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Two new species of *Anthurium* section *Xialophyllium* (Araceae) from Panama

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Abstract

Two new species of *Anthurium* section *Xialophyllium* from Panama are described here. Both species have close affinities with *Anthurium microspadix*, *A. davidsoniae* and *A. myosuroides*. *Anthurium monteazulense sp. nov.*, known only from Chiriquí Province, is characterized by its epiphytic habit, internodes somewhat longer than broad, loosely intact cataphylls, leaf blades subcordate, bullate, ovate with two pairs of basal veins and short-stipitate green to greenish yellow cylindroid spadix. The other species, *Anthurium batistae sp. nov.*, known only from Veraguas Province, is characterized by its terrestrial habit, elongate internodes, deciduous cataphylls, leaf blades rounded at base, ovate with one pair of basal veins and prominently stipitate purplish red cylindroid spadix.

Key words: Taxonomy, Veraguas, Chiriqui, Flora of Panama

Introduction

Anthurium Schott (1829: 828) is a monophyletic and Neotropical genus, present from Mexico to Argentina (Croat 1986, Carlsen & Croat 2013) and represented by 905 species in the Neotropics (Boyce & Croat 2014), although Panama represents the biggest area of diversity in Central America for this genus (Croat 1986). In the Revision of *Anthurium* for Panama (Croat 1986), 148 species are recognized, later Correa *et al.* (2004) lists 152, but now there are more than 200 species, where many of these species are as yet unpublished.

The section *Xialophyllium* Schott (1860: 440) is principally characterized by stems erect or scandent with long internodes and blades typically longer than broad and rarely conspicuously lobed at the base. In the Revision of *Anthurium* for Panama (Croat 1986), 14 species are recognized in *Xialophyllium* section, but now there are ca. 17 species and ca. 112 currently classified species distributed in the Neotropics. Many of these remain unpublished and there are even more undescribed species anticipated.

Croat & Sheffer (1983) mention that *Xialophyllium* section seems certain to be an unnatural one with at least two different types of plants involved: the *Anthurium microspadix* Schott (1858: 180) group and the *Anthurium caucanum* Engler (1885: 274) group. The *Anthurium microspadix* group has thin, veiny, usually matte often somewhat bullate blades and commonly has greenish inflorescences and the *A. caucanum* group have more coriaceous, usually semiglossy to glossy blades which are smooth or at least not markedly veiny or bullate (Croat & Sheffer 1983, Croat 1986). A recent phylogenetic study of Carslen & Croat (2013) placed *Anthurium microspadix* and *A. mindense* Sodiro (1902: 470) of section *Xialophyllium* in a well supported clade with other species of section *Polyneurium* Engler (1898: 384), but more studies supported by expanded sampling to confirm the monophyly of Section *Xialophyllium* are required.

Materials and methods

This study is based on the investigations of herbarium collections of *Anthurium* housed at MO, PMA, SCZ, and UCH. The descriptions are based on fertile material, and the descriptive terminology is according to Croat & Bunting (1979).

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FIGURE 1. *Anthurium monteazulense*. Holotype specimen: Panama. Chiriqui: vic. Monte Azul, 1.4 mi N of Entre Rios on E. slopes of Cerro Punta, 3 mi by road from town of Cerro Punta, 2250 m, 8°53'06"N 82°34'30"W, 22 November 1979, *T. Antonio 2716* (Photo MO Herbarium).

Taxonomy

Anthurium monteazulense Croat, O.Ortiz & Baldini, *sp. nov*. (Fig. 1)

Species characterized by epiphytic habit, loosely intact cataphylls, long-petiolate leaves (to 30 cm long), moderately large narrowly ovate, brownish green-drying, bullate, subcordate and acuminate blades with two pairs of basal veins as well as by the narrowly lanceolate green reflexed-spreading spathe and short-stipitate green to greenish yellow cylindroid spadix.

Type:—PANAMA. Chiriquí: vic. Monte Azul, 1.4 mi N of Entre Rios on E slopes of Cerro Punta, 3 mi by road from town of Cerro Punta, 2250 m, 8°53'06"N 82°34'30"W, 22 November 1979, *T. Antonio 2716* (holotype, MO!).

