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Novae Gesneriaceae Neotropicarum III. Additional New Species from Venezuela

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Expeditions to remote areas of Venezuela and preliminary preparation of the treatment of Gesneriaceae for the *Flora of the Venezuelan Guayana* by Julian Steyermark revealed several new species. Further work on the family for the *Flora* is being carried out by Christian Feuillet and is expected to yield additional new species.

Besleria parviflora L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Bolívar: Chimantá Massif, along stream in quebrada, forested slopes along trail between Camp 2 and Camp 3, north-western part of Abácapa-tepuí, 750–1,100 m, 5 Apr. 1953, *Steyermark 74810* (holotype, VEN; isotypes, F, NY, US). Figure 1.

Besleriae solanoidi Kunth affinis sed marginibus florum integris vel subintegris lobis calycis brevioribus subacuminatis corollis 6–7 mm longis albis differt.

Large, single-stemmed, terrestrial, suffrutescent herbs; stems erect, 0.7–1.5(–2) m tall, strigillose near apex, glabrescent below, internodes 3–6 cm long. Leaves nearly equal in a pair, petiolate; blades oblong to ovate-elliptic, 13.5–26.5 × 4.7–7.9(–9) cm, subcoriaceous, apex acuminate or acute, base acute to cuneate, margin minutely denticulate toward the apex or entire and remotely undulate, lateral veins 5–6 on each side 12–20 mm apart, the uppermost lateral vein 4.5–7.5 cm below the apex, dark green, glabrous to puberulent adaxially, pale green, mainly glabrous but with numerous obscure circular scales and strigillose along the veins and margins abaxially; petioles 1.3–4.5 cm long, densely appressed-pubescent. Inflorescences of 5–8 flowers congested or fasciculate in the upper axils; peduncles obsolete or to 3 mm long, densely pubescent; bracts lacking; pedicels slender, 2–5 mm long, densely pubescent. Flowers very small; calyx lobes connate for ¼–½ of their length, lanceolate to ovate, 1–3(–4) mm long, 0.9–2 mm wide at base (lower lobe slightly smaller), green, apex acute to acuminate, outer surface with sordid adpressed pubescence at base along the midvein but pubescence

terminating below apex, sessile glands dispersed on surface, glabrous within; corolla creamy white to greenish yellow to yellow, short-tubular, lacking spur, 6–7 mm long, 1.5 mm wide at base, 3 mm wide at mouth, outer surface minutely puberulent, minutely papillate-puberulent at mouth, glabrous below, lobes 2–2.5 mm long and wide, pale white or dull maroon with upper 2 lobes maroon, lower lobes pale yellow; stamens didynamous, filaments broadened at base, adnate to corolla base for 1.5 mm, shorter pair 2.5 mm long, longer pair 3.5–4 mm long, glabrous, anthers broader than long, 0.3 × 0.8 mm, staminode between the bases of the shorter filaments, linear-ligulate, 0.8 × 0.2 mm, sterile anther 0.1 × 0.1 mm; disc annular, 0.5 × 1.2 mm, sublobulate at summit; ovary ovoid, 2 × 1.2 mm, glabrous, style 1.7 mm long, glabrous. Berry ovoid to globose, 3–4 mm long and wide, yellowish, dull orange to reddish, glabrous; seeds broadly fusiform, ca. 0.5 × 0.3 mm, striate.

Distribution. *Besleria parviflora* is distributed near streams in wet forests in Bolívar and Amazonas, Venezuela, at 450–1,300 m.

Additional specimens examined. VENEZUELA. BOLÍVAR: Munic. Raul Leoni, 78 km S of Uriman-tepuí, vicinity of small summit of sandstone, 4°39'N, 62°36'W, 450 m, Sep. 1986, *A. Fernandez 3449* (MO); 17 km E of El Paují, 64 km W of Santa Elena, Río Las Ahallas, 4°30'N, 61°30'W, 850 m, 30 Oct. 1985, *Liesner 19202* (MO, US); 4 km W of El Paují, 2–5 km N of road, Río Chaberú, 4°30'N, 61°36'W, 12 Nov. 1985, *Liesner 19932* (MO, US, VEN); Dist. Piar, Amaruay-tepuí, slope up to base wall, S side about 1 km from SW corner of tepuí, 20–35 m tall forest, 5°54'N, 62°15'W, 550–810 m, 25 Apr. 1986, *Liesner & Holst 20313* (MO), 26 Apr. 1986, *20386* (MO); rocky hematite exposures on open slopes on summit at W end of Sororopán-tepuí, 2,225–2,255 m, 13 Nov. 1944, *Steyermark 60052* (F, US); Sierra de Lema, headwaters of Río Chicanán, 80 km SE of El Dorado, 6°5'N, 62°W, 690 m, 22 Aug. 1961, *Steyermark 89386* (VEN); along small stream in quebrada, between Río Paramichí and Salto de Chalimano, SE toward Venezuela–Brazil frontier, NW of Serranía Pia-soi (Pia-shauhy, Pia-Savi), 4°52'N, 62°58'W, 525–650 m, 5 Jan. 1962, *Steyermark 90609* (US, VEN); Venezuela–Brazil frontier, NE of Serranía Pia-soi (Pia-savi), 3°53'N, 62°46'W, 650–800 m, 5–6 Jan. 1962,



Steyermark 90653 (US, VEN). TERRITORIO FEDERAL AMAZONAS: Sierra Parima, 45 km NW of headwaters of Río Orinoco, along Venezuela–Brazil frontier, 2°27'24"N, 63°56'W, 1,300 m, 18–23 May 1972, *Steyermark 106014* (VEN); Upper Orinoco, *Croizat 889* (NY), *1044* (NY).

