

*DE MACROCARPAEAE GRISEBACH (EX GENTIANACEIS)*  
*SPECIEBUS NOVIS XII: THREE NEW SPECIES FROM THE ANDES OF PERU*

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**Abstract.** Three new species from Peru, *Macrocarpaea abiseo*, *M. felicitata*, and *M. huamantanga*, are described and illustrated.

**Keywords:** *Macrocarpaea*, Gentianaceae, Helieae, Ecuador

Three new species of *Macrocarpaea* Gilg from Peru are described and illustrated, one based on a single specimen from a poorly known locality, and two from recently collected material that have been sequenced and included in a new molecular phylogeny of the genus (Vieu and Grant in prep.). This paper continues a series of studies in preparation of a full monograph (Grant, 2003, 2004, 2005, 2007, 2008, 2011, 2014; Grant and Struwe, 2001, 2003; Grant and Trunz 2011; Grant and Weaver, 2003).

1. *Macrocarpaea abiseo* J.R. Grant, *sp. nov.* TYPE: PERU. San Martín: Dist. Huallaga, Valley of Rio Apisoncho, 30 km above Jucusbamba, 7°55'S, 77°10'W, 3000 m, 4 September 1965, A.C. Hamilton & P.M. Holligan 688 (Holotype K). Fig. 1.

*Macrocarpaea abiseo* is a new species from Amazon-facing slopes of the Andes in central Peru that differs from *Macrocarpaea pajonalis* in having slightly visible secondary veins on its leaves, spiculate calyces, and flowers that are less nodding.

*Shrub* glabrous to hyaline spiculate, especially spiculate on petioles, bracteoles, and calyces which are covered with short simple hairs. *Stems* terete to slightly quadrangular, solid, 4–5 mm in diameter just below the inflorescence. *Leaves* oval to ovate, sessile to short-petiolate, 3.0–8.5 cm long. *Petioles* 0–10 mm, robust with slight vagination one quarter the length of the petiole; interpetiolar ridge 2–3 mm. *Blades* 3.0–7.5 × 1.5–5.0 mm, entire, revolute, dark above, and lighter below, glabrous, thick, leathery-coriaceous, midrib thick, secondary veins slightly visible either above or below; leaf base aequilateral to oblique, cuneate; leaf apex obtuse to rounded. *Inflorescence* a few branched short compact thyrses, 10–14 cm high; branches 3–5 cm long; 5–8 flowered per branch. *Bracts* oval to obovate, sessile to short-petiolate, 8–20 × 4–16 mm; bract base aequilateral, cuneate; bract apex obtuse to rounded; bract petioles 0–2

mm. *Flowers* pedicellate, erect; pedicels 5–8; bracteoles inconspicuous and scabrous, linear to triangular, 1.0–2.5 × 0.5–1.0 mm. *Calyx* campanulate, 6–8 × 5–6 mm, hyaline spiculate, faintly rugose, ecarinate, reniform to ovate; calyx lobes 1–2 × 2.5–3.0 mm, rounded. *Corolla* funnel-shaped, 28–33 mm long, 12–15 mm wide at the apex of the tube, yellow, smooth; corolla lobes ovate, 7–8 × 6–7 mm, obtuse to rounded. *Stamens* 15–20 mm long; filaments 10–15 mm long, filiform, flattened; anthers elliptic to sagittate, 5 × 1.5–2.0 mm, sagittate, versatile; pollen glabra-type. *Pistil* 26–28 mm long; ovary 6.5–7.0 × 2–3; style 17–18 × 0.5–0.75 mm; stigma lobes spatulate, 2.5–3.0 × 2 mm. Capsules and seeds unknown.

**Distribution and habitat:** *Macrocarpaea abiseo* occurs on Amazon-facing slopes of the Andes in central Peru. Since this area has been little explored, it is not surprising there are novelties in the region. The only other species of *Macrocarpaea* known from this area is *Macrocarpaea gran-pajatena* J.R. Grant.

