New species of Gesneriaceae from the Neotropics (II).

Gesneriana 1(1): 29-97. 1995.

GESNERIANA 1(1): 29-97. 1995.

New Species of Gesneriaceae from the Neotropics (II)

Hans Wiehler
Gesneriad Research Foundation, 1873 Oak Street, Sarasota, Florida 34236, USA

ABSTRACT: For 25 species recently published in abbreviated form in volume 72 of Phytologia, more detailed descriptions, pertinent commentary and diagnostic illustrations are provided. Interspersed among these species, in alphabetical generic order, are an additional 14 species. More will appear in the next issues of Gesneriana.

KEY WORDS: Gesneriaceae, *Achimenes, Codonanthe, Columnea, Corytoplectus, Dalbergaria, Drymonia, Nautilocalyx, Neomortonia, Niphaea, Paradrymonia, Pentadenia, Phinaea, Rhoogeton, Smithiantha, Trichantha*, Mexico, Honduras, Costa Rica, Panama, Colombia, Ecuador, Peru, Bolivia.

During the past ten years, the Gesneriad Research Foundation has accumulated a wealth of species new to science from its expeditions into the rain forests of the New World, from collections sent by fellow workers and from herbarium research. Publishing is now a new phase in the work of the Foundation. Since the GRF greenhouse and herbarium contain much more new plant material, novelties will continue to be illustrated and described. In the meantime, the expeditions into the vanishing rain forests are continuing.

Achimenes admirabilis Wiehler, Phytologia 73(3): 220. 1992.

Figure 1

A *Achimene erecta* (Lamarck) H. P. Fuchs caulibus, petiolis pedicellisque trichomatibus glanduliferis, rhizomatibus sine trichomatibus glanduliferis, corollarum tubis longioribus, et corollarum faucibus sine sacculis recedit.

Slender, terrestrial herb with underground rhizomes with compacted, thick, succulent leaf-scales, each rhizome ca. 1.5 by 0.3 cm, pale yellow, externally glabrous; stems erect or ascending, rarely branching, 10-25 cm tall, ca. 2.5 mm in diameter, reddish maroon, with elongated green lenticels, puberulous, with scattered longer capitate-glandular trichomes, the internodes 0.5-3.0 cm long, the leaves in whorls of 3 or 4, of equal size, the petioles 0.4-1.0 cm long, reddish maroon, puberulous, with scattered longer capitate-glandular trichomes, the lamina lanceolate-elliptic, 2.5-3.5 by 1.0-1.5 cm, acuminate, serrate, cuneate, adaxially dark green, hirsute, abaxially lighter green, or spotted with maroon, or completely maroon, or merely the veins outlined with maroon, puberulous, the secondary pairs of veins 3-5. Inflorescence an axillary cyme of 1, 2, or more flowers (the second and any subsequent flower often changed into an asexual propagule consisting of a bright green, scaly rhizome), the peduncle present or absent, the prophylls 0.4-1.2 by 0.2-0.5 cm, the pedicels 1.2-2.0 cm, maroon, puberulous-hirsute, with capitate-glandular trichomes, the hypanthium at anthesis ca. 2 mm long, the calyx lobes equal, triangular, ca. 5 by 2 mm, entire, yellow-green, hirsute, with capitate-glandular trichomes; corolla oblique in the calyx, tubular, with a minute spur, the tube ca. 2 cm long, bright orange-red, glabrous but with scattered capitate-glandular trichomes, the limb large and oblique to the tube, the lobes spreading, unequal, the 2 upper lobes ca. 5 by 8 mm, the other 3 lobes ca. 7 by 8 mm, bright orange-red, glabrous, the throat yellow, with maroon spotting, the tube inside glabrous, but dorsally near the throat with short, capitate-glandular trichomes; stamens 4, included, ca. 1.5 cm long, white, glabrous, the anthers coherent into a square, each anther 0.8 by 0.8 mm, the thecae parallel, dehiscing by longitudinal slits; ovary semi-inferior, turbinate, ca. 5 mm long, green, sericeous, the style ca. 1.4 cm long, white, pilose, the stigma bilobed; nectary a ring, ca. 1 mm high, yellow, glabrous. Fruit a dry, bivalved capsule, splitting loculicidally; seed fusiform, ca. 0.4 by 0.2

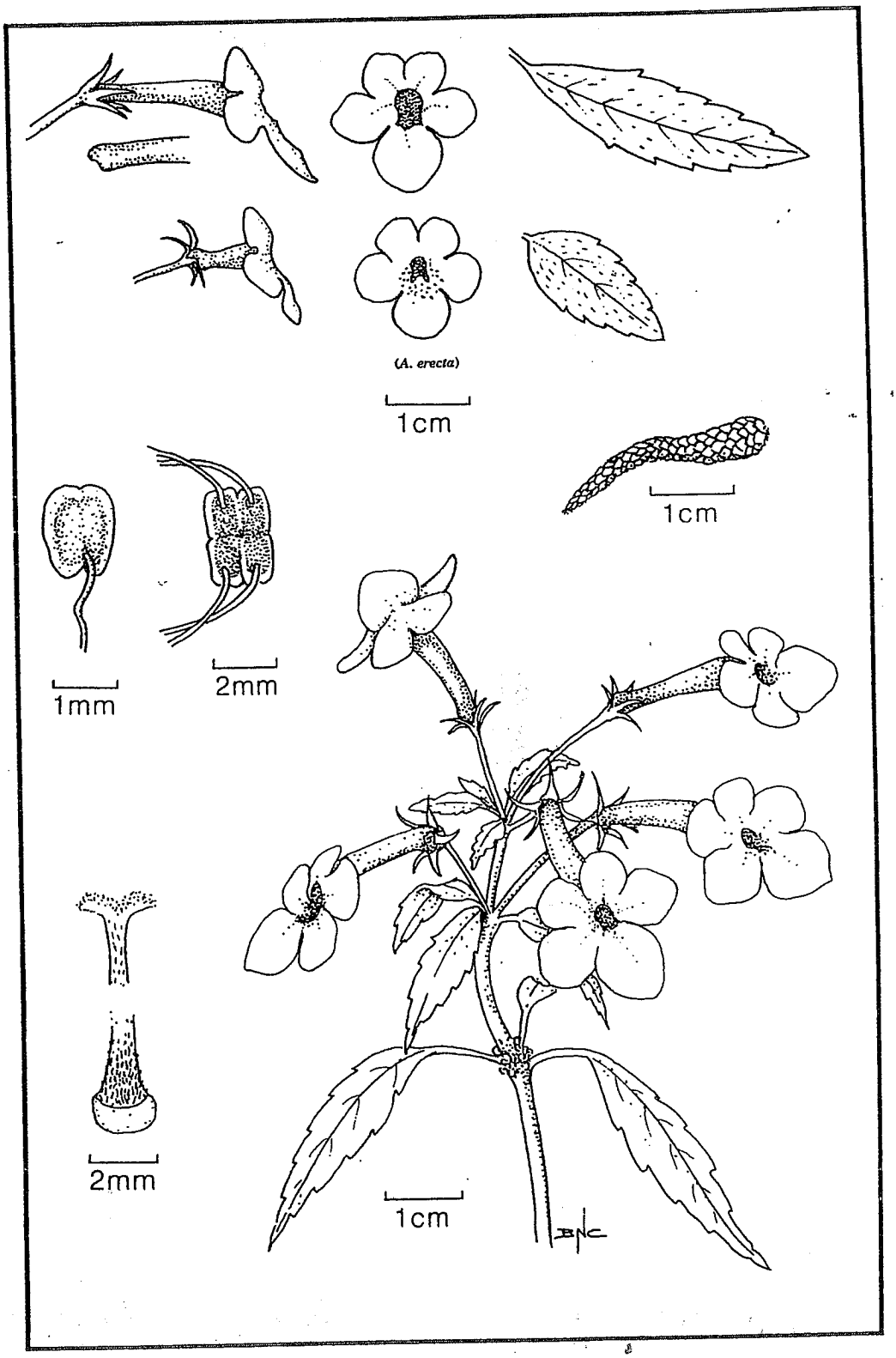

Figure 1: **Achimenes admirabilis** Wiehler Mexico
Voucher specimen: *Wiehler 8408* (GES)
Illustrator: *Barbara N. Culbertson*, 1987
Sponsor: *Greater New York Chapter, AGGS,* in memory of *Evelyn Clawson*

mm, striate, light brown. Chromosome number $n = 11$.

TYPE: *MEXICO*: OAXACA: District Juchitán, headwaters of Río Coatzacoalcos, E. of Santa Maria Chimalapa, above junction with Río Blanco, on large boulders by river. Rhizomes collected by *T.B. MacDougall, no. 668*, April 1966, cultivated at Cornell and GRF greenhouses, accession no. G-1024, 5 Jan. 1984, *Wiehler 8404* (HOLOTYPE: GES; ISOTYPES: BH, K, MEXU, NY, SEL, US, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *MEXICO*: OAXACA: Municipio Chiquihuitlán de Benito Júarez: Las Tres Aguas, 1000 m, Aug. 1909, *Conzatti 2501* (F); same area, Chiquihuitlán a Santa Ana, 1200 m, Aug. 1919, *Conzatti 3852* (MEXU, US); VERA CRUZ: Orizaba, 1857, *Mohr 316* (US); municipio Río Blanco, cerca Río Blanco, 1219 m, Sept. 1944, *Sharp 44868* (GH, MEXU, US); origin in Mexico unknown, cultivated in England in the 1920s, listed in Sutton's catalogue of 1927 as "*Achimenes harveyi*" (nomen nudum), said to be of hybrid origin but to come true from seed; cultivated in North America as *A.* 'Burnt Orange' or *A.* 'Harveyi,' GRF greenhouse accession no. G-3086, 4 Jan. 1984, *Wiehler 8405* (GES); agrees in all essential aspects with the type collection, except that the leaves are narrower.

DISTRIBUTION: This species is known so far from three areas in Mexico (at altitudes between 1000 and 1200 m): two in southern Oaxaca (one close to Santa Cruz Huatulco and Pochutla, near the Pacific Ocean, and the other close to San Miguel Chimalapa, near the border with Chiapas), and the third in Veracruz, near Orizaba. *Achimenes erecta* occurs also in Oaxaca and Veracruz.

ETYMOLOGY: The specific epithet of this new species comes from the Latin, meaning admirable, astonishing, or exotic, and alludes to the attractive whorled and colored leaves and to the showy bright red corollas.

Achimenes admirabilis at first glance resembles in habit and flower *A. erecta*, native to Mexico, Central America, Colombia, (Peru?), Jamaica, and Hispaniola. This is the type species of the genus *Achimenes*. It differs from *A. admirabilis* in the absence of capitate-glandular trichomes on stems, petioles, pedicels, calices and corollas, the presence of the same kind of trichomes on the surface of the rhizomes, the dull maroon (versus bright green) color of the aerial rhizomes, the length of the corolla tube ca. 1 cm (versus ca. 2 cm), and, more decisively, in the presence of 3 indentations or tiny pouches ventrally in the throat of the corolla, as in *A. misera* Lindley. The inside of the corolla tube of *A. admirabilis* is without pouches or longitudinal grooves. All collections of *A. admirabilis* have a verticillate leaf arrangement, while in *A. erecta* the leaves are occasionally opposite-decussate (though predominately whorled). -- Another desirable feature of this attractive new species is that (in Florida) it blooms much later than its congeners, in winter, from mid-December through February. Collections of *A. erecta* from Jamaica, Panama and Mexico blossom in Florida in October.

The plant collector Thomas B. MacDougall who found the type collection of *A. admirabilis*, worked in southern Mexico from 1930 to 1973. Among the many new plants he discovered were quite a few gesneriads. The seeds and rhizomes he sent "up north" were much appreciated.

Codonanthe erubescens Wiehler, Phytologia 73(3): 221. 1992.

Figure 2

Habitu plantae et aspectu floris *C. crassifoliae* (Focke) Morton similis, praecipue differt corollis longioribus, staminum filamentis pilosis, antherarum thecis corniculatis, et ovariorum stylis pilosis.

Epiphytic, perennial herb and creeper, the thin stems to 1 m long, 1-2 mm in diameter, young shoots green, older stems tan, clinging to tree trunks or branches, with adventitious roots on nodes and internodes, or pendent stems draping from branches, freely branching, the internodes 0.5 to 3 cm long, stems, leaves, pedicels and calyx minutely pubescent but appearing glabrous; leaves opposite-decussate, equal or subequal, the petiole ca. 0.6 cm long, green, the lamina ovate, rarely elliptic, acute, entire, rarely obscurely serrulate, decurrent, succulent, green or flushed with red, with 6-8 dot-like extra-floral nectaries abaxially, the secondary veins invisible. Inflorescence a reduced, axillary cyme of several flowers (but appearing one at a time), the peduncle and prophylls absent, the pedicels 5-8 mm long, green; calyx conical, the lobes subequal, lanceolate, 3-5 by 1-1.5 mm, entire, green or suffused with red, with an extra-floral nectary in the sinus between adjacent lobes; corolla oblique in the calyx, infundibular, 3-3.5 cm long, cream-white, in full

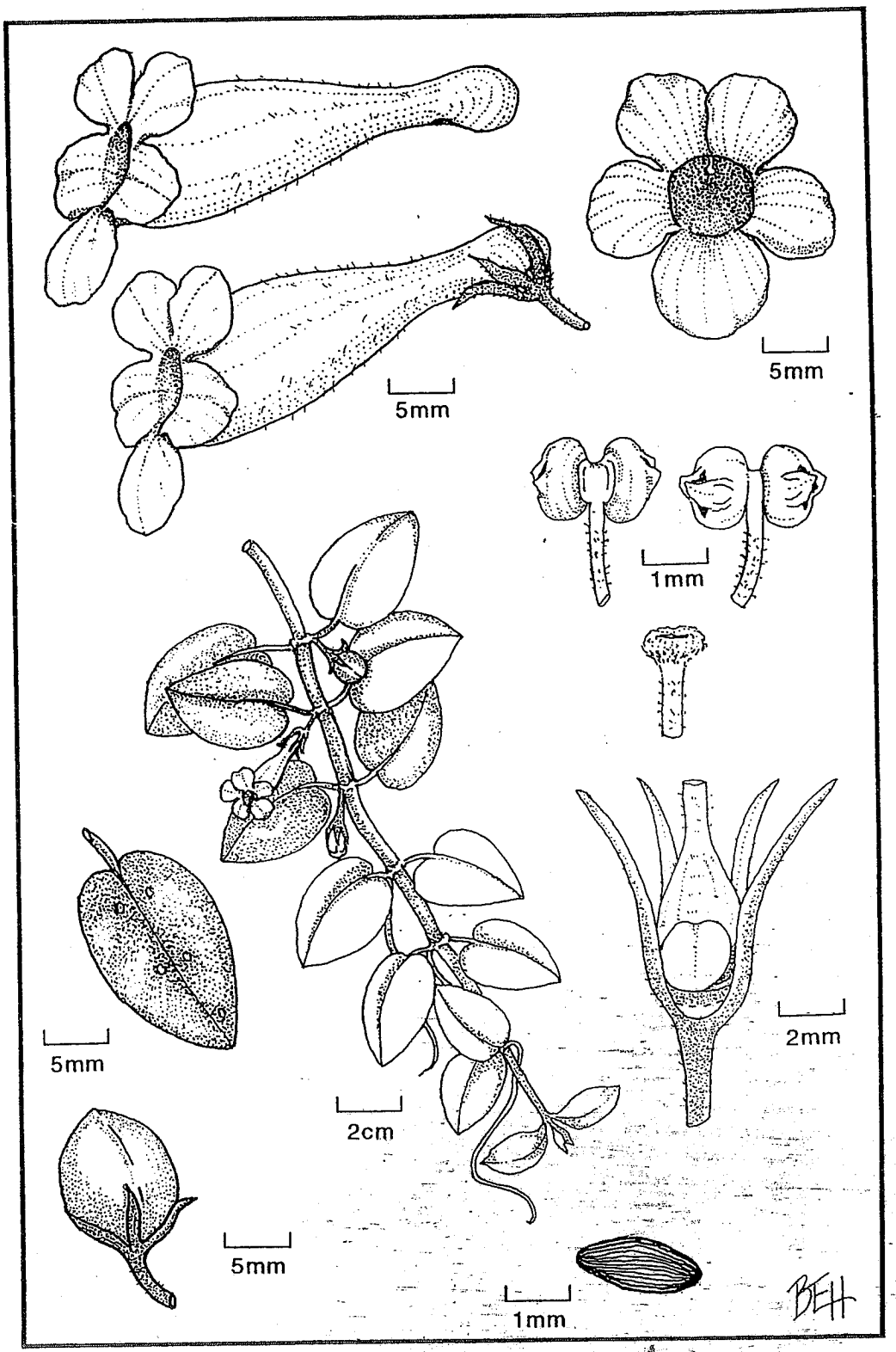

Figure 2: **Codonanthe erubescens** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 88152* (GES)
Illustrator: *Barbara E. Harrison*, 1993
Sponsor: *Selby Gardens Associates, Sarasota, Florida*

sun flushed with pink, puberulous, constricted above the long, curved spur, then abruptly expanding, the diameter above midpoint and below the spreading limb 7 mm, the lobes subequal, 5 by 5 mm, rounded, entire, the inside of the tube puberulous; stamens 4, included, the filaments 2.1 cm long, adnate to the base of the corolla tube for 9 mm, white, pubescent, pilose, and with capitate-glandular trichomes, the anthers syngenesious in pairs, white, 1 by 1.6 mm, the thecae dehiscing by a central pore adorned with short, triangular horns; ovary superior, turbinate, 4 mm long, green, pubescent, the style 1.3 cm long, white, pilose, the stigma stomatomorphic; nectary a double-connate dorsal gland, white, pubescent. Fruit an ovoid, slightly pointed, shiny, red, pubescent berry, 1.2 cm long; seed elliptic, 2 mm long, reddish, striate, enveloped by a fleshy funicle 3.2 mm long.

TYPE: *ECUADOR*: MORONA-SANTIAGO: 10 km S of Gualaquiza, on road from Limón to Zamora, on trees in cow pasture, 22 April 1988, *Wiehler & GRF Expedition 88152* (HOLOTYPE: GES; ISOTYPES: QCA, F, K, MO, NY, S, SEL, U, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: NAPO: about 25 km from Baeza on road to Lago Agria, on trees in open pasture, in fruit, without flowers, 24 April 1986, *Wiehler & GRF Expedition 86174* (GES, US); on same road, 32 km from Baeza, *Wiehler & GRF Expedition 86180* (GES), *86181* (GES); outside Tena, on tree on the property of Hotel Auca, above bank of Dos Ríos, 23 April 1986, *Wiehler & GRF Expedition 86202* (GES, QCA); same area, *Wiehler & GRF Expedition 93199* (GES, QCNE); MORONA-SANTIAGO: 12 km W of Sucua, on road to Los Tanques de Aguas, on trees, 18 April 1988, *Wiehler & GRF Expedition 8876* (GES); Cordillera de Cutucú: E of Patuca, Sept. 1987, *N.H.Williams et al., s.n.*, seed grown in GRF greenhouse, accession number G-3529, specimen prepared 13 Aug. 1988, *Wiehler 88240* (GES); ZAMORA-CHINCHIPE: road El Pangi - Zamora, about 10 km from Zamora, along Río Zamora, open area, on tree, calyx maroon, corolla cream-white, 24 April 1988, *Wiehler & GRF Expedition 88195* (GES, QCA).

DISTRIBUTION: Along the Amazonian slope of the Andes in Ecuador, at altitudes between 800 to 1600 m.

ETYMOLOGY: The specific epithet *erubescens*, Latin for blushing, reddening, rose, refers to the color of the corolla. The first flowering collection of this species, at the Hotel Auca outside Tena, was adorned with pinkish corollas (and very thick, succulent small leaves). In specimens grown in shade the corolla is typically cream-white, but in sun-exposed plants the corolla can have a rose flush.

The ubiquitous *Codonanthe crassifolia* (Peru to Mexico, the Guianas) was not encountered at the same altitudes on the eastern slope of the Ecuadorian Andes where the smaller-leaved *C. erubescens* occurs. But *C. crassifolia* is found in the adjacent Amazonian lowland of Ecuador; the GRF has collections from around Limoncocha and Mishualli. *Codonanthe erubescens* differs from the more widely spread species by the following characters: smaller, ovate leaves, larger and longer corollas, anther cells horned, stamens, filaments and style pilose.

Columnea filipendula Wiehler, Phytologia 73(3): 222. 1992.

Figure 3

Differt a congeneris omnibus longitudine pedicelli pendentis tenuis.

Epiphytic, perennial herb, the stems erect, ascending, spreading or descending, to 50 cm long, to 8 mm in diameter, young shoots green, mature stems tan, sericeous, the internodes 2.5 to 5 cm long; leaves ternate, less frequently opposite-decussate, equal or subequal, the petiole 1 cm long, sericeous, the lamina narrowly elliptic, 6-9.5 by 1.5-2 cm, long acuminate, subentire, cuneate, green, glabrous, sericeous along the veins below, the secondary pairs of veins 4-5. Inflorescence reduced to solitary flowers in the leaf axils, the peduncle absent, the bracts and prophylls minute, lanceolate, 1 mm long, the sigmoid, thin pedicel 5-6 cm long, the receptacle 3 mm long, both red-maroon, sericeous; calyx lobes subequal, lanceolate, ca. 2 cm long, 0.5 cm wide, subentire, with 1-2 small teeth, yellow-green suffused with maroon, sericeous; corolla erect in the calyx, ca. 6.4 cm long, bright orange-red, sericeous, with a pronounced spur, the tube gradually expanding, the galea 2 by 1.3 cm, the lateral lobes triangular, 7 mm long, the ventral lobe recurved, elliptic, 1.3 cm long, the inside of the tube pubescent; stamens 4, the filaments ca. 5.5 cm long, reddish, puberulous, adnate to the base of the corolla tube for 7 mm, the anthers exposed in the male phase of anthesis, syngenesious into a square, each anther 2 by 1.3 mm; ovary superior, turbinate, 5 mm long, maroon,

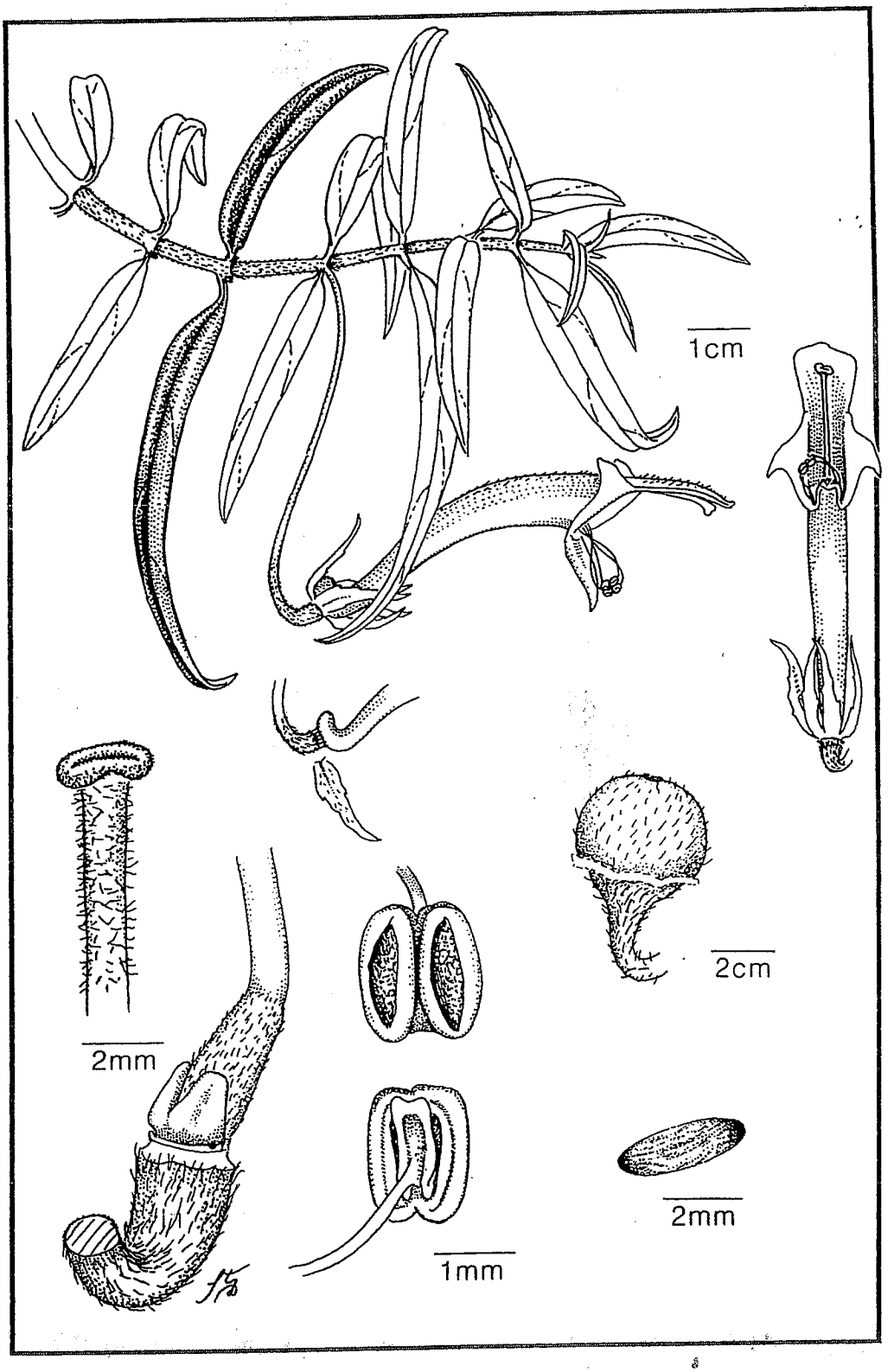

Figure 3: **Columnea filipendula** Wiehler
Voucher specimen: *Wiehler 87103* (GES)
Illustrator: *Stig Dalström*, 1990
Sponsor: *Judy Becker, Salisbury, Connecticut*

Honduras

sericeous, the style ca. 5.8 cm long at the female phase of anthesis, reddish, pilose, the stigma stomatomorphic-bilabiate; nectary a double-connate, dorsal gland, 2.4 x 2 mm, white, glabrous. Fruit a globoid, white, sericeous berry, ca. 1.6 cm in diameter; seed oblong, 1.4 mm long, striate, reddish.