In Morton's key to the Venezuelan species of *Besleria* (1953), *B. parviflora* resembles in habit the widespread *B. solanoides* Kunth, but the latter differs mainly in having an orange corolla 13–15 mm long. The new species can be characterized by entire to subentire leaf blades, shorter subacuminate calyx lobes, and corollas that are 6–7 mm long, white to cream or greenish yellow (rarely with some maroon), and are minutely puberulent externally. Another species that resembles *B. parviflora* is *B. flavo-virens* Nees & C. Martius, originally described from Brazil, but more common in the Guianas and recently also found in Costa Rica. That species has white corollas and longer peduncles and pedicels.

Drymonia pudica L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Aragua: Pittier National Park, rich cloud forest in portion of gradual ascent halfway up Fila de Paraiso, between Portachuelo and summit, 1,400 m, 5 July 1963, *Steyermark 91529* (holotype, VEN; isotype, US). Figure 2.

Drymonia crassae C. Morton affinis, sed foliis longioribus (5–17 cm longis) corollis in faucibus maculatis venis loborum purpureis vel roseis bracteis ellipticis vel ovatis longioribus et latioribus (2–4 × 1.5–2.5 cm) differt.

Woody lianas climbing over small trees, into the crowns of larger trees, and clambering over boulders; stems ± terete, glabrous, internodes 1–10 cm long, 3–8 mm diam., green to brown; branches occasional. Leaves subequal in a pair, petiolate; blades elliptic, oblong to obovate, 5–17 cm long, 2–6 cm wide at widest point, coriaceous, apex acuminate, base acute, margin entire to serrulate, veins pinnate, 4–6 on each side, prominent on lower side, deep or rich green, shiny, glabrous adaxially, pale green with a flesh-colored midrib or silvery, glabrous abaxially; petioles 0.5–3.0 cm long, 1–3 mm diam., glabrous. Inflorescences shorter than the leaves, few-flowered, congested in upper axils; peduncles lacking; bracts present and obvious, elliptic to ovate, 2–4 × 1.5–2.5 cm, basal bracts pale green outside, those above

pinkish, inside rose-wine, or lavender or deep purple veins with green margins; pedicels curved at apex, ca. 2 cm long, 4–5 mm diam., dull wine-red to lavender. Flowers showy; calyx lobes divided almost to base, size and shape similar to the bracts, but for the somewhat smaller dorsal lobe, pale green outside with red-purple veining, inside a rich orchid-purple to wine-red with darker veins; corolla white, limb yellow with purple spots outside, inside purple dotted or lined, lobes veined purple or rose; stamens adnate to corolla base, filaments connate above attachment to corolla, coiling after anthesis; disc a single posterior nectariferous gland; ovary ovoid, glabrous. Fruit a fleshy capsule, broadly ovoid, ca. 3.2 × 2.2 cm, buff-flesh-colored to dull purple; seeds fusiform, ca. 1.0 × 0.4 mm, with the fleshy funiculus persistent, striate.

Distribution. *Drymonia pudica* is known in Venezuela from the states of Aragua, Carabobo, and Yaracuy, where it has been collected at 900–1,400 m in shady sites in rich cloud forests, flowering from March to August.

Additional specimens examined. VENEZUELA. ARAGUA: Pittier National Park, between Rancho Grande and Dos Riitos, 900 m, 19–20 May 1943, *Killip & Lasser 37765* (US, VEN); km 24, June 1938, *Williams 10209* (F, F, US); Ocumare–Maracay, 1 Aug. 1925, *Pittier 11858* (A, G, K, US). CARABOBO: electric plant at Borburata, Aug. 1960, *Aristeguieta 4367* (US); Upper Guaremales, road from Puerto Cabello to San Felipe, 100–500 m, 15 July 1920, *Pittier 8959* (US); Río San Gián, S of Borburata, above the electric plant, between Los Tanques and La Toma, 750 m, 27–28 Mar. 1966, *Steyermark & Steyermark 95153* (F, US). YARACUY: El Amparo, N of Salóm, Santa Rosa road, 1,200 m, 27 May 1973, *Diederichs 229* (VEN); El Amparo near Candelaria, 7 km N of Salóm, 1,220–1,250 m, 17–19 June 1972, *Steyermark 106278* (F, NY, US, VEN).

Leeuwenberg (in litt.) noted that Decaisne as early as 1849 had indicated this taxon to be different by citing specimens (e.g., *Linden 547* (not seen by us)) under the name “*Macrochlamys guttatus*.” Up to the present this latter name has not been validly published, although plants under the name “*Drymonia guttata*” have been in cultivation since 1963, when Steyermark introduced material from the type number. Plants were first grown in cultivation at the New York Botanical Garden under NYBG accession 486/85 and at Cornell University as G-1080. George Bunting collected material of *Drymonia pudica* from

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Figure 1. *Besleria parviflora*. —A. Habit. —B. Lower leaf surface. —C. Flower buds. —D. Flower. —E. Opened corolla with stamens. —F. Pistil and nectariferous disc. —G. Mature berry. —H. Seeds. (A–F from *Steyermark 74810*; G, H from *Steyermark 60052*.)