**Etymology:** Named for *Parque Nacional del Río Abiseo* in Peru, where it occurs.

*Macrocarpaea abiseo* has thick leathery leaves with scarcely visible secondary veins. It appears to belong to a group of species from southern Ecuador and Peru with these characteristics including *M. harlingii*, *M. loranthoides*, *M. luya*, *M. pajonalis*, and *M. stenophylla*. It may be most closely related to *M. pajonalis*, a common species of the Oxapampa and Huánuco region of Pasco and Huánuco in central Peru. However, *M. abiseo* has more visible secondary veins on its leaves, hispid calyces, and flowers that are less nodding. *Macrocarpaea pajonalis* is always completely glabrous. Additional collections from the Oxapampa region that may eventually be attributed to *M. abiseo* are *Perea* 694, *Valenzuela* 13762, *van der Werff* 22970. These were collected within the general distribution of *M. pajonalis*, but at higher elevations.

The following herbaria are acknowledged for the loan of material, photocopies of specimens, data on their collections, and/or for hospitality extended during visits\* by JRG to examine material of *Macrocarpaea*: AAU, AFP, ALA\*, B, BM, BP, BR\*, BRIT, BSB, C, CAS, CAUP, CEPEC\*, CESJ, CHOCO, CHR\*, COAH\*, COL\*, CONN, CR, CUVC\*, CUZ\*, DAV, DUKE, E, EHH, F\*, FAUC, FI, FLAS, FMB, FR\*, FTG, G\*, GB, GH\*, GOET, HAC, HAL, HAM, HAO\*, HB\*, HUA\*, HUCP, HUEFS\*, HUQ, HUT\*, IAN\*, INB, INPA\*, JAUM, JBSD, JE, K\*, L, LD, LINN, LOJA\*, LPB, LS, M, MA\*, MANCH, MARY\*, MBM\*, MBML\*, MEDEL\*, MER\*, MG\*, MICH, MIN, MO\*, MOL\*, MSB, MU, MY, NA, NEU\*, NO, NSW\*, NY\*, OXF, P\*, PH, PORT\*, PR, PRC, Q\*, QAP\*, QCA\*, QCNE\*, QPLS\*, QUSF\*, R\*, RB\*, RNG\*, S\*, SBBG\*, SEL\*, SP\*, SPF\*, TEX, U, UC, UCWI, UDBC, UPCB, UPS, UPTC, US\*, USM\*, VALLE\*, VEN\*, W\*, WIS, WU\*, YU, and Z\*. We also thank Bobbi Angell who prepared the incomparable scientific illustrations, financed through the Overhead of the Swiss National Science Foundation.

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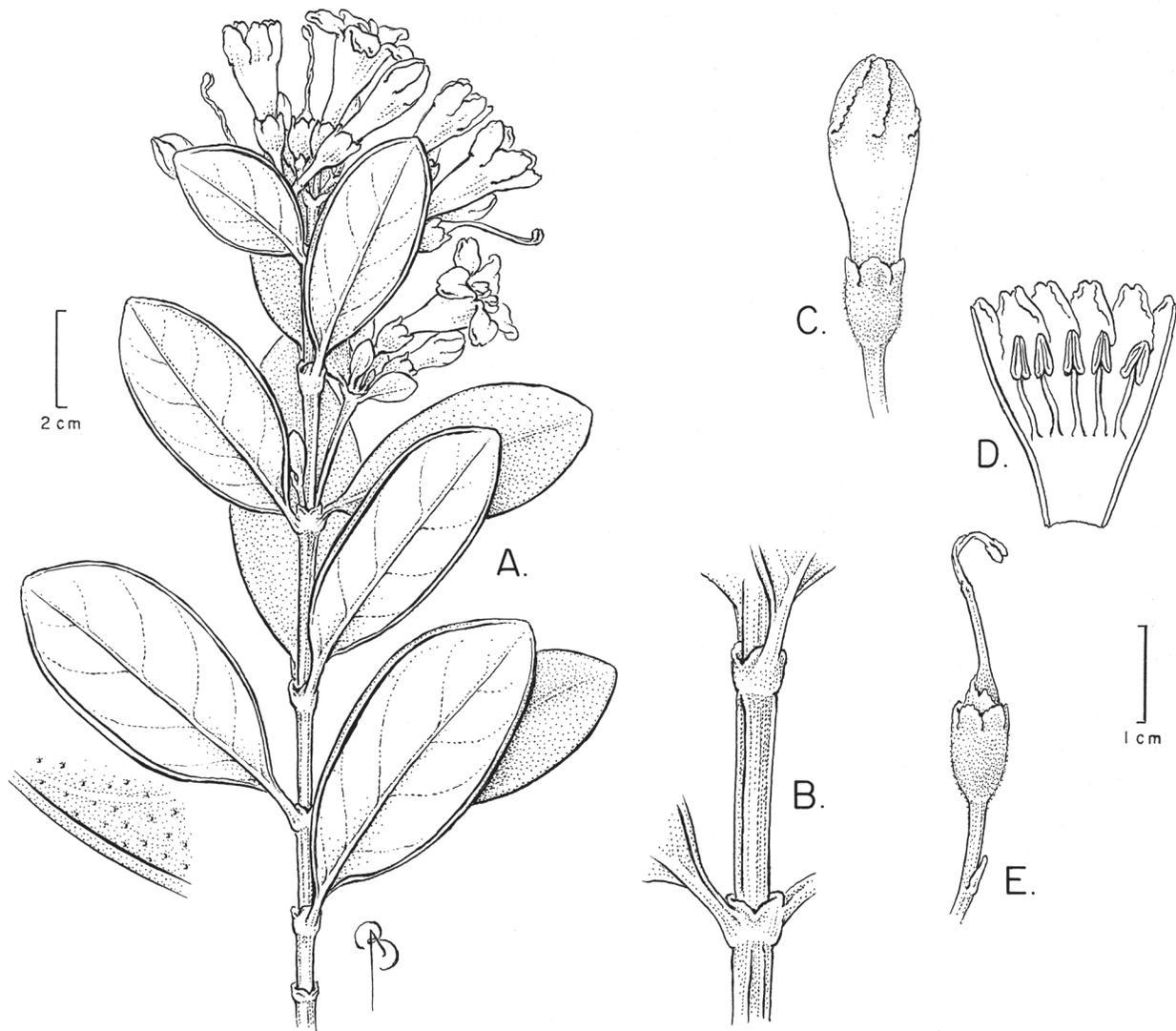