Epiphytic or hemiepipetric; stems to 1 m long; **internodes** 1–1.5 cm long, 8 mm diam. on drying, dark brown, longitudinally ribbed, matte; **cataphylls** to 12 cm long, drying dark brown, thin, persisting semi-intact at upper nodes but soon deciduous with no trace of fibers; **petioles** 28.5–30 cm long, 0.5 cm diam., medium green, weakly sulcate, drying dark brown to reddish, prominently and deeply sulcate, drying matte to weakly glossy; geniculum 1.5 cm long; **blades** ovate-subcordate, 23–25 × 11.5–12.5 cm, 2 times longer than broad, 0.8 times as long as petioles, narrowly long-acuminate at apex, subcordate at base, thinly coriaceous, slightly bicolorous, dark green and matte above, moderately paler and semiglossy below, drying brownish green and matte above, bullate, moderately paler and semiglossy below; posterior lobes rounded; sinus arcuate to triangular, 7–10 mm deep; **basal veins** 2 pairs, free to base or slightly fused 2–3 mm; midrib drying narrowly rounded, concolorus, weakly ribbed on both sides, narrowly round-raised, matte, darker brown; **primary lateral** veins 7–9 pairs, arising at 40–60° angle, weakly raised and narrowly rounded, concolorous with surface above, narrowly raised and darker than surface below; posterior ribs 2–3 mm long, sometimes naked up to 2 mm; collective veins arising from the first pair of basal veins, 4–8 mm from the margin; tertiary veins sunken above, prominently raised below; both surfaces smooth; lower surface short pale-lineate. **Inflorescence** erect; peduncle 21–24 cm long, 1.5–2 mm diam.; **spathe** reflexed-spreading, narrowly lanceolate, 3.5–4.2 × 7–8 mm long., narrowly long-acuminate at apex; **spadix** stipitate 3 mm, cylindroid-tapered, green to yellowish-green, 3.2 cm long, 4 mm diameter, **flowers** 3–4 visible in the principal spiral, 4–5 in the alternate spiral. Berries not seen.

Etymology:—The species is named for the type locality near Monte Azul in Chiriquí Province near Cerro Punta.

Distribution:—This species is known only from the type locality in Chiriquí, Cerro Punta, Panama (Fig. 4).

Habitat and Ecology:—*Anthurium monteazulense* grows at 2250 m in a *Lower montane rain forest* life zone according to the classification of zones proposed by Holdridge *et al.* (1971).

Phenology:—The specimens examined are all flowering in November. Further investigations are required to determine exact flowering and fruiting time.

Conservation status:—Following the IUCN Red List criteria (IUCN 2001), *Anthurium monteazulense* should be listed as Data Deficient (DD).

Additional specimens examined (paratypes):—PANAMA. Chiriqui: vic. Monte Azul, 1.4 mi N of Entre Rios on E slopes of Cerro Punta, 3 mi by road from town of Cerro Punta, 2250 m, 8°53'12"N 82°34'48"W, 25 November 1979, *Croat 48592* (MO, PMA).

TABLE 1. Characters distinguishing *Anthurium monteazulense* from *A. davidsoniae.*

	Anthurium monteazulense	***Anthurium davidsoniae***
Leaves		
Petioles size	28.5–30 × 0.5 cm	13–27 × 0.25–0.35 cm
Dry color	Brownish green	Green
Blades shape	Subcordate	Cordate, broadly lobed
Pairs of basal veins	2 pairs	4 pairs
Posterior ribs length	0–3 mm	5–14 mm
Primary lateral veins	7–9 pairs	10–12 pairs
Inflorescence		
Peduncle length	21–24 cm	9–19 cm

Discussion:—*Anthurium monteazulense* is related to and long confused with *A. davidsoniae* Standley (1940: 4), but the latter species differs with by having leaf blades which dry green and have four pairs of basal vein at least two

pairs of which are in part conspicuously coalesced, shorter and more slender petioles, broadly lobed cordate blades, more pairs of primary lateral veins and inflorescences with shorter peduncles (Table1).

Anthurium monteazulense is also related to others species of section *Xialophyllium* such as *A. microspadix*, *A. myosuroides* Endlicher ex Kunth (1841: 72), *A. holquinianum* Croat & Bay (in Croat *et al.* 2006: 34), *A. patens* Croat (in Croat *et al.* 2010: 131) and *A. leptocaule* Croat (1986: 127). *Anthurium microspadix* differs by having typically smaller blades, usually more than twice as long as broad, not conspicuously bullate and petioles mostly to 16 cm long (vs. more than 28 cm long); *A. myosuroides* differs by having blades usually elliptic (vs. blades ovate), widest at the middle or just below the middle, not conspicuously bullate and spadix usually more than 5 cm long at anthesis (vs. less than 4 cm long); *A. holquinianum* differs by having blades with 10–14 pairs of primary laterals veins (vs. 7–9 pairs of primary laterals veins), 3–5 pairs of basal veins (vs. 2 pairs of basal veins) and a cream to creamy white spadix (vs. a green to yellowish-green spadix); *A. patens* differs by having more slender internodes (3–4 mm diam) versus internodes thicker (8 mm diam), petioles mostly to 1–6 cm long versus longer petioles (above 28 cm long) and *A. leptocaule* differs by having cordate blades drying brown (vs. subcordate blades drying brownish green), more than four pairs of basal veins (vs. two pairs of basal veins) and spadix usually above 7 cm long at anthesis (vs. less than 4 cm long).

