New species of Araceae from the South American Andes

Thomas B. Croat
P.A. Schulze Curator of Botany
Missouri Botanical Garden
P.O. Box 299, St. Louis, MO 63166
Thomas.croat@mobot.org

Noel Altamirano
Museo de Historia Natural Noel Kempff Mercardo
Avenue Irala 565, Casilla No. 2489
Santa Cruz, Bolivia
noelido@hotmail.com

Ann Grace
Volunteer Research Assistant
Missouri Botanical Garden
P.O. Box 299, St. Louis, MO 63166

Carla V. Kostelac
Missouri Botanical Garden
P.O. Box 299, St. Louis, MO 63166
Carla.kostelac@mobot.org

ABSTRACT

Four new species are described as new to science: *Anthurium mateoi* Croat & Altamirano, *A. monteagudoi* Croat & Altamirano, *A. rodvasquezii* Croat and *A. valenzuelae* Croat & Altamirano (Cuzco Department, Peru).

KEY WORDS

Anthurium, Andes, Bolivia, Ecuador, new species, Peru.

INTRODUCTION

The Araceae of Bolivia is relatively well-known owing to work done by Croat & Acebey on the Checklist for Araceae in the *Flora of Bolivia* (in press, Missouri Botanical Garden). New species already discovered during that work have been published (Croat & Acebey, 2005) but recent work by Peter Jørgensen and Peruvian collectors working with him in the Parque Nacional Madidi have discovered more new species. One of them is described here.

Peru is more poorly known than either Bolivia or Ecuador and is richer in species than Bolivia. Collectors working with Rodolfo Vasquez from the Missouri Botanical Garden continue to find new species in southern Peru in Pasco and Cuzco Departments where they are now concentrating. Two species found in Pasco Department and one species from Cuzco Department are being described here.

Anthurium mateoi Croat & Altamirano, **sp. nov.** Type: PERU. Pasco: Oxapampa, Distrito Huancabamba, Parque Nacional Yanachaga- Chemillén, Sector San Daniel, Trocha Erica, 10°26′10″ S, 75°26′15″ W, 2,600 m, 1 Mar 2008, *R. Vasquez, M. A. Monteagudo, A. Peña & J. L. Mateo 33879* (holotype, MO-6303244; isotype, USM).

Anthurium mateoi is related to *A. monteagudoi* Croat and *A. valenzuelae* Croat, both included in this study, as all three species are members of the *Xialophyllium*. The latter two species differ by

having much more elongated blades whereas *A. mateoi* has ovate blades 17–18 cm long. In the Lucid *Anthurium* key, *A. mateoi* tracks with *A. geniculatum* Sodiro and *A. karstenianum* Engl. *Anthurium geniculatum* is found in Ecuador, has long strap-like blades, is cuneate at the base and has many fine primary lateral veins. *Anthurium karstenianum* is also found in Ecuador and differs from *A. mateoi* in having oblong blades, arcuate at the base with the petiole weakly decurrent, 4 basal veins and only 6–8 primary lateral veins.

Terrestrial, scandent; **internodes** 4–12 cm long, 0.4 cm diam.; **cataphylls** persisting as scant fibers 2–4 cm. LEAVES 18.6 cm long with slender, weakly sulcate **petioles** 11–12 cm long, 2 mm diam., C-shaped, drying dark brown; **geniculum** 1 cm long, faint transverse creases visible microscopically; **blades** broadly ovate, subcordate, 17–18 cm long, 8 cm wide, 2.1 times longer than broad, 1.5 times longer than petiole, broadest at middle, cuspidate apex, epunctate on upper and lower surfaces, drying grey-green, semi-glossy on upper surface and yellow-brown, matte on lower surface; **midvein** drying acute and inconspicuous on upper surface, broadly rounded, finely ribbed and darker brown on lower surface; **basal veins** 2 pairs forming **collective veins**, the 1st pair free to the base, inconspicuous, running 1–2 mm from margin ending in the lower 1/4, 2nd pair more prominent, loop connecting to primary lateral veins, running 5 mm from margin to the apex; **primary lateral veins** 8 pairs, departing the midrib at 50°–60° angle, dry weakly raised, sometimes inconspicuous on upper surface, concolorous on lower surface and finely raised, slightly rounded and more prominent on the lower surface; tertiary veins twisted, irregular, inconspicuous. INFLORESCENCES 39.3 cm long with **peduncle** 35.2 cm long, 3 mm diam., drying dark brown, **stipe** 5.3 cm long, 2 mm diam.; **spathe** 4.2 cm long, 2.1 cm wide, spreading at 90° angle from peduncle, clear green, ovate, drying yellow-brown, **spadix** 4.3 cm long, 3 mm diam., cylindroid, dark purple-violet, drying very dark brown, 4 flowers visible per spiral, 3.4 mm long by 1.8 mm wide, lateral **tepals** 1.2–1.5 mm long, surface minutely granular, outer margins 2-sided, inner margins broadly rounded, often curved upward at center.

