TABLE 1. List of 37 voucher specimens transferred from SEL to PTBG, organized alphabetically by species. ID numbers are J.R. Clark's DNA extraction numbers and are those referenced in the two papers. GenBank accession numbers are included for all vouchers for each of the three genic regions analyzed. *C.* = *Cyrtandra*; ITS = internal transcribed spacer regions 1 and 2, including the 5.8S subunit; ETS = external transcribed spacer region; *psbA-trnH* = chloroplast sequence data.

Species of *Cyrtandra*	ID no.	Collector and no.	Origin	ITS	ETS	*psbA-trnH*	Publication(s) of Clark et al.
C. anthropophagorum Seem. ex A.Gray	C0114	Clark 688	Fiji, Viti Levu	EU919987	EU919926	EU920042	2008, 2009
C. aurantiicarpa G.W.Gillett	C0076	Clark 655	Samoa, Savai'i	EU919971	EU919910	EU920030	2008, 2009
C. aurantiicarpa G.W.Gillett	C0076	Clark 655	Samoa, Sava'i	EU919971	EU919910	EU920030	2008
C. calpidicarpa (Rock) H.St.John & Storey	C0053	Clark 584	Hawai'i, O'ahu	GQ475168	GQ475080	GQ475123	2009
C. calpidicarpa (Rock) H.St.John & Storey	C0040	Clark 571	Hawai'i, O'ahu	EU919951	EU919890	EU920010	2008
C. cf. *occulta* A.C.Smith	C0119	Clark 702	Fiji, Viti Levu	EU919990	EU919929	GQ475138	2008, 2009
C. cf. *pogonantha* A.Gray	C0067	Clark 645	Samoa, U'polu	GQ475170	GQ475082	GQ475126	2009
C. cf. *richii* A.Gray	C0068	Clark 646	Samoa, U'polu	EU919967	EU919906	EU920026	2008, 2009
C. compressa C.B.Clarke	C0074	Clark 652	Samoa, Sava'i	EU919970	EU919909	EU920029	2008, 2009
C. compressa C.B.Clarke	C0075	Clark 653	Samoa, Savai'i	GQ475172	GQ475085	GQ475128	2009
C. cordifolia Gaudich.	C0048	Clark 579	Hawai'i, O'ahu	EU919955	EU919894	EU920014	2008, 2009
C. grandiflora Gaudich.	C0046	Clark 577	Hawai'i, O'ahu	EU919954	EU919893	EU920013	2008, 2009
C. grayana Hillebr.	C0103	Clark 666	Hawai'i, Maui	EU919982	EU919921	EU920039	2008, 2009
C. grayi C.B.Clarke	C0105	Clark 676	Hawai'i, Maui	EU919984	EU919923	EU920040	2008, 2009
C. hawaiensis C.B.Clarke	C0038	Clark 569	Hawai'i, O'ahu	EU919949	EU919888	EU920008	2008
C. hawaiensis C.B.Clarke	C0101	Clark 661	Hawai'i, Maui	GQ475175	GQ475088	GQ475133	2009
C. kauaiensis Wawra	C0026	Clark 556A	Hawai'i, Kaua'i	EU919940	EU919879	EU919999	2008, 2009
C. kauaiensis Wawra	C0028	Clark 558	Hawai'i, Kaua'i	GQ475167	GQ475079	GQ475121	2009
C. kaulantha H.St.John & Storey	C0041	Clark 572	Hawai'i, O'ahu	EU919952	EU919891	EU920011	2008
C. kealiae Wawra	C0035	Clark 566	Hawai'i, Kaua'i	EU919947	EU919886	EU920006	2008
C. laxiflora H.Mann	C0037	Clark 568	Hawai'i, O'ahu	EU919948	EU919887	EU920007	2008
C. leucantha A.C.Smith	C0116	Clark 693	Fiji, Viti Levu	EU919988	EU919927	GQ475136	2008, 2009
C. longifolia (Wawra) Hillebr. ex C.B.Clarke	C0023	Clark 551	Hawai'i, Kaua'i	EU919939	EU919878	EU919998	2008, 2009
C. milnei Seem. ex A.Gray	C0113	Clark 687	Fiji, Viti Levu	EU919986	EU919925	GQ475135	2008, 2009
C. munroi C.N.Forbes	C0104	Clark 675	Hawai'i, Maui	EU919983	EU919922	GQ475134	2008, 2009
C. occulta A.C.Smith	C0117	Clark 694	Fiji, Viti Levu	EU919989	EU919928	GQ475137	2008, 2009
C. pogonantha A.Gray	C0071	Clark 649	Samoa, U'polu	EU919968	EU919907	EU920027	2008
C. pogonantha A.Gray	C0066	Clark 644	Samoa, U'polu	GQ475169	GQ475081	GQ475125	2009
C. pogonantha A.Gray	C0081	Clark 660	Samoa, U'polu	GQ475173	GQ475086	GQ475129	2009
C. propinqua C.Forbes	C0039	Clark 570	Hawai'i, O'ahu	EU919950	EU919889	EU920009	2008, 2009
C. richii A.Gray	C0072	Clark 650	Samoa, Sava'i	EU919969	EU919908	EU920028	2008, 2009
C. richii A.Gray	C0073	Clark 651	Samoa, Savai'i	GQ475171	GQ475084	GQ475127	2009
C. sandwicensis (H.Lév.) H.St.John & Storey	C0045	Clark 576	Hawai'i, O'ahu	EU919953	EU919892	EU920012	2008, 2009
C. sp.	C0050	Clark 581	Hawai'i, O'ahu	EU919956	EU919895	EU920015	2008
C. spathulata H.St.John	C0102	Clark 664	Hawai'i, Maui	EU919981	EU919920	EU920038	2008, 2009
C. wainihaensis H.Lév.	C0021	Clark 549	Hawai'i, Kaua'i	EU919937	EU919876	EU919996	2008, 2009
C. wawrae C.B.Clarke	C0022	Clark 550	Hawai'i, Kaua'i	EU919938	EU919877	EU919997	2008, 2009

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AN ANNOTATED SPECIES LIST FOR THE GESNERIACEAE OF CUBA

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ABSTRACT. This checklist includes all type locality information, nomenclature (including synonyms), habit, regional and political distribution for all of the Gesneriaceae reported from Cuba. Additional details are provided for species circumscriptions that differ from previous studies. Discussions are accompanied by figures outlining pertinent details for new circumscriptions. This checklist recognizes 38 species of Gesneriaceae that include the following genera: *Bellonia* (1 species), *Besleria* (1 species), *Columnea* (2 species), *Gesneria* (22 species), *Gloxinia* (1 species), *Pheidonocarpa* (1 species), *Phinaea* (1 species) and *Rhytidophyllum* (9 species). There are 30 endemics and 1 introduced species of Gesneriaceae in Cuba. Lectotypifications are provided for seven taxa. A look-up table is provided to facilitate referencing currently recognized species circumscriptions with previous treatments.

Key words: *Bellonia*, *Besleria*, *Columnea*, Cuba, *Gesneria*, Gesneriaceae, *Pheidonocarpa*, *Phinaea*, *Rhytidophyllum*, taxonomy

INTRODUCTION

A revised circumscription of the Gesneriaceae species in Cuba is provided based on recent field expeditions, visits to herbaria, and a thorough review of original literature. Recent expeditions have resulted in an improved understanding of the taxonomy and geographic distribution of the Gesneriaceae in Cuba. The results presented here will facilitate the preparation of a treatment of the Gesneriaceae for the Flora of Cuba.

Cuba is recognized as one of the significant biodiversity hotspots in the New World owing to its biological species richness and exceptionally high percentage of endemics (Santiago-Valentin & Olmstead 2004; Acevedo-Rodríguez & Strong 2008, 2012). The Caribbean region is the third most important biodiversity hotspot on the planet (Myers et al. 2000, Mittermeier et al. 2004). Cuba is the largest island in the Caribbean and represents the richest flora with the highest proportion of endemics for the region. Of the more than 6500 species of plants in Cuba, over half (>3300) are endemic, with 65 endemic genera (Santiago-Valentin & Olmstead 2004; Acevedo-Rodríguez & Strong 2008, 2012). After Cuba, the next largest Caribbean island is Hispaniola with more than 5400 species of plants, of which about 2200 are endemic and with 31 endemic genera (Acevedo-Rodríguez & Strong 2008, 2012).

The remarkably high percentage of endemic plants in Cuba has been attributed to the complex geological history of the island relative to neighboring islands (Draper et al. 1994). Similarly, within Cuba, the highest concentration of endemic plants is located in the eastern region as a result of extreme variation in climate, geologic history, and diversity of habitats. For example, it is possible to visit the region with the highest precipitation (Baracoa) and the driest region (Guantánamo) in an afternoon.

As recently discussed by Santiago-Valentin and Olmstead (2004), knowledge of Caribbean and

Cuban diversity is primarily based on faunal studies. Likewise, Acevedo-Rodríguez and Strong (2008) discussed challenges in evaluating plant endemism in the Caribbean because of limitations on the current state of information and specifically because of unresolved taxonomic and nomenclatural issues. The Gesneriaceae of Cuba is an example of a plant family where a dearth of taxonomic knowledge has led to artificially low numbers of recorded endemic species relative to other families of similar size in the same area. The high rate of plant endemism in Cuba is not reflected in recent monographic and floristic studies of the Caribbean Gesneriaceae (Skog 1976, 2012). Many of the species that Morton (1957a, 1957b) recognized as Cuban endemics were circumscribed more broadly by Skog (1976, 2012) and/or reduced to subspecies, varieties, or synonyms. For example, in the monographic revision of *Gesneria* (Skog 1976) there were 17 species reported in Cuba and 14 were endemic. The treatment of Gesneriaceae for the Flora of Cuba (Morton 1957a) recognized 28 species of *Gesneria* with 27 endemics. The treatment presented here recognizes 22 species of *Gesneria* with 18 endemics. Thus, some of Skog's broader species concepts are here more narrowly defined and some of Morton's narrow species concepts are here more broadly defined. The overall taxonomic diversity for *Rhytidophyllum* decreased from 12 species in Morton (1957a) to 9 recognized here. The overall decrease in recognized species for *Rhytidophyllum* is a result of the broad species circumscription of *Rhytidophyllum exsertum* based on field observations and herbarium studies.

Since 2006 the first author has visited Cuba seven times and during those trips various research expeditions have facilitated the documentation of poorly known species. Visits to major herbaria in Cuba (HAC, HAJB) allowed for assessment of species distributions and the verification of type specimens. Since Skog was not able to visit Cuba during the preparation of his treatment of *Gesneria* (1976), most of his species concepts were based on fieldwork in neighboring islands with Cuban Gesneriaceae based solely on specimens and literature. The ability to verify type specimens through the online website JSTOR Plant Science in addition to the collection of photographs of type specimens amassed by Skog made possible the compilation of the thorough list of type collections presented here.

One significant difference between the generic circumscriptions presented here and those of Skog (2012) is that a complex of three of the red-flowered species that he recognized as belonging to *Gesneria* are treated here as belonging to *Rhytidophyllum* as was done by Morton (1957a, 1957b) and by Skog earlier (1976). The presence of trichomes at the base of the filaments and the adnation of the filaments to the corolla tube in this complex is consistent with *Rhytidophyllum*. In contrast, glabrous stamens and filaments nearly free from the corolla are characters consistent with *Gesneria*. Molecular phylogenetic results based on nrDNA ITS and G-CYCLOIDEA (GCYC) by Martén-Rodríguez et al. (2010) strongly support that one species of this complex, *Gesneria rupincola* shares a recent common ancestor with *Rhytidophyllum exsertum*. The only character that suggests that the species of this complex belong to *Gesneria* is a corolla that is red instead of the more typical greenish-maroon present in most *Rhytidophyllum* species. Shifts in corolla coloration due to pollinator-mediated selection are common in the Gesneriaceae. The species of this complex are here recognized as belonging to *Rhytidophyllum* rather than to *Gesneria*.

Many of the species in Cuba are also found in other Caribbean islands. Details are only included here for synonyms applied to plants native to Cuba. Species found in Cuba with heterotypic synonyms that were described from other areas are included with the country where the type was collected (e.g., "Described from Jamaica.").

The following list is arranged by genus and species in alphabetical order. A brief description following the synonymy provides details about habit (e.g., lithophyte, shrub, herb, etc.) and distribution. Native countries and all known Cuban provinces are listed. Circumscriptions that differ significantly from Skog (1976, 2012) and Morton (1957a, 1957b) are discussed in detail, as are rare species. Appendix 1 is an alphabetical list of all accepted names and synonyms for Cuban Gesneriaceae. Accepted names are in bold.

The annotated checklist provides information on types and type distributions that have not been reported previously. Many of the non-reported types were distributed in Cuban herbaria (e.g., CSC, HABA, HABE, IH, LS, SV, IM) that are currently housed in the Cuban Institute of Ecology and Systematics in Havana (HAC). Type specimens at HAC were annotated and databased during various trips to Havana since 2006.

Bellonia L. 1 species.

Bellonia spinosa Sw., Prodr. 42. 1788. TYPE: Hispaniola. *O. Swartz s.n.* (Holotype: S; Isotypes: BM, B–W, M).

Scandent subshrub. Native to Hispaniola and Cuba (Granma, Guantánamo, Holguín, Santiago de Cuba). FIGURE 1.

Bellonia is a small genus of two species and is one of the few taxa in the Gesneriaceae with a rotate corolla. The axillary spines and single axillary flowers lacking bracts differentiate this

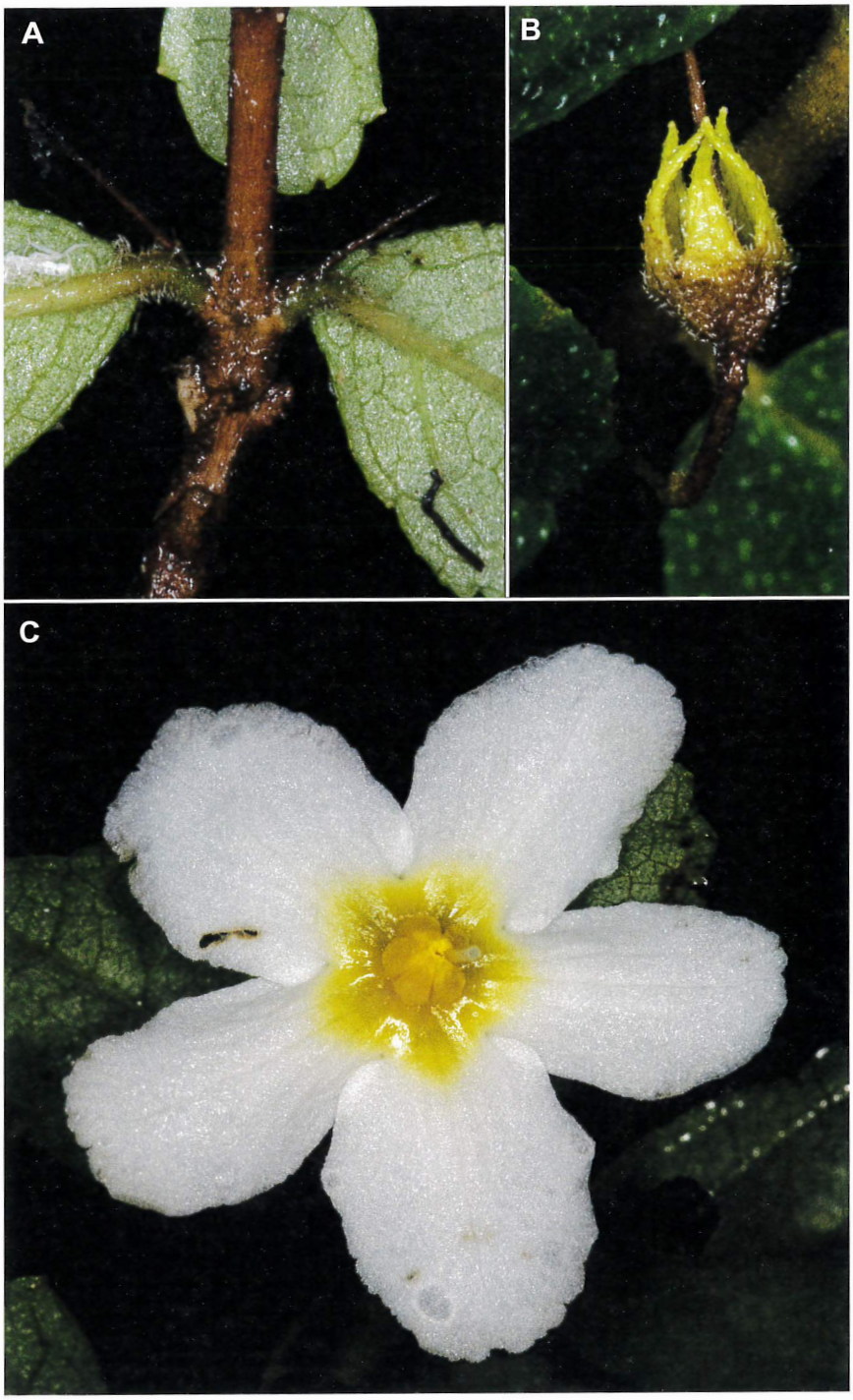

FIGURE 1. **Bellonia spinosa** Sw. **A.** Abaxial view of leaves showing spines. **B.** Calyx lobes. **C.** Front view of flower. (A–C from *J.L. Clark et al. 10573*).

species from *Bellonia aspera,* which lacks spines and has a cymose inflorescence of 2–4 flowers (Xu & Skog 1990). It was suggested by Xu and Skog (1990) that the axillary spines are derived from a modified inflorescence.

Besleria L. 1 species.

Besleria lutea L., Sp. Pl. 2: 619. 1753; *Eriphia lutea* (L.) Raf., Sylva Tellur. 77. 1838. TYPE: West Indies [Neotypified by Leeuwenberg (1958); Neotype: Burman, Plantarum Americanarum, Plumier t. 49, fig. 1. 1756].

Besleria berteroana DC., Prodr. 7(2): 538. 1839. Described from Jamaica.

Besleria lutea L. var. *alpestris* Urb., Symb. Antill. 2: 348. 1901. Described from Guadeloupe and Martinique.

Besleria lutea L. var. *brevipes* Urb., Symb. Antill. 2: 348. 1901. Described from St. Lucia.

Besleria imrayi Hook. f., Bot. Mag. 104: pl. 6341. 1878. *Besleria lutea* L. var. *imrayi* (Hook.f.) Urb., Symb. Antill. 2: 348. 1901. Described from Dominica.

Besleria lutea L. var. *intermedia* Urb., Symb. Antill. 2: 348. 1901. Described from Dominica.

Besleria lutea L. var. *leucantha* Urb., Symb. Antill. 8: 644. 1921. Described from Haiti.

Besleria lutea L. var. *vincentina* Urb., Symb. Antill. 2: 348. 1901. Described from St. Vincent.

Besleria lutea L. var. *vulgaris* Urb., Symb. Antill. 2: 347. 1901, nom. inval.

Eriphia jamaicensis Roem. & Schult., Syst. Veg. 3: 337. 1818. Described from Jamaica.

Eriphia pallida Raf., Sylva Tellur. 77. 1838. nom. superfl. Described from Jamaica.

Gesneria calycina Sieber ex Steud., Nomencl. Bot., ed. 2, 1: 681. 1840, non *Gesneria calycina* Sw. nom. superfl.

Erect terrestrial subshrub. Widespread in the West Indies (Cuba, Hispaniola, Jamaica, and the Lesser Antilles where several synonyms have been proposed and not included here) and South America (Venezuela). Native in Cuba (Granma, Guantánamo, Santiago de Cuba). FIGURE 2.

Columnea L. 2 species; 1 endemic.

Columnea sanguinea (Pers.) Hanst., Linnaea 34: 384. 1865. *Besleria sanguinea* Pers., Syn. Pl. 2(2): 165. 1806. *Alloplectus sanguineus* (Pers.) G.Don, Gen. Hist. 4: 655. 1837–1838. *Hematophyla villosa* Raf., Sylva Tell. 71. 1838 (Based on *Besleria sanguinea* Pers.). *Dalbergaria sanguinea* Steud., Nom. Bot. (ed. 2) 1: 479. 1840. *Tussacia sanguinea* (Pers.) Heynh., Nom. Bot. Hort. 2: 747. 1846. *Collandra sanguinea* (Pers.) Griseb., Mem. Amer. Acad. Arts, n.s., 8: 526. 1863. TYPE: Hispaniola. *Turpin s.n.* (P, not seen).

Columnea sanguinea (Pers.) Hanst. var. *cubensis* Urb., Symb. Antill. 2: 359. 1901. *Columnea cubensis* (Urb.) Britton, Torreya 5: 215. 1905. *Alloplectus cubensis* (Urb.) Stearn, Bull. Brit. Mus. (Nat. Hist.), Bot. 4(5): 189. 1969. *Dalbergaria cubensis* (Urb.) Borhidi, Acta Bot. Hung. 29: 189. 1983. TYPE: Cuba—Oriente [Provincia Guantánamo]: Pinal de Santa Ana, April 1889, *Eggers 4049* (Lectotype designated here, Lectotype: K).

Dalbergaria phoenicea Tussac, Fl. Antill. 1: 141. 1808. *Collandra phoenicea* (Tussac) G. Don ex Loudon, Encycl. Pl. (new ed.) 1402. 1855. Described from Hispaniola.

Collandra picta Klotzsch & Hanst., Allg. Gartenzeitung 22: 162. 1854, not *Collandra picta* (Hook.) Lem. TYPE: described from cultivated plant material (not seen).

Vireya sanguinolenta Raf., Specchio Sci. 1: 194. 1814. Described from Dominican Republic.

Columnea sanguinea (Pers.) Hanst. var. *trinitensis* C.V.Morton, Contr. U.S. Natl. Herb. 29: 4. 1944. Described from Trinidad.

Facultative epiphytic herb. Widespread in the West Indies (Cuba, Hispaniola, Tobago, Trinidad), Central America, and South America. Native in Cuba (Granma, Guantánamo, Holguín, Santiago de Cuba).

Columnea tincta Griseb., Pl. Wright. 2: 526. 1862. TYPE: Cuba—Monte Verde [Provincia Guantánamo]: January–July 1859, *C. Wright 358* [lectotypified by Urban (1901), Lectotype: GOET; Isolectotypes: CGE, G-2 sheets, GH, GOET, K, MO-2 sheets, PH, S].

Alloplectus cristatus A.Rich. in Sagra, Hist. Fis. Cuba, Bot. 11: 72. 1850, non *Alloplectus cristatus* (L.) Mart. TYPE: Cuba—Monte Libano [Provincia Guantánamo]: June, *J. Linden 1962* (Holotype: P).

Scandent epiphytic herb. Endemic to Cuba (Guantánamo, Holguín). FIGURE 3.

Gesneria L. 22 species; 18 endemic.

Gesneria binghamii C.V.Morton, Brittonia 9: 19. 1957. *Pentaraphia incurva* Griseb., Cat. Pl. Cub. 199. 1866. *Gesneria incurva* (Griseb.) Urb., Symb. Antill. 2: 374. 1901, non *Gesneria incurva* Benth., Bot. Voy. Sulphur: 131. 1845. TYPE: Cuba—Cuba Oriental [Provincia Granma]: San Juan de Buenavista, 1860–1864, *C. Wright 3073* (Holotype: GOET; Isotypes: BM, G-2 sheets, GH, HAC, K, LE, MO, P, YU).

