

## DE MACROCARPAEAE GRISEBACH (EX GENTIANACEIS) SPECIEBUS NOVIS V: TWENTY-THREE NEW SPECIES LARGELY FROM PERU, AND TYPIIFICATION OF ALL SPECIES IN THE GENUS

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**Abstract.** In preparation for a monograph of *Macroparpea* (Gentianaceae: Helieae), 23 new species are here described and illustrated: 1 from Colombia (*M. biremis*), 3 from Ecuador (*M. elix*, *M. gattaca*, and *M. pringleana*), and 19 from Peru (*M. canoëfolia*, *M. dillonii*, *M. ericii*, *M. fortisiana*, *M. innarrabilis*, *M. jalca*, *M. kayakifolia*, *M. kuelap*, *M. kuepferiana*, *M. luya*, *M. normae*, *M. obnubilata*, *M. ostentans*, *M. pajonalis*, *M. robin-fosteri*, *M. tabula-fluctivagifolia*, *M. tahuantinsuyuana*, *M. wallnoeferi*, and *M. weigendiorum*). A list of all names originally described in, or transferred to, *Macroparpea* as of year 2002 is presented. Lectotypes are selected for 12 taxa as follows: *Lisianthus obtusifolius* var. *constrictus* Griseb., *Macroparpea bangiana* Gilg, *M. bogotana* Gilg, *M. calophylla* Gilg, *M. chlorantha* Gilg, *M. cochabambensis* Gilg-Ben., *M. glaziovii* Gilg, *M. hartii* Krug & Urb., *M. micrantha* Gilg, *M. pachyphylla* Gilg, *M. polyantha* Gilg, and *M. rubra* Malme. A neotype is selected for *M. duquei* Gilg-Ben., and *M. weberbaueri* Gilg is excluded from use.

**Keywords:** Gentianaceae, Helieae, *Macroparpea*, morphology, Neotropics.

Continued study of herbarium material of *Macroparpea* has revealed numerous new species. This continues a series of articles to describe all new taxa in preparation for a taxonomic monograph: Grant and Struwe (2001); Grant (2003); Grant and Struwe (2003); Grant and Weaver (2003). Here, most of the known new species from Peru are described, as well as a few species from Colombia and Ecuador: Peru (*M. canoëfolia*, *M. dillonii*, *M. ericii*, *M. fortisiana*, *M. innarrabilis*, *M. jalca*, *M. kayakifolia*, *M. kuelap*, *M. kuepferiana*, *M. luya*, *M. normae*, *M. obnubilata*, *M. ostentans*, *M. pajonalis*, *M. robin-fosteri*, *M. tabula-fluctivagifolia*, *M. tahuantinsuyuana*, *M. wallnoeferi*, and *M. weigendiorum*), Colombia (*M. biremis*), and Ecuador (*M. elix*, *M. gattaca*, and *M. pringleana*). Many of these species are known from few collections. For example, four are known from only their type (*M. dillonii*, *M. kayakifolia*,

*M. kuepferiana*, and *M. luya*), whereas four others are known only from the type and a single paratype (*M. canoëfolia*, *M. fortisiana*, *M. obnubilata*, and *M. weigendiorum*). On the other hand, others are represented by a large number of specimens, notably *M. kuelap* and *M. pringleana*. The geographic distribution of the species described herein is shown in Figs. 1–2.

### Colombia

**1. *Macroparpea biremis*** J.R. Grant, *sp. nov.*  
TYPE: COLOMBIA. Cauca: “La Gallera,” Micay Valley, forest, 2200–2600 m, herb, corolla greenish-yellow, 1 July 1922, E.P. Killip 8000 (Holotype: GH). Fig. 3A–B.

*A Macroparpeae duquei* Gilg-Ben. *cui affinis*, sed *foliis ovatis vel oblongis* (vs. *obovatis vel ellipticis*), *inflorescentia pauciflora*, *calycibus grandioribus* (15–19 vs. 10–12 mm), *et bracteolis grandioribus differt*.

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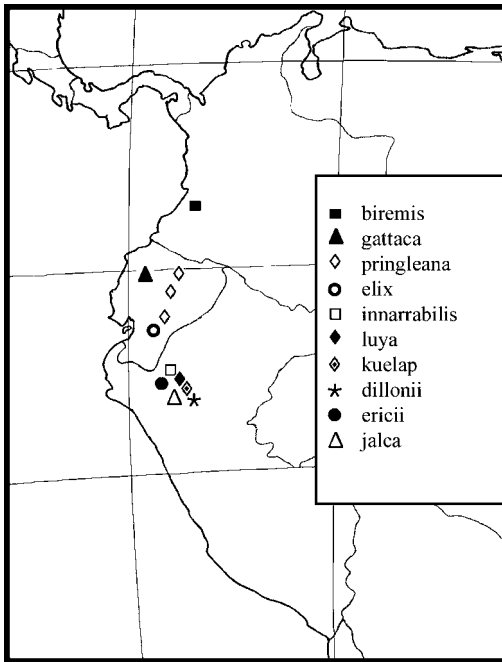


FIGURE 1. Distribution of *Macrocarpaea biremis*, *M. dillonii*, *M. elix*, *M. ericii*, *M. gattaca*, *M. innarrabilis*, *M. jalca*, *M. kuelap*, *M. luya*, and *M. pringleana* in northwestern South America.

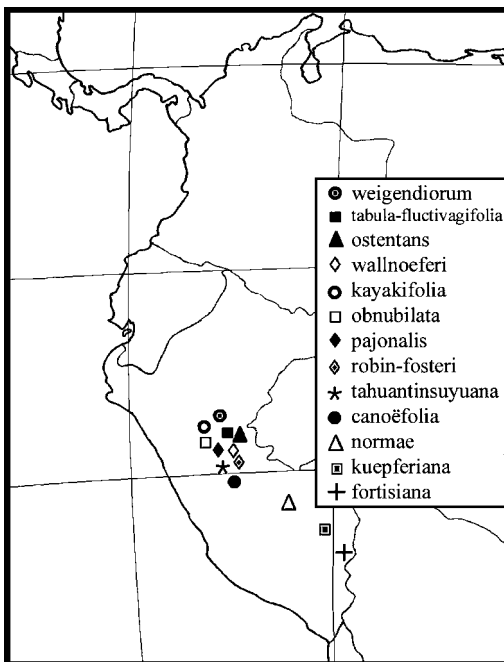


FIGURE 2. Distribution of *Macrocarpaea canoëfolia*, *M. fortisiana*, *M. kayakifolia*, *M. kuepferiana*, *M. normae*, *M. obnubilata*, *M. ostentans*, *M. pajonalis*, *M. robin-fosteri*, *M. tabula-fluctivagifolia*, *M. tahuantinsuyuana*, *M. wallnoeferi*, and *M. weigendiorum* in northwestern South America.

Shrub 1.5–5.0 m, glabrous throughout except hispid on lower leaf surfaces. Stems terete to quadrangular, hollow to solid, 7–8 mm in diam. just below inflorescence. Leaves ovate (to oblong, perhaps artifact of drying and in-rolled edges), petiolate, 7.0–14.5 cm long. Petioles 10–15 mm long, robust with strong open vagination nearly equaling the length of the petiole; interpetiolar ridge 3–4 mm high. Blades 6–13 × 4–5 cm, slightly to strongly revolute (perhaps an artifact of drying), dark above and conspicuously lighter below, with slightly impressed veins above, and slightly raised veins below, hispid to spiculate with short simple hairs on the petiole, midvein, and lateral veins of the lower surface, leathery-coriaceous; base aequilateral to oblique, cuneate to rounded; apex acute. Inflorescence few branched open thyrses, 9–12 cm long; branches 5–6 cm long; 1–7 flowers per branch. Bracts ovate, lanceolate to obovate, petiolate, 3–4 × 1–2 mm; base aequilateral to oblique, cuneate, to short-attenuate and decurrent on the petiole; apex acute to acuminate; bract petioles 8–12 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 3–8 mm long; bracteoles obovate to spatulate, 10–22 × 4–8 mm. Calyx campanulate, 15–19 × 11–14 mm, glabrous, faintly rugose to pustulate, ecarinate; calyx lobes ovate, elliptic to rotund, 9–10 × 6–9 mm, apex obtuse, rounded to acute. Corolla funnel-shaped, (30–)42–55 mm long, 15–20 mm wide at the apex of the tube, green (*Velazos et al. 6865*) to greenish yellow (*Killip 8000*), smooth; corolla lobes half-moon-shaped to broadly ovate, 9–12 × 12–16 mm, apex rounded. Stamens too imperfectly known to describe. Pollen unknown. Pistil too imperfectly known to describe (other than stigma lobes); stigma lobes spatulate, 2–4 × 2.0–2.5 mm. Capsules and seeds unknown.

*Macrocarpaea biremis* belongs to sect. *Macrocarpaea* and occurs in the Northern Andes, on the Cordillera Occidental, the Chocó of Colombia and Ecuador (Fig. 1). It is related to *M. duquei* Gilg-Ben., also of Colombia, but differs in having ovate to oblong leaves (vs. obovate to elliptic), a fewer-flowered inflorescence, much larger calyces (15–19 vs. 10–12 mm long), and larger bracteoles.

**Etymology:** from the Latin *biremis* [*bis-remus*], two-oared, for the pair of opposite leaves that resemble a pair of opposing oars on a sculling shell.

**Paratypes:** COLOMBIA. Cauca: Parque Nacional Natural Munchique, El Tambo, 2600 m,

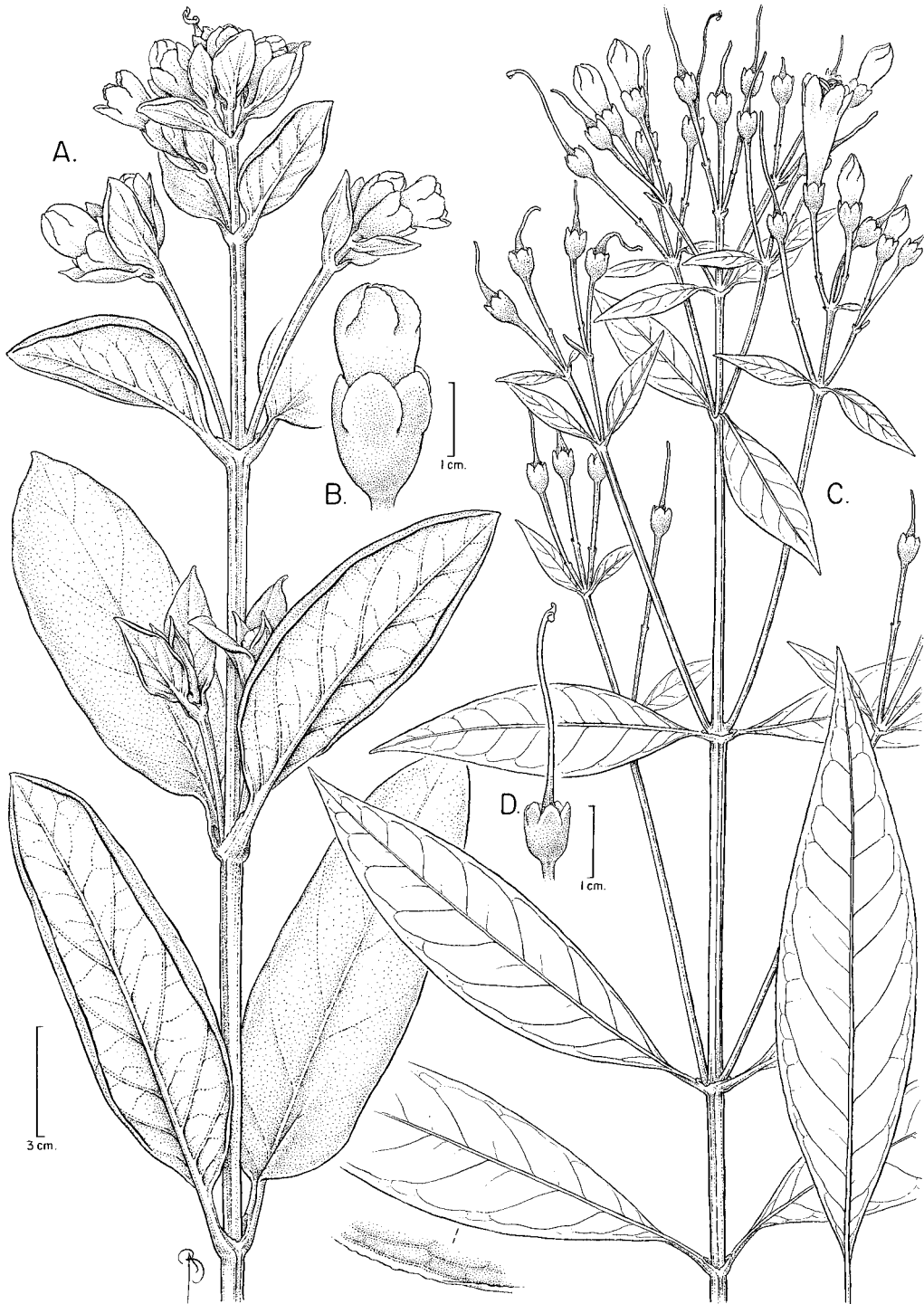


FIGURE 3. A–B. *Macrocarpaea biremis*. A, habit of flowering stem; B, bud. C–D. *M. kayakifolia*. C, habit of flowering stem; D, young fruit. A–B, drawn from Killip 8000 (GH); C–D, drawn from Stein 3864 (NY).

22 July 1993, *Barbosa et al.* 8532 (COL); Municipio del Tambo, Munchique, arbol de 5 m a orilla de carretera, flor verde, 2250 m, 3 March 1999, *C.E. Gonzalez*, C6-01231 (CAUP); Parque Nacional Munchique, El Tambo, vereda La Romelia, carretera de entrada al Parque por el refugio de INDERENA, 2640 m, subarbusto erecto de 1.5 m de alto, corolla verde claro, 20 July 1993, *Velayos et al.* 6865 (COL, MA).

## Ecuador

**2. *Macrocarpaea elix*** J.R. Grant, *sp. nov.* TYPE: ECUADOR. Azuay: highway Cuenca-Cola de San Pablo, km 88, secondary forest, 2540 m, shrub 1.5 m, flowers pale yellow, aromatic, 14 February 1977, *J.D. Boeke & H. Loyola* 988 (Holotype: NY; Isotypes: AAU, QCA). Fig. 4E–K.

*A Macrocarpaea noctilucae* J.R. Grant & Struwe *cui affinis, sed plantis hispidis spiculatis (vs. glabris) differt.*

Shrub or small tree to 1–5 m, hyaline hispid to spiculate with short simple hairs on stems, petioles, leaves, inflorescences, bracts and calyces. Stems terete to slightly quadrangular above, hollow to solid, 5–9 mm in diam. just below inflorescence. Leaves elliptic to ovate, petiolate, (11–)20–33 cm long. Petioles 10–45 m long, robust with strong open vagination or groove nearly equaling the length of the petiole; interpetiolar ridge 2–5 mm high. Blades (10.0–)19.0–28.5 × (5–)11–18 cm, entire, not revolute, dark green above, lighter below, with slightly impressed veins above, and strongly raised veins below, glabrous above, hyaline hispid on all veins below, papery thin, to thin coriaceous; base aequilateral to oblique, cuneate to rounded; apex acuminate to acute. Inflorescence a much-branched open thyrse, often appearing glaucous on dried herbarium specimens due to minute white crystals covering upper stems, petioles, and calyces, 37+ cm long (the total inflorescence unknown, as has been cut into various segments for separate herbarium sheets); branches 11–22 cm long; 9–15 flowers per branch. Bracts obovate, elliptic, obovate, to oblanceolate, sessile to short-petiolate, 15–120 × 7–68 mm; base aequilateral to oblique, cuneate, rounded to short-attenuate; apex acuminate to acute; bract petioles 2–16 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 9–25 mm long; bracteoles inconspicuous and scabrous, linear, or triangular to ovate, lanceolate to oblanceolate, 1.5–20.0 × 1–8 mm. Calyx campanulate, 8–10

× 7–8 mm, spiculate to glabrous, smooth, green, ecarinate; calyx lobes ovate, 2–4 × 2.5–4.0 mm, apex rounded to obtuse. Corolla funnel-shaped (22–)35–45 mm long, 10–20 mm wide at the apex of the tube, pale yellow (*Boeke & Loyola* 988), greenish-yellow (*Harling & Andersson* 23442), pale greenish (*Steyermark* 53548), smooth; corolla lobes ovate, 7–12 × 4–9 mm, apex obtuse to rounded. Stamens 24–30 mm long; filaments 20–25 mm long, filiform, terete; anthers linear to linear-elliptic, 4–5 × 1.5–2.0 mm, sagittate, versatile; pollen “glabra-type.” Pistil 35–40 mm long; ovary 5–7 × 2–3 mm; style 28–30 × 0.75–1.00 mm; stigma lobes spatulate to elliptic, 2–3 × 1.0–1.5 mm. Capsules ovoid to ellipsoidal, 21–35(–41) × 7–11 mm, smooth to faintly rugose, light to dark brown, erect to nodding; style remnant 15–23 mm; seeds “perimetrically winged,” flattened, roughly 3–4 sided in outline, yet appearing as myriads of different puzzle pieces, 0.8–1.9 × 0.5–1.0 mm, bicolored, testa tan, wings orangish straw-colored, testa reticulate, wings ribbed.

*Macrocarpaea elix* occurs in the Central Andes, in the Huancabamba region of Ecuador (Fig. 1). It specifically occurs in southern Ecuador (Azuay, Cañar, and Morona-Santiago), and is related to *M. apparatus* J.R. Grant & Struwe, *M. bubops* J.R. Grant & Struwe, *M. harlingii* J.S. Pringle, and *M. noctiluca* J.R. Grant & Struwe, also of southern Ecuador. *Macrocarpaea elix* differs notably from *M. noctiluca* in being hyaline hispid to spiculate (vs. entirely glabrous in *M. noctiluca*). It is distinct in having a robust vagination/wings on the petioles nearly the entire length of the petiole, and dried inflorescences often appearing glaucous (upper stems, petioles, and calyces) because of the formation of minute crystals. *Macrocarpaea elix* appears to occur in relatively dry forests, as compared with *M. noctiluca*, which is found in much wetter rain forests.

**Etymology:** from the Latin *elix*, a channel for diverting a stream. The name describes the large grooves on the petioles, like channels. The epithet is based on a word used in apposition, and therefore to be maintained according to Article 23.1 of the ICBN (Greuter et al., 2000).

**Paratypes:** ECUADOR. Azuay: The eastern Cordillera, 1–8 km north of the village of Sevilla de Oro, 2440–2745 m, trees to 5 m, leaves deep green, subnitid above, pale green below, corolla pale lemon yellow, 27 July 1945,



FIGURE 4. A–B. *Macrocarpaea pringleana*. A, bud, habit of flowering stem; B, fruit. C–D. *M. harlingii*. C, habit of flowering stem; D, flower. E–K. *M. elix*. E, habit of flowering stem; F, leaf; G, flower, H, habit of flowering stem; I, flower; J, interpetiolar ridge and leaves; K, fruit. A, drawn from *Luteyn 5830* (NY); B, drawn from *Clark et al. 5480* (QCNE); C–D, drawn from *Knapp et al. 7467*; E, drawn from *Harling & Andersson 23442*; F–G, drawn from *Harling & Andersson 23031*; H–I, drawn from *Boeke & Loyola 988*; J–K, drawn from *Camp 4325*.

*Camp 4325* (NO, S, U); Carretera Cuenca-Paute-Sevilla de Oro, colecciones entre Paute-Sevilla de Oro, 2490 m, arbusto de 4 m, cáliz verde, corolla amarilla, frutos amarillos, 8 August 1986, *Jaramillo 8297* (AAU, QCA); Km 29 Paute-Amaluza road, remnants of montane forest mixed with pastures, humid area along small creek, 02°41' S, 79°36' W, 2550 m, tree 3 m, fruits green, 7 August 1986, *P.M. Jørgensen 61429* (AAU, QCNE). Cañar: Above Rivera on road to Pindilig, forest remnants, 2800 m, shrub or treelet to ca. 4 m tall, corolla greenish-yellow, 9 March 1985, *Harling & Andersson 23031* (GB, MO, QCA); Pass on road Azogues-Taday, dry "ceja" scrub, 3100 m, treelet 4–5 m tall, corolla greenish-yellow, 30 March 1985, *Harling & Andersson 23442* (GB, MO, QCA). Morona-Santiago: SW of military checkpoint in Limón (= General L. Plaza Gutiérrez (02°58' S, 78°25' W), 65 km Sw of Mendez (02°42' S, 78°18' W), 2340 m, shrub 1–2 m tall, corolla greenish-yellow, 27 October 1988, *Dorr & Barnett 5910* (HAM, QCA, QCNE); Road Gualaceo-Limón, Loma del Puerco, mountain forest, 2500 m, ca. 3 m tall, corolla pale greenish-yellow, 11 November 1988, *Harling 25814a* (GB); Road Gualaceo-Limón, Loma del Puerco, mountain forest, 2500 m, ca. 3 m tall, corolla pale greenish-yellow, 11 November 1988, *Harling 25814b* (GB); 20 km northwest of Indanza, between Cerro Cruzado and Zapote area, 2134 m, tree 3 m, 2–16 October 1944, *H. Jørgensen OHJ-49* (NY); Along Río Tintas below Arenillas, dense forest between Campanas and Arenillas, along Río Tintas, 10 leagues SE of El Pan, 2195 m, corolla pale greenish, leaves dark green above, pale green below, shrub to small tree 5–10 m tall, 13 July 1943, *Steyermark 53548* (F [3 sheets], US).