FIGURE 1. *Macrocarpaea abiseo*. **A**, habit of flowering stem; **B**, detail of stem nodes; **C**, bud; **D**, open corolla; **E**, immature fruit. All drawn from Hamilton & Holligan 688 (K).

2. *Macrocarpaea felicitata* J.R. Grant & J. Vieu, *sp. nov.*  
 TYPE: PERU. Pasco: Dist. Oxapampa, bosque primario y de arenisca, 10°40'36"S, 075°18'55"W, 2400 m, arbolito 4 m, flores amarillo-verdosas, 21 February 2006, R. Rojas, A. Peña, J. Mateo, & C. Rojas 3935 (Holotype: MO; Isotype: NY). Fig. 2.

*Macrocarpaea felicitata* is a new species from Amazon-facing slopes of the Andes in central Peru that differs from *Macrocarpaea stenophylla* in being a 4 m tall tree with a large panicle of trumpet-shaped corollas and hispid to spiculate calyces.

Small tree to 6 m, hyaline hispid to spiculate with short simple hairs on stems, petioles, leaves, inflorescences, bracts and calyces. Stems terete to slightly quadrangular, solid to hollow, 7–10 mm in diameter just below the inflorescence.

Leaves oval to broadly elliptic, petiolate, 45 cm long. Petiole 6 mm long, robust with strong open vagination one half the length of the petiole; interpetiolar ridge 1–3 mm high. Blade 39 × 22 cm, entire, dark green, with slightly impressed veins above, and slightly raised veins below, hyaline hispid to spiculate throughout especially along veins on lower surface, papery thin; leaf base aequilateral, oblique, to cuneate; leaf apex obtuse to acute. Inflorescence a much branched open thyrses 29–36+ cm high; branches 10–25 cm long; 5–10 flowered per branch. Bracts ovate, oval, elliptic, to narrowly oblanceolate, sessile to petiolate, 12–190 × 2–100 cm; bract base aequilateral to oblique, cuneate, rounded to short-attenuate; bract apex acute to obtuse; bract petioles 0–25 mm long. Flowers pedicellate, spreading; pedicel 9–26 mm long, linear to lanceolate; bracteoles 1.5–12 × 0.5–2.0 mm.

