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A REVISION OF MACROCARPAEA
A NEOTROPICAL GENUS OF
SHRUBBY GENTIANAS

By JOSEPH EWAN



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PREFACE

THE accompanying paper by Joseph Ewan, of the Department of Botany of Tulane University of Louisiana, presents a revision of *Macrocarpaea*, a genus of shrubby gentians occurring in the American Tropics. These studies were carried out in greater part while Mr. Ewan was a member of the staff of the Smithsonian Institution.

ELLSWORTH P. KILLIP,
*Head Curator, Department of Botany,
United States National Museum.*

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A REVISION OF MACROCARPAEA, A NEOTROPICAL GENUS OF SHRUBBY GENTIANAS

BY JOSEPH EWAN

INTRODUCTION

THE genus *Macrocarpaea* as now defined constitutes a group of 30 shrubby gentians confined to tropical America. These have no relatives among the alliances of the gentian family in temperate North America, and by one first visiting the mountain rain forests of the Andes they are not recognized at once as gentians. In the first place, slender "trunked" shrubs of this genus may reach a height of 2 to 4 or 6 meters! Again, the flowers are borne mostly on long peduncles in open panicles or at times in crowded clusters and vary from pale greenish to golden-yellow, now recalling those of foxglove or *Penstemon*, now those of that other Andean genus of ornamental shrubs grown in the open in subtropical United States, *Iochroma* of the Solanaceae. Originally described as species of the polymorphous genus *Lisianthus* somewhat over a century ago, the total number of collections available for study of all species is very limited and many are still known only from the single original type collection. Nevertheless, our knowledge of this genus has grown with the extended exploration of Central and South America. Every botanical collector who visits remote or hitherto unvisited regions returns with some novel material, and so the number of recognized species has doubled in the last quarter century. No systematic account of *Macrocarpaea*, or any partial treatment of the group, exists. The several species described by the German botanist Ernst Gilg, and by Charlotte Gilg, were published without a key to the species or a résumé of affinities. My treatment is an attempt to present a synopsis of the genus as a whole.

HISTORICAL NOTE

When, in 1839, A. H. R. Grisebach, physician and Privat Docent at the University of Göttingen, wrote a monograph of the Gentianaceae he placed ¹ the group of plants now known as the genus *Macrocarpaea* in the genus *Lisianthus*,² creating at that time a section *Macrocarpaea*

¹ Gen. Sp. Gent. 173. 1839.

² Grisebach therein spelled *Lisianthus* "*Lisyanthus*," following Aublet (1775) in this, but Linnaeus had priorly established the genus (1767) in the orthographic form generally accepted; Grisebach himself later (1845) took it up.

to receive them. This section included eight species, viz, *Lisianthus glaber*, which may be taken as the type of the genus *Macrocarpaea*, and *L. revolutus*, *L. macrophyllus*, *L. obtusifolius*, *L. viscosus*, *L. daturoides*, *L. frigidus*, and *L. ovalis*.³ Grisebach characterized this section as comprising for the most part plants with large leaves (when compared with other herbaceous species of the alliance of *L. longifolius* L.), a dichotomous inflorescence of erect flowers, a broadly cylindrical corolla tube but with the lobes relatively short and regular, and a biloculate capsule with the placenta free from the septum. His sectional treatment of the genus *Lisianthus*, which appeared six years later,⁴ followed his first account without important alterations. Six of Grisebach's eight species of his section *Macrocarpaea* are placed in that genus today, *Lisianthus daturoides* having been transferred by Gilg to *Symbolanthus*, and *L. frigidus* to *Calolisianthus*. Thus, the limits of the section *Macrocarpaea* as Grisebach conceived them were accepted without substantial change by Gilg when he established the genus in 1895.⁵

At the time Gilg established the genus he restricted the application of the name *Lisianthus glaber* L. f. to the plants of Peru and Bolivia, though that name rests upon a Mutis collection most assuredly originating in Colombia. *Macrocarpaea glabra* (L. f.) Gilg, as I interpret that species, is a rather common plant of the mountain slopes above Bogotá, which would have been easily accessible to Mutis at the time of his residence in that city. Gilg renamed this Colombian species *Macrocarpaea bogotana* in 1895 on the basis of his misapplication of the old *Lisianthus* name. *Macrocarpaea glabra*, on the other hand, is not known from Peru or Bolivia. The exact identity of the Peruvian and Bolivian collections so referred by Gilg cannot be ascertained at present owing to the destruction of the Berlin Herbarium. In 1895 Gilg published⁶ eight other additions to *Macrocarpaea*, each based on a single collection in the Berlin Herbarium. Subsequently he described an Ecuadorian species,⁷ followed by two Peruvian species,⁸ and a supposedly new Colombian one.⁹ It is fortunate that isotypes of some of these proposed species have been preserved in other herbaria, along with the invaluable photographs taken under the auspices of the Field Museum of Natural History (now Chicago Natural History Museum).

³ Grisebach added a ninth species, *L. mathewsii*, in the Addendum to his *Gen. Sp. Gent.* 361. 1839, but this has been referred to *Symbolanthus* by Gilg.

⁴ DC. Prodr. 9: 77-78. 1845.

⁵ Engl. & Prantl, Pflanzenfam. 4 (2): 94. 1895.

⁶ Bot. Jahrb. Engler 22: 337. 1895.

⁷ Bot. Jahrb. Engler 25: 724. 1898.

⁸ Repert. Nov. Sp. Fedde 2: 53-54. 1906.

⁹ Jahrb. Engler Bot. 50: Beiblatt 50. 1913.

GEOGRAPHIC DISTRIBUTION

Macrocarpaea demonstrates a pattern of distribution in tropical America that is becoming increasingly familiar to students of plant geography. With a primary concentration of species in the northern Andes of South America, the genus has tenuously reached as far north in Central America as the mountains of Costa Rica (two species), as far south as Peru and Bolivia about the affluences of the Amazon, and as far east as the isolated sedimentary plateaulike mountains of Venezuela dominated by Roraima. Outlying species occupy only certain islands of the West Indies, and a distinctive species-group, the well-marked subgenus *Paranagenes*, is endemic to the mountains of southeastern Brazil. In its Andean pattern *Macrocarpaea* approximates closely that of the related genus *Symbolanthus* as well as *Cinchona* and several other characteristic Andean genera. Based on the criterion of the greatest concentration of both species and individuals, aside from the vagaries of exploration, the genus shows an Andean origin, precisely in the complex mountain region roughly designated geographically as the "Nodus" or the "Knot." This is the dissected terrain created by the perplexing pattern of the catchment basins of the Cauca, Patía, Putumayo, San Juan, Napo, and Pastaza Rivers of southern Colombia and northern Ecuador. Examining the evidence again, this time from the standpoint of the relict species which occupy the isolated plateau-mountains of Venezuela and Trinidad, one concludes that the genus may have had a more easterly origin, with the endemic species of these mountains representing the remnants of possible generic prototypes. These species of Venezuela and Trinidad are unlike the majority in the genus in their characteristic, small, sessile leaves, without prominent lateral nerves. The species most resembling these eastern species, *Macrocarpaea ovalis*, grows at nearly the other end of the Andean range of the genus in Peru and southern Ecuador. Again, it may be noticed that the endemic species of Venezuela and Trinidad often demonstrate transitional characters toward the morphology of the genera *Symbolanthus* and *Calolisianthus*. *Calolisianthus frigidus* of the Lesser Antilles, displaying some characters of *Macrocarpaea*, should perhaps be considered in this connection. In short, possibly these relict endemics are the phylogenetically oldest species of *Macrocarpaea*.

Two endemic species of *Macrocarpaea* of Venezuela, *M. cerronis*, of Sororopán-tepuí, and *M. salicifolia*, of the mesa between Sororopán-tepuí and Ptari-tepuí, both of which are not known from Roraima or Duida, have their closest relative on Mount Tucuche, Trinidad. An almost equally close relative is *M. subcaudata* of Costa Rica. *Macrocarpaea bracteata*, another remarkable endemic of Venezuela, is nearly unique in the genus for its peculiar leafy bracts; in its vegetative

characters it is approached by the Brazilian *M. obtusifolia*. *Macrocarpaea valerii*, of Costa Rica, is most closely related to *M. macrophylla* of Colombia.

Each of the Colombian species of *Macrocarpaea* occupies a discrete geographic province within that country. Thus, *Macrocarpaea glabra* is confined to the Bogotá region; *M. polyantha*, to the páramos of Norte de Santander; *M. macrophylla*, the Central and Western Cordilleras; *M. pachyphylla*, the Eastern Cordillera of the southern departments; *M. ovalis* and *M. duquei*, the Western Cordillera of the southern departments; and *M. calophylla*, the Sierra Nevada de Santa Marta.

GENERIC RELATIONSHIPS

Gilg's fundamental taxonomy of the genera of Gentianaceae is based solely on the characters of the pollen grain. Though of value as a criterion to be taken along with other morphological characters, it is unfortunate to group together arbitrarily on this basis alone plants which manifest several unlike characters. Sometimes further study of a plant group, originally distinguished solely on the basis of pollen-grain characters, will provide other morphological *differentiae* of a fundamental nature. This is the situation in Gilg's genus *Rusbyanthus*. This Bolivian genus is closely related to *Macrocarpaea*, and though Gilg places it next to that genus in his treatment of the family, he creates a distinct subdivision for it, resting it on the supposedly diagnostic characters of the pollen. The only other distinction which Gilg provides for *Rusbyanthus* in his key to the genera of Gentianaceae is that of the placental attachment in relation to the ovary wall. There can be small doubt of the relationship of *Rusbyanthus* to *Macrocarpaea*, however, and the two genera may be distinguished as follows:

Calyx-lobes distinctly unequal, the alternate members shorter, narrower (about two-thirds as broad); corolla very showy, 45-60 (commonly 55-60) mm. long; capsule berrylike, with a thin cartilaginous wall, rupturing irregularly; seeds large, 3-4 mm. long, lunate-reniform, the coat alveolate.

Rusbyanthus

Calyx-lobes essentially equal; corolla more or less showy but seldom as much as 55 mm. long (except in *M. duquei*); capsule generally with a thick, almost woody wall, dehiscent longitudinally into more or less regular valves; seeds relatively small or even minute, less than 2 mm. long.----- **Macrocarpaea**

An instance of the placing of unrelated genera together in a subdivision of the Gentianaceae is shown by Gilg's association of the genus *Symbolanthus*, which surely must be related to *Macrocarpaea*, with *Chelonanthus*, *Lagenanthus*, etc., of the Gentianoideae-Helieae, rather than with the Gentianoideae-Gentianeae-Tachiinae, where *Macrocarpaea* is to be found. Here pollen characters were relied upon exclusively in the recognition of natural groups within the

Gentianaceae, with the consequent obscuring of other alliances within the family. *Symbolanthus*, another genus of woody gentians confined to the Andes, closely resembles *Macrocarpaea* in its leaf and flower characters and some species referred to it now may be of uncertain disposition in either genus. In general, however, the two genera may be distinguished as follows:

Corolla zygomorphic or subzygomorphic, the lobes acuminate or sharply acute, spreading, the lower lobes decurved or reflexed (sometimes strongly so); capsule almost baccate, often pleasantly sweet-aromatic, sphaeroidal or broadly oblong, filling the strongly accrescent calyx-----	Symbolanthus
Corolla actinomorphic or nearly so, the lobes blunt, rounded or simply acute, all erect; capsule almost woody to papery-chartaceous, never actually fleshy, with a soft pulpy wall, usually narrowly acuminate, the fruiting calyx moderately, if at all, accrescent, free from the capsule-----	Macrocarpaea

A fuller discussion of the relationships of *Macrocarpaea* to *Symbolanthus*, *Calolisianthus*, and related genera must await systematic studies of those groups.

GENERAL MORPHOLOGY AND DESCRIPTIVE TERMINOLOGY

Leaf.—The leaf blade of *Macrocarpaea* is sometimes thick and coriaceous, generally with a firm, rimlike, almost cartilaginous margin, which is described in this treatment as revolute-margined. These species constitute the section *Magnoliifoliae*. The remaining species (*M. rubra* and section *Tabacifoliae*) have distinctly membranous to simply firm but not coriaceous blades, lacking the revolute margin. They are at times quite thin and very fragile on withering or drying. The blades vary from smooth, that is, without roughness or pubescence of any kind, the usual condition, to punctate or weakly pubescent. Pubescence in this genus is usually a mere puberulence, less often hirtellous especially along the midrib. Rarely the blades are microlepidote beneath, that is, roughened with a pavementlike covering of minute scales. When a leaf-blade is glabrous both above and beneath it is described as amphiglabrous, a term introduced in my studies of *Delphinium* (Univ. Colorado Stud. ser. D. 2: 78. 1945.) All leaf measurements are exclusive of the petiole.

Flower.—The flower of *Macrocarpaea* is typically campanulate, varying from narrow- to open-campanulate or less often salverform. Commonly the corolla is more or less abruptly ventricose above the calyx. A very few species display noncampanulate corollas; these comprise cylindric long-tubed and short-tubed almost included corolla forms.

Capsule.—The fruit is the most conservative organ of the plant in this genus, being almost uniformly elongate-fusiform to short-ovoid, and even this variation may prove to be largely developmental when additional collections are available for study. Mature capsules of

very few species are represented among the collections studied. All measurements are exclusive of the usually more or less persistent style, which in some species hardens to form a rather stout beak at maturity of the capsule.

MATERIAL STUDIED AND ACKNOWLEDGMENTS

Material has been available for this study from the Arnold Arboretum of Harvard University (A), Instituto de Ciencias Naturales, Bogotá (COL), Chicago Natural History Museum (F), Gray Herbarium of Harvard University (GH), Missouri Botanical Garden (MO), New York Botanical Garden (NY), Academy of Natural Sciences of Philadelphia (PH), U. S. National Herbarium (US), and the U. S. National Arboretum (USNA), the abbreviations indicated above being used in this paper for the place of deposit of the collection. I am grateful to the curators of these institutions for their cooperation in making available to me this material for study. Special thanks are due E. P. Killip, who has furthered this revision in many ways. Dr. S. F. Blake has kindly made suggestions for the improvement of the paper.

SYSTEMATIC TREATMENT

Genus *MACROCARPAEA* (Griseb.) Gilg

Lisianthus sect. *Macrocarpaea* Griseb. Gen. Sp. Gent. 173. 1839.

Macrocarpaea Gilg, Engl. & Prantl, Pflanzenfam. 4 (2) : 94. 1895.