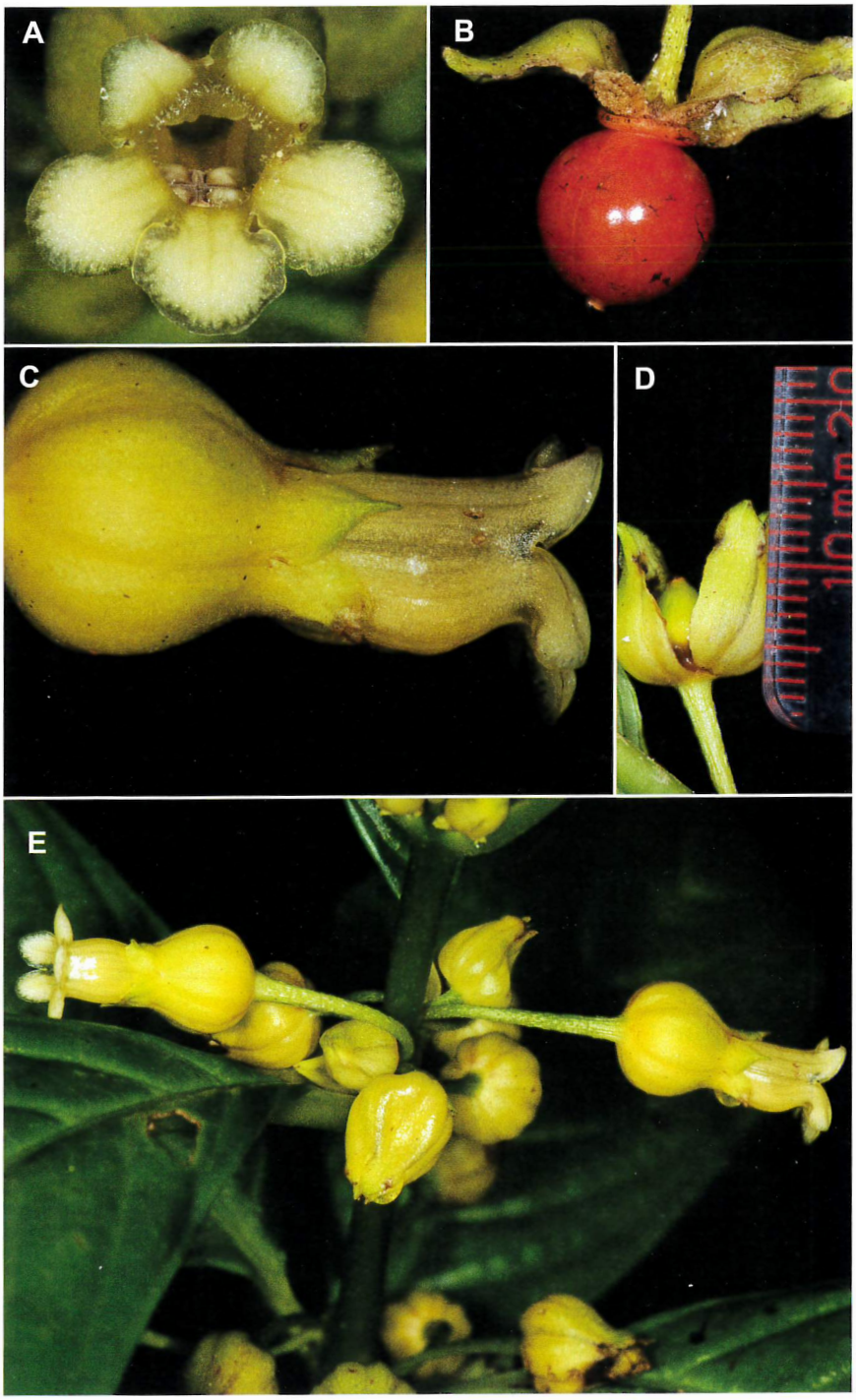

FIGURE 2. **Besleria lutea** L. **A.** Front view of flower. **B.** Mature fruit an indehiscent fleshy berry. **C.** Lateral view of flower showing fused calyx. **D.** Immature fruit with persistent calyx. **E.** Habit showing cluster of axillary flowers. (A–E from *J.L. Clark et al. 10510*).

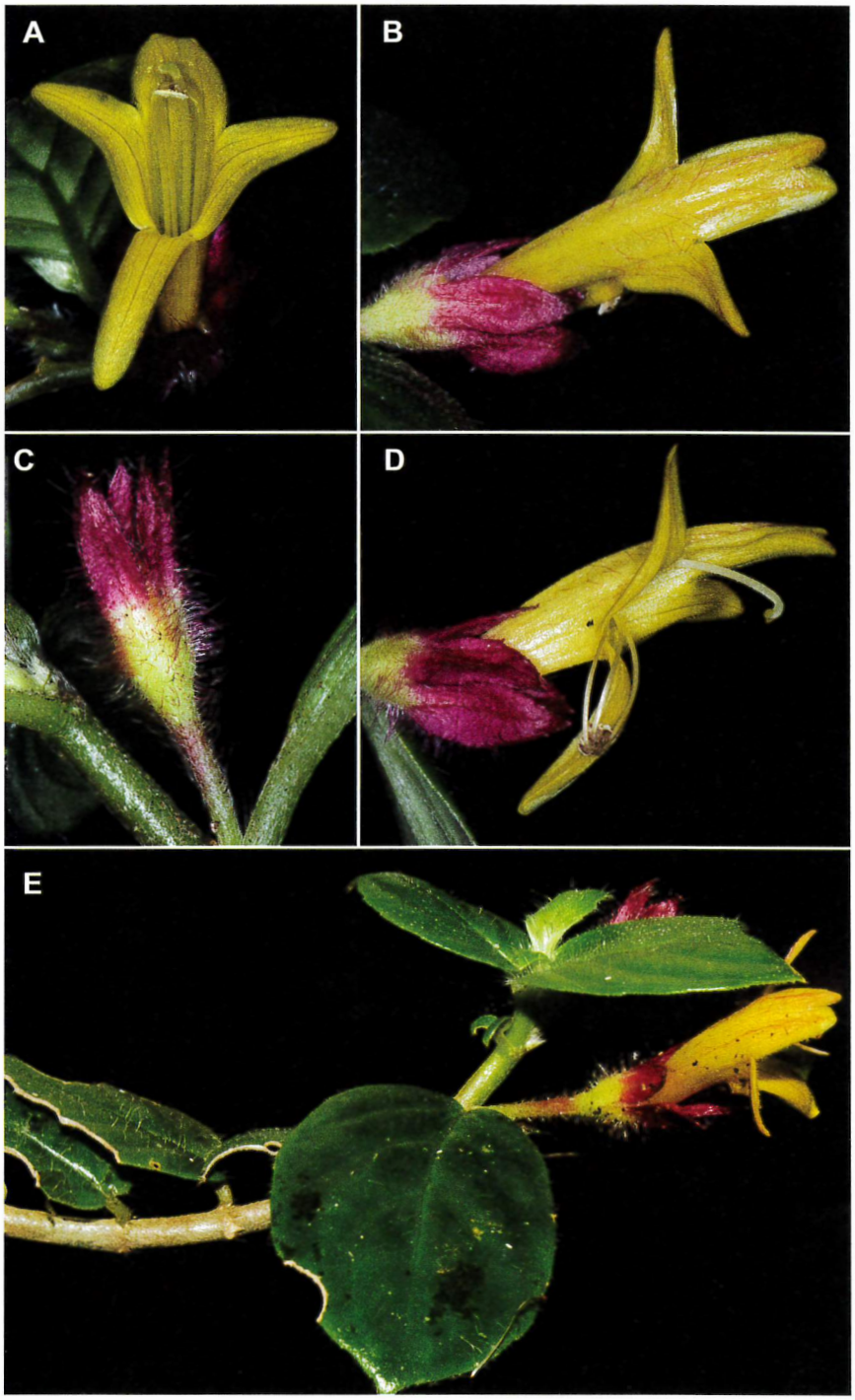

FIGURE 3. **Columnea tincta** Griseb. **A.** Front view of flower. **B.** Adaxial view of flower. **C.** Immature calyx. **D.** Lateral view of flower. **E.** Habit. (A–E from *J.L. Clark et al. 12775*).

Erect subshrub. Endemic to Cuba (Granma, Guantánamo, Santiago de Cuba).

Gesneria bracteosa Urb., Symb. Antill. 9: 269. 1924. TYPE: Cuba—Baracoa [Provincia Guantánamo]: Lomas de Cuaba, edge of Manacales, 17 January 1915, *E.L. Ekman 4296* (Holotype: S; Isotypes: K, S).

Gesneria norlindii Urb., Symb. Antill. 9: 268. 1924. TYPE: Cuba—Baracoa [Provincia Guantánamo]: inter Taco et Nibujón, 4 December 1914, *E.L. Ekman 3730* (Holotype: S).

Erect subshrub. Endemic to Cuba (Guantánamo, Holguín). FIGURE 4.

This species is differentiated from other congeners by the presence of serrate leaves and elongate peduncles that exceed the length of the leaves (FIGURE 4E). The calyx lobes are narrow and elongate, often exceeding the length of the corolla (FIGURE 4B). This species was considered a synonym of *Gesneria duchartreoides* in Skog (1976). *Gesneria duchartreoides* differs from *G. bracteosa* in having calyx lobes shorter than the length of the corolla tube and leaves nearly entire (FIGURE 6).

Gesneria brevifolia Urb., Repert. Spec. Nov. Regni Veg. 21: 69. 1925 . TYPE: Cuba—Pinar del Río, Pan de Guajaibón, on the eastern top of the mountains, 750–800 m, 9 January 1921, E.L. Ekman 12760 (Holotype: S; Isotype: S).

Erect subshrub. Endemic to Cuba (Pinar del Río).

Gesneria brevifolia was until recently only known from the type collection and it had never been collected with flowers. It was noted on the holotype (*E.L. Ekman 12760*, S) that it grew in dense thickets on the eastern slopes of the mountain, Pan de Guajaibón, from 750 to 800 m. A 2008 expedition by the first author to the summit of Pan de Guajaibón did not locate an extant population of Gesneria brevifolia. Trails from the village of San Juan de Sagua to the summit as well as the summit of Pan de Guajaibón were explored. However, subsequent trips to the type locality by Cuban biologists resulted in a discovery of a population near an abandoned military base on the summit (Lisbet González Oliva, HAC, pers. comm.).

Gesneria celsioides (Griseb.) Urb., Symb. Antill. 2: 377. 1901. *Conradia celsioides* Griseb., Cat. Pl. Cub. 200. 1866. *Pentaraphia celsioides* (Griseb.) M. Gómez, Anales Hist. Nat. 23: 279. 1894. *Gesneria humilis* L. subsp. *celsioides* (Griseb.) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 34. 1979. TYPE: Cuba—Viñales [Provincia Pinar del Río]: 1860–1864, *C. Wright 3077* (Holotype: GOET; Isotypes: BM, G, GH, HAC-2 sheets, K, MO, P, S, W, YU).

Terrestrial herb. Endemic to Cuba (Pinar del Río).

Skog (1976) had a broad circumscription of *Gesneria humilis* that included *G. celsioides* as a synonym. In contrast, Morton (1957a) recognized *G. celsioides* as a separate species. Morton later discussed the two species in detail (Morton 1959) and described *G. celsioides* as a narrow endemic restricted to the base of rock formations called "mogotes" in the Pinar del Río region of western Cuba. Recent field expeditions to Pinar del Río between 2006 and 2010 documented *G. celsioides* and it is here recognized as heterospecific from *G. humilis*.

Gesneria clarensis Britton & P.Wilson, Mem. Torrey Bot. Club 16: 109. 1920. TYPE: Cuba—[Provincia Sancti Spíritus]: Sancti Spíritus mountains, Sierra del Caballete, 1–11 August 1916, *F. León & F. Clement 6504* (Holotype: NY; Isotypes: HAC, NY, S, US).

Shrub to 2 m tall. Endemic to Cuba (Sancti Spíritus, Villa Clara). FIGURE 5.

This species is not well-documented in herbaria (fewer than five collections known) and only one fertile collection was known before the present study. *Gesneria clarensis* was collected during a 2008 expedition to the Cordillera Guamuhaya to the Reserva Ecológica Altura de Banao. The corolla of this species is campanulate with an orange tube and bright green lobes (FIGURE 5).

Gesneria cubensis (Decne.) Baillon, Hist. Pl. 10: 60, pls. 48, 49. 1888. *Pentaraphia cubensis* Decne., Ann. Sci. Nat., Bot. ser. 3, 6: 108. 1846. TYPE: Cuba—St. Yago de Cuba [Provincia Santiago de Cuba]: Pinal de Nimanima, 1844, *J. Linden 2076* (Holotype: P; Isotypes: BM, BR, G, G-DC, GOET, K-4 sheets, LE, NY-2 sheets, P-2 sheets, TCD, W).

Pentaraphia verrucosa Decne., Ann. Sci. Nat., Bot. ser. 3, 6: 107. 1846. *Conradia verrucosa* (Decne.) Scheidw., Allg. Gartenzeitung 15: 226. 1847. *Gesneria verrucosa* (Decne.) Kuntze, Revis. Gen. Pl. 473. 1891. TYPE: Cuba—Mt. Liban [Provincia Guantánamo]: 1844, *J. Linden 1841* (Holotype: P; Isotypes: BM-2 sheets, BR, CGE, DS, G, K-2 sheets, NY, P-2 sheets, W).

Gesneria bonaoana Alain, Phytologia 25: 275. 1973. Described from Dominican Republic.

Gesneria calcicola Alain, Mem. New York Bot. Gard. 21: 144. 1971. Described from Dominican Republic.

Gesneria dolichostyla Urb., Symb. Antill. 7: 540. 1913. Described from Dominican Republic.

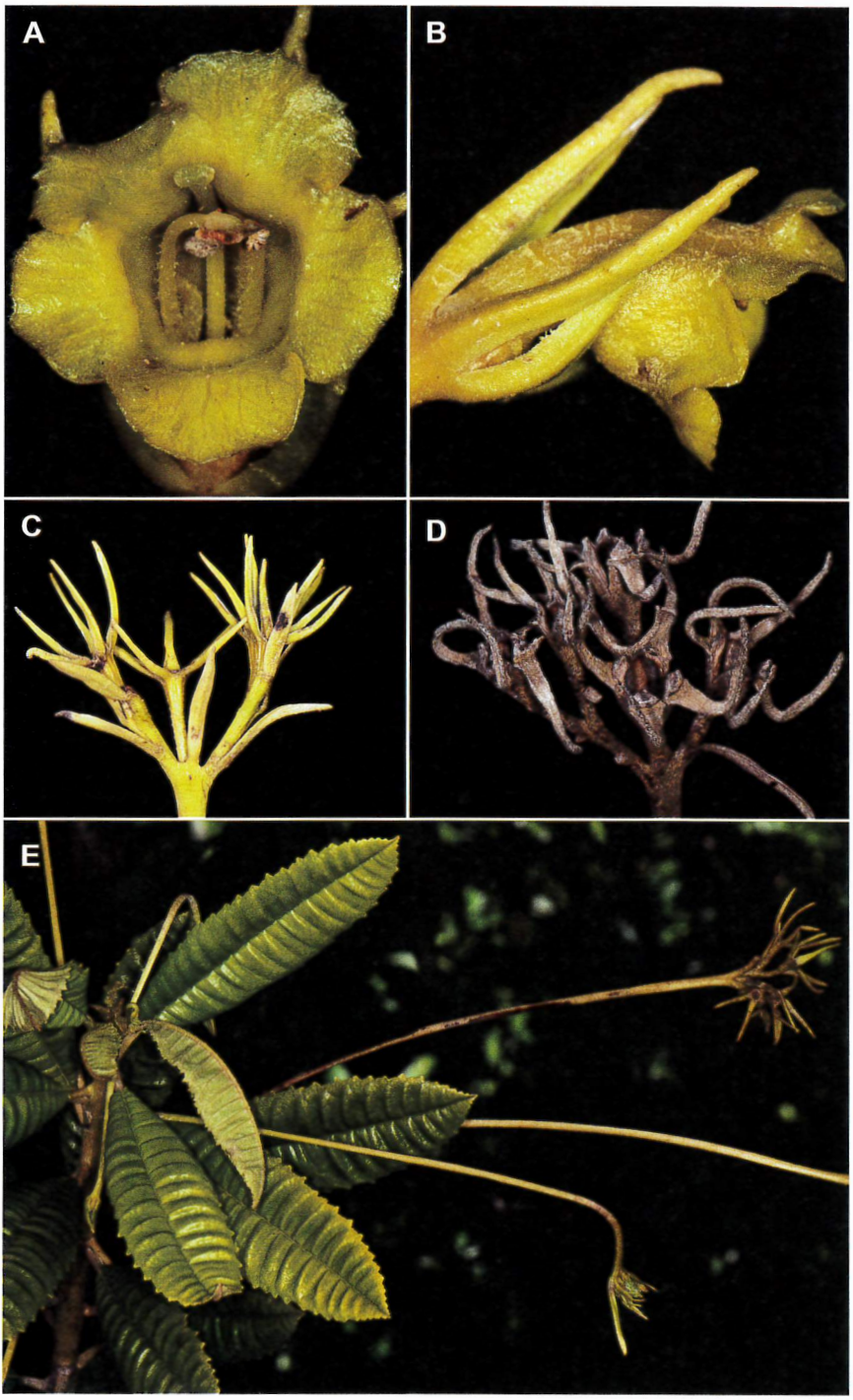

FIGURE 4. **Gesneria bracteosa** Urb. **A.** Front view of flower. **B.** Lateral view of flower. **C.** Inflorescence. **D.** Infructescence. **E.** Habit showing serrate leaf margins and peduncles exceeding length of leaves. (A–E from *J.L. Clark et al. 10567*).

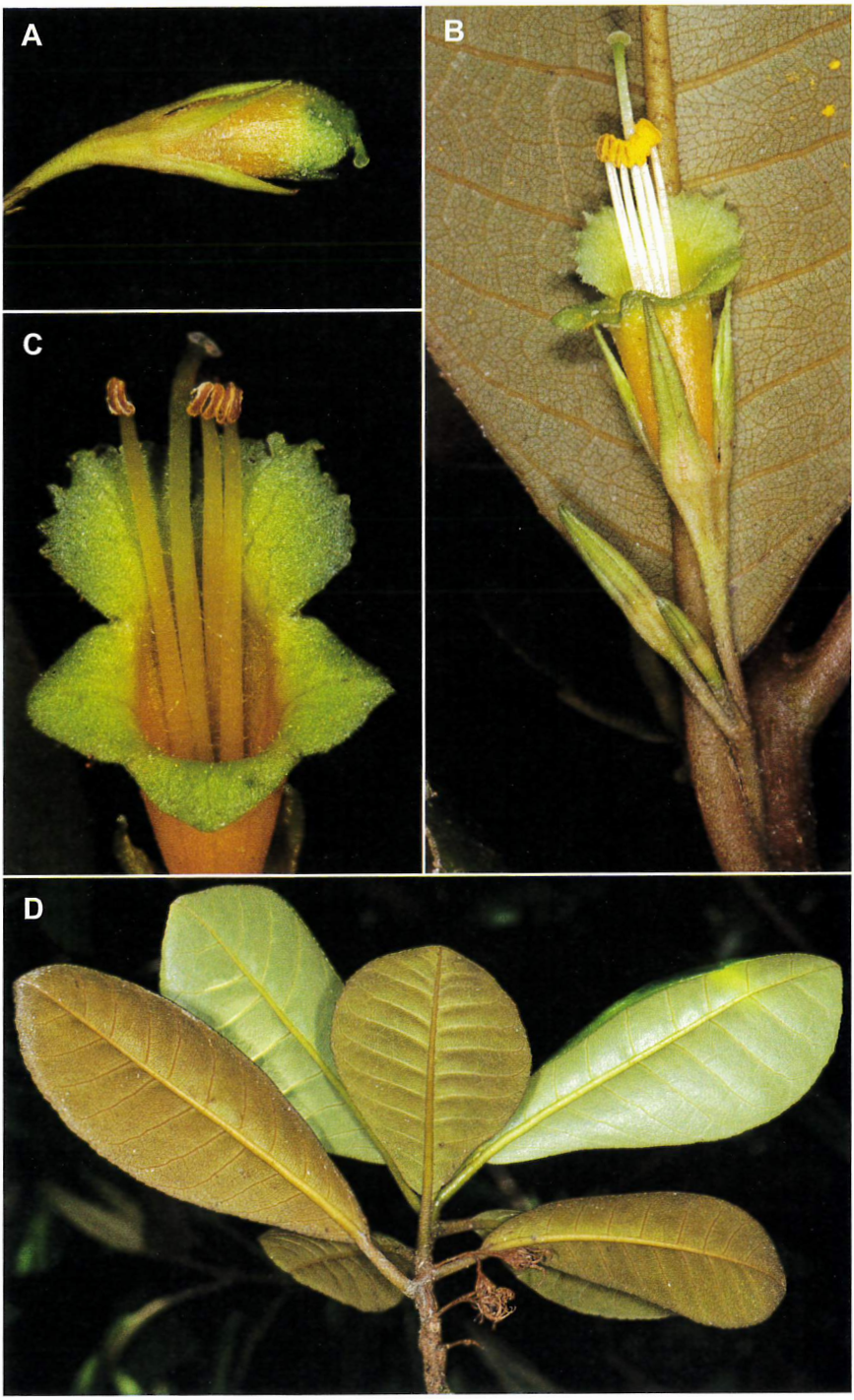

FIGURE 5. **Gesneria clarensis** Britton & P. Wilson. **A.** Immature flower. **B.** Abaxial view of flower. **C.** Front view of corolla. **D.** Habit. (A–D from *J.L. Clark et al. 10488*).

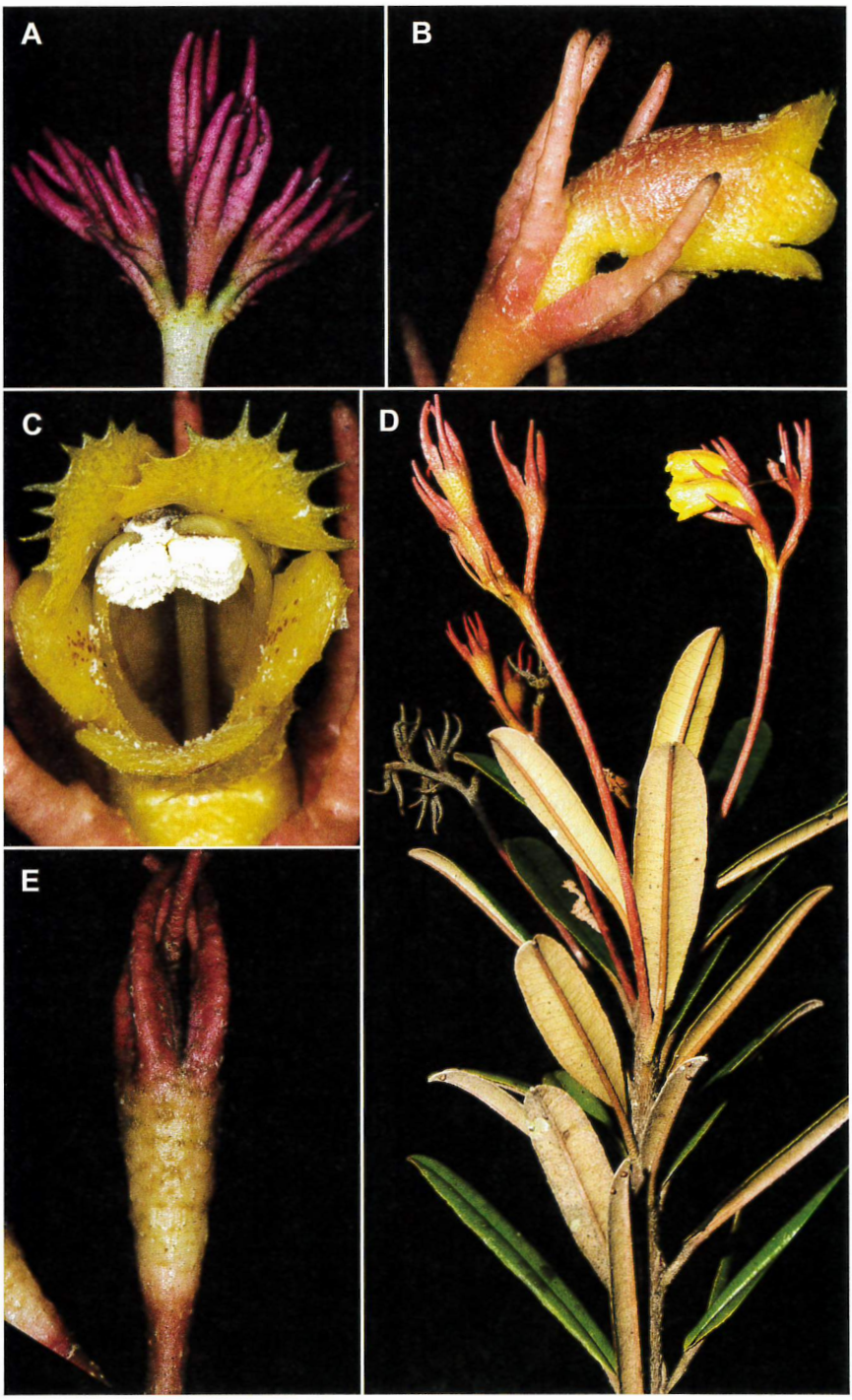

FIGURE 6. **Gesneria duchartreoides** (C. Wright) Urb. **A.** Immature inflorescence. **B.** Lateral view of flower. **C.** Front view of flower showing fimbriations on upper lobes. **D.** Habit. **E.** Immature fruit showing warty capsule. (A–E from *J.L. Clark et al. 12791*).