Anthurium batistae Croat, O.Ortiz & Baldini, *sp. nov*. (Fig. 2–3)

The species is characterized by its terrestrial habit, elongate internodes, mostly deciduous cataphylls, subterete petioles, narrowly ovate narrowly long-acuminate blades which are rounded at base and dry moderately dark brown with one pair of basal veins and 4–5 pairs of primary lateral veins as well as by the lanceolate green spathe, prominently stipitate purplish red narrowly cylindroid spadix.

Type:—PANAMA. Veraguas: Parque Nacional Santa Fe, La Sabaneta, 1240 m, 8°40’33”N 80°59’30”W, 30 October 2014, *Juvenal Batista, Ángela Cano & Mathieu Perret 1215* (holotype, PMA!).

Terrestrial herb to less than 1 m tall; **internodes** elongate, 6.5–9 cm long, 6 mm diam.; drying medium yellow-brown; **cataphylls** 2–2.5 cm long, mostly soon deciduous with a few remnants at node; **petioles** subterete, 19.5–22.5 cm long, 1.5–2 mm diam.; **blades** narrowly ovate, 18–19 × 9.2–10.5 cm, 1.8 times longer than wide, slightly shorter than the petioles, broadest in lower 1/3, narrowly long-acuminate at apex, rounded at base, drying moderately dark brown, slightly paler and yellowish green below; **basal veins** one pair; collective veins arising from the only basal veins or the lowermost pair of primary lateral veins, 6–8 mm from the margin; **primary lateral veins** 4–5 pairs, arising at 55–60° angle, prominently loop-connecting the primary lateral veins; tertiary veins raised above, prominently raised below; upper and lower surfaces lacking short pale lineations. **Inflorescence** erect; peduncle 22 cm long, 1.5 mm diam.; **spathe** lanceolate, 2.5 × 0.6 cm, spreading-reflexed, green weakly tinged with purple; **spadix** 3.2 cm long, 3 mm diam., narrowly cylindroid, faintly purplish red, prominently stipitate, stipe 2 cm long, 1 mm diam., faintly tinged red; **flowers** 3 visible per spiral. Berries not seen.

Etymology:—The species is named in honour of Juvenal Batista, a young Panamanian Botanist who collected this new species for the first time.

Distribution:—This species is known only from the type locality in Veraguas Province, Santa Fe, Panama (Fig. 4).

Habitat and Ecology:—*Anthurium batistae* grows at 1240 m in a *Premontane rainforest life* zone according to the classification of zones proposed by Holdridge *et al.* (1971).

Phenology:—October. Further investigations are required to determine exact flowering and fruiting seasons.

TABLE 2. Comparison of the characteristics between *Anthurium batistae* and *A. microspadix*

	Anthurium batistae	*Anthurium microspadix*
Leaves		
Petioles length	19–22.5 cm	5–16 cm
Blades shape	Ovate	Narrowly oblong–elliptic to oblong–ovate
Inflorescence		
Peduncle length	22 cm	5–15 cm
Spathe length	2.5 cm	3–5 cm
Stipe length	2 cm	0.1–1.5 cm
Stipe color	Red	Whitish green to yellow
Spadix color	Purplish red	Yellowish green

FIGURE 2. *Anthurium batistae* in its habitat at the type locality (Veraguas province, Santa Fe National Park, around La Sabaneta). A. In its habitat. B. Blades with one pair of basal veins. C. Flowering spadix. D. Cataphylls deciduous with a few remnants at node (Photo Juvenal E. Batista).

FIGURE 3. *Anthurium batistae*. Holotype specimen: Panama. Veraguas: Parque Nacional Santa Fe, La Sabaneta, 1240 m, 8°40’33”N 80°59’30”W, 30 October 2014, *Juvenal Batista, Ángela Cano & Mathieu Perret 1215* (Photo PMA Herbarium).

