Published in Harvard Papers in Botany 7, issue 2, 423-436, 2003
which should be used for any reference to this work

DE MACROCARPAEAE GRISEBACH (EX GENTIANACEIS) SPECIEBUS NOVIS II: TYPIFICATION OF THE RUIZ AND PAVON NAMES

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Abstract. Ruiz and Pavon described four species of *Lisianthus* (Gentianaceae) that are now recognized in the genus *Macrocarpaea*: *Lisianthus corymbosus*, *L. ovalis*, *L. revolutus*, and *L. viscosus*. These species were described from specimens collected in the province of Huánuco, Peru, and are here identified as relatively narrow endemics largely of that province. Their complicated taxonomic or nomenclatural history has required a careful review that revealed interesting details relevant to their circumscriptions. Lectotypes are selected for *Lisianthus corymbosus*, *L. revolutus*, *L. viscosus*, *Macrocarpaea arborescens*, *M. pachystyla*, and *M. sodiroana*. *Lisianthus corymbosus* is recognized as an illegitimate name, and is therefore reduced to synonymy under the next validly published name, *Macrocarpaea pachystyla*. *Lisianthus ovalis* does not have a type, and is therefore excluded from use. *Macrocarpaea arborescens* is identified here as a species of southern Ecuador, previously recognized as *M. ovalis*. The name "Macrocarpaea magnifica Ewan, ined" is a *nomen herbariorum*, here recognized as *M. arborescens*. The previously broadly circumscribed *Macrocarpaea sodiroana* is here recognized as restricted to the province of Pichincha, Ecuador. A new identification is reported where the anomalous specimen *Dannouse s.n.* (NY) previously identified as "*Macrocarpaea* sp." by Ewan (1948) is identified as *Tabernaemontana crassa* (Apocynaceae).

Keywords: Gentianaceae, *Macrocarpaea*, Neotropics, nomenclature, Pavon, Ruiz, Sodiro, Tafalla, typification.

Four species of *Macrocarpaea* were described from collections brought back from Ruiz and Pavon's *Expedición Botánica al Virreinato de Perú y Chile (1777–1788)*: *Lisianthus corymbosus*, *L. ovalis*, *L. revolutus*, and *L. viscosus* (Ruiz and Pavon, 1799). This is an account of the collection and description of these species and subsequent typification herein.

On 8 April 1777, Hipólito Ruiz Lopez (1754–1815) was given orders from King Carlos III of Spain to travel to his dominions in America to study their botanical natural history (Ruiz, 1940: 9; 1998). José Antonio Pavon y Jiménez (1754–1844) was appointed as second botanist, and José Burnette and Isidro Gálvez as draftsmen. French naturalist Joseph Dombey (1742–1794) also accompanied the travels. The expedition left Madrid on 19 September 1777 and Cádiz on 19 October, arriving at the port of Callao (Lima) nearly six months later on 8 April 1778. On 14 November 1784, Juan José Tafalla (1755–1811) and Francisco Pulgar also joined the expedition in Peru (Ruiz, 1998: 29). Ruiz and Pavon remained in Peru and Chile for nearly eleven years, departing on 1 April 1778, returning some seven months later in Cádiz on 12 October 1778, and in Madrid on 16 December 1778. Dombey had left previously, arriving in Cádiz on 22 February 1785 (Steele, 1964), while Tafalla remained in Peru and Ecuador continuing to send back specimens to Madrid until his death in Lima.

In Ruiz and Pavon's major scientific works, *Prodromus* (Ruiz and Pavon, 1794), *Flora Peruviana et Chilensis* (Ruiz and Pavon, 1798–1802), and *Systema* (Ruiz and Pavon,

This work was supported by a Swiss National Science Foundation grant, No. 3100–052885 to the Université de Neuchâtel, Switzerland. For assistance with historical collections, I thank Maribel Atirido, Ana del Valle, and Gloria Pérez de Rada at the Real Jardín Botánico de Madrid (MA), Spain, and Ines Padilla at the Herbario P. Luis Sodiro S.I., Quito (QPLS), Ecuador. Permission to reproduce original Ruiz and Pavon plates was granted from the Real Jardín Botánico de Madrid. I thank Philippe Küpfer, James S. Pringle, Lena Struwe, and Richard E. Weaver for reviewing the manuscript, and Dick Brummitt, Michael O. Dillon, Mary Endress, Paul Hiepko, Beat Leuenberger, James L. Reveal, William Skinner, and Maximilian Weigend who each helped in various ways. Library research was largely carried out at the Conservatoire et Jardins botaniques de la Ville de Genève, Switzerland. I thank the following herbaria either for the loan of material, photocopies of specimens, data on their collections, or for hospitality extended during visits* to examine material of *Macrocarpaea*: AAU, ALA*, B, BM, BR, BSB, C, CAS, COL*, CR, CUVC, CUZ*, DAV, DUKE, E, F, FI, FLAS, G*, GB, GH, GOET, HAC, HAM, HAO*, HUT*, INB, JBSD, K, L, LD, LOJA*, LPB, M, MA*, MANCH, MBM*, MICH, MIN, MO, MOL*, MSB, MY, NA, NY*, NSW*, OXF, P*, PH, QCA*, QCNE*, QPLS*, R*, RB*, S*, SEL*, SP, TEX, U, UC, UCWI, UPCB, US*, USM*, VEN*, W*, WIS, WU*, and Z*.

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1798), some 1900 new taxa were described from notes and illustrations made in the field, and herbarium specimens brought back to Madrid. Four of these species are of interest here, *Lisianthus corymbosus*, *L. ovalis*, *L. revolutus*, and *L. viscosus* (Ruiz and Pavon, 1799: 13–15). The two other species described in *Lisianthus* are *L. calygonus* Ruiz & Pav. [= *Symbolanthus calygonus* (Ruiz & Pav.) Griseb.], and *L. acutangulus* Ruiz & Pav. [=*Chelonanthus alatus* (Aubl.) Pulle].

