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DE MACROCARPAEAE GRISEBACH (EX GENTIANACEIS) SPECIEBUS NOVIS I: AN INTRODUCTION TO THE GENUS *MACROCARPAEA* AND THREE NEW SPECIES FROM COLOMBIA, ECUADOR, AND GUYANA

JASON R. GRANT[1] AND LENA STRUWE[2]

Abstract. A monographic revision of the neotropical genus *Macrocarpaea* (Gentianaceae: Helieae) has been initiated. The taxonomic and nomenclatural background is provided as an introduction in this first of several papers. These gentians are typically montane shrubs with large, funnelform, night-blooming, bat-pollinated flowers and have a high rate of species endemicity. It is also an excellent group from which to study neotropical montane biogeography, since they occur in all major neotropical montane habitats. Three new species are described and illustrated: *Macrocarpaea angelliae* (Ecuador) in discussion with *M. stenophylla* where a neotype is selected, *M. ayangannae* (Guyana), and *M. luteynii* (Colombia). New synonymy is reported for one published species [*Macrocarpaea guttifera* = *Ravenia biramosa* (Rutaceae)] and six "nomen herbariorum": "Axelsonia globiflora Dusén, ined." = *M. rubra*, "M. buchtienii Gilg, ined." = *M. cinchoniifolia*, "M. ekmanii Ewan, ined." = *M. pinetorum*, "M. gilgiana Rusby, ined." = *M. cochabambensis*, "M. peduncularis Rusby, ined." = *M. bangiana*, and "M. tabacifolia Ewan, ined." = *M. cinchoniifolia*.

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

Macrocarpaea is a genus of herbs, shrubs, and small trees that occur primarily in montane regions of the Neotropics. The flowers are generally large (2.0–7.5 cm long), funnelform, night-blooming, and bat-pollinated. With some 65+ species, it is the largest genus in the tribe Helieae, has a high rate of species endemicity, and exhibits a wide range of morphological variation. Important and taxonomically consistent morphological characters at the species rank that are readily visible on herbarium material include the architecture of the inflorescence (a thyrse, where the primary branching is racemose, and the secondary is cymose); position of the flowers before and after anthesis (erect, spreading, horizontal, nodding); calyx size, shape (lobes acute, acuminate, cuspidate, obtuse, rounded), vestiture (glabrous, scabrous, hairy); and leaf size and shape (linear, lanceolate, ovate, elliptical, obovate).

Macrocarpaea is positioned in the tribe Helieae of the Gentianaceae (Clade C in Thiv et al., 1999) and is itself monophyletic (Grant and Struwe, 2000; Grant and Struwe, unpubl.). The genus has a geographic distribution pattern typical of many groups in the Neotropics. Within the primary range (Costa Rica and Panama, and the Andes of Venezuela through Colombia, Ecuador, and Peru to Bolivia), there are around 52 species of narrow endemics and relatively few wide-ranging species (e.g., *Macrocarpaea sodiroana* and *M. revoluta*). Outside this primary and generally contiguous range, there are four species endemic to the Greater Antilles

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(Cuba, Dominican Republic, and Jamaica), six species endemic to the Guayana Highlands (Brazil, Guyana, and Venezuela), and three species endemic to southeastern Brazil. The center of diversity of the genus appears to be in the Andes of Colombia, Ecuador, and Peru, where the largest number of species and nearly all the undescribed species are found.

Grisebach (1839) described *Lisyanthus* sect. *Macrocarpaea*, which was elevated to the genus rank by Gilg (1895). In the latter work, Gilg also described the monotypic genus *Rusbyanthus* based on a species with warty pollen [*R. cinchoniifolius* Gilg] that Weaver (1974) reduced to synonymy under *Macrocarpaea*. The only revision ever made of *Macrocarpaea* was published by Ewan (1948), who recognized 31 species based on 95 herbarium collections. Since then, the five species that have pollen in tetrads [*M. arborea* (Britton) Ewan, *M. quelchii* (N. E. Brown) Ewan, *M. cerronis* Ewan, *M. salicifolia* Ewan, and *M. tepuiensis* (Gleason) Steyerm., the latter three being placed in synonymy under *Rogersonanthus arboreus* (Maguire and Boom, 1989; Struwe et al., 1999) were segregated by Maguire and Boom (1989) as the new genus *Rogersonanthus*. This resulted in the genus *Macrocarpaea* being specifically defined as having pollen only in monads (Nilsson 1968, 1970). Additionally, since Ewan (1948) to the present time, 13 species have either been transferred to *Macrocarpaea* or described as new (Ewan, 1950, 1951; Alain, 1955; Steyermark, 1963; Robyns and Nilsson, 1970; Weaver, 1972, 1974; Maguire, 1981; Maas, 1993; Pringle, 1995; Struwe and Albert, 1998). Several works have addressed *Macrocarpaea* taxonomy in specific regional areas (Costa Rica—Weaver, 1972; Panama—Sytsma, 1987; Ecuador—Pringle, 1995; and the Venezuelan Guayana—Struwe et al., 1999); however, no modern comprehensive treatment exists for the genus. This paper is part of an in-progress revision of the entire genus, based on the examination of over 1700 herbarium specimens on loan from over 50 herbaria throughout the world. Several species recognized by Ewan will be synonymized, and at least 65 species will be accepted, a third of which are so far undescribed. Three of these new species are described here in this first of a series of papers on *Macrocarpaea* systematics.