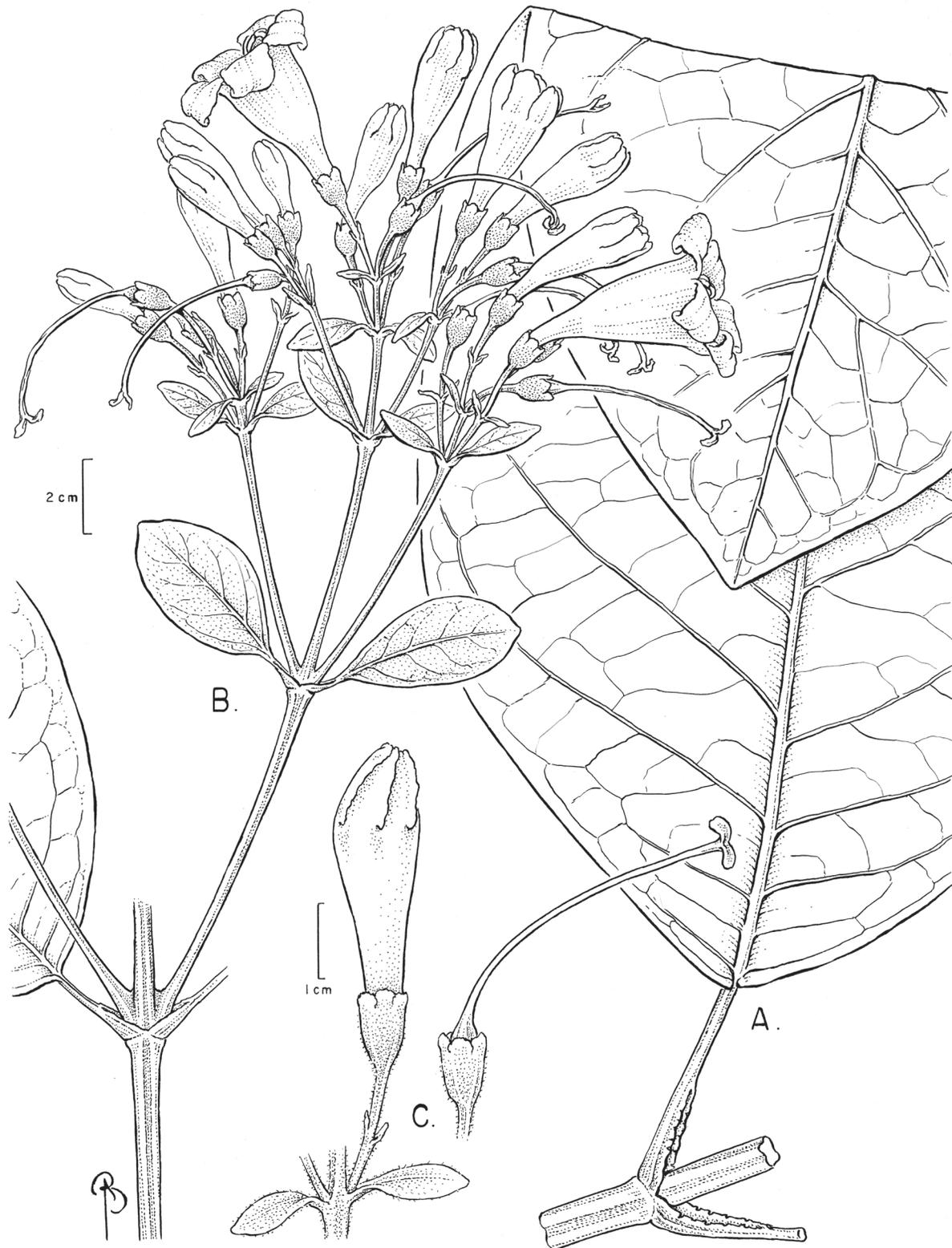


FIGURE 2. *Macrocarpaea felicitata*. A, lower leaf; B, habit of flowering stem; C, bud and pistil in calyx. A from *Vieu et al. JV11 (NY)*, B–E from *Rojas et al. 3935 (MO)*.