Anthurium mateoi is endemic to Peru, known only from the type locality in Pasco Department, Oxapampa Province in the Parque Nacional Yanachaga-Chemillén at 2,600 m in a *Montane wet forest* life zone (Holdridge et al., 1971).

The species is a member of sect. *Xialophyllium* characterized by its terrestrial, scandent habit, very long internodes, mostly persistent cataphylls, slender weakly sulcate petioles and ovate brown drying blades with 2 pairs of basal veins. The 1st pair margins out in the lower 1/3 and the 2nd pair depart the midrib at 75° and form the collective veins. *Anthurium mateoi* is also characterized by its long-pedunculate inflorescence, an ovate green spreading spathe and a cylindroid dark purple-violet spadix.

The species is named in honor of Peruvian botanist, J. L. Mateo who was part of the team who collected the type species. Mateo works with Rodolfo Vasquez who is working on a florula of the Oxapampa region.

Anthurium monteagudoi Croat & Altamirano, **sp. nov.** Type: PERU. Pasco: Oxapampa. Sector Abra esperanza. Parque Nacional Yanachage-Chemillén. 10°31′54″ S 075°20′59″ W, 2,550 m, 28 Feb 2007, *R. Vasquez, A. Monteagudo & V. Flores 32014* (holotype, MO-6242273; isotypes, B, Q, US, USM).

Anthurium monteagudoi is a member of sect. *Xialophyllium*. Its blade resembles some of the less typical blades of *Anthurium valenzuelae* also collected from Peru in this study. *Anthurium monteagudoi* is distunguished from *A. valenzuelae* in having fewer primary lateral veins (8–12 versus 11–21), distinctive collective vein pattern and a stipe that measures in cm rather than mm. *Anthurium monteagudoi* tracks in the Lucid *Anthurium* key with *A.*

aristatum Sodiro, *A. funiferum* Klotzsch & H. Karst. ex Engl. and *A. geniculatum*.

Anthurium aristatum is found in Ecuador at a somewhat lower altitude (1,100–1,800 m). The blades have similar shape but are much larger (20–33 cm long, 8–10 cm wide), primary lateral veins emerge at 70°–80° angle from the midvein, the base is broadly obtuse, nearly truncate and blades dry dark reddish brown on both surfaces. *Anthurium funiferum* also has a larger blade, cataphylls persisting only as loose fibers, and petioles that are much longer (20–30 cm long). *Anthurium geniculatum,* also from Ecuador, has larger blades, internodes that are 8–10 cm long, many fine primary lateral veins and peduncle length 25–30 cm.

Terrestrial; stem erect; **internodes** 4–8.5 cm long; **cataphylls** persistent 2–7 cm long, fibrous, drying reddish brown. LEAVES 25 cm long with sheathed **petioles**, subterete, 5–17 cm long, 1.5–2 mm diam.; **geniculum** 0.8–1.7 cm long; **blades** ovate-elliptic to lanceolate, 9.5–19.5 cm long, 3.7–6.2 cm wide, 2.4–4 times longer than wide, 0.7–1.1 times longer than petiole, long, tapered acuminate at apex, cuneate to subcordate at base, **midrib** prominent and drying acute on both surfaces, often drying darker brown on lower surface; **primary lateral veins** 7–12 pairs, arising at 50–55° angle, inconspicuous, slightly rounded on upper surface, more acutely raised on lower surface, concolorous on both surfaces; **collective veins** arising prominently from the base, running 4–6 cm, forming a straight-sided V-shape to 2–4 mm from the margin, concolorous on both surfaces; **tertiary veins** reticulate; **upper surface** drying semiglossy, subcoriaceous, minutely papillate, epunctate, drying brown; **lower surface** drying semiglossy, papillate, with white pustules, yellow-green. INFLORESCENCES 25 cm long, erect, spreading 60–65° from the stem; **peduncle** terete, 9.7–28 cm long; **stipe** 0.3–6.5 cm long; **spathe** 3–6.5 cm long, 0.5–0.8 cm wide, elliptic-lanceolate, reddish green fresh, drying dark brown, semi-transparent; **spadix** cylindrioid, 2–7.2 cm long, 0.1–0.5 cm diam., red, drying dark brown; flowers 3–3.3 mm long, 2.3–2.5 mm wide, 4–5 visible per spiral, outer tepal 2-sided, inner tepal broadly rounded, lateral tepal 1.2 mm wide.

