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LISIANTHIUS (GENTIANACEAE)

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16. *Lisianthus troyanus* Urb. Symb. Antill. 6: 32. 1909 (as *Lisianthus*). ✓ LECTOTYPE. Jamaica: near Troy, Harris 8789 (NY!).

Slender subshrubs, glabrous throughout. Stems 0.5–1.5 m. tall and to 1 cm. in diameter, erect or ascending, terete, green above and gray-brown below. Leaves membranaceous, the principal lateral veins prominent, glossy grass-green above, paler and dull beneath, the blades 2.9–12 (16.8) cm. long and 0.7–4.9 cm. broad, 3–4 times as long as broad, elliptic (usually narrowly so) to oblanceolate, broadest at or above the middle, the apices short-acuminate (long-acuminate or acute), the bases long-attenuate and tapering into the narrowly winged, 0.5–2.5 cm. long petiole. Inflorescences of apparently simple dichasia, these sometimes reduced to single flowers; flowering branches 1–2-ternately divided; inflorescence branches and stalks terete, elongate and the inflorescences diffuse. Flowers nodding, pedicels slender, 3–19 mm. long; bracteoles subulate, scarious. Calyx (4) 5.5–10.5 (12) mm. long, fused for $1/8$ – $1/4$ its length; the lobes 3–9 (11) mm. long and 1–1.5 mm. broad, lanceolate or subulate-lanceolate, long acuminate, scarious-margined, ridged abaxially; the tube 1–3 mm. long. Corolla 3.3–4.6 cm. long, tubular-funnelform, uniformly bright yellow; tube 2.2–3.3 cm. long and 5–7.5 mm. in diameter at the apex, constricted in the lower $1/3$ – $2/5$; lobes 9–14 mm. long and 2.5–4.5 mm. broad, widely spreading, ovate-lanceolate or lanceolate, abruptly short-acuminate (to gradually acuminate), $1/3$ – $2/5$ ($1/2$) as long as the tube. Stamens inserted on the corolla tube $1/3$ – $2/5$ of the distance from the base to the apex; filaments 1.9–3 cm. long, not exceeding the corolla lobes but rarely almost equalling them; anthers 1.5–2.5 mm. long and 1–1.5 mm. broad, narrowly oblong, acutish, the connective slightly exserted. Styles 2.4–3.7 cm. long, exceeding the filaments, slightly surpassing the corolla lobes or not; stigmas capitate, distinctly bilobed. Capsules oblong-ellipsoid, 8–12 mm. long, not including the 1–2.5 mm. long beak, and 2.5–4 mm.

* Continued from volume 53, p. 272.

in diameter; the marcescent corolla not persisting on the mature capsule. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From 90 to 600 meters on rocky limestone hillsides or roadside banks in western Jamaica (MAP 10).

REPRESENTATIVE COLLECTIONS

Jamaica. near Troy, *Harris 8789*✓(UCWI; isotype); Cockpit Country, Troy, *Britton 509* (NY); Cockpit Country, near Balaclava, *Marble 923* (NY). HANOVER: Cocoa Walk District, W side of the Hanover Hills, near the Great Morass, Farr s.n. (IJ, NY); Houghton Mtn. District, 0.5 mi. S of Cave Valley, *Proctor 11295* (IJ). WESTMORELAND: 0.5 mi. S of Moreland Hill School, *Weaver & Weaver 1272* (A, BM, DUKE, F, LL, MICH, MO, S, UCWI, US).

Lisianthus troyanus, a rather uncommon species, is probably most closely related to the Puerto Rican *L. laxiflorus* and the Cuban *L. glandulosus*. It resembles these species strongly in most respects, particularly in its capitate, distinctly bilobed stigmas, but it should not be confused with them since the ranges of all three species are distinct. Of the Jamaican species, *L. troyanus* most closely resembles *L. latifolius*. That species differs however in its peltate stigmas, its corolla tubes not conspicuously constricted in the basal portion, its styles and filaments never exceeding the corolla lobes, and its broader leaves; in addition *L. latifolius* is restricted to the cloud forests and elfin woodland in the mountains of eastern Jamaica while *L. troyanus* is found on dry limestone hillsides of western Jamaica at an elevation below 700 meters.

The holotype of *Lisianthus troyanus*, along with most of Urban's type material was destroyed during the bombing of Berlin during World War II (H. Scholz, *in litt.*). However, I have seen 2 isotypes (NY, UCWI). Of these, the specimen at the New York Botanical Garden is more complete and better exhibits the characters described by Urban. Therefore, *Harris 8789* (NY) is designated the lectotype of *L. troyanus* Urb.

The specimens of *Lisianthus troyanus* from the vicinity of Troy in the Cockpit Country, including the type collection and two additional ones, differ slightly from those specimens from the far western parishes of Jamaica. These latter specimens are distinguished from the typical element by having corolla lobes abruptly acuminate and slightly shorter in relation to the tube, generally shorter calyx lobes, and styles surpassing the corolla lobes. Although there is an overlap in all the critical characters, plants of the two groups of populations look slightly different from herbarium specimens. However the paucity of material at hand makes critical evaluation of their relationships difficult. Until more material is available, particularly from the region between the presently known distributions of these groups of populations, I prefer to make no formal distinction between them.

17. *Lisianthus glandulosus* A. Rich. *in* Ramon de la Sagra, *Hist. Isla de Cuba* 11: 102. 1850 (as *Lisianthus*). TYPE. Cuba: Sierra Maestra, St. Yago de Cuba, *Linden 2014* (P!).

L. stenophyllus Urb. Symb. Antill. 9: 237. 1924. TYPE. Cuba. ORIENTE: Sierra Maestra, Pinar del Papayo, *Ekman* 9269 (s!).

Slender subshrubs, glabrous or minutely spiculate. Stems 0.2–1 m. tall and to 5 mm. in diameter, slender, erect or ascending, glabrous or rarely minutely spiculate, especially above, brown and terete below, green and 4-angled above. Leaves membranaceous, the venation not particularly conspicuous; foliage leaves subsessile or short-petiolate, the blades (1.5) 2.3–10.5 cm. long and (0.2) 0.8–4.2 cm. broad, elliptic to very narrowly elliptic to ovate-lanceolate, widest at or below the middle, 2–10 times, but usually less than 6 times, as long as broad, gradually acuminate at the apex, the base obtuse or shortly attenuate into the short, winged



MAP 8. Distribution of *Lisianthus* species. *L. domingensis* (squares), *L. glandulosus* (half-circles), *L. silenifolius* (dots).

petiole; petioles to 7 mm. long. Inflorescences of long-pedunculate, apparently simple (1-compound) dichasia, occasionally reduced to 1–2 flowers; flowering branches 1–2-ternately divided, each division terminated by a dichasium or a reduced dichasium; axes of the flowering branches and inflorescences strongly angled, the angles frequently expanded into narrow, scarious wings. Flowers nodding, frequently strongly, the pedicels relatively stout (3) 8–13 (20) mm. long; bracteoles subulate or linear, scarious. Calyx (5) 6.5–12 mm. long, the lobes (4.5) 5.5–10.5 mm. long and 1–2 mm. broad, narrowly lanceolate, long-acuminate, scarious-margined, weakly carinate abaxially. Corolla (2.4) 2.9–3.8 cm. long, tubular-funnel-form, uniformly bright yellow; the tube (1.9) 2.2–3.2 cm. long and 3–6 mm. in diameter at apex, tightly constricted in the lower half, 3 times (or more) as long as the calyx; the lobes 5–9 mm. long and 2–4 mm. broad, spreading, narrowly ovate, abruptly or gradually short-acuminate (acute), 2/10–3/10 as long as the tube. Stamens inserted above the apex of the calyx lobes; filaments 1–2.2 cm. long, never exceeding the corolla lobes, the longer ones usually equalling the style; anthers 1.5–2 mm. long and ca. 1 mm. broad, oblong, obtuse. Style 1.5–2.5 cm. long. Capsule fusiform or oblong-ellipsoid, short-beaked, 8–15 mm. long, not including the 1–2 mm. long beak, and 2–4 mm. in diameter; calyx in fruit 1/3–2/3 as long as the capsule; the marcescent corolla sometimes persisting until the seeds are shed. FLOWERING: All year.

DISTRIBUTION: From 300 to 1500 meters in pinelands or in moist limestone forests in the mountains, particularly the Sierra Maestra, in Oriente Province in eastern Cuba (MAP 8).

REPRESENTATIVE COLLECTIONS

Cuba: without locality, *Linden* 2014 (BM; isotype). ORIENTE: Sierra Maestra, Pinar del Papayo, *Ekman* 9269 (s; type of *L. stenophyllus*), supra Daiquiri, *Ekman* 8174 (MICH, s), Loma del Gato, *Ekman* 7004 (s), Gran Piedra, *Shafer* 9058 (NY, US), Pico Turquino, *Seifríz* 1075 (US), w. of Rio Yao, *Morton & Acuña* 3429 (US), foothills on n. side of La Bayamesa, *Webster* 4078 (MICH, US); Pico del Cristal, *Lopez* 81 (US); Baracoa, pinelands on way to Florida, *Ekman* 3992 (F, MICH, s, UC, US); at the top of El Yunque, *Ekman* 3976 (F, s, US); minas de Iberia ad Taco Bay, *Ekman* 3807 (s); on Vía Azul, between Sabanilla and Cajobabo, at km. 22 from Sabanilla, *Morton & Alain* 9000 (US); Camp La Gloria, s. of Sierra Moa, *Shafer* 8081 (NY); Sabanilla to Yumuri Arriba, *Shafer* 8409 (NY, US); vicinity of El Cuero, *Britton & Cowell* 12768 (NY); Arralo de Medio, *Shafer* 3258 (NY); Sierra del Nipe, Loma Mensura, *Ekman* 5743 (s); Corajo, "Treinta Pinos," *Ekman* 5178 (s).

Lisianthus glandulosus is probably most closely related to the Jamaican *L. troyanus* and the Puerto Rican *L. laxiflorus*. It differs from both of these species in its corolla lobes which are less than 1/3 as long as the tube. It differs further from *L. troyanus* in its strongly 4-angled inflorescence branches and its style never exceeding the corolla lobes. It differs further from *L. laxiflorus* in that its corolla tube is 3 times or more longer than the calyx.

Although Perkins (1902) considered it a synonym of *Lisianthus glandulosus*, *L. silenifolius*, the only other Cuban species, differs strongly in that it is an annual or perennial suffrutescent herb with inflorescences of compound dichasia, sessile leaves, and ovoid capsules. *L. silenifolius* is here placed in subsect. HERBACEI of sect. LISIANTHIUS.

In the protologue of *Lisianthus stenophyllus*, Urban stated that his new species is distinguished from the other Antillean species by its narrow leaves. *L. stenophyllus* is known from only the two specimens of the type collection, *Ekman* 9269, and these specimens indeed have leaves narrower than any found elsewhere in the genus. The leaves are at least 8 times longer than broad. However, except for being more densely spiculate, *Ekman* 9269 is identical to *L. glandulosus* in its other features. Since leaf shape is a widely variable character throughout the genus, *L. stenophyllus* is not maintained as a distinct species. Its apparent sympatry with *L. glandulosus* would prevent me from treating it as a variety of that species. Therefore, at least until more material is available, I consider it to be a slightly aberrant population of *L. glandulosus*.

18. *Lisianthus laxiflorus* Urb. Symb. Antill. 3: 332. 1902 (as *Lisianthus*). ✓LECTOTYPE. Puerto Rico: prope Peñuelas ad montem Las Cruces, *Sintenis* 4386 (UCWI!).

†*Lisianthus gracilis* sensu Perkins, Bot. Jahrb. 31: 493. 1902, not *Leianthus* (= *Lisianthus*) *longifolius* β *gracilis* Griseb.

Spindly subshrubs, glabrous throughout. Stems 0.3–1 m. tall and to 5 mm. in diameter, erect or ascending, or reputedly climbing, brown and more or less terete below, green and angled above. Leaves thin-membranaceous, the principal lateral veins and often the veinlets evident, at least upon drying; leaves 2.6–9.7 cm. long and 0.4–3.1 cm. broad, lanceolate (or ovate-lanceolate), broadest below the middle, the apices gradually long-acuminate, the bases obtuse or short-attenuate and tapering into the short, winged petiole, subsessile or the petioles to 5 mm. long. Inflorescences of long-pedunculate, apparently simple (1-compound) dichasia, often reduced to 1 or 2 flowers; flowering branches typically 1–2-ternately divided, the divisions terminated by dichasia, the lateral ones 1–(2–3)-flowered, the terminal one (1)2–3-flowered; axes of the flowering branches and inflorescences strongly 4-angled, the angles typically expanded into narrow, scarious wings. Flowers nodding, the pedicels relatively slender (0.3)1.1–2.2(2.8) cm. long; bracteoles foliaceous or more rarely nearly scarious, linear to narrowly elliptic, 2–8(10) mm. long. Calyx 8–13.5 mm. long, fused for $1/8$ its length or less; the lobes 7–12 mm. long and 1–2 mm. broad, narrowly lanceolate, long-acuminate, ridged abaxially, essentially green but with narrow, scarious margins; the tube 0.5–2 mm. long. Corolla 3.0–4.5 cm. long, deeply cleft, funnelform, uniformly bright yellow; the tube 1.8–2.5 cm. long and 4–7 cm. in diameter at the apex, slightly constricted in the lower $1/3$ – $1/2$; the lobes 1.2–2 cm. long and 2–4 mm. broad, $6/10$ as long to nearly as long as the tube, spreading or perhaps slightly recurved, elliptic-lanceolate or lanceolate, gradually long-acuminate. Stamens inserted on the corolla tube one half or just less than half the distance from base to apex; filaments 1.4–2.5 cm. long, reaching to about the midpoint on the corolla lobes, occasionally equalling the style; anthers 1.5–2.5 mm. long and ca. 1 mm. broad, oblong, obtuse or acutish. Styles 1.9–2.7 cm. long; stigmas capitate, distinctly bilobed. Capsule fusiform, short-beaked, 7–15 mm. long, not including the 1 mm. long beak, and 2.5–4 mm. in diameter; calyx in fruit nearly equalling capsule; the marcescent corolla occasionally persisting until the seeds are shed. FLOWERING: Dec.–July.

DISTRIBUTION: From 300 to 1300 meters in moist forests or along roadsides in the mountains of Puerto Rico (MAP 9).