Shrubs (rarely low herbaceous perennials) with mostly quadrangular or terete, or compressed, often grooved stems, the internodes sometimes very short; leaf blades usually ovate or oval, less often obovate or lanceolate, the apex acute or cuspidate, acute or cuneate at base, petiolate to sessile, thick-coriaceous to thin-membranous, always entire; flowers borne in open, cymose, more or less bracteate panicles or rarely simply in racemes or few-flowered clusters; calyx-tube short-campanulate to subcylindric, the lobes 5, subequal, more or less ovate, overlapping or less often valvate; corolla narrow campanulate or salverform to open campanulate or rarely long-tubular, the lobes 5, subequal or two somewhat larger, generally ovate or oblong-ovate, acute or rounded; stamens 5, attached to corolla tube most often medianly, usually included, occasionally exerted; ovary ovoid or pyriform, 2-carpellate, each carpel maturing so as to suggest a leaf-blade ovuliferous over the whole upper surface, the blades inrolled to form a pair of tight coils ovuliferous to edges; style elongate, stigma bilobed, often deeply so, rarely capitate; mature capsule short-ovoid to elongate-fusiform, nearly woody to cartilaginous or chartaceous, wholly free from the persistent rather woody cupulate calyx, dehiscent longitudin-

ally into two more or less regular valves or carpels, each carpel with a false incomplete partition between the two inrolled coiled portions of the carpel; seeds very numerous, minute, quadrate or nearly so, usually yellowish or pale brown. Type: *Macrocarpaea glabra* (L. f.) Gilg.

KEY TO THE SUBGENERA

Low herbaceous perennials about 1 m. high; corolla reddish; sepals unlike, 3 obovate, rounded, thin, golden-translucent, the alternate 2 ovate, acute, opaque-green, the calyx-tube sulcate below the sinuses----- I. PARANAGENES
Tall woody perennials generally 1-3 m. high or more; corolla yellowish or greenish; sepals essentially alike, the calyx-tube not sulcate below the sinuses----- II. EUMACROCARPAEA

PARANAGENES Ewan, subg. nov.

Perennes nanae, caulibus simplicibus brevibus quadrangularibus herbaceis; corolla rubra; calycis lobis dimorphis, tribus obovatis, obtusis, membranaceis, aureo-translucentibus, duobus alternis ovatis, acutis, viridi-opacis, tubo sulcato infra sinum loborum. Typus: *M. rubra* Malme.

A single species, the type, from eastern Brazil.

EUMACROCARPAEA Ewan, subg. nov.

Frutices saepe alti vel ramosi, caulibus teretibus vel quadrangularibus lignosis; corolla pallido- vix viridi-flava; calycis lobis valde similibus subaequalibus, tubo non sulcato infra sinum loborum. Typus: *M. glabra* (L. f.) Gilg.

KEY TO THE SECTIONS

Floral leaves (subtending the lowest branch of the panicle) thick, coriaceous, the blades of the principal leaves less than 15 cm. long, more or less revolute-margined; internodes often conspicuously short, grooved and vertebra-like----- I. Section MAGNOLIIFOLIAE¹⁰
Floral leaves (subtending the lowest branch of the panicle) thin and membranous or firm but not coriaceous, usually large, the blades of principal leaves 15-30 cm. long, plane; internodes not noticeably short, either terete and smooth or simply quadrangular----- II. Section TABACIFOLIAE¹¹

¹⁰ *Magnoliifoliae* Ewan, sect. nov. Folia inflorescentiae crassa atque coriacea, minus quam 15 cm. longa, margine revoluta, saepe nitentia; internodiis saepe conspicue brevibus, sulcatis, vertebri-formibus. Typus: *M. revoluta* (R. & P.) Gilg.

¹¹ *Tabacifoliae* Ewan, sect. nov. Folia inflorescentiae membranacea vel submembranacea vel crustacea vix coriacea, saepe magna, laminis principis 15-30 cm. longis, planis; internodiis saepe elongatis, teretibus et laevibus interdum quadrangularibus. Typus: *M. obtusifolia* (Griseb.) Gilg.

KEY TO THE SPECIES

Low herbaceous perennials about 1 m. high; corolla reddish; sepals unlike, 3 obovate, rounded, thin, golden-translucent, the alternate 2 ovate, acute, green-opaque, the calyx-tube sulcate below the sinuses (subgenus *Paranagenes*).

1. *M. rubra*

Tall woody perennials generally 1-3 m. high or more; corolla yellowish or greenish; sepals essentially alike, the calyx-tube not sulcate below the sinuses (subgenus *Eumacrocarpa*).

1a. Floral leaves (subtending the lowest branch of the panicle) thick, coriaceous, the blades of the principal leaves less than 15 cm. long, more or less revolute-margined; internodes often conspicuously short, grooved, and vertebralike (section *Magnoliifoliae*).

Flowers subtended by 2 large spatulate-obovate leaflike bracts; leaves sparsely punctate beneath..... 2. *M. stenophylla*

Flowers not subtended by large bracts; leaves not punctate beneath (except *M. cochabambensis* and *M. chlorantha*).

2a. Leaves lanceolate or narrowly elliptic, acuminate or acute, long-petiolate or if ovate then at least distinctly petiolate.

Calyx divided nearly to the base, the lobes about 3-4 times as long as the tube; leaves impressed-nerved above..... 3. *M. calophylla*

Calyx divided less than $\frac{1}{2}$ to the base, the lobes $\frac{1}{3}$ to $\frac{2}{3}$ as long as the tube; leaves plane, not impressed-nerved above.

Calyces and pedicels cano-hirtellous; leaves both hirtellous and more or less glandular-dotted..... 4. *M. cochabambensis*

Calyces and pedicels glabrous or hirsutulous with dark hairs; leaves very thinly if at all hirsutulous, not glandular-dotted.

3a. Leaves with all the veins obscure both above and below or only the midrib evident, the blades lance-ovate to narrowly lanceolate (broadly ovate in *M. cerronis*), more or less bullate; panicle mostly few-flowered (8- to 10-flowered in *M. subcaudata*).

Pedicels elongate, very slender, 15 mm. or more long; leaves lance-ovate, 12-15 cm. long, 5-6 cm. wide, the petioles 20-24 mm. long; Trinidad..... 5. *M. arborea*

Pedicels stout, seldom as much as 15 mm. long; leaves smaller, less than 12 cm. long by 5 cm. wide.

Panicle congested; flowering branches leafy to tips; leaves crowded, broadly ovate, the petioles 6-10 mm. long; Venezuela.

6. *M. cerronis*

Panicle or raceme diffuse or open; flowering branches not conspicuously leafy up to inflorescence; leaves not crowded on stems, narrowly lanceolate, the petioles 15-20 mm. long.

Leaves barely acute; raceme without leaf-like bracts, 3- to 5-flowered; Venezuela..... 7. *M. salicifolia*

Leaves tapering to a long almost caudate tip; panicle with leaflike bracts throughout, 8- to 10-flowered; Costa Rica.

8. *M. subcaudata*

3b. Leaves with the veins evident at least beneath, the blades generally broadly ovate, not at all bullate; panicle nearly always many-flowered.

4a. Panicle congested, the lowest lateral peduncles 1-4 cm. long, but little exceeding the subtending floral leaves; cauline leaves barely if at all connate-clasping.

Corolla 3.5 cm. long; calyx short-turbinate; secondary veins obscure beneath----- 6. *M. cernis*

Corolla showy, 4–5.5 cm. long; calyx deep-campanulate; secondary veins evident beneath.

Leaves lanceolate, at most less than 5 cm. wide, more or less tapering to a slender petiole 10–20 mm. long; ripe capsules 25–27 mm. long, on pedicels, 18–25 mm. long. 9. *M. bangiana*

Leaves ovate, 5–9 cm. wide or more, short-acute to a petiole less than 10 mm. long; ripe capsules 18–20 mm. long, on pedicels 8–15 mm. long----- 10. *M. glabra*

4b. Panicle open or more or less diffuse, the lowest lateral peduncles 7–15 cm. long, much exceeding the subtending floral leaves; cauline leaves connate-clasping by a distinct collar-like base.

Corolla 23–30 mm. long; branches of panicle less than 8 cm. long----- 11. *M. domingensis*

Corolla 30–55 mm. long; branches of panicle 10–20 cm. or more long.

Lower panicle branches arcuately spreading; capsule ovoid, abruptly acuminate, the marcescent style long-persistent; cauline leaves commonly plicate, amphiglabrous.

12. *M. polyantha*

Lower panicle branches divaricate or straight; capsule slender, long attenuate from the base to a deciduous tip; cauline leaves plane, hirtellous on the veins beneath.

13. *M. revoluta*

2b. Leaves ovate to suborbicular, shortly acute or obtuse, subsessile or very shortly petiolate.

Corollas tubular, 50–60 mm. long, narrow, 5–6 mm. median diameter, the lobes short, rounded, erect; leaves crowded, the blades oblong-ovate 3.5–4 cm. long----- 18. *M. chlorantha*

Corollas more or less campanulate, generally much shorter (less than 45 mm. long, except in *M. glabra*), broader (about 10 mm. in median diameter).

Floral leaves acute at the tips, amphiglabrous; calyx-lobes lance-acute, pale hyaline-margined to the base; corolla mostly 50–55 mm. long, the lobes in anthesis merely approximate----- 10. *M. glabra*

Floral leaves obtuse or rounded at the tips, usually hairy along the nerves beneath; calyx-lobes low triangular or subtruncate to barely acute, narrowly scarious-margined toward the tips; corolla 35–45 (seldom 55) mm. long, the lobes in anthesis broadly overlapping. Leaves impressed-nerved above, the veins prominently raised beneath; corollas mostly 4–5.5 cm. long, thick-fleshy; pedicels densely hirtellous with golden hairs, sometimes glandular.

14. *M. pachyphylla*

Leaves plane above, the veins only moderately if at all prominent beneath; corollas less than 4 (seldom 4.5) cm. long, coriaceous but not noticeably thick-fleshy; pedicels at most only sparsely pubescent with scattered hairs, never glandular.

Branchlets not leafy up to the panicle, the cymose panicle long-pedunculate, rather open or loose; leaves 9–14 cm. long, 6–7 cm. wide, the secondaries evident below----- 15. *M. densiflora*

Branchlets leafy up to the compact panicle; leaves 4–6 cm. long, 2–4 cm. wide, the secondaries obscure below.

Calyx-lobes spatulate-ovate, usually distinctly overlapping, broadly hyaline-scarious; leaves of flowering shoots 3-4 (or 5) cm. long, 1.5-3 cm. wide, shortly but distinctly apiculate.

16. *M. quelchii*

Calyx-lobes narrowly ovate, valvate, narrowly hyaline-scarious; principal leaves 5-6 cm. long, 3-4 cm. wide, rounded at the tips----- 17. *M. ovalis*

18. Floral leaves (subtending the lowest branch of the panicle) thin and membranous or firm but not coriaceous, usually large, the blades of the principal leaves 15-30 cm. long, plane; internodes not noticeably short, either smooth or simply quadrangular (section *Tabacifoliae*).

Flowers subtended by a pair of small conspicuous bracts, these deltoid-orbicular, winged-petiolate; calyx-lobes prominently overlapping, dark-green, spreading, ampliate, 1 cm. long, 1.5 cm. wide----- 19. *M. bracteata*

Flowers not subtended by prominent bracts; calyx-lobes not disproportionately large or foliose.

Calyx divided nearly to the base, the lobes broad, overlapping, hyaline-margined, both calyx and distal portion of corolla finely papillate with sessile dotlike glands; leaves both amphiglabrous and punctate with fine dotlike glands----- 20. *M. guttifera*

Calyx divided less than one-third to the base, not at all glandular (or if so then also puberulent); leaves never both amphiglabrous and punctate.

Calyx pubescent with fine matted hairs; cauline leaves obovate, 30 cm. long, 20 cm. or more wide; eastern Brazil----- 21. *M. obtusifolia*

Calyx glabrous (or merely puberulent in *M. macrophylla* and *M. sodiroana*) or glandular-muriculate but not tomentulose; leaves oval, ovate, or elliptic.

Leaves of panicle stalk wholly unlike the lower cauline leaves (all the floral leaves ovate or lance-ovate, 8-10 cm. long, the lower cauline blades obovate, strongly acuminate at tip, 25-35 cm. long, contracted to a distinct petiole 2-4 cm. long); calyx goblet-shaped or ovoid with a distinctly incurved rim, the lobes low-triangular, broadly overlapping; corolla narrow campanulate, 22-28 mm. long; Jamaica.

22. *M. thamnoides*

Leaves of panicle stalk essentially like the lower cauline leaves, being only smaller replicas of them, the blades never strongly acuminate at tip; calyx campanulate or oblong with a flaring or erect rim.

Leaves lanceolate or elliptic, very thin membranous, the blades 20-24 cm. long, 6-8 cm. wide, borne on slender petioles 30-35 mm. long; corolla 22-26 mm. long; calyx finely verrucose-- 23. *M. micrantha*

Leaves oval or ovate, often broadly so, or suborbicular, borne on short stout petioles (at times 1-2 cm. long) or as often sessile. Corolla very large, 50-75 mm. long, the flower-buds acuminate to a beaklike point; calyx 12-15 mm. long; leaf-blades narrowed to a stout, winged-subauriculate, amplexicaulous petiole.

24. *M. duquei*

Corolla usually much smaller, 25-40 (or 50) mm. long, the buds rounded; calyx less than 12 mm. long (except *M. pachystyla*); leaf-blades more or less abruptly acute to a distinct sometimes amplexicaulous petiole.

Calyx-lobes suborbicular, hyaline-membranous, broadly overlapping, the calyx-tube acute at base; corolla lobes conspicuously finely crisped, pale-hyaline----- 25. *M. corymbosa*

Calyx-lobes low, truncate to rounded, only slightly overlapping (or if distinctly so then the calyx-tube rounded at base); corolla lobes not as above.

5a. Panicle ample (with 2 or 3 pairs of divaricate elongate lateral branches), 20–35 cm. long, leafy-bracteate to the ultimate pedicels; upper cauline leaves sessile or petiolate.

Upper cauline leaves 15–24 cm. wide, barely acute, sessile by a connate-clasping base; the venation open by the secondaries deploying at the margin; corolla narrow-campanulate to salver-shaped, the lobes spreading, 7–8 mm. long; shrubs 2.5 or at most 4–8 m. high.

26. *M. macrophylla*

Upper cauline leaves 8–12 cm. wide, abruptly acuminate, narrowed to a petiole 1–2 cm. long; the venation closed by the secondaries continuing to and merging at tip; corolla open campanulate, the lobes reflexed, 10–12 mm. long; shrubs 2 m. high----- 27. *M. valerii*

5b. Panicle more congested, less than 20 cm. long, not noticeably leafy-bracteate; upper cauline leaves always distinctly petiolate.