*Calyx* campanulate, 8–11 × 5–6 mm long, hyaline hispid to spiculate with short simple hairs, ecarinate; calyx lobes ovate to reniform, 1.5–2.0 × 2–3 mm, rounded to obtuse, the edges slightly fimbriate. *Corolla* funnel-shaped, 57–63 mm long, 23–30 mm wide at the apex of the tube, greenish-yellow, smooth; corolla lobes ovate to elliptic, 11–18 × 7–14 mm, apex obtuse to rounded. *Stamens* 43–48 mm long; filaments 38–42 mm long, filiform, flattened; anthers elliptic to sagittate, 5–6 × 1.5–3 mm, sagittate, versatile; pollen glabra-type. *Pistil* 60–62 mm long; ovary 8–11 × 3–4 mm; style 45–47 × 1 mm; stigma lobes spatulate to oblong, 5–6 × 1.0–2.5 mm. Capsules and seeds unknown.

**Distribution and habitat:** *Macrocarpaea felicitata* occurs in primary to secondary forests on Amazon-facing slopes of the Andes on the Cordillera Central in central Peru near Oxapampa. This is the area where *Macrocarpaea* is currently best understood in Peru. There are ample herbarium collections of all the species, which was useful in discriminating *M. felicitata* from the known taxa. The region has an impressive number of at least nine overlapping species including *M. angustifolia* J.S. Pringle, *M. felicitata* J.R. Grant, *M. ostentans* J.R. Grant, *M. pajonalis* J.R. Grant, *M. revoluta* (Ruiz & Pavon) Gilg, *M. robin-fosteri* J.R. Grant, *M. tahuantinsuyuana* J.R. Grant, *M. viscosa* (Ruiz & Pavon) Gilg, and *M. wallnoeferi* J.R. Grant. *Macrocarpaea felicitata* can be easily identified within this group in having small (5 mm long) puberulent hairy calyces.

**Etymology:** From the Latin, *felicitata*.

**Additional specimen examined:** PERU. Pasco: Oxapampa, Distrito de Villa Rica, Sector “el bosque Sho’llet,” 75°18.916 W, 10°40.281 S, 2369 m, 13 January 2012, Vieu, J., E.R. Rodriguez & D. Desrousseaux JV11 [DNA voucher = JV09] (NY).

3. *Macrocarpaea huamantanga* J.R. Grant & J. Vieu, *sp. nov.* TYPE: PERU. Cajamarca: Distrito de Jaén, caserío San Jose, camino hasta la catarata “del velo de la novia,” Bosque de Huamantanga, 5°42.370 S, 78°57.106 W, 2223 m, 21 February 2012, J. Vieu & D. Desrousseaux 43 [DNA voucher = JV47] (Holotype: NY; Isotype: MO). Fig. 3.

*Macrocarpaea huamantanga* is a new species closely related to *M. chthonotropa*, yet differs in having generally oblanceolate leaves, a large panicle inflorescence with comparatively small flowers, and an urceolate-campanulate calyx with thickened calyx lobes and a thickened area at the base between each calyx lobe.

*Tree* to 4 m, glabrous throughout. *Stems* terete to slightly quadrangular above, hollow, 7–13 mm in diameter just below the inflorescence. *Leaves* elliptic, oblong, ovate to obovate, short-petiolate, 36–40 cm long. *Petioles* 20–30

mm long, robust with strong open vagination one-third the length of the petiole; interpetiolar ridge 2–3 mm. *Blades* 36–37 × 11–17 cm, entire, not revolute, dark above and conspicuously lighter below, with slightly impressed veins above, and slightly raised veins below, glabrous above and below, papery thin; leaf base aequilateral to oblique, cuneate, decurrent on the petiole to the base of the leaf; leaf apex acute to acuminate. *Inflorescence* a much branched open thyrse 50+ cm; branches 18–40 cm long; 5–15 flowered per branch. *Bracts* elliptic, oblong, ovate to oblanceolate, sessile to short-petiolate, 10–220 × 4–70 mm; bract base aequilateral to oblique, cuneate, decurrent on the petiole to the base of the bract; bract apex acuminate; bract petiole 0–10 mm long. *Flowers* pedicellate, erect; pedicels 8–22 mm long; bracteoles inconspicuous and scabrous, linear, triangular to ovate, 1–10 × 1–3 mm. *Calyx* campanulate to urceolate, 5–7 × 6–7 mm, glabrous, rugose, ecarinate, but calyx lobes thickened dorsally, and thickened basally between each calyx lobe; calyx lobes ovate, 2–4 × 2–4 mm, acute to obtuse. *Corolla* funnel-shaped, 28–38 mm long, 10–15 mm wide at the apex of the tube, yellow, smooth; corolla lobes ovate, 8–11 × 6–7 mm, apex obtuse to rounded. *Stamens* 20–23; filaments 16–18 filiform, flattened; anthers elliptic to oblong, 4–5 × 2 mm, sagittate, versatile; pollen glabra-type. *Pistil* 30–32 mm long; ovary 5–7 × 1–3 mm; style 21–22 × 0.5–1.0 mm; stigma lobes spatulate, 3–4 × 1–2. *Capsules* ellipsoidal to linear-long, 24–26 × 7–9 mm, smooth to faintly ribbed, faint-orangish tan, erect to slightly spreading. *Seeds* “Perimetrically winged type,” flattened, roughly 3–4 sided in outline, yet appearing as myriads of different puzzle pieces, straw-colored, testa reticulate, wings ribbed.