In these Ruiz and Pavon's texts, there is little information on when or where the specimens were collected. Ruiz had planned to publish such information in a manuscript entitled *Viaje* that disappeared soon after his death in 1815. A version of this manuscript later surfaced and was published as *Relación del Viaje Hecho a los Reynos del Perú y Chile por los Botánicos y Dibuxantes Enviados para aquella Expedición, Extractado de los Diarios por el orden que Llevó en ellos su Autor Don Hipólito Ruiz* (Ruiz, 1931). It was translated into English by Bror Eric Dahlgren, and published as *Travels of Ruiz, Pavon, and Dombey in Peru and Chile (1777–1788)* (Ruiz, 1940). Jaime Jaramillo-Arango located another manuscript at the British Museum, and combined the manuscript versions into a single text that included a reordering of chapters in chronological order entitled *Relación Histórica del Viaje que Hizo a los Reynos del Perú y Chile el Botánico D. Hipólito Ruiz en el Año de 1777 hasta el de 1778, en cuya Epoca Regresó a Madrid* (Ruiz, 1952). The English translation of Jaramillo's work prepared largely by Richard Evans Schultes has been recently published as *The journals of Hipólito Ruiz, Spanish botanist in Peru and Chile 1777–1788* (Ruiz, 1998). When these four texts are considered in concert with Ruiz and Pavon's protologues, the herbarium material can be studied in a proper timeframe.

Between 1 August–1 September 1780, the expedition worked near the cities of Huánuco and Chinchao where they collected *Lisianthus corymbosus* and *L. ovalis* (Ruiz, 1940: 81). However, several unfortunate incidents befell these collections. In April 1784, they sent back to Spain via the *San Pedro de Alcántara* 53 cases containing all the pressed plants and illustrations made to that date. By July 1786 Ruiz had learned that the ship had first encountered a storm off the coast of Chile and all the living plants were swept overboard, then on approaching the coast of Portugal, hit rocks and sank on 2 February 1786 with all the dried plant specimens (Steele, 1964). Dombey had sent his collections (perhaps of similar material collected by Ruiz and Pavon) back to France on the *El Peruano*. Relevant material to *Lisianthus* and *Macrocarpaea* may be among the Dombey collections at Paris (P), but has not been searched for by this author. Earlier on 6 August 1785 a fire in Macora destroyed all of Ruiz' manuscripts of plant descriptions. Therefore, within a relatively short period of time, they had lost all of their herbarium specimens, drawings and manuscripts made from 1778–1785, including presumably all material of *L. corymbosus* and *L. ovalis*. Though this was a tremendous setback, Ruiz soon began rewriting the descriptions with plant specimens and illustrations newly collected at Macora and elsewhere. *Lisianthus ovalis* was soon recollected near Puzuzo (Ruiz, 1940: 204), and was redescribed. From 15 August–24 September 1786, they botanized in the region of Muña, collecting *Lisianthus revolutus* and *L. viscosus*. Herbarium specimens of *L. corymbosus*, *L. revolutus*, and *L. viscosus* are extant at Madrid, though there are none of *L. ovalis*. The original elements of *L. corymbosus*, *L. revolutus*, and *L. viscosus* include their protologue, published illustrations, and herbarium specimens. Typification of each of these names is discussed in detail below.

1. *Macrocarpaea pachystyla* Gilg, Bot. Jahrb. Syst. 22: 336. 1896. TYPE: PERU. Chicoplaya, *Tafalla s.n.* (Type: B? [destroyed]; Lectotype: MA-Ruiz & Pavon [2 sheets], selected here; Isolectotypes: G [G-BOISS, G sheet number 8647/14]). Figs. 1–2.

Synonym : *Lisianthus corymbosus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799, *nom illeg., syn. nov. Macrocarpaea corymbosa* (Ruiz & Pav.) Ewan, Contr. U. S. Natl. Herb. 29: 242. 1948. TYPE: PERU. Huánuco: Habitat in Peruviae nemoribus inter Acomayo et Chinchao ad Pati praedium, *Ruiz & Pavon s.n.* (Lectotype: MA-Ruiz & Pavon [2 sheets], selected here; Isolectotypes: BM [5 sheets, BM sheet numbers 583101, 583102, 583107, 583108, 583109], F [2 sheets, F sheet numbers 842844, 843438], G [2 sheets, G sheet numbers 8647/9, 867/13 (G-BOISS)]. Figs. 3–4.

FIGURES 1–4. 1, *Macrocarpaea pachystyla*, lectotype *Tafalla s.n.* (MA-Ruiz & Pavon). Photo Jason R. Grant; 2, *Macrocarpaea pachystyla*, label of lectotype *Tafalla s.n.* (MA-Ruiz & Pavon). Photo Jason R. Grant; 3, *Macrocarpaea corymbosa* original illustration in Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799, fig. CXXIV; 4, *Macrocarpaea corymbosa*, lectotype *Ruiz & Pavon s.n.* (MA-Ruiz & Pavon). Photo Jason R. Grant.

Additional material examined: PERU. Without province or locality, 1835, *Matthews 2065* (BM, E, K, OXF, P, W); *Stockholm Herbarium s.n.* (S). Huánuco: Peruvia subandina, Cuchero, 1 February 1930, *Poeppig 1666* (W); Rondos, 24 April 1962, *Schunke-Vigo 5880* (F, US); Huamilies, Monzón, Paujil, 22 March 1972, *Schunke-Vigo 5298* (F, G, GH, MO, NY, US). San Martín: Mariscal Caceres, Tocache Nuevo, 4 May 1971, *Schunke-Vigo 4848* (COL).

The type of *Macrocarpaea corymbosa* (described as *Lisianthus corymbosus*) was collected between 1 August–1 September 1780, near Huánuco and Chinchao (Ruiz, 1940: 81). The type material consists of ten sheets in four different herbaria (BM, F, G, and MA). The most complete sheet at Madrid is selected as the lectotype. Four other sheets here identified as the type material of *M. pachystyla* have been previously thought to partially represent original material of *M. corymbosa*. While the original material is thought to have been lost when *San Pedro de Alcántara* sank, there are in fact Ruiz and Pavon collections at Madrid that must represent collections made as replacements after the original set was lost.

When Ruiz and Pavon described *Lisianthus corymbosus*, they cited *Lisianthus glaber* L.f. [Suppl. Pl. 134. 1781] as a synonym. Therefore, *Lisianthus corymbosus* is a superfluous renaming of *Lisianthus glaber*. This opinion is shared by Kunth (1818: 185), Grisebach (1839: 173–174), and Gilg (1896: 337). However, in the only monograph of *Macrocarpaea*, Ewan (1948: 242–243) disagreed, providing a lengthy discussion on the problems surrounding *Lisianthus corymbosus* and *L. glaber*, but missing the key point that Ruiz and Pavon cited *L. glaber* in synonymy. Ewan transferred *L. corymbosus* to *Macrocarpaea* as *M. corymbosa* (Ruiz & Pav.) Ewan. While Ruiz and Pavon effectively described and illustrated *Lisianthus corymbosus*, their synonymy of *L. glaber* can not be overlooked and the name must be considered superfluous. *Lisianthus glaber*, now recognized as *Macrocarpaea glabra*, is a distinct species from the Bogotá region of Colombia.