Calyx broadly cupulate, 9–14 mm. wide, the lobes lance-ovate, acute, hyaline-scarious to the base; upper cauline leaves suborbicular, barely acute, the petioles abruptly connate-clasping----- 28. *M. pachystyla*

Calyx narrow or oblong, 7–10 mm. wide, the lobes broad, subtruncate or blunt, hyaline only at their tips; upper cauline leaves ovate, acute.

Panicle flattened-corymbose; corolla 40–55 mm. long, the lobes 11–16 mm. long----- 29. *M. viscosa*

Panicle diffuse; corolla 35–45 mm. long, the lobes 8–9 mm. long----- 30. *M. sodiroana*

1. *Macrocarpaea rubra* Malme, Arkiv Bot. 22A (2) : 3. 1928.

Slender herbaceous perennial about 1 m. high or even flowering when only 30 cm. tall, the stem simple, quadrangular, smooth or sulcate on alternate faces, glabrous throughout; leaves rather large, elliptic to lance-ovate, acute, thin, membranous, amphiglabrous, the principal blades 10–18 cm. long, 6–9 cm. wide, narrowed to a slender petiole, 4–14 mm. long; panicle now unbellike, now diffusely pyramidal, always leafy-bracteate, the flowers cymosely clustered; calyx goblet-shaped, 9–11 mm. long, the lobes unlike, 3 obovate or spatulate, rounded, crisp, thin, golden-translucent at tips, much broader than two alternate lobes which are nonmembranous, more green-opaque, acute, the calyx-tube grooved below the sinuses; corolla reddish urceolate, a little swollen at the throat, 22–28 mm. long, the lobes short, broadly ovate, 1–2 mm. long, erect; mature capsule globose, thin-walled, 12–16 mm.

long; seeds triangular or helmet-shaped, about 1 mm. broad, finely alveolate.

Type from Desiro Ypiranga, 830 m., State of Paraná, Brazil, October 27, 1908, *Dusén* s. n. (isotype, A).

Specimens examined.—BRAZIL: Paraná: Desiro Ypiranga, *Dusén* 6965 (US), 15790 (US), Serra do Mar, Ypiranga, 830 m., *Dusén* 17288 (A).

A highly distinctive species upon which Per Dusén founded an unpublished genus. In the present treatment it is placed in the proposed monotypic subgenus *Paranagenes*. In some particulars, notably the showy, broadly urceolate corollas, *Macrocarpaea rubra* stands between the subgenus *Eumacrocarpaea* and the genus *Rusbyanthus*. The seeds of the latter genus, however, are fundamentally different. *Macrocarpaea rubra* is a local endemic of the Paraná region. *Macrocarpaea glaziovii* Gilg, removed to the doubtful species section in this revision, may be the prior name for this plant.

2. *Macrocarpaea stenophylla* Gilg, Bot. Jahrb. Engler 22: 337. 1896.

Small shrub 1 m. high, the branchlets quadrangular, glabrous throughout, internodes short, 3.5–6 cm. long, but often longer than the leaves; leaves ovate-oblong, obtuse or shortly acute at both apex and base, coriaceous and a little revolute, sparsely punctate-dotted beneath, nearly or quite glabrous, 2.8–3.8 (or “5.5”) cm. long, 12–18 mm. wide, on short petioles, 2–3 mm. long; panicles congested, the 4–6 flowers borne in short-pedunculate leafy-bracteate cymes; flowers light-green, subtended by 2 large spatulate-obovate leaflike bracts, 10–16 mm. long; calyx short-campanulate, 6–9 mm. long, the lobes low, rounded, thin hyaline margined; corolla turbinate-campanulate, 32–35 mm. long, the lobes ovate to suborbicular, 7–10 mm. long; capsule unknown.

Type from between Pacasmayo and Moyobamba, Mojón Cruz, between Ventilla and Bagazán, 3,300 m., Dept. Amazonas, Peru, *Stübel* 24c.

Specimen examined.—PERU: Amazonas: La Jalca, between Chachapoyas and Moyobamba, January 20, 1930, *L. Williams* 7582 (F).

This little-known but distinctive *Macrocarpaea*, readily distinguished by the subtending leaflike bracts below the flowers, resembles *M. chlorantha* in the characters of its leaves, in the congested inflorescence, and in its general habit, but the flowers of the latter species are cylindric long-tubular, suggesting those of the genus *Lochroma*, and it lacks the subtending bracts of this species.

3. *Macrocarpaea calophylla* Gilg, Bot. Jahrb. Engler 22: 339. 1896.

Shrub or subshrub, the branchlets pubescent, longitudinally grooved or ribbed below, subterete above; leaves elliptic, subcoriaceous, more or less acute glabrous, 6–9 cm. long, 4–5.5 cm. wide, evidently pinnate-

nerved, the nerves and veins impressed above, prominent beneath, petiolate, the petioles 1–2 cm. long; panicle few-flowered, the flowers disposed in pedunculate cymes, the pedicels 2.5–3 cm. long, the bracts leaflike but short; calyx nearly campanulate, coriaceous, 8–9 mm. long, the lobes almost free, rounded; corolla “dark brown,” 4–4.5 cm. long, the lobes broadly ovate, rounded, about one-third as long as the tube; stamens inserted in the lower part of the tube and equaling the tube or a little exserted; anthers oblong, sagittate, recurved at anthesis; style filiform, thickened, much exceeding the tube; stigma broadly bilobed, the lobes suborbicular.

Type from San Sebastián de la Sierra, 4,500 m., “Prov[ince of]” Santa Marta, now Dept. Magdalena, Colombia, 1843, *Funck* 530.

The above description is based on the original diagnosis, no specimen having been seen. The occurrence of several endemic plant species in the Sierra de Santa Marta suggests that *Macrocarpaea calophylla* may, likewise, prove to be an endemic species of that range.

4. *Macrocarpaea cochabambensis* C. Gilg, Notizb. 13: 381. 1936.

Small slender tree or subshrub to 6 m. high; stems laterally compressed and sulcate, leafy up to the flowers; leaves oval to oblong-ovate, rather thin, 7–13.5 cm. long, 5–9 cm. wide, glabrous above except along midrib, thinly hirsutulose and black glandular-dotted beneath, all shortly petiolate, the petioles rather prominently amplexicaulous; panicle ample, diffuse, leafy-bracteate, the branches and pedicels densely hirsutulose with white spreading simple or branching hairs; calyx urceolate-campanulate, 11–13 mm. long, the lobes suborbicular, conspicuously overlapping, erosulate; corolla greenish-white, turbinate-campanulate, 38–45 mm. long, the tubes flaring above the calyx, the lobes narrowly ovate, 8–10 mm. long; immature capsule nearly spherical, included within the calyx, tipped by the tardily deciduous style.

Type from forest, Incachaca, 2,300 m., Prov. Chapare, Dept. Cochabamba, Bolivia, January 30, 1929, *J. Steinbach* 8992 (isotype, F, Mo).

Additional collection.—BOLIVIA: “Near Yungas, 4000 ft. 1885,” *Rusby* 1172 (NY).

Rusby wrote of this Yungas specimen in 1898 (*Bull. Torrey Club* 25: 545) “*Macrocarpaea* sp. apparently undescribed, near *M. bogotense* Gilg Mature leaves wanting” and later gave it a commemorative specific name for Gilg, but this was never published.

The specimen at the Gray Herbarium bearing the label of *Steinbach* 8992 is not an isotype of *Macrocarpaea cochabambensis* but represents, rather, *Rusbyanthus cinchonaefolius* Gilg.

5. *Macrocarpaea arborea* (Britton) Ewan, comb. nov.

PLATE 1

Chelonanthus arboreus Britton, Bull. Dept. Agr. Trin. & Tob. 19: 230. 1922.

Tree 3–5 m. high, “with a few nearly upright branches and a smooth

trunk 3 or 4 inches in diameter near the ground," glabrous throughout, the stems at least above subterete; leaves elliptic, thick-coriaceous, dark-green, 5-10 (or 14.5) cm. long, 2.5-4.5 (or 7) cm. wide, the mid-vein prominent beneath, the lateral veins wholly obscure, the apex acute or short-acuminate, the base narrowed or subcuneate, the rather stout petioles 1-2 (or 3) cm. long; panicles rather strict, long-pedunculate, more or less dichotomously branching, 5- to 7-flowered, the bractlets lance-subulate, 3-5 mm. long, the pedicels slender or at times stout, rather unusually (6-12 mm.) long, decurved after anthesis; calyx turbinate- or shallowly campanulate, 8-10 mm. long, barely acute or rounded at the base, the lobes triangular-ovate, acute, rather broadly hyaline-margined, 6-8 mm. long, conspicuously overlapping; corolla tubular-campanulate, greenish-yellow or greenish-white, 2-3 cm. long, the lobes short, rounded; stamens about as long as the corolla-tube; stigmas flat, oblong; capsule ovoid-oblong, abruptly contracted to a stout beak, 18-21 mm. long (excluding the beak).

Type from "forested bank near summit of Mount Tucuche," Trinidad, British West Indies, April 3-5, 1920, *Britton, Hazen, & Mendelson* 1295 (NY).

Specimens examined.—TRINIDAD: Blanchisseuse Road, top of Morne Bleu, May 16, 1926, *W. E. Broadway* 6207 (sterile) (US); Mount Tucuche, 900 m., April 20, 1945, *J. S. Beard* 473 (A, photo at US, USNA).

Of the discovery of this evidently rare species Britton wrote:

One of the most interesting wild plants observed by us in Trinidad during April, 1920, was a small tree of the Gentian family, growing at the top of the precipitous northern slope of Mount Tucuche a short distance from the summit; we had gone a few feet off the excellent path up this mountain and plunging through dense undergrowth came out at the top of the slope and face to face with this curious plant, which is probably rare, for none of the several botanists who have previously explored the mountain appear to have found it; at all events it has never been described and is thus new to Science.

Britton related *Macrocarpaea arborea* to *Chelonanthus* on the basis of the plant's "much resembling" *Lisianthus frigidus* (Sw.) Urban, of St. Vincent and Guadeloupe, which has, in turn, been assigned to *Calolisianthus* by Gilg. However, as even Britton pointed out, *Chelonanthus frigidus* has fewer or solitary and larger flowers than the arboreal species under discussion. The corolla of *C. frigidus* is moreover, salverform like that of *Calolisianthus*, a fact which Britton did not consider. Corolla form, in my opinion, is the critical criterion of relationship among the major groups within what was included in the original inclusive genus *Lisianthus*. Thus, the St. Vincent *Lisianthus frigidus* may be referred to *Calolisianthus*, following Gilg; *Chelonanthus arboreus* of Trinidad, to *Macrocarpaea*.



MOUNT FOOLONG
 CHINA
 BRITTON & ROY
 1929

Macrocarpaea arborea Britton & Ewan
 1929

NEW YORK BOTANICAL GARDEN
 PLANTS OF THE NEW YORK BOTANICAL GARDEN
 1895
Chelodactylus arborescens Britton
 Forest Park near Hamlet
 MOUNT FOOLONG
 N. L. BRITTON
 T. F. ROY
 COLLECTED BY BRITTON & ROY
 CHINA
 APR. 2-8 1929

MACROCARPAEA ARBOREA (BRITTON) EWAN



1184414

CHICAGO
HARV. MUSEUM

80058 PLANTS OF VENEZUELA *Type*
Macrocarpaea cerronis Ewan
Shrub, common, 3-5 feet tall; corolla
dull green; leaves coriaceous, dark
green above, pale green below

MACROCARPAEA CERRONIS EWAN



18102
 CHICAGO
 NAT. HIST. MUSEUM

PLANTS OF VENEZUELA *TYPE*
 60279
Macrocarpaea salicifolia Ewan
 Simple-stemmed, herbaceous, 10 feet tall
 corolla green; leaves coriaceous,
 dark green above, pale green below

State of Bolivar, vicinity of "Mesa Kelly Camp," on road between
 Paraitene and Santa Rita, altitude 1815 meters.
 1932

MACROCARPAEA SALICIFOLIA EWAN



MACROCARPAEA REVOLUTA (R. & P.) GILG

6. *Macrocarpaea cerronis* Ewan, sp. nov.

PLATE 2

Frutex intricate ramosus 1–2 m. altus, ramis quadrangularibus, ad apicem foliosis; foliis ovatis vel breviter ovato-lanceolatis cuspidatis vel breviter acutis, crassis, utrinque glabris, 5–7 cm. longis, 2–4 cm. latis, margine revolutis, costa manifesta et nervis secundariis infra obscuris, basin versus sensim in petiolum ca. 5 mm. longum contractis; paniculis cymosiformibus floribus 6–12; calyce breviter campanulato vel turbinato, lobis ovatis, acutis, 6–7 mm. longis, hyalino-scariosis; corolla campanulata, subviridi, 3.5 cm. longa, lobis rotundatis, ovatis, 8–10 mm. longis; genitalibus inclusis; capsula immatura ovoidea, acuta, 1.5 cm. longa.

Rather intricately branched shrub 1–2 m. high, the stems quadrangular, at least distally leafy up to the panicle; leaves ovate to short ovate-lanceolate, cuspidate or shortly acute, thick, amphiglabrous, 5–7 cm. long, 2–4 cm. wide, revolute, the midrib evident but secondaries obscure beneath, narrowed at base to a petiole about 5 mm. long; panicle rather cymose, 6- to 12-flowered; calyx short-campanulate to turbinate, the lobes ovate, acute, 6–7 mm. long, hyaline-scarious margined; corolla dull green, 3.5 cm. long, campanulate, the tube flaring above the calyx, the lobes rounded, ovate, 8–10 mm. long; stamens included; immature capsule ovoid, acute, 1.5 cm. long.

Type in the Chicago Natural History Museum, No. 1184414, collected on Sororopán-tepuí, State of Bolívar, Venezuela, 2,225–2,255 m. elevation, November 13, 1944, by *Julian A. Steyermark* (No. 60058) (isotype, US).

It is of phytogeographic interest that the nearest relative of *Macrocarpaea cerronis* and of *M. salicifolia*, two species of the Venezuelan *cerros*, is *M. arborea* (Britton) Ewan from the Northern Range, Trinidad, B. W. I. These three species are recognizable as a group by their lanceolate to short-ovate leaves having a distinct midrib but with the secondary veins obscure beneath. From the Trinidad *M. arborea*, *M. cerronis* differs in its short-petiolate somewhat smaller leaves, crowded on the branchlets, and the larger more urceolate corollas with larger more spreading lobes.