Macrocarpaea stenophylla Gilg, Bot. Jahrb. Syst. 22: 337. 1896. NEOTYPE: PERU. Amazonas: Central Cordillera of the Andes, Chachapoyas to Moyabamba, small shrub, La Jalca, 2700–3300 m, 20 January 1930, *Williams 7582* (Neotype: F, here designated).

Gilg (1896) based *Macrocarpaea stenophylla* on a single specimen, *Stübel 24* (B). Since this material cannot be currently located, it was presumably destroyed when the Berlin-Dahlem herbarium was partially destroyed during the Second World War. No isotypes have been found, so our identification of the species is based entirely on the original description and locality information. Ewan (1948) cited *Stübel 24* (B) and *Williams 7582* (F) as the two specimens he knew of *M. stenophylla*. Because the Stübel collection is missing, and since the Williams material does in fact match the protologue, the latter is here selected as the neotype for *M. stenophylla*.

During the research on these specimens of *Macrocarpaea stenophylla*, as well as the material cited by Pringle (1995: 97–98) in *Flora of Ecuador*, a problem emerged. The Ecuadorian material cited by Pringle clearly represented a taxon quite different from the Peruvian. Therefore, the three Peruvian specimens alone are here identified as *M. stenophylla*, while the Ecuadorian material represents a new species that is described below as *M. angelliae*.

Additional material examined: PERU. Amazonas: Cerro de Fraijaco (Huaui-Huni), NE of Tambo de Ventilla, 3200-3400 m, shrub, corolla pale yellow (baryta y.), dry sandy soil, 7 July 1948, *Pennell 15861* (PH). Cajamarca: Prov. San Ignacio: 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).

Macrocarpaea angelliae J. R. Grant & Struwe, *sp. nov*. TYPE: ECUADOR. Zamora-Chinchipe: Carretera Loja-Zamora, cerca al Paso, 2800–2900 m, sufrutex de 1.0–1.5 m, brácteas verdes, sépalos amarillo-verdosos, vegetación representiva de *Clusia*, *Simplocos*, *Psychotria*, 15 March 1989, *Romoleroux 804* (Holotype: NY; Isotype: AAU). Fig. 1.
= *Macrocarpaea stenophylla* in part *sensu* Pringle, *Flora of Ecuador* 53: 97–98. 1995.

A Macrocarpaea stenophylla Gilg cui affinis, sed foliis ovatis, ellipticis, lanceolatis, apicibus