REPRESENTATIVE COLLECTIONS

Puerto Rico: Peñuelas, inter frutices ad Las Cruces, *Sintenis* 4386 (F, GH, MO, NY, S, UCWI, US; islectotypes); Maricao, *Sintenis* 202 (BM, GH, S, US; cited collection); Yauco, *Garber* 64 (GH, NY; cited collection); 14 mi. ne. of Mayagüez, *Heller* 4474 (F, GH, MICH, MO, NY, US; cited collection); Lares, ad Buenos Aires, *Sintenis* 6077 (BM, US; cited collection); prope Utuado, *Sintenis* 6424 (BM, GH, NY, US; cited collection); south side of El Yunque Mtn., *Blomquist* 13195 (DUKE, MO); km. 15 on El Yunque Road from Palmer to Florida, *Wagner* 2 (A); Route 191, km. 17.2 on south side of the Luquillo Mountains, *Wagner* 1802 (DUKE); Río de Maricao, *Britton & Cowell* 4228 (F, MO, NY, US); Maricao Forest, near radar site, *Howard & Nevling* 15349 (A); Cerro Gordo,

San German, Vélez 1426 (GH); mountains of Toro Negro, Cerro de Punta, Alain 9480 (IJ); Sierra de Naguabo, Shafer 3528 (F, MO, NY, US).

Lisianthus laxiflorus, the only species in the genus known from Puerto Rico, is most similar to the Jamaican *L. troyanus* Urb., from which it differs in its 4-angled inflorescence branches, its lanceolate leaves, its corolla lobes 3/5–9/10 as long as the tube, and in its distribution.

In her treatment of *Lisianthus*, Perkins (1902) included a plant which she called *Lisianthus gracilis* (Griseb.) Perk., citing as the basionym *Leianthus longifolius* (L.) Griseb. var. *gracilis* Griseb. (Fl. Brit. W. Ind. Isl. 421. 1862). From the specimens she cited, all Puerto Rican, it is obvious that this plant is the same as *Lisianthus laxiflorus* Urb. In fact, all of these specimens were cited slightly later by Urban as representative of *L. laxiflorus*.

In his treatment of *Leianthus longifolius* (= *Lisianthus longifolius* L.) Grisebach (1862) recognized 3 varieties: α (the typical one), β *gracilis*, and γ *cordifolius*. No authentic material of Grisebach's has been seen; his description of β *gracilis* is brief and could equally well apply to some specimens of the Jamaican *Lisianthus longifolius*, as well as to *L. laxiflorus* or the Cuban *L. glandulosus*. However, in his comprehensive description of *Leianthus longifolius*, Grisebach (loc. cit.) states that the corolla tube is "twice or thrice" as long as the lobes. *Lisianthus laxiflorus* is thus excluded, since in this species the corolla tube is less than twice as long, and usually less than 1.5 times as long, as the lobes. In addition, Grisebach (loc. cit.) gave the distribution of *Leianthus longifolius* as Jamaica and Cuba; *Lisianthus laxiflorus* is restricted to Puerto Rico.

From the description, then, *Leianthus longifolius* (including var. *gracilis*) as circumscribed by Grisebach (1862) does not include the Puerto Rican material. Therefore, since Perkins' *Lisianthus gracilis* was based on Grisebach's *Leianthus longifolius* var. *gracilis*, Urban was correct in applying a new name to the Puerto Rican *Lisianthus*.

In describing *Lisianthus laxiflorus* Urban cited 9 specimens as representative of his new species. Although most of these were destroyed during World War II (H. Scholz, *in litt.*), there is reason to believe that at least one specimen of *L. laxiflorus* seen by Urban is extant. Among the collections at the University of the West Indies in Mona, Jamaica, is a specimen of Sintenis 4386, the label of which, including the word "typus," is written in Urban's hand as determined by Dr. C. D. Adams of that university. The locality data on this specimen, "Prope Peñuelas ad montem Las Cruces," compares favorably with an entry, "Peñuelas in monte Las Cruces," in Urban's protologue of *L. laxiflorus*. In addition, this specimen was annotated by Perkins, as *Lisianthus gracilis* (Griseb.) Perk., in 1901, the year before the original description of *L. laxiflorus* was published. Since both Perkins and Urban worked at Berlin-Dahlem, it is quite possible that Urban saw this specimen.

Twelve additional specimens of Sintenis 4386 have been seen. The labels

of these were not written in Urban's hand and the locality data ("Peñuelas, inter frutices ad Las Cruces") differ from those of the above-mentioned specimen.

Until proved otherwise, I consider the specimen of *Sintenis* 4386 (UCW1) from "Prope Peñuelas ad montem Las Cruces" to be the only cited specimen probably seen by Urban, and I designate it the lectotype of *Lisianthus laxiflorus* Urb.

19. *Lisianthus latifolius* Sw. Prodr. 40. 1788; Fl. Ind. Occ. 1: 348. 1797 (as *Lisianthus*). ✓LECTOTYPE. Jamaica, without exact locality, Swartz (s!).

Leianthus latifolius (Sw.) Griseb. Gen. & Sp. Gent. 199. 1839 [1838].

Slender shrubs or subshrubs, glabrous throughout. Stems 0.3–2 m. tall and to 1.5 cm. in diameter, erect or ascending, terete, green and herbaceous above, gray-brown and woody below. Leaves firmly membranaceous, the principal lateral veins usually prominent, glossy grass-green or rather dark green above, paler and dull beneath, the blades (3.6)5–17(21.6) cm. long and (1.5)2–7 cm. broad, 2.5 to 4 times as long as broad, elliptic or oblong elliptic (obovate), widest at or above the middle, long-acuminate, the bases attenuate into the winged (0.3)1–4.2 cm. long petiole. Inflorescences of pedunculate, apparently simple dichasia, or occasionally reduced to solitary, axillary flowers; flowering branches 1–2-ternately divided, each division terminated by a dichasium, with 1–3 pairs of reduced leaves below the first division; inflorescence branches terete, elongate, and the inflorescences diffuse. Flowers nodding, pedicels relatively stout (0.6)1–2.6 cm. long; bracteoles subulate, scarious. Calyx 6–14 mm. long, fused for $1/5$ – $1/4$ its length; lobes 4.5–10.5 mm. long and 1.5–2 mm. broad, lanceolate, long-acuminate, pale green, scarious-margined, ridged abaxially; the tube 1.5–3 mm. long. Corolla funnelform, 3.5–5.5 cm. long; the tube 2.2–3.9 cm. long and 7–10 mm. broad at the apex, bright yellow, slightly constricted in the lower third; lobes 11–18 mm. long and 3.5–6 mm. broad, greenish-yellow, spreading or weakly recurved, ovate-lanceolate or oblong-lanceolate, acute or abruptly short-acuminate, $2/5$ – $1/2$ as long as the tube. Stamens inserted on the corolla tube $1/3$ – $2/5$ of the distance from the base to the apex; filaments 1.9–2.9 cm. long, not exceeding the corolla lobes; anthers 2–3.5 mm. long and 1–2 mm. broad, broadly oblong, obtuse, the connective not at all exerted. Ovary fusiform; style 2.5–4.2 cm. long, never equalling the corolla lobes; stigma peltate. Capsule oblong-ellipsoid to fusiform, long beaked, 10–17 mm. long, not including the 3–7 mm. long beak, and 4–6 mm. in diameter; the marcescent corolla never persisting on the mature capsule. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From 600–2100 meters in cloud forests and elfin woodland in the Blue Mountains and the John Crow Mountains in eastern Jamaica (MAP 10).

REPRESENTATIVE COLLECTIONS

Jamaica. "Ind. occ.", Swartz (s); without locality, Swartz (BM; isoelectotype); without locality, MacFadyen (GH). PORTLAND: west slope of Silver Hill, Anderson & Sternberg 3259 (DUKE); Sir John Peak, Shreve s.n. (NY); Morces Gap, Weaver 1827 (A, BM, DUKE, F, MICH, MO, UCWI, US); east slope of the John Crow Mtns., 1.5–2 mi. sw. of Ecclesdown, Proctor 9990 (IJ). ST. ANDREW: along ridge between Morces Gap and John Crow Peak, Proctor 9517 (IJ); John Crow Peak, Shreve (NY). ST. THOMAS: trail from Portland Gap to Blue Mtn. Peak, Weaver 1952 (DUKE); Portland Gap, Weaver 1953 (A, DUKE, UCWI); near summit of Sugar Loaf Peak, Farr (IJ); summit of High Peak, Lewis (IJ).

Lisianthus latifolius is probably most closely related to *L. domingensis*, from the island of Hispaniola, but the two should not be confused since they have different distributions and clear cut morphological differences. No other species of *Lisianthus* is found in the cloud forests and elfin woodland in the Blue Mountains of Jamaica. Of the Jamaican species, *L. latifolius* most closely resembles *L. troyanus* Urb. The latter species differs, however, in its styles usually exceeding the corolla lobes, its corolla tubes conspicuously constricted in the basal portions, its stigmas capitate, and the beaks of its capsules less than 1/4 as long as the capsules.

In Swartz's herbarium at Stockholm (s) are three specimens of *Lisianthus latifolius*, two inscribed "Ind. occ." and one inscribed "Jamaica." One of the former specimens and also the latter one include a single, unattached flower of *L. longifolius*. Of these specimens the one inscribed "Jamaica" best demonstrates the characters described by Swartz and, excluding the fragment of *L. longifolius*, is here designated the lectotype of *L. latifolius* Sw.

20. *Lisianthus domingensis* Urb. Symb. Antill. 3: 333. 1902 (as *Lisianthus*). ✓LECTOTYPE. Haiti: Gonaives, Morne Fourmi, Buch 761 (IJ!).

Spindly subshrubs, glabrous throughout. Stems 0.4–1 m. tall and to 5 mm. in diameter, erect or ascending, terete, brown below but green above. Leaves membranaceous, the principal lateral veins prominent, at least below, subsessile to distinctly petiolate, the blades 1.8–7.5 cm. long and 0.8–3.1 cm. broad, narrowly ovate to broadly elliptic, abruptly short acuminate to gradually acuminate, the bases more or less rounded to cuneate, or attenuate into the winged petiole; petioles, when present, to 10 mm. long. Inflorescences of reduced dichasia, these 1- or more rarely 2-flowered. Flowers nodding, the pedicels relatively stout, 0.3–2 cm. long; bracteoles 1.5–10 mm. long, narrowly-elliptic to linear-subulate, typically foliaceous but rarely nearly scarious. Calyx 5.5–9.5 mm. long, fused for 2/10–3/10 its length; the lobes 4–7.5 mm. long and 1–2 mm. broad, lanceolate, acuminate, ridged abaxially, with very narrow, scarious margins; the tube 1–3 mm. long. Corolla 2.9–4.4 cm. long, tubular-funnelform,



MAPS 9-13. Distribution of *Lisianthus* species. MAP 9, *L. laxiflorus*. MAP 10, *L. longifolius*. MAP 11, *L. capitatus* (dots), *L. umbellatus* (squares). MAP 12, *L. latifolius* (dots), *L. troyanus* (squares). MAP 13, *L. adamsii* (squares), *L. cordifolius* (dots), *L. exsertus* (half-circles).

uniformly bright yellow; the tube 2.3-3.1 cm. long, slightly constricted in the lower third; lobes 0.8-1.6 cm. long and 2.5-4 mm. broad, oblong-lanceolate, acute or short-acuminate, spreading or perhaps recurved, ca. $1/2$ as long as the tube. Stamens inserted on the corolla tube ca. $2/5$ of the distance from the base to the apex; filaments 1.5-2.4 cm. long, equalling the corolla tube or slightly surpassing it, often equalling the style; anthers oblong, 1.5-2 mm. long and ca. 1 mm. broad. Style 1.6-2.6 cm. long; stigmas peltate. Capsule oblong-ellipsoid, beaked, 11-14 mm. long, not including the 1-3 mm. long beak, and 3.5-5 mm. in diameter; the marcescent corolla sometimes persisting until the seeds are shed. FLOWERING: Dec.-Apr.

DISTRIBUTION: From 900 to 1500 meters in wet, mossy forests in the Cordillera Central of the Dominican Republic and the Massif du Nord of Haiti (MAP 8).

SPECIMENS EXAMINED

Haiti: Gonaives, Morne Fourmi, *Buch* 761 (GH; isotype); road from Camp #1 to La Barrière Couchant, *Nash & Taylor* 1096 (NY); Massif du Nord, Ld. Louis du Nord, Morne Baron, *Ekman* 3889 (s); Port Margot, Morne Maleuvre, *Ekman* 2817 (s). Dominican Republic. SANTO DOMINGO: Cordillera

Central, Loma la Campana, *Ekman 11516* (NY, S, US). TRUJILLO VALDEZ: Los Guineos, San Cristóbal, *Marcano 3658* (US).

Lisianthus domingensis, the only species known from the island of Hispaniola, is very poorly collected. It most closely resembles the Jamaican *L. latifolius*, both in morphology and habitat preference. That species differs, however, in its terete inflorescence branches, its usually 3-flowered dichasia, its long-beaked capsules, its broader leaves, and of course, its distribution.

The type of *Lisianthus domingensis*, along with most of Urban's type material, was destroyed during the bombing of Berlin in World War II (H. Scholz, *in litt.*). Two isotypes (GH, IJ) have been seen. Of these, only the specimen at the Institute of Jamaica includes flowers. Since it is the more complete of the known isotypes and the one which better demonstrates the characters described by Urban, *Buch 761* (IJ!) is designated the lectotype of *L. domingensis* Urb.

The Haitian plants, including the type collection, differ slightly in leaf morphology from the plants of the Dominican Republic. The Dominican plants are distinguished from the typical element by having leaves usually more rounded at the base and subsessile. These differences are minor and not entirely consistent, and especially in view of the lack of material at hand, represent insufficient grounds for formal recognition of the two groups of populations as distinct taxa.

21. *Lisianthus axillaris* (Hemsl.) O. Ktze. Rev. Gen. Pl. 2: 429. 1891.

Leianthus axillaris Hemsl. Biol. Centr. Am. Bot. 2: 344. 1882. ✓TYPE. British Honduras: without exact locality, *Barlee* (DUKE, photo. !; K, holo.).

Lisianthus francisiae Sprague, Kew Bull. 1929: 8. 1929. ✓TYPE. British Honduras: Corozal, *Francis 1* (DUKE, photo. !; K, holo.).

Subshrubs, glabrous throughout. Stems terete, green, or brown near the base, erect or ascending, or the lateral ones spreading. Leaves membranaceous, shiny green above and duller below, the blades 1.6–13.8 cm. long and 0.9–5.1 cm. broad, elliptic (ovate), short-acuminate (acute), the bases shortly attenuate, subsessile or short-petiolate, the petioles then winged and to 8 mm. long. Flowers borne singly in the axils of the foliage leaves, usually opposite, rarely in axillary, short-pedunculate monochasia or dichasia, the peduncles then 0.5–4.5 cm. long. Pedicels 0.9–3.0 cm. long, ascending or horizontal, becoming recurved with age; bracteoles subulate, scarious. Calyx 8.5–13.5 mm. long, fused for $1/5$ – $1/6$ its length; lobes 7–11.5 mm. long and 1.5–3 mm. broad, lanceolate, very long-acuminate, scarious margined, keeled abaxially, the keel to 0.5 mm. broad; tube 1.5–2.5 mm. long. Corolla tubular-funnelform, 3.7–5.3 cm. long; the tube 3.1–4.5 cm. long and 5–8 mm. broad at the apex, crimson, narrowly constricted in the basal half; lobes 5–10 mm. long and 3–4.5 mm. broad, greenish-yellow, spreading, narrowly oblong-ovate (ovate-lanceolate or ovate), acuminate or cuspidate-acuminate. Stamens inserted on the

corolla tube about 2/5 of the way from the base to the apex; filaments 1.8–3.1 cm. long equalling or slightly exceeding the corolla tube in mature flowers; anthers 2.5–3 mm. long and 1–2.5 mm. broad, oblong, yellow. Ovary narrowly ovoid; style 3.2–4.6 cm. long, conspicuously exceeding the corolla lobes in mature flowers, exceeding the stamens; stigma peltate, distinctly bilobed. Capsule narrowly ovoid, indistinctly beaked, 11–19 mm. long and 4–6 mm. in diameter, the marcescent corolla persisting until well after the shedding of the seeds. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: Near sea level to 500 meters along roadsides and in secondary scrub throughout much of British Honduras and into adjacent northeastern Guatemala and northeastern Yucatán, Mexico (MAP 6).

