep maroon on the inner surface, green heavily tinged with maroon on the outer surface and often forms a loose spiral at anthesis.

Anthurium nervatum is most easily confused with *A. ranchoanum*, but that species has a shorter spadix with an erect, green spathe and larger flowers which are fewer per spiral. It may also be confused with *A. colonicum*, but that species has early exserted, acute pistils and fewer primary lateral veins.

One collection from El Valle in Coclé Province (Croat 37443) is probably also this species, but has a smaller, more ovate-triangular, more coriaceous blade with the posterior lobes sharply turned upward, and a deeper sinus; it also has a green rather than maroon spadix.

PANAMA. BOCAS DEL TORO & CHIRIQUÍ: Cerro Colorado, Folsom *et al.* 4706 (MO); trail into Bocas and in woods on Pacific slope, from Chamí station to ca. 9 mi. along road, 1,100–1,750 m, 8°35'N, 81°54'W, Hammel &

Trainer 14919 (MO, PMA). CHIRIQUÍ: above Santa Fe along mining road 18–27 mi., off Pan-Am Hwy. above Chamí or turnout to Escopeta, 1,200–1,500 m, Croat 33145 (DUKE, F, MO, PMA); along mining road 31.6 km beyond bridge over Río San Félix, 10.6 km beyond turnout to Escopeta, 1,690 m, Croat 37177 (MO), 37169 (MO, PMA); upper mining road 20–28 mi. from San Félix, Continental Divide, 1,200–1,500 m, Croat 33305 (MO), 33394 (MO, RSA, US); along mining road 20 mi. above bridge over Río San Félix, near village of San Félix, 750 m, Croat 48459 (MO); Cerro Pate Macho, 1,500–1,900 m, Stein *et al.* 1257 (MO); SE slopes, trail from Río Palo Alto, 4 km NE of Boquete, 1,700–2,100 m, Sysma *et al.* 4830 (MO). COCLÉ: Cerro Caracoral, Duke & Dwyer 15118 (NY), Kirkbride 1096 (MO, NY); Cerro Moreno, Molejón-Coclecito, 13 km NW of Cascajal, 130–250 m, 8°46'44"N, 83°1'54"W, Davidge & Hamilton 23713 (B, MO); El Copé Region, Alto Calvario, 800–900 m, Folsom & Jaslon 2691 (MO); El Copé, W of sawmill, Hammel 2408 (MO); Continental Divide, lumber road N of El Copé, 10 km above El Copé, 2.2 km N of sawmill, 750–930 m, Croat 44717, 49169 (MO, PMA); El Valle Region, El Valle de Antón, La Mesa, Croat 37443 (CAS, CM, F, LE, KYO, M, MO, PMA, US). VERAGUAS: Santa Fe Region, vic. Escuela Agrícola Alto Piedra, 500–735 m, Croat 33987 (CAS, MO, US), 34244 (MO, PMA), Croat & Folsom 34134 (MO); 1,150–1,450 m, McPherson 12070 (MO); Cerro Tute, 750–1,450 m, Croat 48912, 48925 (MO, PMA), Knapp & Dressler 5415 (MO, US), 5446 (MO), Knapp & Kress 4369 (MO), Knapp & Sysma 2475 (MO), Sysma *et al.* 4590 (MO); Río Tercero Brazo, beyond school 500–700 m, Croat 27329 (F, K, MO, PMA, US).

Anthurium nizandense Matuda, Bol. Soc. Bot. Mexico 24: 35, fig. 1. 1959. TYPE: Mexico. Oaxaca: Nizanda near the Isthmus of Tehuantepec, 16°40'N, 95°02'W, MacDougall s.n. (holotype, MEXU). Figures 207, 208.

Anthurium kruseanum Matuda, Anales Inst. Biol. Univ. Nac. Mexico 36: 107, fig. 1. 1966. TYPE: Mexico. Guerrero: La Junta (at junction of Río Omilán and Río Papagayo) S of Tierra Colorada, Kruse 881 (holotype, MEXU).

Usually terrestrial or epilithic; leaf scars 0.7–1.2 cm high, 1.3 cm wide; roots moderately numerous, descending, greenish to tan, smooth to somewhat pubescent, moderately elongate, tapered; cataphylls subcoriaceous, 3–7 cm long, rounded and minutely apiculate at apex, drying dark brown, persisting semi-intact, eventually as a reticulum of fibers. Leaves erect-spreading; petioles 6–24 cm long, (3)5–6 mm diam., quadrangular to D-shaped to subterete, flattened to broadly and sharply sulcate adaxially, the margins sharply raised, rounded abaxially, the surface pale-speckled, sometimes tinged with red-violet; geniculum slightly paler and thicker than petiole, 1–1.5 cm long; blades subcoriaceous, obovate-elliptic to elliptic, acute to abruptly acuminate at apex (the