To explain the matter in further detail, the following chronology may be presented. Linnaeus filius (1781) described *Lisianthus glaber* based on a Colombian Mutis icon. J. E. Smith (1789) expanded on Linnaeus filius's description, and provided an illustration of the plant that we now refer to as *Macrocarpaea glabra* from Bogotá. Ruiz and Pavon (1799) described and illustrated *Lisianthus corymbosus* from Peru; however, they simultaneously cited *Lisianthus glaber* in synonymy. Kunth (1818), Grisebach (1839), and Gilg (1896: 337) recognized *Lisianthus glaber* L.f. They regarded *L. corymbosus* as a synonym of *L. glaber*, recognizing that Ruiz and Pavon's publication of *L. corymbosus* was illegitimate. However, Gilg (1896: 337) seems to consider *L. glaber* as a Peruvian plant when he recognized *L. corymbosus* as a synonym. And therefore, since the Colombian species needed a new name, Gilg (1896: 337) described *Macrocarpaea bogotana* as "*L. glaber* Kunth, not L.f". Gilg based *M. bogotana* on a Colombian specimen that is identical to that of *Lisianthus glaber* L.f. Gilg (1896: 336), then described *Macrocarpaea pachystyla* based on similar Peruvian Ruiz and Pavon [Tafalla!] herbarium specimens that Ruiz and Pavon had described *L. corymbosus*. Could Gilg's *Macrocarpaea bogotana* and *M. pachystyla* be "new names" for *L. glaber* Kunth not *L. glaber* L.f., and *L. corymbosus nom. illeg.*, respectively? Though seemingly logical, there is nothing to suggest this as fact in the text, so all hypotheses must be left to supposition. Ewan (1948: 226, 242–243) recognized *Macrocarpaea bogotana* as a synonym of *M. glabra*, and *Macrocarpaea corymbosa* and *M. pachystyla* as two separate species, but knew that each was based on Ruiz and Pavon collections from Peru.

Gilg (1896) described *Macrocarpaea pachystyla* from material thought to have been collected by Ruiz and Pavon. However, the handwriting and style of the labels are consistent with those of Juan Tafalla, as is discussed further in a similar situation with *M. ovalis* below. Also, the herbarium specimens have a slightly different appearance than the known Ruiz and Pavon collections of *M. corymbosa*. Since *M. pachystyla* appears to be conspecific with *M. corymbosa*, *M. pachystyla* is therefore recognized as the next validly published name for this taxon.

While studying the Ruiz and Pavon collections at Madrid, I was puzzled by the annotation labels of Ernst Gilg. I had first thought that they had been transcribed by someone else making herbarium revisions after the publication of his articles. However, with comparison of verified handwriting samples and annotation labels from Berlin, I was able to determine that the annotations are in fact in his hand. Part of the Ruiz and Pavon collections in Madrid had

been sent to Berlin for study.[2] We may presume that these specimens of *Macrocarpaea* were part of the loan from Madrid to Berlin, were annotated by Gilg, and were returned prior to the partial destruction of the Berlin herbarium in 1945 when all *Macrocarpaea* collections including most Gilg types were lost.

2. *Macrocarpaea ovalis* (Ruiz & Pav.) Ewan, Contr. U. S. Natl. Herb. 29: 234. 1948.

Basionym: *Lisianthus ovalis* Ruiz & Pav., Fl. Peruv. Chil. 2: 13. 1799. TYPE: PERU. Huánuco: Habitat in Peruviae nemoribus per Chinchao runcationes, *Ruiz & Pavon s.n.*; original material no longer extant.

Synonym: *Helia ovalis* (Ruiz & Pav.) Kuntze, Rev. Gen. Pl. 428. 1891.

The type of *Lisianthus ovalis* was collected between 1 August–1 September 1780, near Huánuco and Chinchao (Ruiz, 1940: 81). However, all specimens were presumably lost when the *San Pedro de Alcántara* sank. It was soon recollected near Puzuzo and apparently dried and redescribed (Ruiz, 1940: 204). Nevertheless, no definitively authentic material of *L. ovalis* is extant, nor was an illustration published that could be used as a lectotype. Therefore this name is excluded from use.

While I state here that no authentic material of *Lisianthus ovalis* is currently extant, that assessment comes only after much research that has revealed an example of Ruiz and Pavon's replacement in their herbarium of their own specimens lost in the fires and shipwreck with material later collected by Juan Tafalla. There *are* herbarium specimens labeled as *Macrocarpaea ovalis* in the Ruiz and Pavon herbarium at Madrid, as well as duplicates at BM, F, and G that date to the time period of Ruiz and Pavon. This material has always been considered to be type material of *M. ovalis*, e.g. by Ewan (1948). However, the first clue that these specimens could not be the type material of *M. ovalis* was when I identified the mounted specimens as a locally common species of Loja, Ecuador (*M. arborescens*). The problem is that Ruiz and Pavon described *M. ovalis* from Huánuco, Peru, and while it is not impossible in principle for this species to occur in both countries, no species of *Macrocarpaea* has such a wide disjunction. The hunt was then on to determine whether Ruiz and Pavon could have named *M. ovalis* based on specimens from Ecuador rather than Peru. While I knew that the specimens represented an Ecuadorian species, I needed proof to show that they could not be *M. ovalis*. While I had the duplicates on loan from BM, F, and G, I needed to verify the primary set. Therefore, I examined the original set of Ruiz and Pavon collections in Madrid. Regarding these other sets, the British Museum (BM) material came from the auction after the death of Aylmer Bourke Lambert, who had purchased the specimens directly from Pavon (Ruiz, 1952: XXVI; 1998: 27). The Geneva (G) material had been sent to de Candolle directly from Pavon. The Field Museum (F) material was distributed directly by Madrid likely during Joseph MacBride's *Flora of Peru* project based at the Field Museum during the mid-20th century. Additional material may also be in the Webb herbarium at Florence (FI), but has not been searched for by this author.