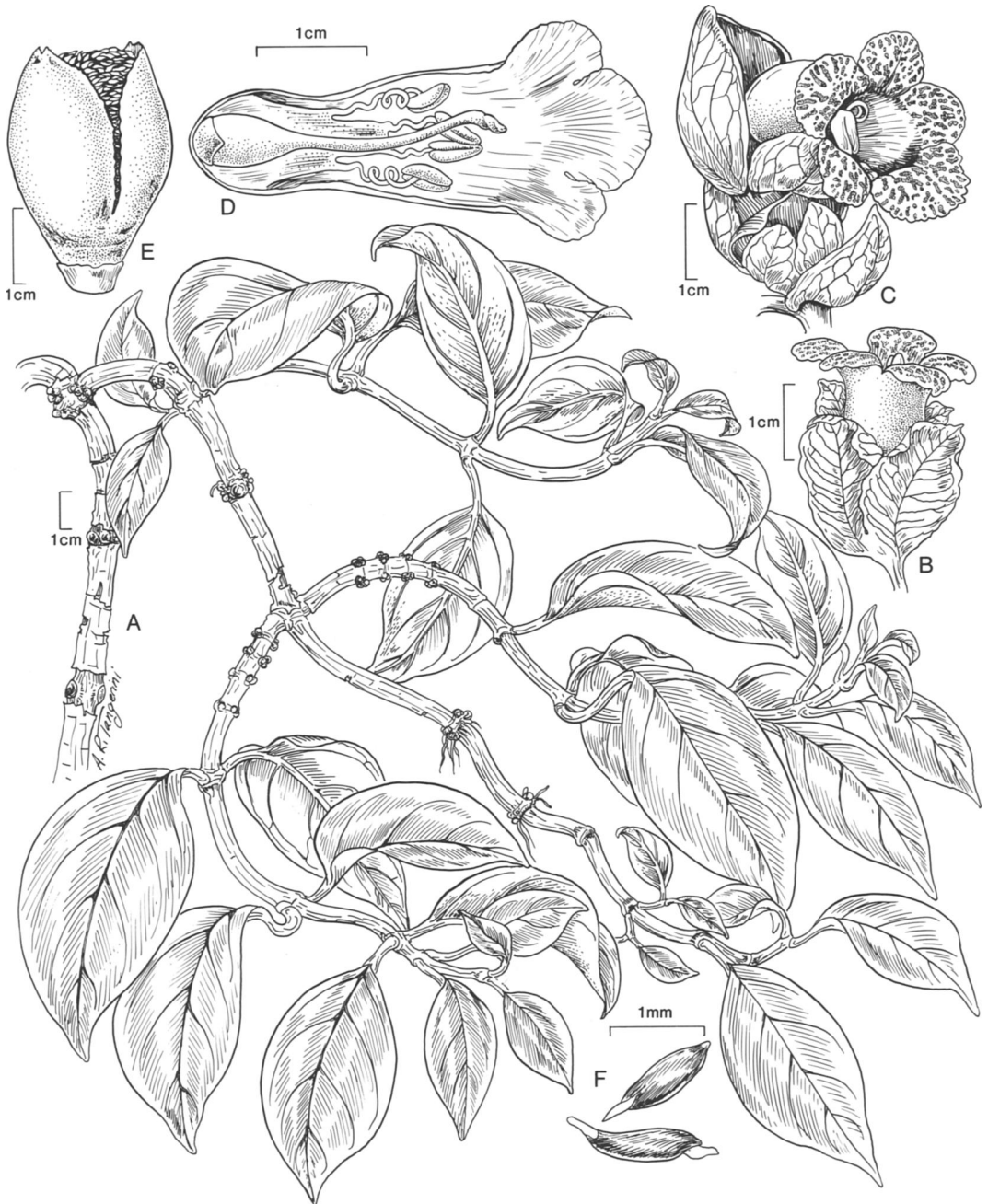


Figure 2. *Drymonia pudica*. —A. Habit. —B. Flower. —C. Flower (face view). —D. Corolla cut open, with stamens, nectariferous gland and pistil. —E. Capsule. —F. Seeds. (A from living material and Steyermark 91529; B, C from Steyermark 106287; D from Killip & Lasser 37765; E, F from Steyermark 91529.)

Pittier National Park in Venezuela in 1968 and sent it to Cornell University where it was grown as G-1292. Plants of this species are still in cultivation from both the Steyermark and the Bunting collections.

No flowers have been seen on *Drymonia pudica*

cultivated in temperate regions, hence the specific epithet.

Another endemic Venezuelan species, *Drymonia crassa* C. Morton (1953), differs in having white fleshy corollas with undistinguished calyx lobes that

are green with lilac margins, 25×9 –12 mm, leaves densely hirtellous or puberulous on the veins below, 5 – 8×1.5 –3.0 cm, bracts linear oblong, ca. 20×5 mm, entire, and pilose.

Nautilocalyx arenarius L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Territorio Federal Amazonas: white sand savanna and dwarf forest, 1 km E of Maroa, $2^{\circ}45'N$, $67^{\circ}35'W$, 125 m, 20 Apr. 1970, *Steyermark & Bunting 102830* (holotype, VEN; isotypes, MO, US). Figure 3.

Nautilocalyci whitei Rusby affinis, sed plantis arenariis, foliis in pagina inferiore venis pubescentia ravida sericea tectis, floribus 2–4 in axillis differt.