Macrocarpaea cerronis, known only from Sororopán-tepuí, where it is said to be a common shrub, is closely related to *M. salicifolia* from the adjoining mesa of Ptari-tepuí. It will be noted that *Macrocarpaea cerronis* occurs at a considerably higher elevation than *M. salicifolia*. It is perhaps significant that of the two related Venezuelan species the one occurring at the lower altitude most nearly agrees in its morphology with *M. arborea* of Trinidad. The foliage characters of the two species are at once distinct but the corollas are of the same size, have nearly the same color, and corolla limb, though *M. cerronis* has a somewhat more ventricose corolla tube. The time of flowering is evidently the same. Here we may be observing the near-

contemporaneous emergence of two species from a single ancestral species accompanied by the geographic isolation of the two segregates.

7. *Macrocarpaea salicifolia* Ewan, sp. nov.

PLATE 3

Frutex strictus 2.5–3.5 m. altus, caulibus subquadrangularibus ubique laevibus; foliis ovatis vel lanceolatis, crassis acutis abrupte cuspidatis subcuneatis basin versus sensim in petiolum 1.0–1.5 cm. longum contractis, margine revolutis, costa manifesta et nervis secundariis utrinque obscuris utrinque glabris opaco-viridibus infra pallidioribus, 11–13 cm. longis, 2.5–5 cm. latis; racemis 3–5-floribus, pedunculis 4–5 cm. longis, pedicellis rigidis, 1–2 cm. longis; calyce turbinato ca. 10 mm. longo, lobis ovatis, 7–8 mm. longis, scariosis vel hyalino-marginatis; corolla campanulata, 3.5 cm. longa, viridi, lobis late ovatis, suborbicularibus, 10 mm. longis, approximatis; capsula immatura ovoideo-pyriformi, 1.5 cm. longa, stylo persistenti 2.0–2.5 cm. longo.

Upright shrub 2.5–3.5 m. high; stems simple, weakly quadrangular, smooth throughout, moderately leafy up to the few-flowered raceme; leaves ovate or lanceolate, simply acute to abruptly cuspidate, somewhat cuneate at the base to a petiole 1–1.5 cm. long, thick, narrowly revolute, the midrib prominent, lateral veins obscure on both surfaces, amphiglabrous, dull green above, paler beneath, 11–13 cm. long, 2.5–5 cm. wide; raceme 3- to 5-flowered, barely exceeding the uppermost leaves, the peduncle 4–5 cm. long, pedicels stout, 1–2 cm. long; calyx turbinate, about 10 mm. long, the calyx lobes ovate, 7–8 mm. long, broadly scarious or hyaline-margined; corolla campanulate, 3.5 cm. long, green, the lobes broadly ovate, rounded, 10 mm. long, approximate; immature capsule ovoid-pyriform, 1.5 cm. long, the persistent style 2–2.5 cm. long.

Type in the Chicago Natural History Museum, No. 1184028, collected in vicinity of "Misia Kathy Camp," on the mesa between Ptari-tepuí and Sororopán-tepuí, State of Bolívar, Venezuela, 1,615 meters elevation, November 15–17, 1944, by *Julian A. Steyermark* (No. 60279).

Additional specimen examined.—VENEZUELA: Bolívar: Forested sandstone south-facing slopes between plateau portion and "Cave Camp," Ptari-tepuí, 1700–1800 m., *Steyermark* 59721 (F, US).

The relationships of this species are with *Macrocarpaea cerronis*, of Venezuela, *q. v.*

8. *Macrocarpaea subcaudata* Ewan, sp. nov.

Frutex, parte superiore caulis subtereti laevi; foliis lanceolatis, subcaudatis et revolutis, costa subtus manifesta venis secundariis subtus subobscuris supra obscuris, utrinque glabris, supra saturate viridibus, subtus pallidioribus; paniculis 8–10-floribus; calyce breviter campanulato, 10 mm. longo, lobis suborbicularibus, submembranaceis

et subciliolatis, 3–4 mm. longis; corolla verisimiliter ochroleuca, 26–30 mm. longa, lobis angustis ovatis acutis margine pallidis, 5–6 mm. longis; staminibus vix exsertis (?); capsula ignota.

Slender shrub about 2 m. high (?); upper stems nearly terete, essentially smooth, sparingly leafy up to the panicle; leaves lanceolate, tapering to a subcaudate tip, narrowly revolute, the midrib evident beneath, secondaries faint below, obscure above, amphiglabrous, dark olive green above, paler beneath, 11–12 cm. long, 3.0–3.5 cm. wide, narrowed to a slender petiole 1–2 cm. long; panicle 8- to 10-flowered, the flowers apparently yellowish; calyx short-campanulate, 10 mm. long, the lobes rounded, very thin, faintly ciliolate, 3–4 mm. long; corolla narrow campanulate, 26–30 mm. long, the lobes narrowly ovate, acute, a little pale on the margins, 5–6 mm. long; stamens barely exerted (or only appearing so upon wilting?); capsule unknown.

Type in the U. S. National Herbarium, No. 1080493, collected in the vicinity of La Palma, Costa Rica, at 1,500 meters elevation, November 1902, by "C[arlos] W[ercklé]" (No. 16492).

The type of *Macrocarpaea subcaudata* has the leaves rather strongly revolute beyond what may be expected in this genus. A biographical note on the collector, I believe, will elucidate the cause of this somewhat collapsed condition of the type specimen. P. C. Standley writes¹² of Carlos Wercklé and his work in Costa Rica in these words:

Wercklé collected less extensively than the other persons named [i. e., H. Pittier, A. Tonduz, etc.] but discriminately, giving his attention to special groups, particularly bromeliads and orchids. The majority of endemic bromeliads of Costa Rica were described from his collections. His specimens usually were disgraceful, for on his tramps over the country he used to cram any strange plants into his pockets or into a bag, and they reached the herbarium in a sad state, but still in good enough condition for study. After all, such a method of collection is not ill adapted to bromeliads.

More difficult to settle is the exact origin of the type, since there are three localities in Costa Rica bearing the same place name "La Palma," the only designation on the original label. Fortunately the notation "1500 ms." guides me in deciding in favor of its being the La Palma on the old road from San José to the Atlantic coast.

9. *Macrocarpaea bangiana* Gilg, Bot. Jahrb. Engler 22: 335. 1896.

Slender shrub 1.5–2.5 m. high, the branchlets quadrangular, the uppermost subterete with short internodes, glabrous or thinly puberulent, asperulate below; leaves approximate, the blades lance-oblong to lanceolate, acute, 9–15 cm. long, 3–5 cm. wide, strongly veined and strigulose along veins beneath, microlepidote, glabrous and shining above, petiolate, the petioles 12–18 mm. long; panicle compound-

¹² Field Mus. Bot. 18 (1): 50. 1937.

cymose, leafy-bracteate, the lateral branchlets stiffly divergent, stout, rather short, 6–7 cm. long; flowers showy, large, the corollas 4.5–4.8 cm. long, funnelform-campanulate, the lobes ovate-rounded, 12–14 mm. long; stamens barely exerted, the anthers 7 mm. long; stigma bilamellate, deltoid-expanded; capsule almond-shaped, 25–28 mm. long, glabrous, tipped by short persistent style; seeds unknown.

Type from Yungas, Bolivia, *Miguel Bang* 520 (isotypes, F, G, MO, NY, US).

Additional specimen examined.—BOLIVIA: Dept. de La Paz, above Santa Bárbara, 6,500 feet. *R. S. Williams* 1561 (NY).

This narrow-leaved species belongs to the same group as *Macrocarpaea viscosa* (R. & P.) Gilg, of which it may be a geminate species of the eastern slope of the Bolivian Cordillera Oriental though the Peruvian *M. viscosa* is little known. *M. bangiana* is not, on the other hand, related to *M. glabra*, as suggested by Gilg, a species misinterpreted by him. *Williams* 1561 was not identified by Gilg as this species; he annotated a sheet in 1904 to the effect that, "sine floribus haud accuratius determinanda," yet this fruiting collection is clearly this species even to the minute pubescence characters. It was made the type of an unpublished species by Rusby.

10. *Macrocarpaea glabra* (L. f.) Gilg in Engler, Pflanzenfam. 4²: 94. 1895.

Lisianthus glaber L. f. Suppl. 134. 1781.

M. bogotana Gilg, Bot. Jahrb. Engler 22: 337. 1896. Based on (1) *Lisianthus glaber* sensu H. B. K. Nov. Gen. & Sp. 3: 183. 1819, in turn based on *Humboldt and Bonpland* coll. from "[Santa Fe de] Bogotá"; also based on (2) *Triana* 1965, from vic. Bogotá, and (3) *Holton* 470, from Montserrat above Bogotá, Dept. Cundinamarca, Colombia. Three sheets of *Holton* 470 (GH, NY, PH) and a probable duplicate of *Triana* 1965 (US No. 1481182), though labeled only "Bogotá," have been studied.

Shrub 1.5–2.5 m. high, stems quadrangular, longitudinally grooved, mostly with numerous short erect rather leafy branches, glabrous throughout up to the puberulent pedicels, the internodes usually short, one-half as long to about equaling the leaves; leaves oval or lance-ovate, 5–14 cm. long, 3.5 to 6.5 cm. wide, with a firm cartilaginous margin, plane or narrowly revolute, amphiglabrous or with a few scattered hairs along the midrib beneath, bifacial, lower side paler, nervose, dark olivaceous shining above, subsessile, but only uppermost distinctly connate-clasping; panicle narrow, the laterals divergent, not more than 10 cm. long, mostly 3–5 cm., leafy-bracteate, the floral leaves little reduced over the principal cauline leaves, the cymules usually congested, 6- to 10-flowered; calyx cylindrical-campanulate, 11–14 mm. long, subglabrous to puberulent, the lobes triangular-ovate, acute, only a little overlapping, thin, 4–5 mm. long; corolla greenish yellow, salver-shaped, 40–55 mm. long, early shriveling, the lobes deltoid-ovate, 8–12

mm. long, 4–10 (or 12) mm. wide; capsule relatively short, ovoid at maturity, 18–20 mm. long; seeds quadrate, thin, 0.5 mm. long, honey-colored, irregularly roughened.

Type from "America meridionali," certainly from Colombia, and likely from Bogotá, communicated by *José Celestino Mutis* (type in Linnaean Herb., London; isotypes, *Mutis* 4562 US 1562647, Madrid Bot. Garden).

Specimens examined.—COLOMBIA: Cundinamarca: Mount Guadalupe near Bogotá, 3,350 m., *Niemeyer* 215 (US). Montserrate, *Dawe* 11 (US); *Pérez Arbeláez* 1058 (US); *Killip* 38076 (US). Sierra de Siete Picos, 2,900–3,100 m., *Cuatrecasas* 5672 (US). Los Gaques, w. slope of Páramo de Guasca, 3,250 m., *Killip* 34074 (US). Santa Fé de Bogotá, *Purdie*, s.n. (GH). Las Cruces, Bogotá, *Pennell* 2195 (PH). Without locality, *Mutis* 90 (US), 333 (US).

Macrocarpaea glabra is apparently localized in the Bogotá region where it is a familiar shrub scattered among the páramo vegetation on the mountains above the city. A single collection, *García-Barriga* 12061, from between San Miguel and Aguadita, 1,980–2,360 m., Dept. Cundinamarca, described by the collector as a small tree 3.5 m. high, has the corolla more flaring-campanulate, the tube narrow above the calyx. It deserves close study in the field.

The *Mutis* illustration referred to in the original description by the phrase "Icon. Mutis. Amer. v. 2. t. 1." is one of a collection of plates on the flora of Colombia, unpublished, preserved in the Library of the Linnean Society of London (cf. *Pritzels, Thesaurus*, ed. 2, item 6590). In the original description the petiolate condition of this species was over-stressed but the statement must be checked against the contemporary broad definition of the genus *Lisianthus*, many species of which have strongly sessile leaves.

Upon our request, Dr. Arturo Caballero, of the Madrid Botanic Garden, compared *Mutis* 4562 in the Madrid Herbarium with the *Mutis* plates and reported that they unquestionably represent the same species. These Madrid plates have been studied first by Triana and more recently by Killip, who has published a brief account of this *Mutis* collection (*Bull. Pan Amer. Union* 67: 162–171, illus. 1933), but they have not been collated with the series in the Linnean Society at London.

There is a sheet of a poor inflorescence in postanthesis in the Herbario Nacional Colombiano (No. 20125), labeled "*Lisianthus glaber*" and the source given as "Prov. de Bogotá, alt. 2,700 m. Junio 1855," collected by Triana, "3550 [=genus number]—3 [=species number]," which is almost certainly *Macrocarpaea macrophylla* and very doubtfully from the Bogotá region. The Colombian National Herbarium, which possesses a good set of Triana plants, has no collection of *M. glabra* collected by Triana, but it does contain another sheet of *M.*

macrophylla taken by him, with the original label (No. 16738). Sheet No. 20125 may have the wrong label attached.

There is a sterile sheet from Venezuela (State of Mérida: between La Cumbre, San José, and Mucutuy, 1,820–2,590 m., *Steyermark* 56239) which resembles *M. glabra* in its leaf characters and old dried inflorescences of the previous year, but may prove to be an undescribed *Macrocarpaea*. The leaves are unlike any Venezuelan species of *Symbolanthus* known to the writer.

11. *Macrocarpaea domingensis* Urb. & Ekman, Arkiv Bot. 23A (11): 30. 1931.

Shrub 2–3 m. high, the branchlets stout, nearly terete above, grooved or angled, glabrous up to the pedicels, the upper internodes short; leaves lanceolate to oblong-oval, barely acute or blunt at the tip, 14–16 cm. long, 5.0–6.5 cm. wide, smooth and shining on both surfaces, the veins more evident beneath, all petiolate, the petioles sometimes wing-margined, 1.0–1.5 cm. long; panicle moderately ample, the branches rather arcuately spreading or ascending, 6–8 cm. long, the flowers loosely clustered in leafy-bracteate cymules; calyx short-campanulate, 7–9 mm. long, acute at base, glabrous, the lobes rounded, broadly overlapping, 3 mm. long, pale-scarious, minutely fimbriate; corolla greenish-yellow or yellowish, narrow-campanulate, 23–30 mm. long, the lobes ovate, barely acute, pale-scarious; immature capsule elongate-fusiform, tapering to a short marcescent style.

Type from mossy forest at the summit of La Loma Campana, 1,200 m., where it is not rare, Cordillera Central, Dominican Republic, *E. L. Ekman* H11504, February 11, 1929 (isotype, US).