When I first examined the "Ruiz and Pavon" collections of *Macrocarpaea ovalis* at Madrid I was disappointed since I quickly recognized that they represented the Ecuadorian species, not the Peruvian species as I had hoped. However, the missing puzzle piece soon came into place when I compared verified handwriting samples of botanists who collected during the time period of Ruiz and Pavon in the New World, e.g. Dombey, Mutis, Nee, Pavon, Ruiz, Tafalla. The handwriting on the labels of the specimens of *M. ovalis* at Madrid was different than that of Ruiz or Pavon, but easily matched that of Tafalla! Juan Tafalla collected with Ruiz and Pavon in Peru, and remained in Peru and

[2] "Die Direktion des Botanischen Museums in Madrid hat in sehr anerkennenswerter Weise das dort aufbewahrte Herbar von Ruiz und Pavon zur Bearbeitung zur Verfügung gestellt; einzelne Teile des Herbars werden leihweise übersandt und nach Durchsicht und Revision des Materials zurückgeschickt; die Originale zu den Beschreibungen und Abbildungen in der Flora Peruviana, dem für die Flora von Peru sowie Teilen von Chile grundlegenden Werk, können somit mit neueren Material verglichen werden, soweit sie nicht schon in früher verteilten Dubletten in Berliner Herbar vorhanden waren." Anonymous, Notizbl. Bot. Gard. Berlin-Dahlem 103: 161. 1931.

[The directors of the Botanical Museum in Madrid have made the commendable decision to make the herbarium of Ruiz and Pavon housed at their institution available for examination. Individual parts of the herbarium will be loaned out for examination and review. Materials will then be returned to the Museum. Under this arrangement, the originals used as a basis for the descriptions and illustrations in *Flora Peruviana*, the seminal work for the flora of Peru and portions of Chile, can be compared with more recent materials. This is particularly important for specimens that were not previously available in the Berlin herbaria.]

later Ecuador after Ruiz and Pavon returned to Spain. Tafalla continued to send specimens from his travels for Ruiz and Pavon to describe, or "replace" in their collections the missing specimens lost during Ruiz and Pavon's travels (Ruiz, 1940: 257).

The Tafalla labels on the "*M. ovalis*" specimens have cryptic abbreviations. Yet, this seemingly coded information saw new light once Tafalla was identified as the collector. There are three sheets, two of which have full label data that read "Pentand. Monog., Lisianthus, F.H.D. N. 540., Ex Hualaseo, A° 805" [the second sheet is a duplicate of #540], and "Pentand. Monog., Lisianthus, N. 572 S.L., Ex Loxa, A° 805" (also Tafalla, 1989: 26). After the handwriting samples identified the collector as Tafalla, and by comparing it to known Tafalla labels, it now makes sense. The "F.H." of Tafalla labels refers to his *Flora Huayaquilensis*, which has only been recently published (Tafalla, 1989). This is a flora of the Guayaquil area of Ecuador that also covers species collected on his expedition to Loja in search of *Cinchona* (Rubiaceae), from which quinine was extracted to treat malaria. The locality Hualaseo is in the province of Cuenca (Tafalla, 1989: LXXVII), and "Loxa" is Loja, both in Ecuador. The "A° 805" can be identified as "Año 1805" [year 1805], the year Tafalla is known to have collected in Loja, Ecuador (Tafalla, 1989). The text of *Flora Huayaquilensis* also confirms the identity of specimen numbers 540 and 572 of Tafalla as originating in Loja (Tafalla, 1989: 26; Cevallos, 1991).

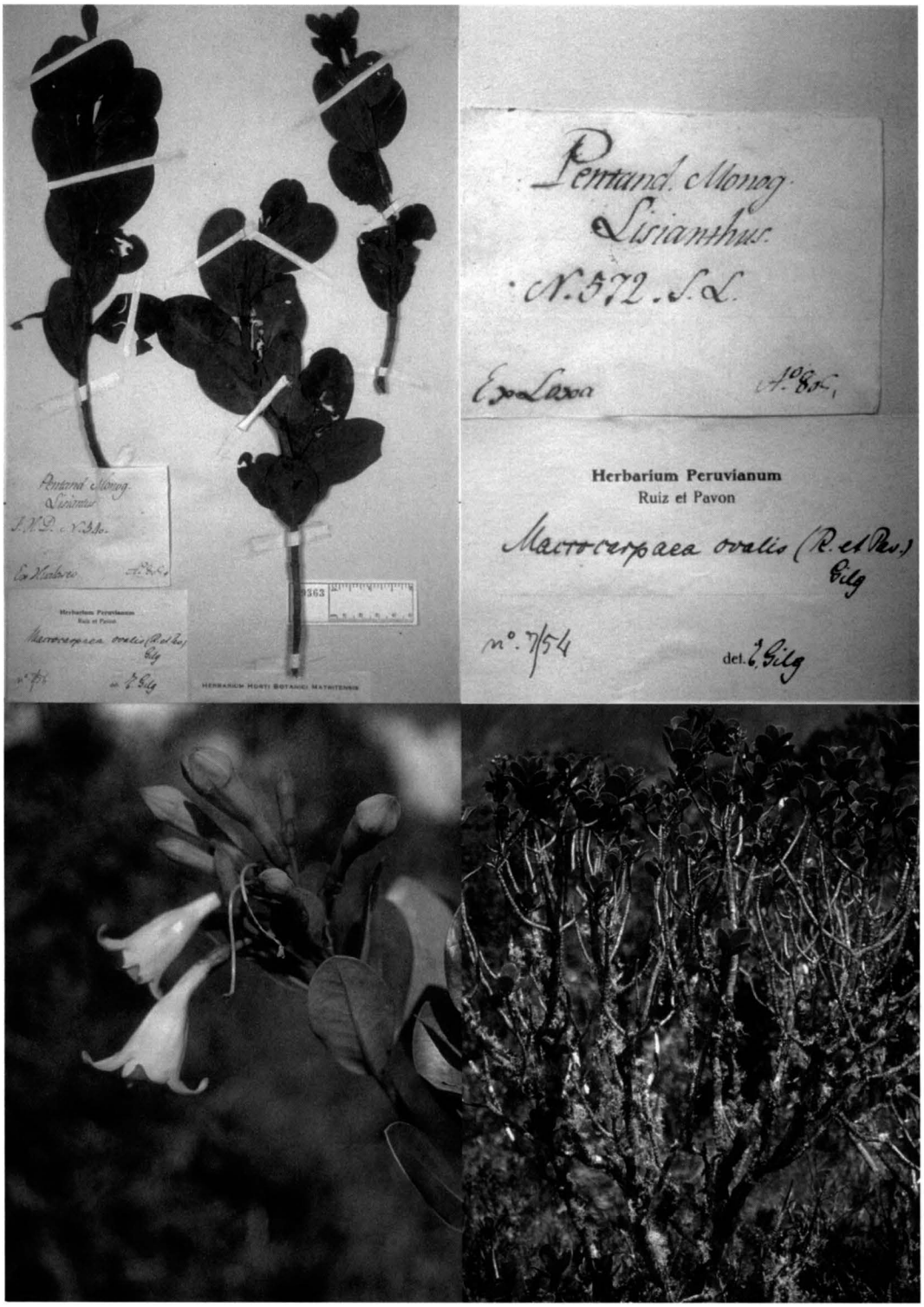
Therefore, the specimens long regarded as the type material of *Macrocarpaea ovalis* were in fact collected by Tafalla in 1805 in Loja, Ecuador. They can't possibly be type material of *Lisianthus ovalis* since the name was published earlier, in 1799. Since no type material of *L. ovalis* is known to exist, nor was there an illustration published as was the case for *L. corymbosus*, *L. revolutus*, and *L. viscosus*, the name must be excluded.