Low, spreading, terrestrial suffrutescent herbs; stems brittle, 6–10 cm long and 3–4 mm wide, densely sericeous, several branched from the base. Leaves subsessile or shortly petiolate, 4–6 pairs on each stem; blades narrowly elliptic-lanceolate or oblanceolate, 7.5 – 10×0.7 –2.2 cm, apex acute, base narrowly acute and decurrent onto the inconspicuous petiole, softly coriaceous, lateral veins strongly ascending toward apex at an angle of 60 – 70° , scarcely evident but concealed by densely gray-pale sericeous pubescence abaxially, veins abaxially obsolete with surface dull green, minutely and densely pubescent, margin minutely and inconspicuously crenulate-serrulate with 30–35 low glandular obtuse projections (these end in a flat tip with a depressed part) along the upper $\frac{2}{3}$ of the blade; petioles, when present, 5 – 10×2 –3 mm, densely sericeous. Inflorescences axillary, densely flowered, with 2–4 flowers in fascicles on each side; bract subtending each side of a flower cluster, ovate to lanceolate-elliptic, 1.2 – 2.0×0.6 –0.8 cm, acute at apex, narrowed to the base, glabrous adaxially, tomentose abaxially; pedicels absent or to 11 mm long, densely tomentose. Flowers with the calyx conspicuously gamosepalous, 18–20 mm long, tube campanulate, 10–15 mm long, asymmetrically rounded at base and slightly gibbous on dorsal side, 0.7 cm wide at base, 1.2 cm wide at summit, pale green, moderately to densely villosulous outside, minutely sparsely appressed-pubescent inside, lobes unequal, ovate-lanceolate, 10–11 mm long, 5 mm wide below, narrowed apically, subtubose or obtusely acute, with a shorter intermediate lobe, densely pubescent outside, sparsely appressed inside below apex, glabrescent within below, upper margins of the larger lobes with repand subglandular enlargements; corolla mostly white, suffused with purple, 4.7–5 cm long, tube 3.8–3.9 cm long, 0.4 cm wide at base, 0.7–0.9 cm wide at middle, 0.8–1.0 cm wide at mouth,

dorsally villous at base, appressed-pubescent elsewhere, limb ca. 2.3 cm wide, larger lobes suborbicular, 1×0.7 –0.8 cm, rounded, pink-tinged, appressed-pubescent outside on lower part, glabrous elsewhere, glabrous and pink dotted within, the smaller lobes densely appressed-pubescent outside, inside glabrous; stamens included, filaments glabrous, anthers reniform-suborbicular, 2×2 mm, bilobed, rounded at summit; disc of a single bilobed gland, ovoid-oblong, 1.8 – 2.0×1.5 –1.8 mm, with a sulcate longitudinal groove medially; ovary slenderly ovoid, densely sericeous-tomentose, style densely pilose with spreading hairs ca. 1 mm long. Fruit not seen.

Distribution. *Nautilocalyx arenarius* is apparently very limited in distribution but locally common near San Carlos de Río Negro in Territorio Federal Amazonas, Venezuela, except for the type specimen collected near Maroa. All collections were growing at about 120 m elevation in low forest on white sand.

Vernacular names. “Jabilla” (Baré language), “gordura” (Spanish) (both *Clark 6617*).

Additional specimens examined. VENEZUELA. TERRITORIO FEDERAL AMAZONAS: Distr. Río Negro, 3 km NE of San Carlos de Río Negro, ca. 20 km S of confluence of Río Negro and Brazo Casiquiare, $1^{\circ}56'N$, $67^{\circ}03'W$, 119 m, 31 Dec. 1977, *Clark 6464* (MO, NY, US, VEN); 10.8 km NE of San Carlos on Solano road, ca. 20 km S of confluence of Río Negro and Brazo Casiquiare, $1^{\circ}56'N$, $67^{\circ}03'W$, 119 m, 19 Apr. 1978, *Clark 6617* (NY); km 11 NE of San Carlos de Río Negro along road to Solano, $1^{\circ}53'N$, $67^{\circ}02'W$, 75 m, 24 June 1984, *Davidse & Miller 26552* (MO, US); San Carlos de Río Negro, 20 km from the confluence of Río Negro and Brazo Casiquiare, $1^{\circ}56'N$, $67^{\circ}W$, 119 m, *Delascio et al. 9341* (VEN); 7 km from San Carlos de Río Negro along the road to Solano, 18 Nov. 1978, *Fernandez 3447* (MY); 11 km N of San Carlos on road to Solano, $1^{\circ}47'N$, $67^{\circ}48'W$, 120 m, 5 Apr. 1984, *Gentry et al. 46371* (MO, US); IVIC study area, 4 km E of San Carlos de Río Negro, 120 m, $1^{\circ}56'N$, $67^{\circ}4'W$, 120 m, 10 Nov. 1977, *Liesner 3286* (MO, US, VEN), 1 Dec. 1977, *Liesner 4132* (MO, VEN), 9 Apr. 1979, *Liesner 6417* (MO, VEN); 9 km NE of San Carlos de Río Negro, $1^{\circ}57'N$, $67^{\circ}W$, 120 m, 26 Nov. 1977, *Liesner 3907* (MO, US, VEN); San Carlos de Río Negro, Oct. 1974, *Medina s.n.* [herb. no. 223665] (VEN); 2 km N of San Carlos, along road to Solano, 6 Feb. 1977, *Morillo & Villa 5342* (VEN); 12 km N of San Carlos, 100–120 m, 6 Feb. 1977, *Morillo & Villa 5383* (VEN); 6–7 km S of Solano, 120 m, *Morillo & Villa 5448* (VEN); 1–4 km NE of San Carlos, $1^{\circ}56'N$ $67^{\circ}02'W$, 100 m, 24 Apr. 1974, *Morillo et al. 3909* (VEN—2 sheets); near San Carlos de Río Negro, along road to Solano, 28 Aug. 1982, *Ruíz & Ramirez 4030* (MY); Upper Río Negro, San Carlos, 15 Dec. 1947, *Schultes & Lopez 9370* (US—2 sheets); near San Carlos, 1853–1854, *Spruce 3469* (K—2 sheets); 3 km NE of San Carlos de Río Negro along road to Solano, 120 m, 9 Apr. 1984, *Stein 1500* (MO, US); near