REPRESENTATIVE COLLECTIONS

Mexico. QUINTANA ROO: Chetumal, *Miranda* 8116 (MEXU). YUCATAN: Moctezuma, *Enríquez* 814 (MEXU). British Honduras. BELIZE DIST.: 8 mi. w. of Hattieville on Belize-Cayo road, *Weaver & Wilbur* 2255 (A, DUKE). CAYO DIST.: between Mileposts 39 & 40 on Belize-Cayo road, *Weaver & Wilbur* 2251 (A, BM, DS, DUKE, F, IJ, LL, MICH, MO, NY, S, UC, US); Mountain Pine Ridge, 9 mi. s. of Georgeville on road to Augustine, *Weaver & Wilbur* 2254 (A, BM, DUKE, F, MICH, MO, NY, S, UC, US); Blue Hole Section, Humming Bird Highway, *Gentle* 8945 (F, LL); COROZAL DIST.: Corozal-Consijo road, *Lundell* 4857 (F, GH, MICH, MO, NY, US). ORANGE WALK DIST.: Honey Camp, *Lundell* 538 (BM, DS, F, GH, MO, NY, S, US). STANN CREEK DIST.: Humming Bird Gap, Humming Bird Highway, *Gentle* 9246 (F, LL); Freshwater Creek Reserve, *Pelly* 16 (BM, F). Guatemala. PETÉN: 6.5 km. e. of Dos Lagunas, *Contreras* 1617 (LL); Nictun, Lake Petén, *Lundell* 3159 (MICH, s); Bajo de Santa Fé, ca. 25 km. e. of Tikál, *Contreras* 1438 (F, LL).

Lisianthus axillaris is one of the more distinctive of the *Lisianthus* species. With its crimson corolla tube and solitary flowers in the axils of the foliage leaves, it is not easily mistaken for any other species. The only other species with red flowers is *L. viscidiflorus* (subsect. HERBACEI), of central Guatemala and Chiapas, Mexico. *L. viscidiflorus*, however, has shorter, obtuse corolla lobes, purple anthers, and both terminal and axillary inflorescences of compound dichasia.

Lisianthus francisiae Sprague is synonymous with *L. axillaris*. Sprague, in the description of *L. francisiae*, mentions that the only differences between the two are in the vegetative portion of the plant, *L. francisiae* being herbaceous and freely branched, *L. axillaris* being woody and unbranched; and *L. francisiae* having larger, narrower leaves more narrowed at the base. Leaf shape and size have proved of little taxonomic utility in this genus, both characters varying markedly in different parts of a given plant.

All of the species of sect. LISIANTHIUS subsect. FRUTICOSI are characterized by having a variety of growth forms, and *L. axillaris* is no exception. Freely branched plants and entirely unbranched plants are frequently encountered in this group. The populations of *L. axillaris* which

I have seen in British Honduras were composed of plants with both types of branching patterns (*Weaver & Wilbur* 2251 and *Weaver & Wilbur* 2254). The unbranched plants seemed to be those growing in the more unfavorable spots, locations which were either shady or dry.

Lisianthus axillaris is woody only at the base. The type specimen of *L. francisiae*, of which a photograph has been seen, obviously represents the midportion of a single plant. In the midportions, plants of *L. axillaris* are not distinctly woody.

Williams (1968, 1969) included *Lisianthus francisiae* as a synonym of *L. axillaris*. To my knowledge, no author since Sprague has recognized *L. francisiae* as a distinct species.

Lisianthus petenensis Standl. & Steyerl, was based on *Lundell* 3153, from Nictun, Lake Petén, Guatemala (holotype US, isotype MICH). Williams (1968, 1969) considered *L. petenensis* to be a synonym of *L. brevidentatus*. *Lundell* 3153, however, differs strikingly from that species in its much broader, red corolla tube, longer corolla lobes, style not exceeding either the filaments or the corolla lobes, and sessile leaves. Careful examination of the type and only known collection of *L. petenensis* convinced me that it is a hybrid between two species widely separated from *L. brevidentatus*.

Lisianthus axillaris and *L. saponarioides* are the only species presently known from the Guatemalan department of Petén. Both of these species have been collected in the vicinity of Lake Petén, the type locality of *L. petenensis*. *Lundell* 3153 is morphologically intermediate between *L. axillaris* and *L. saponarioides* and is probably a hybrid between them. The putative hybrid and its presumed parents are compared in TABLE 1.

Lundell 3153 is similar to *Lisianthus axillaris* in its red corolla tube, distinctly carinate calyx lobes, and stamens of unequal length in a given flower. It resembles *L. saponarioides* in its inflorescences of frequently sessile, compound dichasia, style not exceeding either the filaments or the corolla lobes, and its indistinctly lobed stigma. In the remaining characters outlined in TABLE 1, it is intermediate between the two species.

In search of further proof of their hybrid origin, pollen was taken from both specimens of *Lundell* 3153 and stained with cotton blue-lactophenol. As a control, pollen was taken from a specimen of *Lisianthus axillaris* (*Contreras* 1438, F) and *L. saponarioides* (*Contreras* 3766, F), both from the vicinity of Lake Petén, and similarly stained. The percentage of pollen viability for all four specimens is summarized in TABLE 2.

22. *Lisianthus seemannii* (Griseb.) O. Ktze. Rev. Gen. Pl. 2: 429. 1891 (as *Seemannii*).

Leianthus Seemannii Griseb. in Seemann, Bot. Voy. Herald 170. 1854. ✓TYPE.

Panama. DARIÉN: Piñas, *Seemann* 1064 (MO, photo. !; K, holo.).

Lisianthus corymbosus Perk. Bot. Jahrb. 31: 491. 1902. ✗No type designated.

Cited specimens presumably at (B) and destroyed during World War II.

Slender subshrubs, glabrous throughout. Stems 0.5–2 m. tall and to

TABLE 1. A morphological comparison of "L. petenensis" and its presumed parents

	L. SAPONARIOIDES	"L. PETENENSIS"	L. AXILLARIS
INFLORESCENCES	Compound dichasia, some nearly sessile	Compound dichasia, some nearly sessile	Solitary, axillary flowers
INFLORESCENCE BRANCHES	Winged	Narrowly winged	Terete
PEDICELS	0-1 mm. long	1-3 mm. long	9-30 mm. long
CALYX	5.5-10 mm. long	7-10 mm. long	8.5-13.5 mm. long
CALYX LOBES	Ridged	Distinctly carinate	Distinctly carinate
COROLLA SHAPE	Salverform, constricted nearly its entire length, lobes flaring	Constricted 2/3 its length, lobes flaring	Tubular-funnelform, constricted 1/2 its length, lobes spreading
COROLLA TUBE	1.0-1.5 cm. long, green	2.3-2.5 cm. long, red	3.1-4.5 cm. long, red
COROLLA LOBES	4-7 mm. long	6-6.5 mm. long	5-10 mm. long
INSERTION OF STAMENS/ LENGTH OF COROLLA TUBE	0.7-0.8	0.6	0.4
FILAMENTS	0.3-0.9 cm. long, equal in length, exceeding the style	1.4-1.6 cm. long, unequal in length, exceeding the style	1.8-3.1 cm. long, unequal in length, not exceeding the style
STYLE	0.6-1.0 cm. long, not exceeding corolla lobes	1.7-2.0 cm. long, not exceeding corolla lobes	3.2-4.6 cm. long, exceeding corolla lobes
STIGMA	Indistinctly lobed	Indistinctly lobed	Distinctly lobed

TABLE 2. Pollen viability in "*L. petenensis*" and its presumed parents

	TOTAL NO. OF GRAINS EXAMINED	% VIABLE	% NOT VIABLE
<i>L. saponarioides</i>	900	97%	3%
" <i>L. petenensis</i> "			
<i>Lundell 3153</i> (US)	1040	19%	81%
<i>Lundell 3153</i> (MICH)	742	21%	79%
<i>L. axillaris</i>	1209	97%	3%

1.5 cm. in diameter, erect or ascending, terete and gray-brown below, 3-4-angled and green above. Leaves thin-membranaceous, glossy dark green above, paler and dull beneath, the lateral nerves prominent, the blades 1.9-15.7 cm. long and 1.1-5.3 cm. broad, the petioles 0.3-2.5 cm. long or the upper leaves subsessile; principal foliage leaves elliptic, long-acuminate, shortly attenuate into the winged petiole, the leaves on the flowering branches smaller, essentially sessile, lanceolate to ovate, rounded or obtuse at the base. Inflorescences of pedunculate or sessile 1-4-compound dichasia, the lateral branches scorpioid; inflorescence branches contracted and the dichasia or groups of dichasia compacted, 4-angled, 2 of the angles frequently expanded into narrow, scarious wings; flowering branches with several to many pairs of reduced leaves below the first division. Flowers horizontal or nodding, sessile or with pedicels to 6 mm. long. Calyx 8.5-14 mm. long, fused for $1/10$ - $1/6$ its length; lobes 7.5-12 mm. long and 1-2 mm. broad, narrowly lanceolate, very long-acuminate, with broad scarious margins, ridged or carinate abaxially. Corolla 3.2-5.2 cm. long, narrowly tubular-funnelform, uniformly lemon-yellow outside and cream-colored inside; tube 2.3-3.7 cm. long and 4-7 mm. in diameter at the apex, constricted in the lower third; lobes (9) 10.5-15 mm. long and 2.5-6 mm. broad, widely spreading and slightly recurved at the tips, narrowly lanceolate, long cuspidate-acuminate, ca. half as long as the tube. Stamens inserted on the corolla tube ca. $1/3$ of the distance from the base to the apex; filaments 1.9-3.1 cm. long, not surpassing the corolla lobes; anthers 1.5-2.5 mm. long and 1-1.5 mm. broad, oblong, acutish, the connective slightly exserted. Style 2.6-3.7 cm. long, at most equalling the corolla lobes, always surpassing the filaments; stigma peltate. Capsules oblong-ellipsoid, very short-beaked, 9-14 mm. long and 3-6 mm. broad; calyx in fruit equalling or slightly exceeding the capsule; the marcescent corolla persisting until the seeds are shed. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From 200-1200 meters, mostly along roadsides, but also in wet or dry secondary scrub or at the margins of forests from north-central Costa Rica, through the mountainous portion of Panama to northwestern Colombia (MAP 7).

REPRESENTATIVE COLLECTIONS

Costa Rica. ALAJUELA: roadside from Alajuela, via San Isidro de Alajuela to Fuente, *Dodge, Thomas & Valerio 4865* (MO); Grecia, road to Sarchí, *Smith 10055* (F, MO). HEREDIA: Sta. Bárbara, au pied du Barba, *Pittier 1670* (US; cited collection of *L. corymbosus*). SAN JOSÉ: vicinity of El General, *Skutch 4109* (GH, MO, s, US); El Rodeo, *Hunnewell 16713* (DUKE, GH). **Panama.** CHIRIQUÍ: between Hato del Jobo and Cerro Vaca, *Pittier 5292* (NY). COCLÉ: Bismarck, above Penonomé, *Williams 259* (NY); 3.5 km. se. of El Valle de Antón along road from El Espino to El Valle, *Weaver 1671* (A, BM, DS, DUKE, F, IJ, LL, MICH, MO, NY, s, UC, US); 2 mi. s. of Coclé, *McDaniel 8248* (DUKE, US). DARIÉN: vicinity of Piñas, *Duke 10637* (MO). HERRERA: 10 mi. s. of Ocú, *Tyson, Dwyer & Blum 2876* (MO); vicinity of Las Minas, La Peña, *Stern, Eyde & Ayensu 1779* (MICH, MO, US). VERAGUAS: Isla de Coiba, *Dwyer 1650* (MO). **Colombia.** ANTIOQUIA: landslide on Río Guapá, 8 km. e. of Guapá, *Haught 4652* (COL, F, US).

Lisianthus seemannii is one of the better collected of the Central American species. With its congested inflorescences, its long narrow calyx and corolla lobes, and its corolla paler inside than out, *L. seemannii* should not be confused with any other species of series *Longifolii*. Its relationships within the group are obscure. It is the only species of series *Longifolii* typically with compound dichasia. It most closely resembles the Jamaican *L. longifolius*, especially vegetatively, but differs strongly from that species in the inflorescence type.

Lisianthus seemannii has the double distinction of being the only species found on a Pacific island (Isla de Coiba), or on the South American continent. *Haught 4652* (COL, F, US) from Dept. Antioquia, Colombia, is the only known collection of a *Lisianthus* species from South America. Ewan determined this specimen as *L. arcuatus* Perk. and reported it (Proc. Biol. Soc. Wash. 63: 163–166. 1950) as representing a previously unreported extension of the genus into South America. In the same article Ewan stated that *L. seemannii* probably represents the same species as *L. arcuatus*. *L. arcuatus* and *L. seemannii* are certainly not synonymous, the former is rather a synonym of *L. skinneri*. *Haught 4652* undoubtedly is *L. seemannii*.

In the key to the species of *Lisianthus* in Perkins' treatment (1902) of the genus, *L. seemannii* and *L. corymbosus* are separated as follows: *L. seemannii* with ecarinate calyx lobes and the stamens included; *L. corymbosus* with carinate calyx lobes and the stamens shortly exserted. Judging from her treatment in general, by "stamens exserted" Perkins evidently meant that the stamens exceed the corolla lobes when pressed. A duplicate of one of the specimens cited by Perkins as representative of *L. corymbosus*, *Pittier 1670*, is among the collections at the United States National Herbarium. I have seen this specimen and the stamens definitely do not exceed the corolla lobes in any of the flowers. The calyx lobes of *L. seemannii* are never completely ecarinate, although the keel in some specimens is not particularly distinct. At any rate, *Pittier 1670* is so similar in all respects to the type of *L. seemannii*, of which I have

seen a photograph, that a more distinctly carinate calyx would hardly serve to separate *L. corymbosus* as a distinct species.