Gesneria domingensis Urb., Repert. Spec. Nov. Regni Veg. 21: 223. 1925. Described from Dominican Republic.

Gesneria heteroclada Urb., Repert. Spec. Nov. Regni Veg. 18: 372. 1922. Described from Dominican Republic.

Gesneria mornincola Urb. & Ekman, Ark. Bot. 22A(10): 75. 1929. Described from Haiti.

Gesneria scopulorum Urb. & Ekman, Ark. Bot. 22A(10): 73. 1929. Described from Haiti.

Gesneria subalata Urb. & Ekman, Ark. Bot. 22A(10): 74. 1929. Described from Haiti.

Terrestrial shrub to 2 m tall. Native to Hispaniola and Cuba (Guantánamo, Holguín, Santiago de Cuba, Villa Clara).

Gesneria duchartreoides (C. Wright) Urb., Symb. Antill. 2: 375. 1901. *Pentaraphia duchartreoides* C. Wright, Anales Acad. Ci. Med. Habana 6: 316. 1870. TYPE: Cuba—Cuchillas de Baracoa [Provincia Guantánamo]: *C. Wright s.n.* (Holotype: GH; Isotype: GOET).

Gesneria pachyclada Urb., Symb. Antill. 9: 270. 1924. TYPE: Cuba—Sierra de Cristal [Provincia Holguín]: 1200–1300 m, 8 March 1916, *E.L. Ekman 6822* (Holotype: S).

Terrestrial shrub, 1–2 m tall. Endemic to Cuba (Guantánamo, Holguín). FIGURE 6.

Gesneria duchartreoides differs from other congeners by the terrestrial subshrub habit and elongate (non-campanulate) tubular corolla (FIGURE 6B). It is similar to *Gesneria viridiflora*, which is differentiated by a campanulate corolla (FIGURE 16B) with fimbriations on the upper and lower petal lobes (FIGURE 16A). In contrast, *G. duchartreoides* has fimbriations limited to the upper two petal lobes and entire lateral and lower lobes (FIGURE 6C). Recent collections and photographs by S. Suárez T. (CITMA-Holguín) from the Sierra de Cristal show that populations are conspecific with populations on the highway between Baracoa and Guantánamo (La Farola).

Gesneria ferruginea (C.Wright) Urb., Symb. Antill. 2: 373. 1901. *Gesneria salicifolia* (Griseb.) Urb. var. *ferruginea* (C. Wright) L.E.Skog, Smithsonian Contr. Bot. 29: 70. 1976. *Pentaraphia ferruginea* C. Wright in Sauvalle, Anales Acad. Ci. Med. Habana 6: 317. 1870. TYPE: Cuba—Locality uncertain, *C. Wright 3643* (Holotype: GH; Isotypes: NY-2 sheets, US).

Terrestrial shrub to 2 m tall. Endemic to Cuba (Pinar del Río). FIGURE 7.

This species was recognized as a synonym of *Gesneria salicifolia* in Skog (1976). The type locality for *Gesneria ferruginea* is the forests in La Cajalbana in the Province of Pinar del Río in western Cuba where the soils are characterized as serpentine (derived from ultramafic rocks). In contast, *Gesneria salicifolia* is restricted to limestone rocks in eastern Cuba. These two areas are ecologically different, as such, it is unlikely that they are conspecific. Furthermore, significant morphological differences are found between these two species. *Gesneria ferruginea* is an unbranched terrestrial subshrub that grows along streams. *Gesneria salicifolia* is a woody epilithophyte that grows on limestone rock faces.

The type specimen labels do not include locality information. The protologue (Wright 1870) described the type locality as Bahía Honda at the base of a hill named "Cajarbana" along streams in pine forests. In a publication on C. Wright collecting localities (Howard 1988) there is no "La Cajalbana" but there is "Bahía Cajalbana." It is presumed that this is what is currently known as La Cajalbana, Estación Biologica Cuabal in the province of Pinar del Río (Municipio: La Palma, Cuabales de Cajalbana). There are 12 serpentine regions in Cuba and the Cajalbana is one of the largest and oldest (several millions of years), which has facilitated the amount of time for the evolution of endemic flora (Borhidi 1991) such as *Gesneria ferruginea.*

Gesneria fruticosa (L.) Kuntze, Revis. Gen. Pl. 2: 473. 1891. *Craniolaria fruticosa* L., Sp. Pl. 618. 1753; *Martynia fruticosa* (L.) Gloxin, Observ. Bot. 15. 1785. TYPE: Description of *Craniolaria fruticosa* L. based on Plumier description (Nov. Pl. Am. Gen. 27, 1703) and an unpublished Aubriet copy of Plumier drawing.

Gesneria craniolaria Sw., Prodr. 89. 1788, nom. superfl. *Conradia craniolaria* (Sw.) Mart., Nov. Gen. Sp. Pl. 3: 38. 1829. *Pentaraphia craniolaria* (Sw.) Decne., Ann. Sci. Nat., Bot., ser. 3, 6: 99. 1846. *Codonoraphia craniolaria* (Sw.) Oerst., Centralamer. Gesner. 68. 1858.

Gesneria fimbriata Lam., Encycl. 2: 703. 1788, nom. superfl.

Erect shrub to 2 m tall. Native to Hispaniola and Cuba (Guantánamo).

Gesneria glandulosa (Griseb.) Urb., Symb. Antill. 2: 373. 1901. *Pentaraphia glandulosa* Griseb., Cat. Pl. Cub. 199. 1866. TYPE: Cuba—El Yunque de Baracoa [Provincia Guantánamo]: 12 June 1861, *C. Wright 3075* (Holotype: GOET; Isotypes: G, GH, K, NY).

Lithophytic shrub with erect shoots to 50 cm tall. Endemic to Cuba (Guantánamo). FIGURE 8.

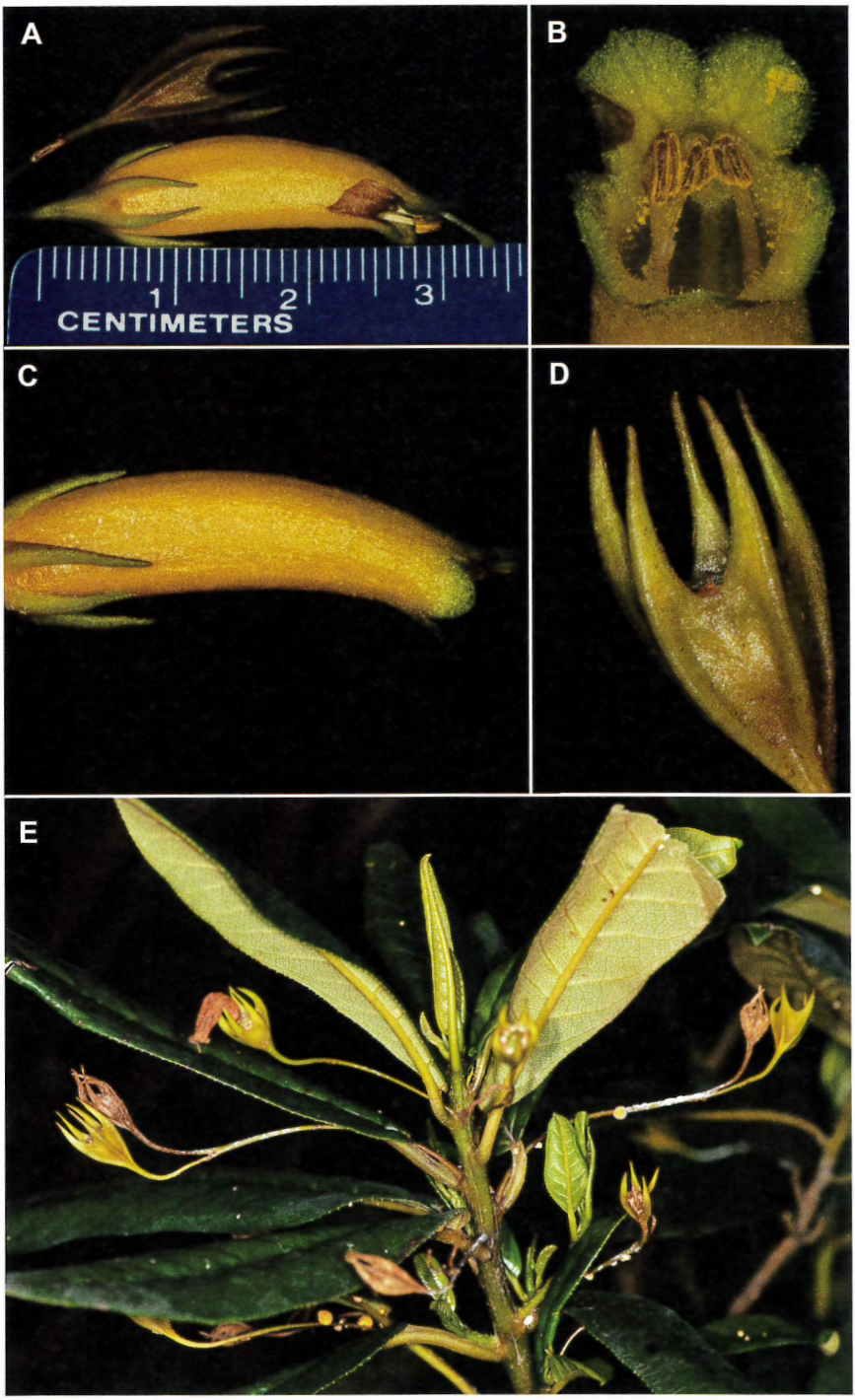

FIGURE 7. **Gesneria ferruginea** (C. Wright) Urb. **A.** Lateral view of flower and immature fruit. **B.** Front view of flower. **C.** Lateral view of flower. **D.** Immature fruit. **E.** Habit. (A–E from *J.L. Clark et al. 10627*).

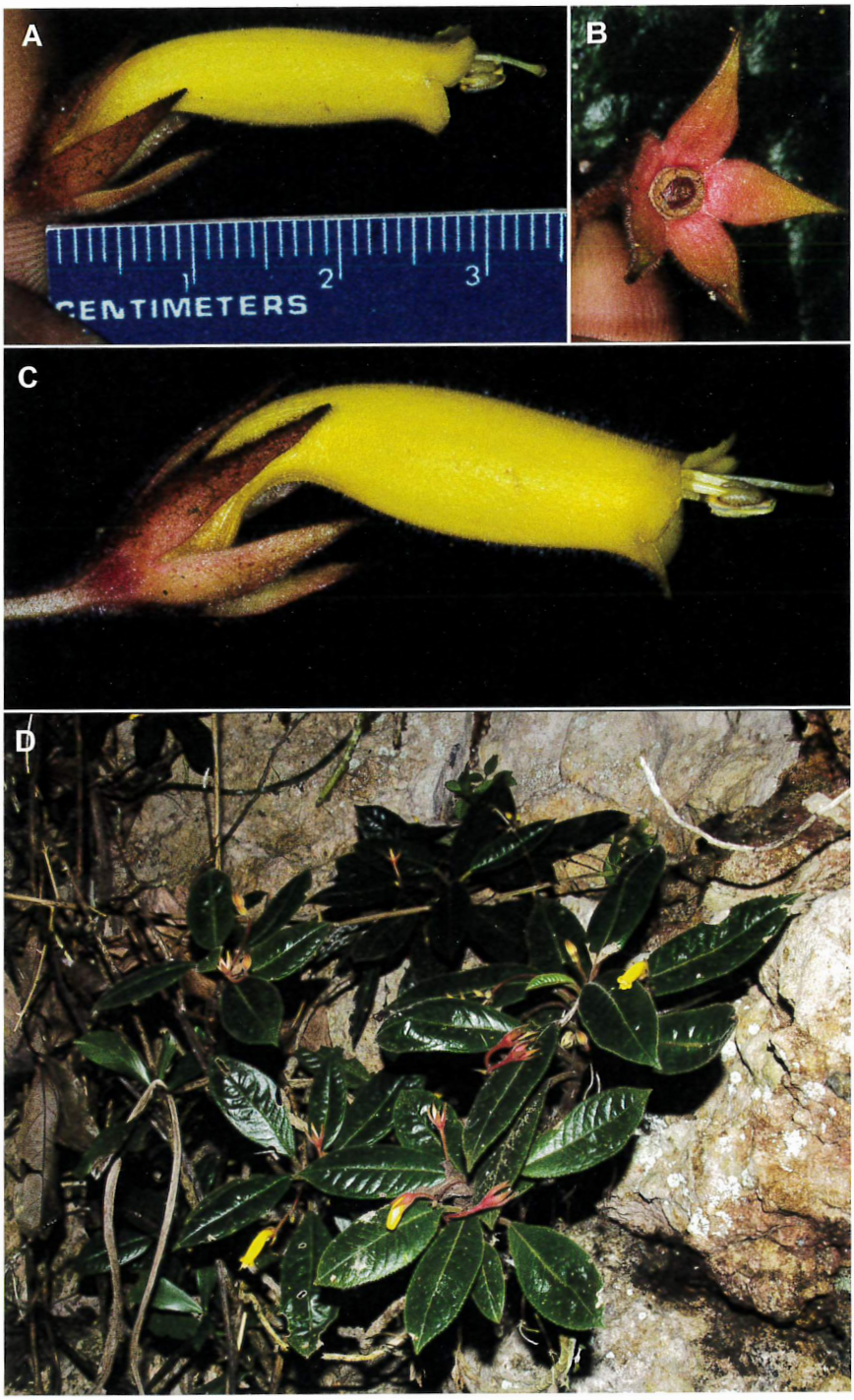

FIGURE 8. **Gesneria glandulosa** (Griseb.) Urb., **A.** Lateral view of flower. **B.** Front view of calyx. **C.** Lateral view of flower. **D.** Habit. (A–E from *J.L. Clark et al. 12772*).

Gesneria glandulosa is differentiated from other congeners by the erect shrubby habit, subcoriaceous leaves with glandular trichomes, exserted stamens, and elongate sepals. There are only three known collections of this species and they are all from the type locality near the main trail to the summit of Yunque de Baracoa. There are many exposed vertical rock faces near the upper reaches of the summit trail where extant populations of *Gesneria glandulosa* are located. A population of *G. glandulosa* was documented in 2012 (*J.L. Clark et al.* 12772) about 50 meters from the main trail to the summit of Yunque de Baracoa. Another collection (*Arias et al. 58937*, HAJB) was collected in 1981 from the upper region of Yunque de Baracoa. A collection at HAC that is labeled as an isotype (*C. Wright 3075*) has the correct label, but the mounted specimen belongs to Acanthaceae and is clearly in error.

Gesneria gloxinioides (Griseb.) Urb., Symb. Antill. 2: 377. 1901. *Conradia gloxinioides* Griseb., Cat. Pl. Cub. 200. 1866. *Pentaraphia gloxinioides* (Griseb.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23: 279. 1894. TYPE: Cuba—Pinar del Río: 1860–1864, *C. Wright 3078* (Holotype: GOET; Isotypes: BM, G-2 sheets, GH, HAC, K, MO, P, YU).

Terrestrial subshrub to 1 m tall. Endemic to Cuba (Pinar del Río).

This species is only known from the type collection. It is distinct from all other congeners by cuneate leaf bases, the arrangement of the anthers side by side, and densely pilose leaves with glandular-ciliate margins. Howard (1988) mentions that *C. Wright 3078* was collected in November (no specific year) in Sagua. No specific collection locality information is available from the herbarium specimens or in the protologue (Grisebach 1866).

Gesneria heterochroa Urb., Symb. Antill. 9: 270. 1924. TYPE: Cuba—Santiago de Cuba: Sierra Maestra, 750 m, 9 November 1917, *E.L. Ekman 8741* (Holotype: S).

Gesneria clarensis Britton & P.Wilson var. *turquinensis* C.V.Morton, Brittonia 9: 19. 1957. TYPE: Cuba—[Provincia Santiago de Cuba]: Pico del Este [Pico Turquino]: Sierra Maestra, 1–2 August 1935, *J. Acuña 9712* [Holotype: HAC (formerly SV); Isotype: US (fragment)].

Terrestrial shrub to 2 m tall. Endemic to Cuba (Santiago de Cuba). FIGURE 9.

The species described by C.V. Morton as *Gesneria clarensis* var. *turquinensis* was based on vegetative characters from a single sterile collection. The protologue (Morton 1957b) stated, "flores ignoti." Fieldwork in Cuba has shown that intraspecific variation in leaf shapes is common within individuals and populations of *Gesneria*. The sterile specimen designated by Morton as the holotype could easily fall within the range of leaf variation in *Gesneria heterochroa*.

Recent fieldwork in eastern Cuba by Gabriel Garcés González (Centro Oriental de Ecosistemas y Biodiversidad, BIOECO) has documented a population of more than 20 individuals near the summit of La Gran Piedra, a popular tourist destination located on the outskirts of the city of Santiago de Cuba. The corolla is mostly bright green with white lobes (FIGURE 9). This combination of coloration is unusual in the family.

Gesneria humilis L., Sp. Pl. 612. 1753. *Conradia humilis* (L.) Mart. ex G.Don, Gen. Hist. 4: 650. 1837–1838. *Pentaraphia humilis* (L.) Hanst., Linnaea 34: 294. 1865. TYPE: Haiti—Plumier, Nov. Pl. Am. Gen. 27, fig. 9. 1703.

Gesneria acuminata Urb., Symb. Antill. 1: 479. 1900. TYPE: Cuba—Río Manacal [Provincia Granma]: March 1889, *H.F.A. von Eggers 4892* [Lectotypified by Skog (1976), Lectotype: GOET; Isolectotypes: C, P, Z].

Gesneria incisa Urb., Symb. Antill. 1: 479. 1900. TYPE: Cuba—1822–1824, *E. Poeppig s.n.* [Holotype: B, destroyed, Lectotypified by Skog (1976), Lectotype: W; Isolectotypes: BP, BR, MO].

Terrestrial subshrub. Native to Haiti and Cuba (Cienfuegos, Guantánamo, Holguín, Isla de la Juventud, La Habana, Pinar del Río, Sancti Spíritus, Santiago de Cuba). FIGURE 10.

Gesneria humilis is one of the most commonly collected species of Gesneriaceae in Cuba. It grows in dense populations near woods and streams or on rocks in streams. In Haiti, the species is rare but from there it was described by Plumier during his explorations of the Caribbean in which he visited Haiti. He did not visit Cuba. Plumier described the species as *Gesnera humilis, flore flavescente* in 1703. Unfortunately, Plumier did not preserve specimens of the plants he drew and not many have been seen since his time. Other botanists, such as Erik Ekman (1883–1931), have searched for *Gesneria humilis* in Haiti, but were unsuccessful. The rediscovery of *Gesneria humilis* was made about 270 years after Plumier's initial discovery during an expedition to Hispaniola organized by Skog in 1970 (Skog & Talpey 1971). Locating *Gesneria humilis* in Haiti was important because it validated its presence outside of Cuba and because no voucher specimens had existed from the country of origin.

Gesneria libanensis Linden ex C. Morren, Ann. Soc. Roy. Agric. Gand 2: 361. 1846. *Con-*

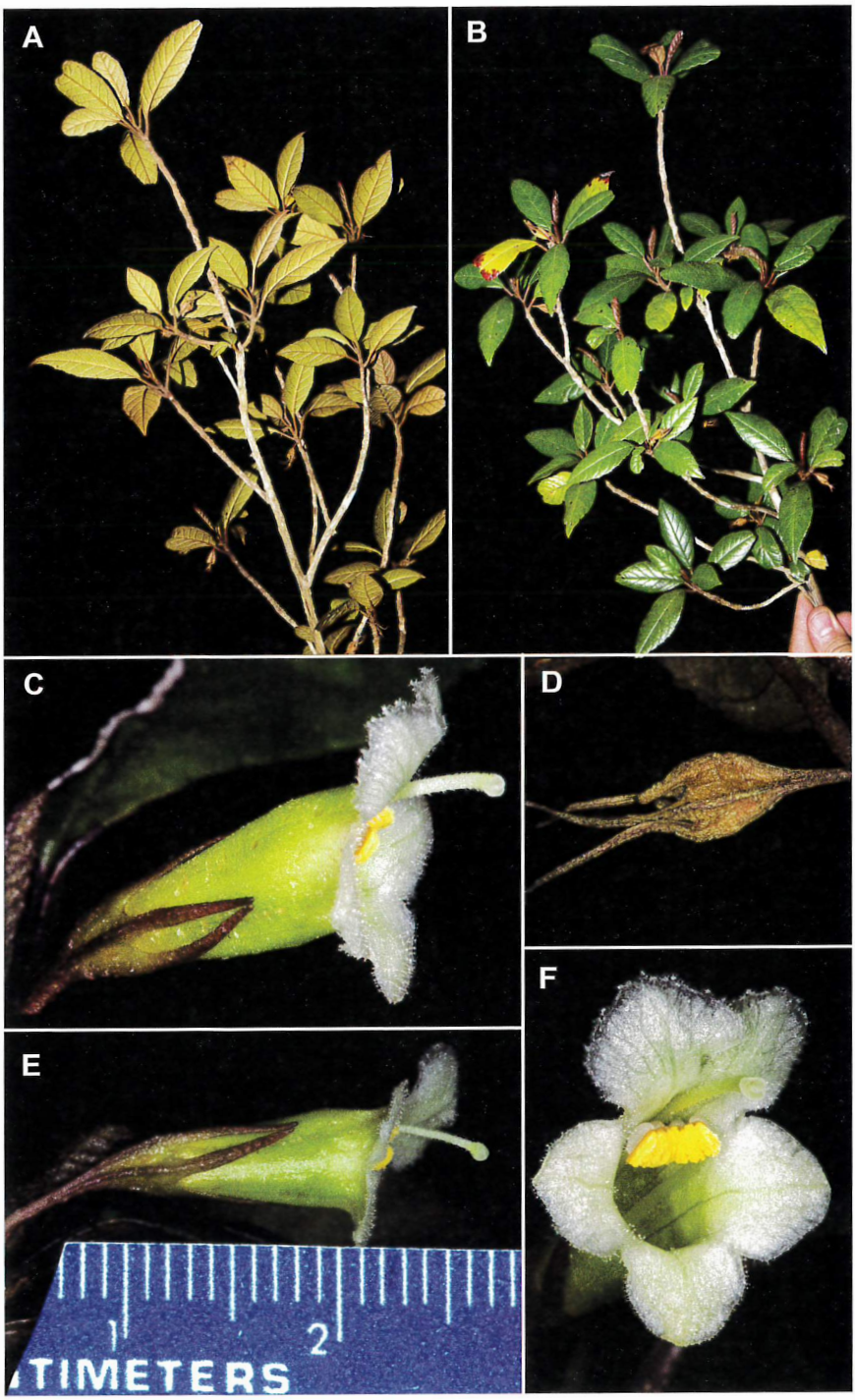

FIGURE 9. **Gesneria heterochroa** Urb., **A.** Habit showing abaxial surface of leaves. **B.** Habit showing adaxial surface of leaves. **C.** Lateral view of flower. **D.** Mature fruit. **E.** Lateral view of flower. **F.** Front view of flower. (A–E from *J.L. Clark et al. 12800*).