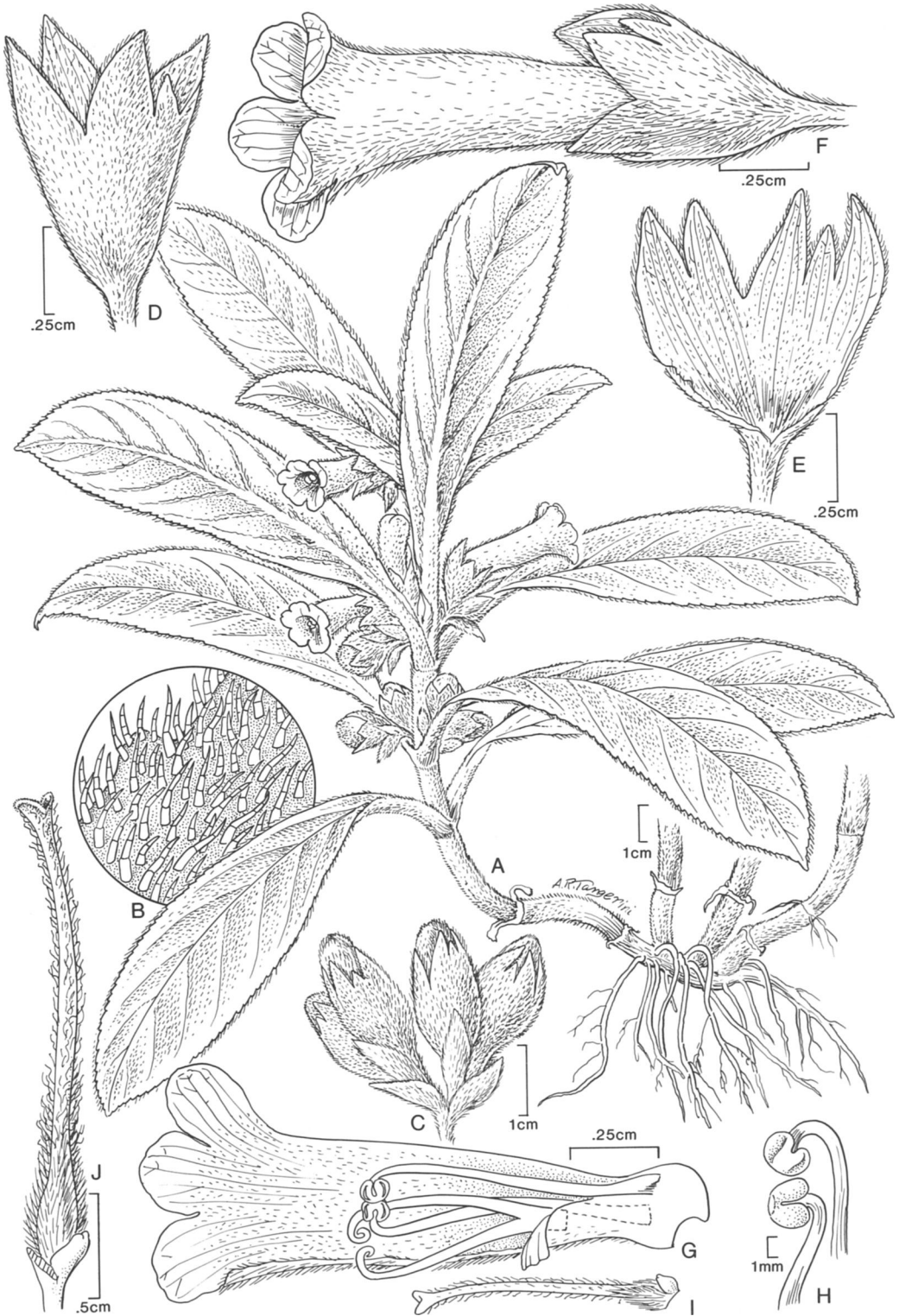


Figure 3. *Nautilocalyx arenarius*. —A. Habit. —B. Leaf surface. —C. Flower buds. —D. Calyx. —E. Calyx opened. —F. Flower. —G. Corolla opened, with stamens. —H. Anthers. —I, J. Pistil and nectariferous gland. (A from Spruce 3469; B–J from Steyermark & Bunting 102830, Clark 6454, and Clark 6617.)

San Carlos de Río Negro, 1°55'N, 67°W, 125 m, *Wessels Boer 2272* (US).