Since *Macrocarpaea ovalis* has been shown to be restricted to central Peru, it left the Ecuadorian taxon that has traditionally held the name *M. ovalis* momentarily nameless. However, the name *Macrocarpaea arborescens* is available, yet with a full set of problems of its own (see below).

3. *Macrocarpaea arborescens* Gilg, Bot. Jahrb. Syst. Beibl. 111: 50. 1913. TYPE: COLOMBIA. Cauca: W Andes of Popayán, 1800-2500 m, *Lehmann 5450* (Type: B? [destroyed]; Lectotype: GH, selected here; Isolectotypes: F, K, US). Figs. 5–8.

Synonym: "Macrocarpaea magnifica" Ewan, nomen herbariorum 1983, *ined.* Based on: ECUADOR. Azuay: Páramo de Castillo, 2745–3355 m, 18 August 1945, *Camp 4795* (NO).

Additional material examined: ECUADOR. Azuay: Páramo de Castillo, 18 August 1945, *Camp 4795* (NO, NY, S); Sevilla de Oro, 29 August 1996, *Garmendia & Cisneros 1113* (QCNE); Sevilla de Oro, 31 August 1996, *Garmendia & Cisneros 1171* (QCNE); Sigsig-Gualaquiza, Molón, 11 December 1968, *Harling et al. 8236* (GB, QCA); Pica Sevilla de Oro-Méndez, 7 August 1983, *Jaramillo 5588* (QCA); Carr. Zigzig-Molón-Gualaquiza, 6 August 1986, *Jaramillo et al. 8856* (AAU, NY, QCA); Km 74 de Cuenca, Carr. Zigzig-Molón-Gualaquiza, 6 August 1986, *Jaramillo et al. 8866A* (QCA). Cañar: Pindilig-Rivera, 9 March 1985, *Harling & Andersson 22989* (GB, QCA). Loja: Loja, 1 December 1896, *André 4549* (F, GH, NY); Loma de Oro, 10 km S of Saraguro, 2 January 1981, *Balslev 1385* (AAU, NY); Road Loja-Saraguro, 15 February 1987, *Bohlin et al. 1357* (GB, QCA); Nudo de Cajanuma, 2 July 2000, *Chassot 00-15* (NEU); 5 km S of Saraguro, 7 October 1988, *Ellemann 66594* (AAU, LOJA, QCA); Hac. Horta-Naque 7 November 1946, *Espinosa, R. 897* (K); Cajanuma Field Station, and trail to Mirador, 17 February 2001, *Grant & Struwe 01-4066* (LOJA, NEU, NY, QCA, QCNE, US); From Loja-Saraguro road, then 2.2 km on road towards Fierro Urco, 18 February 2001, *Grant & Struwe 01-4075* (LOJA, NEU, NY, QCA, QCNE, US); From Loja-Saraguro road, then 3 km on road towards Fierro Urco, 18 February 2001, *Grant & Struwe 01-4084* (LOJA, NEU, NY, QCNE, US); Loma de Loro, 11 February 1985, *Harling & Andersson 21918* (GB); Laraguro and San Lucas, 8 September 1865, *Jameson 67* (K); Loma del Oro, 4 August 1986, *Jaramillo et al. 8816* (QCA); Saraguro-Loja, km 12.4, turnoff towards Fierro Urco, 7 December 1994, *Jørgensen et al. 1314* (HAM, LOJA, MO, NY, QCA); P.N. Podocarpus, Cajanuma, 29 October 1977, *Lewis 3674* (AAU); Páramos de Saraguro, 2 January 1979, *Luteyn et al. 6669* (NY, QCA); P.N. Podocarpus, Nudo de Cajanuma, 6 September 1988, *Madsen & Elleman 75280* (AAU, LOJA, QCA); P.N. Podocarpus, Cajanuma 'Mirador', November 1997, *Matt 2* (ER); P.N.



FIGURES 5–8. 5, *Macrocarpaea arborescens,* (though previously thought type of *Lisianthus ovalis*) *Tafalla 540* (MA-Ruiz & Pavon). Photo Jason R. Grant; 6, *Macrocarpaea arborescens*, label of *Tafalla 572* (MA-Ruiz & Pavon), illustrating the handwriting of Juan Tafalla. Photo Jason R. Grant; 7, *Macrocarpaea arborescens*, inflorescence, *Grant & Struwe 01-4084*. Photo Jason R. Grant; 8, *Macrocarpaea arborescens*, habit as a well-branched tree, *Grant & Struwe 01-4066*. Photo Jason R. Grant.

Podocarpus, Cajanuma 'Mirador', November 1997, *Matt 3* (ER); P.N. Podocarpus, S of Loja, 22 February 1985, *Øllgaard et al. 57953* (AAU, LOJA, QCA); P.N. Podocarpus, S of Loja, 22 February 1985, *Øllgaard et al. 57983* (AAU, LOJA, QCA); Ca. km 5 rd Fierro Urco from Pichig, 12 February 1989, *Øllgaard & Madsen 90494* (AAU, LOJA, QCA); Páramo de Saraguro, 17 March 1983, *Pipoly 6393* (GB, NY); Hualaseo, 1805, *Tafalla 540* (MA-Ruiz & Pavon [2 sheets]); Loja, 1805, *Tafalla 572* (MA-Ruiz & Pavon); Tafalla [likely # *540* or *572*, though unmarked] (BM, F, G). Morona-Santiago: Río Yacuambi, Rumetranca, Cooral-Huica, January 1944, *Goetschel 94945* (VEN); Sigsig-Gualaquiza, 9 April 1968, *Harling et al. 8117* (GB). "Peru" Without province or locality, *Lobb 22* (K). "Peru" Without province or locality, *Lobb s.n.* (F, W).