**3. *Macrocarpaea gattaca*** J.R. Grant, *sp. nov.* TYPE: ECUADOR. Pichincha: Vía San Juan-Chiriboga-Empalme, 2550 m, arbusto de 2 m, flores gamopétalas, cáliz verde, corolla amarillenta-verdosa, 10 September 1977, *J. Jaramillo 22* (Holotype: NY; Isotypes: AAU, MO, QCA). Fig. 5.

*A Macrocarpaeae nicotianifoliae* Weaver & J.R. Grant *cui affinis, sed foliis brevioribus ovatis vel deltoideis, ramis paucifloribus* (3–9 vs. 3–15), *calycibus brevioribus* (8–11 vs. 10–13), *bracteolis manifeste grandioribus, lobis corollae crispis, et vestigium stylo capsulae longiore* (5–17 vs. 3–10) *differt.*

Unbranched shrub to tree to 2–5 m, hyaline spiculate to scabrous with short simple hairs on stems, petioles, leaves, inflorescences, bracts, and bracteoles. Stems terete to quadrangular, solid to hollow, 4–10 mm in diam. just below inflorescence. Leaves ovate to nearly deltoid, sessile to short-petiolate, 10.5–18.5 cm long. Petioles 0–5 mm long, usually absent, but rarely a short robust petiole with strong open vagination present; interpetiolar ridge 3–5 mm high. Blades 10–185 × 8–11 cm, entire, not revolute, dark green, with slightly impressed veins above, and slightly raised veins below, hyaline hispid to spiculate on veins on lower surface, papery thin, to thin coriaceous; base aequilateral to oblique, rounded to nearly truncate; apex acute. Inflorescence a much-branched open thyrse, 33+ cm long, the total inflorescence unknown, as has been cut into various segments for separate herbarium sheets; branches 9–38 cm long; 3–9 flowers per branch. Bracts ovate to nearly deltoid, inaequilateral, suborbicular to elliptic, sessile to petiolate, 12–77 × 6–54 mm; base aequilateral to oblique, rounded to nearly truncate; apex acuminate to acute; bract petioles 0–5 mm long. Flowers pedicellate, erect to spreading; pedicels 7–20 mm long; bracteoles ovate to obovate, 5–18 × 3.5–14.0 mm. Calyx narrowly campanulate, 8–11 × 5–6 mm, glabrous, smooth, green, ecarinate; calyx lobes ovate to reniform, 1.3–2.5 × 3–5 mm, obtuse, acute to rounded. Corolla funnel-shaped, 45–53 mm long, 18–23 mm wide at the apex of the tube, yellow (*Grant & Torres 02-4209*), yellowish-green (*Jaramillo 22*) to pale green (*Asplund 18200*), smooth; corolla lobes ovate, 9–13 × 8–14 mm, obtuse to rounded, often crisped. Stamens 27–37 mm long; filaments 22–30 mm long, filiform; anthers linear to linear-elliptic, 5–7 × 2–3 mm, sagittate, versatile; pollen "glabra-type." Pistil 47–52 mm long; ovary 10–12 × 2–4 mm; style 34–36 × 1.0 mm; stigma lobes spatulate, 3–4 × 1.0–1.5 mm. Capsules obovoid to ellipsoidal, 25–36 × 7–9 mm, smooth, rugose, to faintly ribbed, greenish to tan, erect to nodding; style remnant 5–17 mm. Seeds "rimmed" type, angular to polyhedral (tetrahedrons, rectangular prisms, to multi-sided prisms), 2- to 7-sided, 0.6–1.0 × 0.3–0.7 mm, faint orangish-tan, rugose-reticulate.

*Macrocarpaea gattaca* belongs to sect. *Macrocarpaea* and occurs in the Northern Andes, on Pacific slopes on the Cordillera Occidental,

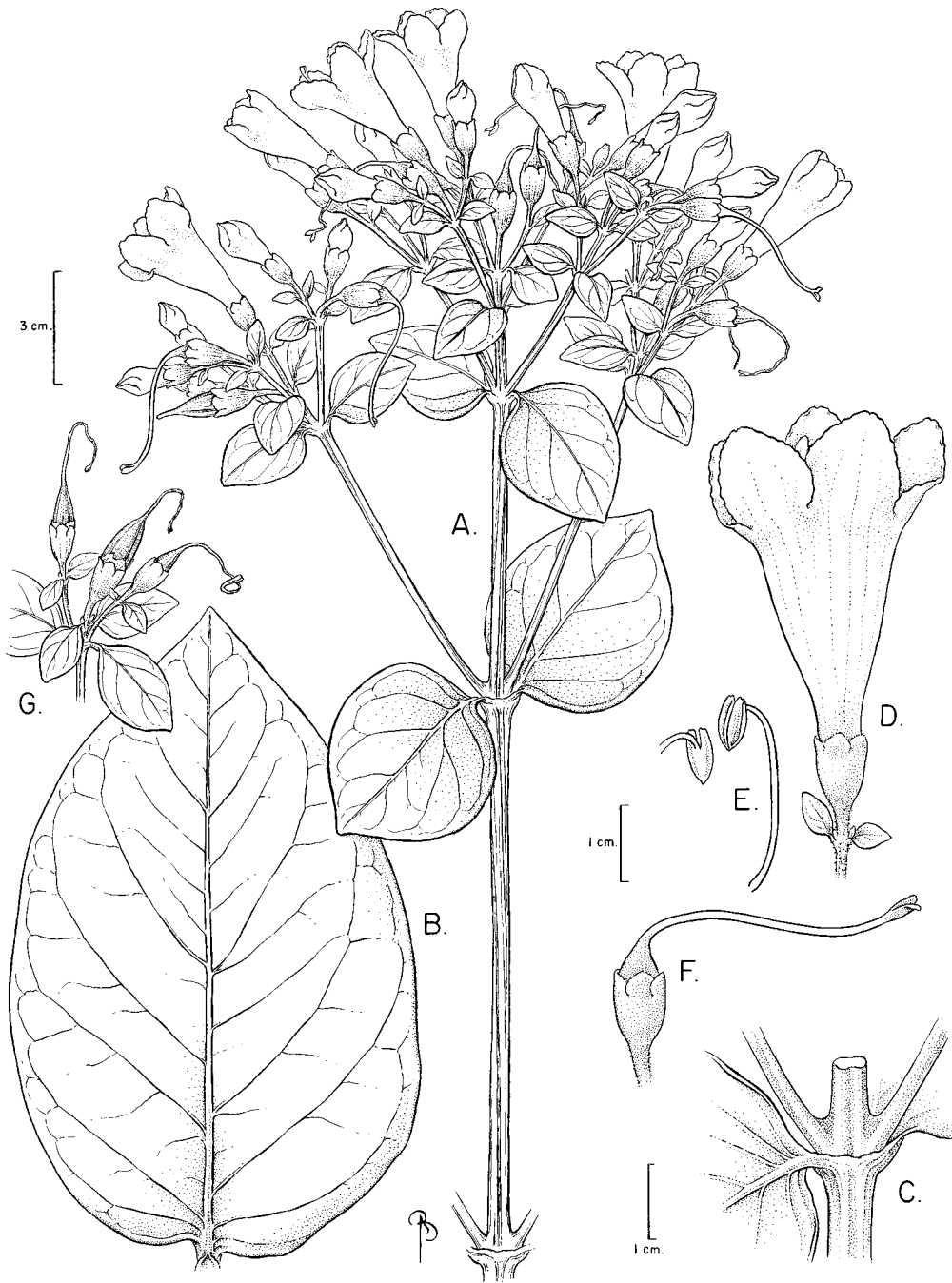


FIGURE 5. *Macrocarpaea gattaca*. A, habit of flowering stem; B, leaf; C, detail of interpetiolar ridge; D, flower; E, anthers; F, immature fruit; G, maturing fruits. A,C–F, drawn from *Asplund 18200* (S); B, drawn from *Jaramillo 22* (QCA); G, drawn from *Freire 456* (AAU).

the Chocó of Colombia and Ecuador (Fig. 1). It appears to be related to *M. nicotianifolia* Weaver & J.R. Grant (Colombia: Cundinamarca), among other undescribed species from southern Colombia. It differs from *M. nicotianifolia* in its smaller, ovate to nearly deltoid leaves, diffuse inflorescences with fewer flowers per branch (3–9 vs. 3–15), shorter calyces (8–11 vs. 10–13 mm), large prominent bracteoles, crisped corolla lobes, and longer style remnants on the capsule (5–17 vs. 3–10 mm).

Specimens of *Macrocarpaea gattaca* have been previously identified as *M. sodiroana* Gilg. Because of the lumping of morphologically similar specimens into that species, and my initial difficulty in finding the discrete morphological characters to form meaningful species delimitations, molecular analyses of the former *M. sodiroana* complex were undertaken (Grant, unpublished). The results clearly showed the polyphyletic nature of *M. sodiroana* sensu Pringle (1995), necessitating an examination of the taxonomy of this group. The most clearly defined “segregate” of *M. sodiroana* is here described as *Macrocarpaea gattaca*. In fact, *M. gattaca* is not at all related to *M. sodiroana*, even belonging to a different taxonomic section. The two species are nearly sympatric yet occur in two distinct elevation bands. For example, along the classic plant-collecting trail, the road from Santo Domingo to Quito, *M. sodiroana* occurs from 1000 to 1500 m, while *M. gattaca* occurs from 2500 to 2700 m.

**Etymology:** Molecular studies first identified this as a distinct species, distinctly separate from the inclusion of specimens within a broadly defined *Macrocarpaea sodiroana*. Therefore, the name *M. gattaca* derives from the four letters A, C, G, and T, which represent the DNA nitrogenous bases adenine, cytosine, guanine, and thymine.

**Paratypes:** ECUADOR. Pichincha: Parroquia Pacto-Gualea, sector del Río Pishashi, 1030–1070 m, 23 July 1994, *Aimancaña & Guzmán 156* (QAP); Salvador, between San Juan and Chiriboga, shrubby slope, 2600 m, tree about 5 m high, flowers pale green, 28 October 1955, *Asplund 18200* (S); Carretera Quito–Las Palmas–Palmeras, 2800 m, arbusto escandente de 3 m, de large, en borde de carretera, 29 November 1986, *Freire 456* (AAU, QCA); 67 km up the old road Santo Domingo–Quito from where it merges with the new Santo Domingo–Quito road, 02°17'S, 078°36'W, rare single-stemmed woody shrub

to 2 m tall, flowers yellow, visited by small wasps, 26 February 2002, *J.R. Grant & Torres 02-4209* (NEU, NY, US); Via San Juan-Chiriboga, km 33 desde Quito, bosque de 10 años de edad, sobre pendiente y areas de vegetación secundaria, 2700 m, planta de vegetación secundario, dicho ser arbolito con hojas opuestas de 1 m t large, frutos inmaduros color verdes, 2 April 1976, *Oldeman 3449* (NY, QCA); Canton Quito, Parroquia Nanegal, Montañas de Maquipucuna, Cerro Sosa and ridge adjacent to Cerro Montecristi, primary rain forest, 00°04–05'N, 78°37'W, 2100–2200 m, tree 5 m high, 9 July 1991, *Webster et al. 28902* (DAV, MICH, MO, QCNE, TEX).

**4. *Macrocarpaea pringleana*** J.R. Grant, *sp. nov.* TYPE: ECUADOR. Pastaza: Puyo-Puerto Napo Road, 14–18 km N of Puyo, heavily cut over forest, now pasture with remnant trees, 1000–1025 m, shrub to 3.5 m tall, calyx and ovary green, corolla yellowish-green, common, 25 April 1978, *J.L. Luteyn & M. Lebron-Luteyn 5830* (Holotype: NY; Isotype: GH [2 sheets]). Fig. 4A–B.

*A Macrocarpaea sodiroanae* Gilg cui affinis, sed foliis brevioribus semper longe-petiolatis (5–50 mm), et capsulis brevioribus (23–32 × 6–9 vs. 28–41 × 5–9 mm differt.

Unbranched shrub to tree (to perhaps a semiliana-like shrub [*Harling et al. 19621*], or epiphytic shrub [*Hammel & Wilder 17267*]), 1–5 m, glabrous throughout. Stems terete to slightly quadrangular, hollow, 5–9 mm in diam. just below inflorescence. Leaves ovate to ovate-elliptic, petiolate, 12–29(–38) cm long. Petioles 5–50 mm long, slender with slight vagination to one quarter the length of the petiole; interpetiolar ridge 2–5 mm high. Blades 11.5–26.5(–33.0) × 6.0–14.5(–18.0) cm, entire, not revolute, bright green above, lighter below, with slightly impressed veins above, and slightly raised veins below, glabrous above and below, papery thin; base aequilateral to slightly oblique, cuneate, rounded to attenuate and decurrent on the petiole; apex acute to long acuminate (sometimes nearly apiculate). Inflorescence a much-branched open thyrses, 46+ cm long, as the inflorescence of the single plant has been cut into multiple lengths for separate herbarium sheets; branches 6–40 cm long; 3–18 flowers per branch. Bracts ovate, elliptic, to lanceolate, sessile to short-petiolate, 12–113 × 4–63 mm; base aequilateral to oblique, cuneate to rounded; apex acuminate; bract

petioles 0–4 mm long. Flowers pedicellate, erect; pedicels 11–17 mm long; bracteoles linear to lanceolate to ovate, 0.5–10.0 × 0.5–3.0 mm. Calyx campanulate, 6–10 × 6–8 mm, glabrous, smooth, ecarinate; calyx lobes ovate to elliptic, 2–4 × 2–4 mm; apex rounded, obtuse to acute. Corolla funnel-shaped, 30–40 mm long, 15–25 mm wide at the apex of the tube, yellowish-green (*Luteyn & Lebron-Luteyn 5830*), greenish yellow to green, smooth; corolla lobes ovate to elliptic, 9–12 × 7–12 mm, apex obtuse to rounded. Stamens 21–28 mm long; filaments 17–22 mm long, filiform, flattened; anthers elliptic to oblong, 4–6 × 2–3 mm, sagittate, versatile; pollen “glabra-type.” Pistil 29–34 mm long; ovary 8–9 × 2–3 mm; style 19–22 × 0.5–1.5 mm; stigma lobes spatulate, 2–3 × 1.0–1.5 mm. Capsules ellipsoidal to oblong, 23–32 × 6–9 mm, smooth to ribbed, chestnut-tan, erect to slightly spreading; style remnant 2–9 mm. Seeds “perimetrically winged,” flattened, roughly 4-sided in outline, yet appearing as myriads of different puzzle pieces, 0.8–1.1 × 0.5–0.9 mm, bicolored, testa brown, wings straw-colored, testa reticulate, wings ribbed.

*Macroparpaea pringleana* occurs in the Central Andes, in the Huancabamba region of Ecuador (Fig. 1). It has been confused with *M. sodiroana*, yet these are two distinct species that occur on opposite sides of the Andean Cordillera. *Macroparpaea pringleana* occurs exclusively on Amazon-facing slopes of Ecuador, ranging from Sucumbios to Zamora-Chinchipe, whereas *M. sodiroana* occurs on Pacific slopes of the Andes from Pichincha in Ecuador northward to Valle in Colombia.

*Macroparpaea pringleana* and *M. sodiroana* are both 1–5 m tall, unbranched shrubs to small trees with hollow stems, glabrous throughout, with much-branched open thyrses. *Macroparpaea pringleana* differs in having shorter leaves that are always long-petiolate (5–50 mm long petioles) vs. sessile to pedicellate leaves (0–30 mm long petioles), shorter capsules (23–32 × 6–9 mm vs. 28–41 × 5–9 mm). At the southernmost extreme of the species in Zamora-Chinchipe, specimens have long, slender petioles, elliptic leaves with a long acuminate to apiculate apex (e.g., *Jaramillo & Grijalva 13411*, and *Neill & Palacios 9496*). These likely represent simply the extreme of the species, but nevertheless will continue to be studied in case they merit taxonomic recognition.

**Etymology:** named for James S. Pringle (1937–), Royal Botanic Gardens, Hamilton,

Ontario, Canada, student of North and South American Gentianaceae, author of the treatment of the family in the *Flora of Ecuador* (1995).

**Vernacular name:** tabaquillo, *Vargas 3634*.

**Paratypes:** ECUADOR. Morona-Santiago: El Partidero, between the ríos Paute and Negro, eastern slope of the cordillera, valley of the ríos Negro and Chupianza (on the trail from Sevilla de Oro to Mendez), 640–945 m, shrub 5 m, leaves pale green above, subglaucous below, inflorescences large, terminal to 0.75 m, corolla greenish-yellow, 14 December 1944, *Camp 1533* (NO, NY, S); Loma San José Grande–Sendero San José–Río Bomboiza, bosque húmedo premontano, vegetación de potreros y bosques secundarios, 02°38'S, 78°27'W, 1300–1600 m, arbusto de 2–3 m, flores verde aqua, 21 April 1991, *Cerón 14358* (MO, QAP, QCNE); environs of Santa Susana de Chiviáza, rastrojos, 1200 m, upright herb 2 m, corolla green, 1 March 1993, *Harling & Ståhl 26808* (GB, S); Environs of Pan de Azúcar, along road Indanza–Don Bosco, ravines and wet forest, 1000–1100 m, subshrub 2.0–2.5 m, corolla greenish-yellow, 2 March 1993, *Harling & Ståhl 26853* (S); 2–4 km N of Arapicos, 800–900 m, shrub 1 m high, flowers green, 4 April 1981, *Lugo S. 5980* (GB); 2–6 km S of Arapicos, 800–900 m, herb 1.5 m high, flowers green, 6 April 1982, *Lugo S. 6003* (GB); Río Cuyes y vía Bomboiza-Gualaquiza, bosque húmedo premontano, bosque secundario y potreros, 03°25'S, 78°35'W, 800 m, arbusto 3 m, frutos secos, 1 November 1986, *Palacios 1430* (QCNE, U). Napo: Tena-Pano road, 550 m, 18 July 1982, *Besse et al. 1668* (SEL); Reserva Ecológica Antisana, comunidad Shamato, entrada por km 21 - Shamata, 1700 m, terrestrial herb, 1 m tall, growing on eroded sunny trailside, fruits elongate and green, 23 April 1998, *Clark, J.L. et al. 5029* (MO, QCNE); Reserva Ecológica Antisana, Sector Guacamayos, Sendero Jumandy–La Virgen (km 30), path follows potential oil pipeline, ends near Río Urcusiqui, 00°38'S, 77°49'W, shrub 2 m tall, 1700–1800 m, 1 May 1998, *Clark, J.L. et al. 5480* (HUA, MO, QCNE); new road to Loreto (56 km S of Baeza), 28 km E of junction with Baeza-Tena road, in forest along stream, 00°50'S, 77°33'W, 1100 m, slender, sometimes epiphytic shrub to 4 m tall, flowers green, 21 December 1988, *Hammel & Wilder 17267* (MO); Carretera Hollín-Loreto, km 25, Centro Challuayacu,