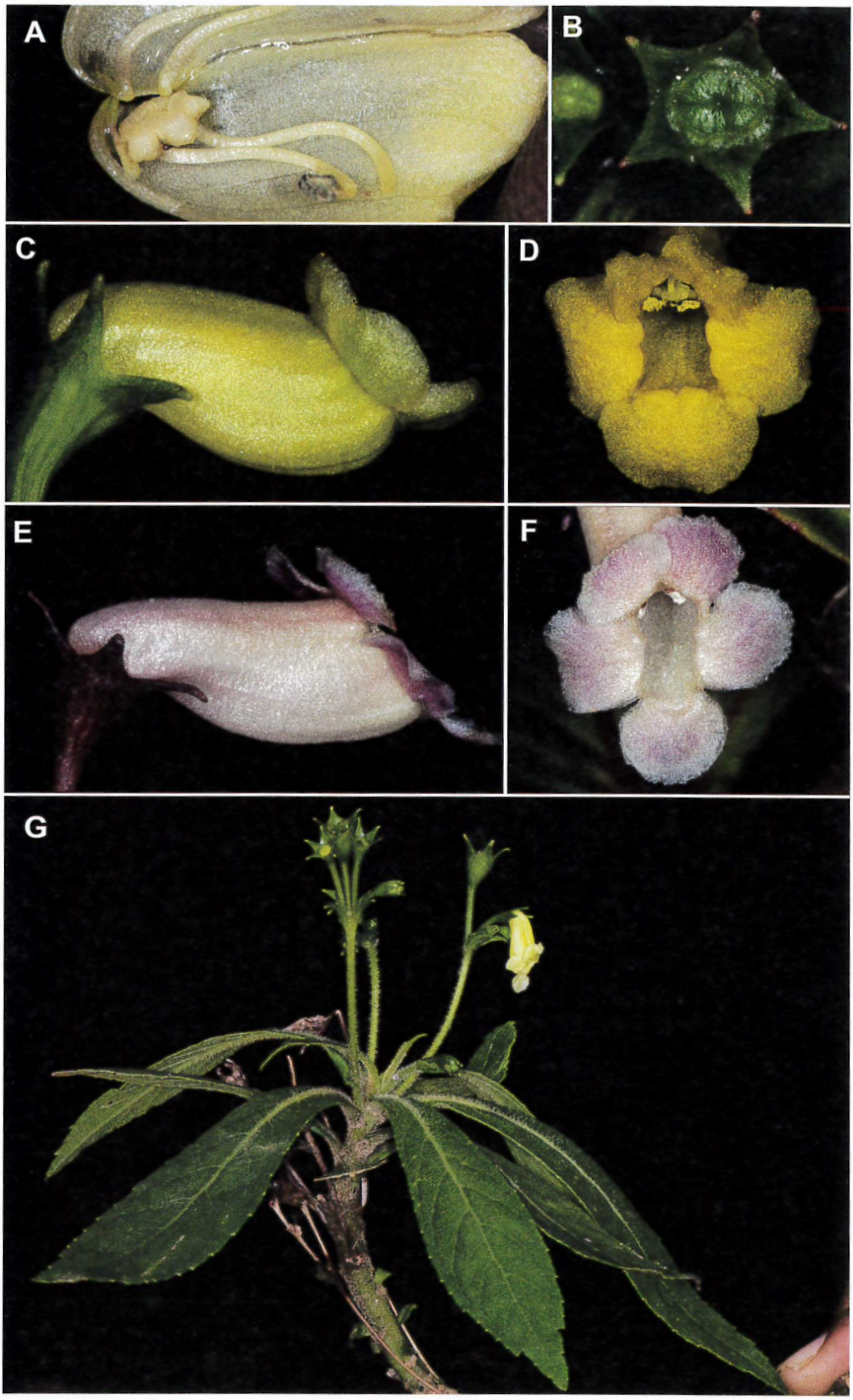

FIGURE 10. **Gesneria humilis** L. **A.** Inside of corolla showing glabrous surface. **B.** Immature fruit. **C.** Lateral view of flower. **D.** Front view of corolla. **E.** Lateral view of flower. **F.** Front view of flower. **G.** Habit. (A from *J.L. Clark et al. 10574*; B&G from *J.L. Clark et al. 10472*; C from *J.L. Clark et al. 10630*; D from *J.L. Clark et al. 13071*; E&F from *J.L. Clark et al. 10633*).

radia libanensis (Linden ex C. Morren) Griseb., Fl. Brit. W. I. 462. 1862. *Ophianthe libanensis* (Linden ex C. Morren) Hanst., Linnaea 26: 205. 1854. *Pentaraphia libanensis* (Linden ex C. Morren) Hanst., Linnaea 34: 292. 1865. TYPE: Cuba—[Provincia Guantánamo]: Monte Libano, June 1844, *J. Linden 1833* [Lectotypified by Skog (1976), Lectotype: GENT; Isolectotypes: BM-2 sheets, BR, FI-W, G, K, NY, P-2 sheets, W-2 sheets)].

Rhytidophyllum floribundum Lem., Fl. Serres Jard. Eur. 2: t. 178. 1846. *Herincquia floribunda* (Lem.) Decne. ex Hérincq, Rev. Hort. [Paris]., ser. 3(2), 20: 323. 1848. *Pentaraphia floribunda* (Lem.) Benth. & Hook. f. ex Carriere, Rev. Hort. 50: 30. 1878. Nom. superfl.

Conradia corrugata Griseb., Mem. Amer. Acad. Arts, n.s., 8: 526. 1862 ["1861"]. *Pentaraphia corrugata* (Griseb.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23: 280. 1894. *Gesneria libanensis* Linden ex C. Morren var. *corrugata* (Griseb.) Urb., Symb. Antill. 2: 381. 1901. TYPE: Cuba—[Provincia Guantánamo]: Monte Verde, 4 February 1861, *C. Wright 1335* (Holotype: GOET; Isotypes: BR, CGE, G-3 sheets, GH, K, LE, MO, NY, P, PH, UC, YU).

Conradia floribunda Paxton, Paxton's Mag. Bot. 15: 99. 1849. TYPE: Plate and description in Paxton, Paxton's Mag. Bot. 15: 99. 1849. No locality information available.

Lithophytic herb with basal rosette of leaves. Endemic to Cuba (Guantánamo, Holguín, Santiago de Cuba).

Gesneria libanensis is similar to *G. purpurescens* and *G. yumuriensis*, but is easily differentiated by habit and the presence of persistent dead leaves. *Gesneria libanensis* also differs by the presence of elongate shoots in contrast to basal rosette forming habits in the latter two. The leaf blades are usually persistent (rarely deciduous) and herbarium specimens often have dense clusters subtending mature leaves. Persistent dead leaves are not common in *G. yumuriensis* or *G. purpurascens*.

Gesneria nipensis Britton & P.Wilson, Mem. Torrey Bot. Club 16: 109. 1920. TYPE: Cuba—Oriente [Provincia Holguín]: Sierra Nipe, near Woodfred, 450–550 m, 17 December 1909, *J.A. Shafer 3201* (Holotype: NY; Isotypes: F, HAC, US).

Terrestrial shrub, 1–2 m tall. Endemic to Cuba (Guantánamo, Holguín). FIGURE 11.

Gesneria purpurascens Urb., Symb. Antill. 2: 380. 1901. TYPE: Cuba—[Provincia Guantánamo]: prope Baracoa, 1861, *C. Wright 3080* [Lectotypified by Skog (1976), Lectotype: GOET; Isolectotypes: BM, G, GH, HAC-2 sheets, K, MO, P, YU].

Gesneria acunae Borhidi, Acta Bot. Acad. Sci. Hung. 22: 320. 1977 ["1976"]. TYPE: Cuba—[Provincia Guantánamo]: sobre un paredón al Este del Yunque de Baracoa, 300 m, 14 January 1960, *Bro. Alain & M. López 7541* (Holotype: HAC; Isotype: US).

Lithophytic herb with basal rosette of leaves. Endemic to Cuba (Guantánamo, Holguín). FIGURE 12.

Gesneria reticulata (Griseb.) Urb., Symb. Antill. 1: 478. 1900. *Conradia reticulata* Griseb., Cat. Pl. Cub. 201. 1866. *Pentaraphia reticulata* (Griseb.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23: 280. 1894. TYPE: Cuba—[Provincia Guantánamo]: Yunque de Baracoa, 1861, *C. Wright 3081* (Holotype: GOET; Isotypes: BM, G, GH, K, YU).

Gesneria cuneifolia (DC.) Fritsch var. *disjuncta* C.V.Morton, Brittonia 9: 19. 1957. *Gesneria cuneifolia* (DC.) Fritsch subsp. *disjuncta* (C.V.Morton) Borhidi, Bot. Közlem. 62: 27. 1975. TYPE: Dominican Republic—Río San Juan, 22 March 1928, *G.S. Miller Jr. 1244* (Holotype: US).

Gesneria cuneifolia (DC.) Fritsch var. *obovata* (Griseb.) C.V.Morton, Brittonia 9: 19. 1957. *Gesneria cuneifolia* (DC.) Fritsch subsp. *obovata* (Griseb.) Borhidi, Bot. Közlem. 62: 27. 1975. *Gesneria cuneifolia* (DC.) Fritsch var. *obovata* (Griseb.) C.V.Morton, Brittonia 9: 19. 1957. *Gesneria cuneifolia* (DC.) Fritsch subsp. *obovata* (Griseb.) Borhidi, Bot. Közlem. 62: 27. 1975. TYPE: Cuba—[Provincia Guantánamo]: Yunque de Baracoa, 1861, *C. Wright s.n.* (Holotype: GOET).

Gesneria pallida C.V.Morton ex Borhidi & O.Muniz, Acta Bot. Acad. Sci. Hung. 22: 319. 1977 ["1976"]. TYPE: Cuba—[Provincia Guantánamo]: Pinares y cañadas al Norte de Yunque de Baracoa, 150 m, 13 January 1960, *H. Alain, J. Acuña & Ramos 7609* (Lectotype designated here, Lectotype: HAC; Isolectotypes: HAC-2 sheets, US).

Lithophytic herb with basal rosette of leaves growing on rock faces. Native to Hispaniola, Puerto Rico, and Cuba (Guantánamo, Holguín). FIGURE 13.

Gesneria salicifolia (Griseb.) Urb., Symb. Antill. 2: 373. 1901. *Pentaraphia salicifolia* Griseb., Cat. Pl. Cub. 199. 1866. TYPE: Cuba—La Catalina, near Sagua de Tánamo, Oriente, 19 March 1861, *C. Wright 3074* (Holotype:

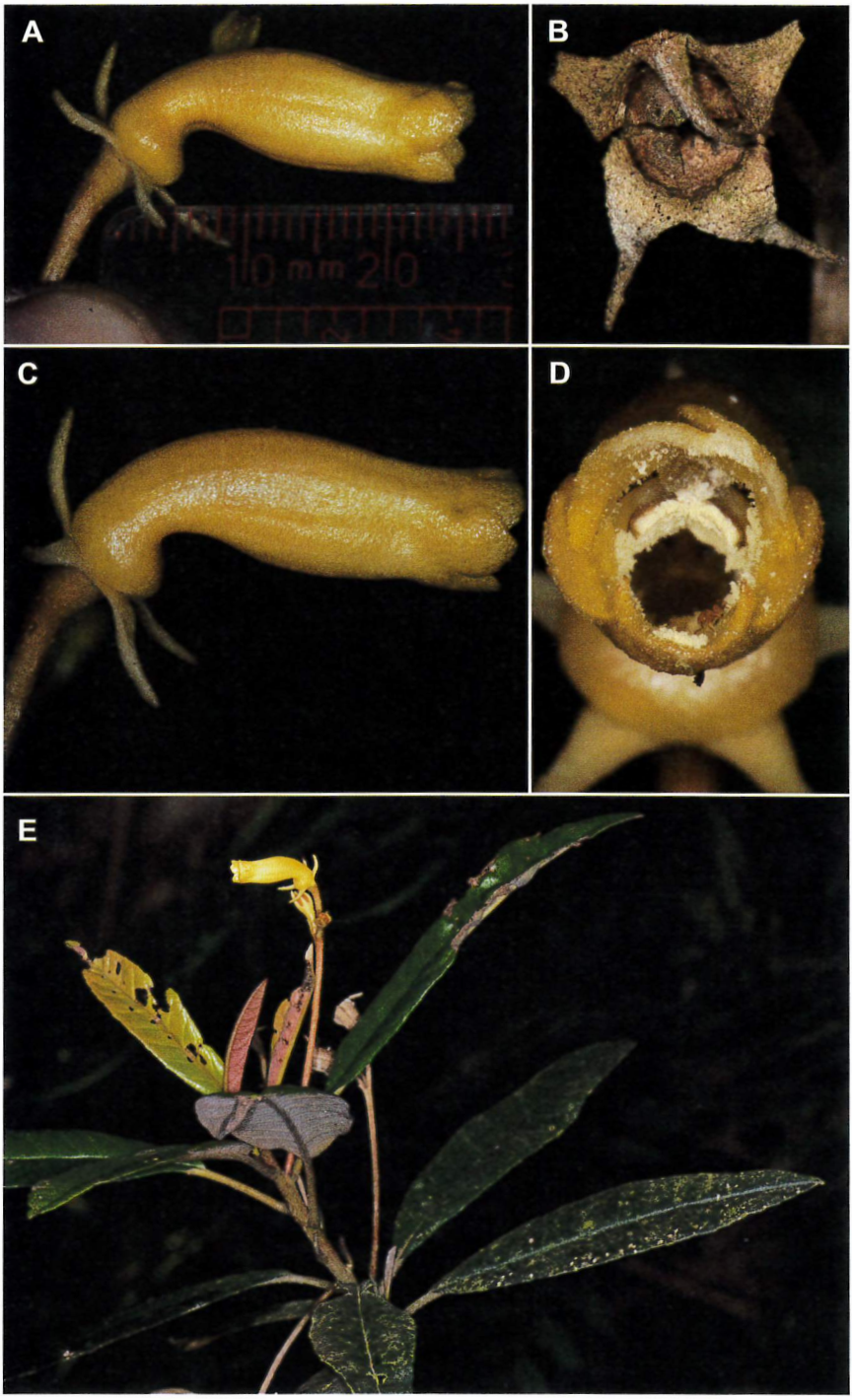

FIGURE 11. **Gesneria nipensis** Britton & P. Wilson. **A.** Lateral view of flower. **B.** Mature fruit. **C.** Lateral view of flower. **D.** Front view of flower fruit. **E.** Habit. (A–E from *J.L. Clark et al. 10577*).

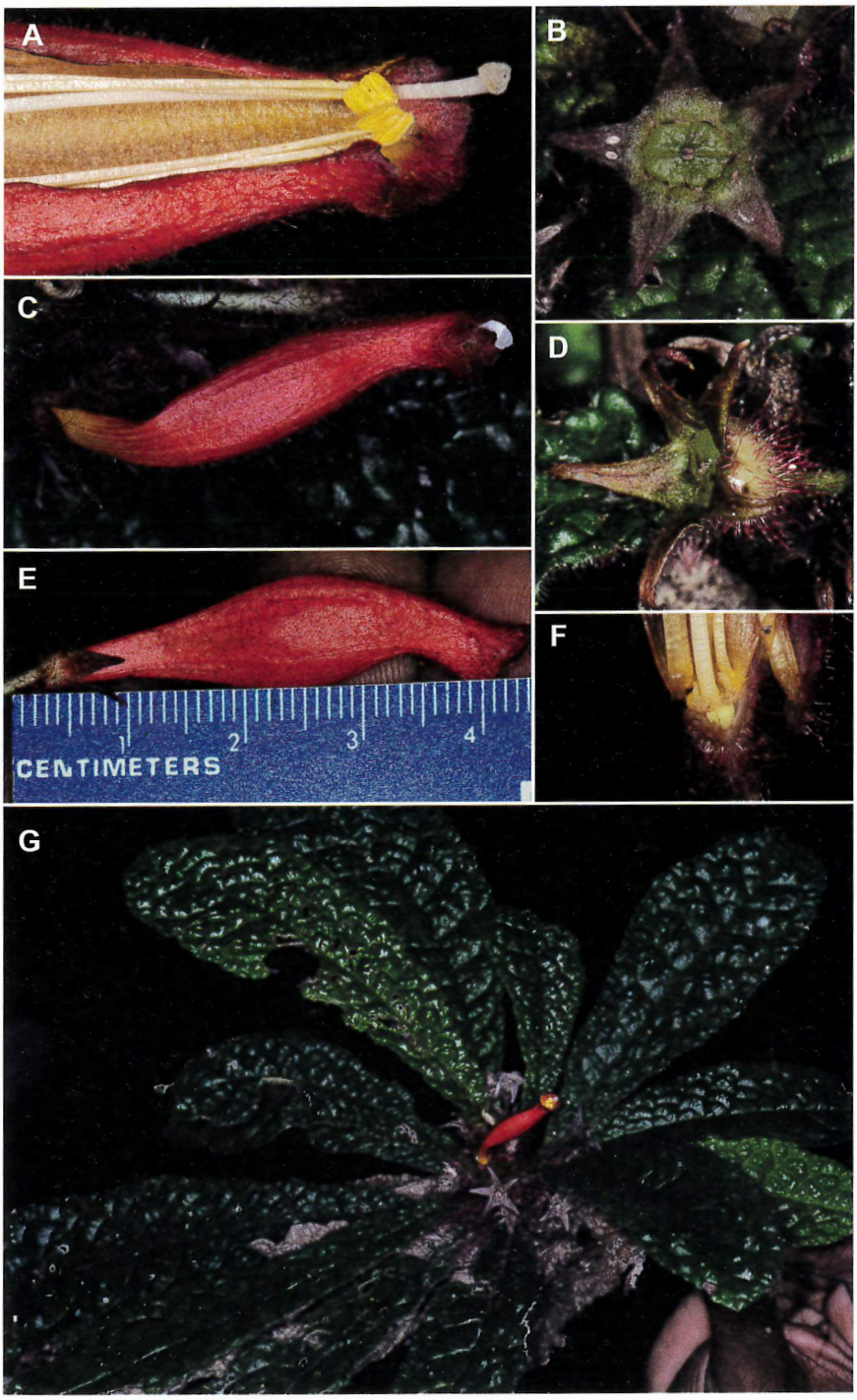

FIGURE 12. **Gesneria purpurascens** Urb. **A.** Inside of corolla. **B.** Front view of immature fruit. **C.** Lateral view of flower. **D.** Lateral view of mature fruit showing red trichomes. **E.** Lateral view of flower. **F.** Lateral view of inside corolla. **G.** Habit. (A, B, C, F, G from *J.L. Clark et al. 10564*; D&E from *J.L. Clark et al. 12769*).

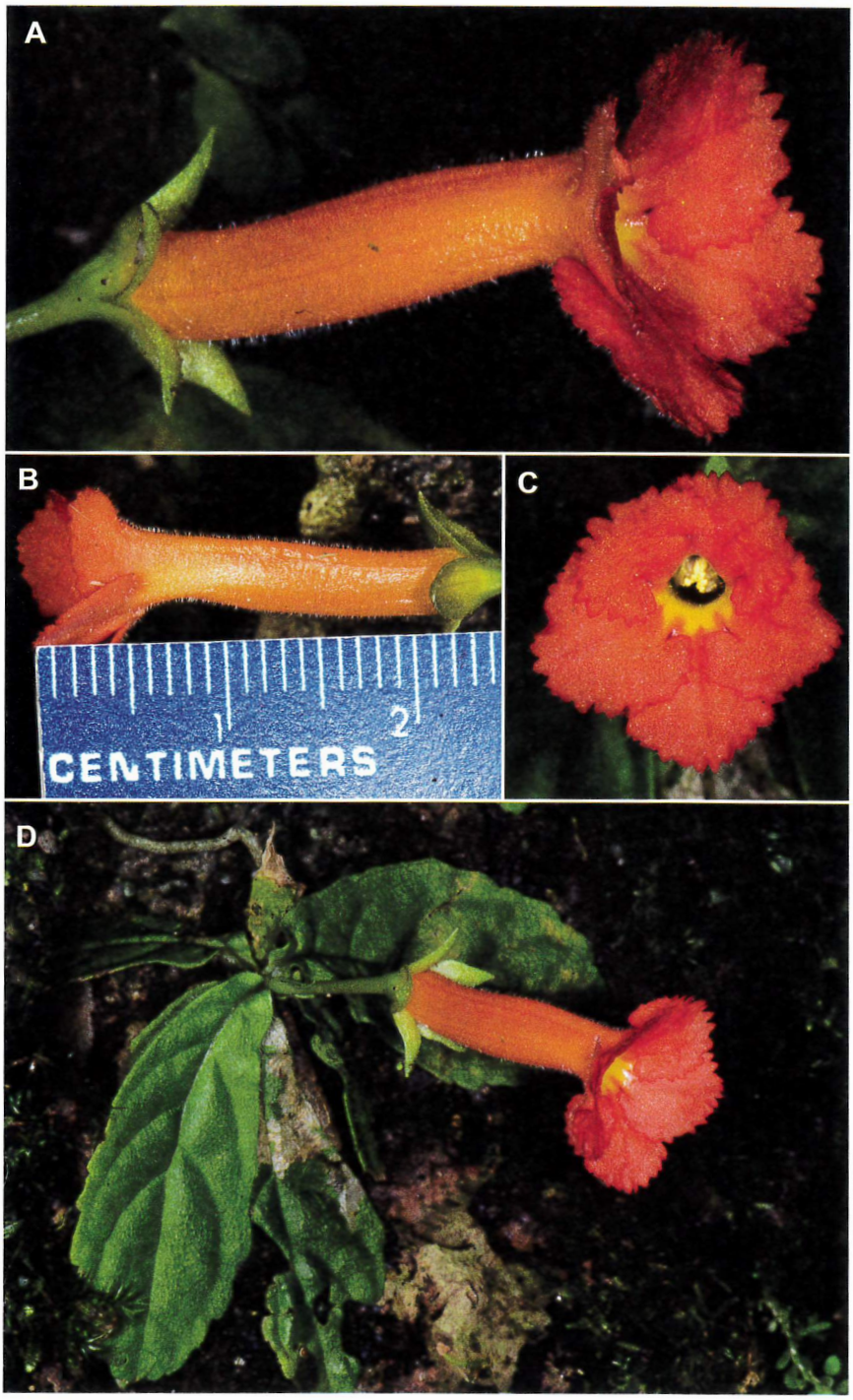

FIGURE 13. **Gesneria reticulata** (Griseb.) Urb. **A. & B.** Lateral view of flower. **C.** Front view of corolla. **D.** Habit. (A–D from *J.L. Clark et al. 12780*).

GOET; Isotypes: BM, G, GH, HAC-2 sheets, K, MO, NY, P, YU).