Gilg described *Macrocarpaea arborescens* from material collected by Lehmann with label information indicating Colombia as the country of provenance. However, the plants on Lehmann's sheets represent a species endemic to southern Ecuador. Lehmann is known to have collected in the Loja area of southern Ecuador, and therefore I suggest that Lehmann's labels may have been confused. It is highly unlikely that *M. arborescens* had a historical contiguous distribution from Colombia to southern Ecuador, especially since this type of disjunction between the two countries as is not presently known in *Macrocarpaea*. While it may be a bold assertion to suggest label errors, there is at least one other case within the Gentianaceae that seems to fit the same pattern. *Gentiana dacrydioides* Gilg was also described from a Lehmann collection allegedly from Cauca (Pringle, 1995: 53). Yet, all the specimens currently referred to the species are from southern Ecuador, none from Colombia (J. Pringle, pers. comm.).

Karl Friedrich Lehmann (1850–1903), who collected the type of *Macrocarpaea arborescens* was the German consul in Popayán, Colombia, and made many plant collections in Colombia, Ecuador, and Guatemala, often with other botanists such as Ellsworth Paine Killip (1890–1968). The genus *Lehmanniella* Gilg (Gentianaceae) was named in his honor (Gilg, 1895: 95). He is not to be confused with the more famous Johann Georg Christian Lehmann (1792–1860), botanist of Hamburg, Germany who largely botanized in Europe.

The annotation of the unpublished name "Macrocarpaea magnifica sp. nov." by Ewan in 1983 occurs on the NO sheet of *Camp 4795*. There is no text with the annotation, so one cannot determine what he was thinking. In any case, this specimen falls well within the circumscription here of *Macrocarpaea. arborescens*.

4. *Macrocarpaea revoluta* (Ruiz & Pav.), Gilg in Engl. & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.

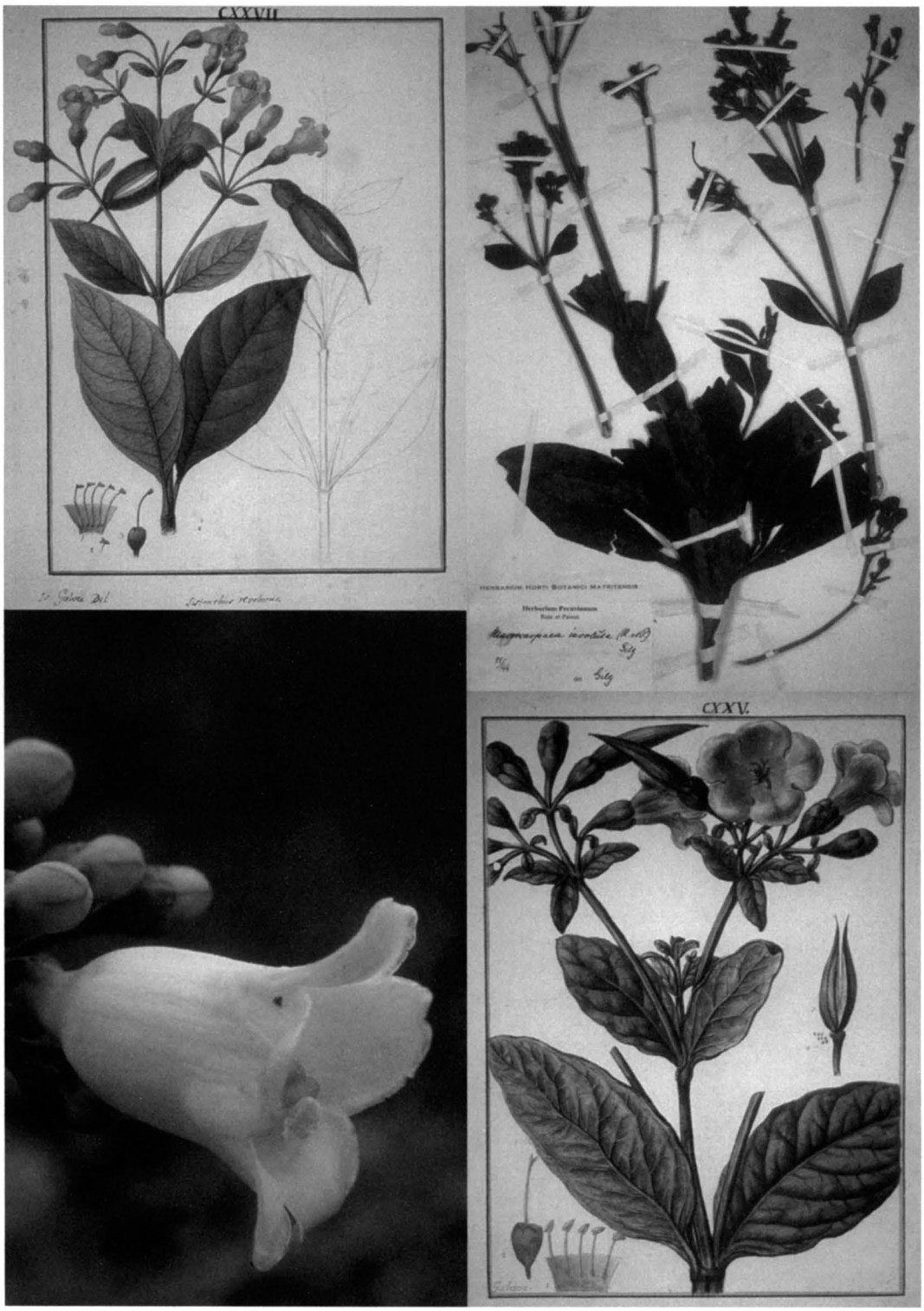
Basionym: *Lisianthus revolutus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799. TYPE: PERU. Huánuco: Habitat in montibus altis frigidis Muña ad Saria tractum, 15 August–24 September 1796, *Ruiz & Pavon s.n.* (Lectotype: MA-Ruiz & Pavon, selected here; Isolectotypes: BM [2 sheets, BM numbers 582105, 583106], MA-Ruiz & Pavon [3 sheets], F [F sheet 842851], G [3 sheets, G (8647/40), G-BOIS (8647/42), G-DEL (8647/41)]. Figs. 9–11.

Synonym: *Helia revoluta* (Ruiz & Pav.) Kuntze, Rev. Gen. 428. 1891.