23. *Lisianthus longifolius* L. Mant. Pl. 43. 1767 (as *Lisianthus*).
LECTOTYPE. T. 9, Figure 1 in P. Browne, Civ. Nat. Hist. Jam. 1756.

Tachia longifolia (L.) Mart. ex G. Don, Gen. Hist. 4: 197. 1837.

Leianthus longifolius (L.) Griseb. Gen. & Sp. Gent. 196. 1839 [1838].

Leianthus longifolius β *scabridus* Griseb. loc. cit. p. 197. TYPE. Willdenow 3556, presumably at (B) but not seen.

Lisianthus longifolius var. *scabridus* (Griseb.) Perk. Bot. Jahrb. 31: 492. 1902.

Spindly subshrubs, minutely puberulous or essentially glabrous. Stems 0.5–2 m. tall and to 2 cm. in diameter, erect, ascending, or sprawling, terete or somewhat quadrate below, green above and gray-brown below, essentially glabrous, or more commonly, moderately to densely short-puberulous above, becoming nearly glabrous below. Leaves firmly membranaceous, glossy grass-green or somewhat gray-green above, paler and dull beneath, glabrous to sparsely short-puberulous above and/or on the midrib below, the margins minutely ciliolate to entire; blades of the foliage leaves (1.5)3–12(14.5) cm. long and (0.5)1–4(5) cm. broad, elliptic to narrowly-elliptic (ovate or lanceolate), short- to rather long-acuminate (acute or rarely obtuse or mucronate), the bases obtuse to cuneate or short-attenuate, the petioles to 2.9 cm. long or the leaves subsessile, glabrous to rather densely short-puberulous; leaves on the flowering branches subsessile or short-petiolate (0.5)1.5–7(8.5) cm. long and (0.3)1–3(4.5) cm. broad, ovate-lanceolate to ovate and lanceolate (elliptic). Inflorescences of dichasia, these often reduced to 1 or 2 flowers; flowering branches with 1–6 pairs of leaves below the first division, sparsely to freely branched, the lower branches usually alternate or bifurcate, each segment diverging from a straight line and appearing almost dichotomous, the upper branches usually opposite, the axes terete, nearly glabrous to rather densely short-puberulous. Flowers subsessile or more commonly pedicellate, the pedicels then to 16 mm. long, relatively stout, glabrous or short-puberulous; bracteoles linear or subulate, scarious. Calyx (0.7)1–2(2.8) cm. long, fused for 1/8–1/10 its length, alate or very rarely merely carinate, when alate the wings 0.5–4 mm. broad, glabrous or sparsely puberulous along the wing or keel; lobes (0.6)0.8–1.8 (2.5) cm. long, lanceolate, long-acuminate, with a scarious or hyaline margin; tube 1–4 mm. long. Corolla (2.9)3.5–6(6.7) cm. long, glutinous, tubular-funnelform; tube (2.3)2.7–3.9 cm. long and 6–14(16.5) mm. broad at the apex, bright yellow, glossy to rather dull, constricted in the lower third; lobes 0.7–2(2.8) cm. long and 3–9 mm. broad, ovate-lanceolate or oblong-lanceolate, abruptly or more or less gradually acuminate, yellow-green, strongly recurved or merely spreading and only the tips recurved, 1/4–3/4 as long as the tube. Stamens inserted on the corolla tube ca. 1/4–1/3 of the distance from the base to the apex; filaments

2–3.8 cm. long, never exceeding the corolla lobes; anthers 2–4.5 mm. long and 1–2 mm. broad, oblong to narrowly oblong, obtuse to acutish at the apex, the connective slightly exerted or not. Style 2.3–4.8 cm. long, very rarely exceeding the corolla lobes, but nearly always conspicuously exceeding the filaments; stigma capitate or somewhat peltate. Capsule ellipsoid or oblong-ellipsoid, beaked, 7–17 mm. long, not including the 1–4 mm. long beak, and 3–7 mm. in diameter; calyx in fruit nearly as long to longer than the capsule; the marcescent corolla persisting until long after the seeds are shed. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From sea level to 1500 meters along roadsides and in rather dry secondary scrub throughout Jamaica except for the westernmost parishes (MAP 11).

REPRESENTATIVE COLLECTIONS

Jamaica. CLARENDON: 1.5 mi. se. of Chapelton on road to Suttons, *Weaver & Weaver* 1264 (A, DUKE); vicinity of Bog Hole, 1 mi. ne. of Corner Shop, *Weaver & Weaver* 1265 (A, DUKE); summit area of Croft's Hill, *Proctor* 29266 (IJ); 1 mi. due s. of Arthur's Seat, *Proctor* 26443 (IJ, LL, MICH). PORTLAND: 3 mi. e. of Port Antonio, *Weaver & Weaver* 941 (A, DUKE, UCWI); near mouth of Rio Grande, *Proctor & Stearn* 11860 (IJ). ST. ANDREW: above Gordon Town, *Byndloss* 8378 (F, NY); Bellevue, near Constant Spring, *Britton* 954 (F, NY, US); on road from Kingston to Hardwar Gap, ca. 2 mi. nne. of Irish Town, *Weaver & Weaver* 943 (A, DUKE, UCWI, US); 9 mi. se. of Kingston on road to Newstead, *Weaver* 1804 (A, DUKE, UCWI, US); road from Chestervale to St. Peters, *Weaver & Weaver* 1080 (A, DUKE, IJ). ST. ANN: road from Jamaica A-1 to Hollymount on Mt. Diablo, *Weaver & Weaver* 894 (A, DUKE, F, MICH, UCWI, US); between Lime Hall and St. Ann's Bay, *Stearn* 718 (A, BM); Roaring River, *Stearn* 739 (A, BM). ST. CATHERINE: halfway between Ewarton and Worthy Park, *Adams* 13008 (DUKE, UCWI); Bog Walk, *Crawford* 819 (GH, NY, US); vicinity of Red Ground, ca. 5.5 mi. n. of Old Harbour, *Weaver & Weaver* 1118 (A, BM, DUKE, F, LL, MICH, MO, NY, S, US); 4 mi. sw. of Ewarton on road to Worthy Park, *Weaver & Weaver* 1251 (A, BM, DUKE, F, IJ, MICH, MO, UCWI, US); ST. ELIZABETH: hills behind Hampton School, *Weaver & Weaver* 1191 (A, BM, DUKE, MICH, MO, UCWI, US); 1.5 mi. ne. of Malvern on road to Leeds, *Weaver & Weaver* 1197 (A, DUKE, IJ, MICH, S, US). ST. JAMES: hills overlooking Ironshore Estate, *Proctor* 23239 (IJ, LL, MICH, NY); Glen Devon, Montego Bay, *Norman s.n.* (BM). ST. MARY: Gibraltar Beach, near Oracabessa, *Proctor* 7455 (IJ). ST. THOMAS: Helen's Gap, Cinchona, *Nichols* 64 (F, GH, MO, NY, US); 1–2 mi. nnw. of Whitehall, *Proctor* 19805 (A, IJ); ca. 3 mi. nw. of Trinityville, *Proctor* 24396 (IJ, LL); 2.5 mi. nw. of Richmond Vale, *Weaver & Weaver* 953 (A, DUKE, MICH, US); Arntully, *Weaver & Weaver* 976 (A, DUKE, F, US); 1.5 mi. nw. of Bath on road to Beacon Hill, *Weaver & Weaver* 1200 (A, BM, DUKE, UCWI, US); along road from Easington to Llandewey, *Proctor* 24227 (IJ). TRELAWNY: 1 mi. se. of Windsor, *Proctor* 15646 (BM, IJ); 2–3 mi. N by road from Burnt Hill Crossroads, *Hespenheide* 1279 (DUKE, GH, LL, MICH, MO, US); road from Burnt Hill to Barbecue Bottom, *Weaver & Weaver* 997 (A, DUKE, F, MICH, UCWI, US).

According to Stearn (1957), Linnaeus had virtually no first-hand ex-

perience with Jamaican plants except for those in Patrick Browne's herbarium, which he purchased in 1758. Savage (1945) does not list a specimen of *Lisianthus longifolius* in his catalogue of the extant portion of the Linnaean Herbarium in London. Therefore, it must be assumed either that Patrick Browne's herbarium did not contain a specimen of this species when it was purchased by Linnaeus, or if a specimen was present, it was lost in the interim. It is entirely possible that Linnaeus based his *Lisianthus* (= *Lisianthus*) *longifolius* on an illustration rather than on an actual specimen. In the original description of this species, Linnaeus (1767, p. 43) cited two figures, one of Patrick Browne (1756, t. 9, figure 1) and one of Hans Sloane (Voyage 1: t. 101, figure 1. 1707). Therefore, a lectotype must be chosen from the illustrations.

Linnaeus's (1767, p. 43) diagnosis of *Lisianthus* (= *Lisianthus*) *longifolius* consists merely of the phrase, "*Lisianthus foliis lanceolatis*." In addition, he included polynomials given by Browne (1756, p. 157) and Sloane (Cat. Pl. Jam. 58. 1696) for the same species. Linnaeus's diagnosis was obviously made with Browne's polynomial, "*Lisianthus* [*Lisianthus*] *erectus, foliis lanceolatis, floribus singularibus terminalibus*," in mind. In addition, Browne's figure more accurately portrays *L. longifolius* than does Sloane's figure. Therefore, Browne's figure (Civ. Nat. Hist. Jam. t. 9, figure 1. 1756) is designated the lectotype of *L. longifolius* L.

Lisianthus longifolius, a rather weedy plant, is found most commonly on roadside banks and in the secondary scrub that covers much of Jamaica. It is frequently encountered and its large, yellow flowers are quite conspicuous. Indeed, *L. longifolius* has been by far the most frequently collected of the species.

Lisianthus longifolius is also the most variable of the species. The characters in which this variation is most pronounced are as follows: (1) pubescence; (2) length of the corolla; (3) length of the calyx; (4) the ratio between the length of corolla lobes and length of corolla tube; and (5) width of the calyx wing. Both the range and the pattern of the variation are most perplexing. These vary independently and abruptly without any obvious correlation with elevation, habitat, or geography. As a result a given population may differ noticeably in certain of these critical characters from another only a few miles away, while closely resembling in these same characters yet another population far removed geographically but differing in others. An analysis of the variation is presented in FIGURE 8.

Eight populations which display the range of variation within the species were scored for each of these critical variables. The degree of pubescence in each population was ranked on a scale from 0 to 4 and represented schematically by means of proportionately filled circles. The empty circles represent the most nearly glabrous type (0); the completely filled circles represent the type which is most densely pubescent (4). The ranges of the remaining characters were numerically evaluated and the values placed proportionately on each of the four axes of a tetragon. The eight populations are:

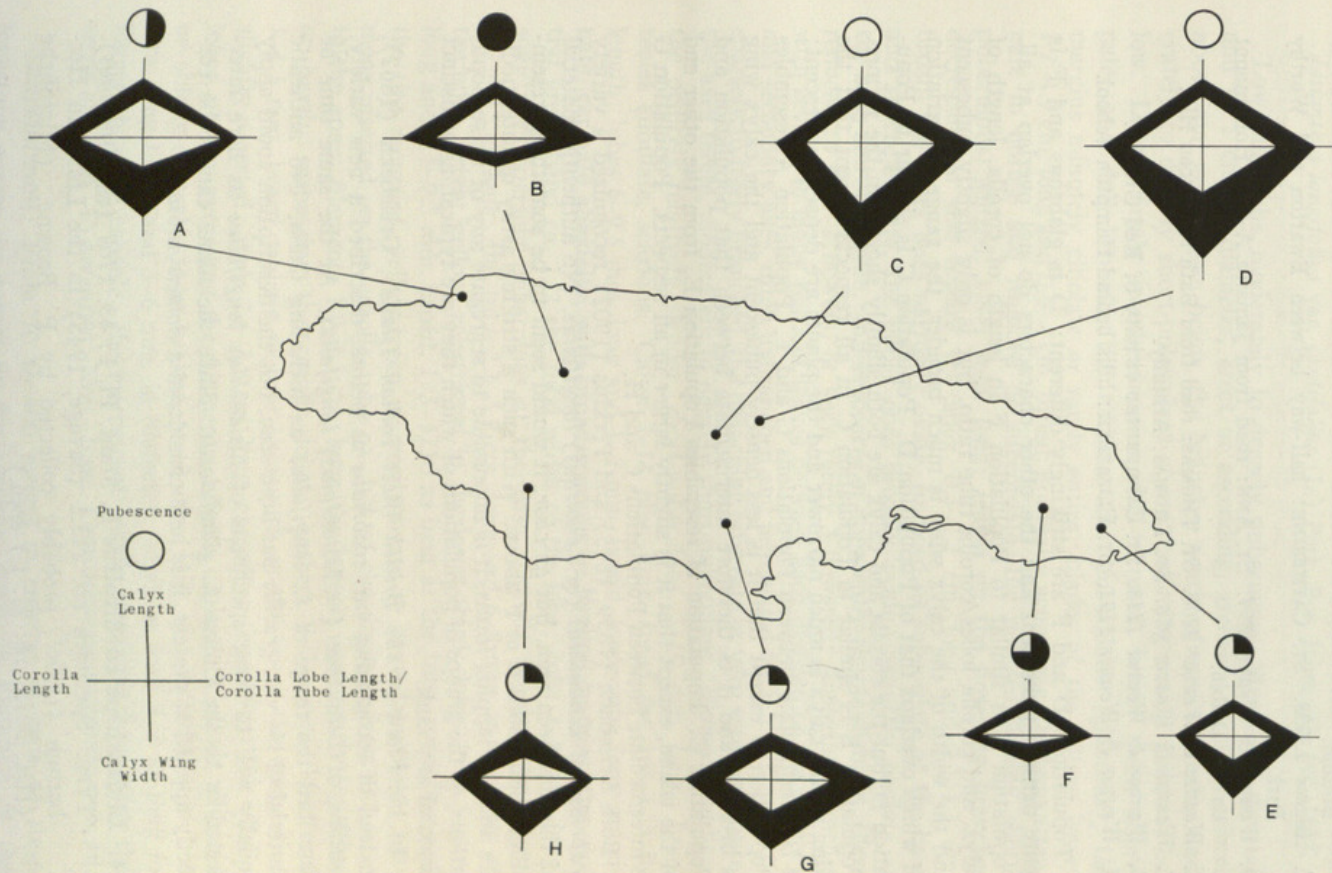


FIGURE 8. An analysis of the variation in *Lisianthus longifolius*. See text for explanation.

- A. *Proctor* 23239. ST. JAMES: hills overlooking Ironshore Estate.
- B. *Weaver & Weaver* 997. TRELAWNY: road from Burnt Hill to Barbecue Bottom.
- C. *Adams* 13008. ST. CATHERINE: half-way between Ewarton and Worthy Park.
- D. *Weaver & Weaver* 894. ST. ANN: road from Jamaica A-1 to Hollymount on Mt. Diablo.
- E. *Weaver & Weaver* 1200. ST. THOMAS: road from Bath to Beacon Hill.
- F. *Weaver & Weaver* 976. ST. THOMAS: Arntully.
- G. *Weaver & Weaver* 1118. ST. CATHERINE: vicinity of Red Ground.
- H. *Weaver & Weaver* 1191. ST. ELIZABETH: hills behind Hampton School.