Anthurium monteagudoi is known only from the type locality in Pasco Department near Oxapampa between 1,900 and 2,910 m in a *Tropical moist forest* transitioning to *Tropical wet forest* life zone.

Anthurium monteagudoi is named for Peruvian botanist, Abel Monteagudo who collected the type specimen. Monteagudo works with Rodolfo Vasquez of the Missouri Botanical Garden and has collected many new and interesting Araceae. We are happy to be able to name this interesting new species in his honor in recognition of all his hard work with the Flora of Peru.

Paratypes: PERU. **Pasco**: Oxapampa, Huancabamba, Sector Abra Esperanza, Parque Nacional Yanachaga-Chemillén 10°22′ S, 75°27′ W, 2,900 m, 1 Aug 2003, *R. Vásquez, A. Monteagudo,* et al., *28432* (MO, USM); 10°37′ S, 75°20′ W, 2,050 m, 21 Sept 2003, *J. Lingan, R. Rojas, K. Meza & C. Rojas, 668* (MO, USM); 10°22′, 75°36′ W, 2,824 m, 10 Oct 2003, Sector Grapanazu, 10°25′ S, 75°27′ W, 2,410 m, 12 Oct 2003, *J. Lingan, I. Salinas & K. Meza, 707* (MO, USM); Sector Chacos-Antena, 10°37′ S, 75°17′ W, 2,600 m, 14 Jan 2004, *R. Vásquez, J. Perea, A. Peña R Francis & L. Mateo 28679* (MO, USM); 10°18′24″ S 75°35′06″ W, 2,550 m, 20 May 2004, *R. Rojas, A. Peña & C. Rojas 2361* (MO, USM); Sector Chacos, 10°37′25″ S 075°17′43″ W, 2,100 m, 3 June 2004, *R. Rojas, M. Huaman, A. Peña, J. Mateo & C. Rojas 2600* (MO, USM); 10°22′33″ S 75°36′48″ W, 2,720 m, 18 Sep 2004, *A. Monteagudo*, *A. Peña, J. Perea & R. Francis 7094* (MO, USM); 10°38′42″ S 075°17′30″ W, 2,740 m, 4 Nov 2004, *A. Monteagudo, A. Peña, C. Arias & C. Rojas 7527* (B, K, MO,USM); 10°32′34″ S, 75°21′43″ W, 2,410–2,520 m, 16 Mar 2005, *E. Ortiz & J Mateo 496* (MO, USM); Cerca de la laguna San Daniel, 10°15′ S, 75°16′ W, 2,400 m, 13 Aug 2005, *A. Monteagudo, A. Pena, R. Francis & E. Quintuya, 9287*, (MO, QCNE, USM); 10°31′37″ S, 75°21′16″ W, 2,910 m, 12 Oct 2006, *A. Monteagudo, R. Francis, G. Castillo & L. Cardenas 12783*

(COL, MO, USM); 10°26′46″ S, 75°26′18 W, 2,260 m, 21 Apr 2007, *A. Monteagudo, A. Peña, & V. Flores 13674* (M,MO, S, USM); 10°22′42″ S, 75°27′00″, 2,650 m, 01 Dec 2007, *A. Monteagudo, A. Peña, V. Flores & R. Rivera 16066* (F, MO, NY, USM). **Cajamarca**: San Ignacio, Distrito Huarango, 05°03′50″ S 78°43′19″ W, 2,378 m, 27 Aug 2007, *J. Perea, E. Becerra, A. Peña & J. Diaz 3891* (MO, USM); 2,600 m, 1 Mar 2008, *R. Vásquez, A. Monteagudo, A. Peña and J. L. Mateo 33870* (G, GH, MO, USM). BOLIVIA. **La Paz**: Franz Tamayo Parque Nacional Madidi, Pinalito 14°29′43″ S, 68°15′26″ W, 1,900–2,020 m, 13 July, 2002, *A. Fuentes, A. Araujo, H. Parimo, R. Alvarez & M. Villanueva 4987* (MO, USM).