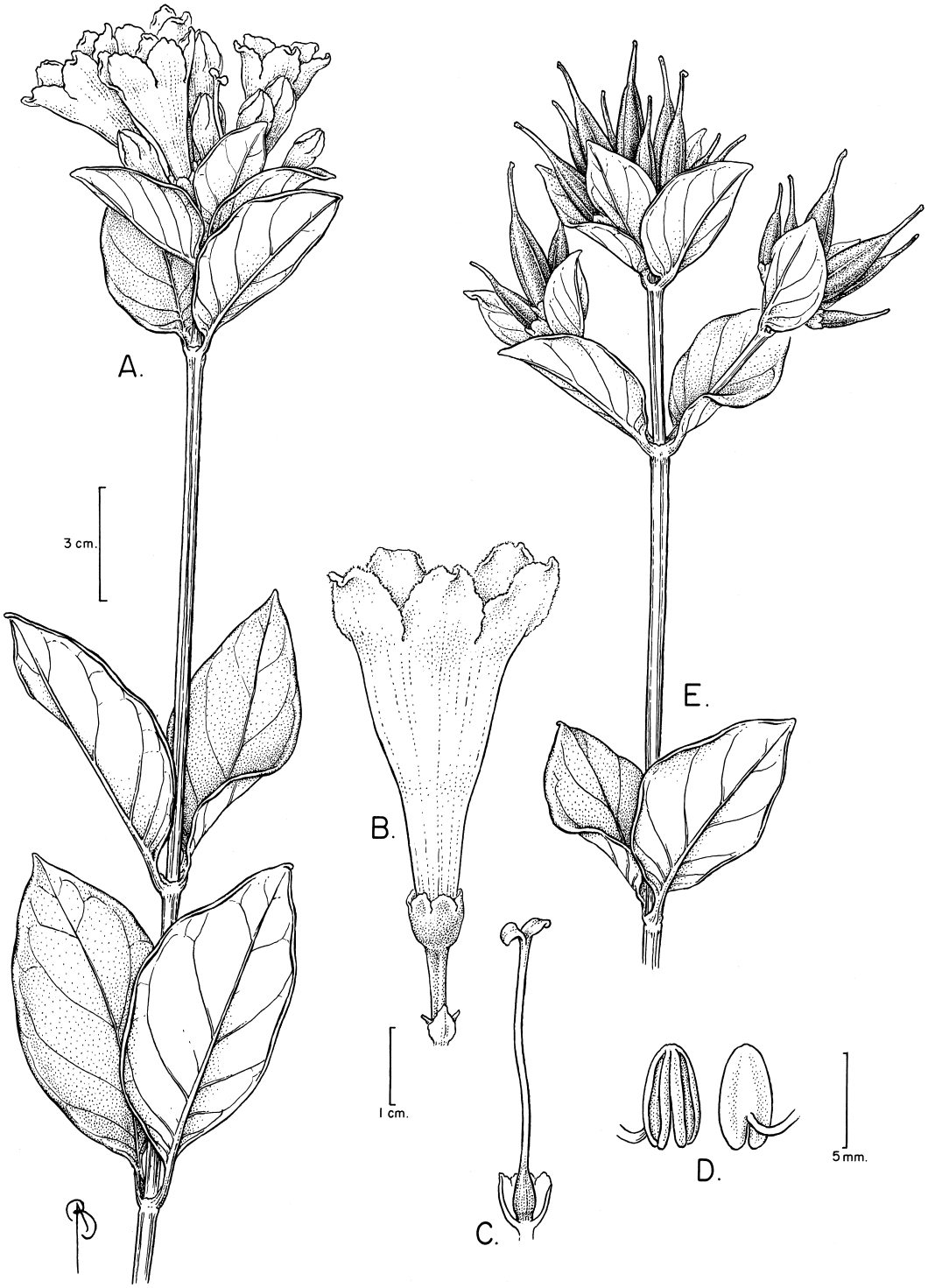

FIGURE 1. *Macrocarpaea angelliae*. A, habit of flowering stem; B, flower; C, gynoecium; D, anthers; E, fruiting stem. From *Øllgaard 91065* (AAU).

acutis vel acuminatis, et bracteis longioribus foliiformibus differt.

Shrubs 1.0–1.5 m tall; stems terete, solid or hollow, up to 8 mm in diameter, glabrous throughout except lower leaf surfaces. Leaves short-petiolate, ovate, elliptical to lanceolate, 5.5–13 × 2.5–6.0 cm, glabrous, edges strongly revolute (at least when dried), the base rounded to slightly attenuate, the apex acute to acuminate, leathery-coriaceous, the upper side dark green with slightly impressed veins, the lower contrasting light green with raised veins and short brown sessile stellate hairs; interpetiolar ridge 4–6 mm high; petioles 3–11 mm long. Inflorescence 4-11 cm long, 6- to 20-flowered; bracts large, leaf-like, ovate, apex obtuse, 2.5–6.6 × 1..9–3.1 cm, clasping each cyme. Flowers pedicellate, erect, not spreading; pedicels 8–11 mm. Bracteoles inconspicuous, scabrous, ovate 2–5 × 2.0-4.5 mm, sessile to the receptacle. Calyx campanulate, 6–8 mm long, yellowish-green, the lobes rounded, 1–3 mm, with hyaline margins, remaining erect in fruit. Corolla yellowish-green, 3.5–5.1 cm long, funnelform, the lobes ovate to elliptical, 8–13 × 8–12 mm, lobe apex obtuse. Stamens reaching the base of the corolla lobes; filaments of unequal length, filiform, straight; anthers linear, 4.5–5.0 mm long, sagittate, versatile. Gynoecium 3 cm long, ovary 5–6 × 3–4 mm, style 24–25 x 1.0 mm, stigma 2-lobed, each lobe circular, 2–3 × 2 mm. Capsules erect to slightly spreading from another, slightly woody, 2.5–3.0 cm (excluding the style base), rugose, shiny, with a persistent, elongate style base to 15 mm long. Seeds unknown.

Macrocarpaea angelliae differs from *M. stenophylla* in its generally more robust appearance, ovate, elliptical to lanceolate leaves with acute to typically acuminate apices (vs. ovate, elliptical to obovate leaves with acute apices), and larger, more leaf-like bracts. In *M. stenophylla*, the two bracts (or bracteoles) that immediately subtend each flower are distinctly spatulate to obovate, 9–15 × 5–6 mm at broadest, contrasting to the bracts that subtend the inflorescence that are 2.1–5.2 × 1.4–2.9 cm. In *M. angelliae*, the bracteoles that subtend each flower are minute, scabrous, ovate 2–5 × 2.0-4.5 mm, while the bracts that subtend each inflorescence are 2.5–6.6 × 1..9–3.1 cm. *Macrocarpaea stenophylla* grows in dry sandy soils in "la jalca" vegetation, and has a pale yellow to pale-greenish-yellow corolla, while *M. angelliae* occurs in wet montane forests and ridges, and has a yellowish-green corolla.