TYPE: *HONDURAS*: foggy cloud forest S of Copán, altitude 1450 m, live cuttings collected in June 1981 by *Claire Herzog s.n.*, cultivated at Selby Gardens and the GRF under accession number G-3063; type material prepared 6 May 1987, *Wiehler 87103* (HOLOTYPE: GES; ISOTYPES: EAP, F, K, MO, NY, SEL, US).

ADDITIONAL MATERIAL EXAMINED: *NICARAGUA*: locality unknown, collected by *Phil McGillivary s.n.* from Miami in 1976, cuttings received from Mark Worsdale from Miami in Sept. 1977; paratype material prepared 8 May 1987, *Wiehler 87106* (GES).

DISTRIBUTION: Known only from the above two collections in Honduras and Nicaragua, Central America.

ETYMOLOGY: The specific epithet in *Columnea filipendula* (from the Latin *fili-* = thread- and *pendulus* = hanging, thus "hanging from a thread") refers to the unusual, 5-6 cm long, thin, S-curved pedicel by which the flower is suspended from the stem, with the corolla tube usually parallel to the main axis of the shoot.

With its narrow, usually ternate leaves, *Columnea filipendula* resembles *C. linearis* Oersted from Costa Rica, and *C. purpusii* Standley from Mexico. The pedicels in *C. erythrophaea* Decaisne from Mexico are somewhat pendulous, but only 3-4 cm long, and thicker. The latter species has wider, lanceolate leaves and much more prominent, reflexed calyx lobes with long teeth at the base.

Columnea glicensteinii Wiehler, Phytologia 73(3): 223. 1992.

Figure 4

C. nicaraguensi Oersted affinis, sed caulibus squammulosis, foliis rubris, calicum lobis serratis, et corollarum tubis pilosis differt.

Epiphytic, perennial herb or subshrub with stems erect, ascending or descending, to 40 cm long, 7-10 mm in diameter, tan, sericeous, covered with little brown scales, the internodes 2-3 cm long; leaf pairs very unequal, the petiole ca. 3 mm long, yellow-green, sericeous, the lamina of the larger leaf of a pair elliptic or oblanceolate, 11-15 x 4-5 cm, acuminate, entire, oblique, dark green above, lighter green and blotched or suffused with wine-red below, puberulous, the secondary pairs of veins 4-6, the lamina of the smaller leaf similar, 3-5 by 1.5-2 cm. Inflorescence reduced to solitary flowers in the axils of the larger leaves, the peduncle absent, the bracts and prophylls 5-9 by 2-4 mm, green, the pedicels 1-1.4 cm long, yellow-green, sericeous, the receptacle ca. 5 mm long, yellow-green, villous, the calyx lobes subequal, lanceolate, ca. 1.6 cm long, serrate, light green, adaxially blotched with wine-red, sericeous; corolla ca. 7.5 cm long, the dorsal side and the lobes wine-red, with yellow veins, the ventral side and the spur lemon-yellow, the tube outside glandular pilose (long, capitate, glandular trichomes), inside puberulous with short capitate glandular trichomes; stamens 4, the filaments ca. 6 cm long, yellow, distally glandular pilose, the anthers at anthesis exerted, coherent into a rectangle, each anther 2 by 1.7 mm; ovary superior, ovoid, yellow-green, sericeous, the style ca. 7 cm long, cream-white, distally glandular pilose, the stigma bilobed; nectary a double-connate, dorsal gland, 2.5 by 1.5 mm, white, glabrous. Fruit a globoid, white, pilose berry, ca. 1.5 cm in diameter; seed oblong, 1.8 mm long, striate, brown.

TYPE: *COSTA RICA:* without specific locality: live plants collected by *L. Glicenstein, no. 13*, in 1978, GRF greenhouse accession no. G-2674, 4 June 1984, *Wiehler 8401* (HOLOTYPE: GES; ISOTYPES: CR, K, NY, SEL, US, others to be distributed).

DISTRIBUTION: Known only from Costa Rica.

ETYMOLOGY: Named for Dr. Leon Glicenstein who some years ago collected and photographed many gesneriads in Costa Rica. He recollected the rare *Drymonia peltata* (Oliver) H.E. Moore, known only from the type collection (before 1877), a gesneriad with peltate leaves.

Corytoplectus cutucuensis Wiehler, sp. nov.

Figure 5

Differt a *C. specioso* (Poeppig) Wiehler inflorescentiis epedunculatis, et a *C. pulchero* (N.E. Brown) Wiehler* inflorescentiis non solitariis.

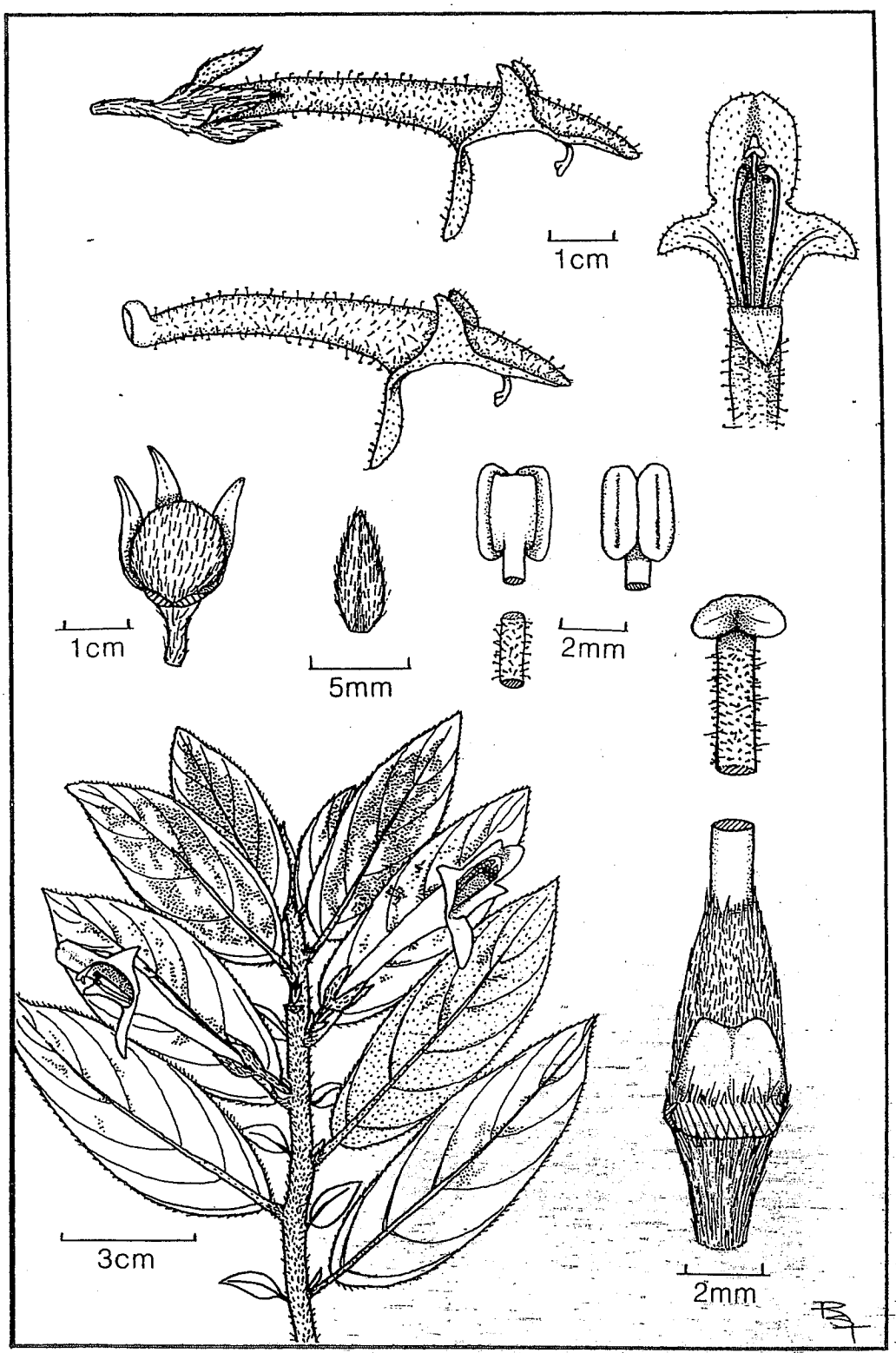

Figure 4: **Columnea glicensteinii** Wiehler Costa Rica
Voucher specimen: *Wiehler8401* (GES)
Illustrator: *Robert Scott Thompson*, 1982
Sponsor: Honolulu Gesneriad Society, Hawaii

Terrestrial, perennial herb with thick, succulent, erect stems, to 30 cm tall, 0.9 - 1.3 cm in diameter, tan, sericeous near the apex, the internodes 1 - 3.5 cm long; leaf pairs equal to subequal, the petiole 3 to 6 cm long, maroon, sericeous, the lamina ovate, 10 - 17 by 6 - 10 cm, acute to acuminate, crenulate, ciliate, rounded or oblique at the base, thick, bullate, velutinous, dark green above, with the veins outlined in light green or white, maroon below, the secondary pairs of veins 8 - 10. Inflorescence reduced to axillary, epedunculate cymes of 2 - 4 flowers, the prophylls small, lanceolate, ca. 1.3 by 0.4 cm, light green flushed with maroon, velutinous, the pedicels 1.5 to 5 cm long, 3 mm in diameter, maroon, sericeous; calyx conical, the lobes subequal, pleated, obovate, concave, 1.5 by 1.3 cm, serrulate, orange-red, velutinous; corolla nearly erect in the calyx, urceolate, pouched, ca. 2.5 cm long, 1.5 cm at midpoint, the spur almost absent, light yellow at base, orange above, sericeous, the small, spreading lobes subequal, rounded, 2.5 by 2.5 mm, red; stamens 4, included, the filaments ca. 1.5 cm long, adnate to the base of the corolla tube for 4 mm, white, glabrous, the anthers free, each anther 3 by 3 mm, the thecae dehiscing by longitudinal slits; ovary superior, cone-shaped, ca. 5 mm long, white, puberulous, the style ca. 1.4 cm long, white, glabrous, the stigma stomatomorphic; nectary consisting of a dorsal and a frontal gland, each ca. 2 by 1.5 mm, grey, glabrous. Fruit a glistening white, round berry, ca. 1.2 cm in diameter, puberulous, transparent, with the black seeds shining through; seed oblong, 0.8 by 0.3 mm, striate, black.

TYPE: *ECUADOR*: MORONA-SANTIAGO: Cordillera de Cutucú, western slope, along trail from Logroño to Yaupi, wet montane forest, ca. 1300 m altitude, live specimen collected in Nov. 1976 by *Madison, Bush & Davis s.n.*, without herbarium specimen, grown in Selby and GRF greenhouses with accession number G-2412; type specimens prepared 8 July 1984, *Wiehler 8406* (HOLOTYPE: GES).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: MORONA-SANTIAGO: Cordillera de Cutucú: trail from Macas to top of Cordillera, plants found between 1150 to 1700 m, not below, terrestrial in open, wet forest, in clay soil, 16 April 1988, *Wiehler & GRF Expedition 8838* (GES, K, NY, QCA, QCNE, US); Cordillera de Cutucú: along road above Patuca, at 1600 m, terrestrial at montane forest edge, 17 April 1988, *Wiehler & GRF Expedition 8840* (GES, QCA, QCNE); ZAMORA-CHINCHIPE: Cordillera del Cóndor, western slope: crossing Río Zamora by ferry N of El Pangui, S of pueblo Chuchutaza, road into the mountains for 15 km, terrestrial at edge of wet forest, 22 April 1988, *Wiehler & GRF Expedition 88163* (GES, QCA, QCNE, US).

ETYMOLOGY: Named for the Vieja Cordillera de Cutucú, an ancient mountain range in the eastern part of the Ecuadorian Andes, full of endemic plants.

DISTRIBUTION: Known only from the eastern side of the Andes in Ecuador, in the Cordillera de Cutucú, and in the continuation of that range to the south, the Cordillera del Cóndor; in montane rain forest, at altitudes between 1150 to 1700 m.

Corytoplectus cutucuensis is one of the showy members of the gesneriad family, with ornamental leaves (dark green with white venation) and bright, contrasting flowers (orange, yellow, red). The shiny berry fruit is surrounded by enlarged, orange-red calyx lobes.

The more widely spread *C. speciosus* (Poeppig) Wiehler, also found in Zamora-Chinchipe, differs from the new species by its pedunculate inflorescence and tubular corolla. Both *C. deltoideus* (Morton) Wiehler from the distant Guiana Shield and *C. pulchra* (N.E. Brown) Wiehler from an unknown locality in northern Colombia have tubular yellow corollas with a pouch, appearing vaguely urceolate. But in these two species the corolla lobes are smaller, not concave, and the plant indumentum differs from that of *C. cutucuensis*. In the Colombian species the flowers are solitary in the leaf axils.

****

* *Corytoplectus pulcher* (N. E. Brown) Wiehler, comb. nov. Basionym: *Hypocyrta pulchra* N. E. Brown, Gard. Chron. ser. 3, 16: 244. 1894. Bot. Mag. 122: plate 7468. 1896.

Dalbergaria evolvens Wiehler, Phytologia 73(3): 223. 1992.

Figure 6

Dalbergariae madisoniae Wiehler aemulans, differt nodiis brevioribus, corollarum tubis citrinis, sine callis, extus sericeis, intus trichomatibus glanduliferis.

Epiphytic, perennial, suffrutescent herb, the stems erect, ascending or spreading, sparsely

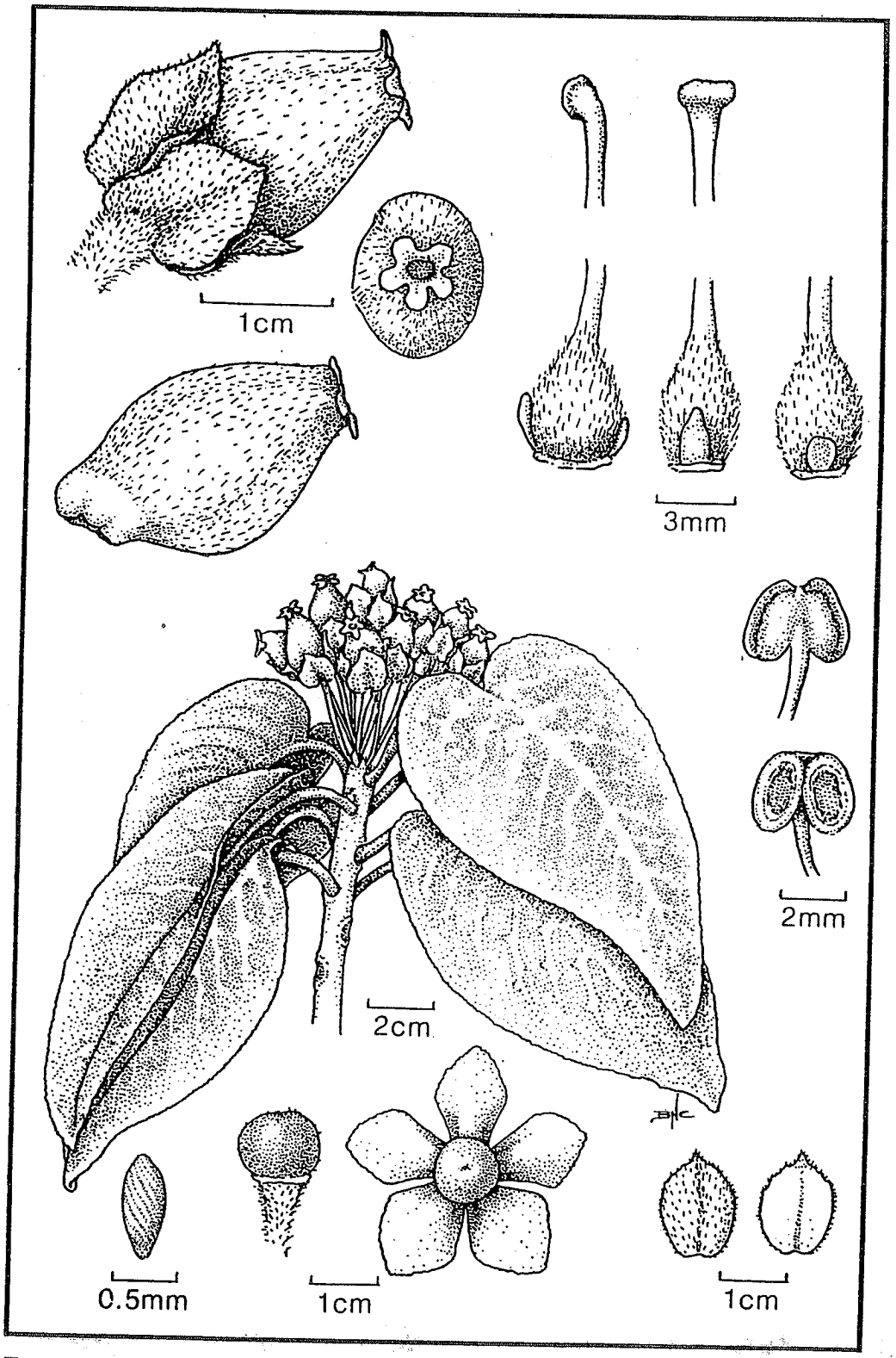

Figure 5: **Corytoplectus cutucuensis** Wiehler
Voucher specimen: *Wiehler 8406* (GES)
Illustrator: *Barbara N. Culbertson*, 1988
Sponsor: *Bea Gold, Miami Beach, Florida*

Ecuador

branching, to 1.5 m tall, 0.7-1.2 cm in diameter, green, sericeous, the internodes 0.6-3.2 cm long; leaf pairs very unequal, the petiole 0.3-1.0 cm long, green, sericeous, the lamina of the larger leaf of a pair oblanceolate, 14-17 by 4.5-6 cm, acuminate, obscurely serrulate, oblique, the adaxial surface dark green and glabrescent, the abaxial surface with a red tip, lighter green or flushed with maroon, puberulous, with 7-8 pairs of secondary veins, the lamina of the smaller leaf similar, 2-3 by 0.5-0.8 cm. Inflorescence an axillary, reduced cyme of 1-2 flowers, the peduncle absent, the prophylls lanceolate, ca. 3 by 0.8 cm, entire, ciliate, greenish yellow or flushed or spotted with maroon, sericeous, the subtending bracts similar, linear, ca. 1 by 0.3 cm, the pedicels ca. 0.4 cm long, greenish yellow, sericeous, distally with prominent red calluses; calyx conical, the lobes subequal, lanceolate, ca. 2.2 by 0.3 cm, thickened and swollen at the base, subentire or obscurely serrulate, ciliate, greenish yellow, sometimes spotted with maroon, sericeous; corolla oblique in the calyx, tubular, ca. 5.3 cm long, spurred, sigmoid, lemon-yellow, sericeous, the lobes unequal, the upper 2 fused into a galea, 8 by 6 mm, the lateral lobes triangular, 6 mm long, the lower lobe recurved, ca. 10 by 5 mm, the ventral part of the throat marked with red, the inside of the galea, the lower lobe, and the inside of the tube furnished with capitate-glandular trichomes; stamens 4, partially excluded in the male phase, the filaments ca. 4 cm long, yellow, glabrous, the anthers coherent into a rectangle, each anther 2 by 2 mm; ovary superior, turbinate, ca. 6 mm long, pale yellow, sericeous, the style ca. 4.5 cm long, pale yellow, with capitate-glandular trichomes, the stigma bilabiate; nectary a double-connate, dorsal, white, glabrous gland, 1.5 by 1.5 mm. Fruit a narrowly pointed berry, ca. 2.3 by 0.8 cm, yellow, sericeous, surrounded by enlarged calyx lobes, ca. 3.5 by 0,7 cm; seed fusiform, ca. 1.2 by 0.3 mm, striate, brown.

TYPE: *ECUADOR*: NAPO: km 71 on road from Baeza to Lago Agrio, epiphyte on moss-covered tree trunks, and terrestrial in wet gravel on roadside cut, in flower, 4 May 1979, *Wiehler & Masterson 79304* (GES, QCA, NY, S); type material prepared from live cuttings of above collection, GRF greenhouse accession number G-2757, 8 June 1984, *Wiehler 8403* (HOLOTYPE: GES; ISOTYPES: QCA, K, MO, NY, S, SEL, US).

DISTRIBUTION: Known only from the type locality on the Amazonian slope of the Andes of Ecuador.

ETYMOLOGY: The specific epithet (from the Latin *evolvere*, to unfold, develop, evolve) refers to the state of the evolution of the shape of the corolla in this species.

In the majority of the species of *Dalbergaria* (and *Pentadenia*) the corolla has remained tubular, more or less straight, with a small and narrow limb, the lobes of equal size. *Dalbergaria evolvens* and *D. madisonii* Wiehler show the first stage in the evolution from the tubular to the columneoid corolla. The tube develops a sigmoid curvature, with the upper two lobes elongated and fused into a galea (to protect the protruding anthers and stigma from rain), and the lower lobe lengthens and recurves. The loosely fused anther quartet (in the male phase) and the stigma (female phase) are now larger and strategically positioned outside the corolla tube to insure more successful pollination by hummingbirds.

In other species of *Dalbergaria* with columneoid corollas the development has progressed much farther than in the two species cited above. Fully developed galeas are found in *D. alba* Wiehler, *D. albiflora* (Kvist & L. Skog) Wiehler, *D. ericae* (Mansfeld) Wiehler, *D. eubracteata* (Mansfeld) Wiehler, *D. kalbreyeriana* (Masters) Wiehler, *D. medicinalis* Wiehler, *D. praetexta* (Hanstein) Wiehler, *D. picta* (Karsten) Wiehler, *D. pictoides* Wiehler, and *D. tessmannii* Mansfeld) Wiehler.

Dalbergaria evolvens, with all the other species cited above, belongs to the section *Cryptocolumnea* (Hanstein) Fritsch in *Dalbergaria*. It is closely related to *D. madisonii* from the Cordillera de Cutucú, on the same Amazonian slope of the Andes of Ecuador, but about 300 km to the south. In *D. madisonii* the internodes are much longer, the corolla tube is wider, orange, sericeous-pilose, callused in the throat, and the tube inside pilose, without capitate-glandular trichomes.

Dalbergaria filifera Wiehler, Phytologia 73(3): 224. 1992. *Columnea fililoba* Kvist & L. Skog, Allertonia 6:356. 1993.

Ex affinitate *Dalbergariae lanatae* (Seemann) Wiehler et *D. crassa* (Morton) Wiehler, ab utroque calycum forma et corollarum appendicibus distinctus.