Anthurium rodvasquezii Croat, **sp. nov.** Type: PERU. Pasco: Oxapampa; Distrito Huancabamba, Parque Nacional Yanachaga-Chemillén, sector San Daniel, Bosque esclerófilo y pajonal con montículos aislados, 10°26′13″ S, 75°27′33″ W, 2,363 m, 25 Feb 2008, *R. Vasquez M., A. Monteagudo, A. Peña & J. L. Mateo 33655* (holotype, MO-6266759; isotype, USM).

Anthurium rodvasquezii is perhaps most closely related to *A. flavescens* Poepp. that also occurs in the Pasco Department and Oxapampa Province and also has a few large flowers per spiral. However that species occurs at lower elevations (235–700 m) and differs in having typically shorter internodes, typically shorter, more nearly elliptic to oblanceolate-elliptic grayish drying blades.

Terrestrial to 30 cm.; **internodes** green 2–6 cm long, 0.7 cm diam; **cataphylls** 3–4 cm long, persisting intact, drying reddish brown. LEAVES 36.7 cm long with **petioles** subterete, 13–19 cm long, 2–3 mm diam., **geniculum** 1.5 cm long, reddish, drying darker than petiole, finely furrowed; **blades** ovate-elliptic, 17–23 cm long, 5–8 cm wide, 2.5–3.2 times longer than broad, 1–1.4 times longer than petiole; abruptly acuminate at apex with 0.8 cm apiculum, cuneate at the base; **midrib** fine, acutely rounded, concolorous above, narrow, flattened drying reddish below; **primary lateral veins** 10–11, very fine, acute, concolorous above, slightly raised, acutely rounded, concolorous, arising from the midrib at 70°–80° angle, curving upward near the margin; **collective veins** arising at the base and loop connecting the primary lateral veins, 3–4 mm from the margin; **upper surface** minutely granular, epunctate drying dark brown; **lower surface** minutely granular, epunctate, drying medium brown. INFLORESCENCES 20 cm long with **peduncle** 12–18 cm long, 2 mm diam., reddish, drying dark brown, **stipe** 0.5–0.8 cm long, 3 mm diam, **spathe** reflexed, green or yellow, 3.2–4.7 cm long, 0.5–1.6 cm wide, **spadix** yellow, 3.2–5.2 cm long, 0.4–0.7 cm diam., 3–4 flowers per spiral, 3 mm long, 2.5 cm wide, lateral tepals 1.8 mm wide, inner margin broadly rounded, outer margin 2-sided. INFRUCTESCENCES to 5 cm long, 0.8 cm diam.; **berries** 3 mm diam., round, drying yellowish.

Anthurium rodvasquezii is endemic to Peru, known only from the type locality in Pasco Department, Province of Oxapampa, Distrito Huancabamba in the Parque Nacional Yanachanga-Chemillén at 2,363 m in a *Lower montane wet forest* or *Premontane rain forest* life zone.

The species is a member of sect. *Xialophyllium* characterized by its terrestrial habit, elongated slender internodes, long-petiolate leaves, subterete petioles, brown-drying oblong-elliptic to narrowly ovate-elliptic blades with the collective veins arising from the base and loop-connected with the primary lateral veins as well as by the long-pedunculate inflorescence with the green reflexed spathe and short-tapered yellow spadix with only three flowers visible per spiral.

The species is named in honor of renowned Peruvian botanist, Rodolfo Vasquez who has published floras of the Iquitos Region in Loreto Department and the Río Cenepa region in Amazonas Department. Vasquez is now working on similar works centered on the Oxapampa region in Pasco Department where he and his crew collected the type specimen of this species.