1230 m, 10 November 1988, *Hurtado & Alvarado 955* (AAU, MO); *Crescit in silvis*, Cuyuyua Baeza, 1 February 1905, *Sodiño s.n.* (QPLS [2 sheets]); Carretera Tena-Baeza, Cordillera de Guacamayos, Reserva Ecológica Antisana, 16 km al norte del desvío a Loreto, bosque pluvial premontano, 00°40'S, 77°50'W, 1800 m, planta de 1 m, botones florales cremas, 18 June 1995, *Tirado & Murillo 1563* (MO). Pastaza: Mera, forest on precipitous bank of Río Pastaza, 1050 m, herb to 3 m high, flowers light green, 21 December 1955, *Asplund 18939* (S [2 sheets]); Hacienda San Antonio de Baron von Humboldt, 2 km al NE de Mera, 1300 m, 5 March 1985, *Baker et al. 5509* (QCNE); Road N from Mera known as the “via Anzu,” remnants of premontane humid forest, 01°20'S, 78°10'W, 1100 m, National Cancer Institute voucher specimen, shrub 2 m tall, flowers yellow, 1 January 1988, *Boom et al. 7884* (NY, QCA, QCNE); El Topo, 1250 m, ca. 2 m high, flowers yellowish-green, 28 November 1959, *Harling 3413* (S); Mera, along Río Allpayacu, riverside thickets, 1000 m, shrub with lignified main stems, ca. 3 cm in diam. at the base and ca. 2 m high, corolla yellowish-green, 6 March 1980, *Harling & Andersson 16984* (GB [2 sheets]); Mera, 1100 m, ca. 2.5 m high, corolla yellowish-green, 25 May 1968, *Harling et al. 10208* (GB); Mera, trail to Pindo, 1000 m, semi-liane 2 m, flowers greenish-yellow, 16 January 1982, *Harling et al. 19621* (GB); Cabeceras on the Río Bobonaza, ca. 12 km E of Puyo, ca. 2 m high, corolla and stamens green, 16 November 1974, *Lugo S. 4618* (GB, U); Veracruz (Indillama), ca. 1 m high, corolla green, 22 November 1974, *Lugo S. 4656* (GB); Trail between Baños and Mera, near Río Negro, in border low woods, 400–500 m, shrub 4 m high, flowers greenish-yellow, occasional, 23 February 1935, *Mexia 6977* (NA, UC, US); Between Mera and Río Negro, 27 km from Puyo on road to Baños, 1 km N of the road, primary mountain rainforest, 01°25'S, 78°11'W, shrub 1–2 m tall, corolla yellow-green, 1300–1400 m, 14 January 1988, *Molau et al. 2469* (AAU, GB, HAM, QCA, QCNE); Hacienda San Antonio de Baron von Humboldt, 2 km al NE de Mera, 01°27'S, 78°06'W, 1100 m, bosque pluvial premontano, bosque perturbado y margenes, hierba de 2.5 m, leñosa en la base, fruto verde, en la margen del bosque, 27 February–19 March 1985, *Neill et al. 5809* (HAM, MO, QCNE); Munic. Puyo, Canton Puyo, Los Vencedores, Estación Experimental E.S.P.O.C.H., submontane forest, 01°30'S, 77°56'W, 800–1000 m, 4 October 1995, *Pinus RBS-0023* (MO); Munic. Puyo, Canton Puyo, Los Vencedores, Estación Experimental E.S.P.O.C.H., about 30 minutes by car south of Puyo, premontane tropical rain forest, 01°30'S, 77°56'W, subshrub to 3 m tall, flower buds light greenish-yellow, open flowers light yellow, fruits dry, 800–1040 m, 14 December 1995, *Soejarto et al. 9424* (F [2 sheets], HUA); Puyo, Los Vencedores, km 32 Puyo-Macas, Estación Experimental E.S.P.O.C.H., trail from Field Station to river leading to waterfall, submontane tropical rain forest formation, large shrub, flower buds yellowish-green, fruits dry, in secondary forest edge, 8 June 1996, *Soejarto et al. 9645* (F); Río Cayabe, between Mera and Río Topo, tropical rain forest along a ravine, 1100 m, 17 July 1967, *Sparre 17619* (S). Sucumbios: Gonzalo Pizarro Canton, Parroquia Reventado, PreCooperativo García Moreno, Tercera Línea al N de la carretera, cerca al Río Dué, bosque pluvial premontano, 00°03'N, 77°35'W, 1800 m, arbolito de 5 m, flores verde-agua, 23 May 1990, *Cerón & Ayala* (NEU, QCNE). Tungurahua: Río Topo, 1220 m, shrub about 3 m high, flowers light green, 12 November 1955, *Asplund 18364* (S); Baños, Parroquia Río Verde, sector Machay, collections made on forested trail starting from Machay (Baños-Puyo road) to Río Verde, 01°23'05"W, 78°16'50"W, 1800–2200 m, tropical montane wet forest, terrestrial herb 0.5 m tall, corolla yellow and campanulate, 24 December 2000, *Clark, J.L. et al. 5724* (QCA, US); between Ambato and Baños, 10 January 1981, *D'Arcy 14014* (HAM, MO, NY); Cashurco, near Río Negro, northern side of Río Pastaza, ca. 1.0–1.5 m high, corolla green, 18 March 1969, *Lugo S. 813* (GB); Baños, Zona de amortiguamiento del Parque Nacional Llanganates, Río Verde, canon a las cascadas de Machay, bosque húmedo montaña bajo, vegetación secundaria, suelo aluvial, 01°23'S, 78°17'W, 1630 m, arbol de 12 m, frutos alargados secos, nombre vernacular tabaquillo (informante Manuel Sánchez), 29 July 1999, *Vargas, H. 3634* (MO, QCA, QCNE). Zamora-Chinchipe: Nangaritza, Parroquia Pachicutza, colecciones en el sector noreste del Campamento military, bosque primario, 900 m, arbusto de 3 m, flores en botón verdes, 6 December 1990, *Jaramillo & Grijalva 13411* (NY, QCA); Nangaritza, lower slopes of Cordillera del Condor, above Río Nangaritza at

Pachicutza, tropical premontane wet forest, 04°07'S, 78°37'W, 950 m, erect herb or subshrub to 2 m tall, in small forest openings, corolla yellow-green, 4 December 1990, Neill & Palacios 9496 (HAM, MO, QCNE).

## Peru

Peru is the most species-rich country for *Macrocarpaea*, followed by Colombia and Ecuador. Of the new species currently known from Peru, 19 are described here: *M. canoëfolia*, *M. dillonii*, *M. ericii*, *M. fortisiana*, *M. innarrabilis*, *M. jalca*, *M. kayakifolia*, *M. kuelap*, *M. kuepferiana*, *M. luya*, *M. normae*, *M. obnubilata*, *M. ostentans*, *M. pajonalis*, *M. robin-fosteri*, *M. tabula-fluctivagifolia*, *M. tahuantinsuyuana*, *M. wallnoeferi*, and *M. weigendiorum*. At least six species are yet to be described.

Peru is also the center of diversity of *Macrocarpaea* sect. *Magnolifoliae*. At least 14 species belong in the section, 8\* of which are described here: *M. canoëfolia*\*, *M. cinchonifolia* (Gilg) Weaver, *M. fortisiana*\*, *M. luna-gentiana* J.R. Grant & Struwe, *M. normae*\*, *M. obnubilata*\*, *M. ostentans*\*, *M. pachystyla* Gilg, *M. revoluta* (Ruiz & Pav.) Gilg (type species!), *M. robin-fosteri*\* , *M. tahuantinsuyuana*\*, *M. viscosa* (Ruiz & Pav.) Gilg, *M. weigendiorum*\*, and *M. zophoflora* Weaver & J.R. Grant.

*Macrocarpaea* sect. *Magnolifoliae* is characterized by having “corymbosa-type” pollen, “winged-type” seeds, generally large corollas and calyces, and inconspicuous scabrous to triangular bracteoles, and occurs in Ecuador, Peru, and Bolivia. Corymbosa-type pollen has evolved once in *Macrocarpaea*, within sect. *Magnolifoliae*. While species of the section have “corymbosa-type” pollen, three exceptions are known to date. These basal species, according to molecular data (Grant, unpubl.), have “glabra-type” pollen: *M. luna-gentiana*, *M. viscosa*, and *M. zophoflora*.

**5. *Macrocarpaea canoëfolia*** J.R. Grant, *sp. nov.* TYPE: PERU. Junín: Tarma, Agua Dulce, 2000 m, along a steep path in the forest, tree 4 m, flower very fleshy, white-creamy-green, pistil and stigma green, stamens white, anthers palest brown, calyx and stalk pale green, stem brownish-green, leaf velvety, thin, glossy, with thick veins, one plant seen, 5 March 1948, F. Woytkowski 35417 (Holotype: UC; Isotype: F). Fig. 6A–B.

A *Macrocarpaea cinchonifoliae* (Gilg) Weaver, *M. ostentans* J.R. Grant, et *M. tahuantinsuyuanae* J.R. Grant *cui affinis*, sed *foliis brevioribus* (7.5–18.3 × 2.5–5.8 cm vs. 25–40 × 11–20 cm), et *ramis paucifloribus* (1–3 vs. 3–9) *differt*.

Tree to 4 m, glabrous throughout. Stems terete, solid to hollow, 4–5 mm in diam. just below inflorescence. Leaves lanceolate, narrowly elliptic to ovate, petiolate, 8–22 cm long. Petioles 5–37 mm long, slender with very slight vagination; interpetiolar ridge 3–5 mm. Blades 7.5–18.3 × 2.8–5.8 cm, entire, not revolute, dark above and below, with slightly impressed veins above, and slightly raised veins below, “velvety, thin, glossy, with thick veins” (Woytkowski 35417), papery thin; base aequilateral to attenuate and decurrent on the petiole; apex acute to acuminate. Inflorescence a few branched open thyrses, 10–12 cm long; branches 7–9 cm long; 1–3 flowers per branch. Bracts ovate, elliptic, to lanceolate, petiolate, 25–60 × 9–23 mm; base aequilateral, cuneate; apex acute to obtuse; bract petioles 3–6 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 18–34 mm long; bracteoles inconspicuous and scabrous, to ovate, 1–3 × 0.50–0.75 mm. Calyx campanulate, 16–20 × 16–18 mm, glabrous, smooth, ecarinate; calyx lobes rotund, ovate, to reniform, 5–9 × 10–11 mm, rounded to obtuse. Corolla funnel-shaped, 47–58 mm long, 23–32 mm wide at the apex of the tube, white-creamy-green (Woytkowski 35417) to greenish-cream (Gentry *et al.* 40187), smooth; corolla lobes ovate, 14–21 × 14–20 mm, obtuse to rounded. Stamens 27–40 mm long; filaments 22–32 mm long, filiform, flattened; anthers elliptic to oblong, 7–8 × 2.5–3.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 39–44 mm long; ovary 8–9 × 4–5 mm; style 35–39 × 2–3 mm; stigma spatulate to rounded, 4–5 × 2.0–2.5 mm. Capsules and seeds unknown.

*Macrocarpaea canoëfolia* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It belongs to a group of closely related species, including *M. cinchonifolia*, *M. normae*, *M. obnubilata*, *M. ostentans*, *M. robin-fosteri*, and *M. tahuantinsuyuana*. These species occur from central Peru to Bolivia, and generally have narrowly elliptic long-petiolate leaves, and large calyces and corollas. *Macrocarpaea canoëfolia* may be specifically related to *M. cinchonifolia*, *M. ostentans*, and *M. tahuantinsuyuanae*.



FIGURE 6. A–B. *Macrocarpaea canoëfolia*. A, habit of flowering stem; B, flower. C–F. *M. tahuantinsuyuana*. C, habit of flowering stem; D, flower; E, immature fruit; F, mature fruits. G–H. *M. obnubilata*. G, habit of flowering stem; H, bud. I–J. *M. viscosa*. I, leaf and habit of flowering stem; J, calyx. A, drawn from Woytkowski 35417 (UC); B, drawn from Gentry et al. 40187 (HAM); C–E, drawn from van der Werff 8657 (USM); F, drawn from Woytkowski 6672A (MO); G–H, drawn from Díaz & Baldéon 2256 (MO); I–J, drawn from Foster et al. 10511 (USM).

*tinsuyuana*, but has the smallest leaves of the four species (only 7.5–18.3 × 2.5–5.8 cm vs. leaves in the other three species up to 25–40 × 11–20 cm), and few-flowered branches (1–3 vs. 3–9).

**Etymology:** from the French *canoë*, and the Latin *folia*, leaf, for the canoe-shaped leaves. The dieresis is retained to reflect the separate pronunciation of the o and e. The dieresis in the epithet is to be maintained, according to Article 60.6 of the ICBN (Greuter et al., 2000).

**Paratype:** PERU. Junín: Chilpes, 8 km S of Vitoc, trail along steep slopes overlooking Río Tulumayo, 11°12'S, 75°20'W, 1420–1700 m, shrub 2 m, flowers greenish-cream, 8 February 1983, *Gentry et al.* 40187 (NY).

**6. *Macrocarpaea dillonii*** J.R. Grant, *sp. nov.* TYPE: PERU. Amazonas: Dist. Vista Alegre, Puente sobre el Río Salas, 06°10'S, 77°19'W, 1525 m, bosque perennifolio, arbusto, 2–3 m de alto, cápsulas cilíndrico-cónicas, 30 June 1998, *I. Sánchez Vega, M. Dillon & M. Zapata* 9572 (Holotype: F; Isotypes: CPUN [not seen], HAO, MO [not seen], NEU, U). Fig. 7J–K.

*A Macrocarpaeae sodiroanae Gilg cui affinis, sed petiolis et calycibus hispidis vel spiculatis (vs. glabris) differt.*

Shrub to 2–3 m, glabrous throughout except petioles and calyces that are hyaline hispid to spiculate with short simple hairs. Stems terete, hollow, 9–11 mm in diam. just below inflorescence. Leaves ovate to ovate-elliptic, petiolate, 23–34 cm long. Petioles 10–40 mm long, robust with strong open vagination one half to nearly equaling the length of the petiole; interpetiolar ridge 2–4 mm high. Blades 22–30 × 13.5–17.0 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; base aequilateral to oblique, cuneate to attenuate and decurrent on the petiole; apex acute to acuminate. Inflorescence probably a much-branched open thyse (the lack of a complete inflorescence precludes confirmation); branches 15–30 cm long; 8–15 flowers per branch. Bracts ovate to lanceolate to linear, sessile to petiolate, 9–32 × 1–16 mm; base aequilateral to oblique, short-attenuate and decurrent on the petiole; apex acuminate to acute; bract petioles 0–5 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 13–22 mm long; bracteoles often absent, those present are inconspicuous and scabrous, linear, triangular to ovate, 1–5 ×

1–3 mm. Calyx campanulate, 7–9 × 6–8 mm, hyaline hispid to spiculate with short simple hairs, ecarinate; calyx lobes ovate, 3–4 × 4–5 mm, apex rounded to obtuse. Corolla, androecium, and gynoecium unknown. Capsules linear-long to narrowly ellipsoid, 33–37 × 6–7 mm, smooth to faintly ribbed, greenish-brown, tan to light brown, erect to slightly spreading; style remnant 4–6 mm. Seeds “perimetrically winged,” flattened, angular, roughly triangular in outline, yet appearing as myriads of different puzzle pieces, 0.7–1.3 × 0.6–1.0 mm, straw-colored, testa reticulate, wings ribbed.

*Macrocarpaea dillonii* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It belongs to a group of species previously lumped together under *M. sodiroana* (e.g., sensu Ewan, 1948; Pringle, 1995), having large, thin, ovate leaves; small, slender flowers; and perimetrically winged seeds and glabrate pollen. *Macrocarpaea dillonii* is unique in this group in having hyaline hispid to spiculate petioles and calyces.

**Etymology:** named for Michael O. Dillon (1947–), of the Field Museum of Natural History, Chicago, Illinois, U.S.A. (F), a co-collector of the type.

**7. *Macrocarpaea ericii*** J.R. Grant, *sp. nov.* TYPE: PERU. Cajamarca: San Ignacio, Huarango, Localidad Romerillo, Cordillera entre Romerillo y Nuevo Mundo, vegetación primaria con predominancia de árboles enanos, 05°14'S, 78°46'W, 2300 m, sufrutice 1 m, flores amarillas, 27 July 1997, *J. Campos, E. Rodríguez, & S. Núñez* 4296 (Holotype: MO; Isotype: HUT [not seen]). Fig. 7E–I.

*A Macrocarpaeae subsessilis Weaver & J.R. Grant cui affinis, sed foliis obovatis grandioribus (4–17 vs. 2.5–9 cm), et inflorescentia grandiori (8–44 vs. 3–11 cm) cum cymis paucifloribus (1–3 vs. 2–8) differt.*

Unbranched shrub, 1.0–1.6 m, glabrous throughout. Stems terete to slightly quadrangular, solid, 3–8 mm in diam. just below inflorescence. Leaves obovate, varying to slightly elliptic, short-petiolate, (4–)7–15 cm long. Petioles 2–6 mm long, robust with strong open vagination one half the length of the petiole; interpetiolar ridge 2–5 mm high. Blades (3.4–)6.0–13.0 × (2.5–)4.5–8.5 cm, entire, slightly revolute, dark above and below, lateral veins scarcely visible either above or below, glabrous, thick, leathery-coriaceous; base aequilateral to oblique, cuneate to rounded;



FIGURE 7. A–B. *Macrocarpaea bubops*. A, leaf; B, branch of flowering stem and interpetiolar ridge. C–D. *M. ostentans*. C, leaf; D, habit of flowering stem. E–I *M. ericii*. E, mature leaf; F, smaller mature leaf; G, habit of flowering stem; H, detail of fruiting flower, notice two pronounced bracteoles; I, habit of fruiting stem. J–K. *M. dillonii*. J, leaf; K, habit of fruiting stem. A–B, drawn from *Beltran & Foster 1197* (USM); C–D, drawn from *Wallnöfer 12-9688* (U); E, drawn from *Campos et al. 4296* (MO); F–H, drawn from *Weigend 98/500* (M); I drawn from *Campos et al. 5564* (U); J–K drawn from *Sánchez Vega et al. 9572* (HAO).

apex rounded to obtuse. Inflorescence a few-branched open thyrses, 8–44 cm long; branches 3–28 cm long, 1–3 flowers per cyme. Bracts obovate to oblanceolate, petiolate, 25–55 × 13–23 mm; base aequilateral, cuneate; apex rounded to obtuse; bract petioles 5–8 mm long. Flowers pedicellate, erect to spreading; pedicels 3–22 mm long; bracteoles linear to oblanceolate, 5–20 × 2–5 mm. Calyx campanulate, 8–11 × 6–8 mm, glabrous, faintly verrucose, ecarinate, ovate to elliptic; calyx lobes 4–5 × 3.5 mm, rounded to obtuse. Corolla funnel-shaped, 20–30 mm long, 11–14 mm wide at the apex of the tube, yellow to greenish-yellow, smooth; corolla lobes ovate to elliptic, 6–10 × 5–8 mm, apex obtuse to rounded. Gynoecium, androecium, and pollen unknown. Capsules ovoid to ellipsoidal, 16–20 × 8–10 mm, smooth, faintly verrucose to pustulate, straw-colored, erect to slightly nodding; style remnant 5–10 mm. Seeds “perimetrically winged-reversal to rimmed,” angular to polyhedral to flattened (pyramids, tetrahedrons, rectangular prisms, to multi-sided prisms), 2- to 5-sided, not winged, 0.5–1.0 × 0.3–0.5 mm, straw-colored, rugose-reticulate.

*Macrocarpaea ericii* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It is a distinct endemic of Cajamarca, easily recognized by its thick, leathery, obovate leaves, and flowers that are subtended by a pair of spatulate bracteoles. It is related to *M. subsessilis* Weaver & J.R. Grant of Loja, Ecuador, and the two may be referred to as sister species across the Huancabamba depression/divide. It differs from *M. subsessilis* in having larger obovate leaves (4–17 vs. 2.5–9.0 cm) and larger inflorescence (8–44 vs. 3–11 cm) with fewer-flowered cymes (1–3 vs. 2–8). In the broad sense, *M. ericii* may also be related to *M. loranthoides* (Griseb.) Maas (Peru: Amazonas), *M. luya* J.R. Grant (Peru: Amazonas), and *M. stenophylla* Gilg (Peru: Amazonas, Cajamarca). The characters that unite this loose assemblage of species are their thick, leathery, obovate leaves; short, generally few-flowered inflorescences; and polygonal seeds of the “perimetrically winged-reversal to rimmed” type.

**Etymology:** named for Eric Frank Rodríguez Rodríguez (1963–), Herbarium Truxillense, Universidad Nacional de Trujillo, Peru (HUT), a co-collector of the type.

**Paratypes:** PERU. San Ignacio: San José de Lourdes, Localidad Estrella del Oriente “Cerro del Oso,” vegetación enana, 04°46'S, 78°59'W,

1600–1700 m, sufrutice 1.2 m, flores amarillas, cápsulas verdes, 6 September 1997, *Campos & Díaz 4410* (HUT [not seen], MO [not seen], NEU, U [2 sheets]); San Ignacio, near San José de Lourdes, llanos, forest remnants, peat bog and open jalca area over sandstone, 1900–2100 m, shrub in dryish areas in grassland, leaves strongly coriaceous, dark green, flowers strongly zygomorphic, pale greenish-yellow, 10 June 1998, *Weigend et al. 98/500* (M, USM [not seen]). Piura: Cordillera de San José, páramo 1700 m, flores verdosas, 23 September 1961, *Friedberg 692* (USM).

**8. *Macrocarpaea fortisiana*** J.R. Grant, *sp. nov.* TYPE: PERU. Puno: Sandia, near Sagrario, on trail, 1000–1300 m, perennial herb 2 m high, calyx yellow-green, corolla yellow-green, fruit yellowish-green, moist open places on stream bank, much fog and rain, 26 May 1942, *R.D. Metcalf 30629* (Holotype: UC; Isotypes: G, GH, MO, US). Fig. 8C–E.

*A Macrocarpaeae pachystylae Gilg cui affinis, sed basi folio rotundato, inflorescentia pauciflori, et calycibus et corollis grandioribus differt.*

Shrub to 2 m, glabrous throughout. Stems terete, hollow, 8–11 mm in diam. just below inflorescence. Leaves broadly ovate to subdeltoïd, petiolate, 19–28 cm long. Petioles 20–45 mm long, robust with slight vagination one eighth the length of the petiole; interpetiolar ridge 2–7 mm high. Blades 21.0–23.5 × 12–15 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; base aequilateral, rounded; apex acute. Inflorescence a few branched open diffuse thyrses, 48+ cm long; branches 19–33 cm long; 3–6 flowers per branch. Bracts ovate, subdeltoïd to lanceolate, sessile to short-petiolate, 28–130 × 10–95 mm; base aequilateral to oblique, cuneate to rounded; apex acuminate to acute; bract petioles 0–10 mm long. Flowers pedicellate, distinctly spreading; pedicels 19–36 mm long; bracteoles inconspicuous and scabrous, triangular, linear to ovate, 2–13 × 0.75–5.00 mm. Calyx campanulate, 14–19 × 13–18 mm, glabrous, smooth, yellow-green (*Metcalf 30629*), ecarinate; calyx lobes rotund to ovate, 6–12 × 6–10 mm, calyx lobe apex rounded to obtuse. Corolla funnel-shaped, 40–44 mm long, 20–25 mm wide at the apex of the tube, yellow-green (*Metcalf 30629*) to green (*McCarroll 128*), smooth; corolla lobes



FIGURE 8. A–B. *Macrocarpaea kueferiana*. A, habit of flowering stem; B, bud. C–E. *M. fortisiana*. C, leaves and interpetiolar ridge; D, habit of flowering stem; E, bud. A–B, drawn from Vargas 18928 (CUZ); C, drawn from Metcalf 30629 (GH); D–E, drawn from McCarroll 128 (NY).

ovate, 13–14 × 11–14 mm, obtuse to rounded. Stamens 32–39 mm long; filaments 25–30 mm long, filiform, flattened; anthers elliptic to oblong, 7–9 × 2.5–4.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 38–42 mm long; ovary 7–8 × 2–3 mm; style 27–29 × 1.5–2.0 mm; stigma lobes spatulate, 4–5 × 2.0–2.5 mm. Capsules and seeds unknown.