Terrestrial (in extremely wet subcloud forest), perennial herb or subshrub, the stems ascending or

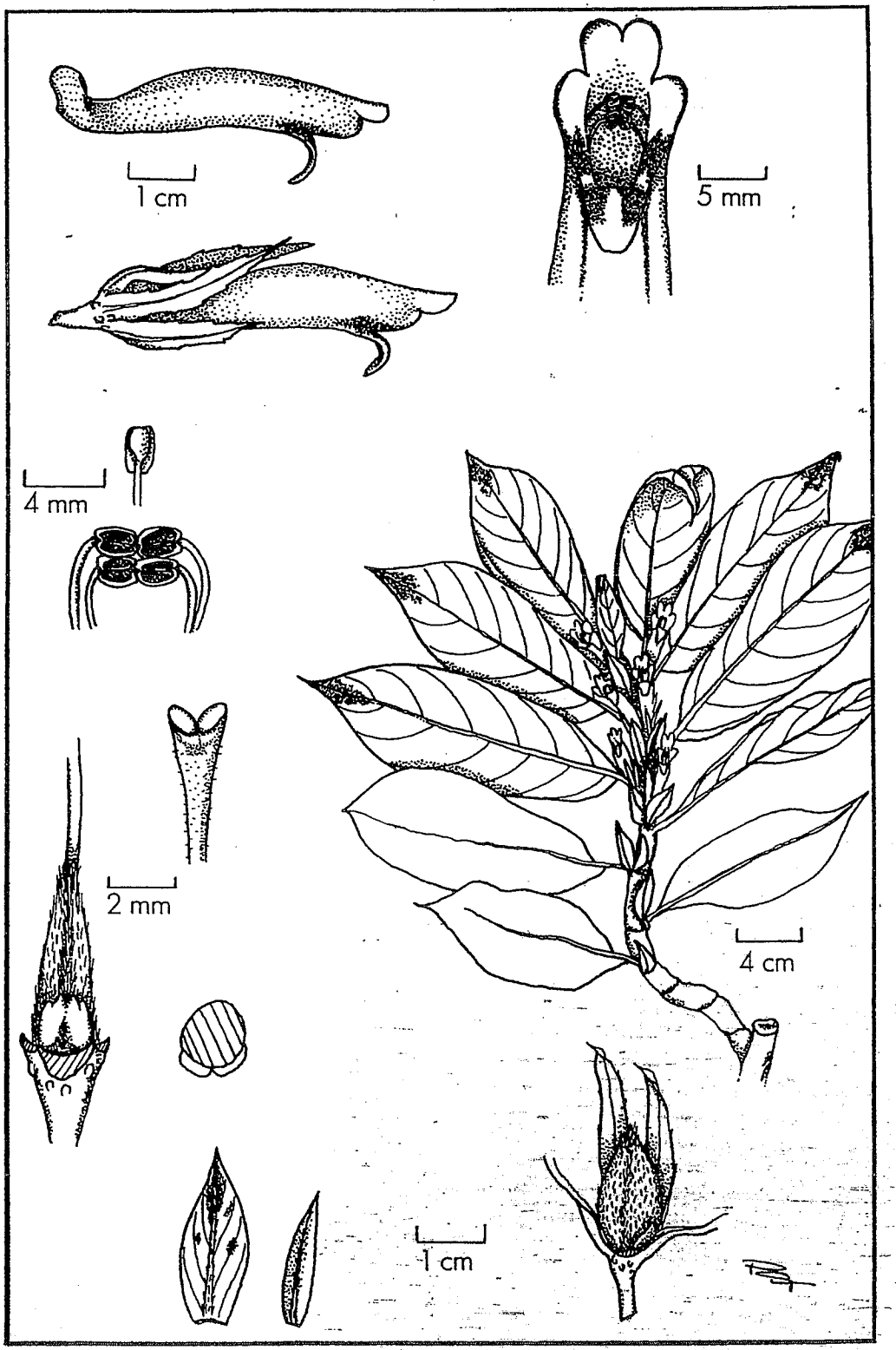

Figure 6: **Dalbergaria evolvens** Wiehler Ecuador
Voucher specimen: *Wiehler 8403* (GES)
Illustdrator: *Robert Scott Thompson*
Sponsor: *David Masterson, San Francisco, California*

spreading, to 1 m tall, 0.9-1.2 cm in diameter, maroon, sericeous, the internodes 1.5 to 8 cm long; leaf pairs very unequal, the petiole of the larger leaf 1.5 to 2.3 cm long, maroon, sericeous, the lamina of the larger leaf oblanceolate, 23-19 by 6-9 cm, acuminate, serrulate to subentire, oblique, upper leaf surface bluish green, glabrous, lower surface green, green with maroon spotting or flushing, or completely maroon, glabrous but sericeous along the veins, with 2 or 4 translucent red spots below the apex, along the mid-vein, with additional smaller translucent spots scattered irregularly, the secondary pairs of veins 8-10, the lamina of the smaller leaf similar, 2 by 1 cm, without translucent spots, often caducous. Inflorescence reduced to axillary cymes of 1-2 flowers, the peduncle absent, the small prophylls lanceolate, 9 by 2 mm, the pedicels ca. 0.4 cm long; calyx conical, greenish yellow, sericeous, the lobes subequal, narrowly lanceolate, pectinate, the filiform teeth 5 to 12 mm long, some of the teeth with secondary branching, greenish yellow, lanate; corolla erect in the calyx, tubular, ca. 3.3 cm long (not including the lobe filaments), lemon-yellow, lanate, constricted above the spur, inflated at mid-point, the non-spreading lobes equal, rounded, 5 by 4 mm, with a 1.8-2.3 long, 1 mm in diameter, bright orange, sericeous-hirsute filament extending from the outside of each lobe, the inside of the lobes and the inside of the tube glabrous; stamens 4, included, the filaments adnate to the base of the corolla tube for 1 mm, ca. 2.5 cm long, white, glabrous, the anthers syngenesious into a rectangle, each anther 4 by 2 mm; ovary turbinate, 4 cm long at anthesis, white, pubescent, the style ca. 2.5 cm long, white, pubescent, the stigma bilabiate; nectary reduced to a double-connate, dorsal gland, 2 mm long, reddish, glabrous. Fruit not seen.

TYPE: *ECUADOR*: ESMERALDAS: near new road from Lita and Alto Tambo towards San Lorenzo, about 20 km W of Alto Tambo, on the Chocó Escarpment, the first rise of the Andes from the hot lowland, ca. 1000 m altitude, extremely wet subcloud forest, terrestrial in open, primary forest, 22 April 1990, *Wiehler & GRF Expedition 9033* (HOLOTYPE: GES; ISOTYPES: QCA, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: ESMERALDAS: same area, about 18 km from Alto Tambo, terrestrial, 24 April 1090, *Wiehler & GRF Expedition 9062* (GES).

DISTRIBUTION: Known from the provinces of Esmeraldas and Carchí, in low-altitude cloud forests of the Pacific slope of the Andes.

ETYMOLOGY: The specific epithet refers to the unusual, long filaments extending from the corolla lobes of this species: from the Latin *filum* = thread, and *fere* = to carry, bear, thus "thread-bearing."

In its stiff, almost shrubby, upright habit and the glabrous leaves with translucent red "windows" or "eyes," *Dalbergaria filifera* belongs to a group of soggy wet rain forest gesneriads which include *D. crassa* (Morton) Wiehler, *D. lanata* (Seemann) Wiehler, *D. dimidiata* (Bentham) Wiehler, *D. incredibilis* (Kvist & Skog) Wiehler*, *D. robusta* Wiehler and several undescribed species from the Pacific slope of the Andes of Colombia and Ecuador. They have the same stiff branches with long internodes, and almost identical stiff leaves with the remarkable red eye spots, an aid in the pollination by hummingbirds. These vegetatively similar species diversify in their flowers: from plain to extremely pectinate calyx lobes, and from bright red to lemon-yellow, always tubular corollas. Another line of development is in the lobes of the corollas: from thickened calluses on the lobes of *D. crassa* to the 2 mm long, erect tufts of trichomes on the thickened lobes of the corolla in *D. lanata*, to the 7 mm long filaments emerging from the thickened lobes of a still undescribed species from Colombia (*D. digitata* ined.), to *D. filifera* with 2.5 cm long filaments, and finally to *D. incredibilis* with the filaments up to 3.8 cm long. Both of the latter have also thickened corolla lobes, probably a defense mechanism against nectar robbers. The lobes and their appendages are a single, functional unit, not separate whorls.**

Filaments or appendages on the corolla are found also in 10 (out of 70+) species of *Trichantha* Hooker, with *T. minor* Hooker and *T. filifera* Wiehler as good examples. These appendages, of varying sizes, emerging from the sinuses of the corolla lobes, are best seen as a case of parallel evolution, and they are not a key character of that genus. Furthermore, there is no linkage of corolla lobe filaments with translucent red spots on leaves within *Trichantha*. Such red spots have arisen independently in a few other species, such as *T. heterophylla* (Oersted) Wiehler, *T. sanguinolenta* (Oersted) Wiehler, and *T. segregata* (Morley) Wiehler, all without floral appendages.

The affinity of *Dalbergaria filifera* and *D. incredibilis* is clearly with other species of *Dalbergaria*, and not with any of *Trichantha*.

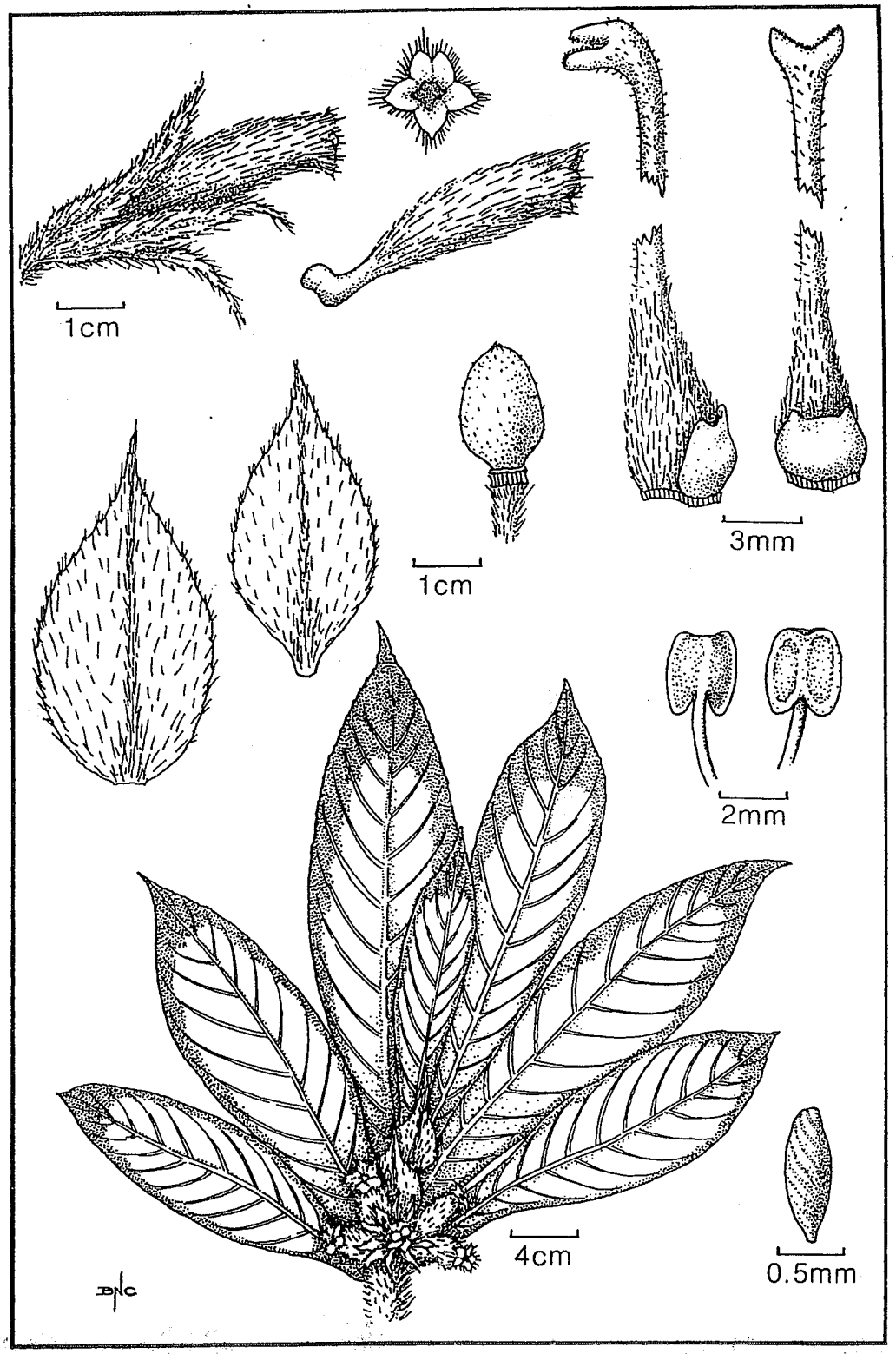

Figure 7: **Dalbergaria mastersonii** Wiehler Ecuador
Voucher specimen: *Wiehler & Masterson 7968* (GES)
Illustrator: *Barbara N. Culbertson*, 1987
Sponsor: *American Gesneriad Society of San Francisco, California*

****

* *Dalbergaria incredibilis* Kvist & L. Skog, comb. nov. (*Columnea incredibilis* Kvist & Skog, Nord. J. Bot. 8:253. 1988.)

** Thickened or callused small corolla lobes, restricting the entrance to the nectar-food source, are also present in a group of closely related species of *Trichantha*, including *T. calotricha* (Donnell Smith) Wiehler and *D. dissimulata* (Morton) Wiehler. This is another incidence of parallel evolution, and not of any close affinity between *Dalbergaria filifera* and the above species of *Trichantha*.

Dalbergaria mastersonii Wiehler, Phytologia 73(3): 225. 1992. *Columnea cinerea* Kvist & L. Skog, Allertonia 6:351. 1993.

Figure 7

Ex affinitate *D. asterolomae* Wiehler, a qua imprimis differt habitu compacto, foliorum laminis adaxialibus hirsutis, calicum lobis acutis serratisque, corollis brevioribus, et antherarum filamentis ovariorumque stylis glabris.

Epiphytic, perennial subshrub, the stems emerging from a common base, erect, ascending or spreading, sparsely or non-branching, to 1 m tall, 0.8-1.9 cm in diameter, tan and wooly below, green and velutinous near the apex, the internodes 2-5 cm long; leaf pairs very unequal, the petiole subsessile, to 5 mm long, the lamina of the larger leaf of a pair oblanceolate, 20-31 by 5-11 cm, acute, serrulate, oblique, the adaxial surface dark green, hirsute, the abaxial surface sericeous, pale green, the apex for 3-7 cm solid dark red (Greyed Purple Group 183 A), often also with additional deep red blotches below the apex, and/or deep red margins and midveins, with 13-15 pairs of secondary veins; the lamina of the smaller leaf of a pair similar, but lanceolate, 3-6 by 0.7-1.4 cm. Inflorescence in the axil of the larger leaf of a pair, a reduced cyme of 2-4 flowers, the peduncle absent, the prominent prophylls ovate, serrate, ca. 4 by 2.5 cm, usually wine-red (Greyed Purple Group 183 D, but in other collections pale yellow-green), glabrescent above, hirsute below, the subtending bracts lanceolate, ca. 3 by 1.5 cm, yellow-green, blotched with wine-red, indumentum as above; pedicels ca. 0.4 cm long, yellow-green, blotched with wine-red, sericeous; calyx conical, the lobes subequal, lanceolate, ca. 2 cm long, serrate, yellow-green and blotched with wine-red or completely wine-red, with long, silky, white hairs; corolla slightly oblique in the calyx, tubular, ca. 4 cm long, spurred, inflated near mid-point, proximally white and glabrous, the upper 2/3 yellow-green (Yellow Green Group 154 B), covered with appressed, long, silky, white hairs, the lobes subequal, ovoid, each ca. 4 by 4 mm, entire, glabrous inside, but with capitate-glandular trichomes at the base of each lobe, the tube inside glabrous; stamens 4, included in the male phase, the filaments ca. 3 cm long, white, glabrous, the anthers coherent into a rectangle, each anther ca. 2 by 2 mm; ovary superior, turbinate, ca. 6 cm long, yellow-green, sericeous, the style ca. 3 cm long, white, glabrous, the stigma bilabiate; nectary a double-connate, dorsal, greyish-white, glabrous gland, 2.1 by 2.1 mm. Fruit a pointed berry, ca. 1.7 by 1.1 cm, pink (Red Group 38 A), sericeous; seed fusiform, ca. 1.2 by 0.3 mm, striate, brown.

TYPE: *ECUADOR:* PICHINCHA: Cloud forest of Tandapi, near village of Cornejo Astorga (Tandapi), about 1.5 km from bridge over Río Pilatón, epiphyte in sunny area, 24 April 1979, *Wiehler and Masterson 7968* (HOLOTYPE: GES; ISOTYPES: QCA, NY, US, U, SEL, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR:* PICHINCHA: "In silva monte Corazón, alt. 1500-3000 m," July 1882, *Sodiro 189/35*, (P); Tandapi cloud forest, in shade, 24 April 1979, *Wiehler & Masterson 7958* (GES); same area, 16 March 1980, *David & Eileen Masterson 8063* (GES); old road from Santo Domingo to Quito, below Chiriboga, 27 April 1979, *Wiehler & Masterson 79112* (GES, US); same area, 11 April 1986, *GRF Expedition, Wiehler et al. 8612* (GES, QCA), also *8618, 8619* (both GES); along road between Nono and Mindo, 34 km below Nono, 27 April 1986, *GRF Expedition, Wiehler et al. 86260* (GES, QCA); CARCHI: 12 km E of Maldonado, on road to Tulcán, alt. 2230 m, 27 Sept. 1979, *A. Gentry & G. Shupp 26651* (MO).

DISTRIBUTION: Pacific slope of the Andes of Ecuador, from Pichincha to Charchi, in rain and cloud forests at an altitude of 1200 to 2200 meter.

ETYMOLOGY: Named in honor of David Masterson of San Francisco who, in the company of the author, discovered this showy species in 1979. David became an eager grower of neotropical Gesneriaceae and a tireless supporter of the work of the Gesneriad Research Foundation.

Dalbergaria mastersonii is related to *D. asteroloma* Wiehler from the same general area, but Masterson's species differs in a more compact habit, the hirsute adaxial lamina of the leaf, the pointed and serrate calyx lobes, the shorter corolla, and the glabrous style and anther filaments.

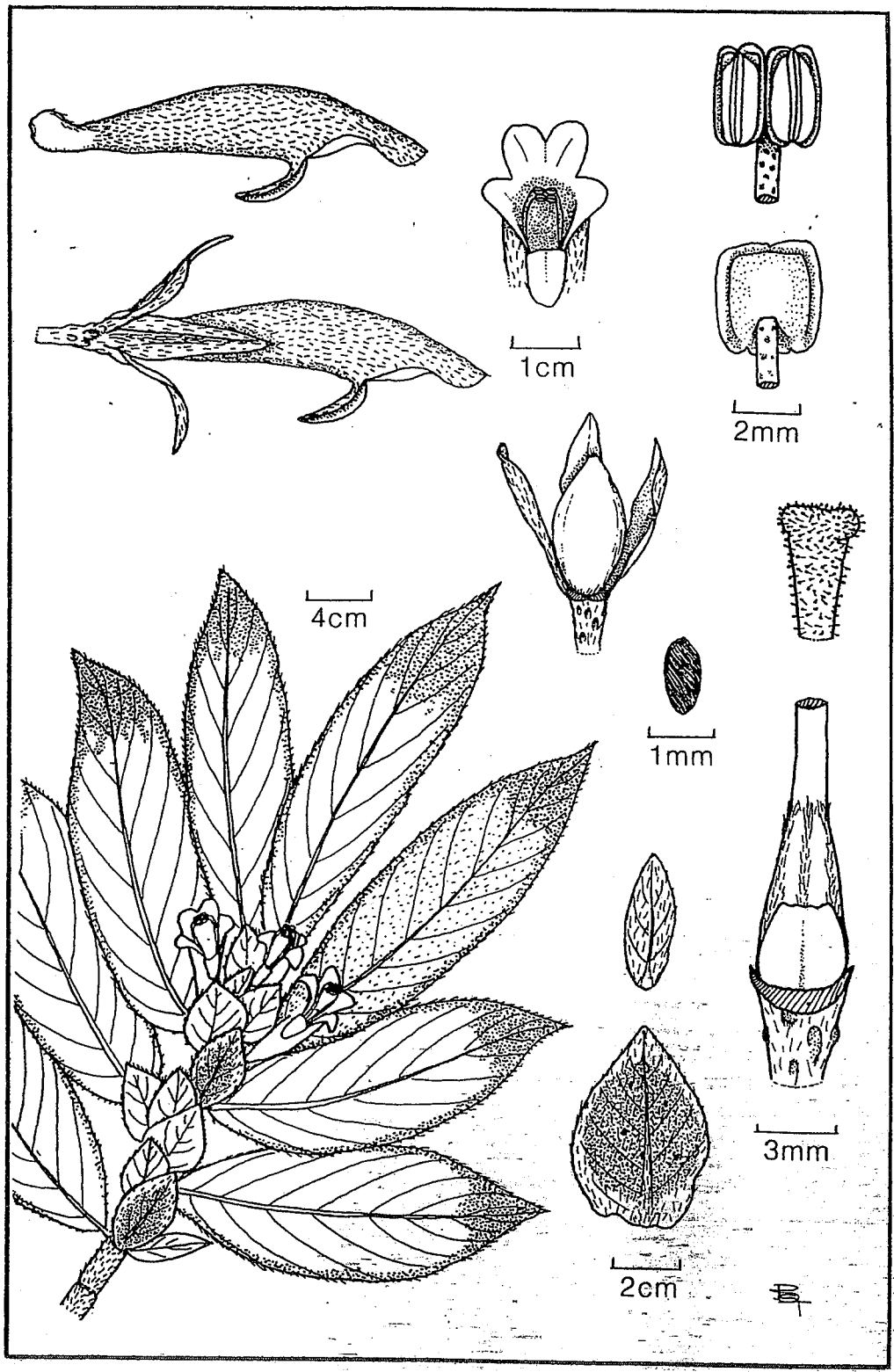

Figure 8: **Dalbergaria medicinalis** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 88215* (GES)
Illustrator: *Robert Scott Thompson*, 1988
Sponsor: *Broward County Chapter of AGGS, Fort Lauderdale, Florida*

Dalbergaria medicinalis Wiehler, Phytologia 73(3): 226. 1992. *Columnea densibracteata* Kvist & L. Skog, Allertonia 6:352. 1993.

Figure 8

Differt a *Dalbergaria picta* (Karsten) Wiehler foliorum apicibus non translucidis, corollarum forma recta et baccis albis.

Epiphytic, perennial, suffrutescent herb, the stems erect, ascending, or spreading, sparsely branching, to 1.2 m long, ca. 1.2 cm in diameter, tan below, green near apex, densely sericeous, the internodes 2-4.5 cm long; leaf pairs very unequal, the petiole ca. 5 mm long, green, sericeous, the lamina of the larger leaf of a pair elliptic, acuminate, subentire to obscurely serrulate, ciliate, oblique, green and sericeous on both surfaces, but the abaxial side with maroon-red tips, additional spotting, or completely maroon-red, with ca. 12 pairs of secondary veins, the lamina of the smaller leaf of a pair similar, ca. 3 by 1 cm. Inflorescence an axillary, reduced cyme of 1-4 flowers, the common peduncle absent, the prophylls leafy, ovate, ca. 5 by 4.5 cm, subentire, sericeous, yellow-green, often spotted with maroon-red, or completely maroon-red, the margins sometimes edged with yellow, the subtending bracts lanceolate, 3.5 by 0.7 cm, similar to the prophylls, the pedicels ca. 1 cm long, yellow-green, sericeous, distally covered with red calluses; calyx conical, similar to pedicel, covered with red calluses, the lobes subequal, lanceolate, ca. 1 by 0.4 cm (2.5 by 1 cm in fruit), with a raised mid-vein, subentire, yellow-green, sericeous; corolla erect in the calyx, columneoid, 5-6.6 cm long, constricted below the spur, the tube white, cream-white or yellow, sericeous, the face of the limb orange (in other collections similar to tube, marked with maroon-red or rose), the galea 0.9 by 1.8 cm, the lateral lobes triangular, 1 cm long, the lower lobe lanceolate, 1.6 by 0.7 cm, the throat covered with glandular-capitate trichomes, the inside of the tube glabrous; stamens 4, excluded in the male phase of anthesis, adnate to the base of the corolla tube, 4.5-5.5 cm long, white, pubescent, the anthers syngenesious into a rectangle, each anther 3 by 3 mm; ovary superior, turbinate, 5-7 mm long, sericeous, the style 4.5-5.5 cm long, distally pubescent, with glandular-capitate trichomes, the stigma stomatomorphic; nectary a double-connate, dorsal, glabrous gland, 3 by 5 mm. Fruit a pointed berry, 2.5 cm long, 1.4 cm wide, cream-white, sericeous; seed fusiform, 1 by 0.3 mm, striate, brown, with a funicle 4 mm long.