Paratype: PERU. **Pasco**: Oxapampa; Distrito Huancabamba, Parque Nacional Yanachaga-Chemillén, Sector Tunqui, camino al valle del Palcazúm bosque montano maduro, 10°16′24″ S, 75°30′37″ W, 15 Sep 2006, *G. A. Castillo, V. Flores, L. Hernani & M. Corrales M. 996* (MO, USM).

Anthurium valenzuelae Croat & Altamirano, **sp. nov.** Type: PERU. Dept. Cuzco: Province Calca, Distrito Quebrada Yantile, camino a Lacco, in primary moist forest, 12°38′51″ S 07°215′13″ W, 2,425 m, 23 Feb 2004, *L. Valenzuela, E. Suclli, I. Huamantupa, A. Carazas 2866* (holotype, MO-4780142; isotypes, K, NY, US, USM).

A few blades of *Anthurium valenzuelae* that were wider than typical for the species were similar to *A. monteagudoi* but *A. monteagudoi* is distinguished by having fewer primary lateral veins (8–12 versus 11–21) and collective veins which emerge prominently from the base forming a straight-sided V for 4–6 cm to near the margin.

Epiphytic vine to 1.5 m tall; **internodes** longer than wide, 1–3 cm long, 0.4–0.8 cm diam.; **cataphylls** persisting as fibers with apex acute, 2–8 cm long, drying reddish brown. LEAVES 27.3 cm long with **petioles** terete, 3.5–23 cm long (average 7.3 cm), 0.2–0.3 cm diam., weakly sheathed, shallowly and broadly sulcate; **geniculum** 0.5–1 cm long, drying darker than petiole; **blades** green, lanceolate, acuminate at apex, obtuse at base, with straight margins 9–35 cm long (average 20.8 cm), 1.2–6 cm wide (average 2.8 cm), 3.5–12.5 times longer than broad (average 7.8), 1.3–7 times longer than petiole (average 3.1), drying medium to dark reddish brown, semiglossy above and below, glandular punctations are lacking on both surfaces but many specimens have white pustules on the lower surface; **midrib** red, drying sunken above, prominently raised, bluntly acute below; **primary lateral veins** 11–21 pairs (average 14), arising at 45° to 60° angle, drying finely raised, slightly rounded, more conspicuous on lower surface; **collective veins** arising from the base and running 2–3 mm from margin, conspicuous on both surfaces; tertiary veins conspicuous below, less conspicuous above. INFLORESCENCES 22 cm long; **peduncle** terete, 5–33 cm long (average 17); **stipe** 0.2–0.5 cm long; **spathe** green or reddish, spreading, lanceolate, 3–7 cm long, 0.3–1.2 cm wide, acuminate at apex, drying dark brown; **spadix** erect, red to violet, 2.4–15 cm long (average 7.3 cm), 0.3–0.5 cm wide, cylindroid, tapered, drying dark brown, 3–5 **flowers** visible per spiral, 1.8–3.4 mm long, 1.5–2.4 mm wide, **tepals** outer margins 2-sided, inner margin broadly rounded. lateral tepals 0.8–1.8 mm wide.

Anthurium valenzuelae is a member of sect. *Xialophyllium*. It is known from the type locality in Cuzco Department of Peru at about 2,400 m elevation. It has also been found at Oxapampa and San Ignacio in Peru between 2,000 and 3,200 m. In Ecuador the species has been found in Morona-Santiago and Zamora-Chincipe Provinces at altitudes between 900 and 2,300 m. Thirty-seven specimens have been examined and classified as *Anthurium valenzuelae*. The species is characterized by long, strap-like blades. Although the length-width ratios of the blades show considerable variation from 3.5 to 12, other features such as venation pattern, flower structure, persistent cataphylls and long internodes indicate they belong to a single, distinct species.