Macrocarpaea domingensis, known only from the type, has not been collected on the other West Indian islands. The authors draw the distinction between this species and *M. thamnoides* of Jamaica, but it is not a close relative of that other Caribbean species. Its relationships are clearly with the Andean species, *Macrocarpaea polyantha*, *M. revoluta*, and *M. bangiana*. In the sum total of its characters *M. domingensis* is perhaps most closely related to the Colombian *M. polyantha*, from which it differs in its larger flowers, less strongly arcuate branches of the panicles, and its plane, not plicate, leaves.

12. *Macrocarpaea polyantha* Gilg, Bot. Jahrb. Engler 22: 336. 1896.

Shrub or small tree, 2–3 m. high, the branchlets stout, more or less quadrangular or nearly terete above, glabrous or subglabrous up to the lightly puberulent peduncles, the upper internodes short; leaves oblong-oval, rounded at base, obtuse at the apex, thick-coriaceous, veins evident beneath, obscure above, amphiglabrous, 11–15 cm. long, 3.5–6.5 cm. wide, even the uppermost petiolate, the petioles stout, 1–1.5 cm. long, connate-clasping by a broad expanded base; panicle

ample, branching below with elongate arcuately spreading peduncles, the flowers numerous, clustered in dense terminal leafy-bracteate cymes, the ultimate pedicels commonly nodding; calyx oblong-campanulate, 10–12 mm. long, acute or narrowed at the base, puberulent, the lobes ovate, rounded, pale scarious, minutely fimbriate; corolla sulphur- or greenish-yellow, narrow-campanulate to salverform, 30–38 mm. long, the lobes triangular-ovate, finely crisped, a little fimbriate; capsule fusiform-ovoid, abruptly narrowed to the marcescent style, 1.5–2.5 cm. long, the fruiting calyx hardening, somewhat accrescent; seeds quadrate, about 0.5 mm., finely honeycomb-pitted over the concave faces.

Type, reputedly, from “Santa Fé de Bogotá, Peña in feuchten Hainen,” Colombia, *Goudot* No. 1.

Specimens examined.—COLOMBIA: Norte de Santander: Between Pamplona and Toledo, thickets along stream, 2,500–2,800 m., *Killip & Smith* 19818 (A, US). Páramo de Hatico, 2,900 m., *Killip & Smith* 20613 (A, US); Cundinamarca: Páramo de Fontibón, 2,600–2,750 m., *Cuatrecasas et al.* 12271 (US).

Macrocarpaea polyantha, as here interpreted, is the shrub of the Colombian páramos of Norte de Santander. I believe the citation of Bogotá as the source of Goudot's collection refers to the Province of Bogotá, a geographic division now abandoned. All collections of *Macrocarpaea* examined from the Bogotá region proper are referable to *M. glabra* (L. f.) Gilg. A. C. Smith, when studying the Kew material in 1931, wrote: “I am unable to find the slightest difference between *Goudot* (type of *M. polyantha* Gilg) and *Holton* 470, both from Bogotá. *Pennell* 2195 is an absolute equal of it, even in details of branching.” There is the possibility that the actual Goudot type, at Berlin when studied by Gilg, differs from the Goudot sheet at Kew. All Goudot collections were only casually labeled, mostly unnumbered, and I believe Gilg may have affixed an arbitrary number to the Berlin sheet. According to Lasegue,¹⁸ Goudot visited the emerald mines at Muzo in the present Department of Boyacá and may have traveled even farther north along the Cordillera Oriental at which time he could have taken the type of *Macrocarpaea polyantha*. However, he apparently made the trip to Bogotá via Río Magdalena and not overland from Venezuela. “La Peña” is identified by Joaquin Esguerra O. in his *Diccionario Jeografico de los Estados Unidos de Colombia* (1879) as “Distrito correspondiente al Departamento de la Palma, en el Estado de Cundinamarca: esta sobre el cerro . . . i a 1240 met. sobra el nivel del mar . . . Dista de Bogotá 10 miriametros.” Is it possible that *M. polyantha* represents the plant collected by Garcia-Barriga (No.

¹⁸ Mus. Bot. Deless. 471. 1845.

12061), mentioned under the discussion of *M. glabra* beyond, rather than the Norte de Santander plant? I regret that a photograph of the type of *M. polyantha* has not been available, for it would afford a check of my belief that it has been up to now mistakenly assigned to the Bogotá region.

The petiolate, obtuse, not sharply acute or acuminate leaves of this species, along with the characteristic panicles with crowded cymules borne on outwardly curving branches and often nodding flowers, distinguish it from *Macrocarpaea glabra*. Gilg's comparison of *Macrocarpaea polyantha* with the Bolivian *M. bangiana* takes on additional significance when this endemic Norte de Santander plant is considered as distinct from the Bogotá shrub, since the leaf characters of the two geographically distant species agree closely.

13. *Macrocarpaea revoluta* (R. & P.) Gilg in Engler, Pflanzenfam. 4¹: 94. 1895.

PLATE 4

Lisianthus revolutus R. & P. Fl. Peruv. Chil. 2: 14. pl. 127. 1799.

Slender open shrub or small tree, 2-4 m. high; branches few, spreading, subterete above, weakly several-angled below, glabrous or peduncles puberulent or finely pruinose; leaves ascending, borne on short stout petioles, thick or subcoriaceous, narrowly lanceolate, acuminate, acute at base, revolute by a narrow firm almost cartilaginous margin, glabrous above, crisp hirtellous along the veins beneath, 10-14 cm. long, 4-5.5 cm. wide; panicle open, diffusely branching, bearing rather crowded many-flowered cymules at summits of elongated stout branchlets; flowers waxy cream-colored, short-pedicellate, the pedicels pruinose-puberulent; calyx short-campanulate, 6-9 mm. long, the lobes short, 2.0-2.5 mm. long, often flaring, little if at all overlapping; corolla campanulate, rather abruptly ventricose, 30-35 mm. long, the lobes triangular-acute, about 1 cm. long; capsule slender, lance-tapering, 32-38 mm. long, often abruptly acute to a short style; seeds more or less quadrate in outline, 0.5-0.8 mm. long, irregularly and lacerately winged, golden-brown, the body finely alveolate.

Type from "montibus altis frigidis," Muña to Saria, Pachitea, Peru, Ruiz & Pavón (authentic material, F 843608, which is plate 4).

Specimens examined.—PERU: Junín: La Merced, 700 m., Macbride 5224 (F). Amazonas: Between Chachapoyas and Moyobamba, L. Williams 7596 (F).

The Ruiz and Pavón plate is in essential agreement with the authentic collection in Chicago Natural History Museum from the herbarium of the Madrid Botanic Garden, except that the cymules are illustrated as 3- or 4-flowered when they are rather 8- to 20-flowered. The petioles in the specimen are completely amplexicaul by a narrow-cupulate base. The veins, moreover, are drawn as too prominent, especially those of the upper leaf surface. A similar discrepancy between a plate pub-

lished by Ruiz and Pavón and modern collections of the plant in question was noted by F. W. Pennell for *Calceolaria tripartita* R. & P. Pennell found flowers and foliage wrongly associated and comments upon the error: "such reconstructions and generalizations occur elsewhere among Ruiz and Pavón's illustrations" (Proc. Acad. Nat. Sci. Philadelphia 97: 174. 1945).

Saria Hill is mentioned only once in the narrative of Ruiz on his "Travels in Peru and Chile" (*op. cit.* 234), in describing a trip of October 1787, but it may be located with reference to Chacahuasi and Muña as lying in headwaters of the Río Huallaga of the Cordillera Oriental of northern Peru. Evidently it is a plant of cold pygmy forests just below the true puña.

There is a Weberbauer collection in both flower and fruit (6116), without locality data,¹⁴ in the Chicago Natural History Museum Herbarium, which for the present may be referred to this species. The inflorescence—a single long-pedunculate umbellike cluster of 7–12 flowers—is singular in the genus *Macrocarpaea*, recalling *Calo-lisianthus*. The leaves of the flowering branch are narrowly lanceolate, those of the lower stem, accompanying the separate fruiting branch, broadly ovate. The narrow fusiform capsules clearly identify the plant as a *Macrocarpaea*.

14. *Macrocarpaea pachyphylla* Gilg, Bot. Jahrb. Engler 22: 338. 1896.

Tall slender arborescent perennial, 3–4 m. or more high, the branches leafless below, sparingly branching above, decussate, bearing leaves in clusters or tufts at the ends of the shorter laterals; stems weakly quadrangular, glabrous or nearly so; leaves of sterile shoots oval or oblong-ovate, 15–18 cm. long, 7.0–8.5 cm. wide, short-petiolate by a connate-clasping base, glabrous above, hirsutulous or setulose with pustulate hairs below, microlepidote on both surfaces, especially below, the veins prominent, the leaves of fertile shoots few and soon reduced above to bracts subtending branches of the panicle, these sessile, subrotund or short-ovate, strongly revolute, impressed-venose, all thick-coriaceous; panicle ample, open-cymose, leafy-bracteate throughout, the cymules 5- to 12-flowered, the flowers showy, the peduncles and pedicels densely setulose; calyx short-campanulate, 10–12 (or 18) mm. long, the lobes low-triangular, blunt, narrowly scarious margined; corollas salver-shaped, 3.5–5.5 cm. long, flaring almost evenly upward

¹⁴ No. 6120, *Macleania farinosa*, was collected east of Huancabamba, Cajamarca, Peru and No. 6116 may be from the same region. In the course of an account of the "Mesotherm evergreen forest" of the Basin of Bellavista and the surrounding Mountains, Weberbauer enumerates *Schefflera* (6118) and *Baccharis* (6119) as components of this forest, all of which along with No. 6116 must have been taken in this region (El Mundo Vegetal de los Andes Peruanos 516. 1945).

to the broad limb 4 cm. wide, cream-yellow, of a very thick-fleshy texture, the corolla lobes triangular-ovate, distinctly overlapping; capsule unknown.

Type from "Prov[ince of] Pasto," Dept. Nariño, "Ecuador" [error for Colombia], 3,300 m., 1847, *Wm. Jameson* 467 (isotype, US).

Specimens examined.—COLOMBIA: Putumayo: Páramo de San Antonio del Bordoncillo, below El Encano and Sibundoy, 3,250 m., *Cuatrecasas* 11785 (US). Nariño: Río de Potreros above Soledad, 3,400 m., Río Tellez drainage, *Ewan* 16531 (USNA). ECUADOR: Loja: Between Loja and Zamora, 1 XII 1876, *André* 4513 (F).

Though scattered citations in botanical monographs record the fact, no published account, either by Jameson himself or by others about his botanical activities,¹⁵ gives any clue as to his ever having botanized in what is now Colombia proper. But the isotype examined bears a characteristic ticket reading "467 *Lisianthus* ———. Province of Pasto at 10,000 feet of elevation." Jameson's collection is a good match for a recent collection, *Cuatrecasas* 11785 from the region bordering Dept. Nariño and Com. Putumayo.

15. *Macrocarpaea densiflora* (Benth.) Ewan, comb. nov.

Lisianthus densiflorus Benth. Pl. Hartw. 227. 1846.

Slender low tree or shrub, the branchlets rather stout, elongated above, nearly terete or terete-compressed, thinly dingy puberulent; leaves oval to obovate, rounded or barely acute at the tip, short-cuneate to a sessile base, 9–14 cm. long, 6–7 cm. wide, venation prominent beneath, glabrous and shining above, fine hirsutulous beneath, especially along the veins; panicle long-pedunculate, rather compact, leafy-bracteate, the cymules 2- to 5-flowered; calyx oblong-campanulate, 10–12 mm. long, squarish at base, the lobes triangular-ovate or rounded, narrowly scarious margined, little if at all overlapping; corolla greenish-yellow, campanulate, gradually flaring above, 40–45 mm. long, the lobes ovate; capsule not seen.

Type from vicinity of Pitayo, Dept. Cauca, Colombia, *Hartweg* 1241.

Specimens examined.—COLOMBIA: Dept. Bolívar: Below Páramo de Chaquiro, 2,800–3,100 m., Cord. Occidental, *Pennell* 4334 (PH). Dept. Cauca: Páramo de Moras: 3,000–3,500 m., Cord. Oriental, *Lehmann* 2087 (US).

Bentham, when describing this species, gave its habitat as the forests of "quina naranjoda" (*Cinchona pitayensis*) and Pennell records "shrub zone" on his label.

¹⁵ Biographical notice by Isaac Anderson-Henry in *Trans. Proc. Bot. Soc. Edinb.* 12: 19–28. 1873. Cf. also Ludwig Diels, *Beiträge zur Kenntnis der Vegetation und Flora von Ecuador* 47. Stuttgart, 1937 (Spanish transl. by R. Espinosa, Univ. Central, 109–110. Quito, 1938).

Macrocarpaea densiflora may be distinguished from *M. ovalis*, which grows in the same general region of Colombia but which is unknown from the Western Cordillera, by its long-pedunculate cymose panicles, borne well above the leaves, whereas *M. ovalis* has the branchlets leafy up to the inflorescence. The flowers in the present species average larger. The leaves of *M. ovalis* have the secondary veins weak or obscure; the blades are much smaller and more narrowly oval than those of *M. densiflora*.

From *Macrocarpaea pachyphylla*, which also grows in the same region in southern Colombia, *M. densiflora* may be distinguished by the smooth and shining upper leaf surfaces, rather than the impressed-nerved condition of *M. pachyphylla*. The corollas in the latter species are fewer, larger, and borne on stout pedicels; furthermore, the lower peduncles are each subtended by rounded, thick-textured, revolute-margined bracts much resembling the leaves.

16. *Macrocarpaea quelchii* (N. E. Brown) Ewan, comb. nov.

Lisianthus quelchii N. E. Brown, Trans. Linn. Soc. II, Bot. 6: 50. pl. 8. figs. 6-9. 1901.

Dwarf glabrous shrub 1-2.5 m. high, the branchlets slender, more or less quadrilaterally compressed, the internodes very short, 0.5-1.5 cm. long, finely muriculate or almost tessellate below; leaves crowded at end of branchlets, closely imbricated, the blades oblong-ovate, rounded or abruptly apiculate, firmly but narrowly revolute, coriaceous, 3-5 cm. long, 1.5-3 cm. wide, all cuneate or contracted to a short petiole less than 5 mm. long, dark green above, dull green beneath, the secondaries obscure on both surfaces; flowers 2-3 in a terminal ill-defined cyme (or rarely solitary?), more or less hidden among the uppermost leaves, short-pedicellate, the calyx short-campanulate, about 1 cm. long, the lobes spatulate- or oblong-ovate, hyaline-margined; corolla cylindrical-campanulate, 28-44 mm. long, greenish or "deep olive-green", the lobes ovate or rounded, approximate, entire or crispulate; young capsule ovoid, about 2 cm. long, attenuate to a slender style.