Additional material examined: PERU. Huánuco: Carpish, 9 November 1938, *Stork & Horton 9913* (GH, K, UC); Leoncio Prado, road from Huánuco to Tingo Maria, Abra Carpish, just north of tunnel, 22 March 2001, *Weigend et al. 5288* (HUT). Junín: La Merced, 10 August 1923, *MacBride 5224* (F, GH, US).

The type of *Macrocarpaea revoluta* (described as *Lisianthus revolutus*) was collected between August–September 1786, between Huánuco and Muña (Ruiz, 1940: 208–211). The exact locality identified by Ruiz and Pavon (1799: 14) is "*Habitat in montibus altis frigidis Muña ad Saria tractum*". The type material consists of four sheets in the Ruiz and Pavon herbarium at Madrid, and a single sheet at the Field Museum in Chicago (a photo of which appears as plate 4 in Ewan, 1948: between pages 222–223). The most complete sheet at Madrid is selected as the lectotype.

The circumscription here of *Macrocarpaea revoluta* is essentially identical to that of Ewan (1948: 230) except for the exclusion of the specimen *Williams 7596*. Most researchers since Ewan (1948) have used this name to identify to a different, relatively common species from the Chachapoyas area of Amazonas, Peru, where the Williams collection is from. That is a yet-to-be-described new species that will appear in a forthcoming installment of this series to be named after the pre-Columbian Chachapoya fortress Kuelap.



FIGURES 9–12. 9, *Macrocarpaea revoluta* original illustration in Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799, fig. CXXVII; 10, *Macrocarpaea revoluta*, lectotype *Ruiz & Pavon s.n.* (MA-Ruiz & Pavon). Photo Jason R. Grant; 11, *Macrocarpaea revoluta*, inflorescence, *Weigend et al. 5288*. Photo Maximilian Weigend; 12, *Macrocarpaea viscosa* original illustration in Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799, fig. CXXV.

5. *Macrocarpaea viscosa* (Ruiz & Pav.) Gilg, Bot. Jahrb. Syst. 22: 337. 1896.

Basionym: *Lisianthus viscosus* Ruiz & Pav., Fl. Peruv. Chil. 2: 14. 1799. TYPE: PERU. Huánuco: Habitat in altis locis Muña ad Tambo nuevo tractus, 15 August–24 September 1786, *Ruiz & Pavon s.n.* (Lectotype: MA-Ruiz & Pavon, selected here; Isolectotype: MA-Ruiz & Pavon). Figs. 12–15.

Synonym: *Helia viscosa* (Ruiz & Pav.) Kuntze, Rev. Gen. 428. 1891.

Additional material examined: PERU. Huánuco: 10 km N of Acomayo, bosque Unchog, 10 October 1982, *Graham s.n.* [= *M. Ramírez R. No. 32*] (F); Pachitea, Panao, road from Chaglla to Rumichaca (Tambo de Vaca), 31 March 2001, *Weigend et al. 5429* (BSB, NY).

The type of *Macrocarpaea viscosa* (described as *Lisianthus viscosus*) was collected between 15 August–24 September 1786, between Huánuco and Muña (Ruiz, 1940: 208–211). The exact locality identified by Ruiz and Pavon (1799: 14) is "in altis locis *Muña* ad *Tambo nuevo* tractus". Ruiz (1940: 211) makes the following observations: "The calyces of this small shrub as well as the flower stalks are covered with a white, crystalline gum that dissolves completely in water and crackles in the fire like gum arabic." In dried material this is a common trait and found in many gentians, for example on seeds, leaves and calyces in *Lisianthius*, Chironieae, Helieae, and Potalieae (Struwe, Weaver, pers. comm.) The type material of *Lisianthus viscosus* consists of two herbarium sheets in the Ruiz and Pavon herbarium at Madrid. No duplicates have been found in other herbaria. The sheet with a leaf and an inflorescence is selected as the lectotype, and the sheet with inflorescence only is selected as the isolectotype.

Macrocarpaea viscosa is a distinctive species, yet has been misunderstood by most students of the genus. Notably, when Ewan (1948: 246) had only seen a photograph of the type at Madrid, he attributed three specimens to *M. viscosa* that in fact represent three different species (none of which is *M. viscosa*!). In all actuality, there was a lapse of nearly 200 years from the time Ruiz and Pavon collected *M. viscosa* in 1786 to when it was recollected by Graham in 1982. The more important collections are those of by Weigend in 2000 near Ruiz and Pavon's original locality. Weigend's herbarium material, flowers preserved in alcohol, and color photographs provide the most significant data in our understanding of this rare species.

6. *Macrocarpaea sodiroana* Gilg, Bot. Jahrb. Syst. 25: 724. 1898. TYPE: ECUADOR. Pichincha: In regione temperata secus fluv. Pilatón, 800–1600 m, August flor., *Sodiro 101/1* (Type: B? [destroyed]; Lectotype: QPLS, selected here; Isolectotypes: QPLS [2 sheets]). Figs. 16–17.

Additional material examined: ECUADOR. Pichincha: Collections made along the old road from Quito to Santo Domingo via Chiriboga: 21 March 1980, *Dodson & Gentry 9725* (MO, SEL); 7 April 1984, *Dodson & Thurston 14162* (HAM, MO [2 sheets]); *Fagerlind & Wibom 1925a* (S); *Fagerlind & Wibom 1925b* (S); 26 February 2002, *Grant & Torres 02–4210* (NEU, NY, US); 8 May 1968, *Harling et al. 9221* (GB); 2 February 1982, *Luteyn et al. 8733* (QCA); February 1975, *Ortiz 20* (MO); 4 February 1944, *Scolnik 1616* (PH); 13 December 1987, *Zak & Jaramillo 3169* (HAM, MO); 15 April 1988, *Zak & Jaramillo 3458* (GB, K, NY, US). Collections made at Parroquia Nanegal, Bosque Protectora Maquipucuna: 24 January 1974, *Harling & Andersson 11575* (GB); 20 May 1991, *Tipaz & Quelal 154* (MO); 18 September 1989, *Webster et al. 27733* (DAV); 7 July 1992, *Webster et al. 29065* (DAV); 15 January 1995, *Webster et al. 31346* (DAV); 17 June 1996, *Webster et al. 31550* (DAV); Carretera Calacalí, Los Bancos, en Mindo, 17 May 1997, *Carrera 23* (QCA); Quito Canton, trek from Lloa to Mindo, 8 February 1998, *J.L. Clark 4521* (QCNE); Quito, Parr. Mindo, Bosque Protector Mindo, 15 July 1992, *Delprete et al. 6100* (TEX); Ridge between Río Mindo and Río Bagasal, 14 July 1992, *Webster et al. 29399* (DAV).