Conservation status:—According to IUCN (2001), *Anthurium batistae* would be considered as Data Deficient (DD).

Discussion:—*Anthurium batistae* is similar to *A. microspadix*, but this latter species has shorter petioles, proportionately narrower blades, inflorescences with shorter peduncles, longer spathes, a shorter stipe and yellowish green stipe and spadices (Table 2).

Anthurium batistae is also related to others species of section *Xialophyllium* with subcordate blades such *A. monteazulense*, *A. myosuroides*, *A. patens*, *A. holquinianum* and *A. davidsoniae*. *Anthurium monteazulense* differs by having upper internodes all short (1–1.5 cm long) versus very elongated internodes (6–9 cm long), blades with 7–9 pairs of primary lateral veins (vs. 4–5 pairs of primary lateral veins) and green to yellowish-green spadix (vs. purplish red spadix); *A. myosuroides* differs by having shorter petioles (4–13 cm long) versus petioles longer (19–22.5 cm long), blades with 3–4 pairs of basal veins (vs. 1 pairs of basal veins) and a yellowish spadix (vs. purplish red spadix); *A. patens* differs by having blades with 2–4 pairs of basal veins and a sessile or slightly stipitate spadix (2 mm long) versus a prominently stipitate spadix (2 cm long) and a pale green to dark green spadix; *A. holquinianum* differs by having blades with 3–5 pairs of basal veins, a cream to creamy white spadix that is usually 10–18 cm long at anthesis (vs. spadix less than 4 cm long) and *A. davidsoniae* differs by having 3–4 pairs of basal veins and a yellow-green spadix at anthesis.

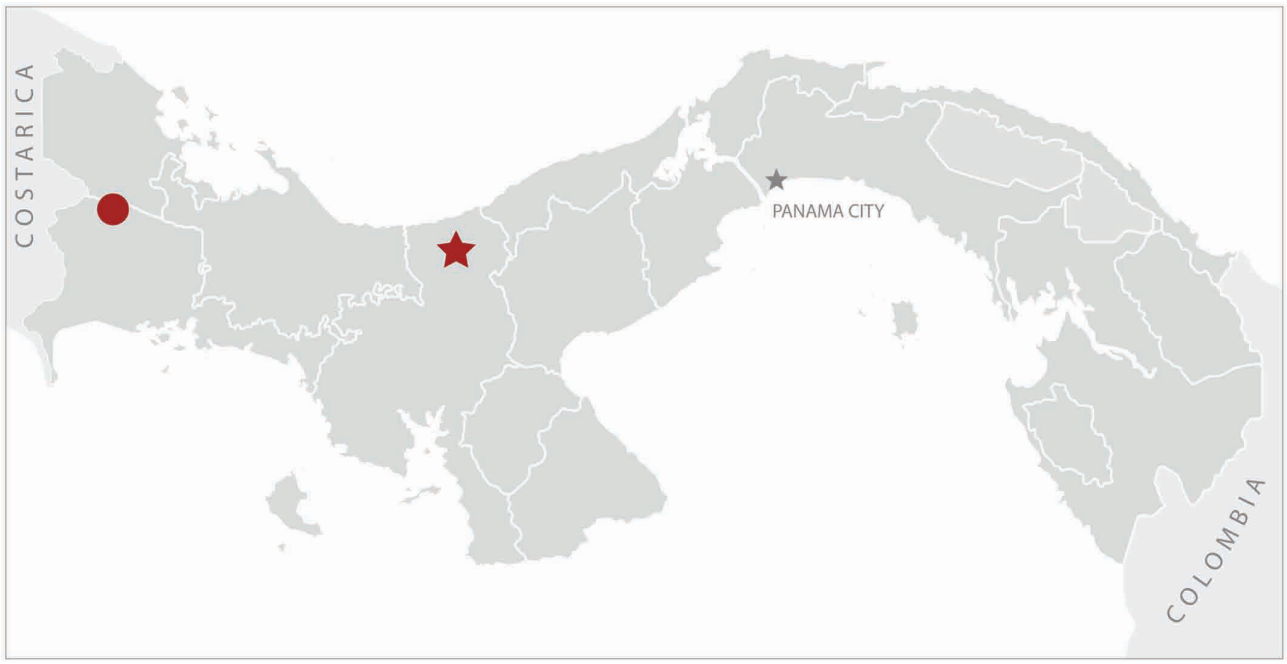

FIGURE 4. Distribution of *Anthurium monteazulense* (circle) and *Anthurium batistae* (star).

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