Type from summit of Mount Roraima, 8,600 feet, *McConnell & Quelch* 106 and 649. The illustration identifies the species unmistakably.

Specimens examined.—VENEZUELA: Bolívar: Southwest-facing portion of sandstone ledge just below summit, 2,560-2,620 m., Mount Roraima, *Steyermark* 58802 (F, US); forested southwest-facing quebrada near Rondon Camp, 2,040 m., *Steyermark* 58672 (F, US).

It is now generally admitted that essentially all plant collections from Mount Roraima actually were obtained not in British Guiana but in Venezuela. This view is based on the fact that the ascent of the mountain has been made by all exploring parties since Richard Schomburgk in 1842 from the Venezuelan side and that all the summit

collections made there have been taken from within the political boundaries of Venezuela. This view has been supported by the ornithologist W. H. Phelps in writing on "The Geographical Status of the Birds collected at Mount Roraima"¹⁶ and more recently restated by A. Dugand and W. H. Phelps in a paper¹⁷ on birds of the Upper Orinoco River.

This Roraima endemic species is most closely related, as N. E. Brown originally pointed out, to *Lisianthus ovalis* R. & P., that is, to *Macrocarpaea ovalis* (R. & P.) Ewan of the present treatment.

17. *Macrocarpaea ovalis* (R. & P.) Ewan, comb. nov.

Lisianthus ovalis R. & P. Fl. Peruv. Chil. 2: 13. 1799.

Helia ovalis (R. & P.) Kuntze, Rev. Gen. Pl. 428. 1891.

Macrocarpaea arborescens Gilg, Bot. Jahrb. Engler 50: Beiblatt 111: 50. 1913.

Type from west of Popayán, Cord. Occ., 1,800–2,500 m., *Lehmann* 5450 (isotype, US).

Tall, slender shrub or small rather densely crowned tree, 2–3 m. high; branchlets slender, erect, with short internodes, glabrous, terete or grooved above; leaves oval, obovate or short oblong-ovate, obtuse at summit, rounded or a little narrowed at base, appearing narrowly revolute because of a firm subcartilaginous border, shining above, veins obscure both above and below, faintly glandular-punctate beneath, 5–6 cm. long, 3–4 cm. wide, the petioles short, 3–5 mm. long; panicle crowded, leafy, the lateral branchlets short, bearing a few 5- to 8-flowered cymules; flowers not at all showy, greenish yellow, the calyx oblong-campanulate, 8–10 mm. long, obtuse at base, the lobes rounded, hyaline-margined, medianly tawny puberulent, the alternate lobes overlapping; corolla narrowly campanulate, the tube flaring but little above the calyx, 3.5–4 cm. long, the lobes ovate, acute, about 1 cm. long, very finely crosulate; capsule not seen.

Type from Chinchao, Dept. Huánuco, Peru, *Ruiz & Pavón* [or *Dombey?*] (fragment of type, F). (Field Mus. photo 29363, type in the Madrid Herbarium).

Specimens examined.—COLOMBIA: Cauca: Cord. Occidental, west of Popayán, *Lehmann* 5450 (US). ECUADOR: Loja: between Loja and Zamora, *André* 4549 (F); western slopes Cord. de Condor, along Río Cachiyacu, 2,000–3,000 m., *Steyermark* 54805 (F, US). Between Tambo Cachiyacu, La Entrada, and Nudo de Sabanillas, 2,500–3,500 m., *Steyermark* 54436 (F, US). Vicinity of Tambo Cachiyacu, 3,000–3,500 m., *Steyermark* 54758 (F). "PERU" [possibly southern Ecuador], *Wm. Lobb* (F).

There is in the Herbarium of the Chicago Natural History Museum a sheet [843437] bearing a fragment of Ruiz and Pavón collection from

¹⁶ Bol. Soc. Venez. Cienc. Nat. 5: 83–90. 1933.

¹⁷ Caldasia 4: 243–276. 1946.



118110

CHICAGO
BOTANICAL MUSEUM

55224 PLANTS OF VENEZUELA *Type*
Macropaea bracteata Ewan

Spreading herb; leaves subcoriaceous,
deep green above; plant 5 feet tall

State of California Department of Agriculture
Division of Plant Industry, Los Angeles
California 90012

MACROCARPAEA BRACTEATA EWAN

Madrid Botanic Garden Herbarium, labeled "Hualasco and Loja." The former locality is probably Peruvian but does not appear in the *Relación del Viaje* of Ruiz (Dahlgren, transl.). It has not otherwise been located. Furthermore, though Pavón is reputed to have collected at Guayaquil, neither he nor Ruiz nor Dombey is known to have botanized in the Loja region. Yet the fragment agrees very closely with the original description of *Lisianthus ovalis* and may, indeed, represent authentic material from Chinchao, mislabeled at some time since its original collection.

As to the origin of the Lobb fragment, from "Peru," again in the Herbarium of the Chicago Natural History Museum, little can be postulated. Since the species has been reported from northern Peru, Lobb's collection may have come from that general region. On the other hand, Lobb's plant agrees almost minutely in leaf pubescence with the Ruiz and Pavón fragment reputedly from Loja, and since Lobb on the basis of his own statement is definitely known to have visited Loja,¹⁸ it may as well have had an Ecuadorian origin.

Field notes of Lehmann accompanying the type collection of *Macrocarpaea arborescens* read, "up to 3 m. high, tree-like shrub, with fairly close, erect ramification. Leaves robust, dark green, shiny. Flowers greenish yellow-white. Colombia. Grows in dense, damp forests on the western slopes of the West Andes of Popayán, 1800–2500 m. Flowers in June."

Otto Kuntze transferred *Lisianthus ovalis* to the genus *Helia*, without comment, but the following phrases in the original description indicate that the transfer to that genus (or subgenus?) cannot be maintained: "planta suffruticosa," "caules plures . . . superne parum ramosi" and "pedunculi axillares terminalesque."

When I first reviewed the Colombian species of *Macrocarpaea* I concluded *M. arborescens*, *Lisianthus ovalis*, and *L. densiflorus* to be conspecific, but further study convinced me that the first two names represented one species and *Lisianthus densiflorus* a second distinct *Macrocarpaea*. To check this conclusion against the collections at Kew, I asked N. Y. Sandwith to compare an isotype of *M. arborescens*, Lehmann 5450, with the type of *M. densiflora* (*L. densiflorus* Benth.), Hartweg 1241, and he found the last to be "obviously a different species." For the distinctions between *Macrocarpaea densiflora* and this species and a record of their distribution in adjacent districts of Colombia, see the discussion under the former species.

18. *Macrocarpaea chlorantha* Gilg, Repert. Sp. Nov. Fedde 2: 53. 1906.

Shrub 1 m. high, the branches acutely 4-angled, the internodes short, 1.0–1.25 cm. long, nearly smooth; leaves oval or oblong-oval, subro-

¹⁸ Cf. Killip, Smiths. Misc. Coll. 87: 1–13. 1932.

tund or scarcely acute at apex, with a petiole 5–8 mm. long, coriaceous or subcoriaceous, 4.0–5.5 cm. long, 1.2–1.6 cm. wide, the veins and nerves hardly evident; flowers crowded at end of short lateral shoots, the cymes dense, 8- to 12-flowered, the pedicels short, 3–10 mm. long; flowers light-green, the calyx-tube tubular-campanulate, 10–12 mm. long, the lobes subtruncate or rounded; corolla long-cylindric, 45–47 mm. long, the tube narrowed below, very slightly enlarged above the calyx, the lobes rounded or suborbicular, equal, about $\frac{1}{5}$ as long as the tube; stamens and pistil exerted.

Type from "Orientem versus a Chachapoyas inter Tambo Ventillas et Pisco Huanuma," Dept. Amazonas, Peru, *A. Weberbauer* 4411 (Field Mus. photo 26828).

Macrocarpaea chlorantha is evidently related on the one hand, and mostly closely, to *M. stenophylla* of Peru, and on the other to *M. ovalis* of Peru, Ecuador, and Colombia. The type of *M. chlorantha* comes from the same general region as does *M. stenophylla*, and the two agree very closely in habit and leaf characters. But in its long-cylindric corollas, unique in the genus *Macrocarpaea*, *M. chlorantha* is so unlike *M. stenophylla* and other species as to throw some doubt on its proper alignment in this genus. Indeed, as a species it is almost unique among lisianthoid plants recalling much more vividly certain genera of Solanaceae.

Macrocarpaea chlorantha is known to me only from the photograph of the type, the original Weberbauer collection having been destroyed in the bombing of the Berlin Botanic Garden. Necessarily, I have had to rely almost wholly on Gilg's description for the morphologic details of the species.

19. *Macrocarpaea bracteata* Ewan, sp. nov.

PLATE 5

Herba vel suffrutex 1.5–2.0 m. altus, caulibus supra herbaceis, teretibus vel subsulcatis, glabris vel supra paucis pilis; foliis omnibus petiolatis, petiolis 1–4 cm. longis, valde connato-amplexicaulibus, laminis foliorum lucidis saturate supra viridibus glabrisque, infra pallidioribus costis hirtellis, infra conspicue venosis, saepe ovatis vel ovalibus, acutis, 11–18 cm. longis, 6–10 cm. latis, laminis foliorum superiorum inflorescentiae subcordatis margine subrevolutis; paniculis ramosis, foliosis, floribus conspicue bracteatis suborbiculatis in densis cymulis pedunculatis; calyce urceolato, lobis difformibus, duobus amplissimis cordato-suborbiculatis, patentibus, lobis alternis minus amplis et foliosis; corolla brevi inclusa, viridi-flava; genitalibus inclusis; capsula ovoidea abrupte acuta, lignosa, 20–22 mm. longa; stigmatibus apice persistente; seminibus minutis, 0.2 mm. longis, castaneis.

Sprawling herb or half shrub, 1.5–2.0 m. high, the stems soft-herbaceous above, terete or weakly grooved, glabrous throughout or scantily hairy at shoot tip; leaves all petiolate, the petioles 1–4 cm.

long, prominently connate-amplexicaulous, the blades dark lustrous, green and glabrous above, pale green and hirtellous on veins beneath, veiny on both surfaces but especially beneath, ovate or less often narrowly ovate, acute, 11–18 cm. long, 6 (or even 3)–10 cm. wide, the uppermost leaves of flowering shoot subcordate, narrowly revolute; panicle freely branching, leafy, the flowers subtended by a pair of conspicuous suborbicular winged-petiolate bracts, crowded in more or less pedunculate cymules, calyx broadly urceolate, two lobes ample cordate-suborbicular, spreading green or green-tipped, more or less crisped 1.0 cm. long, 1.5 cm. wide, the other lobes less ample, less foliose; corolla short, included (cleistogamous?), pale greenish yellow; capsule narrowly ovoid, abruptly acute, woody, 20–22 mm. long, tipped by the persistent capitate stigma; seeds minute, 0.2 mm. long, light brown.

Type in the Herbarium of Chicago Natural History Museum, No. 1184405, collected "in moist cloud forest on south- and southwest facing slopes" at Palojosco, above Los Apostentos, above Humocaro Bajo, State of Lara, Venezuela, 2,375–2,530 meters elevation, February 4, 1944, by *Julian A. Steyermark* (No. 55224) (isotype, US).

Additional specimens examined.—VENEZUELA: Lara: Wet meadow at Las Sabanetas, above Los Apostentos, west of Humocaro Bajo, 2530 m., *Steyermark* 55287 (F, US).

The relationships of *Macrocarpaea bracteata* are not easy to determine. The bracteate flowers are approached in the Peruvian *M. stenophylla* of the section *Magnoliifoliae*, but in the present species the terete stems, long internodes, and larger thinner-textured leaf blades are of quite a different kinship and place it with the section *Tabacifoliae*. The very leafy calyx lobes are unique in the genus and easily set off this species from all others. The two collections of *Macrocarpaea bracteata* at hand differ notably in their leaves, varying from broadly ovate to nearly lanceolate, yet the floral characters are unmistakable. Collections in full anthesis are a desideratum. The vernacular name is "maraquita."

20. *Macrocarpaea guttifera* Ewan, sp. nov.

Frutex 2–3 m. altus, gracilis, ramulis glabris lignosis, fissuratis; foliis petiolatis, petiolo crasso; laminis foliorum amplis, lanceolatis vel ovatis, glanduloso-punctatis coriaceis nitentibus, venis secundariis prominentibus marginem versus confluentibus; panicula parviflora pedunculo robusto; calyce cupulato, profunde lobato, lobis suborbicularibus, valde imbricatis; corolla viridi, tubo anguste campanulato, lobis oblongis acutis crassis, dense pustulato-glandulosis; antheris albis.

Slender shrub 2–3 m. high, the branchlets woody, fissured below, subterete above, wholly glabrous; leaves thick-coriaceous, lanceolate or the uppermost ovate, acuminate, 15–23 cm. long, 6.5–9 cm. wide,

punctate on both surfaces with fine golden glands, venulose; panicle long-pedunculate, nearly bractless, narrow and rather compact, of a few loose 3-flowered cymules; calyx broadly cupulate, 11–18 mm. long, all but the hyaline-scarious margin of the lobes papillate with sessile glands, the lobes divided nearly to the base, broadly oblong or sub-orbicular, conspicuously overlapping; corolla green, slender campanulate, 30–35 mm. long, the lobes oblong, acute, 6–7 mm. long, thick, all but the proximal portion of the tube densely papillate-glandular; anthers white; capsule unknown.

Type in the U. S. National Herbarium, No. 1356268, collected in the vicinity of Iquitos, Department of Loreto, Peru, in woods, at about 100 m. elevation, August 3–11, 1929, by *E. P. Killip and A. O. Smith* (No. 27045).

Macrocarpaea guttifera grows in Amazonian Peru along with *M. micrantha* but differs in several characters from that species. The most notable differences are the stiff, thick, shining leaves, the reduced few-flowered panicle, and broadly cupulate calyx. Especially distinctive characters are the nearly chorisepalous calyx and the papillate-glandular flower parts. 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.

21. *Macrocarpaea obtusifolia* (Griseb.) Gilg in Engler, Pflanzenfam. 4²: 94. 1895.
Lisianthus obtusifolius Griseb. Gen. Sp. Gent. 175. 1839.
Lisianthus obtusifolius var. *constrictus* Griseb. Gen. Sp. Gent. 175. 1839. Type from Minas Gerais, Brazil, *Langsdorff* in Herb. Hooker, Kew.