Macrocarpaea sodiroana Gilg was described from a specimen collected by Sodiro and likely deposited at Berlin (Gilg, 1898). However, all material of *Macrocarpaea* at B was destroyed during the Second World War. Luckily, most of Gilg and Gilg-Benedict's new species have isotypic material in other herbaria (e.g. BM, BR, C, E, G, GH, GOET, K, LD, M, MANCH, MICH, MO, NY, OXF, P, PH, QPLS, US, and W). Lectotypes will be selected from this material for *M. arborescens* Gilg, *M. bangiana* Gilg, *M. bogotana* Gilg, *M. calophylla* Gilg, *M. chlorantha* Gilg, *M. cinchoniifolia* (Gilg) Weaver, *M. cochabambensis* Gilg-Benedict, *M. duquei* Gilg-Benedict, *M. glaziovii* Gilg, *M. micrantha* Gilg, *M. pachyphylla* Gilg, *M. pachystyla* Gilg,

FIGURES 13–16. 13, *Macrocarpaea viscosa*, lectotype *Ruiz & Pavon s.n.* (MA-Ruiz & Pavon). Photo Jason R. Grant; 14, *Macrocarpaea viscosa*, inflorescence, showing corolla throat from front, *Weigend et al. 5429*. Photo Maximilian Weigend; 15, *Macrocarpaea viscosa* , inflorescence, showing corolla from the side, *Weigend et al. 5429*. Photo Maximilian Weigend; 16, *Macrocarpaea sodiroana*, lectotype *Sodiro 101/1* (QPLS). Photo Jason R. Grant.

FIGURE 17. *Macrocarpaea sodiroana*, inflorescence, *Grant & Torres 02-4210*. Photo Jason R. Grant.

M. polyantha Gilg, *M. sodiroana* Gilg, and *M. weberbaueri* Gilg). The exception is *M. stenophylla* where a neotype was required and recently selected by Grant & Struwe (2001). The first set of Sodiro's specimens is at QPLS, located in the Bibliotheca Ecuatoriana Aurelio Espinosa Polit, Quito Ecuador. Original material of *Macrocarpaea sodiroana* was recently identified, and is here selected as lectotype.

Gilg (1898) cites the type of *Macrocarpaea sodiroana* as *Sodiro n. 101/1*. However, this number does not actually correspond to a Sodiro collection number, rather to an order and family. Sodiro gave numbers to each species he collected, not different collections (Jørgensen and Léon-Yánez, 1999: 34). On the QPLS sheets, there is the following information: "Num. 109/1. Ord. 109. Trib. II. Gen. 35." Gilg possibly misread the handwriting of 109/1 as 101/1, and then referred to it as the collection number of the type specimen of *M. sodiroana*. Here, I recognize the lectotype and isolectotypes of *M. sodiroana* as *Sodiro s.n.* (QPLS).

Macrocarpaea sodiroana is a distinct species endemic to Pichincha, Ecuador, and its broad species circumscription by Pringle (1995) is rejected.

A Sodiro collection at Paris (P) incorrectly annotated as type material of *Macrocarpaea sodiroana* by Alicia Lourteig is here identified as *Chelonanthus alatus* (Aubl.) Pulle [syn. *Irlbachia alata* (Aubl.) Maas]. The specimen citation is as follows: Ecuador. Pichincha: In reg. subtrop. secus, fl. Pilatón, I/1889, *Sodiro s.n.* (P). Numerous Sodiro specimens of *Chelonanthus alatus* with similar data were also seen at QPLS.

NEW IDENTIFICATION

1. *Macrocarpaea* sp. Based on *Dannouse s.n.* (NY), determined and discussed by Ewan (1950:164–165).

The specimen collected by Dannouse in Trinidad, and annotated as the genus *Macrocarpaea* by both Nicholas Edward Brown (1920) and Joseph Ewan (1946), and discussed by Ewan (1950: 164) as a species of *Macrocarpaea*, is not a gentian.

It is unclear why Brown thought this was a member of the Gentianaceae. In penciled handwriting on the herbarium sheet itself, Brown simply writes "Seems to be allied to *Macrocarpaea Hartii* Krug & Urb. Not matched at Kew. Sept 1920. N. E. Brown." Ewan writes on his annotation label "Unique in *Macrocarpaea*, not placed, J. Ewan, 1946." Ewan appears to have had some doubts about the provenance of the specimen. Two additional

annotation labels by Ewan have additional information that was discussed in Ewan (1950): ["Dannouse, paid collector hired by Broadway (?); a number of his collections have not been repeated before or since." John Beard, in lett. to J. Ewan 1 V 1946"]. From the specimen itself, Ewan (1950) notes differences from typical *Macrocarpaea* in the leaves and corolla, but maintains it as a gentian although he does not describe it as a new species or assign it to any previously described species.

Both Brown and Ewan were possibly confused by the specimen because it did not match any other neotropical plant they knew. The problem is that while the plant is said to have been collected in Trinidad, the herbarium specimen must have been made from a cultivated tree. My initial determination of the specimen as Apocynaceae was confirmed by Apocynaceae experts Mary Endress, Barry Hammel, and J. Francisco Morales, yet none could immediately place it in any neotropical group. The specimen is clearly a member of the Apocynaceae as can be seen most noticeably in the twisted corolla, the form of the anthers (revealed in the boiled dissection of a flower), and the structure of the inflorescence. Also, no gentian has an inflorescence without bracts subtending the nodes or flowers, as in this specimen.

Endress and this author then ignoring the locality data, identified the plant to genus and species based on morphology and comparison to herbarium material at Zürich (Z). Relatively easy identification to *Tabernaemontana crassa*, a species native to Africa was confirmed by unique characters in the calyx, inflorescence structure, leaf venation and drying patterns. Additionally, Leeuwenberg (1991) mentions that the tree is cultivated in the New World, notably at the Belém Botanical Garden (Brazil). Although it is native to tropical Africa, it has not been reported to escape from cultivation in the Neotropics.

Ewan's description of *Macrocarpaea guttifera*, that turns out to be a member of the Rutaceae (*Ravenia biramosa*) (Grant & Struwe, 2001), and the identification of the Dannouse collection as a *Macrocarpaea*, that turns out to be a member of the Apocynaceae (*Tabernaemontana crassa*), draws further attention to Ewan's rather problematic treatment of the genus (Ewan, 1948, 1950, 1951).

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