Nautilocalyx arenarius resembles most closely *N. whitei* Rusby from Bolivia and Peru in habit. *Nautilocalyx whitei* has leaves that are pale green below with obvious reddish veins, 1–2 flowers per axil, and corollas ca. 3 cm or less long. Plants of the latter species, however, do not grow in white sand areas, but rather in tall, wet forest at a somewhat higher elevation.

Nautilocalyx cordatus (Gleason) L. E. Skog, comb. nov. Basionym: *Episcia cordata* Gleason, Bull. Torrey Bot. Club 58: 466. 1931. TYPE: Venezuela. Amazonas: waterfall at Agüita, *Tate 878* (holotype, NY; isotypes, K, US).

Centrosolenia hirsuta Benth., London J. Bot. 5: 362. 1846 (not *Nautilocalyx hirsutus* (Sprague) Sprague). *Episcia hirsuta* (Benth.) Hanst., Linnaea 34: 350. 1865. TYPE: Guyana. Banks of the Río Parana, *Schomburgh s.n.* (holotype, K).

Distribution. *Nautilocalyx cordatus* is found in the Guayana Highlands of Brazil, Guyana, Surinam, and Venezuela in damp locations in montane rainforests.

Representative specimens examined. VENEZUELA. TERRITORIO FEDERAL AMAZONAS: Cerro Duida, 305–1,095 m, 25–26 Aug. 1944, *Steyermark 57996* (US, VEN); Cerro Aratitoyope, 2°10'N, 65°34'W, 990–1,670 m, 24–28 Feb. 1984, *Steyermark, Berry & Delascio 130055* (NY, US, VEN); Río Siapa, 8 km below Raudal Gallineta, 130–300 m, 20 July 1959, *Wurdack & Adderley 43504* (US—2 sheets).

Among other characters *Nautilocalyx* and *Episcia* are separated because of the presence of axillary stolons in *Episcia* and the lack of such stolons in *Nautilocalyx*. *Episcia hirsuta* had been maintained in *Episcia* because it was believed that the species is stoloniferous. However, no specimens definitely attributable to the taxon appear to have stolons, including the type specimen. Therefore, the species is here transferred to *Nautilocalyx*.

Centrosolenia hirsuta Benth., a synonym of *Nautilocalyx cordatus*, is the type species of *Centrosolenia* Benth., a generic name that predates *Nautilocalyx* Linden ex Hanst. A proposal for the conservation of *Nautilocalyx* against *Centrosolenia* has been submitted for consideration by the next botanical congress (Feuillet & Skog, 1990).

Nautilocalyx chimantensis L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Bolívar: Chimantá Massif, common along shaded wet bluffs and by waterfall, along SW-facing sand-

stone bluffs and Chimantá-tepui (Torono-tepui), near southern corner, 1,700 m, 19–20 May 1953, *Steyermark 75473* (holotype, US; isotypes, F, VEN). Figure 4.

A *Nautilocalyce cordato* (Gleason) L. E. Skog corollarum tubis rubris angustioribus parvisque, calycum tubis parvis, lobis ligulato-oblongis, obtusis vel rotundatis, parte tertia superiore repando-dentatis differt.

Terrestrial, suffrutescent herbs; stems elongated, horizontal except at tip, and rooting at nodes, internodes along horizontal stem 4.5 cm long, 3–4 mm diam., flowering part of stem erect, 3–5 cm long. Leaves appearing alternate, petiolate; blades broadly oblong or ovate-oblong, 7–13 × 4–9 cm, apex broadly rounded or rarely subobtusate, base rounded to subcordate, margin shallowly crenate-dentate with 50–54 broadly rounded crenations 3–3.5 × 0.5 mm, the crenations either mainly similar and all broad, or the broader intercalated with smaller ones, adaxially rugose and deep green, sparsely pilosulous with pale hairs 0.5 mm long over a surface thickly covered with circular scales, abaxially pale green or wine-orchid purple, densely villous with spreading hairs 1–1.5 mm long on midrib and lateral nerves and on the tertiary veins shorter, ca. 0.5 mm long, lower epidermis also covered with numerous obscure circular scales; petioles 2.5–7 cm long, densely villous with spreading hairs 0.5–0.7 mm long. Inflorescences of 2–4-flowered fascicles in the upper axils; pedicels 2–3.5 cm long, reddish below, densely villous with spreading hairs 1–1.5 mm long. Flowers with calyx lobes ligulate-oblong, 8 × 2.5 mm, pale green, apex obtuse or rounded, shallowly 2–3 repand-dentate in upper $\frac{2}{3}$, the repand part appearing as a subglandular protuberance pilose with hairs 0.7–1 mm long, scattered over the outer surface but absent from inner surface, hairs septate and gland-tipped; corolla deep red, tube slender, 3 cm long, gibbous at base, the spur ovate-oblong, 3 × 2 mm, tube 3–4 mm wide at base, 4–6 mm wide at summit, sparsely to moderately pilose-villosulous in dorsal portion and in ventral portion, lobes orbicular, upper three lobes larger, 10–12 × 13–17 mm, lower two lobes smaller, ca. 10 × 10 mm, all glabrous both sides, margin erose; stamens adnate to base of corolla tube for ca. 3 mm, filaments coiling after anthesis, anthers joined in two pairs, 1–2 mm long; disc of a single dorsal nectariferous gland; ovary narrowly ovoid, pilose-sericeous, style ca. 2 cm long, stigma stomatomorphic. Fruit not seen.