Populations D and F are strikingly different; D is glabrous and F is quite densely pubescent and the other characters do not overlap at all. Population E is similar to Population F in length of corolla, length of calyx, and corolla lobes/corolla tube ratio, but is only slightly pubescent and the width of the calyx wing is much broader, the range of variation of which overlaps that of Population D. Population C is similar to Population D, but the corolla and calyx are both slightly shorter in the former. Population B is similar to Population C in all respects except that the wing on the calyx is much narrower and the plants are densely pubescent; it is intermediate between Populations C and F. Population A resembles Population B except that it is less densely pubescent and the calyx wing is broader, and it is therefore intermediate between that population and Population C. Population H resembles Population E, from the other end of the island, except that it is slightly larger in all respects. Population G is intermediate between Populations C and H.

Both Grisebach (1839, 1845) and Perkins (1902) recognized a variety *scabridus* of *Lisianthus* (or *Leianthus*) *longifolius*. No authentic material of this has been seen, but *ex char.* it would seem to be something resembling Populations E or F above. With such a striking array of intermediate and overlapping forms, it is impossible to segregate any of these populations, or the groups of populations of which they are typical, as a distinct taxon of any rank.

In his *Flora of the British West Indian Islands*, Grisebach (1862), instead of recognizing var. *scabridus* as before, described a new variety, *gracilis*, of *Leianthus* (= *Lisianthus*) *longifolius*. At the same time he described the range of *L. longifolius* as including Cuba. No authentic material of his var. *gracilis* has been seen, but the description could apply equally well to some specimens of *Lisianthus longifolius* as here interpreted or to the Cuban *L. glandulosus*. Since the name cannot be correctly applied at present, it is here considered a *nomen dubium*.

- 24. *Lisianthus cordifolius* L. Mant. Pl. 1: 43. 1767 (as *Lisianthus*).
✓TYPE. Specimen no. 213.1 (Savage, 1945) in the Linnaean Herbarium (LINN), probably collected by P. Browne. (Microfiche (IDC 5075. 18: II. 1.) seen.)

Tachia cordifolia (L.) Mart. ex G. Don, Gen. Hist. 4: 197. 1837.

Leianthus cordifolius (L.) Griseb. Gen. & Sp. Gent. 197. 1839 [1838].

Leianthus longifolius γ *cordifolius* (L.) Griseb. Fl. Brit. W. Ind. Isl. 424. 1862.

Lisianthus longifolius var. *cordifolius* (L.) Perk. Bot. Jahrb. 31: 492. 1902.

Low subshrubs, moderately to densely puberulous. Stems 3–6 dm. tall and to 1 cm. in diameter, erect or ascending, greenish or straw-colored above and gray-brown below, the branches nearly always alternate, moderately to densely short-puberulous above, becoming nearly glabrous below. Leaves firmly membranaceous, dull-textured, bright green above, paler and dull beneath, the midribs short-puberulous (glabrous), the margins minutely ciliolate or rarely entire; blades of the foliage leaves 1.2–4.9 cm. long and 0.6–2 cm. broad, gradually acuminate, the base attenuate to obtuse and rounded or subcordate, the petioles densely short-puberulous, winged, 1.5–7 mm. long; leaves on the flowering branches decreasing in size toward the apex, 0.3–2.2 cm. long and 0.2–1.5 cm. broad, the lower ones narrowly ovate, rounded or subcordate at the base and short-petiolate, the upper ones broadly ovate, distinctly cordate at the base and subsessile. Inflorescences of apparently simple dichasia, these reduced to 1 or 2 flowers, or very rarely 3-flowered; flowering branches with several to many pairs of leaves between each division of the primary and secondary axes, often unbranched and terminated by 1 to 2 flowers, or sparsely to freely branched, the branching bifurcate or very rarely opposite, the axes terete, moderately to densely short-puberulous. Flowers nodding, the pedicels relatively slender, short-puberulous, 3–10 mm. long; bracteoles subulate, scarious. Calyx 7–11 mm. long, fused for $1/8$ – $1/5$ its length; lobes 6–9.5 mm. long and 1–2 mm. broad, lanceolate, long-acuminate, carinate abaxially, with broad scarious or hyaline margins, the central green band ca. $1/2$ the total width of the lobe; tube 1–2 mm. long, sometimes sparsely puberulous at the base. Corolla tubular-funnelform, 3.0–4.4 cm. long; the tube 2.1–3.2 cm. long and 6–8 mm. in diameter at the apex, bright yellow, constricted in the lower third; lobes 9–13.5 mm. long and 3.5–9.5 mm. broad, $1/3$ – $4/10$ as long as the tube, spreading and the tips recurved, yellow-green, narrowly ovate to ovate-lanceolate. Stamens inserted on the corolla tube ca. $1/3$ of the distance from the base to the apex; filaments 1.9–3.3 cm. long, the longest ones nearly equalling or barely surpassing the corolla lobes; anthers 2–2.5 mm. long and 1–1.5 mm. broad, oblong, obtuse or acutish at the apex, the connective slightly exserted. Style 2.4–3.8 cm. long, exceeding (equalling) the corolla lobes, always exceeding the filaments; stigma capitate. Capsule ellipsoid or oblong-ellipsoid, short-beaked, 9–12 mm. long, not including the 1–2 mm. long beak, and 3–6 mm. in diameter; calyx in fruit $2/3$ as long to longer than the capsule; the marcescent corolla persisting long after the seeds are shed. FLOWERING: Nov.–June. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From 70 to 400 meters in crevices of rock of steep limestone gorges, or rarely in dry scrubby forest on limestone in the vicinity of Kingston, Jamaica (MAP 12).

REPRESENTATIVE COLLECTIONS

Jamaica. ST. ANDREW: gorge of the Cane River, below the falls at Newstead, *Weaver* 1821 (A, DUKE, F, MICH, UCWI, US); Cane River Valley, *Harris* 12315 (A, F, MO, NY, S, US); on canyon wall along Hope River, *Yuncker* 17374 (F, MICH, S); Hope River Gorge, *Norman* 171 (BM); Long Mountain, back of Kingston, *Webster & Wilson* 4860 (A, IJ, MICH, S, US).

Lisianthus cordifolius is one of the most restricted of the species, known from only two limestone gorges and an adjacent mountain in southeastern Jamaica. It is closely related to *L. longifolius*, and in fact, has been considered to be a variety of that species by Grisebach (1862) and Perkins (1902). *L. cordifolius* differs from *L. longifolius* in its carinate calyx lobes, its branching very rarely opposite, its flowering-branch leaves cordate at the base, and its styles equalling or surpassing the corolla lobes. As explained earlier, *L. longifolius* is a bewilderingly variable species, and some specimens approach *L. cordifolius* in their morphology. However, no specimens have been seen which are not immediately referable to one species or the other.

There is some indication that *Lisianthus cordifolius* and *L. longifolius* may hybridize in nature. *L. cordifolius* is known from only three populations in an eight square mile area in the vicinity of Kingston, Jamaica. Although apparently not common, *L. longifolius* has been collected in that same area. It appears that the pollen viability of one of the three populations of *L. cordifolius*, *Webster & Wilson* 4860, is somewhat lower than might be expected in a fully differentiated, fertile species, giving rise to the possibility of its being a hybrid. The habitat of this population, however, is quite different from that of the other two known populations of *L. cordifolius*. *Webster & Wilson* 4860 was collected in dry, scrubby forest on limestone, while the other two populations grew in rock crevices of steep limestone cliffs. The reduced pollen viability of *Webster & Wilson* 4860 was discovered near the end of my study when field and experimental work was no longer possible. Thus, whether this reduced pollen viability is due to an unfavorable environment or to the population being a hybrid one, I cannot determine at present.

Experimental crosses have been carried out between plants of *Lisianthus cordifolius* and *L. longifolius* grown in the greenhouse of Duke University. The flowers of the seed plants were emasculated before the anthers had dehisced and the plants were isolated in a separate chamber of the greenhouse. All unused flowers were removed before anthesis as a preventative against stray pollen. Pollination was accomplished by rubbing an anther from the pollen parent across the stigmas of the seed parents until the stigmas were covered with pollen. The pollination procedure was repeated every day until the flowers withered. The results are summarized in TABLE 3.

The seed set in the hybrid cross (Cross 2) is somewhat reduced from that obtained when the seed parent (*L. cordifolius*, Cross 3) was selfed. The hybrid seeds were planted and the germination was high. The seedlings are vigorous but to date have not flowered. Therefore the presence

TABLE 3. Summary of experimental crosses between *Lisianthus cordifolius* and *L. longifolius*

CROSS NO.	POLLEN PARENT	SEED PARENT	TOTAL NO. OF FLOWERS	TOTAL NO. OF SEEDS	AV. NO. OF SEEDS
1	<i>L. longifolius</i> (Weaver 2344)	<i>L. longifolius</i> (Weaver 2344)	10	2515	251.5
2	<i>L. longifolius</i> (Weaver 2344)	<i>L. cordifolius</i> (Weaver 2343)	45	11274	250.4
3	<i>L. cordifolius</i> (Weaver 2343)	<i>L. cordifolius</i> (Weaver 2343)	9	3455	383.9

or absence of an effective barrier to hybridization, resulting in reduced pollen or ovule viability, between these two species cannot now be determined.

Extensive field and experimental work must be done before the relationship between *Lisianthus cordifolius* and *L. longifolius* can be explained. However, the morphological evidence strongly suggests that they are distinct taxa. Since the taxa are rather closely sympatric, with obvious intermediates absent, I prefer to treat them as distinct species.

b. *Lisianthus* sect. *Lisianthus* subsect. *Fruticosi* ser. *Exserti* Weaver, *ser. nov.*

Frutices vel arbusculae graciles, omnino glabrae. Styli filamenta staminumque longissimi exserta, segmentis exsertis corolla longior. Pollinis grana exinio laevi vel fere laevi. SPECIES TYPICA: *L. exsertus* Sw.

- 50053792
25. *Lisianthus exsertus* Sw. Prodr. 40. 1788; Fl. Ind. Occ. 1: 346. 1797 (as *Lisianthus*). LECTOTYPE. Jamaica, without exact locality, Swartz (s!).

Leianthus exsertus (Sw.) Griseb. Gen. & Sp. Gent. 197. 1839 [1838].

Lisianthus callosus Bertero in Spreng. Syst. 1: 585. 1825 [1824].

Tachia swartzii G. Don, Gen. Hist. 4: 197. 1837, *nom. illegit.* (Art. 63, I.C.B.N.).

Slender shrubs, rarely becoming treelike, glabrous throughout. Stems 1–6 m. tall and to 6 cm. in diameter at the base, erect or ascending, gray-brown at the base and green above, terete, brittle, distinctly woody. Leaves membranaceous, glossy bright green above, paler and dull beneath, the principal lateral veins evident but often not conspicuous, the blades 3–13.4 cm. long and 1–5.5 cm. broad, elliptic or elliptic-oblong, with a tendency to be widest slightly above the middle, gradually short acuminate or rarely acute, the bases sometimes unequal, attenuate into the 0.5–2.6 cm. long petiole. Inflorescences of pedunculate, apparently simple dichasia; flowering branches once or twice ternately divided, each division terminated by a dichasium; stalks of the flowering branches ascending, flat-

tened in cross section; dichasial branches terete. Flowers nodding, the pedicels 6–11 mm. long; bracteoles subulate, scarious. Calyx 5–11 mm. long, fused for ca. 1/4 its length; lobes 5–8.5 mm. long and 1–1.5 mm. broad, lanceolate or subulate-lanceolate, short-acuminate, mostly scarious but with a narrow green band in the center, slightly ridged abaxially; tube 1–2.5 mm. long. Corolla tubular-campanulate, 2–3.3 cm. long; tube 1–1.6 cm. long and 4–8 mm. in diameter at the widest point, yellow, constricted for about half its length; lobes 2.5–5.5 mm. long and 2–4.5 mm. broad, nearly as broad as long, 1/6–1/9 as long as the tube, yellow-green, erect or slightly spreading, broadly triangular-ovate, abruptly short-acuminate. Stamens inserted just below the middle of the corolla tube; filaments 3.5–6.6 cm. long, greatly exserted, exceeding the corolla lobes by 2.5–5 cm.; the longest one usually equalling or surpassing the style; anthers 2.5–3.5 mm. long and ca. 1 mm. broad, narrowly oblong, narrowed at the apex, the connective slightly exserted. Styles 3.4–6.7 cm. long, greatly exserted; stigma peltate. Capsule oblong-ellipsoid, long-beaked, 9–14 mm. long, not including the 2.5–5 mm. long beak, and 3–5 mm. in diameter; the marcescent corolla not persisting until the seeds are shed. FLOWERING: All year. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From 300 to 1100 meters in secondary thickets or scrub, or along roadsides, or rarely in elfin woodland, in the eastern and central parishes of Jamaica (MAP 12).

REPRESENTATIVE COLLECTIONS

Jamaica: without locality, Swartz ✓ (BM, s; isoelectotypes). ST. ANDREW: vicinity of Cooper's Hill, Red Hills, Proctor 18262 (A, IJ); vicinity of Brandon Hill, Proctor 23499 (IJ, LL); Moresham River, west side, 1/4 mi. above Hermitage Dam Reservoir, Stearn 410 (A, BM, s). ST. CATHERINE: Grandodiorite District, ca. 1 mi. sw. of Parks Road, Webster & Wilson 1954 (IJ, MICH, US). ST. MARY: ne. slopes of Cum See Hill, above Longroad P.O., Proctor 22629 (IJ). CLARENDON: Mason River Savannah, Crosby & Anderson 1151 (DUKE, MICH); Peckham Woods, Harris 11099 (NY, US). PORTLAND: 100–200 m. w. of Silver Hill Gap, along road from Section to Silver Hill Gap, Weaver & Weaver 951 (A, DUKE, UCWI); Proctor's Pool, Adams 9151 (DUKE); trail n. & w. of Silver Hill Gap, Hespenheide 773 (DUKE, GH, LL, MICH); east slope of the John Crow Mountains, 1.5–2.5 mi. sw. of Ecclesdown, Proctor 22114 (IJ, MICH).

Swartz's herbarium presently at Stockholm (s), includes three specimens of *Lisianthus exsertus*, two with the inscription "Jamaica" and one with "Ind. occ." There is also a Swartz specimen of the same species, with the inscription "Jamaica," among the collections at the British Museum (BM). The more complete of the two inscribed "Jamaica" at Stockholm best demonstrates the characters described by Swartz and is here designated the lectotype of *L. exsertus* Sw.