*Macrocarpaea fortisiana* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, on the Cordillera Oriental of Peru (Fig. 2). It is closely related to *M. luna-gentiana* J.R. Grant and *M. pachystyla* on the basis of similar stoutly long-petiolate leaves, and molecular phylogeny (Grant, unpubl.). It differs from both in having leaves that are characteristically rounded at the base, fewer-flowered inflorescences, and larger calyx and corolla.

While *M. fortisiana* is a distinct species, it is only known from a few sheets of damaged and incomplete specimens. The flowers are mostly in bud, with only two verging on being fully open; therefore the description of the flowers is somewhat misconstrued as the flowers are actually larger. Likewise, the leaves that appear to be broadly ovate are so damaged that neither the full size nor shape is known; therefore, an approximation is made based on characterizations of known leaf shapes and sizes in related species.

The five known sheets of *Metcalf 30629* from G, GH, MO, UC, and US can be easily matched up to reassemble a single individual plant that was cut into herbarium-specimen-sized segments. The G sheet has a segment of stem 14 mm in diam. with a single leaf attached. The angle of the cut of the top of the G segment easily matches to the base of the GH specimen, which has four leaves, of which at least the upper third has been sheared off. On the basis of the gradual diminution in the size of the leaves, and again the angle of the cut and diameter of the stem, the GH sheet pairs to the US sheet, which has the beginning of the inflorescence. The US sheet then matches the rest of the inflorescence on the UC sheet. The MO sheet simply has a leftover leaf and two small portions of the inflorescence.

**Etymology:** named for Ernest Fortis (1945–), herbarium manager of the Laboratoire de botanique évolutive, Institut de botanique, Université de Neuchâtel, Switzerland (NEU). Un grand merci pour ton aide précieuse tout au long de ces années.

**Vernacular name:** campanilla, *McCarroll 128*.

**Paratype:** PERU. Puno: Sandia, St. Domingo area, 1550 m, green flowers, bush 2 m, used as remedy for falling hair, of name “campanilla,” 10 April 1940, *McCarroll 128* (NY).

**9. *Macrocarpaea innarrabilis*** J.R. Grant, *sp. nov.* TYPE: PERU. Amazonas: Bagua District, Imaza, Tayu Majaji, Comunidad Nativa de Wawas, bosque primario, vegetación de 2 m, de alto promedio, Uwejush, 05°15'S, 078°22'W, 1100 m, arbusto 1.5 m, flores amarillentas, 7 February 1999, R. Vásquez, C. Vargas, J. Yactayo, & E. Palomino 26057 (Holotype: NEU; Isotypes: MO [not seen], U). Fig. 9C–D.

*A Macrocarpaea noctilucae* J.R. Grant & Struwe *cui affinis, sed frutex 1.5 m, et foliis obovatis vel ellipticis differt.*

Shrub or small tree to 1.5 m, glabrous throughout. Stems terete to slightly quadrangular, solid to hollow, 5–8 mm in diam. just below inflorescence. Leaves obovate to elliptic, petiolate, 6.5–15.5 cm long. Petioles 13–30 mm long, robust with slight vagination 1/8 the length of the petiole; interpetiolar ridge 2–3 mm high. Blades 5.2–12.5 × 3.5–7.5 cm, entire, not revolute, dark above and conspicuously lighter below, with slightly impressed veins above and slightly raised veins below, leathery-coriaceous to papery thin when dried; base aequilateral to oblique, cuneate to rounded; apex rounded, obtuse, to slightly mucronulate. Inflorescence a much-branched open thyrses, 16–32 cm long; branches 9–29 cm long; 1–7 flowers per branch. Bracts obovate to elliptic, petiolate, 25–80 × 14–32 mm; base aequilateral to oblique, cuneate; apex rounded, obtuse, to slightly mucronulate; bract petioles 3–15 mm long. Flowers pedicellate, erect to spreading; pedicels 12–45 mm long; bracteoles varying from inconspicuous and linear to spatulate, 0.5–9.0 × 0.5–3.0 mm. Calyx campanulate, 6–11 × 4–7 mm, glabrous, smooth, ecarinate; calyx lobes ovate, 2–3 × 2.5–4.5 mm, rounded to obtuse. Corolla funnel-shaped, 32–43 mm long, 13–17 mm wide at the apex of the tube, whitish (*Woytkowski 8018*), yellow (*Vasquez 27601*; *van der Werff et al. 16315*), smooth; corolla lobes ovate to elliptic, 7–12 × 5–7 mm; corolla lobe apex obtuse to rounded. Stamens 26–31 mm long; filaments 22–26 mm long, filiform, flattened; anthers elliptic to oblong, 4–5 × 1.5–2.0 mm, sagittate, versatile; pollen

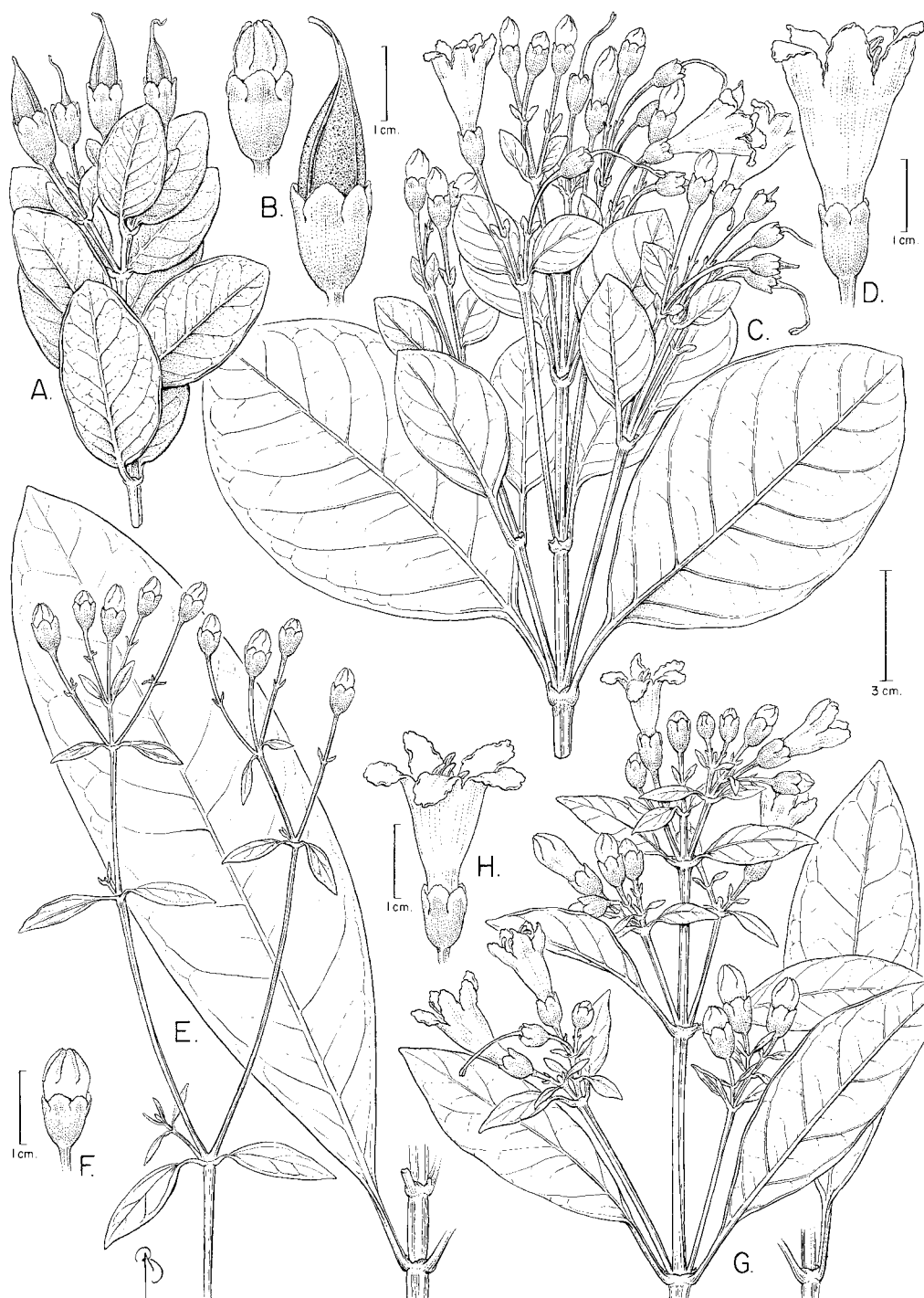


FIGURE 9. A–B. *Macrocarpaea luya*. A, habit of flowering stem; B, bud and fruit. C–D. *M. innarrabilis*. C, habit of flowering stem; D, flower. E–F. *M. tabula-fluctivagifolia*. E, habit of flowering stem, leaf, and interpetiolar ridge; F, bud. G–H. *M. revoluta*. G, habit of flowering stem, leaf, and interpetiolar ridge; H, flower. A–B, drawn from Díaz & Campos 3786 (USM); C–D, drawn from Matthews 1314 (K); E–F, drawn from Wolfe 12333 (F); G–H, drawn from Smith 2748 (HAM).

“glabra-type.” Pistil 32–35 mm long; ovary 5–6 × 2–3 mm; style 26–27 × 0.75–1.00 mm; stigma lobes spatulate, 3 × 1.5–2.5 mm. Capsules ellipsoidal to ovoid, 20–21 × 7–8 mm, smooth to pusticulate, shiny, chestnut to brown, spreading to nodding; style remnant 8–9 mm. Seeds “perimetrically winged,” flattened with wings all around, 0.4–1.0 × 0.6–1.0 mm, faint orangish-tan, rugose-reticulate.

*Macrocarpaea innarrabilis* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It belongs to a group of closely related species including *M. innarrabilis* (Fig. 9C–D), *M. jalca* (Fig. 10A–C), and *M. kuelap*

(Fig. 10D–G), all described as new in this paper. They all occur in northern Peru in Amazonas and Cajamarca provinces, and are related to *M. noctiluca* J.R. Grant & Struwe of southern Ecuador. The inflorescences of these species are triangular in outline and composed of many cymes and flowers; the pedicels are long and slender, slightly nodding at the apex; the calyces tend to be roughly the same length and width; and the seeds are unique in that even though they belong to the “perimetrically winged” group, the wings are much reduced to nearly absent. These four species may be distinguished by the following key:

- 1a. Plants spiculate; calyx lobes elliptic to ovate; shrubs 0.3–4.0 m; plants of Cajamarca, 2300–2800 m . . . . *M. jalca*  
 1b. Plants glabrous; calyx lobes ovate . . . . . 2  
 2a. Calyx lobes ecarinate, concolorous dark; shrubs to 1.5 m; plants of Peru (Amazonas: Bagua, Rodrigues de Mendoza), 900–2500 m . . . . . *M. innarrabilis*  
 2b. Calyx lobes ecarinate to slightly carinate (or at least with a slightly raised portion that dries the same color as the unlobed portion, whereas the edges of the lobe dry a much lighter color, almost like a highlight or fringe); trees 2.5–8.0 m . . . . . 3  
 3a. Plants 2.5–8.0 m tall; capsules 28–37 × 7–8 mm with style remnant 5–12 mm; plants of Peru (Amazonas: Bongará, Chachapoyas), 2095–3350 m . . . . . *M. kuelap*  
 3b. Plants 1–6 m tall; capsules 29–34 × 10–14 mm with style remnant 1–6 mm; plants of southern Ecuador . . . . . *M. noctiluca*

*Macrocarpaea innarrabilis* differs from the other species as noted in the key above, but may be best characterized as a 1.5-m shrub with obovate to elliptic leaves, and ecarinate calyx lobes.

**Etymology:** from the Latin *innarrabilis*, indescribable.

**Paratypes:** PERU. Amazonas: Yambasbamba, August, *Matthews 1314* (K); Amazonas: upper slopes and summit of Cerro Teyu, summit with sclerophyll scrub, 2 m tall, with many lichens, 05°15'S, 078°22'W, 1030 m, shrub 1.5 m, flower yellow, 22 March 2001, *van der Werff et al. 16315* (MO [not seen], NEU); Bagua District, Imaza, Tayu Majaji, bosque primario, sobre roca de arenisca y un manto esponjoso de raíces y hojarasca en descomposición, 05°15'S, 078°22'W, 900–1030 m, arbusto 1.5 m, flores amarillas, 17 February 2002, *Vásquez 27601* (MO). Without locality, “Voyage à l'Équateur et au Pérou,” 1876–1877, *Vidal-Sénège s.n.* (P); Rodrigues de Mendoza, low forests of the eastern slopes of the Andes, mountains and hills covered with grasses, shrubs and low tree, higher up stretches true forests, trees of larger size and thickets too shady to produce flowering herbs, 1400–2500 m, tree, fleshy white flowers, July–August 1963, *Woytkowski 8018* (MO, U).

**10. *Macrocarpaea jalca* J.R. Grant, sp. nov.**  
 TYPE: PERU. Cajamarca: Prov. Cutervo, 10 km northwest of Socota, ceja de la montana, in part shade, 3200 m, shrub to 0.3 m, corolla greenish when young, turning more yellowish, fruit remaining from last year show dry dehiscent pods, leathery-leaved vigorous-growing shrub, previously collected in Carpish area, 10 December 1938, *H.E. Stork & O.B. Horton 10118* (Holotype: UC; Isotypes: F, K, US). Fig. 10A–C.

*A Macrocarpaea noctilucae* J.R. Grant & Struwe, *M. innarrabilis* J.R. Grant, et *M. kuelap* J.R. Grant cui affinis, sed plantis spiculatis, et lobis calyce ellipticis differt.

Shrub or small tree, branching above, to 0.3–4.0 m, hyaline hispid to spiculate with short simple hairs on stems, petioles, leaves, inflorescences, bracts and calyces (to glabrous throughout on specimens that appear to have been treated with alcohol prior to drying). Stems terete to slightly quadrangular, solid to hollow, 4–13 mm in diam. just below inflorescence. Leaves elliptic, oval to ovate, petiolate, (6.5–)12.0–21.0 cm long. Petioles 8–30 mm long, robust with slight vagination 1/8 the length of the petiole; interpetiolar ridge 2–3 mm high. Blades (5.7–)10.0–18.0 ×



FIGURE 10. A–C. *Macrocarpaea jalca*. A, habit of flowering stem; B, flower; C, fruits. D–G. *M. kuelap*. D, habit of flowering stem; E, flower; F, leaf; G, fruits. H–J. *M. normae*. H, habit of flowering stem; I, bud; J, leaf and interpetiolar ridge. K–N. *M. wallnöferi*. K, habit of flowering stem; L, leaf and interpetiolar ridge; M, flower; N, fruits. A, drawn from Smith & Díaz 1558 (WIS); B, drawn from Díaz et al. 3942 (MO); C, drawn from Díaz & Osoreo de Díaz 2584 (USM); D, F, drawn from Grant & Rodríguez 3942 (US); E, G, drawn from Wurdack 524 (NY); H–I, drawn from Vargas 4196 (US); J, drawn from Weberbauer 7921 (F); K, M, drawn from Wallnöfer 20388 (U); L, N, drawn from Wallnöfer 12488 (U).

(2.4–)5.0–9.5 cm, entire, not revolute, dark above and conspicuously lighter below, with slightly impressed veins above and slightly raised veins below, hyaline hispid to spiculate with short simple hairs on petiole, midvein and lateral veins of lower surface, leathery-coriaceous; base aequilateral to oblique, cuneate; apex acute. Inflorescence a much-branched open thyrse, 11–31+ cm long; branches 6–31 cm long; 3–12 flowers per branch. Bracts elliptic, oval, ovate, to obovate, petiolate, 15–92 × 4–34 mm; base aequilateral to oblique, cuneate; apex acute to acuminate; bract petioles 2–9 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 5–35 mm long; bracteoles varying from inconspicuous and linear to spatulate, 2–13 × 1–3 mm. Calyx campanulate, 7–10 × 5–9 mm, spiculate to glabrous, smooth, ecarinate; calyx lobes elliptic (the slides parallel), ligulate, to ovate, 2.5–5.0 × 3–5 mm, apex rounded to obtuse. Corolla funnel-shaped, 36–44 mm long, 13–24 mm wide at the apex of the tube, greenish when young, turning more yellowish (*Stork & Horton 10118*), yellowish-green (*Díaz et al. 3262*, *Díaz et al. 3264*, *Smith J.F. & Díaz 1558*), creamy yellow (*Díaz et al. 3326*), yellow (*Díaz et al. 3942*), smooth; corolla lobes ovate, 8–13 × 7–11 mm, obtuse to rounded. Stamens 28–34 mm long; filaments 23–28 mm long, filiform, flattened; anthers elliptic to oblong, 5–6 × 2–3 mm, sagittate, versatile; pollen “glabra-type.” Pistil 35–38 mm long; ovary 5–8 × 2–3 mm; style 26–28 × 0.75–1.00 mm; stigma lobes spatulate, 2–4 × 1 mm. Capsules ellipsoidal to oblong, 20–27 × 7–11 mm, smooth to ribbed, shiny, chestnut to brown, spreading to nodding; style remnant 4–13 mm. Seeds “perimetrically winged,” flattened with wings all around, 0.3–0.9 × 0.3–0.6 mm, straw-colored, rugose-reticulate.

*Macrocarpaea jalca* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It appears to be largely restricted to Parque Nacional de Cutervo (Cajamarca). It differs from *M. innarrabilis* and *M. kuelap* as noted in the key under *M. innarrabilis*, but specifically in being a spiculate 0.3–4.0 m shrub to small tree, and ecarinate calyx lobes.

**Etymology:** from the vegetation type in which it occurs, the *jalca* of northern Peru. The epithet is based on a word used in apposition, and therefore to be maintained according to Article 23.1 of the ICBN (Greuter et al., 2000).

**Paratypes:** PERU. Cajamarca: Prov. Cutervo, Distrito San Andrés de Cutervo,

Parque Nacional de Cutervo, caserío “Pajonal,” hacia la fila, camino hacia Jaén (Chorro Blanco), 2600 m, árbol 2 m muy ramoso, frutos verdes, 10 August 1987, *Díaz & Osoreo de Díaz 2584* (USM); Cutervo, San Andrés de Cutervo, P.N. de Cutervo, 2400 m, arbusto 1.5 m, flores amarillo verdosas, 14 March 1989, *Díaz et al. 3262* (MO, USM); Cutervo, San Andrés de Cutervo, P.N. de Cutervo, 2400 m, arbusto 2 m, flores amarillento verdosas, 14 March 1989, *Díaz et al. 3264* (MO); Cutervo, San Andrés de Cutervo, P.N. de Cutervo, “jalca” camino a la Laguna “El Pileo,” 2680 m, arbusto herbáceo 3 m, flores amarillo cremosas, 15 March 1989, *Díaz et al. 3326* (HAM, MO, USM); Cutervo, San Andrés de Cutervo, P.N. de Cutervo, Entrada por “Chorro Blanco,” sobre incernas del Sr. Nicolás Navarro, 2300–2400 m, arbolillo 5 m, flores amarillas, 11 January 1990, *Díaz et al. 3942* (HAM, MO [not seen]); Cutervo, Cerros de Cutervo, 2700–2800 m, arbusto, 2 August 1946, *Ferreya 873* (USM); Cutervo National Park, Chorro Blanco region, ca. 15 km N of San Andres de Cutervo, 06°10'S, 78°45'W, 2650–2750 m, ridgetop jalca, tree 4 m, fruits green, 13 September 1991, *Gentry et al. 74765* (U); Cutervo, Lo Hucan Cutervo, 2850 m, 24 January 1959, *Núñez 7162* (Z); Cutervo, P.N. Cutervo, San Andres de Cutervo, 06°10'S, 78°30'W, 2350–2430 m, shrub to 3 m, corolla yellowish-green, 14 March 1989, *Smith J.F. & Díaz 1558* (GB, WIS).

**11. *Macrocarpaea kayakifolia*** J.R. Grant, *sp. nov.* TYPE: PERU. Huánuco: Carpish Hills, trail downslope from San Pedro de Carpish, 3 km E of tunnel, dense cloud forest and forest edge, 09°42'S, 76°05'W, 2250–2450 m, arborescent shrub to 5 m, corolla pale yellow-green, fruits green, elongate, 15 January 1987, *B.A. Stein, J. Kallunki, & C. Díaz 3864* (Holotype: NY; Isotypes: MO [not seen], NEU, U, USM). Fig. 3C–D.

*A Macrocarpaea angustifoliae* J.S. Pringle *cui affinis, sed foliis longioribus et latioribus cum nervis secundarius prominens (vs. foliis linearis cum nervis secundarius inconspicuus), et calycibus grandioribus (7–9 × 7–9 mm vs. 5–6 × 4–5 mm) differt.*

Unbranched tree to 5 m tall, glabrous throughout. Stems terete, solid, 5–7 mm in diam. just below inflorescence. Leaves lanceolate to elliptic, petiolate, 14.5–18.5 cm long. Petioles 13–17 mm long, slender with very slight vagination; interpetiolar ridge 2–3 mm.