Distribution. *Nautilocalyx chimantensis* is apparently endemic to the Chimantá Massif, Bolívar, Venezuela, where it grows on exposed or wet banks.



Figure 4. *Nautilocalyx chimantensis*. —A. Habit. —B. Leaf surface. —C. Flower bud. —D. Flower. —E. Flower (face view). —F. Corolla opened with stamens. —G. Flower with corolla and stamens removed, with calyx, pistil, and nectariferous gland. (A, C-G from *Steiermark 75408*; B from *Steiermark 75473*.)

Additional specimen examined. VENEZUELA. BOLÍVAR: exposed rocky slopes of quebrada on SW-facing portions of Chimantá-tepui (Torona-tepui), Chimantá Massif, 1,410 m, 15 May 1953, *Steyermark 75408* (F, US, VEN).

Nautilocalyx chimantensis differs from *N. cordatus* (Gleason) L. E. Skog, which has similar-shaped leaves, in having red corollas with narrower and shorter corolla tubes, ligulate-oblong, obtuse or rounded and shorter calyx lobes that are repandentate in upper one-third. It differs from *N. maguirei* (described below) in having rounded or obtuse, oblong or obovate-oblong leaf blades with more depressed, rounded crenations, cordate-based and ligulate-oblong, rounded or obtuse, repand-margined calyx lobes.

Nautilocalyx fasciculatus L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Territorio Federal Amazonas: rainforest between Camp I and Culebra, Cerro Huachamacari, Río Cunucunuma, 400 m, 21 Dec. 1950, *Maguire, Cowan & Wurdack 29982* (holotype, US; isotype, US). Figure 5.

Internodiis elongatis, nodis radicanibus, floribus axillaribus fasciculatis, lobis calycis angustis nonnullis apicibus protuberationibus 1–2 munitis, glande dorsali interiore incrassata circulari, trichomatibus omnibus septatis.

Terrestrial, suffrutescent herbs; stems erect, decumbent at base, 20–50 cm tall, 4–5 mm diam., rooting at nodes, internodes elongated, 4–9 cm long, sparsely villous with conspicuously septate hairs. Leaves petiolate; blades oblong-elliptic, 11–18 × (3.5–)4.5–7 cm, membranous, apex and base acute, margins closely low crenate-serrulate from base to apex with 45–70 teeth on each side, margins somewhat ciliate, lateral veins obscure adaxially, 10–11 on each side, ascending at 50–60° angle, faintly anastomosing at 2–3 mm from the margin or ending inconspicuously at margin, sparsely villous with septate hairs 1–1.5 mm long, more dense toward margin, otherwise glabrous, tertiary venation faintly reticulate abaxially with impressed veinlets, sparsely to moderately villous on midrib and lateral veins with hairs 1–1.5 mm long. Inflorescences of 2–5 flowers in fascicles in leaf axils; pedicels 8–20 mm long when elongated, densely villous with conspicuously septate hairs 1.2–2 mm long. Flowers with the calyx tube 2–3 mm long and wide, densely villous, lobes narrowly lanceolate or linear-lanceolate, unequal, 10–15 × 2 mm, slenderly attenuate to apex, 0.7 mm wide, densely villous with 1.5–2-mm-long conspicuously septate hairs, some of the lobes with 1 or 2 remote thickened protuberances rounded on each side; corolla red, tube narrowly

infundibuliform, (3.3–)3.7–5.0 cm long, base gibbous or spurred, spur oblong, rounded, 4 × 3 mm, tube 3–4 mm wide near the base, ca. 5 mm wide near the mouth, densely septate villous outside except at glabrous base, lobes 5–6 mm long and wide, outside villous, inside glabrous; stamens included, filaments adnate to corolla base for about 9 mm above base, then free for ca. 12 mm, glabrous, anthers connate in pairs, laterally flattened and coherent, 2 × 1.8 mm, bilobate at base, round-truncate at summit; disc of a single dorsal gland, or rarely of 2 glands, the dorsal gland oblong, 1.5 × 0.9 mm, rounded and subtruncate at summit, upper median part depressed on outside, inside with a circular thickening, the second gland, when present, ventral, elliptic to acute; ovary narrowly ovoid, 4.5 × 2 mm, densely sericeous with ascending wine-red hairs, style 18–20 mm long, glabrous, stigma bilobate. Fruit an ovoid bivalved capsule surrounded by the persistent calyx; seeds ellipsoid to globose, ca. 0.7 × 0.5 mm, striate.

Distribution. *Nautilocalyx fasciculatus* is known only from damp forests in Territorio Federal Amazonas, Venezuela, at 400–800 m.

Additional specimens examined. VENEZUELA. TERRITORIO FEDERAL AMAZONAS: lowland and slope forests, high montane forest, 2 km S of Camp 3, Cerro de la Neblina, Río Yatua, 800 m, 24 Dec. 1953, *Maguire, Wurdack & Bunting 36874* (US); Depto. Atabapo, open and forested area around waterfall, slope of Cerro Huachamacari, 3°39'N, 65°42'W, 750 m, 6 Mar. 1975, *Liesner 18381* (MO).

Nautilocalyx fasciculatus can be distinguished by its axillary, fasciculate flowers, narrow calyx lobes with 1–2 protuberances near apex, the interior of dorsal gland with a circular thickening, the strongly septate hairs throughout, and elongated internodes.