Although I have seen neither the type nor any other authentic material of *Lisianthus callosus* Bertero, the original description suggests very strongly that the plant is the same as *L. exsertus*. This description is re-

produced below in its entirety (from Bertero in Spreng. Syst. 1: 585. 1825).

callosus Berter. 2. *L. foliis basi*
 inaequalibus acutis,
 petiolis calloso
 annulo ramos
 amplectentibus,
 pedunculis corymbosis,
 staminibus longissimis.
 Jamaica. (Flores
 ochroleuci.)

This diagnosis fits very well the description of *Lisianthus exsertus* and excludes all other known Jamaican species. The only other species with stamens that could possibly be described as "longissimis" is *L. capitatus*, but that species has subcapitate inflorescences. The primary difference between the diagnosis of *L. callosus* and that of *L. exsertus*, immediately above it in Sprengel's treatment, is the phrase ". . . petiolis calloso annulo ramos amplectentibus . . ." The epithet "*callosus*" obviously refers to this character, which rather than being diagnostic for any single species, would describe equally well every species in the genus.

George Don (1837) cited the earlier *Lisianthus exsertus* Sw. as a synonym of his *Tachia swartzii*, the specific epithet of the latter therefore illegitimate (Art. 63, I.C.B.N.). He included two other species of *Lisianthus* in *Tachia* [*T. longifolia* (L.) Mart. = *L. longifolius* L. and *T. cordifolia* (L.) Mart. = *L. cordifolius* L.] but did not change their epithets.

c. *Lisianthus* sect. *Lisianthus* subsect. *Fruticosi* ser. *Umbellati*
 Weaver, *ser. nov.*

Frutices vel arbores graciles, omnino glabri. Folia oblanceolata vel anguste obovata. Inflorescentiae axillares, dense compactae, capitula vel umbellas simulantes, paribus duobus bractearum involucretorum. Styli filamentaque longe exserta. Pollinis grana exinio reticulato. SPECIES TYPICA: *L. umbellatus* Sw.

KEY TO THE SPECIES OF SERIES UMBELLATI

- Pedicels in fruit 8–20 mm. long; corolla tubular, the tube 2.2–3.1 cm. long and 4–6 mm. in diameter at the broadest point, the lobes abruptly short-acuminate, 2–3.5 mm. long and 2–3 mm. broad, about as broad as long, 1/8–1/10 as long as the tube; filaments exceeding the corolla lobes by no more than 8 mm.; styles exceeding the corolla lobes by no more than 1.5 cm.; calyx 4.5–7 mm. long, the lobes 2–4.5 mm. long. 26. *L. umbellatus*.
 Pedicels in fruit to 7.5 mm. long, or the fruits sessile; corolla tubular-campanulate, the tube 1.5–2.3 cm. long and 7.5–10 mm. in diameter at the broadest point, the lobes acute to obtuse, 4.5–7.5 mm. long and 3.5–6 mm. broad, 1/4–1/3 as long as the tube; filaments exceeding the corolla lobes by 8–20

mm.; style exceeding the corolla lobes by 1.1–3.4 cm.; calyx 6.5–12.5 mm. long, the lobes 4–8.5 mm. long. 27. *L. capitatus*.

26. *Lisianthus umbellatus* Sw. Prodr. 40. 1788; Fl. Ind. Occ. 1: 350. 1797 (as *Lisianthus*). \checkmark LECTOTYPE. Jamaica, without exact locality, Swartz (s!).

Leianthus umbellatus (Sw.) Griseb. Gen. & Sp. Gent. 199. 1839 [1838].

Glabrous, spindly, unbranched or sparsely branched shrubs, often becoming treelike. Stems erect or ascending, 1.5–6 m. tall and to 6 cm. in diameter, brittle, gray-brown below and green above, terete. Leaves firmly membranaceous or subcoriaceous, grass-green and glossy above, paler and dull beneath, the blades (7)10–29 cm. long and (2)3–9.5 cm. broad, oblanceolate to narrowly obovate (elliptic), abruptly or gradually short-acuminate, the bases long-attenuate into the 1.1–4.1 cm. long petiole. Inflorescences appearing umbellate, the primary and secondary axes greatly contracted, closely subtended by 2 pairs of opposite, decussate, leafy bracts, the outer pair broadly ovate or suborbicular, rounded or broadly cuneate at the base, 1.8–7.5 cm. long and 1.5–5 cm. broad, the inner pair narrower, elliptic or tending toward oblanceolate, more attenuate at the base, 2–6.2 cm. long and 0.7–2.4 cm. broad; the stalks ascending, flattened in cross section, 7.2–19.4 cm. long. Flowers ascending or horizontal, pedicellate. Calyx pale green, and subscarious, fused for $1/3$ – $1/2$ its length; lobes 2–4.5 mm. long and 1–1.5 mm. broad, lanceolate or subulate, acuminate, ecarinate; tube 2–2.5 mm. long. Corolla tubular, 2.5–3.4 cm. long; tube bright yellow, constricted in the lower half, somewhat inflated and widest below the apex; lobes yellow-green, erect or slightly spreading, orbicular, abruptly short-acuminate. Stamens inserted just below the middle of the corolla tube; filaments 1.7–2.9 cm. long, well exerted; anthers 2–3.5 mm. long and ca. 1 mm. broad, more than twice as long as broad, narrowly oblong, narrowed at the apex, the connective slightly exerted. Style 2.7–3.7 cm. long, well exerted, always exceeding the filaments, exceeding the corolla lobes by up to 1.5 cm.; stigma peltate. Capsule oblong-ellipsoid, long beaked, 1.0–1.5 cm. long, not including the 1.5–2.5 mm. long beak, and 3–5 mm. in diameter; the marcescent corolla not persisting until the seeds are shed. FLOWERING: Feb.–Apr. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: In wet limestone thickets at ca. 600 meters; known from 2 localities, on Dolphin Head Mountain and at the edges of the Cockpit Country in northwestern Jamaica (MAP 13).

REPRESENTATIVE COLLECTIONS

Jamaica: near Troy, *Perkins 1321* (GH). HANOVER: summit of Dolphin Head Mountain, near the village of Askenish, *Weaver 1832* (A, BM, DUKE, F, MO, UCWI, US); slopes of Dolphin Head Mountain, *Harris 10292* (F, NY, US).

Swartz did not designate a type specimen of *Lisianthus umbellatus*. His herbarium, now at Stockholm (s), includes three specimens of this

species, two inscribed "Jamaica" and one inscribed "Ind. occ." The more complete of the former is designated lectotype of *L. umbellatus* Sw.

Several authors before 1909 included under *Lisianthus umbellatus* plants now referred to *L. capitatus*. Grisebach (1862) gave the distribution of *L. umbellatus* as "in high mountains Portland, Guy's Hill s. Anns, Dolphin westmoreland." Similarly, Perkins (1902) cited specimens as typical of *L. umbellatus* from both eastern and western Jamaica, including Harris 6683, from St. Ann, which was later cited by Urban in the original description of *L. capitatus*.

Although in rather poor condition, the lectotype specimen of *Lisianthus umbellatus*, with its long pedicels, short calyx, and short, orbicular corolla lobes clearly resembles the plants presently known only from Dolphin Head Mountain in Hanover Parish and from near Troy at the edge of the Cockpit Country in western Jamaica.

27. *Lisianthus capitatus* Urb. Symb. Antill. 6: 33. 1909 (as *Lisianthus*). LECTOTYPE. Jamaica. ST. ANN: Hollymount, near Ewarton, Harris 8878 (BM!).

Glabrous, spindly, unbranched or sparsely branched shrubs, often becoming treelike. Stems erect or ascending, 1.5–6 m. tall and to 7 cm. in diameter, gray-brown below and green above, terete, brittle. Leaves firmly membranaceous or subcoriaceous, dark glossy green above and paler beneath, the blades (6)12–31 cm. long and (1.5)3.5–6.5 cm. broad, oblanceolate (elliptic), abruptly or gradually short-acuminate, the bases long-attenuate into the 0.7–3.7 cm. long petiole. Inflorescences appearing capitate or umbellate, primary and secondary axes contracted, closely subtended by 2 pairs of opposite, decussate, foliaceous bracts, these elliptic or ovate, rarely orbicular, broadly attenuate or rarely rounded at the base, the outer pair 1.9–8.3 cm. long and 1.5–7.1 cm. broad, the inner pair smaller and narrower, 1.5–7.1 cm. long and 0.4–3.6 cm. broad; stalks ascending, flattened in cross-section, 7.0–23 cm. long. Flowers erect, sessile or short-pedicellate. Calyx pale green and subscarious, fused for $1/3$ – $1/2$ its length; lobes 4–8.5 mm. long and 1–2 mm. broad, lanceolate or subulate, long-acuminate, ecarinate; tube 2.5–4 mm. long. Corolla tubular-campanulate, 1.8–2.8 cm. long; tube yellow or yellow-green, constricted to slightly above the middle; lobes yellow-green, erect or slightly spreading, broadly ovate or rarely suborbicular, the apices obtuse or more rarely acute. Stamens inserted just above the middle of the corolla tube; filaments 1.9–3.2 cm. long, greatly exserted; anthers 3.5–4.5 mm. long and ca. 1 mm. broad, more than 3 times longer than broad, narrowly oblong, narrowed at the apex, the connective slightly exserted. Style 2.7–5 cm. long, greatly exserted, surpassing the corolla lobes by 1.1–3.4 cm., always exceeding the filaments; stigma peltate. Capsule oblong-ellipsoid, long-beaked, 10–17 mm. long, not including the 2–3.5 mm. long beak, and 3–8 mm. in diameter; the marcescent corolla not persisting until the seeds are shed. FLOWERING: Jan.–Sept. CHROMOSOME NUMBER: $n = 18$.

DISTRIBUTION: From sea level to 800 meters, at edges of forests and in moist thickets on limestone, rarely on rocky headlands by the sea, in the eastern and central parishes of Jamaica, principally in the John Crow Mountains, the Mt. Diablo Massif, and the Cockpit Country (MAP 13).

REPRESENTATIVE COLLECTIONS

Jamaica. **PORTLAND:** vicinity of Blue Hole, *Weaver & Weaver* 940 (A, DUKE, F, UCWI); John Crow Mountains, east slope, 1.5 mi. w. of Ecclesdown, *Webster & Wilson* 5134 (A, MICH). **ST. ANDREW:** 0.8 mi. e. of Rock Hall on road to Park Road, *Weaver & Weaver* 1291 (A, DUKE, UCWI, US). **ST. ANN:** prope Moneague ad Guy's Hill, *Alexander* (NY, cited collection); Hollymount, near Ewarton, *Harris* 8878 ✓ (F, NY; isoelectotypes); road from Jamaica A-1 to Hollymount on Mt. Diablo, *Weaver & Weaver* 983 (A, BM, DUKE, F, IJ, LL, MICH, MO, NY, S, UC, US). **ST. THOMAS:** John Crow Mountains, Big Level Area, *Webster & Proctor* 5524 (A, IJ, MICH, US). **TRELAWNY:** Cockpit Country, road from Burnt Hill to Barbecue Bottom, *Weaver & Weaver* 1002 (A, BM, DUKE, F, LL, MICH, MO, NY, S, UCWI, US); vicinity of Ramgoat Cave, Cockpit Country, *Howard, Proctor & Stearn* 14684 (BM, IJ).

Although not described until 1909, *Lisianthus capitatus* has been part of various collections made since the middle of the 19th century that were determined as *L. umbellatus*. It is by far the more common of the two species in series *Umbellati*. Judging from the determination of some of the more recent collections, it is apparent that the species are still sometimes confused. Vegetatively *L. capitatus* is very similar to *L. umbellatus*. However, the flowers of the two species are strikingly different. As pointed out by Urban in the original description of *L. capitatus*, that species differs from *L. umbellatus*: in its flowers sessile or short-pedicellate; its longer calyx; its shorter and much broader corolla; its corolla lobes acute or obtuse, longer than broad, longer in absolute length and much longer in relation to the tube; and in its more greatly exerted styles and filaments.

Urban, in describing *Lisianthus capitatus* cited three specimens as representative of his new species. These, which are syntypes, are: *Harris* 8878 and *Harris* 6683, from Hollymount on Mt. Diablo, and *Alexander s.n.*, "prope Moneague ad Guy's Hill." All of Urban's original material [except for some Ekman specimens at Stockholm (s)] was destroyed during the bombing of Berlin in World War II (H. Scholz, *in litt.*). Several duplicates of the above-mentioned specimens have been seen. Of these, the specimen of *Harris* 8878 at the British Museum is the best preserved and best exhibits the characters described by Urban. This specimen is entirely typical of those from the Mt. Diablo area and undoubtedly represents the taxon described by Urban. Therefore, *Harris* 8878 (BM) is designated the lectotype of *L. capitatus* Urb.

SPECIES NON SATIS NOTA

1. *Lisianthus calciphilus* Standl. & Steyerl., *Fieldiana Bot.* 22: 267. 1940 (as *Lisianthus*). ✓ **TYPE.** Guatemala. ALTA VERAPAZ: Finca Los Alpes, *Wilson* 356 (F!).

Low shrubs (?), glabrous throughout. Stems terete below and 4-angled above. Leaves firmly membranaceous, papillose above and on the margins, subsessile or short-petiolate, narrowly ovate, the apices acuminate, the bases cuneate or rounded. Inflorescences of compound dichasia, but the terminal flower aborted and the lateral branches then appearing to be complete dichasia; branches of the inflorescence strongly 4-angled, the angles expanded into narrow, scarious wings. Bracteoles oblanceolate, green at least along the midline, to 8 mm. long. Calyx ca. 7 mm. long; lobes ca. 5 mm. long, lanceolate, long-acuminate, scarious margined, carinate abaxially. Corolla tubular-funnelform, 3.6–3.9 cm. long, yellow; lobes ca. 6 mm. long and 3 mm. broad, 1/5 as long as the tube, spreading, ovate-lanceolate, abruptly short-acuminate. Filaments 2.2–2.6 cm. long, not exceeding the corolla lobes; anthers broadly oblong, obtuse. Style 2.9–3.4 cm. long, exceeding the corolla lobes; stigma peltate. Capsules not seen.

Lisianthus calciphilus is definitely referable to the typical section of *Lisianthus* as here interpreted. Only the type specimen is known, and it cannot be placed in any of the species recognized in this study. Therefore, *L. calciphilus* is very possibly a good species. The type specimen, *Wilson 356* from Dept. Alta Verapaz, Guatemala, consists of two flowering shoots. However, it is impossible to determine whether these shoots represent primary or secondary (lateral) axes. They are determinate, but not monopodial, and the branching is not excurrent. Therefore, if these shoots represent primary axes, the plant would not fit into either subsect. HERBACEI or subsect. FRUTICOSI, but would rather appear to be somewhat intermediate between them. If the shoots represent lateral axes, they would be similar to the flowering branches of certain species, particularly *L. longifolius* or *L. seemannii*, of subsect. FRUTICOSI, series *Longifolii*.