This species ranges between Loja and Zamora-Chinchipe provinces in southern Ecuador (Fig. 2). At least nine species occur in this area, making it one of the most species-rich regions for *Macrocarpaea*. In particular, to date, Parque Nacional Podocarpus is known to

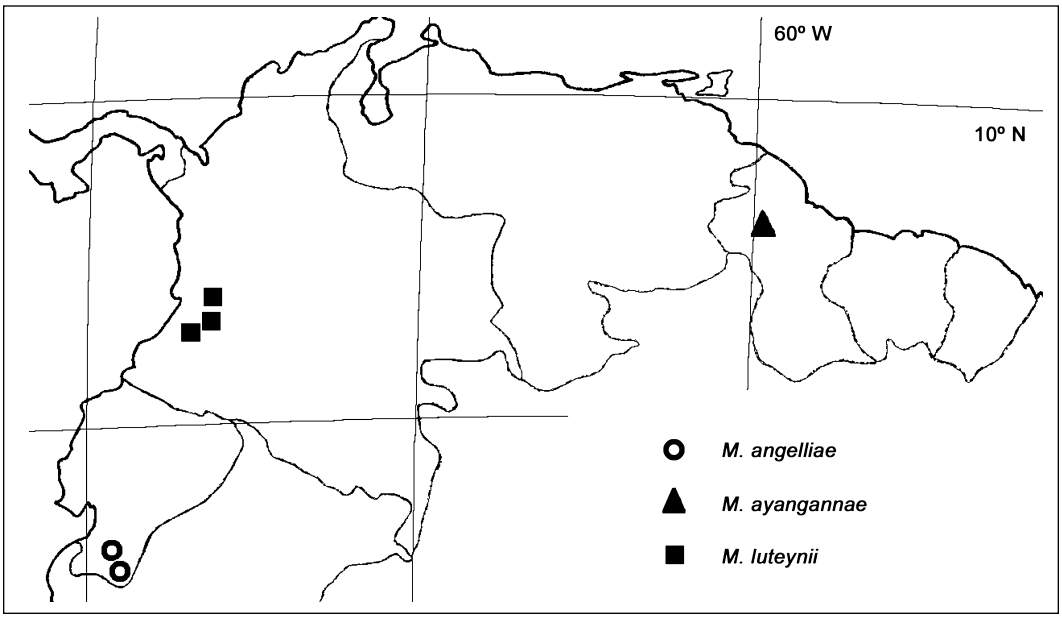

FIGURE 2. Distribution of *Macrocarpaea angelliae* (Ecuador), *M. ayangannae* (Guyana), and *M. luteynii* (Colombia) in northern South America.

be the single richest area in diversity, containing *M. angelliae* J.R. Grant & Struwe, *M. harlingii* J.M. Pringle, *M. micrantha* Gilg, *M. ovalis* (Ruiz & Pav.) Ewan, *M. pachyphylla* Gilg, *M. revoluta* (Ruiz & Pav.) Gilg, and *M.* cf. *sodiroana* Gilg.

Etymology: this species is named in honor of Bobbi Angell (1955–), Marlboro, Vermont, who has so skillfully prepared not only the illustrations of each of the three new species in this article but many others that will appear in forthcoming installments of this series.

Paratypes: ECUADOR. Loja: Yangana-Valladolid Rd., 2500–3000 m, 10 December 1989, *Madsen 86683* (AAU); Parque Nacional Podocarpus, ca. 1 km along trail towards Numbala at pass on the Yangana-Valladolid road, on ridge with low shrub vegetation, 4° 28' S, 79° 10' W, 3000 m, shrub to 1.5 m high, flowers yellow-green, 16 January, 1990, *Knudsen 8* (S). Zamora-Chinchipe: Parque Nacional Podocarpus, road Yangana-Valladolid, just S and E of the pass (Nudo de Sabanilla), muletrack from pass toward Quebrada Honda, wet montane forest and low exposed ridgetop vegetation, 4° 27' S, 78° 08' W, 2750–2950 m, 1.5 m tall shrub on open ridge, 18 February 1989, *Øllgaard 90630* (AAU); Parque Nacional Podocarpus, road Yangana-Valladolid, just S and E of the pass (Nudo de Sabanilla), muletrack from pass toward Quebrada Honda, wet montane forest and low exposed ridgetop vegetation, 4° 27' S, 78° 08' W, 2750–2950 m, 2750–2950 m, 1 m tall, unbranched, woody, flowers greenish yellow, 14 March 1989, *Øllgaard 91065* (AAU).

Macrocarpaea ayangannae J. R. Grant, Struwe, & J. K. Boggan, *sp. nov.* TYPE: GUYANA. Region Cuyoni-Mazaruni: Mt. Ayanganna, easternmost peak, summit and steep slopes, 05° 25' N, 59° 57' W, 1350–1380 m, elfin forest dominated by *Bonnetia roraimae*, *Clusia* spp., and various Myrtaceae, tree 3.5m x 4 cm, calyx and leaves dark green, corolla yellowish-green, 11 March 1987, *Pipoly et al. 11103* (Holotype: US [2 sheets, # 3378137 and # 3378517]. Five duplicates of this specimen apparently exist but could not be located during this study). Fig. 3–4.