Woody arborescent perennial, about 2 m. high, the branches leafy mostly on the upper part; stems laterally compressed or nearly terete, sparsely pubescent below, densely setulose above with short white hairs; lower leaves large, obovate or oval, obtuse, thin, lightly hirsutulous beneath, 30 cm. long, 18 cm. wide, contracted to a short broad petiole, the upper leaves reduced, oval to obovate, obtuse, subsessile, densely hirsutulous beneath, 6–12 cm. long, 4–7 cm. wide; panicle open, loosely branching, the flowers rather crowded in leafy-bracteate terminal clusters; calyx goblet-shaped, rounded at base, 10–11 mm. long, densely white-hirsutulous, appearing viscous, the lobes obtuse; corolla turbinate, 32–45 mm. long, greenish yellow, fading orange-yellow, the tube narrow at base, abruptly flaring above the calyx, the lobes broadly triangular-ovate, crisped or erosulate on margins, 7–10 mm. long; mature capsule pyriform, 2 cm. long, glabrous, inclosed by the somewhat accrescent almost woody calyx; immature seeds obovate, narrowly winged.

Type from Sierra d'Estrella, Brazil, *Sellow*.

Specimens examined.—BRAZIL: "Near Rio Janeiro" [Serra do

Orgãos and Monte Corcovado], *Wilkes Expedition* [Nov. 24 1838–Jan. 6 1839] (US), “Brasilia,” *Riedel* (GH). Serra do Cipó kilom. 138—estrada de Conceição, Munic. Santa Luzia, *Mello Barreto* 8845 (F).

22. *Macrocarpaea thamnoides* (Griseb.) Gilg in Urban, *Symb. Antill.* 1: 387. 1900.

Lisianthus thamnoides Griseb. *Fl. Brit. W. I.* 424. 1864.

M. hartii Kr. & Urb. *Notizbl.* 1: 80. 1895. Type from Jamaica, “J. H. Hart et W. Harris n. 1417, 5352.” Two sheets of *Hart* 1417 (US) have been studied.

Slender subshrub 2 m. high; lower stems nearly terete or somewhat quadrangular-flattened, leafy only as a tuft at summit of stem, the panicle-stalk arising from it, in the manner of *Bocconia*; leaves of two kinds, the lower cauline obovate, strongly acuminate at the tip, 25–35 cm. long, 10–12 (or 20) cm. wide, cuneate to a distinct petiole 2–4 cm. long, connate-amplexicaulous at base, the floral leaves ovate, barely acute or somewhat obtuse, 8–10 cm. long, 4–5 cm. wide, at times lustrous-shining above, all glabrous above and below except for a slight puberulence along the midrib and larger veins beneath; panicle diffuse, the cymules contracted, pedunculate, leafy-bracteate, the branches and pedicels smooth, grooved or wing-angled; calyx ovoid or goblet-shaped, 8–9 mm. long, the lobes low-triangular, broadly auriculate-overlapping, finely fimbriate, about 1 mm. long; corolla narrowly campanulate, small, 22–28 mm. long, the lobes narrowly oblong-ovate to lanceolate, 5–6 mm. long, greenish yellow; very young capsule narrowly ovate, mature capsule unknown.

Type from Jamaica, without definite locality, Macfadyen (Hooker Herb. at Kew, not seen).

Specimens examined.—JAMAICA: vicinity Morce’s Gap, 1,500 m., *Maxon* 2772 (US). Road to St. Georges, *W. Harris* 7718 (F). Near Vinegar Hill, *W. Harris* 6048 (F), *W. Harris* 5353 (US).

Macrocarpaea thamnoides is evidently an endemic of Jamaica. Its closest relative is either *Macrocarpaea glabra* or the other Colombian species, *M. macrophylla*. The shape of the lower stem leaves of *Macrocarpaea thamnoides* is distinctive in the genus.

When describing *Lisianthus thamnoides* in 1864 Grisebach included “Cuba” within the geographic range of the species. Subsequently Grisebach indicated *Charles Wright* 1347 as the collection which constituted the basis of the Cuban record.¹⁹ I have examined a sheet of *Wright* 1347, from “prope villam Monte Verde dictam, Cuba, Orientali,” July 9, 1859 (GH), and find that it is much nearer the endemic species of the Dominican Republic, *Macrocarpaea dominicensis*, than it is to *M. thamnoides* of Jamaica. Taxonomically the

¹⁹ *Cat. Pl. Cub.* 180. 1896.

two species are quite unrelated but it is consistent with evidence from other plant genera to find the Cuban plant more closely related to the plant of the Dominican Republic than to that of Jamaica. Morphologically, the Cuban plant, as represented solely by one sheet of *Wright* 1347, suggests a distinct species. The leaves are more acute than those of *M. domingensis*, while corollas are narrowly campanulate, with short lobes about one-fourth as long as the tube, the tube constricted above the narrow-cupulate calyx. The stamens are evidently exerted.

23. *Macrocarpaea micrantha* Gilg, Bot. Jahrb. 22: 338. 1896.

Macrocarpaea weberbaueri Gilg, Repert. Sp. Nov. Fedde 2: 54. 1906. Type from vic. Moyobamba, 1,000–1,100 m., Dept. Loreto, Peru, *Weberbauer* 4655.

Slender shrub 2 m. high; stems thin, slender, terete or very faintly flattened, dark-green, glabrous but finely roughened, the upper internodes short; leaves ovate or lanceolate, acuminate, thin, 11–21 cm. long, 4.5–9 cm. wide, acute at the base, with a slender petiole, 2–3.5 cm. long, amphiglabrous or with a very few hairs along midrib beneath; panicle often simple, few (7 to 12 or more)-flowered and somewhat compactly branching, sparsely leafy-bracteate; flowers small, greenish-yellow; calyx short-campanulate, 7–9 mm. long, muriculate or finely corrugate, the lobes bluntly rounded, finely erosulate, hyaline-margined, overlapping; corolla slender campanulate, 21–28 mm. long, the lobes ovate, 6–7 mm. long, obtuse, crispulate; capsule slender, fusiform at maturity, 3.0–3.5 cm. long, tapering to a slender style, finely and densely corrugate; mature (?) seeds minute, 0.5 mm. long, yellowish, finely alveolate.

Type from Tarapoto, Dept. of San Martín, Peru, 374 m., *R. Spruce* 4618 (isotype, G; photos of isotypes at Geneva [Field Mus. photo 26829] and Copenhagen [Field Mus. photo 22741]).

Richard Spruce gives an account of the Tarapoto country of eastern Peru, where he collected the type, and of its vegetation in general, in the second chapter of his "Notes of a Botanist on the Amazon and Andes," edited by A. R. Wallace, 1908.

A slender species sharing none of the robust woody characters of the genus as a whole, *Macrocarpaea micrantha* is evidently a little-collected forest species of Amazonian Peru. *Macrocarpaea weberbaueri*, from the same region as *M. micrantha*, judging from the description, is indistinguishable. Gilg related *Macrocarpaea weberbaueri* to *M. revoluta* though it can hardly have an affinity with that species.

A paratype of *Macrocarpaea weberbaueri*, which likewise I have not seen, is *Weberbauer* 5006, from Hacienda Idma, 1,500–1,800 m., Dept. Cuzco, Prov. Convención, Peru. This locality is somewhat above the altitude of the Tarapoto and Moyobamba localities; this collection may prove not to be conspecific.

Specimen examined.—PERU: Loreto: Pumayacu, 600–1,200 m., Klug 3138 (F, GH, MO, US).

24. *Macrocarpaea duquei* C. Gilg, Notizbl. 13: 382. 1936.

Tall shrub or slender tree 3–5 m. high, the branches subterete, the internodes more or less elongated, subglabrous, scabrellous up to the glandular cano-hirtellous pedicels; leaves thick, rather firm when fresh, somewhat reduced above, the blades obovate or oval, rounded at the apex, 15–18 (or midcauline 30) cm. long, 9–13 cm. wide, subglabrous, more or less lustrous above, narrowed at the base to an indistinct, amplexicaulous petiole, this stout, winged-subauriculate, the veins rather prominent, especially beneath, reticulate, tomentellous beneath, the secondaries curving forward and all running along the margin to anastomose at the tip; panicle ample, compound, 15–30 cm. long, of several glomerate cymules of 4–6 or more flowers, all distinctly pedicellate, and with long-pedunculate lateral cymules; flowers spreading or erect in anthesis, very large, showy, the calyx deep-campanulate, 11–15 mm. long, the calyx-lobes rounded, 2–4 mm. long, hyaline-scarious on the margins, very finely ciliolate; corolla turbinate-campanulate, fleshy, clear cream-yellow, 50–75 mm. long, the lobes triangular-ovate, acute, 12–20 mm. long, 12–23 mm. wide at the base; stamens mostly about equaling the sinuses of the corolla but strongly reflexed; style thick, barely if at all exserted, the stigma bilamellate-clavate; immature capsule little exserted from the indurated calyx, quickly tapering to a slender style; seeds unknown.

Type formerly in the Herbarium of the Berlin Botanic Gardens, collected in the vicinity of Socorro Mines, Río Cali drainage, in the Cordillera Occidental, Department of Valle del Cauca, Colombia, at 2,900 m. elevation, August 30, 1936, by *J. M. Duque-Jaramillo* (No. 2).

Collections studied.—COLOMBIA: Dept. Valle del Cauca: Quebrada de Las Nieves, lomas parameras sobre la mina El Diamante, 3,000–3,120 m., Los Farallones, Cord. Occ., *J. Cuatrecasas* 21824 (US); Los Farallones, extremo N., vertiente oriental, Alto del Buey, bosques, 3,450–3,300 m., Cord. Occ., *J. Cuatrecasas* 18077 (US).

Macrocarpaea duquei is one of the most striking species in the genus and at once suggests the handsome Bolivian genus *Rusbyanthus* for its fine flowers. It is perhaps most closely related to *Macrocarpaea macrophylla*, from which its large flowers readily distinguish it. In its thick, rounded, obovate leaf-blades this species suggests the section *Magnoliifoliae*, but the internodes are not at all short, quadrangular, or vertebralike. Of all the Colombian species known to me at present, *Macrocarpaea duquei* stands more nearly midway between the two sections *Magnoliifoliae* and *Tabacifoliae*. It is possible that the origin of the herbaceous section *Tabacifoliae* from the ligneous section *Magno-*

liifoliae, suggested on morphological grounds of flower structure, may have come about through such species as *Macrocarpaea duquei*.

The two Cuatrecasas collections cited are unequal in the size of their corollas, yet I am confident they are conspecific.

25. *Macrocarpaea corymbosa* (R. & P.) Ewan, comb. nov.

Lisianthus corymbosus R. & P. Fl. Peruv. Chile 2: 14, pl. 124. 1799.

Slender shrub up to 4 m. high, the branchlets all glabrous, lightly grooved above, straw-colored, the uppermost subterete with long internodes; leaves distant, all thin-membranous, amphiglabrous, the lower lanceolate, acute at base and apex, 18 cm. long, 9 cm. wide, rather strongly veined beneath, the petioles slender, 2 cm. long, the upper subrotund, abruptly short-acute, 9–10 cm. long, subsessile, the uppermost floral reduced but similar; panicle ample, glabrous, leafy-bracteate, branching below with long-pedunculate 5- to 7-flowered cymules, the terminal portion loosely branching; calyx short-campanulate, acute at the base, 10–11 mm. long, the lobes orbicular or nearly so, conspicuously overlapping, pale-hyaline-margined, finely crisped; corolla greenish yellow, dilated just above the calyx into a narrowly campanulate tube, 30–42 mm. long, the lobes oblong, finely crisped, pale-hyaline; capsule narrow-oblong, 4.0–4.5 cm. long at maturity, mucronate after falling of persistent slender style, muriculate; seeds minute, about 1 mm. long, including the irregularly lacerate wing.

Type from "Peruviae nemoribus inter Acomayo et Chinchao ad Pati praedium," Ruiz & Pavón [or Dombey?] (authentic material, F).

Specimen examined.—PERU: Dept. Cuzco: Lares Valley between Huallhuayoj and Calca, 1,900–2,000 m., *Weberbauer* 7921 (F).

When Ruiz and Pavón published *Lisianthus corymbosus* in 1799 they described fairly accurately the Peruvian plant that Ruiz records having collected in the vicinity of Chinchao.²⁰ At that time they illustrated their species with a plate (*pl. 124*) that fairly represented the Peruvian plant, judged from the few collections at hand. This *Lisianthus corymbosus* had been illustrated nine years earlier when James Edward Smith published a plate under the name "*Lisianthus glaber*."²¹ Smith gave the source of his "*Lisianthus glaber*" as "in America meridionali legit Mutis," and, accordingly, it seems clear from his annotation of the plate, "omnia ex castigatione icone Mutisiana" (all [details] from corrected plate of Mutis), that Smith took the unpublished Mutis plate of the plant as known from Bogotá region and made such corrections as he believed warranted. Perhaps Smith had before him another *Macrocarpaea*, possibly from Peru, which he believed conspecific with the plant Mutis intended to illustrate. I have not seen

²⁰ Cf. Relación del Viaje, Chap. 2.

²¹ J. E. Smith, Icon. Pl. Rar. 2: *pl. 29*. 1790.

the Mutis plate in the Library of Linnean Society of London, but authentic material of *Lisianthus glaber*, brought to the United States National Herbarium from Madrid, has been available. Certainly the details as "corrected" by Smith are not confirmed by this material. Smith's plate shows a plant with petiolate leaves, acute corolla lobes, and a prismatic character in the unopened flower buds—three points unconfirmed by the Bogotá plant and, though not in perfect agreement with the Peruvian material, much more closely illustrative of the collections from Peru. In any event, Ruiz and Pavón correctly distinguished two species of *Macrocarpaea*.

The basis of Smith's error cannot be checked at present but, in any event, it has misled botanists, first Grisebach, then Gilg, in their interpretation of *Lisianthus corymbosus*. Both Grisebach and Gilg misconstrued *Lisianthus corymbosus* R. & P. to be a synonym of *L. glaber*. It would seem that both Grisebach and Gilg placed more importance upon the corrections made by Smith in the original unpublished Mutis plate than upon a comparative study of the Bogotá and Peruvian collections, failing to realize the separate sources of the plants described in turn by Linnaeus filius and by Ruiz and Pavón. That Grisebach should have made this mistake is all the more curious in that he records having examined both a Humboldt and Bonpland collection from the vicinity of "Santa Fé [de Bogotá]", Colombia, and an isotype of the Peruvian *Lisianthus corymbosus*. Nevertheless, modern collections of the two *Macrocarpaeas* involved show the plants of Colombia and Peru to be distinct.