In the original description of *Lisianthus calciphilus*, Standley and Steyermark suggest that their new plant is close to *L. collinus*. (= *L. brevidentatus* var. *collinus*, subsect. HERBACEI). From that plant *L. calciphilus* differs in its longer corolla lobes, broader corolla tube, and much larger bracteoles. Williams (1968, 1969) also associated *L. calciphilus* with *L. collinus*, reducing both to synonymy under *L. brevidentatus*. In several respects, e.g. flower form, papillose leaves, and subfoliaceous bracteoles, *Wilson 356* closely resembles *L. acuminatus*. However if the structures preserved are indeed lateral flowering branches, they are much more greatly proliferated than in that species and would more closely resemble those of *L. longifolius* or *L. seemannii*.

It seemed possible that *Wilson 356* might be a hybrid between *L. acuminatus* and a species in subsect. HERBACEI, perhaps *L. quichensis* or *L. brevidentatus*, thus possibly explaining its peculiar inflorescences. However, its pollen showed nearly 100 percent stainability in cotton blue-lactophenol.

Until more material is available, or until I have studied it in the field, I cannot place *Lisianthus calciphilus* with any degree of confidence in my classification of the species of *Lisianthus* and therefore must treat it as a *species non satis nota*.

EXCLUDED NAMES

- Lisianthus acuminatus* Desr. in Lam. Encycl. 3: 660. 1804. TYPE. Guadeloupe: *de Badier* (P) (Microfiche, IDC 6207. 446: II. 7!) = *L. frigidus* Sw. *fide* Grisebach (1839) = *Calolisianthus frigidus* (Sw.) Gilg.
- Lisianthus acutangulus* Mart. Flora 21 (2-Beibl.): 49. 1838. TYPE: *Martius* 216 (M) = *Calolisianthus acutangulus* (Mart.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus acutangulus* Ruiz & Pav. Fl. Peruv. 2: 14. t. 122, figure a. 1799. TYPE: "In Panatahuarum montibus ad Chinchao runcationes in locis meridionalibus," Ruiz & Pavon (MA) = *Chelonanthus alatus* (Aubl.) Pulle *fide* Williams (1968).
- Lisianthus acutilobus* Steyerl. Bol. Soc. Venez. Cienc. Nat. 26: 439. figure 9. 1966. TYPE: *Steyerl* & *Nilsson* 732 (VEN); referable to *Pagaea* Griseb.
- Lisyanthus alatus* Aubl. Hist. Pl. Guiane 1: 204; 3: t. 80. 1775. TYPE: "Habitat in locis incultis Caienne & Guiane," *Aublet* (P) (Microfiche, IDC 6213. 23: IV. 6!) = *Chelonanthus alatus* (Aubl.) Pulle, Enum. Vasc. Pl. Surinam 376. 1906.
- Lisyanthus alatus* Willd. ex Griseb. Gen. & Sp. Gent. 185. 1839 (*nom. nud.*) = *L. trifidus* HBK. *fide* Grisebach (loc. cit.); *ex char.* referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus albus* Spruce ex Prog. in Mart. Fl. Bras. 6(1): 237. 1866. TYPE: "In vicinis Barra prov. do Alto Amazonas [Brazil]," *Spruce* = *Chelonanthus albus* (Spruce ex Prog.) Badillo in Pittier et al., Cat. Fl. Venezuelana 2: 293. 1947.
- Lisianthus alpestris* Mart. Nov. Gen. & Sp. 2: 93. t. 171. 1827 = *Helia alpestris* (Mart.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891. This should be transferred to *Calolisianthus* (Griseb.) Gilg, according to Nilsson (1970).
- Lisianthus amoenus* Miq. Linnaea 19: 139. 1847. TYPE: "Crescit in Para superiore juxta sylvam [Brazil]," *Focke* (U?) = *Helia amoena* (Miq.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891; *ex char.* referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus amplissimus* Mart. Nov. Gen. & Sp. 2: 96. t. 175. 1827 = *Calolisianthus amplissimus* (Mart.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus angustifolius* HBK. Nov. Gen. & Sp. 3: 181. 1818. TYPE: "In radicibus montis Duidae, prope Esmeraldam [Venezuela]," *Humboldt & Bonpland* (P) (Microfiche, IDC 6209. 72: III. 3!) = *Chelonanthus angustifolius* (HBK.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus angustifolius* Mart. Nov. Gen. & Sp. 2: 99. t. 178, figure 1. 1827 = *L. tenuifolius* Spreng. Syst. Cur. Post. 339. 1827. According to Nilsson (1970) this should be transferred to *Calolisianthus* (Griseb.) Gilg.
- Lisianthus anomalus* HBK. Nov. Gen. & Sp. 3: 184. 1818. TYPE: "Crescit in montosis inter Honda et Mariquita Novo-Granatensium," *Humboldt & Bonpland* (P) = *Symbolanthus anomalus* (HBK.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.

- Lisianthus aphyllus* Vell. Fl. Flum. 2: 78. 1825. From the illustration this is a species of *Voyria* Aubl.
- Lisianthus arboreus* Spruce ex Prog. in Mart. Fl. Bras. 6(1): 240. t. 64, figure 1. 1866. TYPE: *Spruce 3551* (K) = *Adenolisianthus arboreus* (Spruce ex Prog.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- ✓ *Lisianthus auriculatus* Benth. Pl. Hartweg. 226. 1846. TYPE: *Hartweg 1240* (K) = *Helia auriculata* (Benth.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891.
- Lisianthus Baltae* (Weberb. & Gilg) Macbride, Fieldiana Bot. 13(5): 282. 1959 = *Symbolanthus Baltae* Weberb. & Gilg, Fedde, Repert. Sp. Nov. 2: 56. 1906. TYPE: *Weberbauer 4737* (B?).
- Lisianthus bifidus* HBK. Nov. Gen. & Sp. 3: 181. 1818. TYPE: "Crescit in montibus Novo-Granatensibus, prope fodinam Santanna," *Humboldt & Bonpland* (P) (Microfiche, IDC 6209. 72: III. 4!) = *Chelonanthus bifidus* (HBK.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus breviflorus* Benth. Hook. Jour. Bot. 2: 45. 1840. TYPE: Guiana, Sierra Mey, *Schomburgk* (K). According to Bentham (1876) and Nilsson (1970) this should be transferred to *Pagaea* Griseb.
- Lisianthus brevifolius* (Cham.) Griseb. Gen. & Sp. Gent. 187. 1839 = *Helia brevifolia* Cham. Linnaea 8: 11. 1833. TYPE: "Lages [Brazil]," *Sellow*.
- Lisianthus Brittonii* Woodson, Fl. Trinidad & Tobago 2: 183. 1947. Fide Ewan, Contr. U.S. Nat. Herb. 29: 221. 1948 = *Chelonanthus arboreus* Britt. Bull. Dept. Agric. Trinidad & Tobago 19: 230. 1922.* TYPE: *Britton, Hazen & Mendelson 1295* (NY) = *Macrocarpaea arborea* (Britt.) Ewan, loc. cit.
- ✓ *Lisianthus browallioides* Ewan, Proc. Biol. Soc. Wash. 64: 132. 1951. TYPE: *Allen 4932* (MO) = *Macrocarpaea browallioides* (Ewan) Robyns & Nilsson, Bull. Jard. Bot. Nat. Belg. 40: 13. 1970.
- Lisianthus caerulescens* Aubl. Hist. Pl. Guiane 1: 207; 3: t. 82. 1775. TYPE: "Habitat in pratis humidis Guianae," *Aublet* (P) (Microfiche, IDC 6213. 23: IV. 4!) = *Irlbachia caerulescens* (Aubl.) Griseb. Gen. & Sp. Gent. 195. 1839.
- Lisianthus calygonus* Ruiz & Pav. Fl. Peruv. 2: 14. t. 126. 1799. TYPE: "In montibus frigidis Acomayo, Muña et Pallao, ad Chacahuassi et Achapatuman tractus," *Ruiz & Pavon* (MA) = *Symbolanthus calygonus* (Ruiz & Pav.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.
- Lisianthus campanulaceus* Desr. in Lam. Encycl. 3: 660. 1804. TYPE: "Guyane," *Richard* (P-JU) (Microfiche, IDC 6206. 512: III. 3!) = *Helia campanulacea* (Desr.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891; referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus campanuloides* Spruce ex Benth. Jour. Bot. Kew Misc. 6: 201. 1854. TYPE: "Right bank of Rio Negro, opposite Uananaca [Brazil]," *Spruce* (K) = *Chelonanthus campanuloides* (Spruce ex Benth.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus cardonae* (Gleason) Steyerl. Fieldiana Bot. 28: 498. 1953 = *Chelonanthus cardonae* Gleason, Brittonia 3: 189. 1939. TYPE: *Tate 1359* (NY). According to Nilsson (1970) this should be transferred to *Pagaea* Griseb.

* Reference not seen.

- Lisianthus carinatus* Desr. in Lam. Encycl. 3: 658. 1804 = *Tachiadenus carinatus* (Desr.) Griseb. Gen. & Sp. Gent. 201. 1839.
- Lisianthus chelonoides* L.f. Suppl. Pl. 134. 1781 (*nom. illegit.*, Art. 63) = *L. alatus* Aubl. = *Chelonanthus alatus* (Aubl.) Pulle.
- Lisianthus chimantensis* Steyerl. & Maguire, Mem. N.Y. Bot. Gard. 17(1): 461. 1967. TYPE: *Steyermark & Wurdack 374-A* (NY). According to Nilsson (1970) this does not fit into any existing genus.
- Lisianthus corymbosus* Ruiz & Pav. Fl. Peruv. 2: 14. t. 124. 1799. TYPE: "In Peruviae nemoribus inter Acomayo et Chinchao ad Pati praedium," Ruiz & Pavon (MA) = *Macrocarpaea corymbosa* (Ruiz & Pav.) Ewan, Contr. U.S. Natl. Herb. 29: 242. 1948.
- ✓ *Lisianthus crassicaulis* Mart. & Gal. Bull. Acad. Brux. 11(1): 374. 1844. TYPE: *Galeotti 7176* (BR) = *Chelonanthus alatus* (Aubl.) Pulle *fide* Williams (1968).
- Lisyanthus daturoides* Griseb. Gen. & Sp. Gent. 177. 1839. TYPE: *Mathews 1317* (K) = *Symbolanthus daturoides* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.
- ✓ *Lisianthus densiflorus* Benth. Pl. Hartweg. 227. 1846. TYPE: *Hartweg 1241* (K) = *Macrocarpaea densiflora* (Benth.) Ewan, Contr. U.S. Natl. Herb. 29: 232. 1948.
- Lisianthus elegans* Mart. Nov. Gen. & Sp. 2: 98. t. 177. 1827 = *L. pedunculatus* Cham. & Schlecht. = *Calolisianthus pedunculatus* (Cham. & Schlecht.) Gilg.
- Lisianthus Elisabethae* (Schomb.) Griseb. Linnaea 22: 40. 1849 = *Leiothamnus Elisabethae* Schomb. Verh. Ver. Beförd. Gartenb. Königl. Preuss. Staaten 18: 155. t. 1. 1847 = *Symbolanthus Elisabethae* (Schomb.) Gilg, Bot. Jahrb. 22: 340. 1896.
- Lisianthus fistulosus* Poir. in Lam. Encycl. Suppl. 3: 514. 1816 = *Chelonanthus fistulosus* (Poir.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus frigidus* Sw. Prodr. 40. 1788; Fl. Ind. Occ. 352. 1797. TYPE: "Incolit regionem muscosam montis la Soufriere Insulae Dominicae," *Ponthieu* (s!) = *Calolisianthus frigidus* (Sw.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus glaber* L.f. Suppl. Pl. 134. 1781. TYPE: *Mutis*; specimen 213.2 (LINN) (Savage, 1945); (Microfiche, IDC 5057. 118. II. 2,3!) = *Macrocarpaea glabra* (L.f.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus glaucifolius* Jacq. Coll. 1: 64. 1787 = *Eustoma exaltatum* *fide* Grisebach (1845).
- Lisianthus glaucifolius* Nutt. Trans. Am. Phil. Soc. 5: 197. 1837 = *Eustoma Russellianum* *fide* Grisebach (1845).
- Lisyanthus gracilis* Griseb. Gen. & Sp. Gent. 182. 1839. TYPE: *St. Vincent, Guilding* (K) = *L. uliginosus* Griseb. *fide* Index Kewensis = *Chelonanthus uliginosus* (Griseb.) Gilg.

- Lisyanthus grandiflorus* Aubl. Hist. Pl. Guiane 1: 205; 3: t. 81. 1775. TYPE: "Habitat in locis humidis Caienne & Guiane," Aublet (p) (Microfiche, IDC 6213. 23: IV. 5!) = *Chelonanthus grandiflorus* (Aubl.) Chod. & Hassl. Bull. Herb. Boiss. Ser. 2. 3: 549. 1903.
- Lisyanthus grandiflorus* Willd. ex Griseb. Gen. & Sp. Gent. 182. 1839 (nom. nud.) = *L. uliginosus* Griseb. fide Grisebach (loc. cit.) = *Chelonanthus uliginosus* (Griseb.) Gilg.
- Lisianthus imthurnianus* Oliver, Trans. Linn. Soc. Ser. 2. 2: 279. 1887. TYPE: *im Thurn* 306 (κ) = *Calolisianthus imthurnianus* (Oliver) Gleason, Bull. Torr. Bot. Club 56: 402. 1929.
- Lisianthus incarnatus* Sessé & Moc. Fl. Mex. ed. 1. 39. 1893. *Ex char.* not referable to *Lisianthus*.
- Lisianthus inflatus* Mart. Nov. Gen. & Sp. 2: 95. t. 174. 1827 = *L. speciosus* Cham. & Schlecht. fide Grisebach (1839) = *Calolisianthus speciosus* (Cham. & Schlecht.) Gilg.
- Lisianthus Kunthii* G. Don, Gen. Hist. 4: 208. 1837 (nom. illegit., Art. 63) = *L. angustifolius* HBK. = *Chelonanthus angustifolius* (HBK.) Gilg.
- Lisyanthus leucanthus* Lyall ex Griseb. Gen. & Sp. Gent. 202. 1839 (nom. nud.) = *Tachiadenus longiflorus* Griseb. loc. cit.
- Lisyanthus longiflorus* Boyer ex Griseb. Gen. & Sp. Gent. 202. 1839 (nom. nud.) = *Tachiadenus longiflorus* Griseb. loc. cit.
- Lisianthus luteus* Raf. Atl. Jour. 146. 1832 = *Eustoma Russellianum* fide Merrill (Index Rafinesquianum 192. 1949.)
- ✓*Lisianthus macranthus* Benth. Pl. Hartweg. 144. 1844. ✓TYPE: *Hartweg* 799 (κ) = *Symbolanthus macranthus* (Benth.) Moldenke, Phytologia 2: 235. 1947.
- Lisianthus macrophyllus* HBK. Nov. Gen. & Sp. 3: 183. 1818. TYPE: "Crescit locis subfrigidus, in declivitate Parami de Almaguer, inter Pansitara et flumen," Humboldt & Bonpland (p) (Microfiche, IDC 6209. 72: III. 6!) = *Macrocarpaea macrophylla* (HBK.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus madagascariensis* Spreng. Syst. 1: 586. 1825 (nom. illegit., Art. 63) = *L. trinervis* Desr. = *Tachiadenus trinervis* (Desr.) Griseb.
- Lisyanthus Martii* Griseb. Gen. & Sp. Gent. 187. 1839 (nom. illegit., Art. 63) = *L. spathulatus* HBK. = *Helia spathulata* (HBK.) Gilg.
- Lisyanthus Mathewsii* Griseb. Gen. & Sp. Gent. 361. 1839. TYPE: *Mathews* 1836 (κ) = *Symbolanthus Mathewsii* (Griseb.) Gilg, Bot. Jahrb. 22: 344. 1896.
- Lisianthus neriioides* Griseb. Linnaea 22: 39. 1849. TYPE: *Moritz* 1189 (B, but presumably destroyed) = *Symbolanthus neriioides* (Griseb.) Ewan, Proc. Biol. Soc. Wash. 63: 165. 1950.
- Lisyanthus oblongifolius* (Mart.) Griseb. Gen. & Sp. Gent. 187. 1839 = *Helia oblongifolia* Mart. Nov. Gen. & Sp. 2: 123. t. 191. 1827.
- Lisyanthus obtusifolius* Griseb. Gen. & Sp. Gent. 175. 1839. TYPE: Brazil, Sierra d'Estrella, Sellow (κ) = *Macrocarpaea obtusifolia* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.