Nautilocalyx maguirei L. E. Skog & Steyermark, sp. nov. TYPE: Venezuela. Bolívar: Cerro Guaquinima, Río Paragua, on wet rock face of second escarpment in mixed forest, 1,100 m, 14 June 1952, *Maguire 33112* (holotype, US; isotypes, NY, US). Figure 6.

A *Nautilocalyce prophyrotricho* (Leeuwenb.) Wiehler foliis elliptico-oblongis basibus asymmetricis vel oblique obtusis vel rotundatis, petiolis longioribus, paginis inferioribus glabrioribus cum pilis parvis sparsim dispersis, pedicellis longioribus, bullis paginarum superiorum distantioribus.

Terrestrial, subsucculent herbs; stems short, only about 2 cm tall with densely sericeous shortened internodes, or elongated to 12 cm with internodes



Figure 5. *Nautilocalyx fasciculatus*. —A. Habit. —B. Flower with corolla removed. —C. Sepal margin. —D. Flower. —E. Corolla opened, with stamens after anthesis. —F. Corolla base with young stamens. —G. Ventral nectariferous gland. —H. Dorsal nectariferous gland. —I. Capsule with persistent calyx. —J. Seeds. (All from Maguire, Cowan & Wurdack 29982.)



Figure 6. *Nautilocalyx maguirei*. —A. Habit. —B. Flower. —C. Corolla opened, with stamens. —D. Flower with corolla and stamens removed. —E. Capsule with persistent calyx. (A–C, from *Maguire 33112*; D, E, from *Maguire 32736*.)

4.5–6 cm long, 4–6 mm wide and shortly pubescent. Leaves few at apex of stem, petiolate; blades elliptic-oblong to oblong-elliptic, 13–26 × 5–10.5 cm, shortly acute to shortly subacuminate at apex, base suboblique with one side usually obtuse to rounded or some leaves narrowed to an acute base, margin grossly subirregularly dentate from base to apex with 53–85 suborbicular to broadly ovate subobtuse to rounded teeth on each side, and most of lateral nerves or tertiary venation subprominent on lower surface, impressed on upper surface, lateral nerves 14–17 on each side, anastomosing near margin, adaxially bright green, bullate with large bullae 2–3 mm diam. surmounted by few to several short hairs, each upraised bulla bordered by a 4–6-sided reticulum faintly impressed, abaxially glabrous with short, sparse, spreading hairs on midrib; petioles 2.5–8 cm long, 2–3 mm wide, densely villous. Inflorescences mainly of 2–4 flowers in fascicles arising together at the apex of short stem or on an elongated portion of stem; bracts narrowly lanceolate, 4–6 × 0.7–0.8 mm, apex slenderly attenuate, densely appressed-pubescent; pedicels at maturity 2–6 cm long, densely villous with hairs 1.5–2 mm long. Flowers with calyx 6–13 mm long, tube 1.5–2.0 mm long, 5 mm wide at base, lobes subequal, narrowly lanceolate, 7–12 × 1.5–3.5 mm, apex slender acuminate and toothed, densely villous with ascending hairs on both sides from base to apex; corolla red, 3 cm long, tube 2.3 cm long, slightly gibbous at base dorsally, 7–8 mm wide toward mouth, ventrally glabrous for 2 mm, dorsally villous and densely appressed-pilose on rest of the surface outside, glabrous within except sparsely pilosulous for 2.5 mm at summit, lobes suborbicular, 6 × 8 mm, rounded, outside glabrous except appressed-pubescent at base of some lobes, inside glabrous; stamens included, filaments glabrous, anthers suborbicular, 1.2 × 1.1 mm, lobed at base; disc a dorsal nectariferous gland, oblong, 1.5 × 1.0 mm, subtruncate at apex; ovary ovoid, 3 × 2.5 mm, short sericeous, style 12 × 0.3 mm, glabrous. Fruit a globose capsule; seeds not seen.

Distribution. *Nautilocalyx maguirei* is known only from moist cliff faces and shaded banks on Cerro Guaiquinima in Estado Bolívar, Venezuela, at 1,000–1,200 m.

Additional specimens examined. VENEZUELA. BOLÍVAR: Cerro Guaiquinima, upper Río Paragua, 1,200 m, 27 Aug. 1943, Cardona 903 (VEN), Cardona 955 (VEN); base of second escarpment, 1,000 m, 21 Dec. 1951, Maguire 32736 (NY, US).

Nautilocalyx maguirei differs from *N. porphyrotrichus* (Leeuwenb.) Wiehler, which is similar in habit, corolla color and calyx characters, but differs as follows: 1. leaf blades for the most part asymmetrically or obliquely obtuse or rounded, on at least one or both sides; 2. leaf blades elliptic-oblong or oblong-elliptic, but mainly broader; 3. petioles mainly longer; 4. lower leaf surfaces more glabrescent with short, more sparsely scattered pubescence on midrib and nerves, with the larger tertiary reticulum glabrous or nearly so, contrasted with a denser and longer pubescence on midvein and other veins in *N. porphyrotrichus* and resulting in an overall denser pubescence over the lower surface with smaller tertiary reticulum; 5. pedicels longer; and 6. bullae of upper surface more distant, the upper surface presenting a more glabrous aspect whereas the bullae in *N. porphyrotrichus* are more closely crowded, and the leaf surfaces are more densely pubescent.

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