Blades 13.3–16.8 × 3.7–6.0 cm, entire, not revolute, papery thin; base aequilateral, attenuate and slightly decurrent into the petiole; apex acuminate. Inflorescence a much-branched open thyrse, 30–35 cm long; branches 8–30 cm long; 1–13 flowers per branch. Bracts lanceolate, ovate, to elliptic, petiolate, 12–120 × 3–25 mm; base aequilateral, attenuate and slightly decurrent into the petiole; apex acuminate; bract petioles 3–15 mm long. Flowers pedicellate, erect; pedicels (5–)14–28(–49) mm long; bracteoles inconspicuous, linear to linear-lanceolate, 1–3(–8) × 0.5–2.0 mm. Calyx campanulate, 7–9 × 7–9 mm, glabrous, faintly verrucose, ecarinate, ovate to rotund; calyx lobes 2–3 × 2.5–3.5 mm, rounded, obtuse to acute. Corolla funnel-shaped, 33–38 mm long, 13–16 mm wide at the apex of the tube, pale yellow-green, smooth; corolla lobes ovate to elliptic, 8–10 × 5–8 mm, obtuse to rounded. Stamens 24–28 mm long; filaments 20–23 mm long, filiform; anthers linear to linear-elliptic, 4–6 × 1.75–2.00 mm, sagittate, versatile; pollen “glabra-type.” Pistil 32–36 mm long; ovary 4–8 × 2–4 mm; style 30–33 × 1.0–1.5 mm; stigma lobe spatulate to elliptic, 2–3 × 1–2 mm. Capsules and seeds unknown.

*Macrocarpaea kayakifolia* occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It is known only from its type material. It is nevertheless a distinct species related to *M. angustifolia* J.S. Pringle (Pasco, Peru), following a similar bauplan but generally larger in size. It differs in having longer and broader leaves with prominent lateral veins (vs. nearly linear leaves with inconspicuous lateral veins), and larger calyces (7–9 × 7–9 mm vs. 5–6 × 4–5 mm). Both species occur in central Peru and are undoubtedly closely related. *Macrocarpaea angustifolia* is distinct in having linear-long leaves that are smooth with few veins either above or below.

**Etymology:** from the Eskimo *qajak*, transliterated to *kayak* in Indo-European languages, and the Latin *folia*, leaf, for its kayak-shaped leaves.

**12. *Macrocarpaea kuelap*** J.R. Grant, *sp. nov.*  
TYPE: PERU. Amazonas: Prov. Bongará, between Río Utcubamba and Pomacocha, km 327 east of Olmos on Rioja road, 2160–2210 m, tall shrub with naked stem for 3 m, topped by clusters of gigantic leaves and panicles of large yellow campanulate flowers, 31 January 1964, P.C. Hutchinson & J.K. Wright 3903

(Holotype: UC [2 sheets]; Isotypes: F, K, MO, NY [2 sheets], US [2 sheets], USM [2 sheets]). Fig. 10D–G.

A *Macrocarpaea noctilucae* J.R. Grant & Struwe *cui affinis*, *sed arbor 2.5–8.0 m, et calycibus longioribus latioribus infundibuliformis (vs. tubularis) differt.*

Tree or shrub to 2.5–8.0 m, glabrous throughout, often with bluish glaucous color on stems, inflorescences, pedicels and calyces. Stems terete to quadrangular, solid to hollow, 5–20 mm in diam. just below inflorescence. Leaves elliptic to oval (to rarely ovate), petiolate, upper leaves 10–28 cm long, lower leaves 39–52 cm long; upper blades 11–25 × 6–12 cm, lower blades 33–47 × 17–26 cm, entire, not revolute, dark green above, light green below, with slightly impressed veins above, and slightly raised veins below, glabrous above and below, leathery-coriaceous to papery thin when dried; base aequilateral to oblique, cuneate to rounded; apex rounded, obtuse to acute. Petioles 10–30 mm long on upper leaves, 40–60 mm long on lower leaves, robust with slight vagination 1/8 the length of the petiole; interpetiolar ridge 2–5 mm high. Inflorescence a much-branched open thyrse, 25–50+ cm long; branches 14–50 cm long; 5–15 flowers per branch. Bracts elliptic, ovate to oval, petiolate, 14–140 × 4–69 mm; base aequilateral to oblique, cuneate to rounded; apex rounded, obtuse to acute; bract petioles 2–20 mm. Flowers pedicellate, erect to slightly spreading; pedicels 12–30 mm long; bracteoles varying from inconspicuous scabrous and linear, to spatulate, 1–10 × 1–3 mm. Calyx campanulate, 6–11 × 4–8 mm, glabrous, smooth, bicolor, ecarinate to carinate (or at least with a slightly raised portion that dries the same color as the unlobed portion, whereas the edges of the lobe dry a much lighter color, almost like a highlight or fringe); calyx lobes ovate, elliptic to slightly ligulate, 3.5–5.0 × 3–4 mm; calyx lobe apex rounded to obtuse. Corolla funnel-shaped, 35–50 mm long, 18–25 mm wide at the apex of the tube, cream-colored (*Wasshausen & Encarnación* 996), yellow (*J.R. Grant & Rodríguez* 01-3942), yellowish-green (*Díaz & Campos* 3853), pale green, (*Wurdack* 524), smooth, ovate to elliptic; corolla lobes 9–15 × 5–12 mm, apex obtuse to rounded. Stamens 25–34 mm long; filaments 20–28 mm long, filiform, flattened; anthers elliptic to oblong, 5–6 × 2.0–2.5 mm, sagittate, versatile; pollen “glabra-type.” Pistil 36–49 mm long; ovary 5–8

× 2–3 mm; style 27–36 × 1.0–1.5 mm; stigma lobes spatulate, 4–5 × 1–3 mm. Capsules linear-long, narrowly ellipsoid to oblong, 28–37 × 7–8 mm, smooth to ribbed, shiny, chestnut to brown, spreading to nodding; style remnant to 5–12 mm. Seeds “perimetrically winged,” flattened with wings all around, 0.9–1.5 × 0.5–1.0 mm, straw-colored, rugose-reticulate.

*Macrocarpaea kuelap* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It is largely restricted to Amazonas, especially the area around Chachapoyas. It differs from related species as noted in the key in the text under *M. innarrabilis*, but is unique in being a 2.5- to 8.0-m-tall tree, with ecarinate to carinate calyx lobes (or at least with a slightly raised portion that dries the same color as the unlobed portion, whereas the edges of the lobe dry a much lighter color, almost like a highlight or fringe).

As compared with *Macrocarpaea noctiluca*, *M. kuelap* has generally longer and broader calyces and calyx lobes (calyces 6–11 × 4–8 mm, calyx lobes 3.5–5.0 × 3–4 mm in *M. kuelap*; vs. 7–10 × 5–9 mm, calyx lobes 2–4 × 2.5–3.0 mm in *M. noctiluca*). The calyx lobes of *M. kuelap* seem to be slightly flared out (funnel-like), whereas in *M. noctiluca* they tend to remain straight (tube-like).

**Etymology:** named after the pre-Columbian Chachapoya fortress Kuelap, situated within the distribution of this species. The epithet is based on a word used in apposition, and therefore to be maintained according to Article 23.1 of the ICBN (Greuter et al., 2000).

**Paratypes:** PERU. Amazonas: Prov. Luya, Camporredondo, Tullanga, loma entre primer Campamento, Pascoma Pampa y Paseana “La Palma,” 2550 m, arbolillo 4–5 m, frutos verde-amarillentos, 8 September 1989, *Díaz & Campos* 3853 (MO, USM); Chachapoyas, Soloco, loc. Pampa del Tio, camino entre Quitachi y (Las) Tinas, 2000 m, arbusto 4 m, frutos verdes, 5 July 1991, *Díaz et al.* 4595 (MO); entre D’Aguas and Molinopampa, 06°12’S, 77°42’W, 2095 m, single-stemmed tree to 6 m, branching above 3 m from an otherwise unbranched trunk, flowers yellow, 28 January 2001, *J.R. Grant & Rodríguez* 01-3942 (G, HUT, NEU [2 sheets], NY, US [2 sheets]); Chachapoyas, Kuelap Fortress and surrounding, 06°25’S, 77° 7’W, 3000 m, tree with yellow flowers, 16 May 1002, *Henning & Schneider* 250 (NEU); *Matthews* 2118 (BM, K); Prov. of Chachapoyas, *Matthews* 3162

(BM) [both BM specimens of *Matthews* 2118 and *Matthews* 3162 are mounted on the same sheet]; Chachapoyas, *Matthews* 8110 (K); Chachapoyas, Cerro Puma Urco, June 1952, *Soukup* 4056 (US); Bongará, Laguna Pomacocha, ridge NE of lake, 05°50’S, 77°52’W, 2450–3350 m, wet cloud forest with patches of rocky open glades, shrub ca. 2.5 m, flowers yellow, stems suffused with gold, 7 February 1985, *Stein & Todzia* 2104 (MO [not seen], NEU, NY, USM, U); a few km from Molinopampa, scrub on sandy soil with rock outcrops, shrub 2 m, fruits green, 14 March 1998, *van der Werff et al.* 14961 (MO, U); remnants of forest around Laguna Pomacochas, partly on white sand, 05°50’S, 77°57’W, 2250 m, shrub 3 m, flowers yellow, 20 March 1998, *van der Werff et al.* 15255 (MO, U); Chachapoyas, cloud forest between Molinopampa and Mendoza, 10 km E of Molinopampa, 2400 m, shrub 5 m, woody, corolla cream-colored, 23 February 1978, *Wasshausen & Encarnación* 996 (US, USM); Chachapoyas, road from Chachapoyas to Mendoza, 06°12’S, 77°42’W, 2200 m, shrub forest and open vegetation on sandstone, with seepage areas, tree ca. 7 m tall, inflorescence up to 80 cm, 20 October 2000, *Weigend et al.* 2000/892 (F, HUT [not seen], MSB, NEU, USM [not seen]); Central Cordillera of the Andes, Chachapoyas to Moyobamba, 2700–3300 m, rare weed, edge of path, 21 January 1930, *Williams* 7596 (F); Road to Levanto from Chachapoyas, 7 January 1972, *Wolfe* 842 (NA); Chachapoyas, in hills above city of Chachapoyas, at the beginning of the shrubby zone, shrub 2–3 m tall, about 3–4 seasons old judging from dichotomies in stem and their termination by infrutescences, leaf sizes very variable depending on vigor of shoots, 2 January 1972, *Wolfe & Dobson* 711 (US); Chachapoyas, in hills above the city of Chachapoyas, shrub 3 m, flowers pale yellow, 4 January 1972, *Wolfe & Dobson* 754 (GH); Prov. Chachapoyas, middle and upper slopes of Puma-urca southeast of Chachapoyas, 2500–2700 m, tree 3–6 m, corolla pale green, locally frequent in open scrub forest, 25 May 1962, *Wurdack* 524 (F, NY, US, USM). Cajamarca: Cajamarca, Chota, near Las Palmas, ca. 24 km NE of Chota, fragmented montane forest pockets, 06°29’S, 78°37’W, 2789 m, tree to 8 m, flowers cream-yellow, 17 April 1993, *Dillon et al.* 6340 (HAO); Cajamarca, Chota, near village of El

Campamento, ca 21 km WNW of Huambos, fragmented montane forest, 06°24'S, 79°01'W, 2740 m, trees to 6 m, flowers yellow, 20 April 1993, *Dillon et al.* 6432 (HAO). PERU. Without province or locality: *Nee s.n.* (MA).

**13. *Macrocarpaea kuepferiana*** J.R. Grant, *sp. nov.* TYPE: PERU. Puno: Carabaya, San Gabán, Hda. Quillabamba pte. Ario, ladera abierta, 950–1000 m, 8 February 1967, *C. Vargas C.* 18928 (Holotype: CUZ). Fig. 8A–B.

*A Macrocarpaea bangiana Gilg cui affinis, sed textura folia tenui, foliis ellipticis vel ovatis (vs. oblongis vel longe-ellipticis), et petiolis gracilis (vs. petiolis robustis) differt.*

Unbranched shrub, glabrous throughout. Stems terete to slightly quadrangular, solid to hollow, 5 mm in diam. just below inflorescence. Leaves elliptic to ovate, petiolate, 14–26 cm long. Petioles 15–25 mm long, slender with very slight vagination; interpetiolar ridge 3–4 mm high. Blades 12.5–23.5 × 6.5–9.0 cm, entire, not revolute, light green, with slightly impressed veins above and slightly raised veins below, papery thin; base aequilateral to attenuate and slightly decurrent onto the petiole; apex acuminate to acute. Inflorescence a few-branched open thyrse, 26 cm long; branches 12–20 cm long; 7–9 flowers per branch. Bracts ovate, elliptic, to lanceolate, petiolate, 18–52(–79) × 8–25(–45) mm; base aequilateral to attenuate and decurrent on the petiole; apex acuminate to acute; bract petioles 3–5 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 16–34 mm long; bracteoles linear to lanceolate to ovate, 3–25 × 1–10 mm. Calyx campanulate, 6–7 × 5–6 mm, glabrous, smooth, green, ecarinate, ovate to rotund; calyx lobes 2.5–4.0 × 2.5–3.5 mm, rounded to obtuse, the edges slightly fimbriate. Corolla funnel-shaped, 23–31 mm long, 12–20 mm wide at the apex of the tube, yellow?, smooth, ovate; corolla lobes 7–10 × 5–7 mm, obtuse to rounded. Stamens 16–21 mm; filaments 13.5–18.0 mm long, filiform; anthers elliptic to oblong, 2.5–3.0 × 2 mm, sagittate, versatile; pollen “glabra-type.” Pistil 25–27 mm long; ovary 6–7 × 3–4 mm; style 16–17 × 1 mm; stigma spatulate to rounded, 2–3 × 2 mm. Capsules and seeds unknown.

*Macrocarpaea kuepferiana* occurs in the Central Andes, on the Cordillera Oriental of Peru (Fig. 2). Among others it is related to *M. bangiana* (Bolivia), *M. pringleana*, *M.*

*sodiroyana*, and *M. wallnoeferi*. It is closely related to *M. bangiana* of adjacent Bolivia, from which it differs in elliptic to ovate and thinner-textured leaves (vs. oblong to long-elliptic leathery-coriaceous leaves), and slender pedicels (vs. comparatively robust pedicels). It occurs in low elevations (950–1000 m), vs. the upper elevations of *M. bangiana* (1500–2500 m).

**Etymology:** named for Prof. Philippe Küpfer (1942–), Professor of Botany, Laboratoire de botanique évolutive, Institut de botanique, Université de Neuchâtel, Switzerland (NEU). Avec toute ma reconnaissance.

**14. *Macrocarpaea luya*** J.R. Grant, *sp. nov.* TYPE: PERU. Amazonas: Prov. Luya, Camporredondo, Tullanga, Cerro Huicsocunga o Condorpuna, 3310 m, arbusto 6 m, frutos verdes, 3 September 1989, *C. Díaz & J. Campos* 3786 (Holotype: USM; Isotype: MO). Fig. 9A–B.

*A Macrocarpaea loranthoides Gilg cui affinis, sed arbor 6 m, foliis ellipticis-obovatis (vs. oblongis vel oblongis-obovatis), calycibus grandioribus, et capsulis longioribus (22–30 vs. 9–14 mm) differt.*

Robust tree, much branching, 6 m, glabrous throughout. Stems terete to slightly quadrangular, solid to hollow, 4–10 mm in diam. just below inflorescence. Leaves elliptic, varying to slightly ovate to obovate, short-petiolate, 3.5–5.5 cm long. Petioles 1–4 mm long, robust with strong open vagination nearly equaling the length of the petiole; interpetiolar ridge 2–3 mm high. Blades 3.4–5.1 × 2–3 cm, entire, slightly revolute, thick, leathery-coriaceous, lateral veins scarcely visible above but more pronounced below; base aequilateral to slightly oblique, cuneate to rounded; apex rounded to obtuse. Inflorescence a few-branched, nearly sessile thyrse, 4–6 cm long; branches 3–5 cm long, 1–3 flowers per branch. Bracts elliptic to slightly obovate, sessile to petiolate, 11–20 × 7–11 mm; base aequilateral, cuneate to rounded, apex rounded to obtuse; bract petioles 0–2 mm long. Flowers pedicellate, erect to slightly spreading, but never nodding; pedicels 17–22 mm long; bracteoles elliptic, obovate to spatulate, 9–12 × 4–6 mm. Calyx campanulate, 12–14 × 9–12 mm, glabrous, faintly verrucose, ecarinate, ovate to reniform; calyx lobes 4–6 × 5–8 mm, apex rounded. Corolla and pollen unknown. Capsules ellipsoidal, 22–30 × 8–10 mm, smooth, faintly verrucose to pusticu-

late, light brown, erect; style remnant 3–4 mm. Seeds “perimetrically winged—reversal to rimmed,” angular to polyhedral to flattened (pyramids, tetrahedrons, rectangular prisms, to multi-sided prisms), 2- to 5-sided, 0.6–0.9 × 0.5–0.7 mm, dark orangish-tan, rugose-reticulate to wrinkled.

*Macrocarpaea luya* occurs in the Central Andes, in the Huancabamba region of Peru (Fig. 1). It specifically occurs in the region of Chachapoyas where five species of the genus occur: *M. kuelap*, *M. loranthoides*, *M. luya*, *M. stenophylla*, and *M. zophoflora*. *Macrocarpaea kuelap* and *M. zophoflora* are tall trees to 6 m that generally occur at lower elevations (2000–3000 m), while *M. loranthoides* and *M. stenophylla* are shrubs less than 2 m tall of scrubby areas at generally higher elevations (2400–3400 m). *Macrocarpaea luya* fits in somewhere in the middle in being a tall 6-m tree, occurring at an elevation of 3310 m, with a morphology similar to that of *M. loranthoides* and *M. stenophylla*.

*Macrocarpaea luya* is known only from its type specimen from Amazonas, Peru, yet is a distinct species related to *M. ericii* (Peru: Cajamarca, Piura), *M. loranthoides* (Peru: Amazonas), *M. stenophylla* (Peru: Amazonas, Cajamarca), and *M. subsessilis* (Ecuador: Loja). It differs from *M. loranthoides* in its 6-m-tall-tree habit, more broadly elliptical-obovate leaves (vs. oblong to oblong-obovate), larger calyces, and larger fruits (22–30 vs. 9–14 mm).

**Etymology:** named for the province in which it was collected, Luya Province, of Amazonas Department, Peru. The epithet is based on a word used in apposition, and therefore to be maintained according to Article 23.1 of the ICBN (Greuter et al., 2000).

**15. *Macrocarpaea normae*** J.R. Grant, *sp. nov.* TYPE: PERU. Cuzco: Calca, Lares Valley between Huallhuayoj and Calca, 9 March 1929, 1900–2000 m, flowers greenish-yellow, evergreen bushwood, A. *Weberbauer 7921* (Holotype: F [3 sheets]; Isotypes: GH, NY [2 sheets], US [2 sheets]). Fig. 10H–J.

A *Macrocarpaea pachystylae* Gilg *cui affinis*, sed *ramis multifloribus compactis* (vs. *rami paucifloribus diffusis*).

Shrub to 3–4 m, glabrous throughout. Stems terete to quadrangular, solid to hollow, 9–10 mm in diam. just below inflorescence. Leaves ovate, subdeltoid, elliptic, to oval, petiolate,

22–49 cm long. Petioles 40–100 mm long, robust with slight vagination 1/8 the length of the petiole; interpetiolar ridge 2–4 mm high. Blades 18–40 × 11.5–22.0 cm, entire, not revolute, green, with slightly impressed veins above, and strongly raised veins below, glabrous above below, papery thin; blade base aequilateral to slightly oblique, cuneate, rounded to attenuate and decurrent on the petiole; blade apex distinctly acute to acuminate. Inflorescence a much-branched open thyrses, 32+ cm long, the total inflorescence unknown, as has been cut into various segments for separate herbarium sheets; branches 12–32 cm long, 3–10 flowers per branch. Bracts ovate, subdeltoid, elliptic, to oval, sessile to petiolate, 17–100 × 4–40 mm; base aequilateral to oblique, cuneate, rounded to short-attenuate; apex acuminate to acute; bract petioles 0–4 mm long. Flowers pedicellate, erect to slightly spreading, but never nodding; pedicels 18–33 mm long; bracteoles inconspicuous and scabrous, linear, triangular to ovate, 1–3(–7) × 0.3–1.0(–3.0) mm. Calyx campanulate, 9–14 × 8–11 mm, glabrous, faintly rugose to pustulate, ecarinate to carinate on some calyx lobes; calyx lobes rotund, ovate to elliptic, 4–6 × 4–6 mm, apex rounded to obtuse. Corolla funnel-shaped, 30–54 mm long, 21–35 mm wide at the apex of the tube, white-cream (*Vargas 4196*) to greenish-yellow (*Weberbauer 7921*), smooth, ovate; corolla lobes 12–17 × 9–14 mm, apex obtuse to rounded. Stamens 24–41 mm long; filament 18–32 mm long, filiform, flattened; anthers elliptic to oblong, 6–9 × 2.5–3.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 40–50 mm long; ovary 8–10 × 2–3 mm; style 29–37 × 1.5–2.0 mm; stigma spatulate to elliptic, 3–5 × 2.5–3.0 mm. Capsules and seeds unknown.