- ✓ *Lisianthus Oerstedtii* Griseb. Kjoeb. Vidensk. Meddel. 1853: 54. 1854. TYPE: "Voxer mellem Matagalpa og Muimui; Provincem Segovia," *Oersted* = *Helia Oerstedtii* (Griseb.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891.
- Lisianthus Ophiorriza* Vell. Fl. Flum. 2: 78. 1825 = *Metternichia principis* Mikan (Solanaceae) *fide* Sampiro & Peckolt, Arq. Mus. Nac. Rio de Janeiro 37: 331-394. 1943.
- Lisianthus ovalis* Ruiz & Pav. Fl. Peruv. 2: 13. 1799. TYPE: "In Peruviae nemoribus per Chinchao runcationes," Ruiz & Pavon (MA) = *Macrocarpaea ovalis* (Ruiz & Pav.) Ewan, Contr. U.S. Natl. Herb. 29: 234. 1948.
- Lisianthus ovatifolius* Vell. Fl. Flum. 2: 79. 1825 = *L. alpestris* Mart. *fide* Progel in Mart. Fl. Bras. 6(1): 233. 1866.
- Lisianthus paniculatus* Spreng. Syst. Cur. Post. 340. 1827 = *Irlbachia elegans* Mart. *fide* Progel in Mart. Fl. Bras. 6(1): 229. 1866.
- Lisianthus parvifolius* Desr. in Lam. Encycl. 3: 660. 1804. TYPE: "Guyane," Richard (P-JU) (Microfiche, IDC 6206. 512: III. 4!) = *Irlbachia coerulescens* (Aubl.) Griseb. *fide* Grisebach (1839).
- Lisianthus pauciflorus* (Spruce ex Gilg) Macbride, Fieldiana Bot. 13(5): 289. 1959 = *Symbolanthus pauciflorus* Spruce ex Gilg, Bot. Jahrb. 22: 340. 1896. TYPE: Spruce 4429 (K).
- Lisianthus pauciflorus* Sessé & Moc. Pl. N. Hispan. ed. 1. 24. 1888. *Ex char.* not referable to *Lisianthus*.
- Lisianthus pedunculatus* Cham. & Schlecht. Linnaea 1: 199. 1826. TYPE: "In Brasiliae interioribus regionibus," Sellow (HAL) = *Calolisianthus pedunculatus* (Cham. & Schlecht.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus pendulus* Mart. Nov. Gen. & Sp. 2: 94. t. 172. 1827 = *Calolisianthus pendulus* (Mart.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus pratensis* HBK. Nov. Gen. & Sp. 3: 180. 1818. TYPE: "Crescit locis gramineis prope Esmeraldem, in ripa Oronoci," Humboldt & Bonpland (P) (Microfiche, IDC 6209. 72: III. 2!) = *Helia pratensis* (HBK.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891; *ex char.* appears to be referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus princeps* Lindl. Jour. Hort. Soc. 4: 261. 1849. TYPE: Schlim 419 (K) = *Lagenanthus princeps* (Lindl.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.
- Lisianthus pulcher* Hook. Bot. Mag. 75: t. 4424. 1849. TYPE: Colombia, Monte del Moro, Purdie (K) = *Purdieanthus pulcher* (Hook.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.
- ✓ *Lisianthus pulcherrimus* (Gilg) Donn. Sm. in Pittier, Prim. Fl. Costaric. 2: 166. 1898 = *Symbolanthus pulcherrimus* Gilg, Bot. Jahrb. 22: 314. 1896. TYPE: Hoffmann 673.
- Lisianthus pulcherrimus* Mart. Nov. Gen. & Sp. 2: 97. t. 176. 1827 = *Calolisianthus pulcherrimus* (Mart.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.

- Lisianthus pumilus* Benth. Jour. Bot. Kew Misc. 6: 200. 1854. TYPE: Brazil, in inundated woods of the Rio Negro, near San Carlos, *Spruce* (κ) = *Pagaea pumila* (Benth.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 102. 1895.
- Lisyanthus purpurascens* Aubl. Hist. Pl. Guiane 1: 201; 3: t. 79. 1775. TYPE: "Habitat in fissuris humidis rupium montis Serpent," *Aublet* (p) (Microfiche, IDC 6213. 23: IV. 3!) = *Helia purpurascens* (Aubl.) O. Ktze. Rev. Gen. Pl. 2: 428. 1891; referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus purpurascens* HBK. Nov. Gen. & Sp. 3: 182. 1818. TYPE: "Crescit locis inundatis, inter pagum San Fernando de Atabapo et cataractam Maypurensium," *Humboldt & Bonpland* (p) = *L. uliginosus* Griseb. fide Grisebach (1839) = *Chelonanthus uliginosus* (Griseb.) Gilg.
- Lisianthus pyriformis* (Gleason) Steyer. Fieldiana Bot. 28: 498. 1953 = *Chelonanthus pyriformis* Gleason, Bull. Torr. Bot. Club 58: 450. 1931. TYPE: Tate 747 (NY).
- Lisianthus quelchii* N.E. Brown, Trans. Linn. Soc. Ser. 2. Bot. 6: 50. t. 9, figures 6-9. 1901. SYNTYPES: *McConnell & Quelch* 106, 649 (κ) = *Macrocarpaea quelchii* (N.E. Brown) Ewan, Contr. U.S. Natl. Herb. 29: 233. 1948.
- Lisyanthus racemosus* Willd. ex Griseb. Gen. & Sp. Gent. 186. 1839 (*nom. nud.*) = *L. angustifolius* HBK. fide Grisebach (loc. cit.) = *Chelonanthus angustifolius* (HBK.) Gilg.
- Lisianthus ramosissimus* Benth. Jour. Bot. Kew Misc. 6: 200. 1854. TYPE: *Schomburgk* 989 (κ) = *Pagaea ramosissima* (Benth.) Ewan, Proc. Biol. Soc. Wash. 63: 165. 1950.
- Lisianthus recurvus* Benth. Jour. Bot. Kew Misc. 6: 201. 1854. TYPE: Brazil, near Panuré, on the Río Uápes, *Spruce* (κ) = *Pagaea recurva* (Benth.) Benth. & Hook. Gen. Pl. 2: 814. 1876.
- Lisianthus revolutus* Ruiz & Pav. Fl. Peruv. 2: 14. t. 127. 1799. TYPE: "In montibus altis frigidis Muna ad Saria," *Ruiz & Pavon* (MA) = *Macrocarpaea revoluta* (Ruiz & Pav.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus revolutus* Poepp. ex Griseb. in DC. Prodr. 9: 77. 1845 (*nom. nud.*) = *L. glaber* L.f. fide Grisebach (loc. cit.) = *Macrocarpaea glabra* (L.f.) Gilg.
- Lisianthus roseus* Sessé & Moc. Fl. Mex. ed. 1. 39. 1893. *Ex char.* this is not referable to *Lisianthus*.
- Lisianthus Rusbyanus* (Gilg) Macbride, Fieldiana Bot. 13(5): 290. 1959 = *Symbolanthus Rusbyanus* Gilg, Bot. Jahrb. 22: 344. 1896. TYPE: *Rusby* 1227.
- Lisianthus Russellianus* Hook. Bot. Mag. 65: t. 3626. 1839 = *Eustoma grandiflorum* (Raf.) Shinn. Southw. Nat. 2: 41. 1957.
- Lisianthus scabridulus* Steyer. Fieldiana Bot. 28: 496. 1953. TYPE: *Steyerm.* 57979 (F!). According to Nilsson (1970) this should be transferred to *Pagaea* Griseb.
- Lisianthus Schomburgkii* Griseb. in DC. Prodr. 9: 75. 1845. TYPE: *Schomburgk* 298 (κ) = *Chelonanthus Schomburgkii* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus sempervirens* Mill. ex Steud. Nomencl. ed. 1. 486. 1821 (*nom. nud.*) = *Gelsemium sempervirens* (L.) Ait. (Loganiaceae).

- Lisianthus spathulatus* HBK. Nov. Gen. & Sp. 3: 181. 1818. TYPE: "Crescit locis calidissimis, humidis Insulae Pararumae, in flumine Oronoci," *Humboldt & Bonpland* (P) = *Helia spathulata* (HBK.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus speciosus* Cham. & Schlecht. Linnaea 1: 198. 1826. TYPE: "Crescit in Brasiliae regionibus interioribus," *Sellow* (HAL) = *Calolisianthus speciosus* (Cham. & Schlecht.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus splendens* Hook. Lond. Jour. Bot. 6: 264. 1847. TYPE: "Hills of red clay near Canoas, Province of Antioquia, New Grenada," *Purdie* (K) = *Lehmaniella splendens* (Hook.) Ewan, Caldasia 5: 87. 1948. Incorrectly attributed by Ewan (loc. cit.) to Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 101. 1895.
- Lisianthus Spruceanus* Benth. Jour. Bot. Kew Misc. 6: 202. 1854. TYPE: "Brazil, in grassy inundated places near San Gabriel, Río Negro," *Spruce* (K) = *Chelonanthus spruceanus* (Benth.) Pilger in Koch-Grünberg, Zwei Jahre unter den Indianern 2: 31. 1910.*
- Lisianthus subcordatus* Benth. Jour. Bot. Kew Misc. 6: 200. 1854. TYPE: "Brazil, near Panuré, on the Río Uápes," *Spruce* (K) = *Pagaea subcordata* (Benth.) Benth. & Hook. Gen. Pl. 2: 814. 1876.
- Lisianthus Tatei* (Gleason) Steyerl. Fieldiana Bot. 28: 498. 1953 = *Caloisanthus Tatei* Gleason, Bull. Torr. Bot. Club 58: 449. 1931. TYPE: *Tate* 743 (NY). According to Nilsson (1970) this should be transferred to *Pagaea* Griseb.
- Lisianthus tenuifolius* Spreng. Syst. Cur. Post. 339. 1827. According to Nilsson (1970) this should be transferred to *Calolisianthus* (Griseb.) Gilg.
- Lisianthus tetragono-alatus* Steud. Nomencl. ed. 2. 2: 55. 1841 (*nom. nud.*) = *L. acutangulus* Mart. *fide* Progel in Mart. Fl. Bras. 6(1): 234. 1866 = *Calolisianthus acutangulus* (Mart.) Gilg.
- ✓ *Lisyanthus tetragonus* Benth. Pl. Hartweg. 68. 1840. TYPE: *Hartweg* 496 (K) = *Chelonanthus alatus* (Aubl.) Pulle *fide* Williams (1968).
- Lisianthus thamnoides* Griseb. Fl. Brit. W. Ind. Isl. 424. 1862. TYPE: Jamaica *Macfadyen* (K) = *Macrocarpaea thamnoides* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus trifidus* HBK. Nov. Gen. & Sp. 3: 182. 1818. TYPE: "Crescit inter Mariquitam et fodinam Santanna, Novo-Granatensium," *Humboldt & Bonpland* (P) (Microfiche, IDC 6209. 72: III. 5!); referable to *Chelonanthus* (Griseb.) Gilg.
- Lisianthus trinervis* Desr. in Lam. Encycl. 3: 659. 1804. TYPE: (P-JU) (Microfiche, IDC 6206. 512: III. 1!) = *Tachiadenus trinervis* (Desr.) Griseb. Gen. & Sp. Gent. 201. 1839.
- Lisianthus trinervis* Sessé & Moc. Fl. Mex. ed. 1. 39. 1893. *Ex char.* not referable to *Lisianthus*.

* Reference not seen.

- Lisianthus tubiflorus* Thou. ex Roem. & Schult. Syst. 4: 788. 1819. TYPE: "In Madagascar," *Willdenow* (B) = *Tachiadenus tubiflorus* (Thou. ex Roem. & Schult.) Griseb. Gen. & Sp. Gent. 202. 1839.
- Lisyanthus uliginosus* Griseb. Gen. & Sp. Gent. 181. 1839 = *Chelonanthus uliginosus* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus vasculosus* Griseb. Linnaea 22: 37. 1849. SYNTYPES: *Karsten* 27, *Moritz* 28 = *Symbolanthus vasculosus* (Griseb.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 99. 1895.
- Lisianthus virgatus* Boj. ex Griseb. in DC. Prodr. 9: 82. 1845 (*nom. nud.*) = *Tachiadenus gracilis* Griseb. loc. cit.
- Lisianthus virgatus* Prog. in Mart. Fl. Bras. 6(1): 239. 1866. TYPE: In pascuis ad Ega prov. do Alto Amazonas Brazil," *Martius* (M) = *Adenolisianthus virgatus* (Prog.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus viridiflorus* Mart. Nov. Gen. & Sp. 2: 94. t. 173. 1827 = *Chelonanthus viridiflorus* (Mart.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 98. 1895.
- Lisianthus viscosus* Ruiz & Pav. Fl. Peruv. 2: 14. t. 125. 1799. TYPE: "In altis locis Muña ad Tambo," *Ruiz & Pavon* (MA) = *Macrocarpaea viscosa* (Ruiz & Pav.) Gilg in Engler & Prantl, Nat. Pflanzenfam. 4(2): 94. 1895.
- Lisianthus volubilis* Salisb. Prodr. 137. 1796 = *Gelsemium sempervirens* (L.) Ait. (Loganiaceae).
- Lisianthus zeylanicus* Spreng. Syst. 1: 586. 1825 = *Exacum zeylanicum* fide Grisebach (1845).

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