**Distribution and habitat:** *Macrocarpaea huamantanga* occurs in the understory of primary forest of the Andes of Cajamarca in northern Peru.

**Etymology:** Named for its locality at Bosque de Huamantanga, Jaén, Cajamarca.

**Additional specimens examined:** PERU. Cajamarca: Distrito de Jaén, caserío San Jose, camino hasta la catarata “del velo de la novia,” Bosque de Huamantanga, 5°42.370 S, 78°57.106 W, 2223 m, 21 February 2012, J. Vieu & D. Desrousseaux 42 [DNA voucher = JV45], and 44 [DNA voucher = JV48] (NY).

*Macrocarpaea huamantanga* is most closely related to *M. chthonotropa* as can be seen in both morphology as well as in DNA sequences. It is distinct in having generally oblanceolate leaves, a large panicle inflorescence with comparatively small flowers, and an urceolate-campanulate calyx with thickened calyx lobes, and a thickened area at the base between each calyx lobe.



FIGURE 3. *Macrocarpaea huamantanga*. A, lower leaf and habit of flowering stem; B, bud; C, pistil in calyx. All drawn from *Vieu & D. Desrousseaux 43* (NY).

## LITERATURE CITED

- GRANT, J. R. 2004. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis V*: Twenty-three new species largely from Peru, and typification of all species in the genus. *Harvard Pap. Bot.* 9: 11–49.
- . 2005. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis VI*: seed morphology, palynology, an infrageneric classification, and another twenty-three new species, largely from Colombia. *Harvard Pap. Bot.* 9: 305–342.
- . 2007. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis VII*: Four new species and two natural hybrids. *Harvard Pap. Bot.* 11: 129–139.
- . 2008. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis VIII*: Two new species from Ecuador. *Harvard Pap. Bot.* 13: 253–259.
- . 2011. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis IX*: A synopsis of the genus in Bolivia. *Harvard Pap. Bot.* 16: 389–397.
- . 2014. Chapter 3: A monographic revision of the neotropical genus *Macroparvaea* (Gentianaceae) in Ecuador. Pages 37–147 in J. J. RYBCZYNSKI ET AL., EDS. *The Gentianaceae—Volume 1: Characterization and Ecology*. Springer-Verlag Berlin Heidelberg.
- AND L. STRUWE. 2001. *De Macroparvaeae Grisebach (ex Gentianaceis) Specibus Novis I*: An introduction to the genus *Macroparvaea* and three new species from Colombia, Ecuador, and Guyana. *Harvard Pap. Bot.* 5: 489–498.
- AND ———. 2003. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis III*: Six new species of moon-gentians (*Macroparvaea*, Gentianaceae: *Helieae*) from Parque Nacional Podocarpus, Ecuador. *Harvard Pap. Bot.* 8: 61–81.
- AND V. TRUNZ. 2011. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis X*: A synopsis of the genus in Montane Atlantic Forests of Brazil. *Harvard Pap. Bot.* 16: 399–420.
- AND R. E. WEAVER. 2003. *De Macroparvaeae Grisebach (ex Gentianaceis) specibus novis IV*: Twelve new species of *Macroparvaea* (Gentianaceae: *Helieae*) from Central and South America, and the first report of the presence of a stipule in the family. *Harvard Pap. Bot.* 8(1): 83–109.