*Macrocarpaea normae* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, on the Cordillera Oriental of Peru (Fig. 2). It belongs to a group of closely related species including *M. canoëfolia*, *M. cinchonifolia*, *M. obnubilata*, *M. ostentans*, *M. robin-fosteri*, and *M. tahuantinsuyuana*. It may also be related to *M. pachystyla* on the basis of similarly stoutly long-petiolate leaves, drying the same color as herbarium specimens. It differs from *M. pachystyla* in numerous (3–10) densely compacted flowers per branch, vs. fewer (2–6) open diffusely arranged flowers per branch.

In the region of Cuzco, two species of

*Macrocarpaea* are known: *M. maguirei* and *M. normae*. *Macrocarpaea normae* is glabrous throughout, occurring at generally lower elevations of 1700–2800 m, while *M. maguirei* is hyaline hispid, spiculate to velutinous throughout, occurring at higher elevations of 2000–3100 m. South of Cuzco in the Andes, there are only five species of *Macrocarpaea*: *M. bangiana* (Bolivia), *M. cinchonifolia* (Bolivia), *M. cochabambensis* (Bolivia), *M. fortisiana* (Peru: Puno), and *M. kuepferiana* (Peru: Puno). Together, these seven species form a loose group representing the southern-most species in the genus in the Andes.

On the basis of locality and gross morphological similarities, *Macrocarpaea normae* may actually correspond to the Cuzco specimen of *M. weberbaueri* Gilg. However, since there is no extant type of *M. weberbaueri* and its description is based on two discordant elements (see below), I have decided not to neotypify *M. weberbaueri*, and here describe *M. normae*.

**Etymology:** named for Norma Salinas Revilla (1967–), Univ. Nacional San Antonio Abad de Cuzco, Peru (CUZ).

**Paratypes:** PERU. Cuzco: Paucartambo, Kosñipata, Trocha Unión, km 13, 19L 0222887. UTM 855360, 1835 m, 07/03 2003, bosque nublado dominado por Alzateaceae, Cyatheaceae, Myrtaceae, arbusto de 3 m, flores blancas verdosas, corola dehiscente, *K. García et al.* 267 (CUZ [not seen], MO [not seen], NEU); Convención, Choquellohuanca-Lucumaya, en laderas arbustivas, 1700 m, arbusto 3 m, corolla blanca-crema, 28 April 1944, *Vargas 4196* (CUZ, MO, NY); Convención, Hda. Potrero, Garavito, bosques, bordes claros, 2000 m, 13–14 May 1960, *Vargas 13206* (CUZ, MO); Paucartambo, Pillawata-Perolnino, bosque ralo, 2800 m, 9 April 1969, *Vargas 21415* (CUZ).

**16. *Macrocarpaea obnubilata*** J.R. Grant, *sp. nov.* TYPE: PERU. Huánuco: Prov. Huánuco, trocha entre Carpish y Pati, hierba arbustiva 2.5 m, flores amarillo-verdosas, 15 January 1987, *C. Díaz S. & S. Baldéon 2256* (Holotype: NY; Isotypes: MO [not seen], NEU, U). Fig. 6G–H.

A *Macrocarpaea* *revolutae* (Ruiz & Pavon) Gilg *cui affinis*, *sed plantis spiculatis* (vs. *glabris*), *foliis grandioribus sessilibus vel brevepetiolatis* (vs. *semper petiolatis*), *inflorescentia densa, et calycibus latioribus differt*.

Shrub to 2.5 m, hyaline spiculate with short simple hairs on stems, petioles, leaves, inflorescences, and bracts. Stems terete, hollow, 6–11 mm in diam. just below inflorescence. Leaves elliptic, slightly varying to obovate, sessile to short-petiolate, (14–)31–33 cm long. Petioles 0–10 mm long, usually absent, but rarely a short robust petiole with strong open vagination present; interpetiolar ridge 3–4 mm high. Blades (14–)31–33 × (4.5–)13.0–14.0 cm, entire, not revolute, impressed veins above and slightly raised veins below, papery thin; base attenuate and decurrent onto the petiole; apex acute. Inflorescence a much-branched open thyrse, 10–26 cm long; branches 8–16 cm long; 3–15 flowers per branch. Bracts ovate to elliptic, sessile to short-petiolate, 3.0–16.5 × 1.5–8.0 mm; base aequilateral to oblique, short-attenuate and decurrent on the petiole; apex acute to obtuse; bract petioles 0–2 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 12–23 mm long; bracteoles inconspicuous and scabrous, triangular to ovate, 2–7 × 1–3 mm. Calyx campanulate, 8–14 × 10–15 mm, glabrous, faintly rugose to pustulate, ecarinate; calyx lobes ovate, 6–9 × 6–9 mm, rounded to obtuse. Mature corolla unknown. Pollen “corymbosa-type.” Fruits and seeds unknown.

*Macrocarpaea obnubilata* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It belongs to a group of closely related species, including *M. canoëfolia*, *M. cinchonifolia*, *M. normae*, *M. ostentans*, *M. robin-fosteri*, and *M. tahuantinsuyuana*. It may also be related to *M. revoluta* (Fig. 9G–H), from which it differs in being spiculate and having larger and sessile to short-petiolate leaves (vs. always petiolate), and a more densely compact inflorescence, and broader calyces. *Macrocarpaea obnubilata* is known only from several budding to young-flowering inflorescences. Large open flowers and fruits are unknown, yet pollen was retrieved from a large bud to determine pollen type.

**Etymology:** from the Latin *obnubilus*, cloudy, or covered with clouds, for the cloud forest habitat in which it occurs.

**Paratype:** PERU. Huánuco: Pampayacu, 22 January 1927, *Kanehira 292* (GH).

**17. *Macrocarpaea ostentans*** J.R. Grant, *sp. nov.* TYPE: PERU. Pasco: Prov. Oxapampa, Villa Rica-Puerto Bermúdez road, 15 km from

Villa Rica, second growth, 1650 m, shrub 2.5 m, flower buds green, 21 March 1984, *D.N. Smith, S. Knapp & J. Mallet 6440* (Holotype: MO; Isotype: U, USM [not seen]). Fig. 7C–D.

A *Macrocarpaea cinchonifoliae* (Gilg) Weaver *cui affinis, sed ramis multifloribus, pedicellis brevioribus, et calycibus in sicco brunneis concoloribus (vs. basi calyce aureis, lobis calyce castaneis) differt.*

Shrub or small tree to 2.5–5.0 m, glabrous throughout. Stems terete to quadrangular, hollow, 6–10 mm in diam. just below inflorescence. Leaves elliptic to oval, petiolate, (20–27)–47 cm long. Petioles (10–50)–70 mm long, robust with slight vagination 1/8 the length of the petiole; interpetiolar ridge 2–5 mm high. Blades (19–22)–40 × (7.5–11.0)–20.0 cm, entire, not revolute, dark green, with slightly impressed veins above, and slightly raised veins below, glabrous above and below, papery thin; base aequilateral to oblique, short-attenuate, narrowed to rounded; apex acuminate to acute. Inflorescence a much-branched open thyrse, 20–30+ cm long; branches 13–24 cm long, 3–9 flowers per branch. Bracts ovate, elliptic, to lanceolate, sessile to short-petiolate, 25–125 × 12–85 mm; base aequilateral to oblique, cuneate, rounded to short-attenuate and decurrent on the petiole; apex acuminate to acute; bract petioles 0–6 mm long. Flowers pedicellate, erect to spreading; pedicels 17–43 mm long; bracteoles inconspicuous and scabrous, linear, to triangular, 1–4(–9) × 0.5–2.0 mm. Calyx campanulate, 16–20 × 15–20 mm, glabrous, smooth, faintly rugose to pustulate, ecarinate, ovate, suborbicular to reniform; calyx lobes 8–10 × 8–13 mm, rounded to obtuse. Corolla broadly funnel-shaped, 53 mm long, 35 mm wide at the apex of the tube, pale creamy yellow (*Dudley 13357*); cream (*Wallnöfer 12-9688*), smooth; corolla lobes ovate, 16–18 × 14–17 mm, obtuse to rounded. Stamens 30–33 mm long; filaments 25–27 mm long, filiform, flattened; anthers elliptic to oblong, 5–6 × 2.5–3.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 37 mm long; ovary 8 × 2–4 mm; style 23 × 1 mm; stigma lobes spatulate, 6 × 2 mm. Capsules and seeds unknown.

*Macrocarpaea ostentans* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It belongs to a group of closely related species, including *M. canoëfolia*, *M. cinchonifolia*, *M. normae*, *M. obnubilata*, *M. robin-fosteri*, and

*M. tahuantinsuyuana*. These species occur from central Peru to Bolivia, generally have narrowly elliptic long-petiolate leaves, large calyces with ovate to suborbicular lobes, corymbosa-type pollen, and winged-type seeds. *Macrocarpaea ostentans* of Huánuco and Pasco (Peru) is closely related to *M. cinchonifolia* of La Paz (Bolivia), but differs in generally having more flowers per branch, shorter pedicels, and uniformly brown calyces. On dried herbarium specimens of *M. cinchonifolia*, the unlobed (basal) portion of the calyx always dries to a golden orange, and the lobes to chestnut or brown.

An impressive number of eight species occur nearly sympatrically in the area around Oxapampa, five\* of which are described in this paper: *M. angustifolia*, *M. ostentans*\*, *M. pajonalis*\*, *M. revoluta*, *M. robin-fosteri*\*, *M. tahuantinsuyuana*\*, *M. viscosa*, and *M. wallnöferi*\*.

**Etymology:** from the Latin *ostentus*, showing off, or displaying, for its large showy inflorescences.

**Paratypes:** PERU. Huánuco: southwestern slope of the Río LlullaPichis watershed, on the ascent of Cerros del Sira, 1540 m, small 2.5–3.5 m tree, fruit a woody capsule, last year’s fruit in branch axils, rare in very dense damp, dark, drippy, cloud forest in a shallow valley just beyond Camp 4 (Peligroso), really a “Fern Grotto,” with a tumbling waterfall, 25 July 1969, *Dudley 13279* (NA); southwestern slope of the Río LlullaPichis watershed, on the ascent of Cerros del Sira, 1800 m, single- and hollow-stemmed, erect and stiff small tree to 5 m, leaves dark green, flowers pale creamy yellow, in open, dryish, well-drained site in elfin forest (monte chico), above Camp 4 (Peligroso) on way to Camp 5 (Tabano), 28 July 1969, *Dudley 13357* (F, NA); Huánuco: Pachitea, region of Pucallpa, western part of the “Sira Mountains” and adjacent lowland, ca. 24–26 km SE to ca. 26 km ESE of Puerto Inca, from the beginning of the mountain rain forest next to the “Campamento Pato Rojo,” 09°27’ S, 74°46’ W, 1080 m, along the mountain crest to the beginning of the elfin forest after the “Campamento Peligroso” (1560 m) at a height of 1700 m, primary cloud forest, soils: red latosols with a thick humus layer, treelet of 2.5 m, only slightly woody, flowers cream-colored, 9 June 1988, *Wallnöfer 129688* (U, WU).

**18. *Macrocarpaea pajonalis*** J.R. Grant, *sp. nov.* TYPE: PERU. Huánuco: Carpish Hills, ca. 2 km E of tunnel on road to Tingo Maria, 09°42'S, 76°05'W, 2640 m, elfin forest along ridge below road, herb ca. 1.5 m tall, corolla yellow-green, visited by *Heliangelus amethysticollis* hummingbirds, 5 March 1985, B. Stein & C. Todzia 2322 (Holotype: MO; Isotypes: NY, U, USM). Fig. 11G–K.

A *Macrocarpaea harlingii* J.S. Pringle et *M. tabula-fluctivagifoliae* J.R. Grant *cui affinis*, *sed foliis brevioribus crassis, et inflorescentia breviori robusta differt.*

Unbranched shrub to tree, 0.5–4.0 m, glabrous throughout. Stems terete to slightly quadrangular, solid to hollow, 3–12 mm in diam. just below inflorescence. Leaves oblanceolate to obovate, to rarely elliptical or ovate, petiolate, (3.0–)6.0–13.5 cm long. Petioles 3–21 mm long, robust with slight vagination 1/4 the length of the petiole; interpetiolar ridge 2–5 mm high. Blades (2.7–)5.0–11.0 × (1.5–)2.5–5.0 cm, entire, slightly revolute, dark above and below, lateral veins scarcely visible either above or below, glabrous, thick, leathery-coriaceous; base aequilateral to oblique, cuneate; apex acute, obtuse to rounded. Inflorescence a few- to many-branched open thyrse, 5–33 cm long; branches 4–23 cm long, 3–11 flowers per branch. Bracts elliptical, ovate, obovate to oblanceolate, petiolate, 15–50(–100) × 5–15(–42) mm; base aequilateral, cuneate; apex acute, rounded to obtuse; bract petioles 1–16 mm long. Flowers pedicellate, erect to nodding; pedicels (7–)14–36 mm long; bracteoles ovate, elliptic, obovate to lanceolate, 3–16 × 1–10 mm. Calyx campanulate, 9–13 × 7–9 mm, glabrous, faintly verrucose, ecarinate; calyx lobes rotund, ovate elliptic to reniform, 2–4 × 4–5 mm, apex rounded to obtuse. Corolla funnel-shaped, 26–38 mm long, 13–18 mm wide at the apex of the tube, pale-yellow, yellow to yellow-green, smooth to verrucose; corolla lobes ovate, 7–10 × 6–8 mm, obtuse to rounded. Gynoecium and androecium largely unknown. Anthers elliptic to oblong, 6 × 2.5 mm, sagittate, versatile; pollen “glabra-type.” Capsules ellipsoidal, 18–22 × 7–9 mm, verrucose to pusticulate, dark brown, nodding; style remnant 8–15 mm. Seeds “perimetrically winged-type,” flattened, roughly 3- to 4-sided in outline, yet appearing as myriads of different puzzle pieces, winged, 0.4–1.0 × 0.4–0.6 mm, straw-colored, rugose-reticulate.

*Macrocarpaea pajonalis* occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It has affinities to both *M. harlingii* (Ecuador and Peru) (Fig. 4C–D), and *M. tabula-fluctivagifolia* (Peru) (Fig. 9A–B). They have general morphological similarities yet occur in distinct elevation bands, 1080–2000 m (*M. tabula-fluctivagifolia*), 1900–2500 m (*M. harlingii*), and 2500–3000 m (*M. pajonalis*). As compared with the two species of lower elevations, the morphological adaptations of *M. pajonalis* to its higher elevations are reflected in a shorter, more robust inflorescence, and shorter and thicker leaves.

On the basis of locality and gross morphological similarities, *Macrocarpaea pajonalis* may actually correspond to the name *M. ovalis* (Ruiz & Pav.) Ewan. However, since there is no extant type of *M. ovalis*, and its description is too vague to determine what the species actually is with certitude, I decided not to neotypify *M. ovalis* (Grant, 2003), and here describe *M. pajonalis*.

**Etymology:** named for the vegetation type in which it occurs, the *pajonal* of central Peru.

**Paratypes:** PERU. Huánuco: Pampayacu, small shrub, 13 January 1927, *Kanehira* 45 (GH); Prov. Leoncio Prado border to Prov. Huánuco, road from Tingo Maria to Huánuco, above pass (Carpish), 2800 m, upper margin of cloud forest, very wet, low windswept forest, *Podocarpus*, *Cybianthus*, and small-leaved *Siparunas* dominant and mixed with *Chusquea*, 29 March 2001, *Weigend et al.* 5399 (B, HUT, NY, USM [not seen]); Huánuco, km 451 on Lima-Tingo Maria road, Carpish, 2450 m, 4 m tree, fruits green, 2 June 1981, *Young & Sullivan* 507 (HAM, U). Pasco: Oxapampa, Cordillera Yanachaga, Cerro Pajonal “Chacos,” 12 km SE of Oxapampa, shrubland on white sandstone, spongy sphagnum humus up to 2 m deep except here burned, 20°35'S, 75°20'W, 2700–2800 m, shrub 0.5 m, buds yellowish, 7 October 1982, *R.B. Foster* 9008 (MO); San Gutardo, Oxapampa–Cerro de Pasco road 30–35 km W of Oxapampa, elfin forest and “pajonal,” 10°40'S, 76°00'W, 2650–2800 m, shrub 3 m, flowers pale yellow, 3 February 1983, *Gentry et al.* 39988 (HAM, USM); Border between Oxapampa and Pasco, in dwarf forest, rich with Ericaceae, bamboo and *Blechnum*, with *Sphagnum* layer below, San Cotardo, 2700 m, shrub 2 m, flowers yellow, 7 March 1986, *van der Werff* 8577 (HAM, MO)



FIGURE 11. A–F. *Macrocarpaea weigendiorum*. A, habit of flowering stem; B, flower; C, dissected flower; D, gynoecium; E, fruit; F, leaf. G–K. *M. pajonalis*. G, habit of flowering stem; H, flower; I, fruits; J, habit of flowering stem; K, flower. L–O. *M. robin-fosteri*. L, leaf and interpetiolar ridge; M, habit of flowering stem; N, bud; O, fruits. A–F, drawn from Weigend 5363; G–I, drawn from Weigend 5399; J–K, drawn from Weigend 5487; L, drawn from Weigend 5777; M–N, drawn from Foster 9114; O, drawn from Foster 8610.

[not seen]); Oxapampa, 12 km SE of town, road over shoulder of Cerro Pajonal to Villa Rica, in pajonal, i.e., in grassy semi-open vegetation on plateau of sandstone, 3000 m, flowers pale yellow, shrub to 2 m, 5 February 1997, *Weigend & Dostert 97/78* (MSB, USM [not seen]); Oxapampa, old road from Oxapampa to Villa Rica, footpath to antenna, cloud forest, open jalca area near the top, 2200–2600 m, 5 April 2001, *Weigend et al. 5487* (B, USM [not seen]).

**19. *Macrocarpaea robin-fosteri*** J.R. Grant, *sp. nov.* TYPE: PERU. Pasco: Oxapampa, road in construction between Oxapampa and Villa Rica, km 7 SE from Miraflores crest, steep forested ridge slopes, 10°37'S, 75°20'W, 2100–2400 m, arching shrub, 3–4 m, cream-colored campanulate flowers, 11 October 1982, *R.B. Foster 9114* (Holotype: MO; Isotypes: NY, USM). Fig. 11L–O.

*A Macrocarpaea pachystylae Gilg cui affinis, sed plantis spiculatis vel scabris (vs. glabris), inflorescentia densa, et calycibus campanulatis-urceolatis differt.*

Shrub or small tree to 2–4 m, hyaline spiculate with short simple hairs on stems, petioles, leaves, inflorescences, bracts, and petioles. Stems terete to slightly quadrangular above, hollow, 9–11 mm in diam. just below inflorescence. Leaves oval, elliptic to ovate, petiolate, (15.5–)19.0–39.0 cm long. Petioles 20–55 mm long, robust with slight vagination 1/4 the length of the petiole; interpetiolar ridge 2–4 mm high. Blades (14–)17–34 × 7–17 cm, entire, not revolute, dark green, with slightly impressed veins above, and raised veins below, glabrous to rarely spiculate below on veins, papery thin, to thin coriaceous; base aequilateral to slightly oblique, cuneate, rounded to attenuate and decurrent on the petiole; apex acute to acuminate. Inflorescence a much-branched open thyrses, 26–40+ cm long; branches 17–35 cm long; 5–9 flowers per branch. Bracts ovate, oval to elliptic, sessile to short-petiolate, 22–100 × 16–46 mm; base aequilateral to oblique, cuneate to rounded, acute to acuminate; bract petioles 0–4 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 14–22 mm long; bracteoles inconspicuous and scabrous, linear to triangular, 2–8 × 1–2 mm. Calyx campanulate to urceolate, 7–9 × 7–10 mm, glabrous, faintly rugose to pusticulate, ecarinate; calyx lobes ovate, 3–5 × 5–6 mm, obtuse to rounded. Corolla, funnel-

shaped, 40–47 mm long, 18–28 mm wide at the apex of the tube, pale yellow (*Weigend 5777*), cream (*Foster 9114*; *Gentry & Smith 35842*), spiculate to scabrous; corolla lobes ovate, 9–14 × 7–11 mm, obtuse to rounded. Stamens 30–37 mm long; filaments 25–30 long, filiform, flattened; anthers elliptic to oblong, 5–7 × 2.5–3.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 37–40 mm long; ovary 7–9 × 2–3 mm; style 35–37 × 0.5–1.0 mm; stigma lobe spatulate, 2–3 × 1.5–2.0 mm. Capsules ovoid to ellipsoidal, 21–29 × 9–12 mm, smooth, faint-orange tan, erect; style remnant 1–3 mm. Seeds “winged type” to verging on the “perimetrically-winged type,” flattened, prominently winged on both ends to all around, seeds winged, 0.5–1.0 × 0.3–0.9 mm, straw-colored, rugose, boldly ribbed.

*Macrocarpaea robin-fosteri* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It belongs to a group of closely related species including *M. canoëfolia*, *M. cinchonifolia*, *M. normae*, *M. obnubilata*, *M. ostentans*, and *M. tahuantinsuyuana*. It may also be related to *M. pachystyla* on the basis of similarly long-petiolate and broadly elliptic leaves that dry as herbarium specimens the same color. It is readily distinguishable by its being spiculate to scabrous throughout (vs. glabrous), a more congested inflorescence, and campanulate-urceolate calyx (vs. campanulate).

**Etymology:** named for Robin B. Foster (1945–), Field Museum of Natural History, Chicago, Illinois, U.S.A (F), prolific collector of Peruvian plants. The hyphen in the epithet is to be maintained, according to Articles 23.1 and 60.9 of the ICBN (Greuter et al., 2000).