Gesneria gibberosa Urb., Repert. Spec. Nov. Regni Veg. 13: 477. 1915. *Gesneria gibberosa* (Griseb.) Urb., subsp. *gibberosa* (Urb.) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 33. 1979. TYPE: Cuba—[Provincia Guantánamo]: Coastal cliffs near Río Yumurí, 6–8 December 1910, *J. Shafer 7838* (Holotype: B, destroyed; Lectotype, designated by Skog (1976): NY; Isolectotypes: A, HAC, US).

Gesneria salicifolia (Griseb.) Urb., var. *spathulata* L.E.Skog, Smithsonian Contr. Bot. 29: 71, f. 40b. 1976. *Gesneria salicifolia* (Griseb.) Urb., subsp. *spathulata* (L.E.Skog) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 33. 1979. TYPE: Cuba—[Provincia Holguín]: Paredones del Río Moa, Moa, 15 November 1945, *J. Acuña 13348* [Holotype: HAC (formerly SV): Isotype: US].

Lithophytic subshrub with erect shoots to 60 cm tall. Endemic to Cuba (Guantánamo, Holguín). FIGURE 14.

Gesneria salicifolia is differentiated from other congeners by multiple flowers (3–4) per inflorescence, included stamens, and bright red perianth. The subshrub habit and relatively small leaves with serrate margins are similar to *Gesneria cubensis* which is characterized by single axillary flowers.

Populations of *Gesneria salicifolia* are locally abundant on cliffs adjacent to the highway between Moa and Baracoa on the northeastern shoreline in the provinces of Holguín and Guantánamo. Many of the rocks in this area are of serpentine origin, but the populations of *Gesneria saliciolia* are restricted to limestone outcrops (e.g., Cayo Güin, Bahía de Taco, and Río Yumurí).

Gesneria shaferi Urb. Symb. Antill. 7: 541. 1913. *Gesneria shaferi* Urb. subsp. *shaferi* L.E. Skog, Smithsonian Contr. Bot. 29: 157. 1976. TYPE: Cuba—[Provincia Guantánamo]: Yumurí arriba to Bermejal, Oriente, January-February 1911, *J. A. Shafer 8436* (Holotype: B, destroyed, lectotypified by Skog (1976), Lectotype: NY; Isolectotypes: HAC, MO, NY, PH, US).

Conradia depressa Griseb., Cat. Pl. Cub. 200. 1866. *Pentaraphia depressa* (Griseb.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23: 279. 1894. *Gesneria depressa* (Griseb.) Urb., Symb. Antill. 2: 378. 1901. *Gesneria shaferi* Urb. subsp. *depressa* (Griseb.) L.E.Skog, Smithsonian Contr. Bot. 29: 155. 1976. TYPE: Cuba—[Provincia Holguín]: Potosí Mt. Toro, Oriente, 1860–1864, *C. Wright 3079* (Holotype: GOET; Isotypes: BM, G, GH, HAC-2 sheets, K, MO, NY, P, YU).

Gesneria lindmanii Urb., Symb. Antill. 9: 271. 1924. TYPE: Cuba—[Provincia Guantánamo]: Yunque de Baracoa, 17–18 December 1914, *E.L. Ekman 3913* (Holotype: S).

Gesneria samuelssonii Urb., Repert. Spec. Nov. Regni Veg. 21: 70. 1925. TYPE: Cuba—Provincia Guantánamo, Monte Libanon, near Monterus, 700–800 m, 28 November 1922, *E.L. Ekman 3913* (Holotype: S; Isotypes: NY, S).

Epilithophytic herb with basal rosette of leaves. Endemic to Cuba (Guantánamo, Holguín). FIGURE 15.

The variation in corolla color and leaf surface morphology is extreme in this species. During a 2012 collecting expedition to Yunque de Baracoa and La Farola (Provincia Guantánamo) intraspecific variation from numerous populations was documented with photographs and collections. Leaf variation ranges from bullate to flat. The calyx lobes of individuals with bullate leaves are elongate and narrow (FIGURE 15E). The calyx lobes of individuals with non-bullate leaves are broad and triangular (FIGURE 15C). Corolla colors range from yellow with red throats, to dark red suffused with yellow, mostly yellow on upper lobes and uniformly red on lower lobes, uniformly dark red with yellow striations, to yellow tubes with dark red lobes (FIGURE 15). These differences are here recognized as intraspecific variation. The characters used to differentiate subspecies of *Gesneria shaferi* in Skog (1976) are considered here to be variable within populations as shown by recent field collections on the main trail to the summit of Yunque de Baracoa (Guantánamo).

Gesneria viridiflora (Decne.) Kuntze, Rev. Gen. Pl. 2: 473. 1891. *Pentaraphia viridiflora* (Decne.) Hanst., Linnaea 34: 306. 1865. *Duchartrea viridiflora* Decne., Ann. Sci. Nat. Bot. sér. 3, 6: 109, pl. 8. 1846. TYPE: Cuba—St. Yago de Cuba [Provincia Santiago de Cuba]: Sierra Maestra, 3000–4000 ft, 1843—1844, *J. Linden 1702* (Holotype: P; Isotypes: BM-2 sheets, FI-W, G, K-2 sheets, LE, P-2 sheets, W).

Gesneria viridiflora (Decne.) Kuntze var. *acutifolia* C.V.Morton, Brittonia 9: 21. 1957. TYPE: Cuba—Provincia Santiago de Cuba: Nimanima, *C. Wright. 354* (Holotype: GH; Isotype: CGE).

Gesneria viridiflora (Decne.) Kuntze var. *colorata* C.V.Morton, Brittonia 9: 21. 1957. *Gesneria viridiflora* (Decne.) Kuntze subsp. *colorata* (C.V.Morton) Borhidi, Bot. Közlem. 62: 27. 1975. TYPE: Cuba—Santa Clara [Provincia Sancti Spíritus]: Naranjo, Buenas Aires,

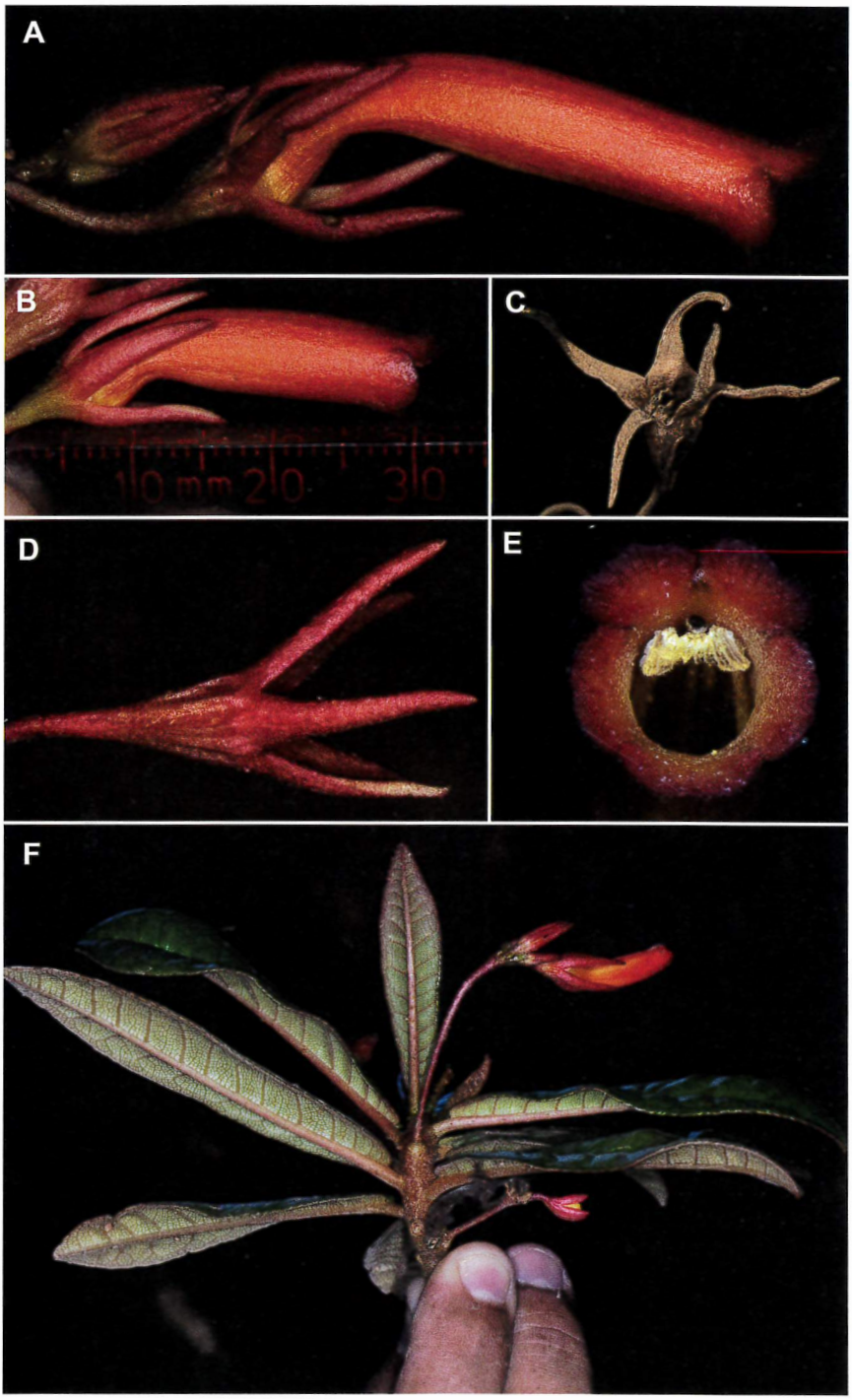

FIGURE 14. **Gesneria salicifolia** (Griseb.) Urb. **A. & B.** Lateral view of flower. **C.** Mature fruit. **D.** Lateral view of flower showing ridged ovary. **E.** Front view of flower. **F.** Habit. (A–F from *J.L. Clark et al. 10566*).

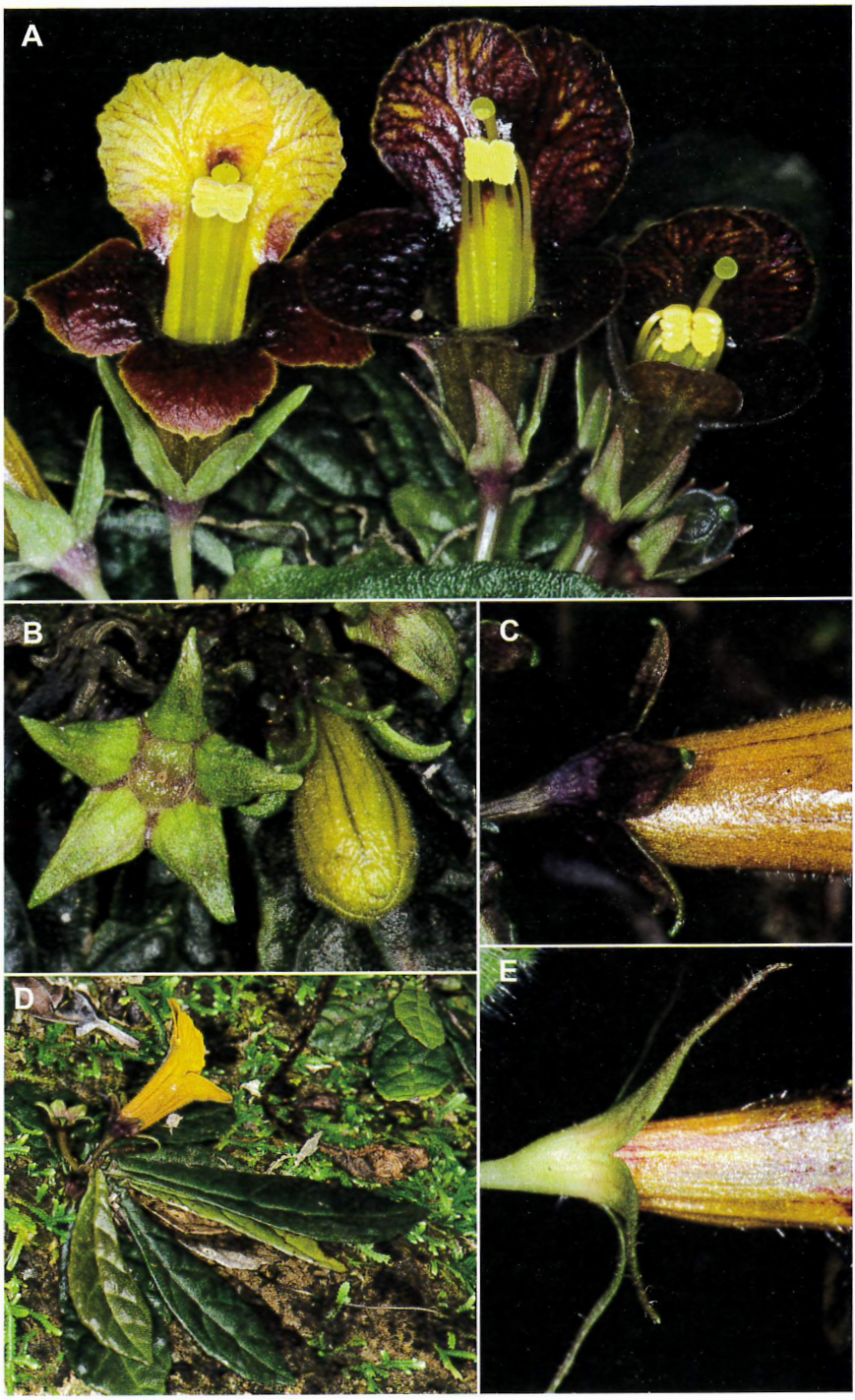

FIGURE 15. **Gesneria shaferi** Urb. **A.** Mature flowers showing color variation. **B.** Immature fruit and immature flower. **C.** Calyx from populations with non-bullate leaves. **D.** Habit. **E.** Calyx from populations with bullate leaves. (A from *J.L. Clark et al. 12773*; B, C&D from *J.L. Clark et al. 12778*; E from *J.L. Clark et al. 12786*).

Trinidad Hills, 2500–3500 ft, 24 July 1930, *J. Jack 8111* (Holotype: US; Isotype: NY).

Gesneria viridiflora (Decne.) Kuntze var. *obovata* C.V.Morton, Brittonia 9: 21. 1957. TYPE: Cuba—Provincia Santiago de Cuba: Cañizo, S of Loma del Gato, Sierra Maestra, July 1921, *Fr. León 9821* (Holotype: US; Isotype: NY).

Terrestrial shrub to 4 m tall. Endemic to Cuba (Cienfuegos, Granma, Guantánamo, Holguín, Sancti Spíritus, Santiago de Cuba). FIGURE 16.

This species is a widespread taxon that has been studied in all of the type localities for the varieties recognized by Morton (1957a). Intraspecific variation in leaf shape is common and does not warrant separate species circumscriptions. For example, one population on the trail leading towards the summit of Pico Turquino (Sierra Maestra) had leaves that ranged from obovate to oval to oblong (FIGURE 16C). Leaf apices also ranged from acute to obtuse and abaxial leaf color ranged from uniformly green to uniformly red.

Gesneria wrightii Urb., Symb. Antill. 2: 373. 1901. *Pentaraphia triflora* Griseb., Cat. Pl. Cub. 199. 1866, non *Gesneria triflora* M.Martens & Galeotti, Bull. Acad. Roy. Sci. Bruxelles 9: 33. 1842, non *Gesneria triflora* Hook., Bot. Mag. 73, pl. 4342. 1847. TYPE: Cuba—Cuba Orientale, farallones, Potrero San Andrés, 23 October 1860–1864, *C. Wright 3072* (Holotype: GOET; Isotypes: BM, G-2 sheets, GH, HAC-2 sheets, K, LE, MO, NY, P, W, YU).

Shrub to 2.5 m tall. Endemic to Cuba (Holguín).

Gesneria wrightii is differentiated from other congeners by multiple flowers (usually 3) per inflorescence and exserted stamens. The subshrub habit and relatively small leaves with serrate margins are similar to *Gesneria cubensis* which is characterized by single axillary flowers and non-exserted stamens.

Gesneria wrightii is only known from the type collection and it is possible that this taxon is conspecific with *Gesneria salicifolia*. Both species have multiple flowers per inflorescence. Distinguishing characteristics used to define *Gesneria wrightii* are three flowers per inflorescence and exserted stamens. Some collections of *Gesneria salicifolia* also have three flowers per inflorescence and others have four. The stamens of *Gesneria salicifolia* are usually inserted, but this character could be variable in *G. salicifolia* and may change depending on the maturity of the androecium.

The type locality of *Gesneria wrightii* (San Andrés) is 130 km W of the westernmost known locality (the type locality) of *Gesneria salicifolia*, Sagua de Tánamo (eastern Holguín Province). The absence of other collections in this gap suggests that *Gesneria wrightii* and *G. salicifolia* are geographically isolated and not conspecific. It should also be noted that Wright's field collection 3072 described the environs of San Andrés as "potrero" (Howard 1988), which translates in English to pasture or grazing land. Wright noted that the area was already heavily converted for agriculture in the 1860s and it is unlikely that there is any extant forest today. There are no recent reports of native Gesneriaceae near San Andrés according to biologists who have extensive experience working in this area (Sara Suárez T., CITMA Holguín, pers. comm.). If *Wright 3072* was collected near San Andrés and the locality is not in error then it is probable that this species is extinct.

Gesneria yumuriensis Britton & P.Wilson, Mem. Torrey Bot. Club 16: 109. 1920. *Gesneria purpurascens* Urb. var. *yumuriensis* (Britton & P.Wilson) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 34. 1979. TYPE: Cuba—[Provincia Guantánamo]: Coastal cliffs, Oriente, face of cliff near Río Yumurí, 6–8 December 1910, *J. A. Shafer 7786* (Holotype: NY; Isotypes: A, HAC, US).

Gesneria lopezii C.V.Morton, Brittonia 9: 19. 1957; *Gesneria libanensis* Linden ex C. Morren subsp. *lopezii* (C.V.Morton) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 34. 1979. TYPE: Cuba—[Provincia Holguín]: on rocks at Cayo del Rey, southwestern foothills of the Sierra de Nipe, 7 January 1956, *C.V. Morton et al. 8759* (Holotype: NY; Isotypes: A, HAC, US).

Lithophytic herb with basal rosette of leaves. Endemic to Cuba (Guantánamo, Holguín). FIGURE 17.

Gesneria yumuriensis was recognized by Skog (1976, 2012) as a synonym of *Gesneria purpurascens*. These two species differ by the presence of red trichomes on dark red calyces and bullate leaves in *G. purpurascens* (FIGURE 12). In contrast, the calyces of *Gesneria yumuriensis* are nearly glabrous and bright green and the leaves lack bullations and are nearly flat.

Skog (1976, 2012) recognized *Gesneria lopezii* as a synonym of *G. libanensis*. In contrast, we recognize *Gesneria lopezii* as conspecific with *Gesneria yumuriensis*. Recent collections and photographs from populations of Gesneria lopezii from its type locality from Cayo del Rey (Provinicia Holguín) have been made by Sara Suárez T. from the Centro de Investigaciones y Servicios Ambientales y Tecnologicos (CITMA Holguín) and live collections are currently in

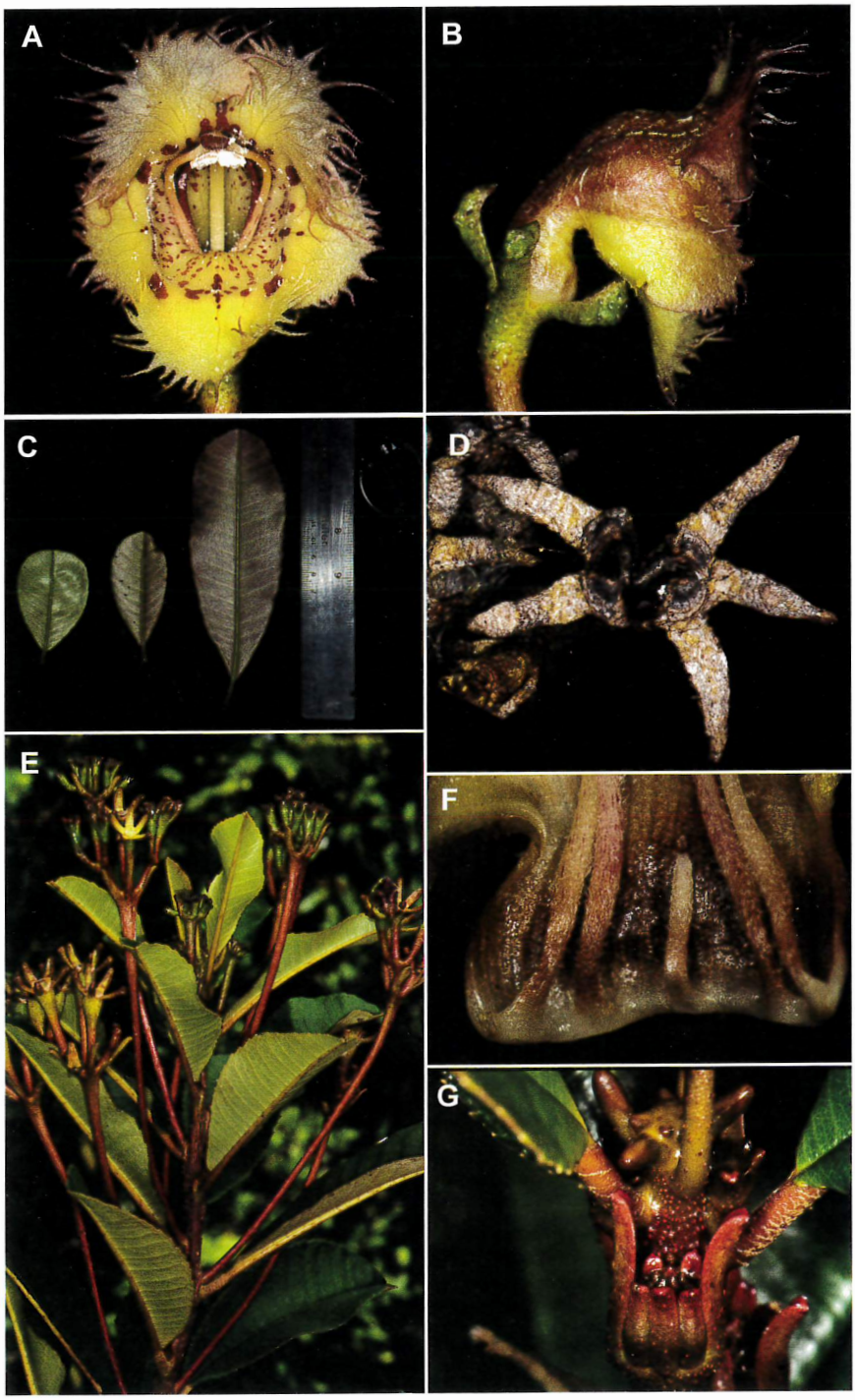

FIGURE 16. **Gesneria viridiflora** (Decne.) Kuntze. **A.** Front view of flower showing fimbriations on upper and lower lobes. **B.** Lateral view of flower. **C.** Variation in leaf shapes from a single population in Sierra Maestra (Prov. Guantánamo). **D.** Mature fruit. **E.** Habit. **F.** Base of flower showing glabrous and nearly free filaments. **G.** Vegetative buds and inflorescence bracts. (A&B from *J.L. Clark et al. 10555*; C, F&G from *J.L. Clark 10509*; D from *J.L. Clark et al. 10523*; E from *J.L. Clark 10552*).