In the Lucid *Anthurium* key, *Anthurium valenzuelae* tracks with *A. amoenum* Kunth & Bouché, *A. mindense* Sodiro *and A. monteagudoi*. *Anthurium amoenum* is found in Bolivia and has broader blades that are nearly ovate, with length/width ratio 2.6. The slender petioles tend to be near the length of the blades. The inner tepal margins are nearly straight. *Anthurium mindense* is found in Ecuador and has blades that are similar size and proportions to *A. venezuelae* but their shape is consistently elliptic rather than lanceolate and the apex tends to be cuspidate with a prominent apiculum 1–2 cm long. Another distinguishing character of *A. mindense* is

the pattern of the prominent collective veins which run 4–6 mm from the margin forming distinct arcs at the juncture of primary lateral veins. A few blades of *A. valenzuelae* that were wider than typical for the species were similar to *A. monteagudoi* but *A. monteagudoi* is distinguished by having fewer primary lateral veins (8–12 versus 11–21) and collective veins which emerge prominently from the base forming a straight-sided V for 4–6 cm to near the margin. In addition, the stipe of *A. valenzuelae* is a few mm long, while that of *A. monteagudoi* is many times longer.

The species is named in honor of Peuvian botanist, Luis Valenzuela who was responsible for collecting the type specimen of this species. Valenzuela regularly works with Rodolfo Vasquez in the Oxapampa region where the type specimen was collected. He has collected many interesting and new species of Araceae.

ECUADOR. **Morona-Santiago:** Cordillera de Cutucú, W slopes, along a trail from Logroño to Yaupi, in the general region, 02°46′ S 078°06′ W, 1,800 m, Nov 1976, *M.T. Madison, E.O. Bush, III & E.W. Davis 3434* (NY); 1,600 m, Nov 1976, *M.T. Madison* et al. *3476* (MO); Cordillera Cutucú, ridge just south and west of Río Itzintza, 02°40′ S 078°00′ W, 4,500–5,500 ft, 17 Nov 1944–5 Dec 1944, *W.H. Camp 1308* (MO, NY); Gualaquiza, Cordillera del Cóndor, Cuangos, 20 km east of Gualaquiza, near disputed Peru-Ecuador border, 03°29′ S 079°14′ W, 1,500 m, 19 Jul 1993, *A. Gentry 80237* (MO, QCNE); Limón Indanza, Cordillera de Huaracayo, east of Cordillera del Cóndor and Río Coangos, forest on sandstone ridge, east of Shuar village of Tinkimints, 03°15′44″ S 078°12′01″ W, 1,380 m, 25 Mar 2001, *D. Neill & J. Manzanares 13202* (MO, QCNE); Cordillera del Cóndor, sandstone ridge, south of Río Warints, east of main crest of Cordillera del Cóndor, 03°14′03″ S 078°17′10″ W, 1,950 m, 14 Dec 2002, *D. Neill & Shuar conservation interns 14134* (MO, QCNE). **Zamora-Chinchipe:** above Valladolid on road to Yangana, 2,300 m, 1 Feb 1985, *G. Harling & L. Andersson 21437* (GB); 3 km E Paquisha, disturbed primary forest, 1,100 m, 11 Apr 1985, *G. Harling 23984* (GB); Campamento Shaime, along Río Nangaritza, forest on calcareous rock, 04°20′ S 078°40′ W, 900 m, 14 Feb 1994, *H. van der Werff, B. Gray, E. Freire & M. Tirado 12991* (MO); Shaime. Sendero hacia el Hito, 04°22′ S 078°42′ W, 900–1,200 m, 27 Oct 1991, *J. Jaramillo 14448* (QCA); Pachicutza, área de transicíon entre el bosque tropical y subtropical. Localidad de colecciónsendero hacia el hito, 00°33′ S 076°10′ W, 1,200–1,350 m, 19 Oct 1991, *J. Jaramillo 14129* (QCA); Nangaritza. Shaimi. SE de Campamento Militar, márgen derecha de Río Nangaritza, bosque primario sobre pendientes 45%, rocas calizas aflorando, 04°18′ S 078°43′ W, 930 m, 27 Oct 1991, *W. Palacios, I. Vargas & E. Freire 8765* (MO); Zamora, Jamboe Bajo, eastern border of Podocarpus National Park, 04°05′ S 078°55′ W, 1,100 m, 5 Nov 1996, *J. L. Clark & P. Conza, P. Walter, M. Zapata 3261* (LOJA, MO, QCNE).