TYPE: *ECUADOR*: PICHINCHA: above Chiriboga, on old road from Quito to Santo Domingo, 2100 m altitude, on tree in cow pasture by creek, open, sunny area, prophylls plain green or maroon, corolla cream-white, lobes orange, 26 April 1988, *Wiehler & GRF Expedition 88215* (HOLOTYPE: GES; ISOTYPES: QCA, K, MO, NY, SEL, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: AZUAY: between Río Blanco and Río Norcay on road between Chacanceo and Molleturo, 1520 m altitude, shrubby, 5 ft tall, 4 June 1943, *Steyermark 52826* (F). PICHINCHA: same area as type collection, on trees along creek, leaves below completely maroon-red, prophylls pale greenish yellow, with some maroon spotting, 26 April 1988, *Wiehler & GRF Expedition 88228* (QCA, GES, K, MO, NY, US; same area, prophylls dark maroon, same day, *Wiehler & GRF Expedition 88221* (GES, QCA); along old road from Quito to Santo Domingo, at various altitudes, 11 April 1986, *Wiehler & GRF Expedition 8633* (GES, K, MO, NY, QCA, SEL); old road from Santo Domingo to Quito, at km 19 past bridge off new road, epiphyte, prophylls and corolla yellow, 27 April 1979, *Wiehler & Masterson 79110* (GES, MO, NY, QCA, SEL, US); same area, 40 km past bridge, 17 March 1980, *D. & E. Masterson 8073* (GES); Tandapi cloud forest, W of Río Pilatón, ca. 1500 m altitude, epiphyte, prophylls yellow with red centers, calyx yellow, corolla lemon-yellow, with red lines on lobes and sinuses, 24 April 1979, *Wiehler & Masterson 7966* (GES); road Antigua to Santo Domingo, kms 72-74, Montane forest, 1800-1900 m altitude, 3 April 1978, *J.& L. Luteyn 5646* (NY); Montañas de Ila, on road from Patricia Pilar to 24 de Mayo at km 12, epiphyte with stems 1 m long, 22 July 1979, *Dodson et al. 8493* (SEL); road from Puerto Quito to Maldonado, forested area, epiphyte, bracts light green with red margins, corolla tube whitish, with maroon markings, leaves used as infusion for menstrual cramps by inhabitants of Los Bancos, 29 April 1990, *Wiehler & GRF Expedition 90107* (GES, QCA, US); road between Los Bancos and Mindo, 7 km outside of Los Bancos, epiphyte, leaves below completely red, 30 April 1990, *Wiehler & GRF Expedition 90113* (GES, K, NY, QCA, US); along same road, ca. 12 km from Los Bancos, on trees, corolla limb with strong maroon markings, 30 April 1990, *Wiehler & GRF Expedition 90131* (GES, QCA); along same road, ca. 15 km from Los Bancos, epiphyte, prophylls yellow-green with maroon striations in center, 30 April 1990, *Wiehler & GRF Expedition 90137* (GES, NY); road Nono to Mindo, epiphyte along stream, ca. 2000 m altitude,

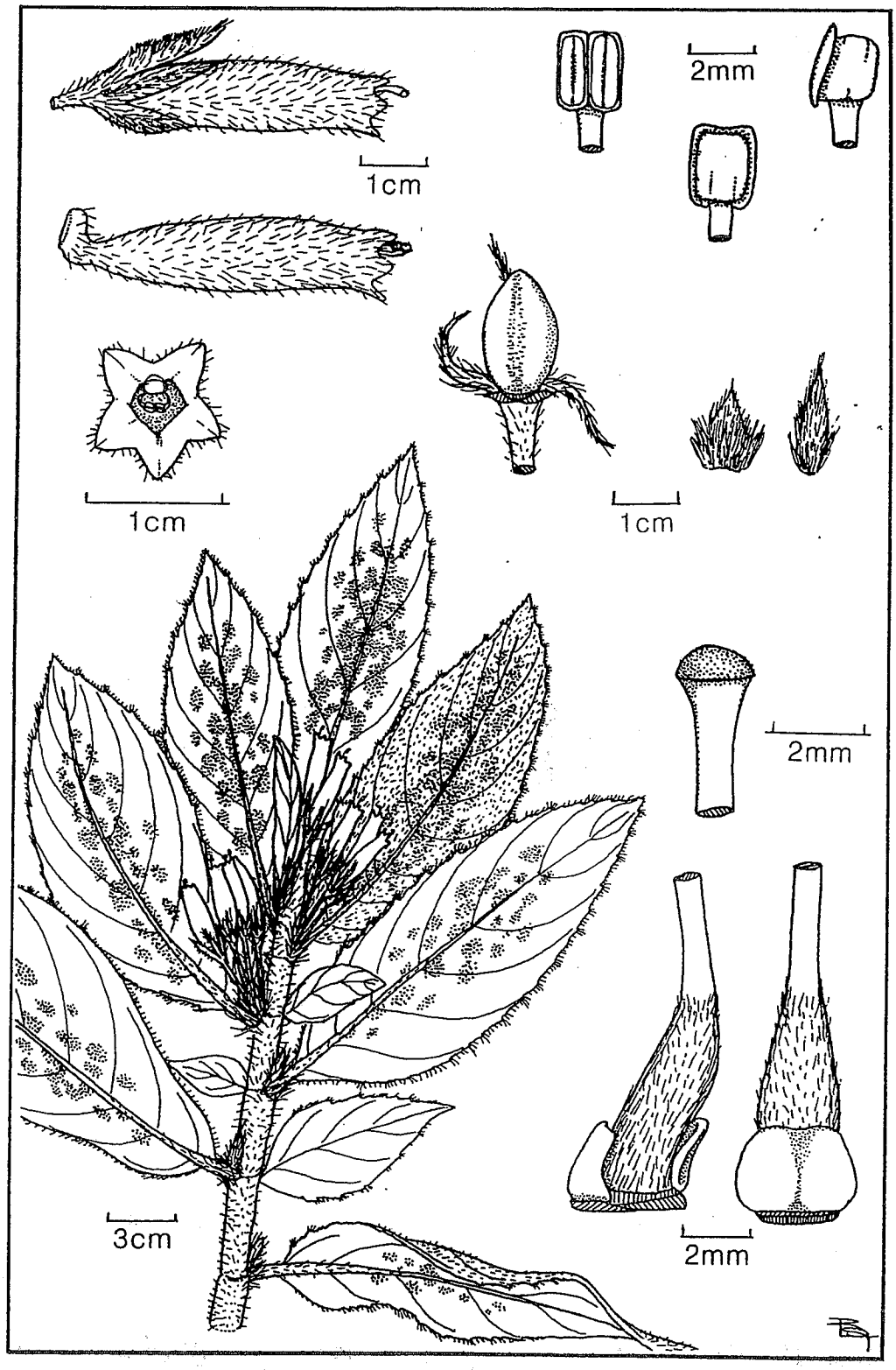

Figure 9: **Dalbergaria ornata** Wiehler Costa Rica
Voucher Specimen: *Wiehler 87105* (GES)
Illustrator: *Robert Scott Thompson*, 1987
Sponsor: *Twin Cities Area Chapter of AGGS, Minneapolis, Minnesota*

11 Nov. 1979, *C.&J. Luer & A. Hirtz 4713* (GES); ca. 20 km past Nono, on road to Nanegal, on tree by creek, 7 Aug. 1971, *Wiehler 71145* (GES, QCA); at km 17 on road Nono to Tandayapá, ca. 2100 m, on rock by Río Alambí, 7 Aug. 1971, *Wiehler 71156* (GES); without locality cited, "Ad arb. truncos in silv. suband. et subtrop," Sept. 1875, *Sodiro 119/36* (P). ESMERALDAS: Parroquia de Concepción: Playa Rica, 105 m altitude, on tree trunks in dense forest, pale chrome yellow flower, abundant, used medicinally, "Huaco," 6 Dec. 1936, *Mexia 8412* (MO, U); 5 km from Lita on road to Alto Tambo, along Río Chuchubí, prophylls green, corolla lobes with small maroon dots in sinuses, 22 April 1990, *Wiehler & GRF Expedition 9011* (GES, NY, QCA, US); on the Chocó Escarpment, about 20 km W of Alto Tambo, 24 April 1990, *Wiehler & GRF Expedition 9061* (GES). *COLOMBIA*: NARIÑO: road Pasto to Tumaco, 4 km past Ricaurte, open area, epiphytes along creek, strong stems horizontal from trees, leaves blue-green above, maroon-red below, corolla white, with maroon markings on limb, lobe margins rose, 9 May 1972, *Wiehler N.H. Williams 72191* (GES); same area, 1/2 way between Altaquer and Junín, on trees with 1-inch diameter branches, leaves below with red tips only, information from village people of Altaquer: the local Indians cook a tea from the leaves of this plant to cure the bite of the coral snake; "la X," 9 May 1972, *Wiehler & N.H.Williams 72194* (GES); Regenwald bei La Guayacana, an der Bahnlinie nach Tumaco, ca. 80 m altitude, 28 July 1956, *St.Vogel 9* (US). CAUCA: Quebrada La Laguna, near Argelia, dense forest, 2000 m altitude, "hoja santa," 15 Sept. 1944, *E.L.Core 1264* (US). VALLE: Cordillera Occidental, vertiente occidental, Hoya del Río Digua, Piedra de Moler, 900-1180 m altitude, 19-28 Aug. 1943, *Cuatrecasas 14914* (F); road Cali to Buenaventura, 4 km past La Elsa, montane forest, 29 April 1972, *Wiehler, Dressler & N.H.Williams 7233a* (GES).

DISTRIBUTION: *Dalbergaria medicinalis* has a fairly wide distribution on the Pacific slope of the Andes: from the Province of Azuay in Ecuador to the Department of Valle in Colombia, at altitudes close to sea-level to 2000 m.

ETYMOLOGY: The specific epithet of this showy species refers to the medicinal qualities of this plant. The Indian tribes of the region use a tea brewed from the large leaves, applied to the wound, as a cure for the bite of the deadly coral snake (*Wiehler & Williams 72194*). In the Province of Pichincha, the women of the local population (both Indian and general) use an infusion of the leaves as pain killer for menstrual cramps (*Wiehler & GRF Expedition 90107*). The label on the Ecuadorian collection *Mexia 8412* states that this plant is "used medicinally" and called "Huaco." In Colombia this species is known as "hoya santa," or holy herb (*Core 1264*).

Dalbergaria medicinalis with its well-developed columneoid corolla belongs to the small section of *Cryptocolumnea* (Hanstein) Bentham. One of its closer relatives is the sympatric but also trans-Andean *D. picta* (Karsten) Wiehler, which has conspicuous translucent red leaf tips, a strongly bent, odd-shaped corolla, and yellow berries.

Dalbergaria ornata Wiehler, Phytologia 73(3): 227. 1992.

Figure 9

Habitu et corollae forma *Dalbergariae polyanthae* Wiehler similis, praesertim differt foliis maculatis, calycum lobis integribus, corollis aurantiacis baccisque albis.

Epiphytic, perennial, suffrutescent herb, the stems erect, ascending or spreading, sparsely branching, to 2 m long, 0.8-1.6 cm in diameter, green or tan, lanate, the internodes 1.5-6 cm long; leaf pairs very unequal, the petiole subsessile to 1 cm long, green, velutinous, the lamina of the larger leaf of a pair oblanceolate, 18-31 by 5-10 cm, acuminate, serrate, ciliate, oblique, adaxially bluish green, hirsute, abaxially green, more frequently green with irregular red-maroon spotting, sometimes completely red-maroon, hirsute (trichomes maroon), with 8-10 pairs of secondary veins, the lamina of the smaller leaf of a pair similar, 3 by 1 cm, early caducous. Inflorescence an axillary, reduced cyme of 4-10 flowers, the peduncle absent, the prophylls ovate, 1 by 0.8 cm, the subtending bracts lanceolate, 1 by 0.3 cm, both red-maroon, velutinous, the pedicels ca. 2 cm long, yellow-green, velutinous, the long trichomes maroon; calyx conical, the lobes subequal, narrowly lanceolate, entire, ciliate, maroon with yellow-green borders, velutinous; corolla erect in the calyx, tubular, ca. 5 cm long, orange, pilose, spurred, the spreading lobes subequal, 5 by 5 mm, yellow, with red centers, the tube inside pubescent; stamens 4, excluded in the male phase of anthesis, the filaments 5.3 cm long, adnate to the base of the corolla tube for 1 mm, white, pubescent, the anthers syngenesious into a rectangle, each anther

1.8 by 1.2 mm; ovary superior, turbinate, 6 mm long, maroon, sericeous, the style ca. 4.8 cm long at the female stage of anthesis, white, glabrous, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 2 by 4 mm, and a single ventral gland, 2 by 1.2 mm, both glabrous. Fruit an elongated, ovoid, white, sericeous berry, 1.9 by 1.2 cm; seed oblong, 1.2 mm long, striate, reddish, with a fleshy funicle 2.6 mm long.

TYPE: *COSTA RICA*: SAN JOSÉ: ca. 30 km SW of the city of San José, along Río Negro. Live plant material collected by *John Hall s.n.* in Jan. 1979, grown in GRF greenhouse under accession number G-2665, type specimens prepared 8 May 1987, *Wiehler 87105* (HOLOTYPE: GES; ISOTYPES: CR, SEL, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *COSTA RICA*: SAN JOSÉ: Basin of El General, 675-900 m altitude, shrub 1.2 m, on rocks by forest stream, March 1940, *A.F. Skutch 4780* (MO, NY, US).

DISTRIBUTION: Endemic to Costa Rica, in the Province of San José. The two known localities are about 100 km apart.

ETYMOLOGY: From the Latin *ornatus*, meaning adorned, ornate, in reference to the beautiful red-maroon leaves, the large, orange corollas with yellow lobes, and the white berries. This is one of the most attractive species in the genus.

In its size, habit and floral aspect, *Dalbergaria ornata* is closely related to *D. polyantha* from the provinces of Puntarenas and San José in Costa Rica, and Chiriquí in adjacent Panama. The latter species has plain green leaves, serrate-laciniate calyx lobes, lemon-yellow corollas, and yellow berries. *Dalbergaria ornata* should become an outstanding representative of a rain forest gesneriad in botanical gardens and in private collections. It is one of the choice gesneriads from Costa Rica.

Dalbergaria robusta Wiehler, sp. nov.

A simili *Dalbergaria crassa* (Morton) Wiehler prophyllis majoribus ovatis rubris et calycibus majoribus integris rubris differt.

Epiphytic, perennial subshrub, the stems emerging from a common base, erect, ascending or spreading, sparsely branching, to 2 m tall, 0.9-1.5 cm in diameter, tan below, green apically, sericeous, the internodes 3-9 cm long; leaf pairs very unequal, the petiole of the larger leaf of a pair 5-7 cm long, ca. 1 cm in diameter, green, sericeous, the lamina oblanceolate, 24-30 by 10-14 cm acute, entire to obscurely serrulate, oblique, leathery, the adaxial surface dark green and glabrescent, the abaxial surface sericeous, pale green, the lateral veins (as well as the stems and petioles) occasionally with red blotches, the lamina occasionally with translucent red spots below the apex, with 10-13 pairs of secondary veins, the lamina of the smaller leaf of a pair similar, 4-7 by 1.5-2.5 cm. Inflorescence in the axils of the larger leaf of a pair, a reduced cyme of usually 4 flowers, the peduncle absent, the prophylls, bracts and calyx lobes red (Orange Red Group 34 B), sericeous, the prominent prophylls ovate, ca. 3.5 by 4.5 cm, the subtending bracts ovate, ca. 2.5-2.0 cm, the pedicels 1 cm long, yellow-green, with red blotches and red calluses, sericeous; calyx lobes subequal, fused for ca. 1/3 of their length, lanceolate, ca. 3.0 by 1.2 cm, entire, the mid-veins with prominent, appressed, silky hairs; corolla somewhat oblique in the calyx, tubular, ca. 4.5 cm long, spurred, somewhat inflated, narrowed proximally and distally, basally cream-white, changing to pale yellow, the upper half yellow-green (Yellow Green Group 151 A), sericeous, the equal-sized lobes constricting the entrance to the tube, lanceolate, 5 by 2 mm, the tips rounded and thickly callused (each lobe resembling a hood, externally with prominent green tufts of hair projecting beyond the apex; stamens 4, included in the male phase of anthesis, the filaments ca. 3.4 cm long, yellow, glabrous, the anthers coherent into a rectangle, each anther 2 by 2 mm; ovary superior, turbinate, ca. 8 mm long, pale yellow-green, sericeous, the style ca. 3.2 cm long, white, glabrous, the stigma bilabiate; nectary a double-connate, dorsal, grayish white, glabrous gland, 2.5 by 2 mm. Fruit a pointed berry, ca. 2.5 by 1.1 cm, yellow, flushed with maroon, sericeous; seed fusiform, ca. 1.2 by 0.3 mm, striate, brown.

TYPE: *COLOMBIA*: CHOCÓ: road from Bolivar to Quibdo, 550 m altitude, one traffic-mangled stem with bruised leaves and inflorescences found in middle of road, left over from trees cut above road bank complete specimen not seen its natural habitat), 14 March 1987, *Wiehler & GRF Expedition 8713A* (GES, as live stem cuttings and pickled flowers); grown at GRF greenhouse under accession no. G-3278, type material prepared 15 Oct. 1988, *Wiehler 88241* (HOLOTYPE: HUA; ISOTYPES: COL, GES, MO, NY, US, others to be

distributed).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The specific epithet (from the Latin *robustus*, strong-growing, robust), refers to the large size of the stems, leaves and corollas of this new Colombian species.

The special features of *Dalbergaria robusta* include its large, leathery leaves with the translucent red "window" spots, and the equal-sized, thickened lobes of the corolla which point inward, restricting the entrance of the yellow-green floral tube.

Dalbergaria robusta is related to a group of species represented by *D. crassa* (Colombia to Panama) which has smaller, lanceolate, light green prophylls, smaller, serrated, light green calyx lobes, and a lemon-yellow corolla with slightly spreading lobes (cf. sub *D. filifera* Wiehler).

Dalbergaria tutunendana Wiehler, Phytologia 73(3): 228. 1992.

Species nova *Dalbergariae villosissimae* (Mansfeld) Wiehler proxima. Differt foliis majoribus, coriaceis, glabrescentibus, apicibus viridibus, et floribus luteis.

Epiphytic, perennial herb or subshrub, the shoots emerging from a common base, sparsely branching, to 45 cm tall, 0.7-1.3 cm in diameter, grayish tan below, greenish tan towards the apex, sericeous, the internodes 2-3.5 cm long; leaf pairs very unequal, the petiole of the larger leaf of a pair ca. 2 cm long, ca. 6 mm in diameter, green, sericeous, the lamina oblanceolate, 22-27 by 8-11 cm, acute, entire to obscurely serrulate, ciliate, oblique, leathery, the adaxial surface dark green, glabrescent to glabrous, the abaxial surface lighter green, occasionally with 2 red spots below the apex, glabrescent, the veins sericeous, with 13 pairs of secondary veins, the petiole of the smaller leaf of a pair 1-2 cm long, the lamina lanceolate, ca. 2.5 by 0.5 cm. Inflorescences in the axils of the larger leaf of a pair, a reduced cyme of 2 to 4 flowers, the peduncle absent, the prophylls and subtending bracts small and non-showy, lanceolate, 7-10 by 1-2.5 cm, yellow-green, with red hairs, the pedicels ca. 7 mm long, yellow-green, covered with red hairs; calyx lobes equal-sized, lanceolate, ca. 2.3 cm long, fused for ca. 4 mm, fimbriate, with ca. 10 teeth on each side of the lobe, yellow-green but appearing orange-red (Orange-Red Group 34A) because of the prominent velutinous indumentum, in fruit changing to wine-red (Red Group 46A), the long teeth covered with the same silky red hairs; corolla almost erect in the calyx, tubular, ca. 3.6 cm long, prominently spurred, inflated in the middle, the spur cream-white, the tube salmon-red (Red Group 40C), distally covered with long, velutinous, lemon-yellow indumentum, the small, spreading lobes subequal, rounded, each lobe ca. 2.5 by 2.5 mm, deep red (Red Group 45A), glabrous, the tube glabrous within; stamens 4, included in the male phase of anthesis, the filaments ca. 3.2 cm long, cream-white, glabrous, the anthers coherent into a rectangle, each anther 2 by 2 mm; ovary superior, turbinate, ca. 7 mm long, salmon red, with a few cream-white spots near the base, sericeous, the style ca. 2.5 cm long, white, glabrous, the stigma bilabiate, included in the female phase of anthesis; nectary a double-connate, dorsal, glabrous, white gland, 2.5 by 2 mm. Fruit a pointed berry, ca. 2.4 by 1.0 cm, salmon red, blotched with cream-white near the base, sericeous; seed fusiform, ca. 1.2 by 0.3 mm, striate, brown.

TYPE: *COLOMBIA*: CHOCÓ: E of Tutunendo, on road Quibdo to Bolivar, Alto de Veinte, hacienda of Ruben Jaramillo, very moist rain forest on slope to river, ca. 480 m altitude, 15 March 1987, *Wiehler & GRF Expedition 8722* (HOLOTYPE: HUA; ISOTYPES: COL, GES, US).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The specific epithet commemorates the village of Tutunendo by which name also the surrounding plant-rich region of the vast Chocó is known.

The outstanding features of this Colombian rain forest species are the large, leathery leaves, the bright red calyx which has a globose shape for several weeks before the floral tube pushes through the lobes, and the salmon-red corolla, covered with bright yellow hairs, 3 mm long, contrasted by the shiny deep red lobes of the corolla which constrict the entrance to the floral tube.

With its sessile flowers along the often bare stems, the globose calyx and straight corolla tube, *Dalbergaria tutunendana* has a similarity to *D. villosissimsa* from the rich rain forests on the eastern slope of the Andes of Ecuador and adjacent

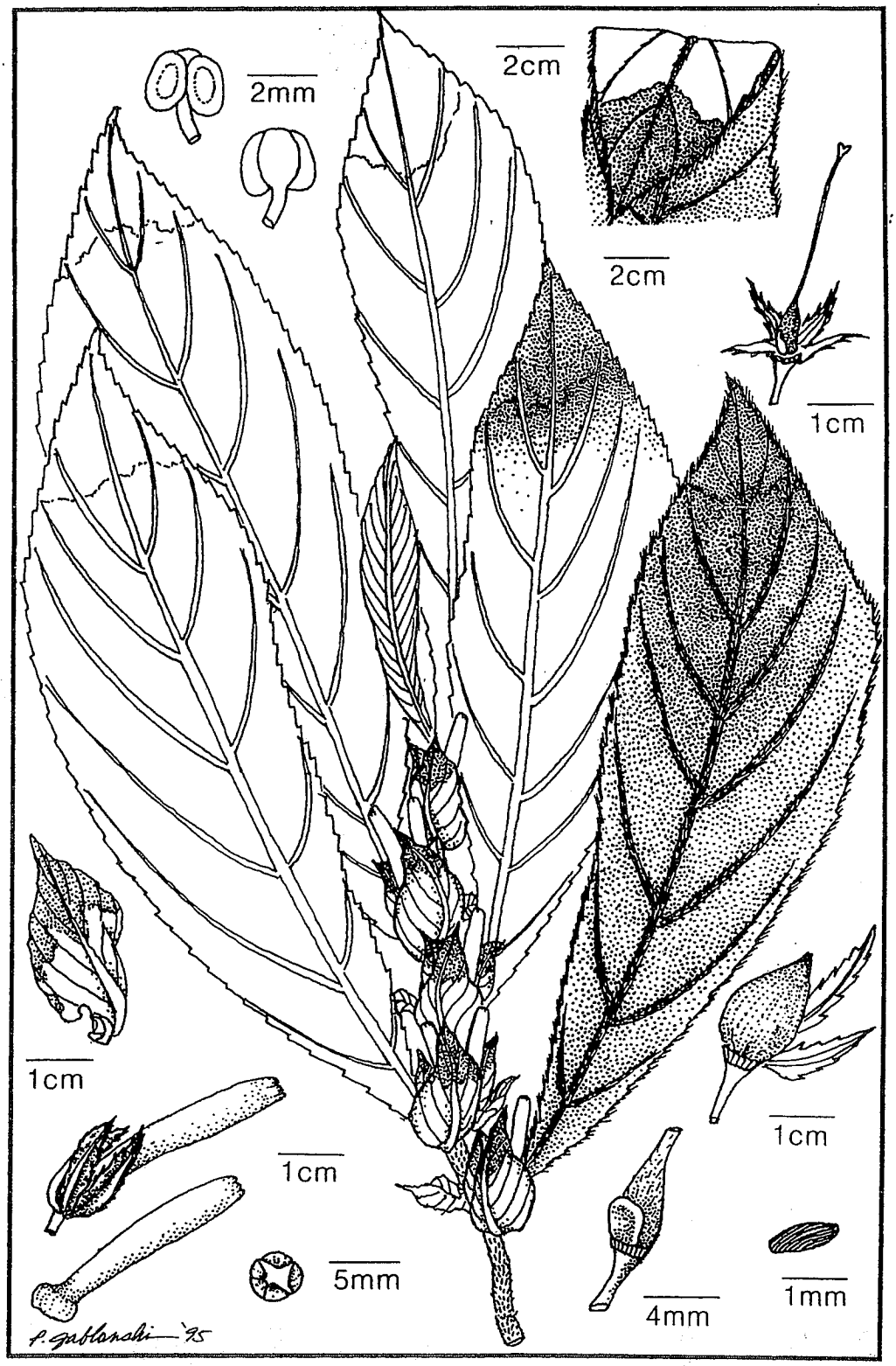

Figure 10: **Dalbergaria variabilis** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 9544* (GES)
Illustrator: *Pamela Jablonski*, 1995
Sponsor: *Dr. Yuriko Yamada, Nagoya, Japan*

Colombi
leathery
tips, yel
corollas.