A Macrocarpaeae rugosae Steyermark cui affinis, sed petiolos longioribus, foliis ovatis, apicibus acutis, basibus rotundatis, inflorescencia paucifloribus, et calyces brevioribus differt.

Trees 3.5 m tall; stems terete, hollow, up to 4 cm in diameter, brownish puberulent with short simple hairs on stems, petioles, leaves, inflorescences, calyces, and corolla lobes. Leaves long petiolate, broadly ovate to elliptic, 7.5–22.0 × 5.5–11.0 cm, slightly rugose, dark green, the base rounded, the apex bluntly acute, margin entire, not revolute, with slightly impressed veins above and slightly raised veins below, all veins brownish puberulent; interpetiolar ridge 1–2 mm high; petiole 1–5 cm long, terete. Inflorescences 7–26 cm long, 9- to 12-flowered; bracts leaf-like, broadly ovate-elliptic with bluntly acute apices, 1.0–6.0 × 0.5–4.0 cm. Flowers pedicellate, erect to horizontal; pedicels 0.9–2.1 cm. Calyx campanulate, 7–10 mm long, thin-coriaceous, dark green, the lobes elliptic, 3–5 × 4–5 mm, with slightly hyaline margins. Corolla yellowish-green, 3.2–3.8 cm long, funnelform, the tube narrowed in the lower third, the lobes ovate to elliptic, 6–8 mm long, lobe apex rounded. Stamens reaching the base of the corolla lobes; filaments of unequal length, filiform, straight; anthers linear, 5–6 mm long, sagittate, versatile. Gynoecium 4 cm long, ovary 8–9 × 3–4 mm, style 31–32 × 1 mm, stigma 2-lobed, each lobe obovate, 4.0–4.5 × 1.0–2.0 mm. Capsules unknown.

This species occurs on Mt. Ayanganna in the Pakaraima Mountains, on the easternmost edge of the Guayana Shield (Fig. 2). It is most similar to *Macrocarpaea rugosa* Steyerm. (the geographically closest species, from the Macizo del Chimantá, Bolívar, Venezuela) and *M. marahuacae* Struwe & V.A. Albert (from Cerro Marahuaca, Amazonas, Venezuela). It differs from *M. rugosa* by its ovate (vs. elliptical) leaf shape, acute leaf apices (vs. broadly rounded), rounded leaf bases (vs. cordate), fewer-flowered inflorescences, and shorter calyces. From *M. marahuacae* it is immediately distinguished by the much finer degree of leaf venation, and ovate (vs. elliptical to obovate) leaf shape.

This is the sixth species found on the tepuis of the Guayana Shield of northern South America, the others being *Macrocarpaea autanae* Weaver, *M. marahuacae* Struwe & V. A. Albert, *M. neblinae* Maguire & Steyerm., *M. piresii* Maguire, and *M. rugosa* Steyerm. (Struwe et al., 1999). This group forms a geographically coherent unit, yet some species may be more closer related to Andean species groups than to each other. A preliminary molecular analysis of *Macrocarpaea* based on 5S-NTS sequences including two species from this group shows support for two separate origins