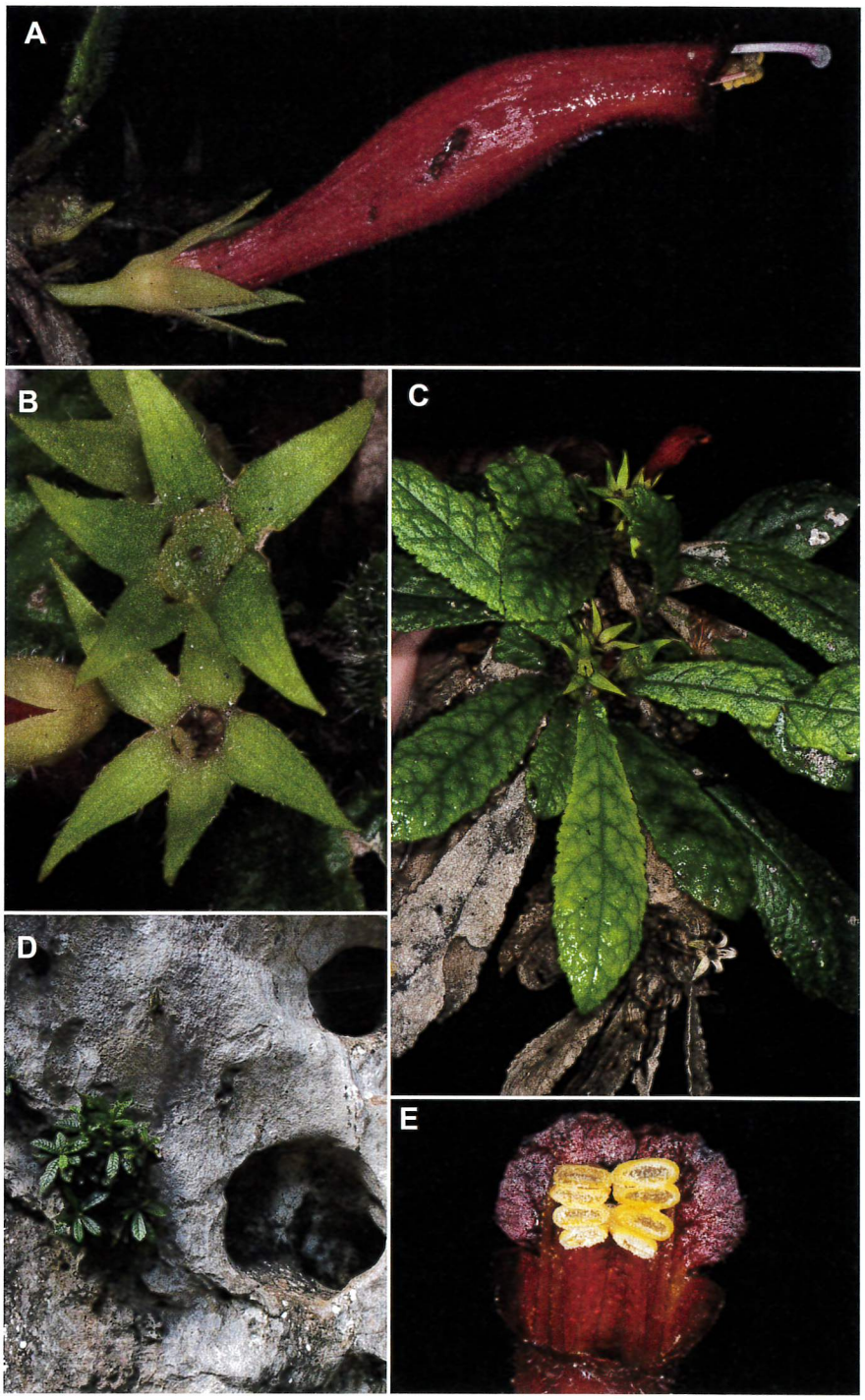

FIGURE 17. **Gesneria yumuriensis** Britton & P. Wilson. **A.** Lateral view of flower. **B.** Fruits. **C. & D.** Habit. **E.** Front view of flower showing androecium. (A, B, C, E from *J.L. Clark et al. 10575*; D from *Sara Suárez T. s.n.*).

cultivation. Studies based on type material and recent collections in cultivation suggest that *Gesneria lopezii* is conspecific with *Gesneria yumuriensis* rather than with *G. libanensis*.

Gloxinia L'Hér. 1 species; 1 exotic.

Gloxinia perennis (L.) Fritsch in Engler & Prantl, Nat. Pflanzenfam. 4(3b): 174. 1894. *Martynia perennis* L., Sp. Pl. 618. 1753.

Commonly cultivated terrestrial herb. Distribution: Exotic in Cuba (Santiago de Cuba), Hispaniola, Jamaica, Puerto Rico, and Lesser Antilles; native to Central America and South America.

Pheidonocarpa L.E.Skog. 1 species; 1 endemic.

Pheidonocarpa corymbosa (Sw.) L.E.Skog subsp. **cubensis** (C.V.Morton) L.E.Skog, Smithsonian Contr. Bot. 29: 43. 1976. *Heppiella cubensis* C.V.Morton, Brittonia 9: 21. 1957. *Pheidonocarpa cubensis* (C.V.Morton) Borhidi, Acta Bot. Acad. Sci. Hung. 25: 31. 1979. *Gesneria mortonii* Wiehler, Baileya 18: 4. 1971, non *Gesneria cubensis* (Decne.) Baillon. TYPE: Cuba—[Provincia Guantánamo]: Sur de la región de Baracoa, Río de Jauco, July–August 1924, *F. Leon 11685* (Holotype: NY; Isotypes: LS, NY, US).

Erect subshrub to 60 cm tall, growing on limestone cliffs. Endemic to Cuba (Guantánamo). FIGURE 18.

Phinaea Benth. 1 species; 1 endemic.

Phinaea pulchella (Griseb.) C.V.Morton var. **pulchella**, Brittonia 9: 22. 1957. *Niphaea pulchella* Griseb., Cat. Pl. Cub. 198. 1866. TYPE: Cuba—[Provincia Pinar del Río]: Loma del Rangel, 1863, *C. Wright 3069* (Holotype: GOET; Isotypes: BM, G, GH, HAC-2 sheets, K, MO, NY-3 sheets, P, S, UC, US, YU).

Lithophytic herb, 10–20 cm tall growing on moist limestone cliffs. Endemic to Cuba (Pinar del Río). FIGURE 19.

Phinaea pulchella var. *pulchella* is endemic to western Cuba and *Phinaea pulchella* var. *domingensis* is endemic to western Haiti (Clark et al. 2011, Boggan et al. 2008). Assuming that the locality is not in error then the population from Haiti is known from a single collection (*E.L. Ekman 9213*) in 1927 and it represents the only collection known from the entire island of Hispaniola.

Recent collections of *Phinaea pulchella* were found to be restricted to limestone cliffs (*J.L. Clark et al. 10583*). The vertical cliffs where this species occurs are usually dry with sporadically distributed moist areas with small clusters of mosses and herbs. It is on these moist areas that *Phinaea pulchella* var. *pulchella* was found to be locally abundant. Recent molecular phylogenetic results of the Gloxinieae strongly support *Phinaea pulchella* as more closely related to *Diastema vexans* from Colombia than to other species of *Phinaea* (Clark et al. 2011). *Phinaea pulchella* is the only species of *Phinaea* known from the Caribbean (the two other species are Central and South American in distribution), and is the only species in the tribe Gloxinieae endemic to the Caribbean (Boggan et al. 2008). The phylogenetic results from Clark et al. (2011) are not congruent with the recent circumscription of *Phinaea* by Boggan et al. (2008) and may warrant the recognition of a new genus for the Caribbean taxon.

Rhytidophyllum Mart. 9 species; 9 endemic.

Rhytidophyllum acunae C.V.Morton, Brittonia 9: 23. 1957. TYPE: Cuba—Montecristo [Provincia Guantánamo]: easternmost part of the province, 500 m, 16 January 1956, *C.V. Morton & Bro. Alain 9181* (Holotype: US; Isotypes: B, BM, GH, NY, SEL, US).

Shrub to 2 m tall. Endemic to Cuba (Guantánamo).

This species is distinguished by its dense whitish lanate indumentum on the lower leaf surfaces. In contrast to most *Rhytidophyllum* species, the inflorescence lacks bifurcations and appears umbellate with 3 or 4 flowers subtended by elongate pedicels.

The species is named in honor of Ing. Julián Acuña Gale, who was the Chief of the Department of Botany at the Estación Experimental Agronómica in Santiago de las Vegas.

Rhytidophyllum coccineum Urb., Symb. Antill. 2: 385. 1901. TYPE: Cuba—Oriente [Provincia Guantánamo]: 1859–1860, *C. Wright 356* (Lectotype designated here, Lectotype GH; Isolectotypes: B, BM, GH, NY, SEL, US, YU).

Shrub to 2 m tall. Endemic to Cuba (Guantánamo, Holguín, Santiago de Cuba).

This species is distinguished from other congeners by the subshrub habit with red corollas. Other *Rhytidophyllum* species in Cuba with red flowers (e.g., *R. rupincola*) are readily differentiated by their scandent habit. The variation in leaf forms ranges from narrow (4–5 X as long as wide) with a long acuminate apex to broad (2–3 X as long as wide). It should be noted that many of the collection numbers by *C. Wright* do not represent a single gathering. The type for *Rhytidophyllum coccineum* is especially problematic because *C. Wright 356* is also the collection number for the

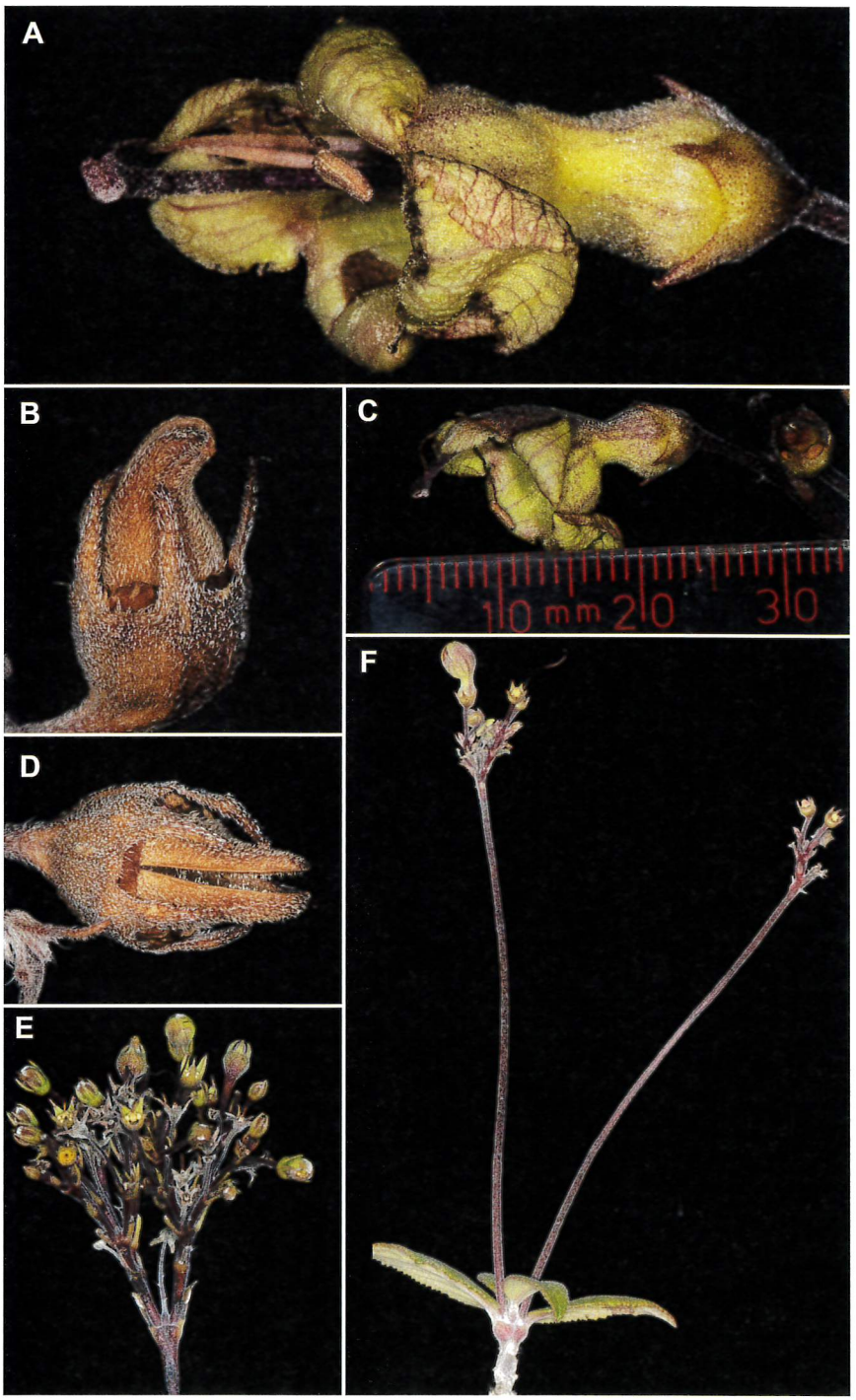

FIGURE 18. **Pheidonocarpa corymbosa** (Sw.) L.E.Skog subsp. **cubensis** (C.V.Morton) L.E.Skog. **A.** Lateral view of flower. **B.** Mature fruit. **C.** Lateral view of corolla. **D.** Mature fruit. **E.** Inflorescence. **F.** Habit showing elongate peduncles. (A–F from *J.L. Clark et al. 10556*).

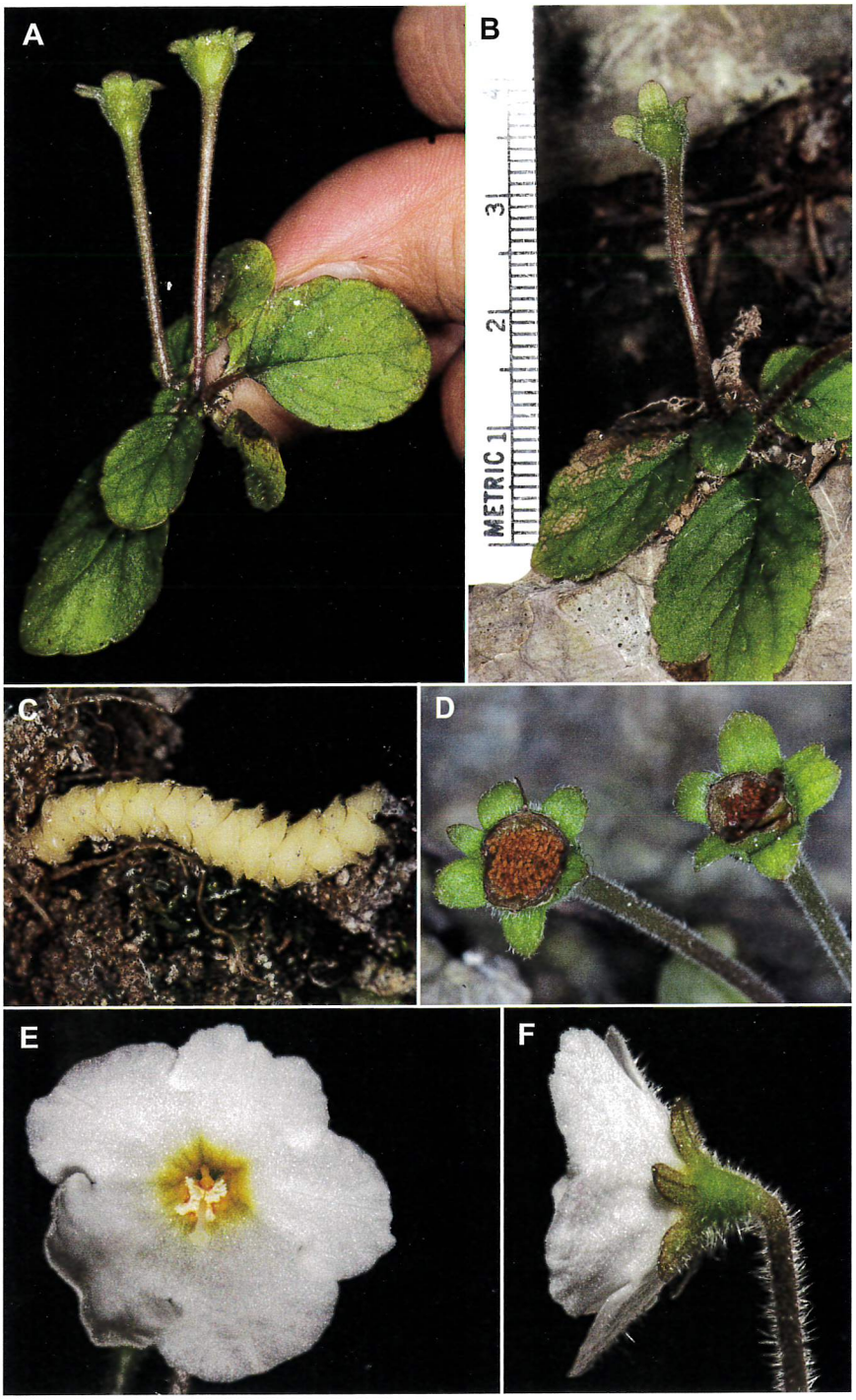

FIGURE 19. **Phinaea pulchella** (Griseb.) C.V.Morton. **A.** Habit showing erect pedicels and basal rosette of leaves. **B.** Habit with scale. **C.** Scaly rhizome. **D.** Mature capsule fruits. **E.** Front view of flower. **F.** Lateral view of flower. (A–D from *J.L. Clark et al. 10583*; E&F from *Julie Mavity-Hudson s.n.*).

types of *Rhytidophllum exsertum* and *R. tomentosum* var. *nudum*.

Rhytidophyllum crenulatum DC., Prodr. 7(2): 524. 1839. *Gesneria crenulata* A. C. ex DC., Prodr. 7(2): 524. 1839, pro syn. TYPE: Cuba—Western Cuba [Provincia La Habana]: February 1829, *R. de la Sagra 7* (Holotype: G-DC; Isotypes: FI-W, K).

Gesneria tomentosa sensu Jacq., Select. Stirp. Amer. Hist. 179. 1763, non *Gesneria tomentosa* L.

Erect subshrub growing on limestone by river banks or on cliffs. Endemic to Cuba (La Habana). FIGURE 20.

Rhytidophyllum crenulatum has a limited distribution and is endemic to the province of La Habana where it is locally abundant. It is one of the most common plants found on the walls of the Parque Histórico Militar Morro-Cabaña (Cuza Pérez & Rodríguez Roque, 2006) and it can be observed growing on walls in urban areas in Old Havana.

Rhytidophyllum earlei (Urb. & Britton) C.V.Morton, Brittonia 9: 23. 1957. *Gesneria earlei* Urb. & Britton in Urban, Symb. Antill. 7: 380. 1912. TYPE: Cuba—Santa Clara [Provincia Cienfuegos]: Río San Juan, 24–25 March 1910, *N. L. Britton, F. S. Earle & P. Wilson 5965* (Holotype: B, destroyed; Lectotype designated here, Lectotype: NY; Isolectotype: GH).

Scandent herb growing on rock faces. Endemic to Cuba (Cienfuegos, Sancti Spiritus). FIGURE 21.

Rhytidophyllum exsertum Griseb., Cat. Pl. Cub. 198. 1866. Type: Cuba—*C. Wright 3070A* (Holotype: GOET; Isotypes: G-DC, GH, K, P).

Rhytidophyllum mogoticola Borhidi & O.Muñiz, Acta Bot. Acad. Sci. Hung. 18: 41. 1973. TYPE: Cuba—Sierra Maestra [Provincia Santiago de Cuba]: Mogotes de la Tabla, between Rihito and La Tabla, 400 m, 5 February 1970, *A. Borhidi & O. Muñiz 27121* (Holotype: HAC; Isotype: BP).

Rhytidophyllum tomentosum (L.) Mart. var. *nudum* Urb. f. *villosulum* Urb., Symb. Antill. 2: 388. 1901. *Rhytidophyllum exsertum* Griseb. subsp. *villosulum* (Urb.) Borhidi, Bot. Közlem. 62: 27. 1975. *Rhytidophyllum villosulum* (Urb.) C.V.Morton, Brittonia 9: 23. 1957. TYPE: Cuba—Río Seco [Provincia Guantánamo]: February 1889, *H.F.A. von Eggers 4743* (Lectotype designated here, Lectotype: M; Isolectotypes: F-2 sheets, HBG-2 sheets, MA, P, S).

Rhytidophyllum tomentosum (L.) Mart. var. *nudum* Urb. f. *viscidum* Urb., Symb. Antill. 2: 388. 1901. Type: Cuba—*C. Wright 356* (p.p.) (Lectotype designated here, Lectotype: GOET).

Rhytidophyllum wrightianum Griseb., Cat. Pl. Cub. 198. 1866. *Rhytidophyllum wrightii* Griseb. ex C. Wright in Sauvalle, Anales Acad. Ci. Med. Habana 6: 316. 1870 (probably in error for *R. wrightianum*). *Rhytidophyllum exsertum* Griseb. subsp. *wrightianum* (Griseb.) Borhidi, Bot. Közlem. 62: 27. 1975. Type: Cuba—*C. Wright s.n.* (Holotype: GOET).

Terrestrial subshrub to 2.5 m tall. Endemic to Cuba (Cienfuegos, Granma, Guantánamo, Holguín, La Habana, Matanzas, Pinar del Río, Sancti Spíritus, Santiago de Cuba, Villa Clara). FIGURE 22.

Rhytidophyllum lomense (Urb.) C.V.Morton, Brittonia 9: 23. 1957. *Gesneria lomensis* Urb., Repert. Spec. Nov. Regni Veg. 21: 70. 1925. TYPE: Cuba—Santa Clara [Provincia Cienfuegos]: Lomas de Siguanea, Mountains at Río Navarro, 4 June 1922, *E.L. Ekman 13907* (Holotype: S).

Scandent herb growing on rock faces. Endemic to Cuba (Cienfuegos, Sancti Spíritus). FIGURE 23.

Rhytidophyllum minus Urb., Repert. Spec. Nov. Regni Veg. 21: 71. 1925. TYPE: Cuba—[Provincia Granma]: Peninsula de Cabo Cruz, S of Niguero, 16 January 1923, *E.L. Ekman 16168* (Holotype: S; Isotypes: G, K, NY, S).

Rhytidophyllum intermedium Urb. & Ekman, Repert. Spec. Nov. Regni Veg. 22: 371. 1926. TYPE: Cuba—[Provincia Santiago de Cuba]: El Morro, 6 July 1924, *E.L. Ekman 19199* (Holotype: S; Isotype: S).

Erect subshrub growing on limestone cliffs and limestone coastal terraces. Endemic to Cuba (Granma, Santiago de Cuba). FIGURE 24.

Rhytidophyllum rhodocalyx Urb., Repert. Spec. Nov. Regni Veg. 21: 72. 1925. TYPE: Cuba—Sierra Maestra [Provincia Santiago de Cuba]: Loma Regino on the northern spur of Pico Turquino, 1700 m, 24 June 1922, *E.L. Ekman 14612* (Holotype: S).

Lithophytic shrub, 60 cm tall. Endemic to Cuba (Santiago de Cuba). FIGURE 25.