Dalberg

Differ

Epiph
subshru
sparsely
diamete
sericeou
very un
sericeou
lanceola
ciliate,
minent
green, o
complet
appress
veins, t
similar,
florescer
flowers,
prophyl
bracts l
greenis
pedicels
calyx c
ceolate,
nearly e
4.2 cm,
lobes nc
entranc
inside g
the fila
anthers
1 by 0.8
yellow,
glabres
double-
glabrou
ceous b
long, st
long.

TYPE:
half-wa
along r
epiphyt
Expedit

Colombia. The latter has smaller, thin, non-leathery, sericeous leaves, abaxially with bright red tips, yellow calyces and yellow (rarely white) corollas.

Dalbergaria variabilis Wiehler, sp. nov.

Figure 10

Differt a congeneris omnibus corollis perangustis.

Epiphytic, perennial, suffrutescent herb or subshrub, the stems erect, ascending or spreading, sparsely branching, to 2.4 m long, 0.9-1.9 cm in diameter, green, tan, or maroon, appressed sericeous, the internodes 2-3.5 cm long; leaf pairs very unequal, the petiole 0.6-1.2 cm long, green, sericeous, the lamina of the larger leaf of a pair lanceolate, 16-30 by 4-6.8 cm, acuminate, serrulate, ciliate, oblique, adaxially bluish green, with prominent translucent red tips, glabrescent, abaxially green, or green with scattered maroon speckling, or completley maroon, glabrescent, the midveins appressed sericeous, with 12-14 pairs of secondary veins, the lamina of the smaller leaf of a pair similar, ca. 2 cm long, often early caducous. Inflorescence an axillary, reduced cyme of 4-6 flowers, the peduncle absent, the prominent prophylls ovate, ca. 3 by 2 cm, the subtending bracts lanceolate, ca. 2 by 0.7 cm, both proximally greenish yellow, distally maroon, glabrescent, the pedicels ca. 0.6 cm long, lemon-yellow, sericeous; calyx conical, the lobes subequal, narrowly lanceolate, serrulate, lemon-yellow, sericeous; corolla nearly erect in the calyx, narrowly tubular, ca. 3.5-4.2 cm, yellow, distally below the limb red, the lobes non-spreading but curved to protect the tube entrance, subequal, ovate, 3 by 2 mm, red, the tube inside glandular pubescent; stamens 4, included, the filaments ca. 3 cm long, white, glabrous, the anthers syngenesious into a rectangle, each anther 1 by 0.8 mm; ovary superior, turbinate, 4 mm long, yellow, sericeous, the style ca. 3 cm long, yellow, glabrescent, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 2 by 4 mm, white, glabrous. Fruit an elongated, ovoid, yellow sericeous berry, 1.6 by 0.9 cm; seeds oblong, 1.1 mm long, striate, yellow, with a fleshy funicle 2.3 mm long.

TYPE: *ECUADOR*: ESMERALDAS: vicinity of Lita, half-way between Alto Tambo and Escarpment, along roadside cuts, and nearby in forest remnants epiphytic on trees, 23 April 1995, *Wiehler & GRF Expedition 9544* (HOLOTYPE: QCNE; ISOTYPES: GES, K, MO, QCA, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: ESMERALDAS: near type locality, 3 km closer to Alto Tambo, along roadside cuts and in adjacent forest remnants, 23 April 1995, *Wiehler & GRF Expedition 9511* (GES, K, MO, NY, SEL, US); same area, just above escarpment, along roadside cuts and in forest above road, 23 April 1995, *Wiehler & GRF Expedition 9530* (GES, NY, QCNE, US); between Lita and Alto Tambo, at Río Chuchubí, along river and roadside, 22 April 1990, *Wiehler & GRF Expedition 9016* (GES, QCNE); same area, ca. 5 km below escarpment, 22 April 1990, *Wiehler & GRF Expedition 9035* (GES, QCA, QCNE); same area, ca. 16 km below escarpment, at ca. 300 m altitude, 24 April 1990, *Wiehler & GRF Expedition 9056* (GES); same area, about 23 km below escarpment, 24 April 1990, *Wiehler & GRF Expedition 9056* (GES, MO, NY). PICHINCHA, near LOS RIOS border: Montañas de Ila, road from Santo Domingo to El Mirador, near E M, undisturbed rain forest, epiphytic, 27 April 1990, *Wiehler & GRF Expedition 9092* (GES). *COLOMBIA*: VALLE: Old road from Cali to Buenaventura, 4 km past La Elsa, epiphytic in intact rain forest, 29 April 1972, *Wiehler, Dressler & N. H. Williams 7212* (COL, GES, US); same road, near Río Anchicayá, 29 April 1972, *ibidem 7214* (GES), same area, ca. 12 km from coast, 30 April 1972, *ibidem 7265* (COL); same area, ca. 5 km from coast, 30 April 1972, *ibidem 72118, 72122, 72151* (GES); hoya del río Anchicayá, entre Sabaletas y la Quebrada del Tátabro, 30-60 m alt., 28, 29 Sept. 1946, *Cuatrecasas 22056* (F); Sabaletas, km 29 of highway from Buenaventura to Cali, alt. 25 m, dense forest, 4 June 1944, *Killip & Cuatrecasas 39218* (US); costa del Pacifico, río Cajambre: Barco, 5-80 m alt., 21-30 April 1944, *Cuatrecasas 17179* (F); costa del Pacifico, río Yurumanguí: veneral, bosques, 5-50 m alt., 28 Jan. - 10 Feb. 1944, *Cuatrecasas 15978* (F, 2 sheets). CAUCA: near El Tambo, la Costa in silva primavera, 1300 m alt., 9 July 1936, *von Sneidern 786* (S); W of Cajibio, quebrada Ortega, 1520 m alt., on tree 35 ft. high, 24 Aug. 1944, *Core 1075* (US). NARIÑO: Barbacoas, vertiente del río Telembí, alt. 200-840 m, 3-5 Aug. 1948, *Garcia-Barriga 13199* (US); Camino de Barbacoas a Cumbira, entre Santa Rosa y Pimbí, 6 Aug. 1962, *Mora 2289* (US); road to Tumaco, near Junin, at km 140, in sparse rain forest, 10 May 1972, *Wiehler & N.H. Williams 72212* (GES); same area, before El Divisio, 10 May 1972, *Wiehler & N.H. Williams 72225* (GES).

DISTRIBUTION: Along the Pacific slope of the

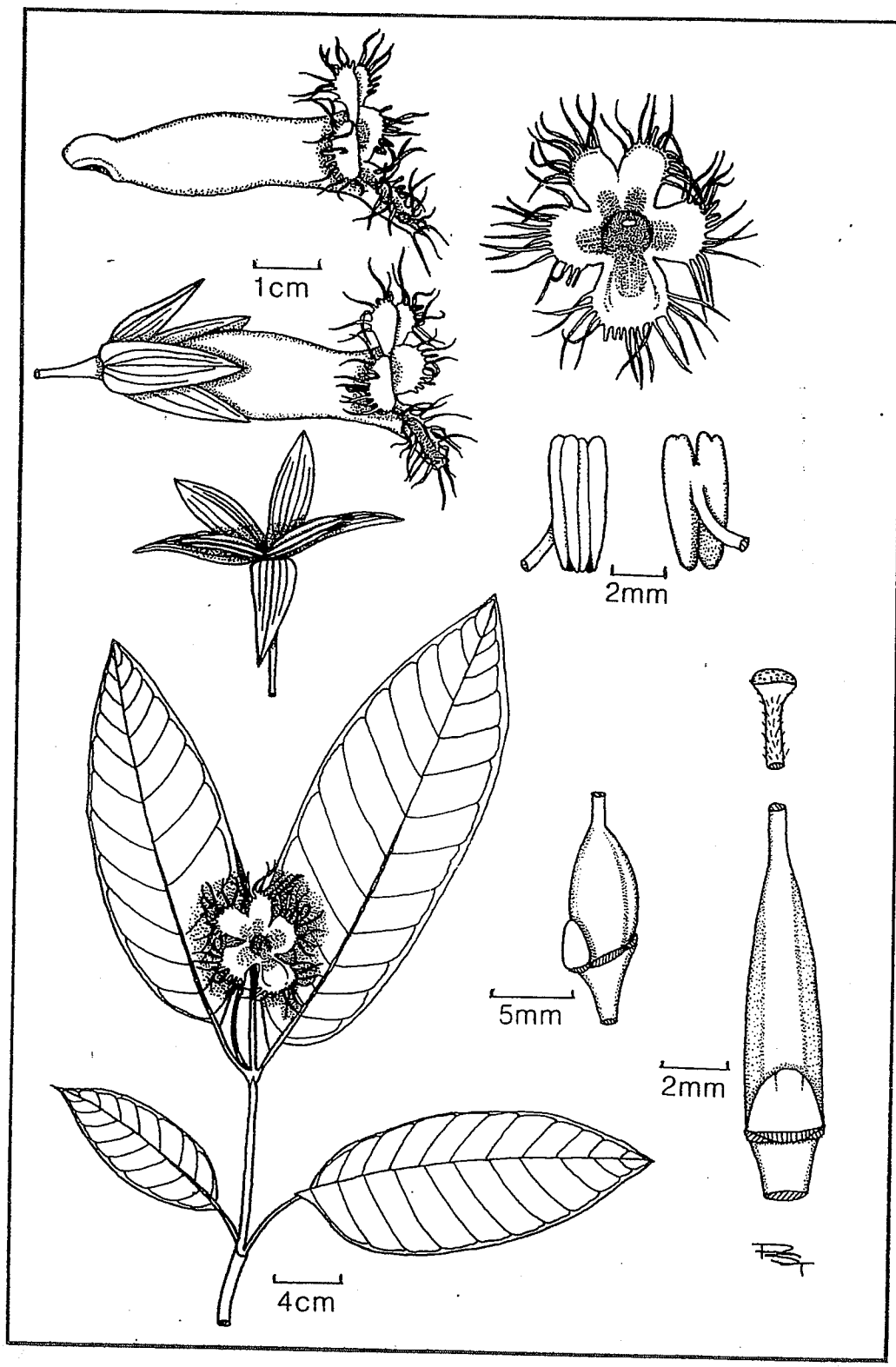

Figure 11: **Drymonia brochidodroma** Wiehler Colombia
Voucher specimen: *Luer & Hirtz 4566* (SEL)
Illustrator: *Robert Scott Thompson*, 1984
Sponsor: *Connecticut Chapter of AGGS*

Andes from central Ecuador to central Colombia, in the provinces and departments of Pichincha, Imbabura (?), Carchi, Esmeraldas, Nariño, Cauca and Valle, at altitudes from near sea level to 1300 m.

ETYMOLOGY: Named for the variability in the color of bracts and corollas. There are regional color differences in the local populations of *Dalbergaria-variabilis*. In the type locality of Lita and Alto Tambo (Esmeraldas), the bracts are greenish yellow topped by a vivid and bright red, the corolla yellow, with a reddish tip and lobes. Further south, in a southern site in Pichincha, the bracts are chartreuse, blotched with red, and the corollas white, with maroon lobes. In Nariño, just north of Ecuador, the bracts are yellowish with small red tips, and the corollas basally yellow, the middle red, and the lobes white. Further north in Colombia, the bracts may be solid yellow, or orange at the tip, or the same as at the type locality, and the corollas clear white, or yellow with red lobes or a ring of maroon just below the limb.

The features that give *D. variabilis* distinction are: leaves glabrescent, the midvein below with appressed (sericeous) indumentum, the tip of the leaf translucent red, the underside of the leaf marked with red or maroon, at the tip, at the margins, along the veins, or mottled with color or completely red. The bracts covering the flowers are prominent, ca.2-3 cm long; the calyx narrow, weakly serrulate; the corolla is a prime character: the 4 cm long tube is unusually narrow, 4-5 mm in diameter, much narrower than in its congeners.

Dalbergaria variabilis belongs to a small group of species, all characterized by narrow corolla tubes, all native to the same area of the Pacific slope of the Andes. The two other species will be published later.

Drymonia brochidodroma Wiehler, sp. nov.

Figure 11

Differt a congeneris omnibus foliorum venatione brochidodroma in combinatione caulibus alatis et corollarum lobis fimbriatis.

Epiphytic, perennial herb, subshrub or vine, the stems sparsely branching, erect, ascending or spreading, to 1/2 m tall, ca. 0.5 cm in diameter, strongly winged, green or maroon at apex, tan below, glabrous, the internodes 3 - 13 cm, often with adventitious roots; leaf pairs strongly unequal, the petiole of the larger leaf of a pair 3 - 5 cm long, green or maroon, glabrous, the lamina elliptic to broadly ovate-lanceolate, 13 -22 by 6 - 10 cm, acuminate, entire, rounded at the base, somewhat leathery, coppery green above, maroon, red-violet or green with maroon flushes below, glabrous, the secondary pairs of veins 7 - 10, each vein joining near or at the margin with the vein above to form a distinct, continuous vein along the margin (brochidodrome venation), the lamina of the smaller leaf of a pair ca. 4 by 2 cm. Inflorescence reduced to axillary, epedunculate cymes of 2 - 4 flowers, the prophylls very small, the pedicels 4 - 6 cm long, maroon, glabrous; calyx conical, the lobes leafy, unequal, lanceolate, ca. 3 by 1.4 cm, acute, entire, green or maroon, glabrous; corolla oblique in the calyx, infundibular, 4.5 to 7 cm long, constricted near the spur and above midpoint, white, glabrous, the lobes of the limb prominent, subequal, red-dotted in some collections, the lower lobe 1.3 by 1.3 cm, the other lobes 1 by 0.8 cm, the cilia to 1 cm long, the throat yellow; stamens 4, included, the filaments ca. 3 - 4 cm long, attached to the base of the corolla tube for 5 mm, white, glabrous, the anthers syngenesious, oblong, sagittate, each anther ca. 2.4 by 1 mm, the thecae dehiscing by a basal pore; ovary superior, cone-shaped, 7 mm long, white, glabrous, the style ca. 2.5 - 3.5 cm long, white, glabrous (apically puberulous in one collection), the stigma stomatomorphic; nectary a double-connate, dorsal gland, 2 by 2 mm, white, glabrous. Fruit a bivalved, laterally compressed, fleshy capsule, ca. 1.9 by 1.2 cm, the split carpel walls inside bright red; seed oblong, 1 by 0.3 mm, striate, dark brown.

TYPE: *COLOMBIA*: NARIÑO: Epiphyte in cloud forest around La Planada, above Ricaurte, 1950 m altitude, 2 Nov. 1979, *Carlyle & Jane Luer & Alex Hirtz 4566* (HOLOTYPE: SEL).

ADDITIONAL MATERIAL EXAMINED: *COLOMBIA*: NARIÑO: Chutucol, via de Barbacoas, 600 m, 1866, *Triana 2508* (G, P); VALLE: Río Bravo, NW of village of Darien, 1733 m, thick, steep forest, erect herb, 18" tall, fls. white, 18 July 1962, *J.W.L. Robinson 62* (K, US); *ECUADOR*: CARCHI: ca. 12 km W of Maldonado, Río Blanco drainage above Chical, tributary of Río San Juan, mostly mature forest, 1300 - 1500 m, vine, stems strongly winged, leaves red-violet beneath, calyx green, 25 Sept. 1979, *A. Gentry & G. Shupp 26597* (MO, SEL); El Pailón, ca. 45 km below Maldonado, 1 Dec. 1979, *M. Madison & E. Besse 2874* (SEL).

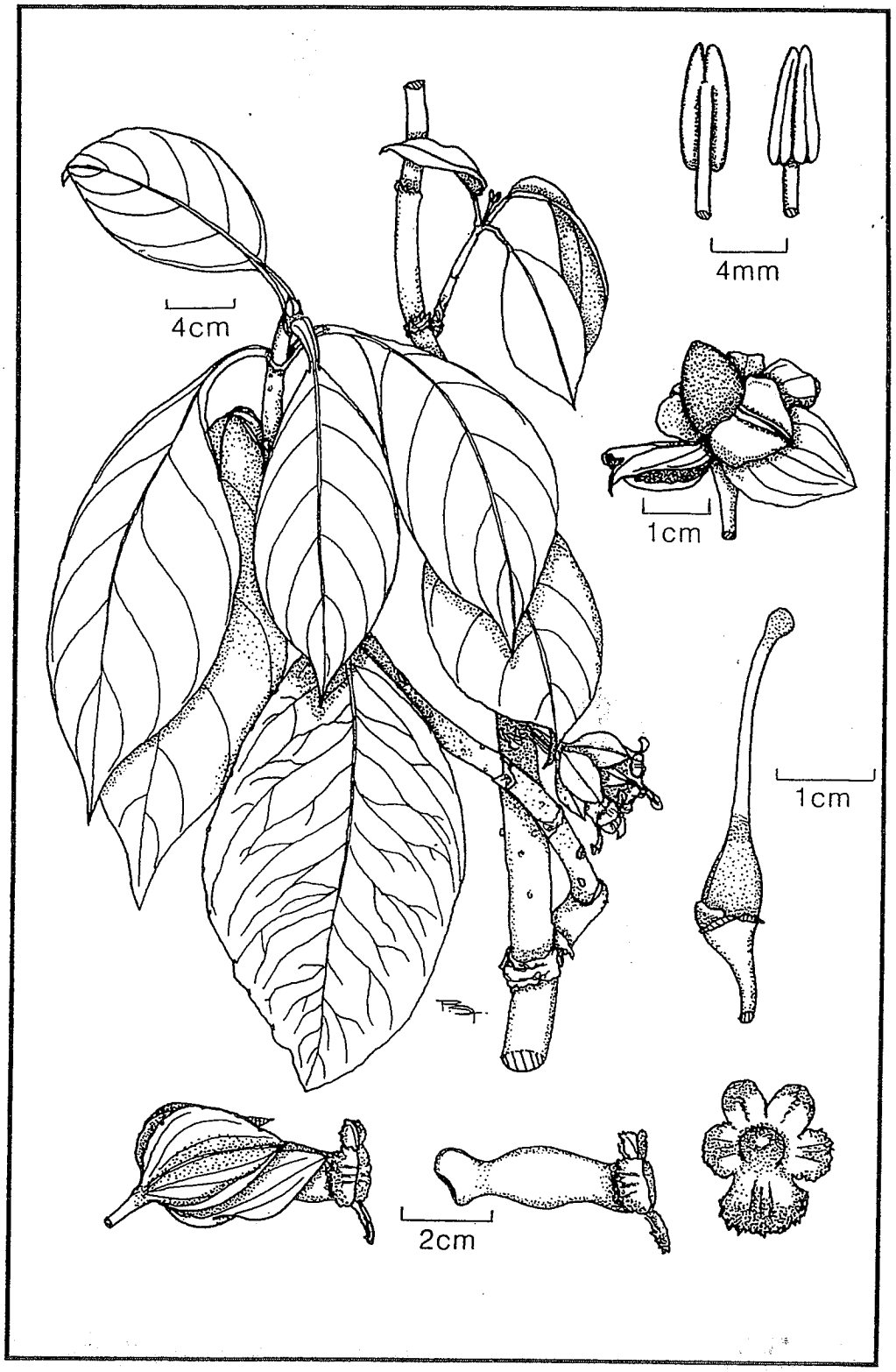

Figure 12: **Drymonia chiribogana** Wiehler Ecuador
Voucher specimen: *Wiehler & Masterson 79109* (GES; G-2773)
Illustrator: *Robert Scott Thompson*, 1984
Sponsor: *Dr. Elinor Crawford, Sarasota, Florida*

ETYMOLOGY: Named for the distinct brochidodrome venation pattern in the leaves. The lateral veins merge with the vein above near or at the margin to form a continuous line at or parallel to the leaf margin. This kind of venation is fairly unusual in the Gesneriaceae.

DISTRIBUTION: Along the rain-drenched western slope of the Andes, from northern Ecuador to central Colombia, at altitudes between 600 to 2000 m. Cloud forest resident, epiphyte.

Drymonia brochidodroma is one of the more elegant and showy representatives of Martius' genus. It stands apart from its congeners with the combination of winged stems, reddish leaves with brochidodrome venation and large, white flowers with flashy, long-fimbriate corolla lobes. The pollinator, probably one of the many species of iridescent Euglossine bees (female) in search of nectar, is not yet known.

Drymonia chiribogana Wiehler, Phytologia 73(3): 229. 1992.

Figure 12

Habitu plantae, foliis albo-nervatis, et calycibus foliosis *Drymoniae killipii* Wiehler similis, sed foliis glabrescentibus, corollarum forma coloreque, et stylis glabris.

Epiphytic, perennial subshrub, the stems sparsely branching, erect, ascending or spreading, to 1.4 m long, to 2.2 cm in diameter, green, glabrescent, the internodes 2-5 cm long; leaf pairs subequal to unequal, the petioles 4-5 cm long, green, glabrescent, adaxially with 2 parallel maroon stripes, the lamina oblanceolate-elliptic, 17-14 by 8-10 cm, acuminate, subentire, oblique, leathery, green, glabrescent, the mid-vein, secondary and tertiary veins marked whitish or silvery adaxially, the secondary pairs of veins 6-7. Inflorescence reduced to axillary, epedunculary cymes of 2-4 or more flowers, the bracts small (prophylls lanceolate, 1.1 by 0.15 cm), the pedicels 2.2 to 3 cm long, light green or maroon, glabrescent; calyx conical, the lobes leafy, subequal, ovate, ca. 3.5 by 2.5 cm, acute, subentire, light green, often suffused with maroon or red, glabrescent; corolla oblique in the calyx, tubular-infundibular, ca. 4.3 cm long, constricted below the spur, white, the limb magenta, the lobes subequal, rounded, 1.3 by 1.3 cm, erose, the throat and the tube inside furnished with red lines, the nectar guide yellow, the tube outside and inside glabrous except for trichomes dorsally in the throat; stamens 4, included, the filaments ca. 2.6 cm long, attached to the base of the corolla tube for 7 mm, white, glabrous, the anthers syngenesious, oblong, saggitate, each anther ca. 7 by 2 mm; ovary superior, obliquely cone-shaped, 8 mm long, white, glabrous, the style ca. 2.4 cm long, white, glabrous, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 2 by 4 mm, grey, glabrous. Fruit a bivalved, laterally compressed, fleshy capsule, 2.6 by 2.3 cm, the split carpel walls externally greenish yellow, inside lemon yellow, the exposed cone of placentae, funiculi and seeds glistening grey; seed ovoid, 0.9 by 0.6 mm, dark brown.

TYPE: *ECUADOR*: PICHINCHA: old road from Quito to Santo Domingo, near Chiriboga, 1200 m altitude, epiphyte in forest, 26 April 1988, *Wiehler & GRF Expedition 88222* (HOLOTYPE: GES; ISOTYPES: QCA, K, NY US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: PICHINCHA: road Santo Domingo to Chiriboga, on old road at km 19 (counting from new bridge and new road), epiphyte in trees overhanging road, 27 April 1979, *Wiehler & Masterson 79107* (GES, K, MO, NY, QCA, US); same road, at km 3, epiphyte on forest trees above road, 11 April 1986, *Wiehler & GRF Expedition 8616* (GES, QCA, US); same road, Quito to Chiriboga, at km 84-88, 1200-1350 m altitude, terrestrial on embankment, 8 July 1979, *Dodson et al. 7795* (SEL); same area, road off old road from Chiriboga to Santo Domingo, 1300 m altitude, Jan. 1989, *A. Hirtz 3984* (GES); Montañas de Ila, 52 km on road from Santo Domingo (at km 7) to Mirador, 1100 m altitude, on trees in rain forest, calyx lobes pale yellow, 27 April 1990, *Wiehler & GRF Expedition 9084* (GES, K, MO, NY, QCA, US); road Puerto Quito to Mindo, 7 km past Los Bancos, on roadside bank, underside of leaves green or red, in same population, 30 April 1990, *Wiehler & GRF Expedition 90130* (GES, QCA, US).

ETYMOLOGY: Named for the ancient village of Chiriboga on the old road from Quito to Santo Domingo de los Colorados. Most of the collections of *Drymonia chiribogana* were found in the vicinity of this charming hamlet. This road is one of the most botanized in Ecuador, but new species still can be found there.

DISTRIBUTION: Found only within the Province of Pichincha, on the Pacific slope of the Andes of Ecuador, at altitudes between 1100 to 1300 m.