**Paratypes:** PERU. Pasco: Oxapampa, Pichis Valley, San Matias Ridge, 10–12 km SW of Puerto Bermúdez, above Santa Rosa de Chivis, trail to Puerto Nuevo, 10°20'S, 75°00'W, 500–900 m, shrub 3 m, fruit dry, shedding seed, 8 September 1982, *R.B. Foster 8610* (HAM, MO, USM); Oxapampa, Río San Alberto, Abra Esperanza, 10°31'S, 75°20'W, 2400–2700 m, steep forested slopes and mossy ridgetop, green shrub 2 m, fruit green, 28 June 1985, *R.B. Foster et al. 10262* (USM); Cordillera Yanachaga, new road in construction from Oxapampa to Villa Rica, 7–9 km E of main road, 10°40'S, 75°20'W, 2100–2500 m, montane cloud forest, herbaceous treelet 3 m, flowers cream, 1 March 1982, *Gentry & D.N. Smith*

35842 (MO, USM); Oxapampa, road to "Pajonal" (Antenna of Oxapampa) and on to Villa Rica, 10°37' S, 75°17' W, 2515 m, treelets ca. 2 m tall in recently opened forest, otherwise probably subsacandent, flowers pale yellow, normally growing in the closed forest under canopy, 17 September 2001, *Weigend et al.* 5777 (B, USM [not seen]).

**20. *Macrocarpaea tabula-fluctivagifolia*** J.R. Grant, *sp. nov.* TYPE: PERU. Huánuco: Southwestern slope of the Río Lullapichis watershed, on the ascent of Cerros del Sira, at edge of steep embankment near Camp 3 (Laguna), 09°26' S, 74°45' W, ca. 1290 m, ascending shrub, sparsely branched, 10 ft tall, dbh 1.5 in, 15 July 1969, *F. Wolfe* 12333 (Holotype: F; Isotypes: NA, NY, USM). Fig. 9E–F.

*A Macrocarpaea harlingii* J.S. Pringle et *M. pajonalis* J.R. Grant *cui affinis, sed a M. pajonalis foliis ellipticis coriaceis, et a M. harlingii J.S. Pringle inflorescentia graciliori, floribus parvis, et calycibus brevioribus differt.*

Unbranched tree, 2.5–4.0 m, glabrous throughout, trunk to 4–10 cm diam., wood solid in trunk, hollow in younger branches, rings prominent, bark thin. Stems terete to slightly quadrangular, solid to hollow, 3–7 mm in diam. just below inflorescence. Leaves oblong, varying to obovate, petiolate, (7–)14–24 cm long. Petioles 1.5–3.0 mm long, robust with slight vagination 1/8 the length of the petiole, interpetiolar ridge 2–5 mm high. Blades (5.5–)12.5–21.5 × (2.5–)4.0–6.3 cm, entire, slightly revolute, dark above and below, lateral veins scarcely visible either above or below, glabrous, thick, leathery-coriaceous; base aequilateral to oblique, cuneate; apex acuminate to acute. Inflorescence a few-branched, open diffuse thyrse, at least 35 cm long, but actually longer since the entire inflorescence doesn't fit onto a single sheet and is cut, so the actual length is unknown; branches 7–31 cm long, 3–5 flowers per branch. Bracts lanceolate, ovate, to elliptic, petiolate, 11–55 × 3–20 mm; base aequilateral, cuneate; apex acuminate to acute; bract petioles 2–6 mm long. Flowers pedicellate, erect; pedicels 15–38 mm long; bracteoles linear to lanceolate, 3–10 × 1–3 mm. Calyx campanulate, 7–8 × 6–8 mm, glabrous, faintly verrucose, ecarinate; calyx lobes rotund, ovate to elliptic, 2.5–3.0 × 3.5–5.0 mm, apex rounded to obtuse. Corolla, pollen, fruits, and seeds unknown.

*Macrocarpaea tabula-fluctivagifolia* occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). Three species of *Macrocarpaea* occur together on the Cerro del Sira in lowland Huánuco, *M. ostentans* (Fig. 7C–D), *M. tabula-fluctivagifolia* (Fig. 9E–F), and *M. wallnoeferi* (Fig. 10K–N), and are all described as new in this paper. These three species have been collected by two groups, that of Dudley and Frank Wolfe in late 1960s, and then again by Bruno Wallnöfer in the late 1980s.

*Macrocarpaea tabula-fluctivagifolia* has affinities to both *M. harlingii* (Ecuador and Peru) (Fig. 4C–D), and *M. pajonalis* (Peru) (Fig. 11G–K). The three species have generally elliptic leathery-coriaceous leaves with a strong midvein and slight lateral veins. The inflorescences are generally diffuse and few-flowered. *Macrocarpaea tabula-fluctivagifolia* differs from *M. harlingii* in having an overall more-slender inflorescence and smaller flowers, notably in a shorter calyx (7–8 vs. 9–15 mm). *Macrocarpaea pajonalis* differs notably from *M. tabula-fluctivagifolia* and *M. harlingii* in having shorter and more-coriaceous leaves, and a denser inflorescence.

**Etymology:** from the Latin *tabula*, board, *fluctivagus*, the surf, and *folia*, leaf, for its "surf-board"-shaped leaves. The hyphen in the epithet is to be maintained, according to Articles 23.1 and 60.9 of the ICBN (Greuter et al., 2000).

**Paratypes:** PERU. Huánuco: SW slope of the Río Lullapichis watershed, ascent of Cerros del Sira, in open dry sites in reduced elfin forest (monte chico) just above camp 5 (Tabano) on way to the summit of the Sira (Cumbre-camp 6), 2000 m, small 12-ft tree, dbh 2–4 inches; leaves erect to ascending, clustered at apices of branches, flowers yellowish, 30 July 1969, *Dudley* 13473 (NA); Pachitea, region of Pucallpa, western part of the "Sira mountains" and adjacent lowland, ca. 24–26 km SE to ca. 26 km ESE of Puerto Inca, from the beginning of the mountain rain forest next to the "Campamento Pato Rojo," 09°27' S, 74°46' W (1080 m), along the mountain crest to the beginning of the elfin forest after the "Campamento Peligroso" (1560 m) at a height of 1700 m, primary cloud forest, soils: red latosols with a thick humus layer, isolated and exposed patches of xeromorphic low tree and shrubland ("Colorado") characterized by typical dense moss and fern cover, differing in

structure and species composition from the surrounding rain forest; treelet of 2.5 m, dbh 1 cm, flowers greenish-yellow, filaments greenish-white, pollen white, this plant at 1230 m, 13 June 1988, *Wallnöfer 18-13688* (U, WU).

**21. *Macrocarpaea tahuantinsuyuana*** J.R. Grant, *sp. nov.* TYPE: PERU. Pasco: 2–4 km E of Oxapampa, artificial pastures and second growth, 1820–1920 m, shrub 3.5 m, fruit green, 11 March 1984, *D.N. Smith, W. Brack-Egg & S. Knapp 6282* (Holotype: U; Isotypes: MO [not seen], NEU, NY, USM). Fig. 6C–F.

*A Macrocarpaea cinchonifoliae* (Gilg) Weaver *cui affinis, sed foliis brevioribus, calycibus concoloribus, et ramis multifloribus differt.*

Shrub or small tree to 2.0–3.5 m, glabrous throughout. Stems terete to slightly quadrangular above, solid to hollow, 5–10 mm in diam. just below inflorescence. Leaves narrowly elliptic, oblanceolate, to lanceolate, petiolate, (17–)26–35 cm long. Petioles (20–)35–45 mm long, slender with very slight vagination, interpetiolar ridge 2–4 high. Blades (15.0–)25.0–30.5 × (4.5–)7.0–11.0 cm, entire, not revolute, light green to dark green, with slightly impressed veins above and slightly raised veins below, glabrous above and below, papery thin; base aequilateral to slightly oblique, cuneate, to attenuate and decurrent on the petiole; apex acuminate to acute. Inflorescence a much-branched open thyrses, 18–44 cm long; branches 10–32 cm long; 3–9 flowers per branch. Bracts ovate, elliptic, lanceolate to oblanceolate, sessile to petiolate, 20–77 × 5–28 mm; base aequilateral to oblique, cuneate, to short-attenuate and decurrent on the petiole; apex acuminate to acute; bract petioles 0–3 mm long. Flowers pedicellate, erect to spreading; pedicels 26–38 mm long; bracteoles inconspicuous and scabrous, linear to triangular; bracteoles 1–5 × 0.5–2.0 mm. Calyx campanulate, 11–13 × 9–11 mm, glabrous, smooth, ecarinate; calyx lobes ovate to reniform, 5–6 × 5–7 mm, apex rounded to obtuse. Corolla funnel-shaped, 47–50 mm long, 23–30 mm wide at the apex of the tube, creamy white (*van der Werff 8657*), smooth, ovate; corolla lobes 12–17 × 9–16 mm, apex obtuse to rounded. Stamens 31–41 mm long; filaments 25–33 mm long, filiform, flattened; anthers elliptic to oblong, 6–8 × 2.5–3.0 mm, sagittate, versatile; pollen “corymbosa-type.” Pistil 30–45 mm long; ovary 6–8 × 2–4 mm; style 20–33 × 1

mm; stigma lobes spatulate, 4 × 2 mm. Capsules ellipsoidal to oblong, 30–37 × 10–14 mm, shiny smooth to pusticulate, greenish-brown, tan to light brown, erect to slightly nodding; style remnant 2–6 mm. Seeds “winged type,” flattened, prominently winged on both ends, winged, 0.6–2.0 × 0.4–0.9 mm, straw-colored, rugose, boldly ribbed.

*Macrocarpaea tahuantinsuyuana* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It belongs to a group of closely related species including *M. canoëfolia*, *M. cinchonifolia*, *M. normae*, *M. obnubilata*, *M. ostentans*, and *M. robin-fosteri*. These species occur from central Peru to Bolivia, generally have narrowly elliptic long-petiolate leaves, large calyces and corollas, corymbosa-type pollen, and winged-type seeds. As compared with *M. cinchonifolia*, *M. tahuantinsuyuana* has smaller leaves, smaller concolorous calyces, and more flowers per branch. It is similar to *M. canoëfolia* in slender elliptic, oblanceolate, to lanceolate leaf blades, yet just on a larger scale, (15.0–)25.0–30.5 × (4.5–)7.0–11.0 cm vs. 7.5–18.3 × 2.8–5.8 cm. In this group, *M. tahuantinsuyuana* has the smallest calyces, 11–13 × 9–11 mm vs., e.g., 16–20 × 16–18 mm in *M. canoëfolia*.

**Etymology:** from the Quichua “Tahuantinsuyu,” the name of the Inca homeland.

**Paratypes:** PERU. Junín: Chanchamayo, Mina Pichita, above San Ramon, cloud forest, 1800 m, shrub 3 m, flowers creamy white, 15 March 1986, *van der Werff et al. 8657* (MO [not seen], USM); Yaupi, 1600 m, tree 2 m, fruit last year’s, brown, two new ones green, open place in Andean ravine, 19 July 1961, *Woytkowski 6672A* (MO, U).

**22. *Macrocarpaea wallnoeferi*** J.R. Grant, *sp. nov.* TYPE: PERU. Huánuco: Pachitea, region of Pucallpa, western part of the “Sira Mountains” and adjacent lowland, ca. 24–26 km SE to ca. 26 km ESE of Puerto Inca, from the beginning of the mountain rain forest next to the “Campamento Pato Rojo,” 09°27'S, 74°46'W, 1080 m, along the mountain crest to the beginning of the elfin forest after the “Campamento Peligroso” (1560 m) at a height of 1700 m, treelet of 2.5 cm, flowers yellowish-green, anthers beige, this plant at ca. 800 m, 20 March 1988, *B. Wallnöfer 18-20388* (Holotype: U; Isotype: WU [not seen]). Fig. 10K–N.

*A Macrocarpaea sodiroanae* Gilg *cui affinis*,

*sed caulibus solidis (vs. fistulosis) 2–4 mm diam. sub inflorescentia, et calycibus et capsulis brevioribus differt.*

Shrub or small tree to 2.5–4.0 m, glabrous throughout. Trunk to 2.1 cm diam., wood always solid, rings prominent, bark papery thin and scarcely measurable, outer surface smooth to rugose, tan. Stems terete, solid, 2–4 mm in diam. just below inflorescence. Leaves elliptic-rhomboid to oval, slightly asymmetric, petiolate, (10.0–)16.0–26.5 mm long. Petioles 5–40 mm long, slender with very slight vagination; interpetiolar ridge 1–2 mm high. Blades (9.5–)14.5–22.5 × (5.0–)7.0–8.5 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; base aequilateral, cuneate, to attenuate and decurrent on the petiole; apex acuminate. Inflorescence a much-branched open thyrse, 14–26 cm long; branches 6–19 cm long; 3–12 flowers per branch. Bracts oval, lanceolate, to elliptic-rhomboid, petiolate, 13–93 × 4–40 mm; base aequilateral to oblique, cuneate to rounded; apex acuminate; bract petioles 1–9 mm long. Flowers pedicellate, erect to slightly spreading; pedicels 13–23 mm long; bracteoles often absent, those present are inconspicuous and scabrous, linear, triangular to ovate, 0.5–7.0 × 0.5–2.0 mm. Calyx campanulate, 6–8 × 5–6 mm, glabrous, faintly rugose to pustulate, ecarinate; calyx lobes ovate, 2.0–3.5 × 3.0–3.5 mm, apex rounded, obtuse to acute. Corolla funnel-shaped, 24–30 mm long, 11–16 mm wide at the apex of the tube, yellowish-green (*Wallnöfer 18-20388*), green (*Dudley 12269A*, *Wolfe 12269A*), purplish-yellow (*Smith 6550*), smooth, ovate to elliptic; corolla lobes 5–9 × 4–5 mm, obtuse to rounded. Stamens 17.5–22.0 mm long; filaments 14–18 mm long, filiform; anthers elliptic to oblong, 3.5–4.0 × 1.0–2.5 mm, sagittate, versatile; pollen “glabra-type.” Pistil 23–26 mm long; ovary 4–6 × 2–3 mm; style 16–18 × 1 mm; stigma lobes spatulate to rounded, 2–3 × 1.0–1.5 mm. Capsules linear-long to narrowly ellipsoid, 23–30 × 5–6 mm, smooth, pustulate to rugose, tan to light brown, erect to slightly nodding; style remnant to 1–3 mm. Seeds “perimetrically winged,” flattened, angular, roughly triangular in outline, yet appearing as myriads of different puzzle pieces, 0.8–1.0 × 0.4–0.9 mm, orangish-tan, straw-colored to

light brown, testa reticulate, wings ribbed.

*Macrocarpaea wallnoeferi* occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It appears to be related to *M. sodiroana*, from which it differs in having solid stems (vs. hollow) that are only 2–4 mm in diam. below the inflorescence (vs. 4–15 mm), smaller calyces (6–8 × 5–6 mm vs. 5–10 × 8–10 mm), and smaller capsules (23–30 × 5–6 mm vs. 28–41 × 5–9 mm).

Dudley and Wolfe collected together on the Cerros del Sira in 1969. Their two collections of this species are *Dudley 12269A* (NA) and *Wolfe 12269a* (F) with identical labels. They undoubtedly refer to the same collection simply deposited by the two different collectors in two different herbaria.

**Etymology:** named for Bruno Wallnöfer (1960–), curator at the Herbarium, Department of Botany, Naturhistorisches Museum Wien, Austria (W).

**Paratypes:** PERU. Huánuco: southwestern slope of the Río LullaPichichis watershed, ascent of Cerros del Sira, in open rain forest above camp 2 (Patricio), 09°30' S, 74°47' W, 1000 m, ascending woody shrub, 3 m, dbh 2.5–4.0 cm, flowers and fruits green, 7 July 1969, *Dudley 12269A* (NA [2 sheets]); southwestern slope of the Río LullaPichichis watershed, ascent of Cerros del Sira, in open rain forest above camp 2 (Patricio), 09°30' S, 74°47' W, 1000 m, ascending woody shrub, 3 m, dbh 2.5–4.0 cm, flowers and fruits green, 7 July 1969, *Wolfe 12269A* (F [2 sheets]); Pachitea, region of Pucallpa, western part of the “Sira Mountains” and adjacent lowland, ca. 24–26 km SE to ca. 26 km ESE of Puerto Inca, from the beginning of the mountain rain forest next to the “Campamento Pato Rojo,” 09°27' S, 74°46' W, 1080 m, along the mountain crest to the beginning of the elfin forest after the “Campamento Peligroso” (1560 m) at a height of 1700 m, primary cloud forest, soils: red latosols with a thick humus layer, treelet of 4 m, dbh 2 cm, unripe fruits green, this plant at ca. 1230 m, 12 April 1988, *Wallnöfer 110-12488* (U, WU [not seen]). Junín: Satipo, Gran Pajonal, between Paucarete and Tihuanaski, secondary forest, 10°45' S, 74°23' W, 1200 m, shrub 3 m tall, flowers purple-yellow, 29 March 1984, *Smith, D.N. 6550* (MO [not seen], NEU, U). Pasco: Prov. Oxapampa, W side of Cordillera de San Matias between Iscosacin and summit, 10°11' S, 75°2' W, 910 m, crest of

mountains, cloud forest with heavy bryophyte cover on ground and all plants, shrub 2.5 m, capsules green, 22 June 1982, *D. Smith 2050* (HAM, MO, USM [not seen]).

**23. *Macrocarpaea weigendiorum*** J.R. Grant, *sp. nov.* TYPE: PERU. Ucayali: Prov. Aguaytia, road from Aguaytia to Tingo Maria, km 33, Abra Divisoria, 09°09' S, 75°45' W, 930 m, old tea plantation at summit of pass, extremely wet and all trees covered in beard of liverworts, tree to ca. 4 m tall, flowers yellow, 26 March 2001, *M. Weigend, K. Weigend, M. Binder & E. Rodríguez 5363* (Holotype: B; Isotypes: F, HUT [2 sheets], M [not seen], NY [2 sheets], U, US). Fig. 11A–F.

*A Macrocarpaeae revolutae (Ruiz & Pavon) Gilg cui affinis, sed foliis breve-petiolatis, inflorescentia diffusa, pedicellis cernuis, et calycibus carinatis differt; et hic auctor et Maximiliani Weigendi idem dies natalis habent.*

Shrub or small tree, 3–4 m, glabrous throughout. Stems terete to slightly quadrangular, hollow, 10–25 m in diam. just below inflorescence. Leaves broadly elliptic below, varying to ovate to toward the inflorescence, sessile to short-petiolate, 19–47 cm long. Petiole absent, the leaf blade so attenuate and decurrent that it obscures the delineation of a petiole, which would be robust with strong open vagination; interpetiolar ridge 4–8 mm high. Blades 19–47 × 11.5–18.0 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; base aequilateral, attenuate and decurrent onto the petiole; apex rounded, obtuse to acute. Inflorescence a much-branched open thyrse, 45+ cm long, as the inflorescence of the single plant has been cut into multiple lengths for separate herbarium sheets; branches 10–37 cm long; 5–13 flowers per branch. Bracts widely varying in shape and size depending on position in the inflorescence; generally large, leaf-like, elliptic to ovate, sessile to short-petiolate, 8–190 × 5–115 mm; base aequilateral, oblique, rounded, to short-attenuate and decurrent onto the petiole; base acute, obtuse to acuminate; bract petioles 0–2 mm long.

Flowers pedicellate, distinctly spreading, bending the pedicels as if the flowers were overweight; pedicels 25–44 mm long; bracteoles inconspicuous and scabrous, triangular to spatulate, 1.5–6.0 × 0.5–2.0 mm. Calyx campanulate, 10–16 × 8–14 mm, glabrous, smooth, green, carinate on calyx lobes, and separately carinate on calyx tube, keels to 0.5–2.0 mm wide; calyx lobes ovate to rotund, 6–8 × 5–7 mm, acute, obtuse to rounded. Corolla funnel-shaped, 35–45 mm long, 26–38 mm wide at the apex of the tube, greenish-white (*Díaz & Baldéon 2271*) to yellow (*Weigend 5363*), smooth, ovate; corolla lobes 12–21 × 9–19 mm, obtuse to rounded. Stamens 27–34 mm long; filaments 22–28 mm long, filiform, flattened; anthers elliptic to oblong, 5–6 × 2.5–3.0 mm, sagittate, versatile. Pistil 36–40 mm long; ovary 10–11 × 0.5–1.0 mm; style 22–24 × 0.5–1.0 mm; stigma lobes spatulate to suborbicular, 3–5 × 2.5–3.0 mm; pollen “corymbosa-type.” Capsules ellipsoidal to oblong, 30–33 × 11–14 mm, shiny smooth to pusticulate, dark brown, spreading to nodding in maturity; style remnant to 5–15 mm. Seeds “winged type,” flattened, prominently winged on both ends, 1.6–2.0 × 0.50–0.75 mm, straw-colored, rugose, boldly ribbed.

*Macrocarpaea weigendiorum* belongs to sect. *Magnolifoliae* and occurs in the Central Andes, the Cordillera Central of Peru (Fig. 2). It is unique in *Macrocarpaea* in having robust keels on the calyx and pedicel (see Fig. 11B). It appears to be related to *M. revoluta* (Fig. 9G–H), sharing sessile to short-petiolate leaves and broad open inflorescences, but clearly differs in its long drooping pedicels and keeled calyces.

**Etymology:** named for Maximilian (1969–) and Katja Weigend (1968–), Freie Universität Berlin, Berlin, Germany (BSB), specialists of Loasaceae and prolific collectors of Peruvian plants.