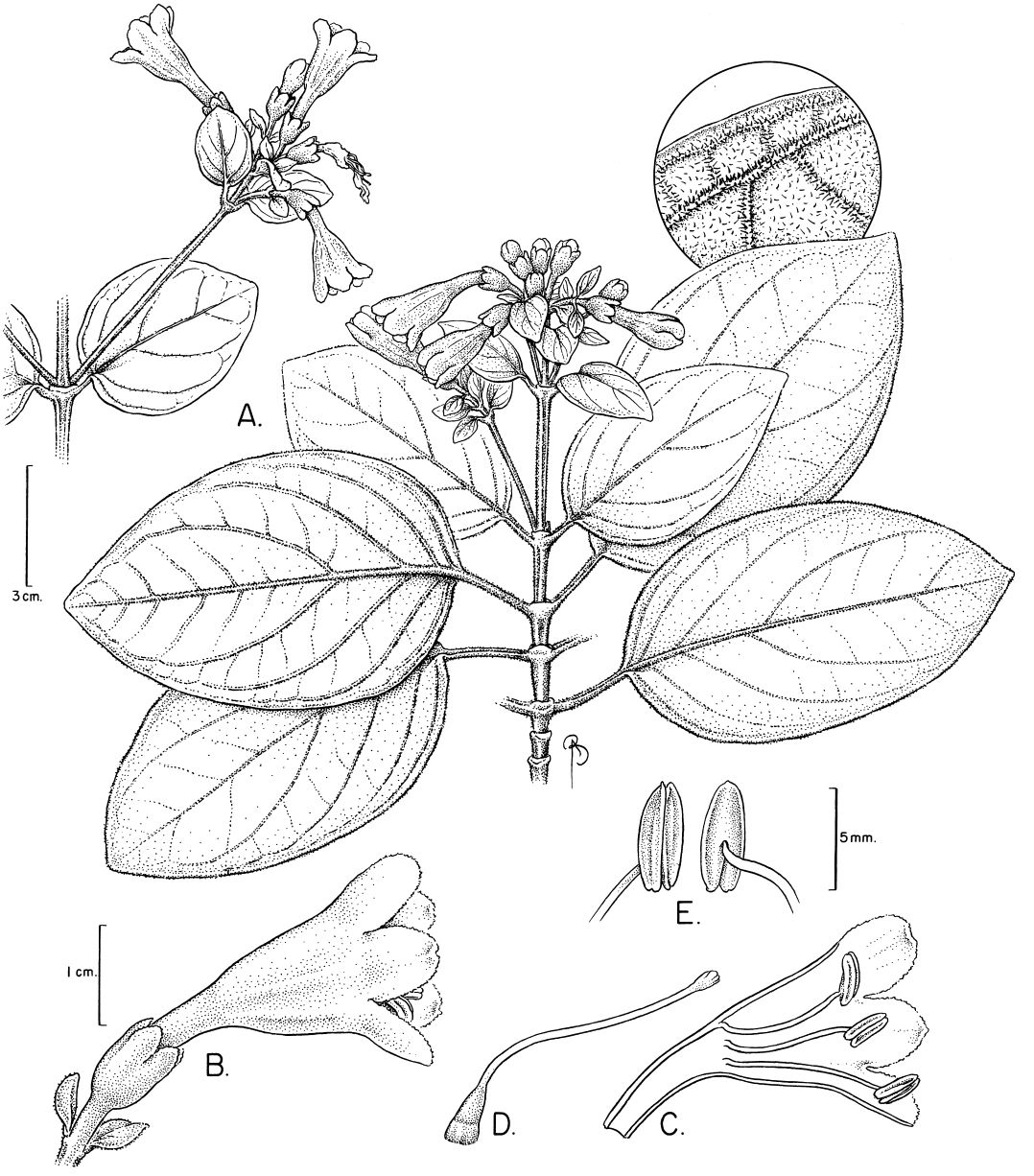

FIGURE 3. *Macrocarpaea ayangannae*. A, habit of flowering stems, with magnified upper leaf surface showing papillate hairs; B, flower; C, internal cross-section of corolla showing; D, gynoecium; E, anthers. From *Pipoly 11103* (US).

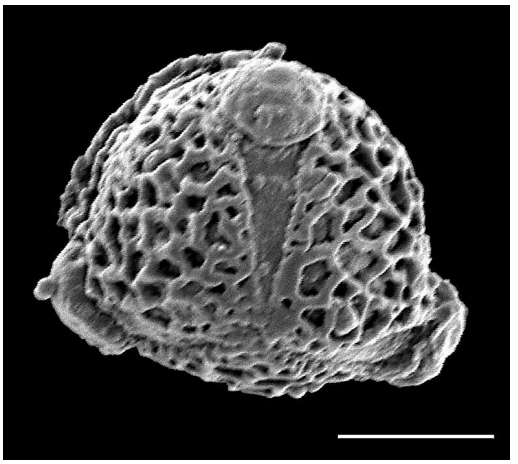

FIGURE 4. *Macrocarpaea ayangannae*, pollen grain. From *Pipoly et al. 1103* (US). Bar equals 10 µm.

from the Andes (Grant and Struwe, 2000; Grant and Struwe unpubl.). This is the first report known to us showing species that occur on the Guayana Shield having an origin in the Andes. A synopsis of the Guayana Shield species of *Macrocarpaea* with a discussion of their biogeography and molecular systematics will be presented in a separate paper.

Etymology: this species is named for the mountain on which it was collected, Mt. Ayanganna in western Guyana.

Macrocarpaea luteynii J. R. Grant & Struwe, *sp. nov*. TYPE: COLOMBIA. Cauca: Parque Nacional Munchique, km 50–55 along road above Uribe, cloud forest, 1875–2256 m, shrub 1.5 m tall, fruits green, 25 April 1979, *Luteyn et al. 7466* (Holotype: NY; Isotypes: COL, F, HAM, MO, U, US). Fig. 5–6.

A Macrocarpaea browallioides (Ewan) A. Robyns & S. Nilsson cui affinis, sed inflorescencia multifloribus, calyces campanulatis, foliis lanceolatis, ovatis, ellipticis, a M. subcaudata Ewan foliis brevioribus differt.