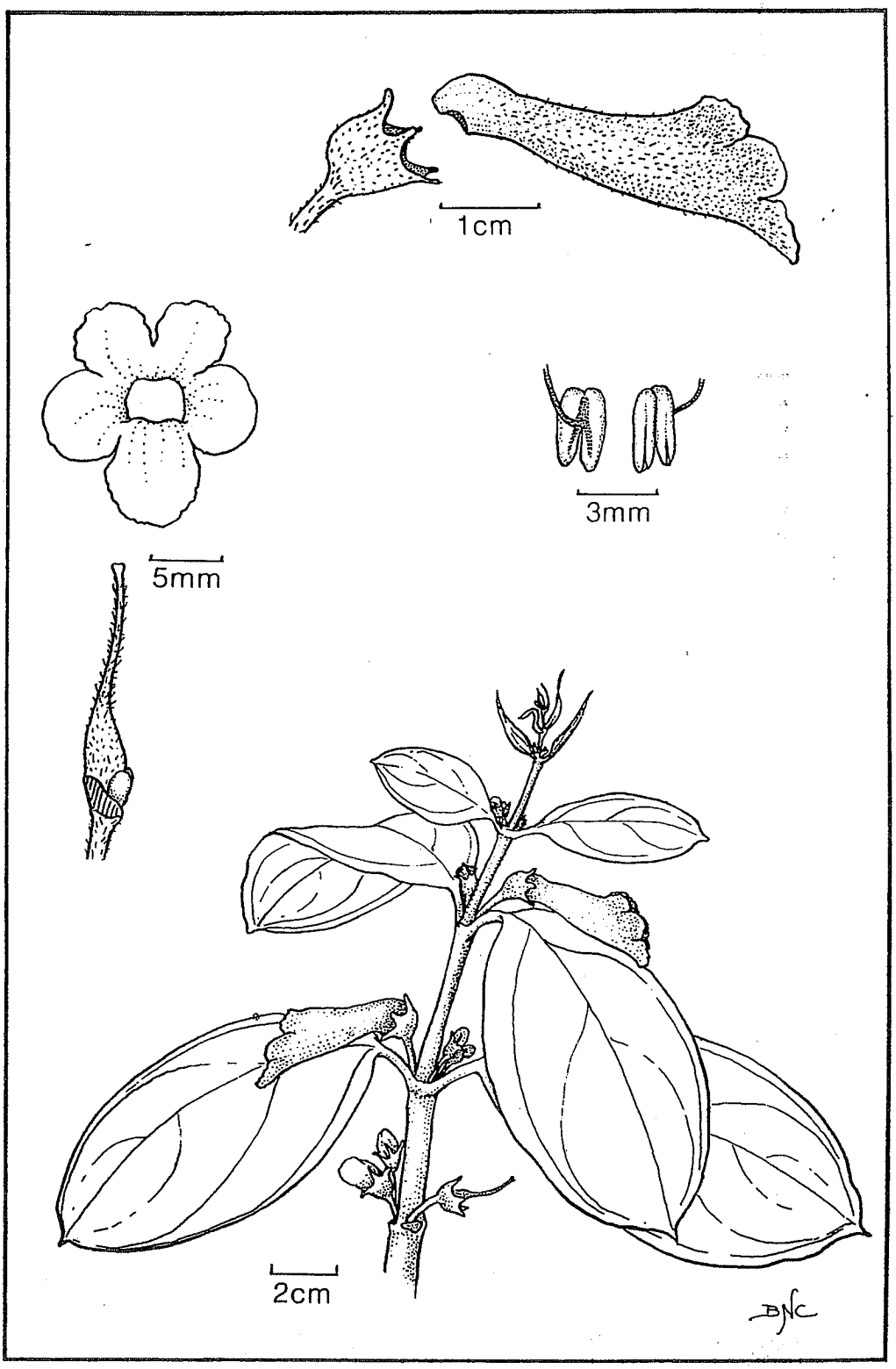

Figure 13: **Drymonia microcalyx** Wiehler Colombia
Voucher specimen: *Alston 8533* (BM)
Illustrator: *Barbara N. Culbertson*, 1986
Sponsor: *Vancouver African Violet Club, BC, Canada*

Drymonia chiribogana appears to be closely related to *D. killipii* Wiehler from the Pacific slope of the Andes in Colombia, from the Chocó to Nariño. Both species occupy a similar habitat, have the same habit, large leaves adaxially decorated with white along the veins, and leafy, greenish calices. But the leaves and calices in *D. killipii* are hirsute, the corolla is much larger (7.5 cm), of a different shape, exuding a fragrance which includes the scent of lemon, and with a different coloration. The style in Killip's species is furnished with capitate glandular trichomes.

Drymonia microcalyx Wiehler, sp. nov.

Figure 13

Inter species generis calice parvo differt.

Perennial subshrub, probably epiphytic; stems at least 40 cm long, 5-6 mm in diameter, reddish brown, sparsely pilose, the internodes 3-6 cm long; leaf pairs unequal to subequal, the petioles 1-1.5 cm long, red, sparsely pilose, the lamina ovate to elliptic, ca. 9-10 by 6-7 cm, acuminate, entire, the base rounded, leathery, green above, reddish brown below, sparsely pilose but appearing glabrous on both surfaces, the lateral pairs of veins 3-4. Inflorescences reduced to axillary, epedunculate cymes of 2-6 flowers, the bracts minute, lanceolate, 1 by 2 mm, reddish, sericeous, the pedicels 1-1.3 cm long, reddish, sparsely sericeous; calyx turbinate, 9-10 mm long, the lobes subequal, lanceolate-subulate, ca. 3 mm long and 1 mm wide, entire, the tube green, flushed with red, the tips of the lobes red, sparsely puberulous-sericeous outside, glabrous inside; corolla oblique, almost horizontal in the calyx, infundibular, ca. 3.5 cm long, spurred, cream-white, dorsally blushed with pink, sericeous, the lobes unequal, rounded, erose, the 2 dorsal and 2 lateral lobes ca. 6 by 6 mm, the ventral lobe ca. 8 by 8 mm, the tube inside dorsally with short capitate glandular trichomes; stamens 4, included, the filaments adnate to the base of the corolla tube for 8 mm, totally ca. 2 cm long, white, proximally pilose, distally glabrous, the anthers coherent, saggitate, each anther 3.5 by 2 mm, the thecae parallel, dehiscing by a basal pore; ovary ovoid, laterally compressed, ca. 6 mm long, reddish, puberulous, the style ca. 2.8 cm long, white, glandular pilose, the stigma stomatomorphic; nectary reduced to a large, double-connate, dorsal gland, 2.5 by 2.5 mm, grey, glabrous. Fruit not seen.

TYPE: *COLOMBIA:* NARIÑO: above village of Paramo (between Junín and Buenavista), 1100 m altitude, forest, 9 May 1939, *A.H.G. Alston 8533* (HOLOTYPE: BM).

ADDITIONAL MATERIAL EXAMINED: *COLOMBIA:* NARIÑO: without locality and date, *Triana s.n.* (BM). The material on this sheet, received at BM from J.J. Triana's herbarium in 1891, represents two new species of *Drymonia*, with the collection labelled "A" featuring *D. microcalyx*.

DISTRIBUTION: Known only from the Province of Nariño, Colombia.

ETYMOLOGY: Named for the shortest or most reduced calyx observed in the genus *Drymonia*.

Drymonia punctulata Wiehler, Phytologia 73(3): 230. 1992.

Figure 14

A *Drymonia chiribogana* Wiehler calycum lobis lanceolatis parvioribus, corollarum forma, et limbis integribus albis recedit.

Epiphytic, perennial subshrub, the stems sparsely branching, erect, ascending or spreading, to 1.2 m tall, to 2.6 cm in diameter, green turning to tan, glabrous, the internodes 2-9 cm long; leaf pairs equal to subequal, the petioles 6-11 cm long, green, glabrous, adaxially with 2 parallel maroon stripes, the lamina ovate to elliptic, 14-21 by 8-12 cm, acuminate, entire, oblique, leathery, shiny, green, (abaxially flushed with maroon in strong sunlight), glabrous, the veins adaxially touched with a grayish white, the secondary pairs of veins 5-6. Inflorescence reduced to axillary cymes of 2-4 or more flowers, the peduncle congested, ca. 5 mm long, the prophylls and subtending bracts reduced, subulate, 5-11 mm long, green glabrous, the pedicels ca. 2.3 cm long, green, distally with a maroon flush, glabrous; calyx conical, the lobes subequal, lanceolate, ca. 2.5 by 1.1 cm, yellow-green, in strong sunlight flushed with maroon, glabrous, the upper or dorsal lobes with a maroon flush at the base; corolla oblique in the calyx, tubular-infundibular, sigmoid, ca. 4 cm long white, glabrous, slightly constricted above the small spur, the limb white, the lobes subequal, rounded, each lobe ca. 8 by 8 mm, entire, the yellow throat and the white tube inside speckled with small maroon dots (in strong sunlight also the face of the limb); stamens 4, included, the filaments ca. 2.2 cm long, white, glabrous, attached to the base of the corolla

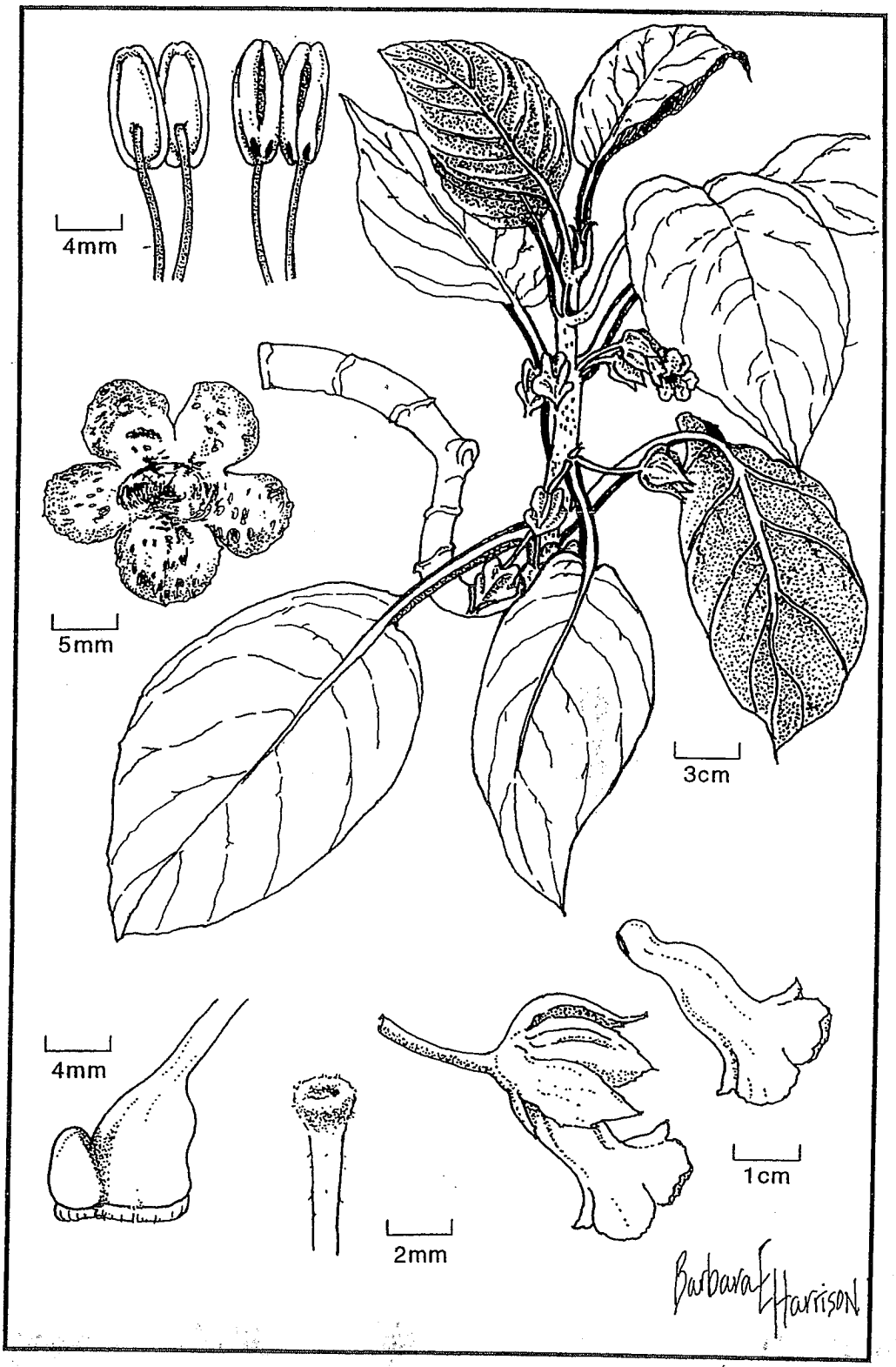

Figure 14: **Drymonia punctulata** Wiehler
Voucher specimen: *Wiehler 9206* (GES; G-3548)
Illustrator: *Barbara Harrison*, 1993
Sponsor: *Natalie Gundrum, Sarasota, Florida*

Ecuador

tube for 6 mm, the anthers syngenesious, oblong, saggitate, each anther ca. 4 by 1.6 mm; ovary superior, obliquely cone-shaped, 6 mm long, white, glabrous, the style ca. 1.5 cm long, white, glabrous, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 1.4 by 4 mm, maroon, glabrous. Fruit not seen.

TYPE: *ECUADOR*: EL ORO: road Buena Vista to Paccha, at km 32, 1100 m altitude, 16 April 1989, *Williams, Dressler & Whitten s.n.* (GES); seed from this collection sown at GRF greenhouse, accession no. G-3548, type material prepared 31 Aug. 1992, *Wiehler 9206* (HOLOTYPE: GES; ISOTYPES: QCA, MO, NY, SEL, US).

DISTRIBUTION: Known only from the type locality in the Province of El Oro in southern Ecuador.

ETYMOLOGY: The specific epithet comes from the Latin *punctulatus*, meaning "minutely dotted," with reference to the maroon specks in the tube of the corolla.

Drymonia punctulata is related to *D. chiribogana* which has ovate leaves, larger, leafy, ovate calyx lobes, a larger, non-sigmoid corolla with a magenta limb and erose lobes. Both species share the whitish veining on the upper surface of the large, leathery leaves. *Drymonia chiribogana* is native to the Province of Pichincha in Ecuador.

Drymonia uninerva Wiehler, Phytologia 73(3): 231. 1992.

Figure 15

Differt a *D. stenophylla* (Donn. Smith) H.E. Moore petiolis brevioribus, foliis abaxialiter sine nervis secondariis prominentibus, calycum lobis latioribus, corollarum limbis albis, et stigmatibus albis.

Epiphytic, perennial, succulent herb; stems sparsely branching, erect or ascending, to 50 cm tall, to 1.5 cm in diameter, grey, glabrous, the internodes 3-5 cm long; leaf pairs equal, subequal, or unequal, the petiole 1-2 cm long, green, glabrous, adaxially with 2 parallel maroon stripes, the lamina elliptic, 12-17 by 4-5 cm, acuminate, entire, obtuse, leathery, dark green above, lighter green below, glabrous, the secondary pairs of veins 5-6, somewhat obscure in dried material. Inflorescence reduced to axillary, epedunculate cymes of 1-4 flowers, the bracts rudimentary, the pedicels ca. 5 mm long, light green, glabrescent; calyx lobes unequal, lanceolate, acuminate, entire, ciliate, light green, glabrescent, the lateral and ventral lobes 2 by 0.7 cm, the dorsal lobe 1.6 by 0.5 cm, the base inside surrounding the ovary and nectary wine-red; corolla ca. 4 cm long, cream-white, glabrous, the lobes unequal, erose, the laterals and dorsals ca. 7 by 7 mm, the ventral lobe 1 by 1 cm, the tube inside lemon-yellow, near the base wine-red, glabrous; stamens 4, included, the filaments ca. 1.6 cm long, white, suffused with wine-red, glabrous, the anthers coherent, oblong, saggitate, each anther 5 by 2 mm; ovary superior, obliquely cone-shaped, 3 mm long, yellow, glabrescent, the style ca. 1.9 cm long, white, glabrous, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 3 by 2 mm, grey, glabrous. Fruit a bivalved capsule, fruiting calyx and external ovary wall pale yellow to white, ovary valves inside flushed with pink, the exposed cone of placentae, funiculi and seed mass yellow; dry seed ovoid, 1 by 0.5 mm, yellow, with a light brown hue. Chromosome no. $n = 9$ (Wiehler, 1972).

TYPE: *COSTA RICA*: without specific locality: collected by *Dr. E.J. Alexander, s.n.*, in 1960, NY greenhouse acc. no. 1670/60, Cornell and GRF acc.no. G-796, 28 April 1973, *Wiehler 7327* (HOLOTYPE: GES; ISOTYPES: B, CR, F, G, GH, K, L, M, MO, NY, P, SEL, U, UC, US, W).

ADDITIONAL MATERIAL EXAMINED: *COSTA RICA*: ALAJUELA: San Pedro de San Ramon, 1929, *Brenes 6635* (F); without locality, 1922, *Brenes 3638* (F). PUNTARENAS: vic. of Palmar Norte, Río Terraba, sea level, 1949, *Paul H. & Dorothy Allen 5247* (US).

DISTRIBUTION: Endemic to Costa Rica.

ETYMOLOGY: Named for the apparent obscurity of the lateral veins on the abaxial surface leaf surface of dried specimens of *D. uninerva*, an easy distinguishing feature when compared with similar species.

Reciprocal hybrids were established between *D. uninerva* and *D. stenophylla* (G-377) by the author in 1972, with 54% hybrid pollen stainability. They were the first hybrids in the large genus *Drymonia* Martius (over 140 species). *Drymonia* 'First Peach' with peach-colored corollas is a popular cultivar. The thick, muscular, vigorous stem structure is more pronounced in the progeny than in the parental species.

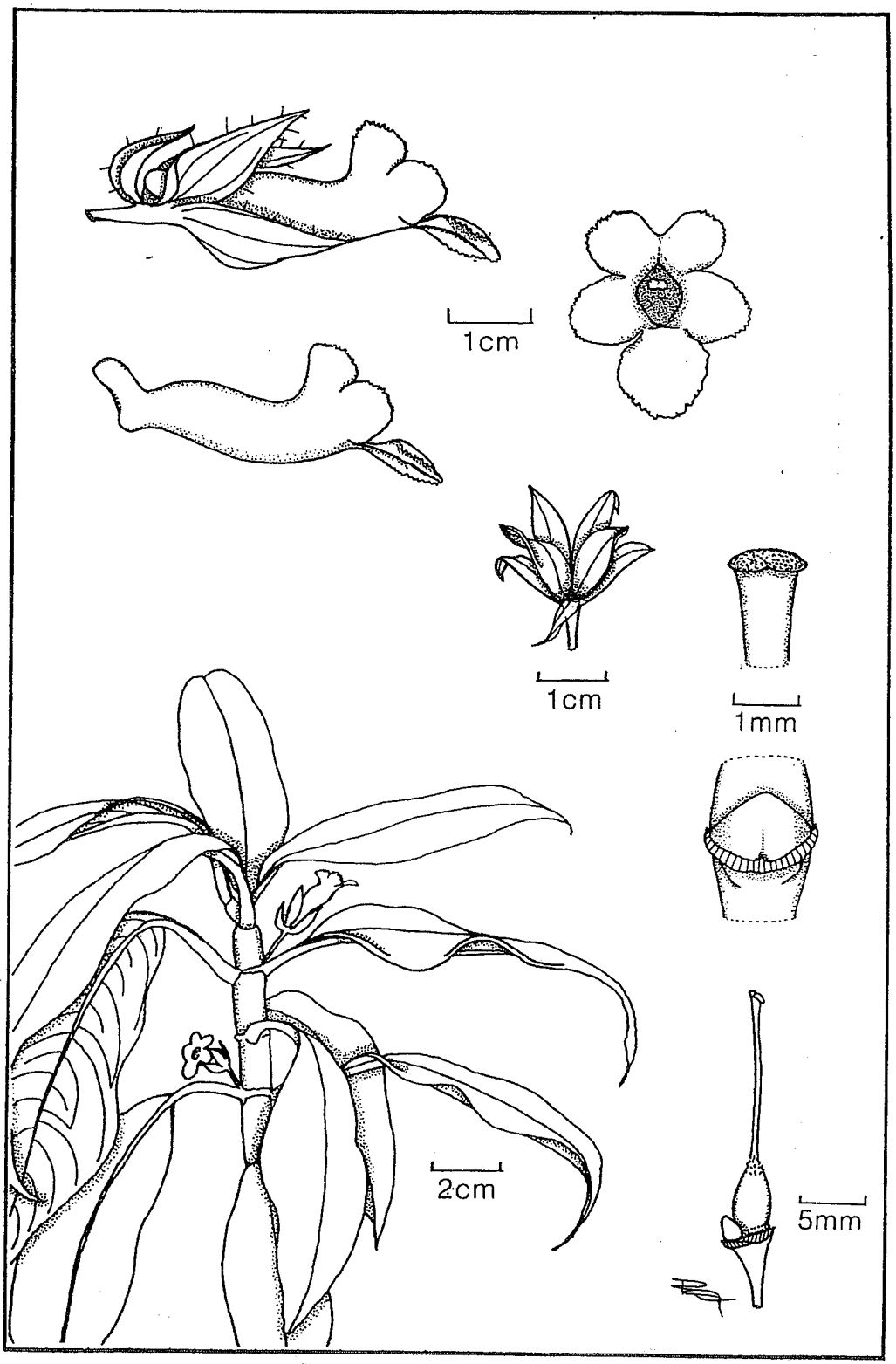

Figure 15: **Drymonia uninerva** Wiehler Costa Rica
Voucher specimen: *Wiehler 7327* (GES; G-796)
Illustrator: *Robert Scott Thompson*, 1982
Sponsor: *Mel Grice, Eaton, Ohio*

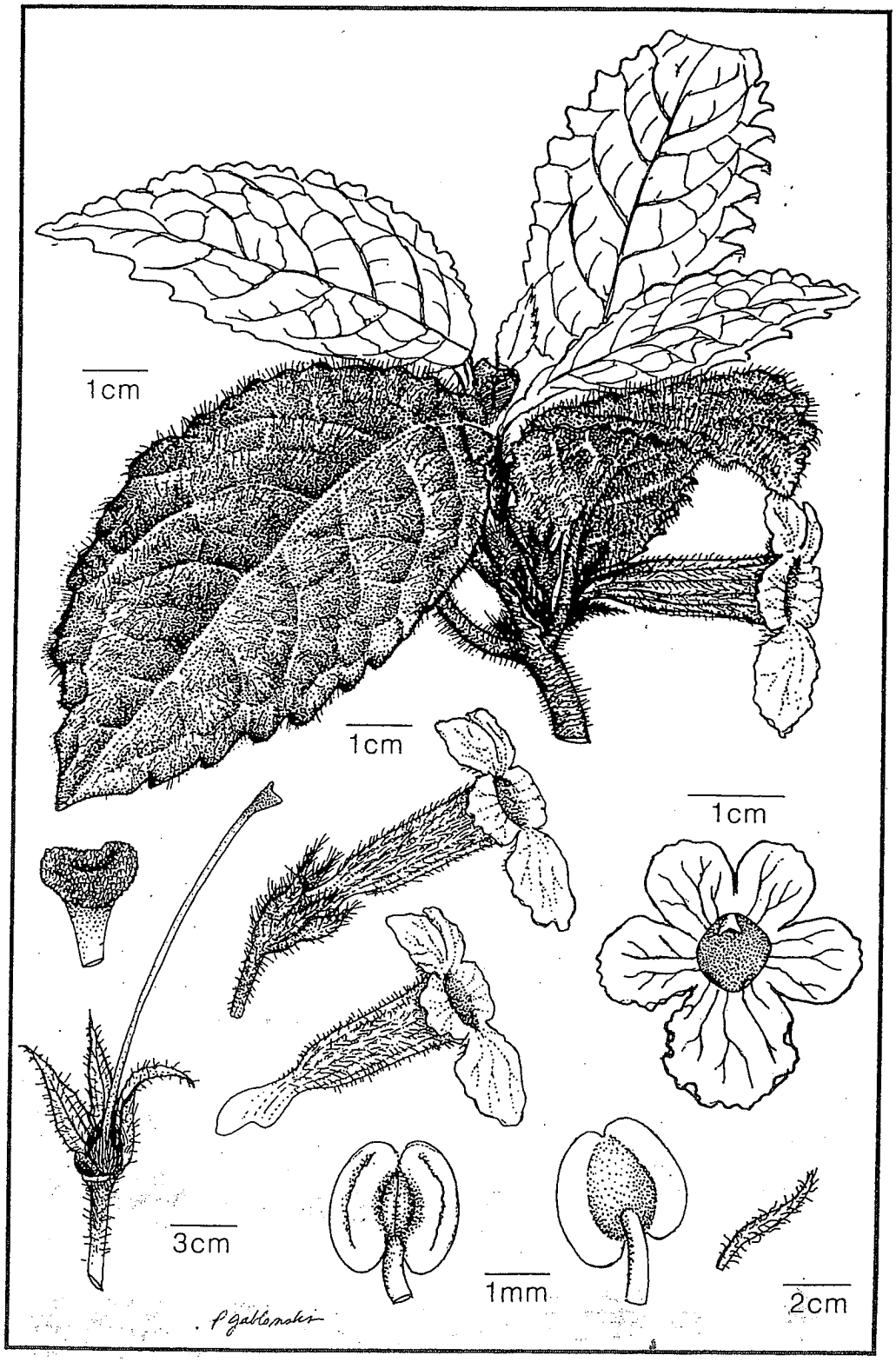

Figure 16: **Nautilocalyx antioquensis** Wiehler Colombia
Voucher specimen: *Wiehler 88242* (GES; G-3217)
Illustrator: *Pamela Jablonski*, 1993
Sponsor: *Åke Lundblad, Skutskär, Sweden*