acumen apiculate), rounded to acute or attenuate at base, 25–57 cm long, 10.7–30 cm wide, broadest at or above the middle, the margins weakly undulate; upper surface matte to semiglossy, medium green, lower surface matte, paler below; both surfaces with short, linear raphide cells and convexly raised epidermal cells, drying brown to greenish brown; midrib acutely to convexly raised above, more prominently so below; primary lateral veins 6–11 per side, departing midrib at 50–80° angle, straight to weakly arcuate-ascending to the collective vein, raised above and below, darker than surface below; tertiary veins obscure above, weakly visible below; collective vein arising from about the middle of the blade or near the apex, 3–9 mm from margin. *Inflorescences* erect, equalling or longer than leaves; peduncle 31–60 cm long, 5–8 mm diam., 1.8–2.7 × as long as petiole, terete; spathe reflexed, subcoriaceous, green, ovate-lanceolate, 8–9.5 cm long, 2.5–3 cm wide, broadest near the base, inserted at 45° angle on peduncle, acute at apex, apparently obtuse at base; spadix pale green becoming reddish brown, somewhat tapered, 12–14 cm long, 9–11 mm diam. near base, 4 mm diam. near apex; flowers rhombic, 1.8–2.5 mm long, 2.8–3 mm wide, the sides sigmoid; 7–9 flowers visible in principal spiral, 5–6 in alternate spiral; lateral tepals 1.5 mm wide, the inner margins broadly convex or weakly concave; pistils not emergent; stigma broadly ellipsoid; stamens emerging rapidly in a complete sequence, emerging shortly above the tepals, arranged in a circle around the pistil; anthers ca. 0.4 mm long, 0.6 mm wide; thecae ellipsoid, weakly divaricate. *Inflorescence* pendent; spathe withered; spadix 6.5 cm long, 1.5 cm diam.; berries greenish white, ovoid, 8 mm long; mesocarp transparent, juicy, pulpy; seeds 1(2) per berry, pale yellow (B & K yellow 9/2.5), broadly obovoid, 5.2–5.4 mm long, 4.5–4.7 mm diam., 3.4–4 mm thick, with a minute, translucent appendage, ± gnarled at apex on side, tinged with brown, enveloped by gelatinous substance.

Anthurium nizandense is endemic to Mexico in southern Guerrero and southern Oaxaca, where it occurs at less than 850 m in seasonally very dry habitats on steep, rocky cliffs in "selva baja caducifolia." It is known only from the vicinity of Tierra Colorada in Guerrero and Nizanda in Oaxaca.

This species is recognized by its greenish white berries and thick, narrowly to broadly elliptic or oblanceolate-elliptic, relatively long-petioleat leaves that are matte on the lower surface and sometimes exhibit a dense array of minute, linear raphide cells on drying. The epidermal cells on both surfaces of

the blade are convexly raised. Matuda reported the petiole to be subquadrangular, but this was possibly due to a misinterpretation of the dried specimen since this feature is not apparent on live material.

In the area of Mexico where it occurs, *A. nizandense* could be confused only with *A. schlechtendalii* subsp. *jimenezii*, which occurs in similar habitats and is more generally abundant. *Anthurium nizandense* is distinguished by its proportionally longer petioles and its more typically elliptic blade, which is distinctly matte on the lower surface. In *A. nizandense* the blades are 1.3–2.5 times longer than the petioles. In *A. schlechtendalii* subsp. *jimenezii*, the leaf blades are usually semiglossy beneath and usually 6–10 times longer (rarely as little as 3 times longer) than the petiole.

MEXICO. GUERRERO: Río Omitlán, bridge over Río Omitlán at confluence of Río Papagayo with Río Omitlán, 850 m. *Croat 45756* (B, BM, CM, K, M, MBM, MO, P, TEX, US); La Junta, S of Tierra Colorada, *Kruse 881* (MEXU); Tierra Colorada, *Kruse 1595* (MEXU). OAXACA: Nizanda, Isthmus of Tehuantepec, *MacDougall s.n.* (MEXU).

Anthurium obscurinervium Croat, sp. nov.

TYPE: Ecuador. Cañar: along road between Azogues and El Triunfo, ca. 2 km S of Hwy. at Cedro Pampa, 800–1,000 m, 2°25'S, 79°10'W, *Croat 50914* (holotype, MO 2828745; isotypes, AAU, BM, G, K, LL, M, MICH, NY, QCA, RSA, SEL, US). Figures 203, 204.

Planta terrestris aut epiphytica; caulis ad 30 cm longis, 1.3–3.5 cm diam.; cataphyllum persistens in fibris tenuibus; petiolus (3.5)6–22 cm longus, 4–10 mm diam., acute D-formatus; lamina anguste oblongato-elliptica aut oblonga-linearis, (18)30–79 cm longa, (3.2)4–7(11) cm lata; nervis primariis lateralibus obscuris; pedunculus 20–45 longus; spathe (2.5)3–7 cm longa, 0.7–1.7 cm diam.; spadix viridis, (1.7)4–11(15) cm longus, 3–6 mm diam.; baccae atropurpureae.

Epiphytic or terrestrial; stem to more than 30 cm long, 1–3.5 cm diam.; roots dense, short, ca. 3 mm diam.; cataphylls subcoriaceous, 4–9 cm long, acute to acuminate at apex, drying whitish (B & K yellow 9/2.5 to yellow-red 9/7.5), persisting as linear fibers. *Leaves* spreading; petioles (3.5)6–22 cm long, 4–10 mm diam., sharply D-shaped, slightly thicker than broad, sharply flattened to broadly and shallowly sulcate adaxially, the margins sharply raised to curved inward, rounded to obtusely or acutely angular, sometimes 1-ribbed abaxially; geniculum somewhat thicker and much paler to darker than petiole, 0.7–1.7 cm long; blades subcoriaceous, narrowly oblong-