Shrubs to 1.5–3.0 m that are erect, leaning, climbing or epiphytic, glabrous to puberulent with short simple hairs on stems, petioles, leaves, inflorescences, calyces, and corolla lobes; stems terete, solid to hollow, up to 8 mm in diameter. Leaves petiolate, linear-lanceolate, lanceolate, elliptical to ovate, 6–11(–14) × 1.3–4.0(–5.3) cm, generally glabrous above and puberulent below, the base attenuate and decurrent into the petiole, margin slightly revolute; venation with impressed veins above and raised veins below, the apex acute to acuminate; interpetiolar ridge 1–2 mm high; petiole 5–23 mm long, slightly winged. Inflorescences 11–18 cm long, 9- to 35-flowered; bracts leaflike, ovate to lanceolate, 2.5–6.0 × 1.5–2.5 cm, apex acute. Flowers pedicellate, erect to horizontal; pedicels 7–31 mm. Calyx campanulate, 5–7 mm long, the lobes elliptic, 2–3 mm long, with hyaline margins, spreading or recurving in fruit. Corolla pale yellow to yellow-green, 1.8–2.4 cm long, funnelform, the lobes ovate to elliptic, 4–5 × 4–5 mm, lobe apex acute. Stamens reaching the corolla lobes; filaments of unequal length, filiform, straight; anthers linear, 2.5–3.5 mm long, sagittate, versatile. Gynoecium 1.9–2.1 cm long, ovary 5–6 × 2 mm, style 13.0–16.0 × 0.5–1.0 mm, stigma 2-lobed, the stigmatic area hardly any wider than the width of the style, with each lobe less than 0.5 mm long. Capsules conspicuously nodding, shiny, rugose, 9–15 mm long (excluding the style base), yellow-green immature, with a persistent, elongate style base to 8–10 mm. Seeds flattened, conspicuously winged, 0.3–1.0 mm.

This species differs from the Central American species *Macrocarpaea browallioides* in its many-flowered inflorescence, campanulate calyx, and generally lanceolate (vs. ovate to elliptical) leaves. The flaring calyx of *M. browallioides* is the most distinct in the genus with its ovate-triangular cuspidate lobes, whereas most species have obtuse to elliptical to rounded lobes. *Macrocarpaea luteynii* differs from *M. subcaudata* in its typically lanceolate (vs. the linear-long), shorter and broader leaves, measuring 60–110(–140) × 13–40(–53) mm (vs. 80–210 × 18–38 mm).

Along with *Macrocarpaea browallioides* (Ewan) A. Robyns & S. Nilsson and *M. subcaudata* Ewan, both of Panama and Costa Rica, this new species is the third in the genus known to be facultatively epiphytic. *Macrocarpaea luteynii* has been found as an erect, leaning, climbing or epiphytic shrub. *Cabrera & van der Werff 15768* and *15772* were collected on the same day and at the same locality. Collection *15772* is typical of *M. luteynii*, consisting of an upright, epiphytic, or terrestrial shrub. However, collection *15769* stands apart from the remaining collections of *M. luteynii* in having a shorter, compact inflorescence and leaves that are generally smaller, ovate, and uniform in size throughout the stem, as opposed to the typical progression of larger to smaller leaves toward

FIGURE 5. *Macrocarpaea luteynii*. A, habit of fruiting stem; B, interpetiolar ridge between opposite leaves, typical of *Macrocarpaea*; C, fruit; D, flower; E, internal cross-section of corolla; F, gynoecium. A-C from *Luteyn 7466* (NY); D-F from *Ruíz et al. 196* (MA).

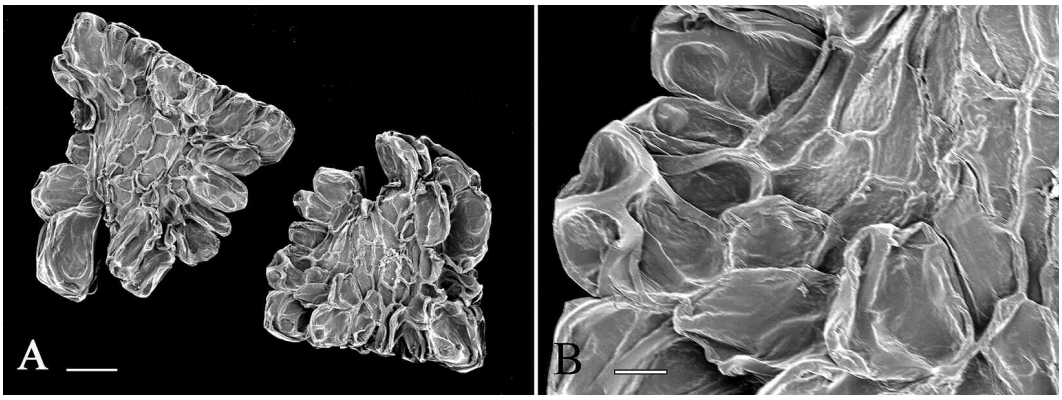

FIGURE 6. *Macrocarpaea luteynii*. A, seeds; B, edge of seed. From *Luteyn 7466* (NY). Bars equal 100 µm.

the inflorescence in other collections. Despite these differences, the inflorescence, flowers, and fruits are identical, making it unlikely that it represents a different species.