26. *Macrocarpaea macrophylla* (H. B. K.) Gilg in Engler, Pflanzenfam. 4²: 94. 1895. *Lisianthus macrophyllus* H. B. K. Nov. Gen. & Sp. 3: 183. 1819.²²

Slender arborescent shrub 2.5–5 or 8 m. high, the stem simple or branching sparingly only above, terete or with longitudinal lesionlike grooves, puberulent above, subglabrous below; leaves large, broadly ovate, the uppermost suborbicular, rather abruptly acute to a sessile base, 25–30 cm. long, 15–20 cm. wide, glabrous above, soft puberulent beneath, especially along the nerves; panicle ample, elongate, 25–35 cm. or more long, with 2–3 or more pairs of laterals, leafy bracteate, the cymules loosely many-flowered; calyx campanulate, 10–12 mm. long, the lobes obtuse to truncate or nearly so, without a well-defined scarious margin; corolla narrow-campanulate to salver-shaped, 30–35 mm. long, cream-color or greenish, the lobes ovate, or shortly deltoid ovate, 7–8 mm. long; capsule ovoid, 21–24 mm. long, the style early deciduous to leave an acute tip; seeds prismatic-oblong, 0.5 mm. long, microscopically foveolate, light-brown.

²² Date *vide* Sherborn and Woodward, Journ. Bot. Brit. & For. 39: 203. 1901, but *cf.* also J. H. Barnhart, Bull. Torrey Club 29: 585. 1902.

Type from trail over paramillo to Almaguer between Pansitara and Río Ruiz, 8,400 feet, Colombia, *Humboldt & Bonpland* (Willd. Herb. No. 3561 *fide* Grisebach; Field Mus. photo 37455, of collection in Humboldt Herbarium at Paris). On modern maps this is a ridge of the Eastern Cordillera lying to the north of Almaguer in the Departamento del Cauca.

Specimens examined.—COLOMBIA: Santander: 15 km. west of Bolívar, 30 km. northwest of Velez, 6,900 feet, *Fassett* 25120 (USNA). Antioquia: La Sierra near Medellín, 2,000 m., *Archer* 1088 (US); Santa Elena, *Archer* 1276 (US); Alto Capiro above Sonsón, *Ewan* 15765 (USNA); La Ceja, *Daniel* 964 (US). Caldas: San Clemente, Cord. Occidental, *Pennell* 10670 (PH). Tolima: Ibagué, *André* K1379 (F); Quindío, *André* 2359 (F). El Valle: San Antonio, west of Cali, Cord. Occidental, *Killip & García* 33650 (US); Cordillera above Cali, 2,000 m., *F. C. Lehmann* 3029 (US); Inza, *Lehmann* 6626 (US); Cuesta de Tocotá, 1500–1900 m., *Pittier* 726 (US). Huila-Caquetá border: Gabinete, 2,300–2,450 m., *Cuatrecasas* 8435 (US).

This *Macrocarpaea*, the most common species in the Central and Western Cordilleras of Colombia, is called “tabaquillo” (or “tavaquillo”) in the Departments of Caldas and Antioquia. Brother Daniel says that the plant common about Santa Elena, Antioquia, which has been mistakenly identified as “*Macrocarpaea polyantha* Gilg” (confined to the Eastern Cordillera), is known as “tabaquillo del monte.”

27. *Macrocarpaea valerii* Standl., Field Mus. Bot. 18: 928. 1938.

Tall herb or subshrub about 2 m. high, freely branching, the branches nearly quadrangular, bracteate throughout, the internodes often elongated, glabrous or nearly so throughout; leaves thin, reduced above, all petiolate, the petioles 1.5–4 cm. long, connate-amplexicaulous, the blades orbicular to lance-ovate, more or less truncate at the apex, abruptly acuminate, those of the principal leaves ovate, 15–25 cm. long, 12–16 cm. wide, venose, the secondaries curving forward and the lowest running along the margin to all merge at the tip; panicle open, diffuse, 20–30 cm. long consisting of several loose cymules of 6–10 flowers, all distinctly pedicellate, and with long-pedunculate lateral cymules; flowers erect in anthesis, early recurving, the calyx cupulate to deep-campanulate, 11–12 mm. long, divided almost halfway to base into oblong rounded or obtuse lobes each ca. 5 mm. long, hyaline-scarious on the margins; corolla flaring-campanulate, fleshy, cream-yellow, 25–35 mm. long, the lobes oblong-ovate, acute, spreading, 9–10 mm. long, 8–10 mm. wide at the base; stamens about equaling sinuses of corolla but recoiled; style thick, included, the stigma clavate-thickened; capsule little exserted from indurated calyx, tapering to a slender style; seeds ovate, flattened, about 0.7 mm. long, light yellow.

Type in the Herbarium of the Chicago Natural History Museum, No. 681824, collected in the vicinity of La Hondura de San José, Costa Rica, at 1,300 m. elevation, August 15, 1933, by *Manuel Valerio* (No. 692).

Specimens examined.—COSTA RICA: Alajuela: La Peña de Zarcero, Cantón Alfaro Ruiz, 1675 m., 30 VII 1938, *Austin Smith* 1001 (F).

Macrocarpaea valerii is most closely related to *M. macrophylla* of Colombia. The strongly veined leaves, with their abruptly acuminate tips, and the large open-campanulate corollas of *M. valerii* are distinctive.

The collection from "Vallee du Rancho Redondo, alt. 1800 m. Avr. 1889," *Pittier* 1153, referred to *Lisianthus thamnoides* by John Donnell Smith,²³ and by inference to *Macrocarpaea valerii* by Standley, has not been located, but I suggest that it may prove, rather, to be the rare *M. subcaudata*.

28. *Macrocarpaea pachystyla* Gilg, Bot. Jahrb. Engler 22: 336. 1896.

Slender arborescent shrub about 2 m. high, the branchlets stout, terete, glabrous, faintly longitudinally striate, leafy above; leaves of two sorts: the principal cauline broadly ovate, acute, distinctly petiolate, the petioles grooved, 2 cm. long, the upper floral leaves oblong-ovate or suborbicular, abruptly narrowed to a connate-clasping base, all thin-membranous, amphiglabrous, paler and glaucous beneath, the secondary veins prominent; panicle loose, leafy-bracteate, of 3–5 few-flowered cymules, the flowers borne on stout pedicels; calyx broad at base, campanulate or goblet-shaped, 15–20 mm. long, 8–14 mm. broad, the lobes broadly ovate, pale-scarious and crosulate-margined, overlapping; corolla showy, yellow-green, turbinate-campanulate, 4 to "5–5.5" cm. long, flaring below the ovate-subrotund lobes; capsule shortly flask-shaped, tapering to a thick persistent style; mature seeds not seen.

Type from Chicoplaya, 26 leagues north of Huánuco, Dept. Huánuco, Peru, *Ruiz & Pavón* (authentic fragment, F; Field Mus. photo 29361).

Specimen examined.—PERU: Puno: Near Sagrario, Prov. Sandía, 1,000–1,300 m., *Metcalf* 30629 (US).

R. D. Metcalf, of the Third University of California Botanical Garden Expedition to the Andes, recorded its habitat as "moist open places on stream bank, much fog and rain." The species is apparently infrequent, judged from the few collections preserved in herbaria.

The large showy corollas suggest the genus *Rusbyanthus* but the leaf shape and size, as well as the calyx and capsule characters, are quite different.

²³ In *Pittier*, Prim. Fl. Costar. 2: 167. 1898.

29. *Macrocarpaea viscosa* (R. & P.) Gilg, Bot. Jahrb. Engler 22: 337. 1896.

Lisianthus viscosus R. & P. Fl. Peruv. Chile 2: 14, pl. 125. 1799.

Slender shrub or small tree 1.5–3 m. high, the branchlets stout, subterete or distinctly angled, glabrous below, glandular-puberulent in the inflorescence; leaves ovate or oval, acute at tip, narrowed at the base into a short but distinct stout petiole, glabrous above, more or less glaucous and puberulent along the veins beneath, 15–20 cm. long, 9–14 cm. wide, thin, venose; panicle broadly corymbose, consisting of 3–5 laterally disposed congested cymes of 6–12 flowers; flowers showy, waxy cream-white, greenish tinged in bud; calyx proportionately small, rounded or subacute at base, campanulate, glandular puberulent on tube, the lobes ovate, rounded, 1.5–2 mm. long, subglabrous, crenulate; corolla open-campanulate, rather uniformly flaring from the constricted base, 4–5 cm. long, the lobes broadly ovate, erect, 11–16 mm. long, only narrowly overlapping; capsule slender, 30–35 mm. long, long-attenuate to the short beaklike persistent style.

Type from "altis locis," from Muña to Tambo Nuevo, Pachitea, Peru, *Ruiz & Pavón* (Field Mus. photo 29362).

Specimens examined.—PERU: Cuzco: Choquellohuanca, Lucumayo, 1,700 m., *C. Vargas* 4196 (US). Huánuco: Carpish, 2,850 m., *Stork & Horton* 9913. Cajamarca: 10 km. northwest of Socota, 3,200 m. *Stork & Horton* 10118 (USNA).

Growing along margins of montaña, *Macrocarpaea viscosa*, as here understood, is a showy flowered shrub with a broad flattened panicle which bears short lateral peduncles and lacks the lower elongated naked branchlets so often characteristic of the genus. The leaves are venose above, as well as below, but oval rather than "oblonga" as given in the original description. In short, the modern collections cited above do not agree well in leaf shape and apparent texture with the original illustration (pl. 125). The very viscid calyx is, moreover, not evident in these modern collections.

The sheet of *Macbride* 5224, collected at La Merced, northeast of Tarma, Dept. Junín, Peru, in the United States National Herbarium is *Macrocarpaea viscosa*, but the same number in the Herbarium of the Chicago Natural History Museum is *M. revoluta*.

The following paragraph may represent a record of the time and place of the collecting of the type of this species:

On the 15th [July, 1784] we left Muña, and we passed the night three leagues from there in a small clearing called Tambo Nuevo which, although cold and filled with water by the frequent showers that fall there almost daily, so abounds with ichu [*Stipa ichu*] that the muleteers stopped, in spite of the dense and damp fog, to let the animals graze on that grass and rest, so as to be able to continue the ascent of this elevated hill, for at the summit there are no trees nor any other larger plants except a species [better translated, a kind] of *Stercorium corymbosum*, known there by the name of Sulba. These small trees

grow to be eight or ten yards tall; their trunk and branches are so covered with black mosses and lichens that they appear like trees singed and clad in mourning. They have the property of burning so badly and emitting so much smoke that no one can get warm by their fire or endure the nuisance of the dense smoke. (Travels of Ruiz, Pavón, and Dombey in Peru and Chile, 1777-1788 by Hipólito Ruiz, translated by B. E. Dahlgren, Publ. Field Mus. Bot. 21: 170. 1940.)

That this was the occasion of the collecting of the type specimen of *Lisianthus viscosus* R. & P. is not improbable. Muña will be found to be almost due east of Huánuco at latitude 10° S., and the puña that Ruiz crossed lies between the drainages of the Río Huallaga and the Río Pozuzo.

30. *Macrocarpaea sodiroana* Gilg, Bot. Jahrb. Engler 25: 724. 1898.

Herbaceous shrub to small tree 1-4 or 10 m. high with slender, glabrous, nearly terete branchlets, the internodes elongate; principal cauline leaves ample, ovate or lance-ovate, amphiglabrous, thin-membranous, 25-30 cm. long, 14-15 cm. wide, cuneate at the base, dark green above, paler green beneath and more or less glaucous, the secondary veins strongly ascending, percurrent and nearly parallel to margin above, the petioles slender, 3-4 cm. long, the uppermost floral leaves reduced but similar; panicle diffuse, leafy-bracteate, the lower branchlets elongate, terminating in rather dense cymules of 3-7 distinctly pedicellate flowers; calyx short-campanulate or cupulate, glabrous, 8-10 mm. long, the lobes low-rounded or subtruncate, hyaline-scarious, erosulate, weakly overlapping; corolla greenish-yellow, campanulate, 30-38 mm. long, the lobes ovate or ovate-oblong, acute, about 1 cm. long, crispulate; immature capsule elongate-pyriform, 2.5 cm. long, attenuate to the persistent subfiliform style; seeds unknown.

Type from "regione temperata secus Río Pilatón," 800-1,600 m., southwest of Quito, Prov. Pichincha, Ecuador, *Sodiro* 101/1.

Specimens examined.—ECUADOR: Prov. Napo-Pastaza: Río Negro, between Baños and Mera, 400-500 m., *Mexia* 6977 (US, USNA). Prov. Santiago-Zamora: Río Tintas below Arenillas, ca. 2,200 m., *Steyermark* 53548 (F, US). Prov. Loja: Río Cachiyacu, western slopes of Cord. de Condor and northwest slopes of Nudo de Sabanillas, 2,000-3,000 m., *Steyermark* 54812 (F); Namanda, southern Loja, 2,400-2,500 m., *R. Espinosa* 198 (US).

Macrocarpaea sodiroana is most closely related to *M. macrophylla* of Colombia but may be distinguished by the broadly cuneate-based, long-petiolate leaves and the prominent percurrent venation. Ynes Mexia reported it as occasional in dense forests near the Río Negro in the Province of Napo-Pastaza.

DOUBTFUL SPECIES

1. *Macrocarpaea glaziovii* Gilg, Bot. Jahrb. Engler 22: 335. 1897. Type from "Rio de Janeiro (?), Brazil, Glaziou (a. 1872) n. 4939."

The description suggests *Macrocarpaea rubra* Malme, but the corolla lobes, as described by Malme, are much too long. Evidently Malme had studied the Glaziou collection in question. The other distinctions drawn by him, namely, the fewer secondary nerves, longer pedicels, and shorter campanulate-urceolate corollas, are well within the expected variation of *M. rubra* upon the basis of the 14 sheets studied of that species. In the event the two collections prove to be conspecific, *M. rubra* Malme must yield to *M. glaziovii* Gilg as the older valid name. It is curious, however, that Gilg did not mention the reddish corollas if the Glaziou plant is the same as *M. rubra* Malme. It is probable that the Glaziou type was taken, not in the vicinity of Rio de Janeiro, but in southern Brazil. I have been unable to discover that Glaziou made any extended collections in 1872; in any event, Urban, in his itinerary of Glaziou in the Flora Brasiliensis, mentions none.

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