PERU. **Cajamarca:** Jaén, Pomahuaca, Aguas verdes, 2,370 m, 6 Nov 1999, *C. Díaz & L. Campos 10868* (MO, QCNE, UB, US, USM); San Ignacio, San José de Lourdes, "Base del Cerro Picorana, restos de bosque andino y arbóreo," Cordillera del Condor, 04°59′25″ S 078°54′05″ W, 2,050–2,160 m, 3 Dec 1998, *C. Díaz & S. Fernández 10208* (MO); Dist. Huarango, Caserio Selva Andina, borde de troche, 05°03′17″ S 078°45′04″ W, 1,890 m, 17 Aug 2006, *J. Perea, V. Flores 2664* (HUT, MO); San José de Lourdes, Selva Andina, 04°59′22″ S 078°53′03″ W, 2,020 m, 21 Nov 1999, *R. Vásquez & S. Flores 26300* (MO). **Cuzco:** Dist. Quebrada Yanatile, camino a Lacco, 12°38′51″ S 072°15′13″ W, 2,425 m, 23 Feb 2004, *L. Valenzuela, E. Suclli, I. Huamantupa & A. Carazas 2866* (CUZ, MO, USM); La Convención, Dist. Santa Ana, Tunquimayo, Parque alta, rumbo a Puncuyoc, 12°54′31″ S 072°48′45″ W, 2,400 m, 21 Nov 2005, *E. Suclli, I. Huamantupa 2844* (CUZ, MO); Dist. Santa Ana, Madre Selva, 12°53′49″ S 072°45′02″ W, 2,300–3,200 m, 20 Mar 2004, *L. Valenzuela, E. Suclli & G. Calatayud 3075* (CUZ, MO, USM); Urubanba, Distrito Machu Picchu, 13°09′ S 72°30′ W,