This species ranges between Cauca and Valle Provinces in southwestern Colombia (Fig. 2). This area, where at least eleven species of *Macrocarpaea* occur, represents another of several important hot spots of diversification in the genus.

Etymology: this species is named in honor of James Leonard Luteyn (1948–) of the New York Botanical Garden, specialist of the páramo and Ericaceae of South America, who has collected many *Macrocarpaea* including the type of this species.

Paratypes: COLOMBIA. Cauca: "La Gallera," Micay Valley, 1900–2000 m, herb, corolla yellow-green, 1 July 1922, *Killip 7940* (GH, US); Parque Nacional Munchique, El Sopadero, 1950 m, arbusto, 28 March 1979, *Lobo 45* (COL); Parque Nacional Munchique, El Tambo, vereda La Romelia, La Gallera, 1950 m, hierba trepadora de 2 m, corola verde-amarillento, 25 July 1993, *González et al. 2832* (COL, MA); Parque Nacional Munchique, El Tambo, camino de la carretera a Nueva Granada, 2280 m, hierba erecta de 1.5 m, flores verde claro, 28 August 1993, *Ruíz, N. et al. 196* (COL, MA). Valle: San Antonio (Cerro La Horqueta), Cordillera Occidental, vertiente oriental, cerca a km 17 de carretera Cali-Buenaventura, bosque nublado, 2060–2100 m, arbusto inclinado, hojas coriáceas, cáliz verde, corola en yema amarillo pálido, ápice pentagonal, estilo blanco-amarillento, estigma verde, fruto jóven verde, 20 January 1986, *Silverstone-Sopkin et al. 2119* (CUVC, U [2 sheets]); km 18 y km 20 de la carretera de Cali a Buenaventura entrando por la finca Zingara, cumbre de la Cordillera Occidental, precipitación pluvial por año, relictus de la selva nublada y bastante intervenida antropogénicamente, 1500–2000 m, epífita leñosa, tallos y hojas quebradizas, botones verdes y flores verde-amarillentas, frutos en cápsulas secas y coriáceas, 28 February 1988, *Cabrera & van der Werff 15769* (COL, U); km 18–20 carr. Cali-Buenaventura, 1500–2000 m, epífita arbustiva, en la selva clímax nublada y muy húmeda, tallos y hojas quebradizos, botones verdes, flores amarillo-verdosas, cáliz verde oscuro, anteras amarillas, 28 February 1988, *Cabrera & van der Werff 15772* (COL).

NEW SYNONYMY

Macrocarpaea guttifera Ewan, Contr. U. S. Natl. Herb. 29: 237–238. 1948.

Macrocarpaea guttifera has always been an anomalous species. Ewan himself stated, "The systematic position of *Macrocarpaea guttifera* cannot be suggested from the several unusual characters that it displays, which, indeed, may be subject to reinterpretation when additional material is available." Richard E. Weaver alerted us to the notion that this species was not a gentian. When we received the type on loan, we concurred but could not place it in a family. Consequently we e-mailed a scan of the specimen to numerous specialists. Barry Hammel (MO/INB) suggested Rutaceae, so we sent it to Rutaceae specialist Jackie Kallunki (NY), who identified the specimen as *Ravenia biramosa* Ducke (Rutaceae). Therefore, *Macrocarpaea*

guttifera is excluded from *Macrocarpaea* and indeed the Gentianaceae and is reduced to synonymy under *Ravenia biramosa* Ducke (1935).

Six "nomen herbariorum" (unpublished names written on herbarium sheets) have been discovered in the course of examination of material. They consist of six unpublished species names in *Macrocarpaea*, and a new genus and new species "Axelsonia globiflora". For a complete accounting of all names concerning *Macrocarpaea*, even though never published, these names and their new synonymy is as follows:

"Axelsonia globiflora Dusén, ined." Based on *Dusén 17288* (S) (Brazil) [= *M. rubra* Malme]

"Macrocarpaea buchtienii Gilg, ined." Based on *Buchtien 1186* (US) and *Buchtien 5639* (NY) (Bolivia) [= *M. cinchoniifolia* (Gilg) Weaver]

"Macrocarpaea ekmanii Ewan, ined." Based on *Ekman 6846* (S); *Ekman 15947* (S); *Wright 1347* (BR) (Cuba) [= *M. pinetorum* Alain]

"Macrocarpaea gilgiana Rusby, ined." Based on *Rusby 1172* (NY) (Bolivia) [= *M. cochabambensis* Gilg-Benedict]

"Macrocarpaea peduncularis Rusby, ined." Based on *Williams 1561* (NY) (Bolivia) [= *M. bangiana* Gilg]

"Macrocarpaea tabacifolia Ewan, ined." Based on *Rusby 1173* (US) (Bolivia) [= *M. cinchoniifolia* (Gilg) Weaver]

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