Rhytidophyllum rhodocalyx is one of the rarest Gesneriaceae species in Cuba. The holotype collection was made by Erik Ekman who was a naturalist and explorer from Sweden who collected in Cuba between 1914 and 1924. One of the

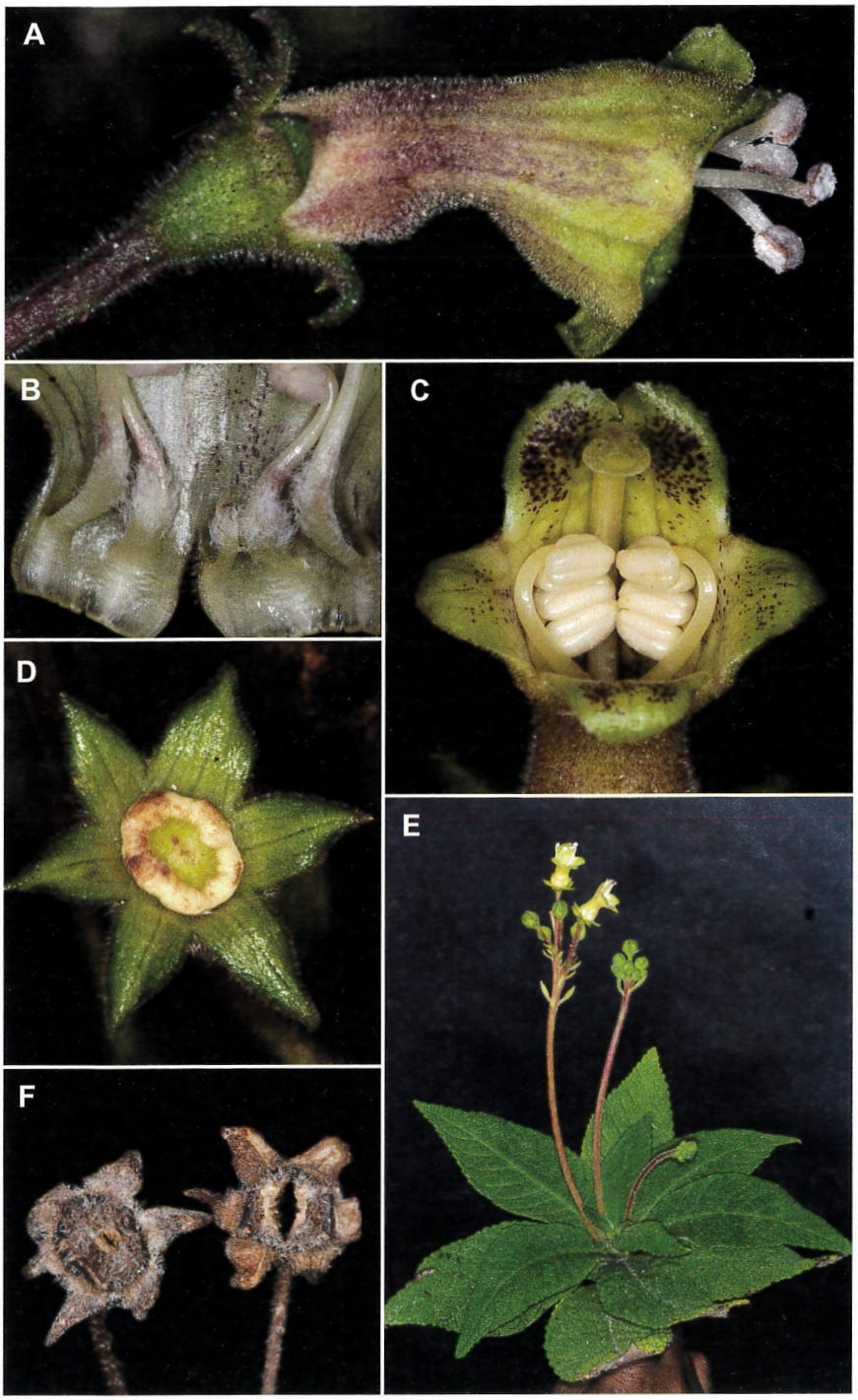

FIGURE 20. **Rhytidophyllum crenulatum** DC. **A.** Lateral view of flower. **B.** Pubescent filaments with stamens adnate to base of corolla. **C.** Front view of corolla. **D.** Nectary gland. **E.** Habit. F. Mature fruit. (A from *J.L. Clark et al. 10585*; B-F from *J.L. Clark et al. 10580*).

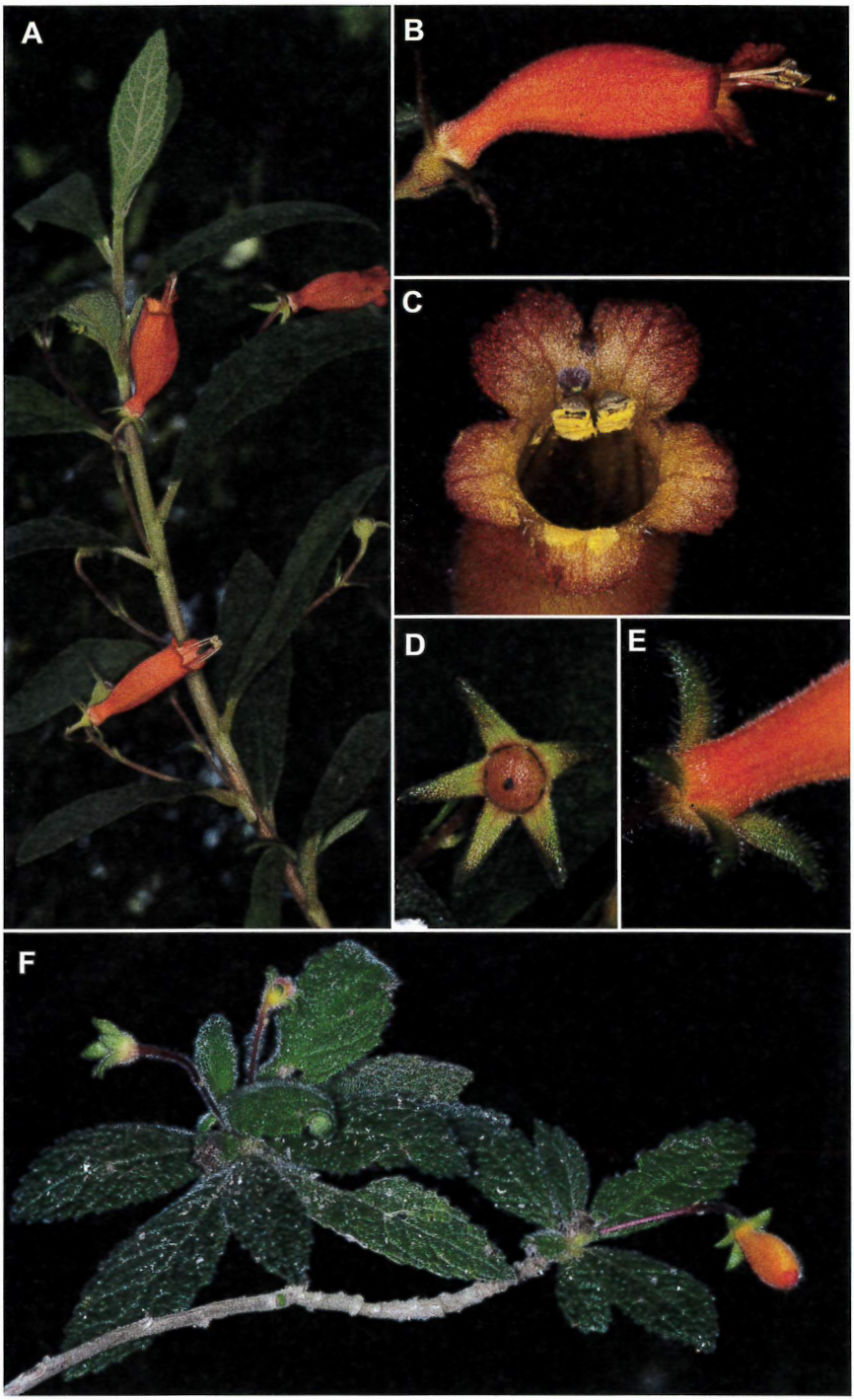

FIGURE 21. **Rhytidophyllum earlei** (Urb. & Britton) C.V.Morton. **A.** Habit. **B.** Lateral view of flower. **C.** Front view of corolla. **D.** Immature corolla. **E.** Calyx. **F.** Habit. (A, B, D from *J.L. Clark et al. 10458*; C, E, F from *J.L. Clark et al. 10486*).

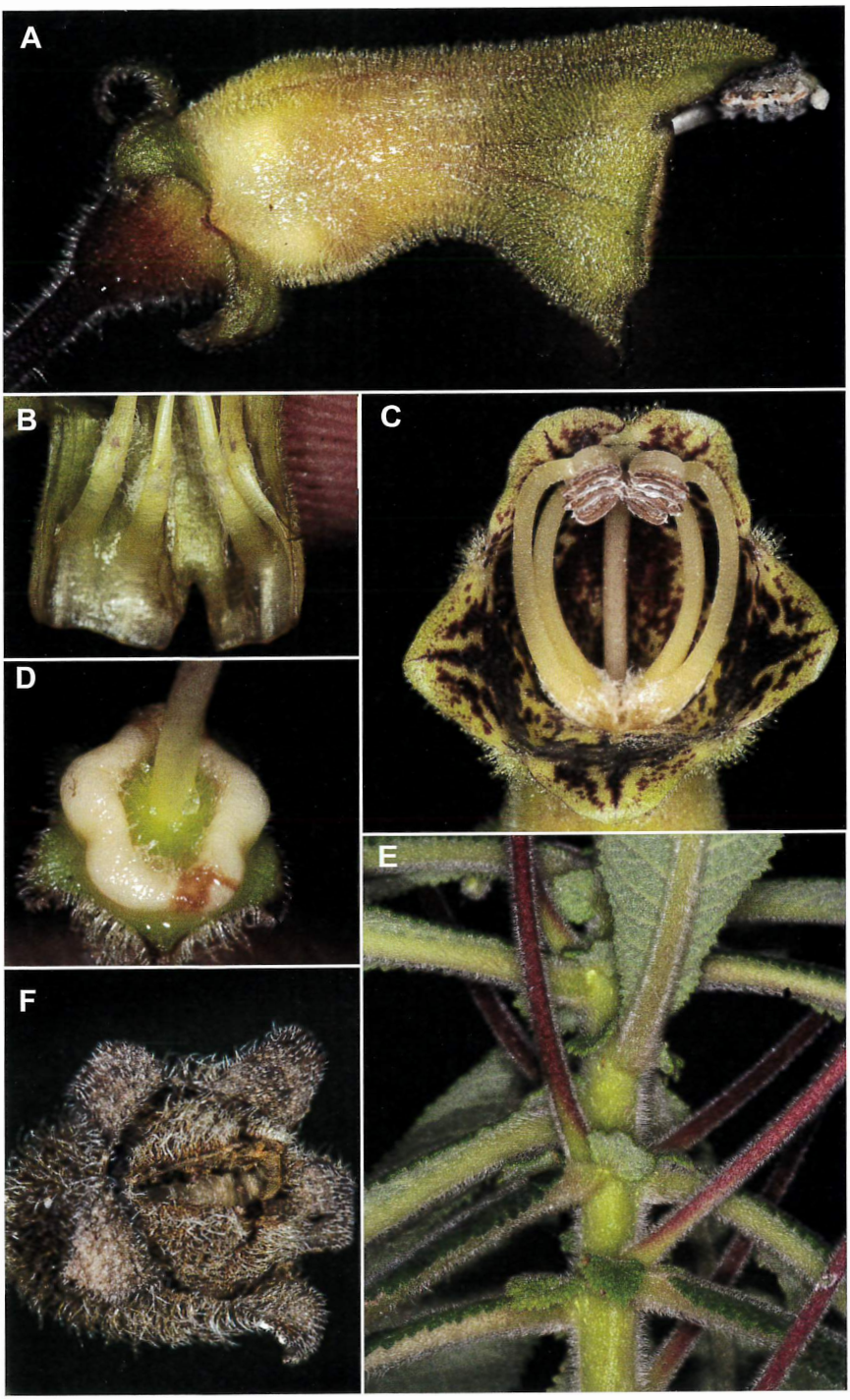

FIGURE 22. **Rhytidophyllum exsertum** Griseb. **A.** Lateral view of flower. **B.** Pubescent filaments with stamens adnate to base of corolla. **C.** Front view of corolla. **D.** Nectary. **E.** Vegetative shoot. **F.** Mature fruit. (A from *J.L. Clark et al. 10585*; B from *J.L. Clark et al. 10569*; C from *J.L. Clark et al. 10551*: D & E from *J.L. Clark et al. 10538*; F from *J.L. Clark et al. 12787*).

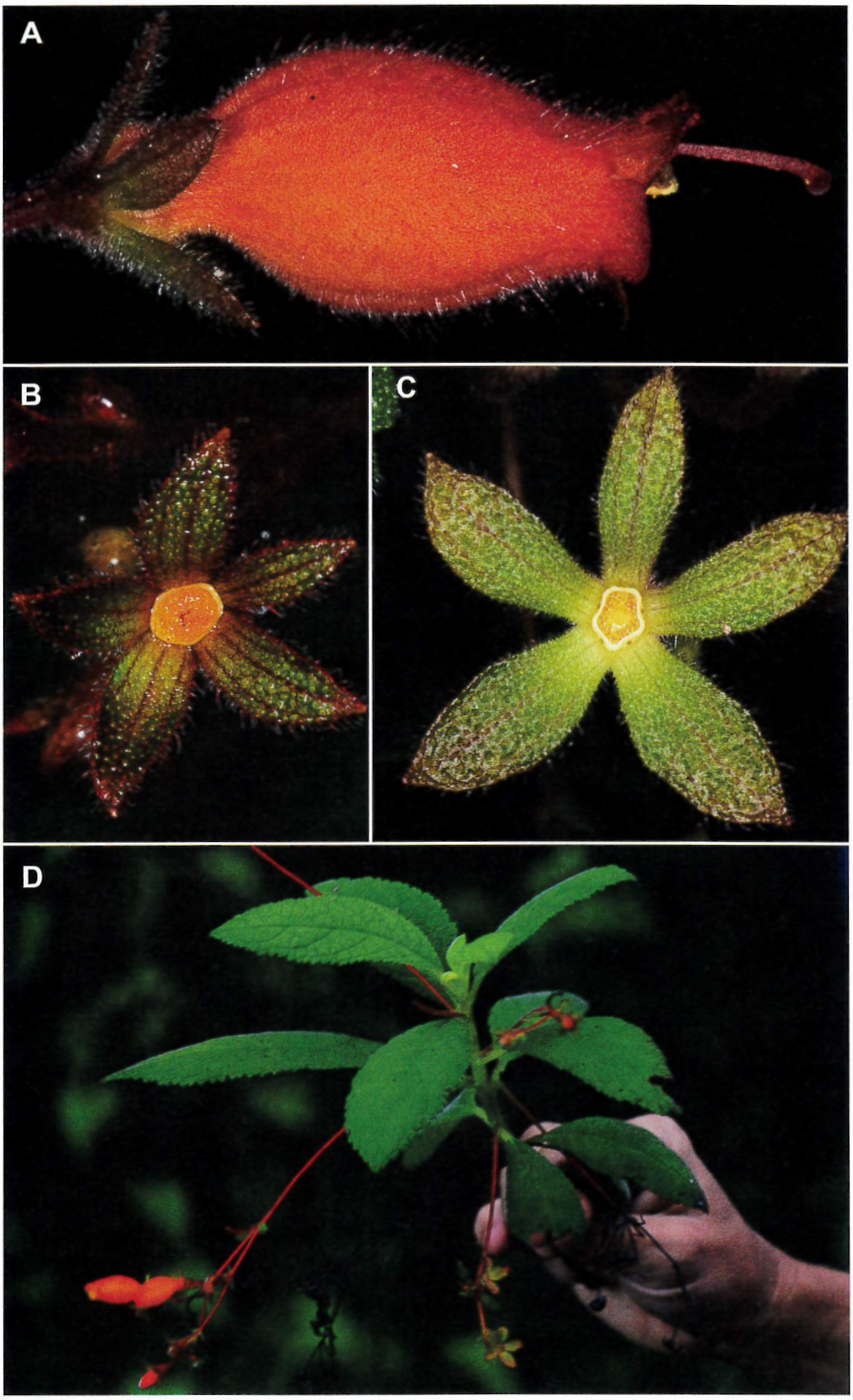

FIGURE 23. **Rhytidophyllum lomense** (Urb.) C.V.Morton. **A.** Lateral view of flower. **B & C.** Calyx. **D.** Habit. (A&C from *J.L. Clark et al. 10469*; B&D from *J.L. Clark et al. 10466*).

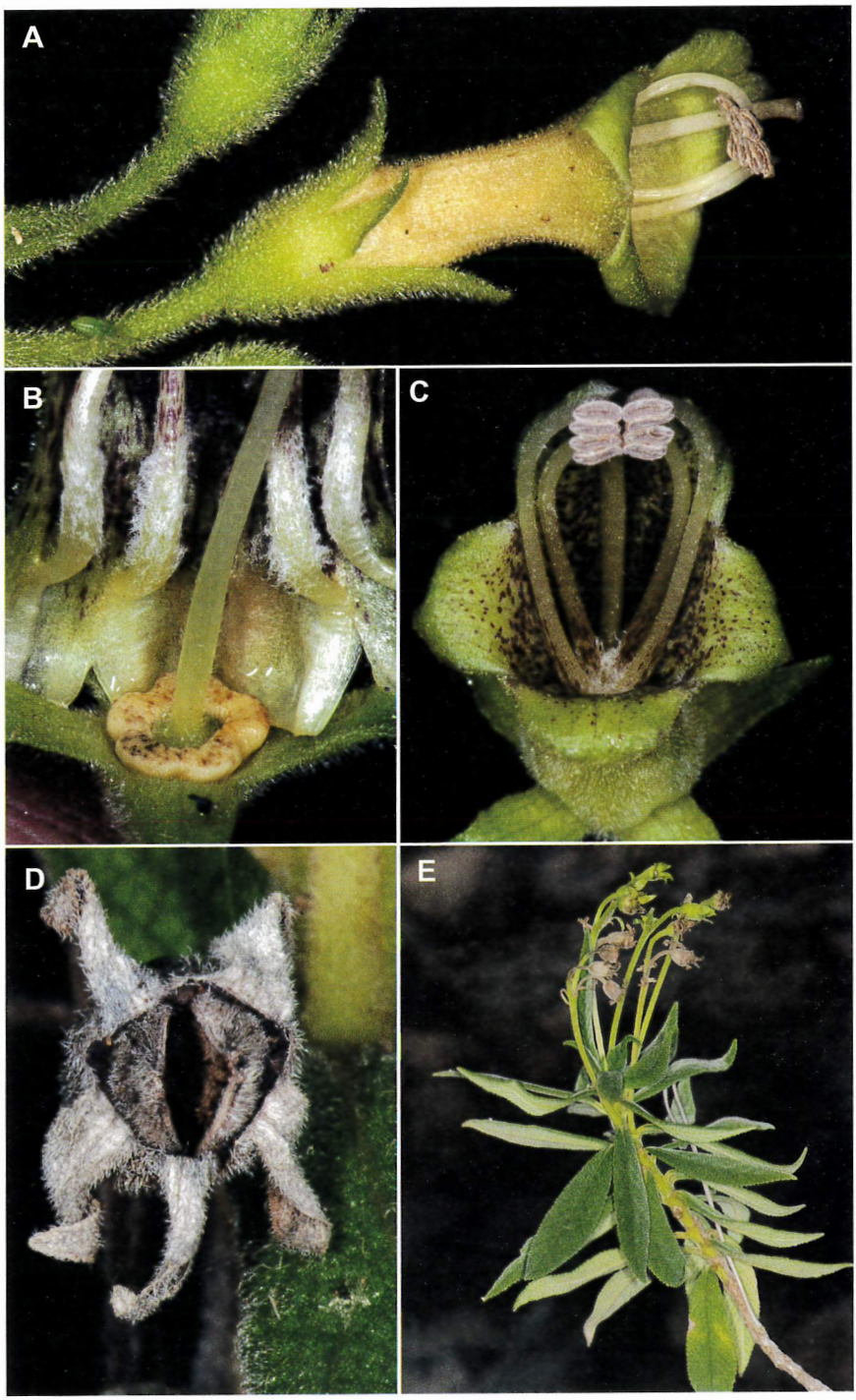

FIGURE 24. **Rhytidophyllum minus** Urb. **A.** Lateral view of flower. **B.** Pubescent filaments with stamens adnate to base of corolla. **C.** Calyx lobes. **D.** Mature fruit. **E.** Habit. (A–E from *J.L. Clark et al. 10500*).

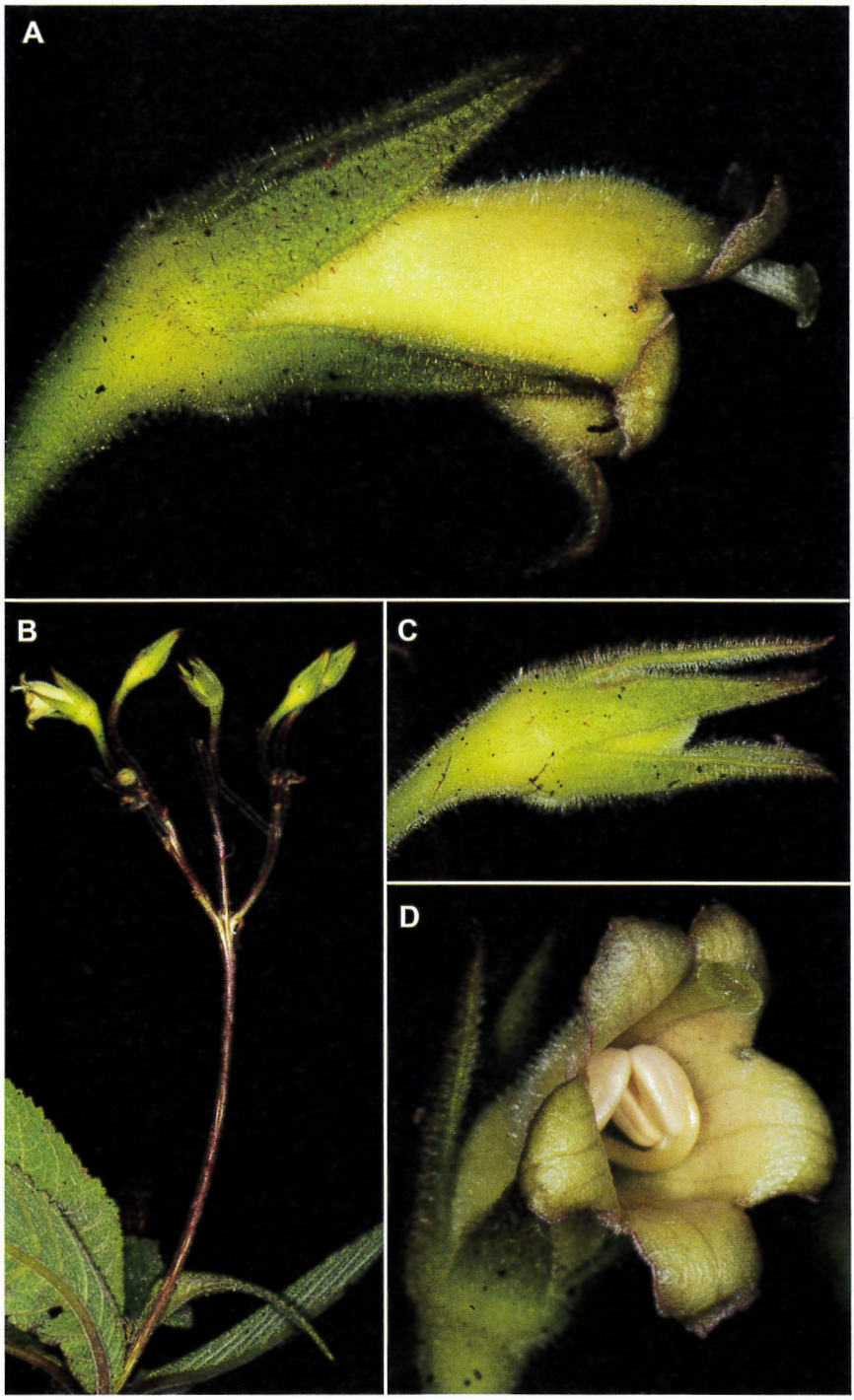

FIGURE 25. **Rhytidophyllum rhodocalyx** Urb. **A.** Lateral view of flower. **B.** Inflorescence. **C.** Calyx. **D.** Front view of corolla. (A–D from *J.L. Clark et al. 10530*).