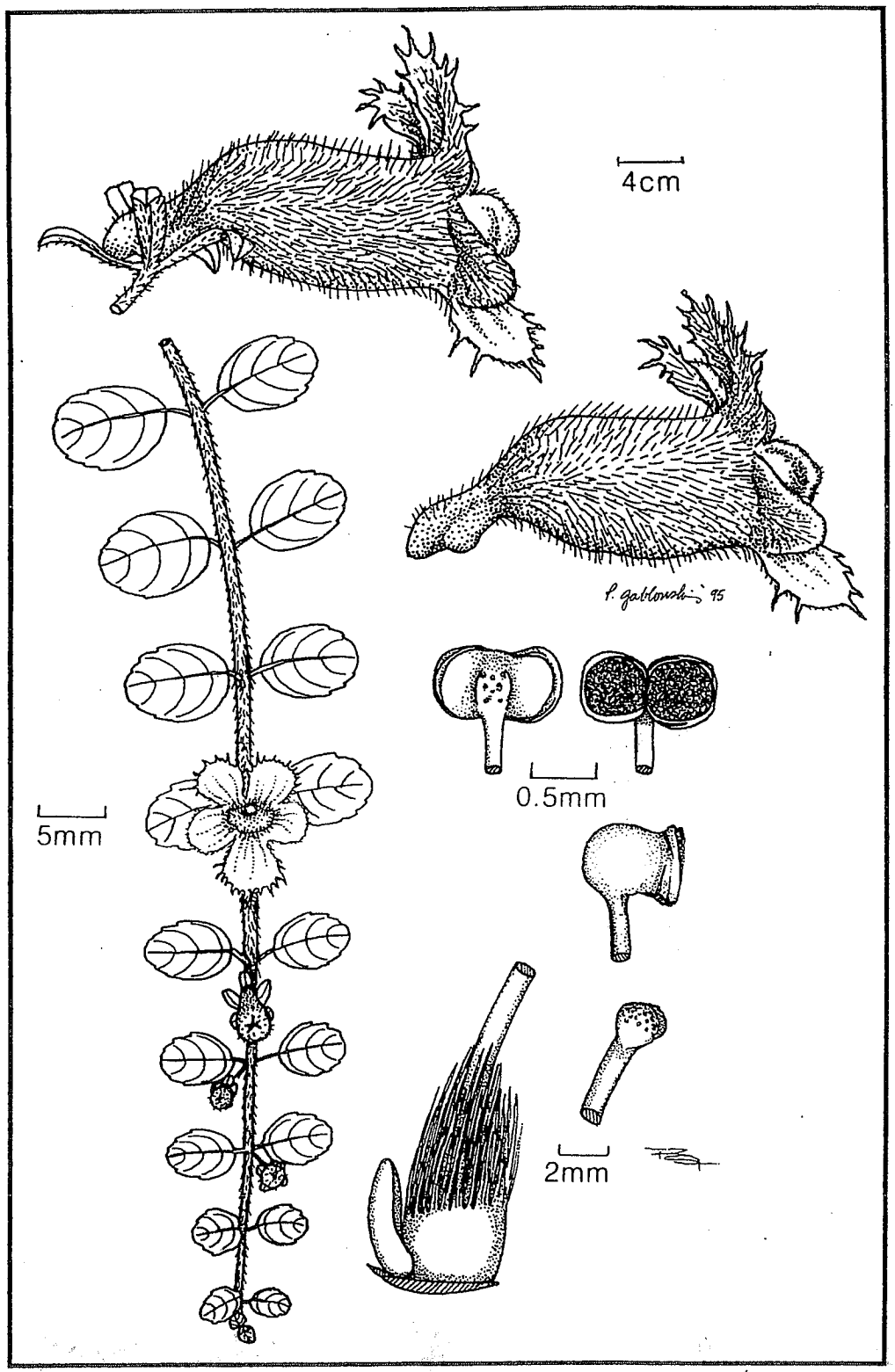

Figure 17: **Neomortonia alba** Wiehler Panama
Voucher specimen: *Wiehler 7427* (GES)
Illustrator: *Robert Scott Thompson & Pamela Jablonski*
Sponsors: *Claude & Norma Ward, Delray Beach, Florida*

Nautilocalyx antioquensis Wiehler, sp. nov.

Figure 16

Fortasse ex affinitate *N. adenosiphonis* (Leeuwenberg) Wiehler, a quo imprimis differt caulibus pilosis, laminis grandioribus, ellipticis, bullatis, et tubis corollarum intus stylisque glabris.

Terrestrial or lithophytic, perennial, somewhat succulent herb, the stems decumbent or ascending, with several unbranching shoots, to 20 cm long, to 6 mm in diameter, pale maroon, pilose, with internodes 3-5 cm long; leaf pairs equal to subequal, the petiole 2-5 cm long, maroon, densely pilose, flattened near the stem, with an interpetiolar line and thickening, the lamina elliptic, 6-12 cm by 3.5-5 cm, acute, crenate to double-crenate, the base rounded or slightly cordate, bullate, dark green above, lighter green, with a pink flush below, pilose. Inflorescences axillary, epedunculate cymes of 2-4 flowers, the prophylls narrowly lanceolate, ca. 6 by 1 mm, green, the pedicels ca. 7 mm long, green; calyx turbinate, the lobes subequal, lanceolate, 1.1 by 0.2 cm, subentire (or with 1-4 small teeth per lobe), pale maroon, or green flushed with maroon, pilose; corolla oblique in the calyx, infundibular, ca. 4.5 cm long, spurred, the tube cream-white, pilose, the limb ca. 2.8 cm in diameter, white, glabrous, the erose to suberose lobes subequal, ca. 1 by 0.8 cm, the lower lobe ca. 1.3 by 1.2 cm, the tube inside cream-white, with a dorsal furrow and 2 brown ventral nectar guides, glabrous; stamens 4, included, the filaments ca. 2.5 cm long, white, glabrous, adnate for 4 mm to the base of the corolla tube, the anthers syngenesious into a square, each anther 2 by 2 mm, with parallel thecae dehiscing by longitudinal slits; ovary superior, turbinate, ca. 4 mm long, light green, sericeous, the style ca. 2.5 cm long, white, glabrous, the stigma stomatomorphic-bifid; nectary a dorsal, double-connate, gray, glabrous gland. Fruit not seen.

TYPE: *COLOMBIA*: ANTIOQUIA: Road Medellin - Puerto Triunfo: Valley and drainage area of Río Magdalena, Río Claro gorge, inside Refugio Ecologico del Cañon del Río Claro, on rocks and adjacent soil along river, in partial shade, ca. 180 m altitude, 20 Nov. 1986, *Wiehler 86298* (1 sterile herb. spec. (GES) and live cuttings), grown and flowered at GRF greenhouse, type material prepared from cultivation, 18 Oct. 1988, *Wiehler 88242* (HOLOTYPE: COL; ISOTYPES: GES, HUA, K, NY, US).

DISTRIBUTION: Known only from the type locality in the Río Magdalena valley in Antioquia.

ETYMOLOGY: Named for the province of Antioquia where this species was found.

In habit and flower this species is perhaps related to the Venezuelan *N. adenosiphon* (Leeuwenberg) Wiehler which has wooly stems, smaller, ovate, non-bullate leaves with reddish margins, and flowers of similar shape and size but with the corolla tube inside pubescent, the anthers in pairs, and the style pilose. Sympatric with *N. antioquensis* is the large-leaved *N. bracteatus* (Planchon) Sprague (*Wiehler 86295*, GES, HUA).

Neomortonia alba Wiehler, sp. nov.

Figure 17

A *N. rosea* Wiehler inflorescentiis sine trichomatibus glanduliferis, et corollae forma, amplitudine, coloreque differt.

Plants herbaceous, perennial, epiphytic, or growing on rocks or tree logs; stems slender, repent, clambering or pendent, branching near the base or at rooting nodes, ca. 1 mm in diameter, 20-50 cm long or longer, the internodes 0.8-3.3 cm long, reddish brown, puberulous; leaves opposite-decussate, but at maturity appearing opposite on a single plane, often slightly anisophyllous, chartaceous to slightly coriaceous, green suffused with red, puberulous, without capitate-glandular trichomes, the petioles 2-4 mm long, the lamina ovate, acute or obtuse, serrulate, with 2-3 teeth on each side, rounded at the base, 1.2-1.4 by 0.7-0.9 cm, with 2-3 pairs of lateral veins. Inflorescences axillary, reduced to a single flower, ebracteate, the pedicel ca. 8 mm long, reddish brown, pilose; calyx turbinate, reddish brown, pilose, the lobes subequal, ca. 3 by 1.3 mm, oblanceolate, with 2 teeth per lobe, the dorsal lobe somewhat narrower; corolla horizontal in the calyx, ca. 2.2 cm long, infundibular, spurred, externally pilose, the tube inflated, the upper and lateral lobes subequal, ca. 7 by 5 mm, the lower lobe larger, ca. 10 by 7 mm, the upper and lower lobes fimbriate, the lateral lobes entire, but with a faint flush of rose, the throat and the tube inside dorsally with short, eglandular trichomes, ventrally glabrous and with a nectar guide of reddish spotting; stamens 4, included, the filaments adnate to the base of the corolla tube, the free length ca. 1 cm, white,

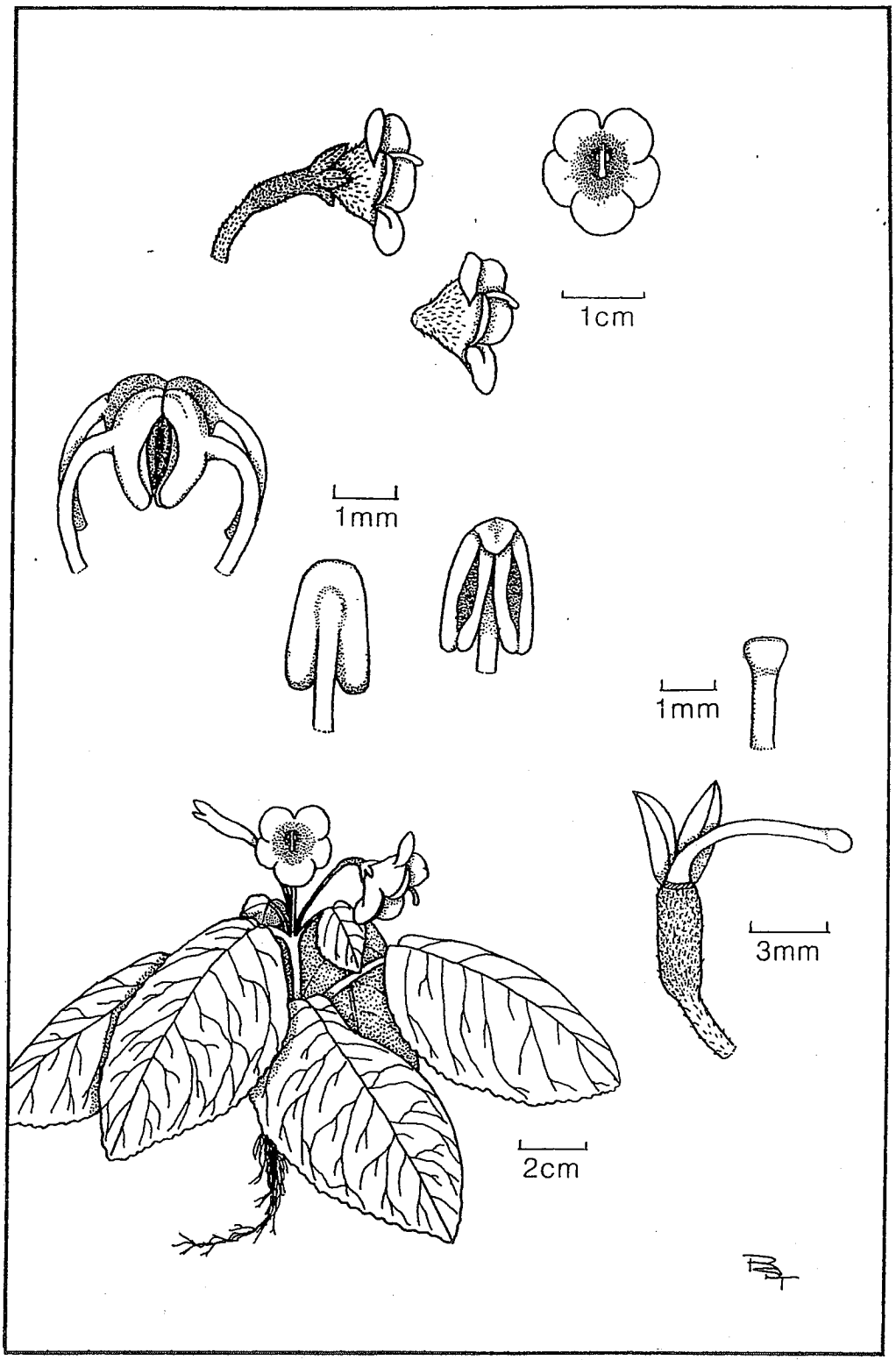

Figure 18: **Niphaea peruviana** Wiehler Peru
Voucher specimen: *Dressler 4935* (SEL; pickled material: GES)
Illustrator: *Robert Scott Thompson*, 1985
Sponsor: Edwina Varner, Fairview, North Corolina

glabrous, the anthers quadrately connate, each anther with a broad connective, each cell dehiscing by a longitudinal slit which expands to a circular opening; ovary superior, turbinate, 2 mm long, pilose, the style ca. 1 cm long in the female phase of anthesis, white, glabrous, the stigma stomatomorphic-bilabiate; nectary reduced to 1 dorsal, white, glabrous gland. Fruit an ovoid, orange, pilose berry, ca. 6 by 5 mm, laterally compressed, splitting into 2 valves when exposed to excessive moisture; seed fusiform, ca. 1.2 by 0.3 mm, striate, brown.

TYPE: *PANAMA*: PANAMÁ: ca. 6 km upstream on Río Pasiga, epiphyte in semi-deciduous forest, 28 Oct. 1971, *Helen Kennedy 1194* (GES), dried specimen and seed sent to author; plants grown from seed at University of Miami greenhouse under greenhouse accession nr. G-1606, type specimens prepared 17 Feb. 1974, *Wiehler 7427* (HOLOTYPE: PMA; ISOTYPES: GES, MO).

ADDITIONAL MATERIAL EXAMINED: *PANAMA*: HERRERA: Chepo de las Minas, Sept. 1979, *Dressler s.n.*, live cuttings received at Selby Gardens greenhouse under accession nr. G-2720, 20 Sept. 1979, herbarium specimens prepared at GRF, 10 Aug. 1983, *Wiehler 8302* (GES, US).

DISTRIBUTION: Known only from Panama, in the provinces of Panamá and Herrera, both localities near the Pacific coast, at altitudes of ca. 1000 m. It appears likely that *Neomortonia alba* will be found in other areas of Panama.

ETYMOLOGY: The specific epithet *alba* refers to the color of the corolla, as distinct from the coloration of the same organ in the companion species, *Neomortonia rosea*.

All three species of *Neomortonia* are sympatric in Panama, and look alike in general habit: climbing or pendent epiphytes with thin stems and small leaves pressed flat against tree trunks or hanging from canopy branches. The red, pouch-flowered *N. nummularia* (Hanst.) Wiehler occurs from southern Mexico to central Ecuador, *N. rosea* with its pinkish, funnel-shaped flowers is most frequent in Colombia, but is also found in Costa Rica, Panama, and northwestern Ecuador, and *N. alba* appears to be an endemic along the Pacific coast of central Panama.

Neomortonia alba and *N. rosea* share both the same habit and a similarly shaped flower. The latter has capitate-glandular trichomes on the peduncle, calyx and corolla, a larger, more oddly-shaped, pink floral tube, and larger lobes with much deeper lacinae.

Niphaea peruviana Wiehler, sp. nov.

Figure 18

Species haec ab *N. oblonga* Lindley differt indumento velutino, foliis crenatis, sed praesertim ovario infero, et antherae thecis loculis tantum longitudinaliter dehiscentibus.

Terrestrial, ± rosette-forming herb with underground rhizomes consisting of small axis compacted with tiny, thick, succulent leaf scales; stems erect, non-branching, to ca. 10 cm tall, ca. 5 mm in diameter, reddish maroon, velutinous, the internodes 1-3 cm long; leaves opposite-decussate, subequal, the petioles 1-2 cm long, maroon, velutinous, the lamina ovate, ca. 8 by 6 cm, irregularly crenate, rounded at apex and base, quilted, young plants green with silver veins, older plants dark red-green, with less obvious variegated veining, puberulous, the secondary pairs of veins 7-8. Inflorescence reduced to single, apparently bractless flowers, the peduncle ca. 2.5 cm long, green-maroon, puberulous; calyx lobes (above the almost completely inferior ovary) subequal, lanceolate, ca. 6 mm long, entire, green-maroon, puberulous; corolla rotate, nearly actinomorphic, white, yellow at the center, externally pubescent, the lobes subequal, ca. 6 by 9 mm, rounded, entire; stamens 4, connate to the base of the shallow corolla tube, the filaments ca. 1.6 mm long, yellow glabrous, the anthers partially connate by forming a column, with the thecae facing inward, each anther 1.4 by 1.4 mm, bright yellow, the thecae dehiscing by longitudinal slits; ovary almost completely inferior, ca. 1 cm long, whitish pubescent, with ca. 2 mm exposed above the calyx lobes, the style ca. 1 cm long, white, glabrous, the stigma stomatomorphic; nectary absent. Fruit not seen.

TYPE: *PERU*: HUANUCO: Finca "Panguana," 1 hour walk from Llullapichis (on Río Pachitea) on Río Llullapichis. On slope in semi-shade. 25 Jan. - 15 Feb. 1975, *R. L. Dressler 4935* (HOLOTYPE: SEL).

DISTRIBUTION: Known only from the type collection in central Peru.

ETYMOLOGY: As the first species of *Niphaea*

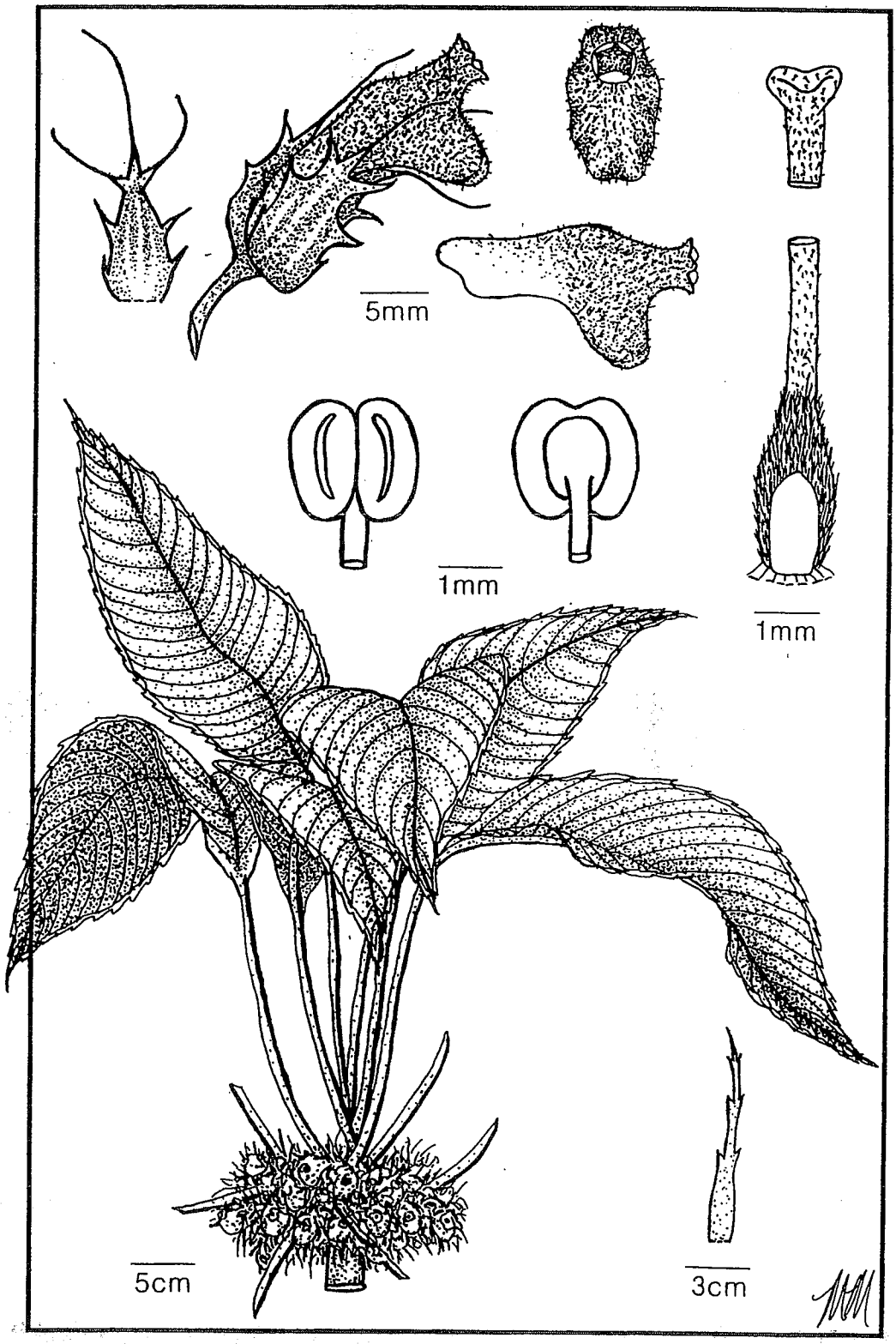

Figure 19: **Paradrymonia binata** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 9071* (GES)
Illustrator: *Merrillee Malwitz*, 1993
Sponsor: *Melissa McDowell, Sarasota, Florida*

Lindley described from Peru, named after the country of origin.

Niphaea peruviana differs from *N. oblonga* from Guatemala and southern Mexico, the only species of the genus presently in cultivation, by the latter's pilose indumentum on the whole vegetative plant body, as well as on pedicels and calyces, and by its serrated leaves with cordate bases. The ovary position of the Central American member is merely semi-inferior. Yet *N. oblonga* has developed a more specialized method of pollen dispersal. By a partial break-down of the joint cell walls between the 2 thecae, each anther has evolved into a single, now larger chamber for pollen release. In the Peruvian species the 2 anther cells appear to remain intact.

Both species exhibit the syndrome of "buzz" bee pollination.

Niphaea peruviana would be an excellent species for the horticultural community, if it could be brought successfully into cultivation from its remote habitat.

Paradrymonia binata Wiehler, Phytologia 73(3): 231. 1992.

Figure 19

Paradrymoniae hypocyrtae Wiehler primo aspectu maxime simili, sed calycibus laciniatis marroninis et corollis luteis.

Terrestrial and rosette-forming herb, or hemi-epiphytic, or epiphytic vine, stems in rosette congested, 2-5 cm tall, ca. 1.7 cm in diameter, green, flushed with rose, glabrescent, the internodes ca. 0.7 cm, (stems of vines only seen in the wild, with longer internodes); leaf pairs subequal to extremely unequal, the petiole of the larger leaf of a pair 13-31 cm long, ca. 0.9 cm in diameter, adaxially winged, bright red, glabrescent, the lamina lanceolate, ca. 30-36 by 12-19 cm, acute, serrate, the base decurrent, bluish green above, lighter green, flushed with maroon below, glabrescent, sparsely puberulous along the veins, the lateral pairs of veins 14-17, the smaller leaf of a pair often rudimentary, needle-shaped, to 2.5 cm long, without lamina, early caducous. Inflorescence axillary cymes of 4-10 or more flowers, the peduncle ca. 3 cm long, maroon, sericeous, the prophylls and subtending bracts needle-shaped, to 1.3 cm long, maroon, sericeous, the pedicels ca. 2 cm long, maroon, sericeous; calyx lobes subequal, lanceolate, ca. 2 cm long, 0.5 cm wide, with ciliate teeth, each tooth ca. 4-10 mm long, maroon, pubescent-pilose; corolla oblique in the calyx, hypocyrtoid, with a prominent pouch, ca. 2.5 cm long, bright yellow, glabrous near the base, then pilose, ventrally saccate, the limb constricted to a narrow opening with equal, rounded lobes, each 3 by 3 mm; stamens 4, included, the filaments adnate to the base of the corolla tube, ca. 2 cm long, white, glabrous, the anthers syngenesious into a square, each anther 2 by 2 mm; ovary superior, turbinate, 3 mm long, maroon, sericeous, the style ca. 2.2 cm long, white, with capitate-glandular trichomes, the stigma stomatomorphic-bilobed; nectary a double-connate, dorsal gland, 2 mm long. Fruit not seen.