**Paratype:** PERU. Huánuco: Prov. Leoncio Prado, Cumbre “La divisoria,” carretera entre Tingo Maria y Pucallpa, trocha de la cumbre hacia la derecha, 170 m, hierba arbustiva 3 m, flores blanco verdosas, 18 January 1987, *Díaz & Baldéon 2271* (HAM, MO [not seen], NEU, U, USM).

TYPIFICATION OF ALL NAMES PUBLISHED IN  
(OR TRANSFERRED TO) *MACROCARPAEA* AS OF THE YEAR 2002

This is a list of all names that have been originally described in *Macrocarpaea*, or that have been transferred to the genus. The names are listed alphabetically by basionym. For those species that are no longer accepted in the genus, or recognized in synonymy under other species of *Macrocarpaea*, the name as currently accepted is appended.

All herbarium material of *Macrocarpaea* at Berlin (B) was destroyed during the Second World War, except for the type of *Lisianthus macrophyllus*, which survived in the Willdenow Herbarium (B-Willd). Both Gilg and Gilg-Benedict likely had type (holotypic) material at Berlin of each of the many new species they described. Luckily, there is isotypic material in many other herbaria from which to select lectotypes (e.g., BM, BR, C, E, G, GH, GOET, K, LD, M, MANCH, MICH, MO, NY, OXF, P, PH, QPLS, US, and W). Twelve lectotypes are selected here, these being for *Lisianthus obtusifolius* var. *constrictus* Griseb., *Macrocarpaea bangiana* Gilg, *M. bogotana* Gilg, *M. calophylla* Gilg, *M. chlorantha* Gilg, *M. cochabambensis* Gilg-Ben., *M. glaziovii* Gilg, *M. hartii* Krug & Urb., *M. micrantha* Gilg, *M. pachyphylla* Gilg, *M. polyantha* Gilg, and *M. rubra* Malme. A neotype is selected for *M. duquei* Gilg-Ben., and the name *Macrocarpaea weberbaueri* Gilg is excluded from use.

*Calolisianthus tepuiensis* Gleason, Brittonia 3: 188–189. 1939. *Macrocarpaea tepuiensis* (Gleason) Steyererm., Fieldiana, Bot. 28(3): 498. 1953. *Rogersonanthus tepuiensis* (Britton) Maguire & Boom, Mem. New York Bot. Gard. 51: 4. 1989. TYPE: Venezuela. Amazonas: *Tate 1361* (Holotype: NY) = ***Rogersonanthus arboreus*** (Britton) Maguire & Boom, Mem. New York Bot. Gard. 51: 8. 1989.

*Chelonanthus arboreus* Britton, Bull. Dept. Agr. Trin. & Tob. 19: 230. 1922. *Macrocarpaea arborea* (Britton) Ewan, Contr. U. S. Natl. Herb. 29: 221. 1948. TYPE: Trinidad. *Britton 1295* (Holotype: NY) = ***Rogersonanthus arboreus*** (Britton) Maguire & Boom, Mem. New York Bot. Gard. 51: 8. 1989.

*Lisianthus browallioides* Ewan, Proc. Biol. Soc. Washington 64: 132. 1951. TYPE: Panama. Bocas del Toro; *Allen 4932* (Holotype: MO; Isotype: G) = ***Macrocarpaea browallioides*** (Ewan) A. Robyns & S. Nilsson, Bull. Jard. Bot. Natl. Belg. 40: 14. 1970.

*Lisianthus corymbosus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799, *nom illeg.*, *Macrocarpaea corymbosa* (Ruiz & Pav.) Ewan, Contr. U. S. Natl. Herb. 29: 242. 1948. TYPE: Peru. Huánuco: *Ruiz & Pavon s.n.* (Lectotype: MA–Ruiz & Pavon [2 sheets]; Isolectotypes: BM [5 sheets], F [2 sheets], G [2 sheets]), selected by Grant (2003) = ***Macrocarpaea pachystyla*** Gilg, Bot. Jahrb. Syst. 22: 336. 1896.

*Lisianthus densiflorus* Benth., Pl. Hartw. 227. 1846. TYPE: Colombia. Cauca: *Hartweg 1241*

(Holotype: K) = ***Macrocarpaea densiflora*** (Benth.) Ewan, Contr. U. S. Natl. Herb. 29: 232. 1948.

*Lisianthus glaber* L.f., Suppl.: 134. 1781. ***Macrocarpaea glabra*** (L.f.) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895. TYPE: COLOMBIA. *Mutis* specimen 213.2 (Lectotype: LINN), designated by Weaver (1972: 304). There are *Mutis* specimens of *Lisianthus glaber* at G, MA–*Mutis*, S, and US that could ostensibly be designated as isolectotypes. However, the lectotype at LINN does not have a collection number, whereas all the other collections do (*Mutis 90*, *Mutis 333*, *Mutis 383*, and *Mutis 4562*). Also, while Linnaeus filius surely saw the material at LINN, it is unlikely he examined the material in the other herbaria.

*Lisianthus loranthoides* Griseb., Gen Sp. Gent. 179. 1839. TYPE: Peru. Amazonas: *Mathews 1315* (Holotype: K; Isotypes: E, OXF) = ***Macrocarpaea loranthoides*** (Griseb.) Maas Cat. Fl. Pl. Gymn. Peru (Mon. Syst. Bot. Missouri Bot. Gard. 45): 1256. 1993.

*Lisianthus macrophyllus* Kunth, Nov. Gen et Sp. 3: 183. (9 July) 1819. ***Macrocarpaea macrophylla*** (Kunth) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895. TYPE: Colombia. *crescit locis subfrigidis in declivitate Parami de Almaguer, inter Pansitarra et flumen, Humboldt & Bonpland s.n.* (Lectotype: P [P–Herbarium Humboldt, Bonpland & Kunth, microfiche, IDC 6209. 72: III. 6], designated by Weaver [1972: 305]; Isolectotype: *Humboldt 3561* [B–Willd, microfiche 7440, No. 246, 3561], determined here).

- Lisianthus obtusifolius* Griseb., Gen et Sp. Gent.: 175. 1839. *Helia obtusifolia* (Griseb.) Kuntze, Rev. Gen. 428. 1891. TYPE: Brazil. Rio de Janeiro: *Sellow s.n.* (Lectotype: K; Isolectotype: P), designated by Weaver (1972: 305) = *Macrocarpaea obtusifolia* (Griseb.) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus obtusifolius* var. *constrictus* Griseb., Gen. et Sp. Gent.: 175. 1839. *Macrocarpaea glaziovii* Gilg subsp. *constricta* (Griseb.) Ewan, Proc. Biol. Soc. Washington 65: 189. 1952. TYPE: Brazil. Minas Gerais, 1000', *Langsdorff s.n.* (Lectotype : K [herb. Hooker]; Isolectotype: BR, designated here) = *Macrocarpaea glaziovii* Gilg, Bot. Jahrb. Syst. 22: 335. 1896.
- Lisianthus ovalis* Ruiz & Pav., Fl. Peruv. Chil. 2: 13. 1799. *Macrocarpaea ovalis* (Ruiz & Pav.) Ewan, Contr. U. S. Natl. Herb. 29: 234. 1948. TYPE: Peru. Huánuco: *Ruiz & Pavon s.n.*; original material no longer extant, determined by Grant (2003). Name not neotypified since the protologue is too vague to accurately associate it with any currently known species.
- Lisianthus quelchii* N.E. Br., Trans. Linn. Soc. II, Bot. 6: 50, pl. 8, Figs. 6–9. 1901. *Symbolanthus quelchii* (N.E. Br.) Gleason, Bull. Torrey Bot. Club 56: 402. 1929. *Macrocarpaea quelchii* (N.E. Br.) Ewan, Contr. U. S. Natl. Herb. 29: 233. 1948. *Irlbachia quelchii* (N.E. Br.) Maas, Proc. Kon. Ned. Akad. Wetensch. Ser. ca. 88(4): 410. 1985. TYPE: Venezuela. Bolivar: *Quelch 106 & 649* (syntypes K) = *Rogersonanthus quelchii* (N.E. Br.) Maguire & Boom, Mem. New York Bot. Gard. 51: 4. 1989.
- Lisianthus revolutus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799. *Helia revoluta* (Ruiz & Pav.) Kuntze, Rev. Gen. 428. 1891. TYPE: Peru. Huánuco: *Ruiz & Pavon s.n.* (Lectotype: MA–Ruiz & Pavon; Isolectotypes: BM [2 sheets], MA–Ruiz & Pavon [3 sheets], F, G [3 sheets]), selected by Grant (2003) = *Macrocarpaea revoluta* (Ruiz & Pav.), Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895. (Fig. 9G–H).
- Lisianthus thamnoides* Griseb., Fl. Brit. W. Ind.: 424. 1864. *Helia thamnoides* (Griseb.) Kuntze, Rev. Gen. 428. 1891. TYPE: Jamaica. *Macfayden s.n.* (Holotype: K) = *Macrocarpaea thamnoides* (Griseb.) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus viscosus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799. *Helia viscosa* (Ruiz & Pav.) Kuntze, Rev. Gen. 428. 1891. TYPE: Peru. Huánuco: *Ruiz & Pavon s.n.* (Lectotype: MA–Ruiz & Pavon; Isolectotype: MA–Ruiz & Pavon, selected by Grant (2003) = *Macrocarpaea viscosa* (Ruiz & Pav.) Gilg, Bot. Jahrb. Syst. 22: 337. 1896. (Fig. 6I–J)
- Macrocarpaea acuminata* Weaver, J. Arnold Arbor. 53(4): 555. 1972. TYPE: Costa Rica. Cartago: *Jiménez M. 2023* (Holotype: F; Isotypes: BM, GH, NY).
- Macrocarpaea affinis* Ewan, Proc. Biol. Soc. Wash. 63: 163. 1950. TYPE: Colombia. Santander: *Uribe 1991* (Holotype: US; Isotype: COL).
- Macrocarpaea angelliae* J.R. Grant & Struwe, Harvard Pap. Bot. 5(2): 490. 2001. TYPE: Ecuador. Zamora-Chinchipec: *Romoleroux 804* (Holotype: NY; Isotypes: AAU, QCA).
- Macrocarpaea angustifolia* J.S. Pringle, Novon 12(1): 80. 2002. TYPE: Peru. Pasco: *R.B. Foster 7747* (Holotype: MO; Isotype: USM).
- Macrocarpaea arborescens* Gilg, Bot. Jahrb. Syst. Beibl. 111: 50. 1913. TYPE: Colombia. Cauca: *Lehmann 5450* (type B? [destroyed]; Lectotype: GH; Isolectotypes: F, K, US), selected by Grant (2003).
- Macrocarpaea autanae* Weaver, Mem. New York Bot. Gard. 32: 336. 1981. TYPE: Venezuela. Amazonas: *Steyermark 105191* (Holotype: VEN; Isotype: NY).
- Macrocarpaea ayangannae* J.R. Grant, Struwe & Boggan, Harvard Pap. Bot. 5(2): 493. 2001. TYPE: Guyana. *Pipoly 11103* (Holotype: US [2 sheets]; Isotype: NY)
- Macrocarpaea bangiana* Gilg, Bot. Jahrb. Syst. 22: 335. 1896. TYPE: Bolivia. LA PAZ: *Bang 520* (type B? [destroyed]; Lectotype: NY [2 sheets]; Isolectotypes: BM, E, G [3 sheets], GH [2 sheets], K, M, MANCH, MICH, MO, US [2 sheets], W, selected here).
- Macrocarpaea bogotana* Gilg, Bot. Jahrb. Syst. 22: 337. 1896. TYPE: Colombia. Cundina-

marca: *Holton 470* (type B? [destroyed]; Lectotype: G; Isolectotypes: G, GH, K, NY, selected here) = *Macroparpea glabra* (L.f.) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.

*Macroparpea bracteata* Ewan, Contr. U.S. Natl. Herb. 29: 236. 1948. TYPE: Venezuela. Lara: *Steyermark 55224* (Holotype: F; Isotype: US).

*Macroparpea calophylla* Gilg, Bot. Jahrb. Syst. 22: 339. 1896. TYPE: Colombia. Magdalena: *Funcke 530* (type B? [destroyed]; Lectotype: G; Isolectotypes: BM, K, LD, OXF, W, selected here).

*Macroparpea cerronis* Ewan, Contr. U.S. Natl. Herb. 29: 223. 1948. TYPE: Venezuela. Bolivar: *Steyermark 60058* (Holotype: F; Isotype: US) = *Rogersonanthus arboreus* (Britton) Maguire & Boom, Mem. New York Bot. Gard. 51: 8. 1989.

*Macroparpea chlorantha* Gilg, Feddes Repert. Sp. nov. Regni Veg. 2: 53. 1906. TYPE: Peru. Amazonas: *Weberbauer 4411* (type B? [destroyed]; Lectotype: G, selected here) = *Macroparpea loranthoides* (Griseb.) Maas Cat. Fl. Pl. Gymn. Peru (Mon. Syst. Bot. Missouri Bot. Gard. 45): 1256. 1993.

*Macroparpea cochabambensis* Gilg-Ben., Notizbl. Bot. Gart. Berlin 13: 381. 1936. TYPE: Bolivia. Cochabamba: *Steinbach 8992* (type B? [destroyed]; Lectotype: NY; Isolectotypes: BM, E, G, K, MO, S, U, Z, selected here).

*Macroparpea domingensis* Urb. & Ekman, Ark. Bot. 23A(11): 30. 1931. TYPE: Dominican Republic. Santo Domingo: *Ekman H11504* (Holotype: S; Isotypes: K, US).

*Macroparpea duquei* Gilg-Ben., Notizbl. Bot. Gart. Berlin 13: 382. 1936. TYPE: Colombia. Cauca: *Duque-Jaramillo 2* (Holotype: B? [destroyed]; Neotype: Colombia. Cauca: *Cuatrecasas 21824* (US); Isoneotypes: COL [3 sheets], F, selected here).

*Macroparpea glaziovii* Gilg, Bot. Jahrb. Syst. 22: 335. 1896. TYPE: Brazil. Rio de Janeiro: *Glaziou 4939* (type B? [destroyed]; Lectotype: P [3 sheets]; Isolectotypes: C [2 sheets], K, selected here).

*Macroparpea guttifera* Ewan, Contr. U.S. Natl. Herb. 29: 237. 1948. TYPE: Peru. Loreto: *Killip & Smith 27045* (Holotype: US) = *Ravenia biramosa* Ducke, Arch. Inst. Biol. Veg. 2: 48. 1935 (Rutaceae), see Grant and Struwe (2001: 497).

*Macroparpea harlingii* J.S. Pringle, Fl. Ecuador 53(159A): 101. 1995. TYPE: Ecuador. Zamora-Chinchipec: *Harling 23531* (Holotype: GB; Isotype: QCA).

*Macroparpea hartii* Krug & Urb., Notizbl. Bot. Gart. Berlin 1: 80. 1895. TYPE: Jamaica. *Hart 1417* (Lectotype: S; Isolectotype: US, selected here) = *Macroparpea thamnoides* (Griseb.) Gilg. Krug & Urban cite two specimens in their protologue, *Hart 1417* (S, US) and *Harris 5352* (BM, US). The Hart material is selected as lectotype since the species was named in his honor, and the material is more ample.

*Macroparpea luteynii* J.R. Grant & Struwe, Harvard Pap. Bot. 5(2): 495. 2001. TYPE: Colombia. Cauca: *Luteyn 7466* (Holotype: NY; Isotypes: COL, F, HAM, MO, U, US).

*Macroparpea marahuacae* Struwe & V.A. Albert, Harvard Pap. Bot. 3(2): 182. 1998. TYPE: Venezuela. Amazonas: *Liesner 24651* (Holotype: MO).

*Macroparpea micrantha* Gilg, Bot. Jahrb. Syst. 22: 338. 1896. TYPE: Peru. San Martín: *Spruce 4618* (type B? [destroyed]; Lectotype: NY; Isolectotypes: BM, BR, C, E, G [3 sheets], GH, GOET, K [2 sheets], LD, OXF [2 sheets], P, W [2 sheets], selected here).

*Macroparpea neblinae* Maguire & Steyer., Mem. New York Bot. Gard. 32: 332. 1981. TYPE: Venezuela. Amazonas: *Maguire 37103* (Holotype: NY; Isotype: US).

*Macroparpea pachyphylla* Gilg, Bot. Jahrb. Syst. 22: 338. 1896. TYPE: Colombia. Nariño: *Jameson 467* (type B? [destroyed]; Lectotype: G; Isolectotypes: BM, G [2 sheets], K, OXF, US, selected here).

*Macroparpea pachystyla* Gilg, Bot. Jahrb. Syst. 22: 336. 1896. TYPE: Peru. Chicoplaya, *Tafalla s.n.* (type B? [destroyed]; Lectotype: MA–Ruiz & Pavon [2 sheets]; Isolectotype: G), selected by Grant (2003).

*Macroparpaea pauciflora* Alain, Mem. Soc. Cubana Hist. Nat. 22: 115. 1955. TYPE: Cuba, Oriente: *Alain 3855* (Holotype: LS [not seen]; Isotype: NY) = *Macroparpaea pinetorum* Alain Mem. Soc. Cubana Hist. Nat. 22: 114. 1955 (see Thiv and Grant, 2002).

*Macroparpaea pinetorum* Alain Mem. Soc. Cubana Hist. Nat. 22: 114. 1955. TYPE: Cuba, Oriente: *Clemente 4401* (Holotype: LS [not seen]; Isotypes: GH, US).

*Macroparpaea piresii* Maguire, Mem. New York Bot. Gard. 32: 338. 1981. TYPE: Brazil, Amazonas: *Maguire 60453* (Holotype: NY; Isotypes: MG, US, VEN).

*Macroparpaea polyantha* Gilg, Bot. Jahrb. Syst. 22: 336. 1896. TYPE: Colombia, Cundinamarca: *Goudot 1* (type B? [destroyed]; Lectotype: G; Isolectotypes: G, GOET, K, P, selected here) = *Macroparpaea glabra* (L.f.) Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.

*Macroparpaea rubra* Malme, Ark. Bot. 22A(2): 3. 1928. TYPE: Brazil, Paraná: *Dusén s.n.* (Lectotype: S; Isolectotypes: GH, LD, selected here).

*Macroparpaea rugosa* Steyerl., Bol. Soc. Venez. Cienc. 25: 83. 1963. TYPE: Venezuela, Bolivar: *Steyerl & Wurdack 861* (Holotype: VEN; Isotypes: F, NY).

*Macroparpaea salicifolia* Ewan, Contr. U.S. Natl. Herb. 29: 224. 1948. TYPE: Venezuela, Bolivar: *Steyerl 60279* (Holotype: F) = *Rogersonanthus arboreus* (Britton) Maguire & Boom, Mem. New York Bot. Gard. 51: 8. 1989.

*Macroparpaea sodiroana* Gilg, Bot. Jahrb. Syst. 25: 724. 1898. TYPE: Ecuador, Pichincha: *Sodiro 101/1* (type B? [destroyed]; Lectotype: QPLS; Isolectotypes: QPLS [2 sheets]), selected by Grant (2003).

*Macroparpaea stenophylla* Gilg, Bot. Jahrb. Syst. 22: 337. 1896. TYPE: Peru, Amazonas: *Stübel 24* (type B? [destroyed]; Neotype *Williams 7582* [F]), selected by Grant and Struwe (2001).

*Macroparpaea subcaudata* Ewan Contr. U.S. Natl. Herb. 29: 224. 1948. TYPE: Costa Rica, San José: *Wercklé 16492* (Holotype: US; Isotype: NY).

*Macroparpaea valerii* Standl. Publ. Field Mus. Nat. Hist. Chicago Bot. Ser. 18: 928. 1938. TYPE: Costa Rica, San José: *Valerio 692* (Holotype: F).

*Macroparpaea weberbaueri* Gilg, Feddes Repert. Sp. nov. Regni Veg. 2: 54. 1906. TYPE: Peru, *Weberbauer 4655* and *Weberbauer 5006* (types B? [destroyed]). All original material of *M. weberbaueri* is no longer extant, and therefore this name is excluded from use. No isotypic material has been located in other herbaria. The two Weberbauer collections are from two strikingly different regions of Peru: collection 4655 is from “in montibus septentrionem versus a Moyobamba, Dept Loreto,” and collection 5006 is from “supra haciendam Idma, Cuzco, Prov. Convención.” On the basis of their localities in Amazonas and Cuzco alone, these undoubtedly represent two different species. The Moyobamba collection, *Weberbauer 4655*, is possibly *M. micrantha*, while the Cuzco specimen, *Weberbauer 5006*, may be *M. normae*, described in this paper. Since *M. weberbaueri* is based on two discordant and missing collections, the name is not neotypified, and therefore simply excluded from use, as in the case of *Lisianthus ovalis* (see Grant, 2003). Ewan (1948: 240) placed *M. weberbaueri* into synonymy under *M. micrantha*, (and was also followed by MacBride, 1959: 287), so the exclusion of the name is not problematic from the viewpoint of the stability of names.

*Rusbyanthus cinchonifolius* Gilg, in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 95. 1895. TYPE: Bolivia, La Paz: *Rusby 1173* (type B? [destroyed]; Lectotype: NY; Isolectotypes: BM, E, G, P, PH, S, US, WIS, selected by Weaver, 1974: 300) = *Macroparpaea cinchonifolia* (Gilg) Weaver, J. Arnold Arbor. 55(2): 300. 1974.

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