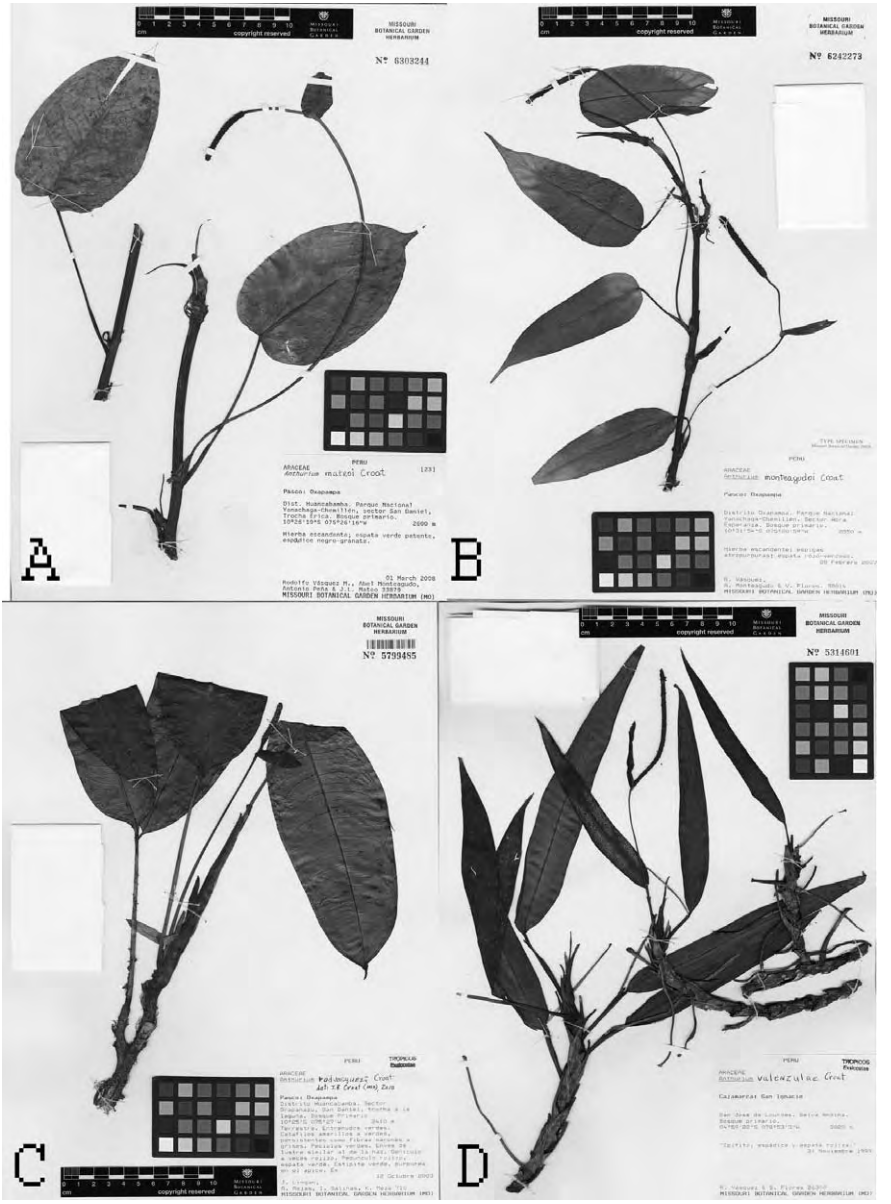

Fig. 1. A. *Anthurium mateoi* Croat & Altamirano. A. Herbarium type specimen (*Vasquez 33879*). B. *Anthurium monteagudoi* Croat & Altamirano. B. Herbarium type specimen (*Vasquez 32014*). C. *Anthurium rodvasquezii* Croat C. Herbarium specimen (*Lingan 710*). D. *Anthurium valenzuelae* Croat & Altamirano. D. Herbarium specimen (*Vasquez 26300*).

2,200 m 19 Nov 2003, *I. Huamantupa, Y. Gutierrez & E. Quispe 3753* (MO, USM). Cajamarca: San Ignacio, San José de Lourdes, Base de Cerro Picorano, restos de bosque andino y arboreo, 04°59′ S 78°54′ W, 2,050–2,160 m, 3 Dec 1998, *C. Diaz & S. Fernández 10208* (MO, USM). Jaén, Pomahuaca, Aguas verdes, no coordinates given, 2,370 m, 6 Nov 1999, *C. Diaz & L Campos 10868* (MO, USM). Calca, Road

Quebrada-Alto Lacto, 12°37′ S 72°14′ W, 2,800 m, *H. van der Werff, L. Valenzuela, E. Suclli & A. Carazas 21192* (MO, USM). **Pasco:** Zona de amortiguamiento del Parque Nacional Yanachaga-Chemillén, Sector Oso-Playa, 10°19′39″ S 075°34′58″ W, 2,410 m, 24 Sep 2007, *A. Monteagudo, A. Peña, J.L. Mateo, V. Flores & C. Rojas 15259* (AMAZ, HUT, MO, MOL, USM); cabecera de la Quebrada Amistad, 10°17′58″ S 075°36′56″ W, 2,220–2,300 m, 30 Jun 2004, *R. Vásquez, A. Peña, R. Francis & H. Cristoba 30318* (MO, USM); Oxapampa; Distrito Huacabamba, Sector Grapanazu San Daniel, trocha a la laguna, 10°25′ S, 75°27′ W, 2,410 m, 12 Oct 2003, *J. Lingan, R. Rojas, I. Salinas & K. Meza 706* (MO, USM). Parque Nacional Yanachaga-Chimillén, 10°15′ S 75°15 W, 2,200–2,350 m, 15 Aug 2005, *A. Monteagudo, A. Peña, R. Francis, & E. Quintuya 9375* (MO, USM), 17 Aug 2005, *A. Monteagudo, A Peña, R. Francis, & E. Quintuya 9431* (MO, USM). Desde el hito de San Daniel hacia la trocha erica en la cordillera Yanachaga, 10°26′ S 75°26 W, 2,260 m, *A. Monteagudo, A. Peña & V. Flores 13676* (MO, USM). Localidad de Lanturachi, sector Santa Barbara, camino a Cueva Blanca, 10°22′ S 75°36′ W, 2,813 m, 18 Oct 2004, *J. Perea, R. Francis, C. Mateo & G. Ortiz 0731* (MO, USM).

LITERATURE CITED

Croat, T. B. & A. Acebey. 2005. New species of Araceae from Bolivia and Tropical Andes. *Novon* 15: 80–103.

Croat, T. B. & A. Acebey. 2011. Araceae in Jørgensen, P. M., M. Nee & S. G. Beck. *Catálogo de las plantas vasculares de Bolivia*. Monogr. Syst. Bot. Missouri Bot. Gard.

Holdridge, L. R., W. H. Hatheway, T. Liang & J. A. Josi. 1971. *Forest Environments in Tropical Life Zones*. Pergamon Press, New York.