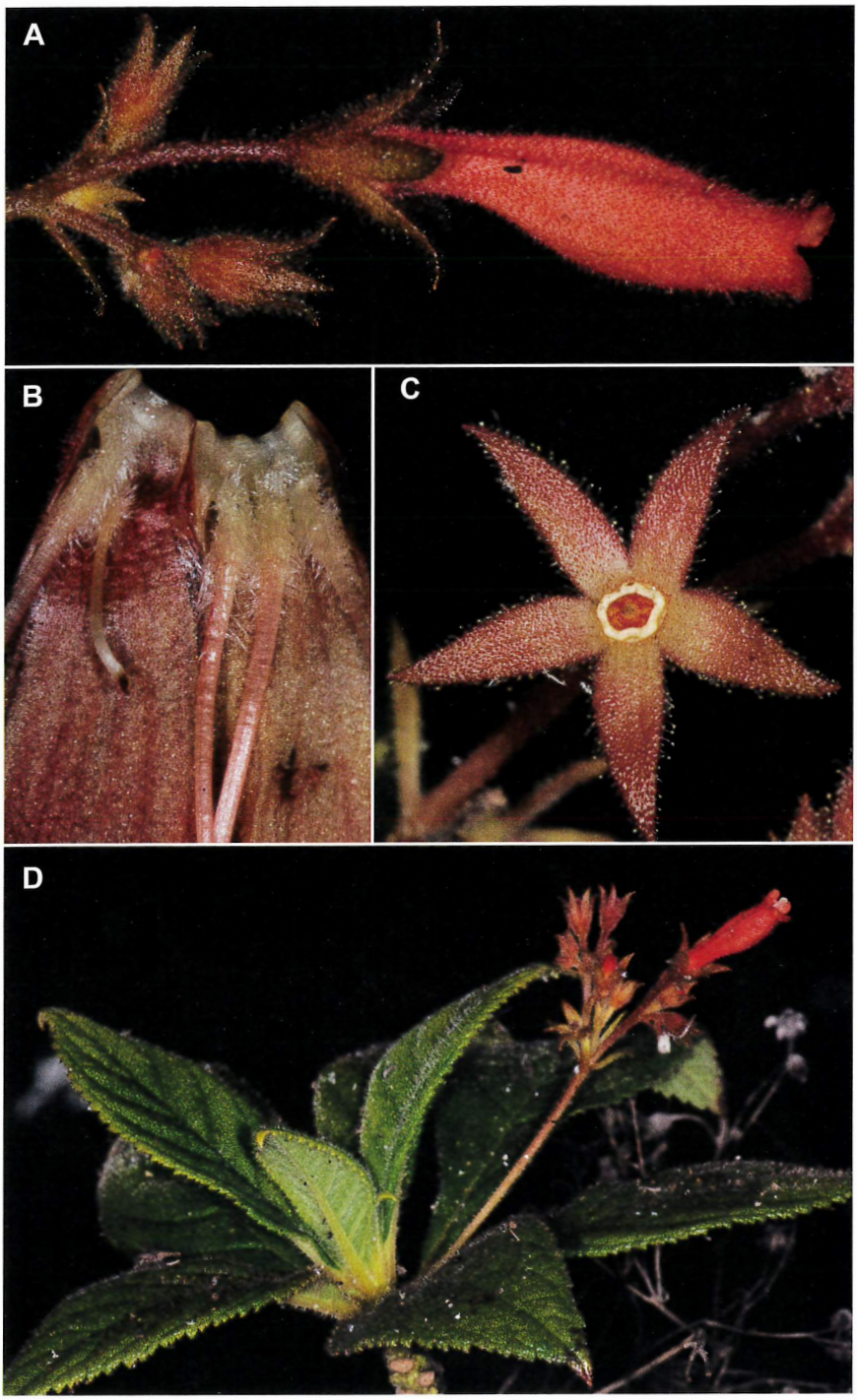

FIGURE 26. **Rhytidophyllum rupincola** (Urb.) C.V.Morton. **A.** Inflorescence. **B.** Pubescent filaments with stamens adnate to base of corolla. **C.** Calyx. **D.** Habit. (A–D from *J.L. Clark et al. 10590*).

most important expeditions that Ekman made was in 1922 where he summited Pico Turquino, the tallest mountain in Cuba. He was accompanied by many well-known botanists including the French priest Brother León who was a resident in Cuba for most of his life. Ekman collected *Rhytidophyllum rhodocalyx* on the southern spur of Pico Turquino. The peak south of Turquino is called "Loma Regino" and was named after the local Cuban guide who cut the trail that allowed the expedition to climb Pico Turquino.

Until 2008 *Rhytidophyllum rhodocalyx* was only known from the holotype at S, which is limited to a sparse collection with no corolla. In the discussion of *Rhytidophyllum* for the Flora of Cuba (Morton 1957a) it was recognized as a species, but Morton mentioned that it may be conspecific with *Rhytidophyllum coccineum*. *Rhytidophyllum rhodocalyx* was rediscovered in August 2008 during an expedition to Pico Turquino. The calyx lobes of most *Rhytidophyllum* species are triangular and short. The long-attenuate calyx lobes of *Rhytidophyllum rhodocalyx* (FIGURE 25) make this taxon one of the most distinctive *Rhytidophyllum* species in Cuba. The calyx lobes were a pertinent character that facilitated Urban's description based on a holotype without mature flowers.

Rhytidophyllum rupincola (Urb.) C.V.Morton, Brittonia 9: 22. 1957. *Gesneria rupincola* Urb., Symb. Antill. 2: 382. 1901. *Heppiella rupincola* C.Wright ex Sauvalle, Anales Acad. Ci. Med. Habana 6: 316. 1869. TYPE: Cuba—Occidente [Provincia Pinar del Río]: in crevices of rocks at Catalina, 1860–1864, *C. Wright 3071* (Lectotype designated here, Lectotype: US; Isolectotypes: GH, HAC-2 sheets, MO, NY-2 sheets, YU).

Rhytidophyllum petiolare Griseb., Cat. Pl. Cub. 198. 1866, non *Rhytidophyllum petiolare* DC. TYPE: Cuba—*C. Wright 3071*, same as type for *Gesneria rupincola* Urb.

Scandent herb growing on rock faces. Endemic to Cuba (Pinar del Río, Sancti Spíritus). FIGURE 26.

Excluded Names

Conradia pumila sensu Millsp., Publ. Field Columbian Mus., Bot. Ser., 1(6): 434. 1900, non (Sw.) Mart. This record is based on a misidentified collection. The citation is based on a specimen from Isle of Pines (*J. Blain 50*; F), misidentified as *Conradia pumila* by Millspaugh. The specimen is *Gesneria humilis* L.

Conradia reticulata Griseb. var. *ovata* Griseb., Cat. Pl. Cub. 201. 1866; *Pentaraphia reticulata* (Griseb.) M. Gómez var. *ovata* (Griseb.) M. Gómez, Anales Soc. Esp. Hist. Nat. 23: 280. 1894. These names do not appear in Grisebach (1866) or Gómez (1894). These names appear in error in Skog (2012).

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APPENDIX 1. Index of all names for Cuban Gesneriaceae. Accepted names are in bold.

Taxon	Accepted name
Bellonia spinosa Sw.	
Besleria lutea L.	
Alloplectus cristatus A.Rich.	**Columnea tincta**
Alloplectus cubensis (Urb.) Stearn	**Columnea sanguinea**
Alloplectus sanguineus (Pers.) G.Don	**Columnea sanguinea**
Besleria berteroana DC.	**Besleria lutea**
Besleria lutea L. var. *alpestris* Urb.	**Besleria lutea**
Besleria lutea L. var. *brevipes* Urb.	**Besleria lutea**
Besleria lutea L. var. *imrayi* (Hook.f.) Urb.	**Besleria lutea**
Besleria lutea L. var. *intermedia* Urb.	**Besleria lutea**
Besleria lutea L. var. *leucantha* Urb.	**Besleria lutea**
Besleria lutea L. var. *vincentina* Urb.	**Besleria lutea**
Besleria lutea L. var. *vulgaris* Urb.	**Besleria lutea**
Besleria sanguinea Pers.	**Columnea sanguinea**
Codonoraphia craniolaria (Sw.) Oerst.	**Gesneria fruticosa**
Collandra phoenicea (Tussac) G.Don ex Loudon	**Columnea sanguinea**
Collandra picta Klotzsch & Hanst.	**Columnea sanguinea**
Collandra sanguinea (Pers.) Griseb.	**Columnea sanguinea**
Columnea cubensis (Urb.) Britton	**Columnea sanguinea**
Columnea sanguinea (Pers.) Hanst.	
Columnea sanguinea (Pers.) Hanst. var. *cubensis* Urb.	**Columnea sanguinea**
Columnea sanguinea (Pers.) Hanst. var. *trinitensis* C.V.Morton	**Columnea sanguinea**
Columnea tincta Griseb.	
Conradia celsioides Griseb.	**Gesneria celsioides**
Conradia corrugata Griseb.	**Gesneria libanensis**
Conradia craniolaria (Sw.) Mart.	**Gesneria fruticosa**
Conradia depressa Griseb.	**Gesneria shaferi**
Conradia floribunda Paxton	**Gesneria libanensis**
Conradia gloxinioides Griseb.	**Gesneria gloxinioides**
Conradia humilis (L.) Mart. ex G.Don	**Gesneria humilis**
Conradia libanensis (Linden ex C.Morren) Griseb.	**Gesneria libanensis**
Conradia reticulata Griseb.	**Gesneria reticulata**
Conradia verrucosa (Decne.) Scheidw.	**Gesneria cubensis**
Craniolaria fruticosa L.	**Gesneria fruticosa**
Dalbergaria cubensis (Urb.) Borhidi	**Columnea sanguinea**
Dalbergaria phoenicea Tussac	**Columnea sanguinea**
Dalbergaria sanguinea Steud.	**Columnea sanguinea**
Duchartrea viridiflora Decne.	**Gesneria viridiflora**
Eriphia jamaicensis Roem. & Schult.	**Besleria lutea**
Eriphia lutea (L.) Raf.	**Besleria lutea**
Eriphia pallida Raf.	**Besleria lutea**
Gesneria acuminata Urb.	**Gesneria humilis**
Gesneria acunae Borhidi	**Gesneria purpurascens**
Gesneria binghamii C.V.Morton	
Gesneria bonaoana Alain	**Gesneria cubensis**
Gesneria bracteosa Urb.	
Gesneria brevifolia Urb.	
Gesneria calcicola Alain	**Gesneria cubensis**
Gesneria calycina Sieber ex Steud.	**Besleria lutea**
Gesneria celsioides (Griseb.) Urb.	
Gesneria clarensis Britton & P.Wilson	
Gesneria clarensis var. *turquinensis* C.V.Morton	**Gesneria heterochroa**
Gesneria craniolaria Sw.	**Gesneria fruticosa**
Gesneria cubensis (Decne.) Baillon	
Gesneria cuneifolia (DC.) Fritsch subsp. *disjuncta* (C.V.Morton) Borhidi	**Gesneria reticulata**
Gesneria cuneifolia (DC.) Fritsch subsp. *obovata* (Griseb.) Borhidi	**Gesneria reticulata**
Gesneria cuneifolia (DC.) Fritsch var. *disjuncta* C.V.Morton	**Gesneria reticulata**
Gesneria cuneifolia (DC.) Fritsch var. *obovata* (Griseb.) C.V.Morton	**Gesneria reticulata**
Gesneria cuneifolia DC. subsp. *obovata* (Griseb.) Borhidi	**Gesneria reticulata**
Gesneria cuneifolia DC. var. *obovata* (Griseb.) C.V.Morton	**Gesneria reticulata**
Gesneria depressa (Griseb.) Urb.	**Gesneria shaferi**
Gesneria dolichostyla Urb.	**Gesneria cubensis**

APPENDIX 1. Continued.

Taxon	Accepted name
Gesneria domingensis Urb.	**Gesneria cubensis**
Gesneria duchartreoides (C.Wright) Urb.	
Gesneria earlei Urb. & Britton	**Rhytidophyllum earlei**
Gesneria ferruginea (C.Wright) Urb.	
Gesneria fimbriata Lam.	**Gesneria fruticosa**
Gesneria fruticosa (L.) Kuntze	
Gesneria gibberosa subsp. gibberosa (Urb.) Borhidi	**Gesneria salicifolia**
Gesneria gibberosa Urb.	**Gesneria salicifolia**
Gesneria glandulosa (Griseb.) Urb.	
Gesneria gloxinioides (Griseb.) Urb.	
Gesneria heterochroa Urb.	
Gesneria heteroclada Urb.	**Gesneria cubensis**
Gesneria humilis L.	
Gesneria humilis L. subsp. *celsioides* (Griseb.) Borhidi	**Gesneria celsioides**
Gesneria incisa Urb.	**Gesneria humilis**
Gesneria incurva (Griseb.) Urb.	**Gesneria binghamii**
Gesneria libanensis Linden ex C.Morren	
Gesneria libanensis Linden ex C.Morren subsp. *lopezii* (C.V.Morton) Borhidi	**Gesneria yumuriensis**
Gesneria libanensis Linden ex C.Morren var. *corrugata* (Griseb.) Urb.	**Gesneria libanensis**
Gesneria lindmanii Urb.	**Gesneria shaferi**
Gesneria lomensis Urb.	**Rhytidophyllum lomense**
Gesneria lopezii C.V.Morton	**Gesneria yumuriensis**
Gesneria mornincola Urb. & Ekman	**Gesneria cubensis**
Gesneria mortonii Wiehler	**Pheidonocarpa corymbosa** subsp. **cubensis**
Gesneria nipensis Britton & P.Wilson	
Gesneria norlindii Urb.	**Gesneria bracteosa**
Gesneria pachyclada Urb.	**Gesneria duchartreoides**
Gesneria pallida C.V.Morton ex Borhidi & O.Muniz	**Gesneria reticulata**
Gesneria purpurascens Urb.	
Gesneria purpurascens Urb. var. *yumuriensis* (Britton & P.Wilson) Borhidi	**Gesneria yumuriensis**
Gesneria reticulata (Griseb.) Urb.	
Gesneria rupincola Urb.	**Rhytidophyllum rupincola**
Gesneria salicifolia (Griseb.) Urb.	
Gesneria salicifolia subsp. *spathulata* (L.E.Skog) Borhidi	**Gesneria salicifolia**
Gesneria salicifolia var. ferruginea (C.Wright) L.E.Skog	**Gesneria ferruginea**
Gesneria salicifolia var. *spathulata* L.E.Skog	**Gesneria salicifolia**
Gesneria samuelssonii Urb.	**Gesneria shaferi**
Gesneria scopulorum Urb. & Ekman	**Gesneria cubensis**
Gesneria shaferi subsp. *shaferi* L.E.Skog	**Gesneria shaferi**
Gesneria shaferi Urb.	
Gesneria shaferi Urb. subsp. *depressa* (Griseb.) L.E.Skog	**Gesneria shaferi**
Gesneria subalata Urb. & Ekman	**Gesneria cubensis**
Gesneria tomentosa sensu Jacq.	**Rhytidophyllum crenulatum**
Gesneria verrucosa (Decne.) Kuntze	**Gesneria cubensis**
Gesneria viridiflora (Decne.) Kuntze	
Gesneria viridiflora subsp. *colorata* (C.V.Morton) Borhidi	**Gesneria viridiflora**
Gesneria viridiflora var. *acutifolia* C.V.Morton	**Gesneria viridiflora**
Gesneria viridiflora var. *colorata* C.V.Morton	**Gesneria viridiflora**
Gesneria viridiflora var. obovata C.V.Morton	**Gesneria viridiflora**
Gesneria wrightii Urb.	
Gesneria yumuriensis Britton & P.Wilson	
Gloxinia perennis (L.) Fritsch	
Hematophyla villosa Raf.	**Columnea sanguinea**
Heppiella cubensis C.V.Morton	**Pheidonocarpa corymbosa** subsp. **cubensis**
Heppiella rupincola C.Wright ex Sauvalle	**Rhytidophyllum rupincola**
Herincquia floribunda (Lem.) Decne. ex Hérincq	**Gesneria libanensis**
Martynia fruticosa (L.) Gloxin	**Gesneria fruticosa**
Martynia perennis L.	**Gloxinia perennis**
Niphaea pulchella Griseb.	**Phinaea pulchella** var. **pulchella**
Ophianthe libanensis (Linden ex C.Morren) Hanst.	**Gesneria libanensis**

APPENDIX 1. Continued.

Taxon	Accepted name
Pentaraphia celsioides (Griseb.) M.Gómez	**Gesneria celsioides**
Pentaraphia corrugata (Griseb.) M.Gómez	**Gesneria libanensis**
Pentaraphia craniolaria (Sw.) Decne.	**Gesneria fruticosa**
Pentaraphia cubensis Decne.	**Gesneria cubensis**
Pentaraphia depressa (Griseb.) M.Gómez	**Gesneria shaferi**
Pentaraphia duchartreoides C.Wright	**Gesneria duchartreoides**
Pentaraphia ferruginea C.Wright	**Gesneria ferruginea**
Pentaraphia floribunda (Lem.) Benth. & Hook.f. ex Carriere	**Gesneria libanensis**
Pentaraphia glandulosa Griseb.	**Gesneria glandulosa**
Pentaraphia gloxinioides (Griseb.) M.Gómez	**Gesneria gloxinioides**
Pentaraphia humilis (L.) Hanst.	**Gesneria humilis**
Pentaraphia incurva Griseb.	**Gesneria binghamii**
Pentaraphia libanensis (Linden ex C.Morren) Hanst.	**Gesneria libanensis**
Pentaraphia reticulata (Griseb.) M.Gómez	**Gesneria reticulata**
Pentaraphia salicifolia Griseb.	**Gesneria salicifolia**
Pentaraphia triflora Griseb.	**Gesneria wrightii**
Pentaraphia verrucosa Decne.	**Gesneria cubensis**
Pentaraphia viridiflora (Decne.) Hanst.	**Gesneria viridiflora**
Pheidonocarpa corymbosa (Sw.) L.E.Skog subsp. **cubensis (C.V.Morton) L.E.Skog**	
Pheidonocarpa cubensis (C.V.Morton) Borhidi	**Pheidonocarpa corymbosa** subsp. **cubensis**
Phinaea pulchella (Griseb.) C.V.Morton var. pulchella	
Rhytidophyllum acunae C.V.Morton	**Rhytidophyllum acunae**
Rhytidophyllum coccineum Urb.	
Rhytidophyllum crenulatum DC.	
Rhytidophyllum earlei (Urb. & Britton) C.V.Morton	
Rhytidophyllum exsertum Griseb.	
Rhytidophyllum exsertum Griseb. subsp. *villosulum* (Urb.) Borhidi	**Rhytidophyllum exsertum**
Rhytidophyllum exsertum Griseb. subsp. *wrightianum* (Griseb.) Borhidi	**Rhytidophyllum exsertum**
Rhytidophyllum floribundum Lem.	**Gesneria libanensis**
Rhytidophyllum intermedium Urb. & Ekman	**Rhytidophyllum minus**
Rhytidophyllum lomense (Urb.) C.V.Morton	
Rhytidophyllum minus Urb.	
Rhytidophyllum mogoticola Borhidi & O.Muñiz	**Rhytidophyllum exsertum**
Rhytidophyllum petiolare Griseb.	**Rhytidophyllum rupincola**
Rhytidophyllum rhodocalyx Urb.	
Rhytidophyllum rupincola (Urb.) C.V.Morton	
Rhytidophyllum tomentosum (L.) Mart. var. *nudum* Urb. f. *villosulum* Urb.	**Rhytidophyllum exsertum**
Rhytidophyllum tomentosum (L.) Mart. var. *nudum* Urb. f. *viscidum* Urb.	**Rhytidophyllum exsertum**
Rhytidophyllum villosulum (Urb.) C.V.Morton	**Rhytidophyllum exsertum**
Rhytidophyllum wrightianum Griseb.	**Rhytidophyllum exsertum**
Rhytidophyllum wrightii Griseb. ex C.Wright	**Rhytidophyllum exsertum**
Tussacia sanguinea (Pers.) Heynh.	**Columnea sanguinea**
Vireya sanguinolenta Raf.	**Columnea sanguinea**

Selbyana 31(2): 228–233. 2013.

NOTES AND OBSERVATIONS ON ROOT-SHOOT REPRODUCTION OF CLONAL POPULATIONS OF HERBACEOUS STREAMSIDE GESNERIACEAE

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ABSTRACT. Meristematic activity is well documented within the Gesneriaceae. The anatomical development of secondary shoots from sub-surface roots resulting in clonal populations evidenced in other angiosperm groups has not been described. Anatomical studies as well as horticultural and habitat observations demonstrate the existence of this growth mechanism in two New World genera; *Drymonia*, in Episcieae, and *Gasteranthus* in Beslerieae. A species from a third genus and another tribe, *Gesneria*, in Gesnerieae has been observed to exhibit the same type of secondary growth. The species examined are clearly different in several key characters, but all are streamside growers in humid rain forest. The anatomical similarities of this growth habit are discussed along with possible reasons for this type of growth and the significance of the habitat.

Key words: *Gasteranthus*, *Drymonia*, ecological niche, adaptive development, ramets

INTRODUCTION

Within the Scrophulariales (now considered part of Lamiales) "some of the individual families are ecologically specialized" (Cronquist 1968). Though this is not from Cronquist's more recent treatment on the classification of flowering plants, and it is referring to specialized families rather than genera and species, the idea of ecological specialization can be applied as well to many genera and species within the large family Gesneriaceae. In the plants under examination here, the majority of one genus and a select few species within the second genus occupy the same rain forest understory streamside ecological niche and would appear to be specialized to their particular habitat.

Interest in the presence of root-shoot vegetative reproduction originated with the observation of new shoot growth from what appeared to be horizontal surface roots growing adventitiously from mature plants of *Drymonia turrialvae* Hanst. These plants were being grown in a large habitat simulation. Subsequently a similar growth habit was observed in plants of *Gasteranthus corallinus* (Fritsch) Wiehl. growing in a smaller habitat simulation. Since these initial observations were made, root-shoot growth has been noted in other species of *Gasteranthus*, both in cultivation and in the field. This type of growth has not previously been described within the Gesneriaceae. Wiehler (1983) noted the retention of "a residue of meristematic activity" but discussed it only in terms of leaves, shoots, nodes and inflorescences. He discussed three types of asexual reproduction, including new vegetative growth in stems and at nodes; new plants forming from meristematic tissue in leaf and leaf petiole material; and the production of propagules instead of flowers as a result of challenging conditions (Wiehler 1983: 68–69). The first of the three is closest to what is described here; however, as this is root tissue and not stem tissue and as a result does not typically have nodes, none of the asexual reproduction types described deal with secondary shoot development from roots.

Several stem modifications are commonly found within the Gesneriaceae, including stolons, rhizomes and scaly rhizomes, aerial propagules, and tubers. Scaly rhizomes, aerial propagules and tubers occur predominantly in species which experience a distinct dry season or in a few cases that grow as epiphytes. The plants being examined here typically occupy a rain forest understory habitat with relatively consistent high humidity, low to medium light and almost constant moisture of a tropical forest streamside niche. They can be found growing across wet rocks or with roots in moss, leaf litter or humus on the stream bank or on the slope above.

This exploration is to address whether or not the observed growth is in fact secondary shoot growth coming from roots, and if this is the case, to explore this concept as an adaptation to an ecological niche.

MATERIALS AND METHODS

Plant samples from both *Drymonia turrialvae* and *Gasteranthus corallinus* that appeared to be roots with shoots as described above were collected from plants in cultivation. Several sections were collected from each species. Microscopic observations were made of external surfaces and cross sections. Further observations were made of other species in the field and in a greenhouse setting with plants in cultivation.

OBSERVATIONS

The tissue giving rise to the new shoots in both species is root tissue. Support for this comes from