TYPE: *ECUADOR*: ESMERALDAS: ca. 5 km W of Lita, dense, wet forest near Río Chuchubí, down the slope towards Río Mira, 800 m altitude, epiphyte 1.5 m high on small tree, entangled with dripping-wet moss, rosette-shaped, the stem near ground level disintegrated, mature leaves (with petioles) over 2 feet (67+ cm) long, 24 April 1990, *Wiehler & GRF Expedition 9071* (GES); type specimens prepared from live material of this collection grown in the GRF greenhouse, accession no. G-3384, 20 Aug. 1992, *Wiehler 9205* (HOLOTYPE: GES; ISOTYPES: QCA, NY, US, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: ESMERALDAS: km 5-18 on road Lita to Alto Tambo, 650-750 m altitude, hemiepiphyte at base of small tree in dark, pluvial forest, uncommon, 18 Jan. 1987, *Dodson, Hirtz, Benzing & C.& J.Luer 16833* (GES, MO).

DISTRIBUTION: Known only from these 2 collections near Lita on the Pacific slope of the Andes of Ecuador, at altitudes between 600 to 800 m. The annual rainfall in this botanically rich area is between 500 and 750 inches.

ETYMOLOGY: The specific epithet comes from the Latin *binatus*, meaning twinned, twinborn, paired, in pairs, in reference to the obvious twin of this new species, *Paradrymonia hypocyrta*.

Paradrymonia binata is very closely related to *P. hypocyrta*, from 200 km further south on the same slope of the Andes, in the Montañas de Ila near Santo Domingo de los Colorados. Both of these species are very rare, each known only from a small, restricted area in the Andes. Both have the

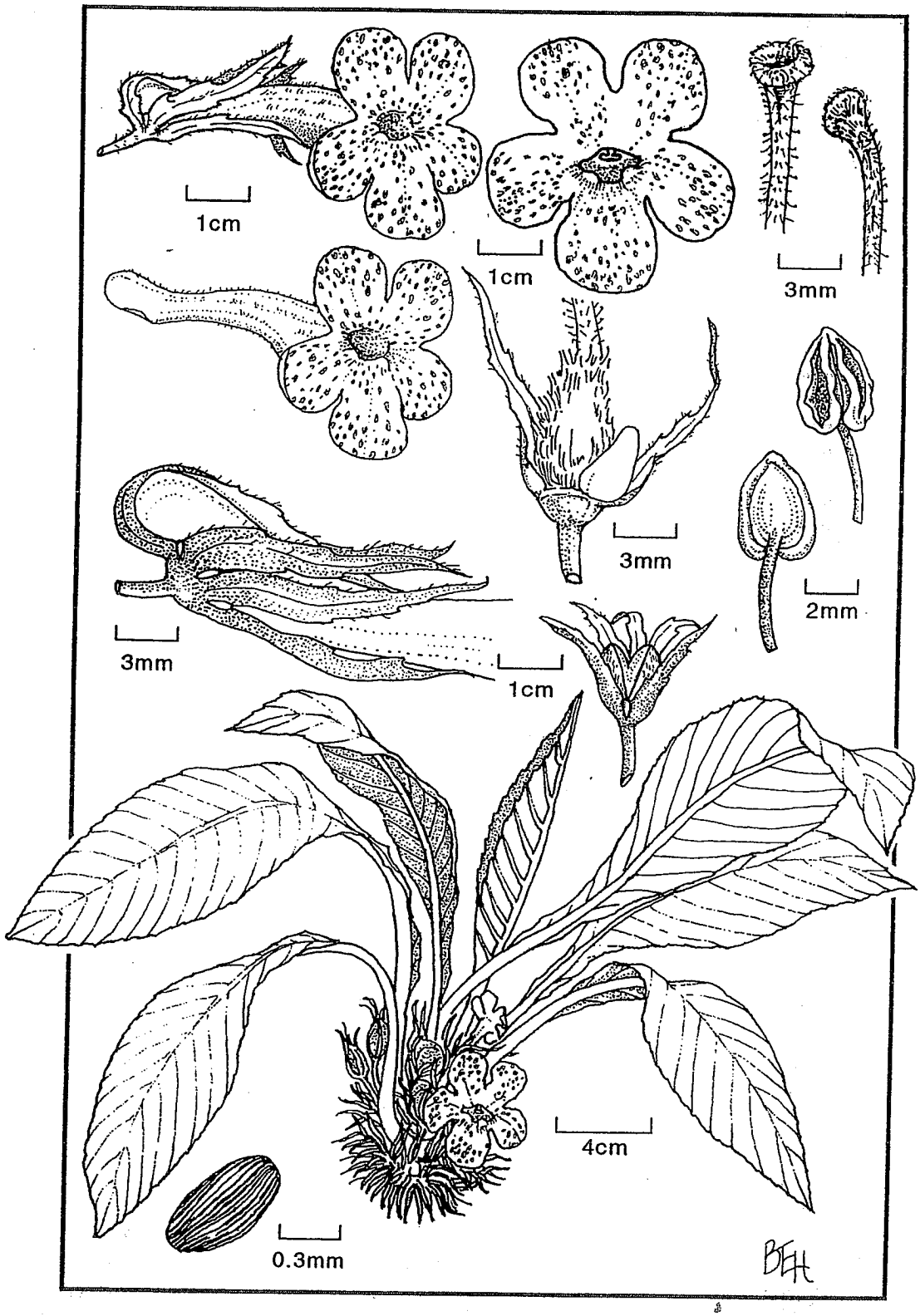

Figure 20: **Paradrymonia fuquaiana** Wiehler Ecuador
Voucher specimen: *Wiehler 9204* (GES)
Illustrator: *Barbara Harrison*, 1993
Sponsor: *Atlanta Botanical Garden, in honor of Rex Fuqua and family, Atlanta, Georgia*

same habit and leaf structure, and the same, oddly-shaped hypocyrtoid corolla, typically associated with the genus *Nematanthus* Schrader from SE Brazil. Pouched corollas occur also in several other, not closely related genera of neotropical Gesneriaceae.

The twins differ in the following characters: in *P. hypocyrta* the peduncles, bracts, pedicels and calyces are fiery orange-red and the corolla bright white; in *P. binata* the same parts of the inflorescence are maroon, and the corolla bright yellow. In the former, the corolla is surrounded by broad and solid calyx lobes with the teeth not very obvious; in the new species, the corolla is enveloped by a network or filigree of teeth radiating from the narrow calyx lobes.

The type material of *Paradrymonia binata* is now in limited cultivation.

Paradrymonia fuquaiana Wiehler, Phytologia 73(3): 232. 1992.

Figure 20

Quoad florum formam, amplitudinem et fabricam internam ad *Paradrymoniam tylocalycem* Wiehler accedit, sed ab ea differt caulibus nodisque longioribus et foliis rigidis coriaceis.

Terrestrial, rosette-forming herb, stems erect, somewhat succulent, 3-6 cm tall, ca. 1.7 cm in diameter, green, with a flush of maroon, glabrescent, the internodes 0.5 to 2 cm; leaf pairs subequal to strongly unequal, the petiole of the larger leaf of a pair ca. 4-8 cm long, ca. 0.9 cm in diameter, adaxially winged, succulent, green, with a flush of maroon, glabrescent, the lamina of the larger leaf elliptic, 27-35 by 7-10 cm, or larger, acute, serrulate, strongly decurrent at the base, dark green above, lighter green below, glabrescent, the lateral pairs of veins 12-14, the smaller leaf of a pair often rudimentary, needle-shaped, without lamina, early caducous. Inflorescence axillary cymes of 4-10 flowers, the peduncle ca. 1-2 cm long, maroon, bracts small, linear, 1.8 by 0.15 cm, the pedicels ca. 0.6 cm long, maroon, weakly sericeous; calyx conical, maroon, with small green or white calluses near the base, the lobes subequal, lanceolate, ca. 2.3 by 0.3 cm, entire but occasionally with 1-2 small teeth, maroon, sericeous; corolla oblique in the calyx, infundibular, ca. 6 cm long, with a spur 7 mm long, a long, narrow tube, 2.4 cm long, 0.4 cm in diameter, gradually widening, cream-white, hirsute, the limb inside white, dotted with royal purple, glabrous, the subequal, spreading lobes each ca. 1.2 by 1 cm, (lower lobe 1.4 by 1.3 cm), entire, the throat inside yellow-gold, hirsute, the venter of the tube with 2 longitudinal ridges (not grooves); stamens 4, included, the filaments ca. 3.5 cm long, adnate to the base of the corolla tube for 5 mm, white, glabrous, the anthers syngenesious into a square, each anther 1.2 by 1.2 mm, the thecae neither horned nor bearded, dehiscing by longitudinal slits; ovary turbinate, 5 mm long at anthesis, maroon, sericeous, the style ca. 2.8 cm long, white, pilose, interspersed with capitate-glandular trichomes, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 2 by 2 mm, maroon, glabrous. Fruit a bivalved capsule, fleshy, deep maroon, sparsely pilose, the valves opening to about 45°. Seeds furnished with a juicy funicle, oblong, 0.5 by 0.3 mm, striate, black.

TYPE: *ECUADOR*: NAPO: N of Tena, road Hollin - Loreto: old road construction camp, at km 17 from Hollin, 1400 m altitude, on logs at road-cut, 6 Jan. 1990, *Determann et al. s.n.*, live plants brought to and grown at Atlanta Botanical Garden, cultivated at GRF greenhouse with accession no. G-3590, type material prepared 20 August 1992, *Wiehler 9204* (HOLOTYPE: GES; ISOTYPES: QCA, NY, US, others to be distributed).

OTHER MATERIAL EXAMINED: same area, ca. 21 km from Hollín, plants on rotting logs in rain forest, 25 April 1993, *Wiehler & GRF Expedition 93185*, (GES), greeenhouse accession no. G-3875; about 30 km from Hollín, in flower on tree trunk by river, petioles and lamina ca. 50 cm long, 27 April 1995, *Wiehler & GRF Expedition 95116* (GES).

DISTRIBUTION: Known only from the type locality and its vicinity on the eastern slope of the Andes of Ecuador, around volcano Tumaco.

ETYMOLOGY: Named in honor of Rex Fuqua and his family of Atlanta, Georgia, U.S.A., who funded the first expedition into the vanishing tropical rain forests undertaken by the new Atlanta Botanical Garden. This trip to Ecuador, in January of 1990, was directed by curator Ron Determann.

The flowers of *Paradrymonia fuquaiana* are of a similar shape, size and peculiar internal construction as those of *P. tylocalyx* Wiehler from Valle, Colombia. The latter differs by its longer stems (to 50 cm tall) with irregular, long inter-

nodes, the stiff, leathery and acuminate leaves, and the presence of bright green calluses in the sinuses of the calyx lobes. Similar green or whitish calluses occur lower, irregularly placed, on the calyx tube of *P. fuquaiana*. The tube of the corolla of the Colombian species is rust-red above, cream-white below, glabrescent, with the face of the limb white. In Mr. Fuqua's species the corolla tube is cream-white throughout, hirsute, and the face of the limb white, spotted with royal purple.

Paradrymonia prististoma Wiehler, Phytologia 73(3): 233. 1992.

Species habitu cum *P. ciliosa* (Martius) Wiehler optime congruens, sed differt corollae forma et corollae limbo ciliato non nisi in lobo ventrali.

Terrestrial, rosette-forming herb and epiphytic climber, stems (after juvenile rosette stage) erect or creeping, somewhat succulent, the erect shoots 10 to 20 cm long (or longer), ca. 6-9 mm in diameter, green, sericeous, the internodes 1-3 cm long, with adventitious roots at nodes and internodes; leaf pairs subequal to strongly unequal, the petiole of the larger leaf of a pair ca. 4-7 cm long, ca. 8 mm in diameter, adaxially winged, succulent, green, sericeous, the lamina of the larger leaf lanceolate or elliptic, 18-24 by 5-7 cm, acuminate, strongly decurrent at the base, the margins serrulate, dark green, sericeous (but appearing glabrescent) above, paler green or flushed with red, glabrous (but sericeous along the green veins) below, the lateral pairs of veins 11-13. Inflorescence axillary cymes of 4-10 flowers, epedunculate, bracts small, lanceolate-linear, ca. 15 by 2 mm, the pedicels ca. 0.5-1 cm long, green, sericeous; calyx conical, the lobes subequal, long-lanceolate, ca. 20 by 2 mm, each lobe with a few obscure teeth, yellow-green, sericeous; corolla oblique in the calyx, infundibular, ca. 4.5-5 cm long, canary-yellow, (Yellow Group 13 B), glabrescent, the spur 5 mm long, the tube proximally narrow, ca. 4 mm in diameter, then bending downward and expanding to a diameter of 10 mm, dorsally and ventrally with 2 longitudinal furrows, the limb deeper yellow (Yellow-Orange Group 14 B), the 2 dorsal and 2 lateral lobes subequal, ca. 5 by 8 mm, entire, the lower lobe 8 by 10 mm, with prominent teeth curved upward, each tooth ca. 2.5 mm long, the inside of the tube deep yellow, glabrous; stamens 4, included, the filaments ca. 3 cm long, fused and adnate to the base of the corolla tube for 2.5 cm, cream-white, glabrous, the anthers syngenesious into a square, each anther 2 by 2 mm, the anther cells bearded; ovary turbinate, ca. 4.5 mm long at anthesis, red, covered with long red trichomes, the style ca. 3 cm long, white, pilose (trichomes red), stigma stomatomorphic-bilobed; nectary a large, double-connate dorsal gland, 3.3 by 2.3 mm, white, glabrous. Fruit not seen.

TYPE: *ECUADOR*: NAPO: unfinished road from Tena to Latacunga, along Río Pano, 16-18 km from Tena, terrestrial and epiphytic, 23 April 1986, *Wiehler & GRF Expedition 86184* (HOLOTYPE: GES; ISOTYPES: QCA, others to be distributed).

OTHER MATERIAL EXAMINED: *ECUADOR*: NAPO: 45 km from Baeza on road to Lago Agria, terrestrial and epiphytic, 24 April 1986, *Wiehler & GRF Expedition 86200* (GES); vicinity of Puerto Napo, seed collected in Sept. 1987 by *N.H. Williams, R.L. Dressler, Mark Whitten et al., s.n.*, sown in GRF greenhouse, accession number G-3534, herbarium specimens prepared 8 Dec. 1991, *Wiehler 91242* (GES, others to be distributed).

DISTRIBUTION: Amazonian slope of the Andes of Ecuador, in the province of Napo, at altitudes of 800 to 1200 m.

ETYMOLOGY: The specific epithet is derived from the Greek *pristis, -is*, f. = shark, and *stoma, -ata*, n. = mouth, with reference to the pronounced, up-turned teeth on the ventral lobe of the corolla. The gaping entrance of the corolla tube resembles a shark mouth.

Paradrymonia prististoma is closely related to *P. ciliosa* (Martius) Wiehler which occurs in the Amazon basin (Río Japurá), the Guianas and Venezuela [including *P. glabra* (Bentham) Hanstein]. Both share the general habit and the bearded anthers. The two species differ as follows:

Table 1: Comparison of characters:

Character	*P. prististoma*	*P. ciliosa*
Corolla tube:	bent	straight
Corolla indumentum:	glabrescent	strigillose
Corolla diam. largest:	near limb	at mid-point
Lobes ciliate:	only ventral lobe	all 5 lobes
Cilia:	up-turned	spreading

The ventral lobe of the corolla in the new species looks like that of *Gloxinia perennis* (Linnaeus) Fritsch.

Completely sympatric with *Paradrymonia prististoma* is the hairy-leaved *P. napoana* Wiehler, and partially overlapping is *P. aurea* Wiehler which is more prevalent further south on the Amazonian slope of the Andes of Ecuador.

Paradrymonia sastrei Wiehler, sp. nov.

Figure 21

Differt a *Paradrymonia ciliosa* (Martius) Wiehler foliis pilosis, corollarum forma, et lobis subintegris rubro-maculatis.

Terrestrial or epiphytic herb or climber; stems erect or creeping, suffrutescent, the erect shoots ca. 15 cm tall, 4-5 cm in diameter, maroon-purple, sericeous, the internodes 1-4 cm long, with adventitious roots on nodes and internodes; leaf pairs subequal to strongly unequal, the petiole ca. 1 cm long, red-purple, pilose, the lamina broadly lanceolate, 10-13 by 4.5-5.2 cm, acuminate, cuneate or oblique at the base, the margins serrate and ciliate with red trichomes, dark green or reddish above, paler colored below, pilose on both surfaces, the lateral pairs of veins 5-7. Inflorescence reduced to solitary axillary flowers or few-flowered cymes, the peduncle absent, the bracts rudimentary, linear, 3 by 0.8 mm, the pedicels ca. 1.2 cm long, maroon, pilose-villous; calyx lobes subequal, lanceolate, ca. 1.7 by 0.5 cm, the dorsal lobe 1.4 by 0.3 cm, green suffused with maroon, entire, pilose; corolla oblique in the calyx, ca. 5 cm long, the spur 6 mm long, the tube near the base narrow for 1 cm, then abruptly expanding, infundibular, white, pilose, the lobes subequal, entire, ca. 1 by 1 cm, the upper 2 lobes red-spotted, the inside of the tube glabrous; stamens 4, included, badly preserved, each anther ca. 2 by 2 mm; ovary turbinate, 3.5 mm long, sericeous-villous, the style and stigma decomposed; nectary consisting of a double-connate, dorsal gland, 2 by 2 mm, maroon, glabrous. Fruit not seen.

TYPE: *COLOMBIA*: AMAZONAS: Río Igarapará (tributary of Río Putomayo), corr. La Chorrera: San Antonio (ca. 72°W, 2°S), 9 July 1974, *Sastre 3608* (HOLOTYPE: P).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: Named for its discoverer, Dr. Claude Sastre, of the Laboratoire de Phanérogamie, Muséum National d'Histoire Naturelle, Paris, France.

Paradrymonia sastrei appears to be versatile in its habit. Like *P. ciliosa*, the type species of the genus, and other congeners, it may be either vining (as in the present collection), or possibly also rosulate. It differs from *P. ciliosa* in the pilose leaves with ciliate margins, in the shape of the corolla, and in the red-spotted, subentire corolla lobes, ciliate in *P. ciliosa*.

Paradrymonia ulei Wiehler, sp. nov.

Figure 22

Ex affinitate *Paradrymoniae ciliosae* (Martius) Wiehler, a qua imprimis differt corollarum lobis integris, antherarum thecis non-barbatis, et stylorum trichomatibus glanduliferis.

Epiphytic or facultative terrestrial, perennial, rosulate herb; stems erect, very short (2 cm in the type collection), 8 mm in diameter, congested with leaves, adventitious roots and floral shoots, the internodes short, hidden from view; leaf pairs equal to very unequal, the petioles 3-6 cm long, maroon, densely hirsute, the lamina lanceolate to elliptic,, ca. 36 by 8.5 cm, acute to acuminate, denticulate, decurrent, dark green and glabrescent to pilose above, lighter green, with a purple flush and sparsely pilose below, but hirsute along the veins, the lateral pairs of veins 12-15. Inflorescences axillary cymes of 4-8 flowers, the peduncle absent, the prophylls and subtending bracts linear, ca. 0.8-1.4 cm long, maroon, sparsely pilose, the pedicel 0.6-1.4 cm long, maroon, pilose; calyx lobes subequal, linear, 1.8-2.4 cm long, with a few subulate teeth on each side, maroon, pilose; corolla oblique in the calyx, tubular-infundibular, ca. 4 cm long, the spur 3 mm long, the tube white, puberulous without, glabrous within, the dorsal and lateral corolla lobes ca. 4 by 4 mm, the ventral lobe 6 by 8 mm, all lobes entire, glabrous; stamens 4, included, the filaments adnate to the base of the corolla tube for 1 mm, ca. 3 cm long, white, glabrous, the anthers coherent into a square, each anther 1.2 by 0.6 mm, the thecae dehiscing by longitudinal slits; ovary turbinate, 3 mm long, sericeous, the style ca. 2.5 cm long, white, puberulous, with short, capitate-glandular hairs, the stigma stomatomorphic-bilobed; nectary reduced to a double-connate, dorsal gland, maroon, glabrous. Fruit not seen.

TYPE: *PERU*: LORETO: Pongo de Cainarachi (below Yurimaguas, Sept. 1902, *Ule 6328* (HOLOTYPE: HBG).

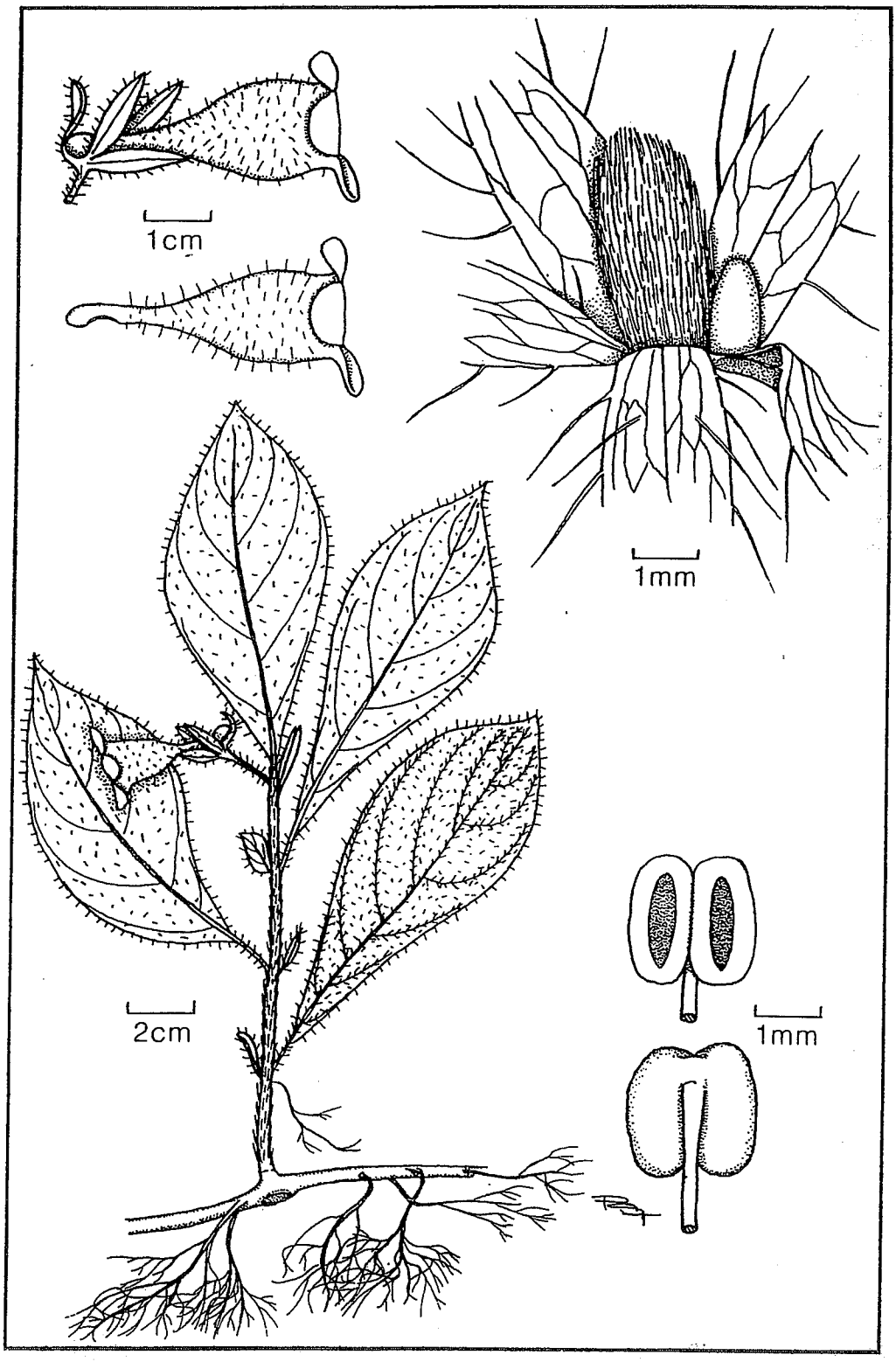

Figure 21: **Paradrymonia sastrei** Wiehler Colombia
Voucher specimen: *Sastre 3608* (P)
Illustrator: *Robert Scott Thompson*, 1982
Sponsor: *Vancouver African Violet Club, BC, Canada*

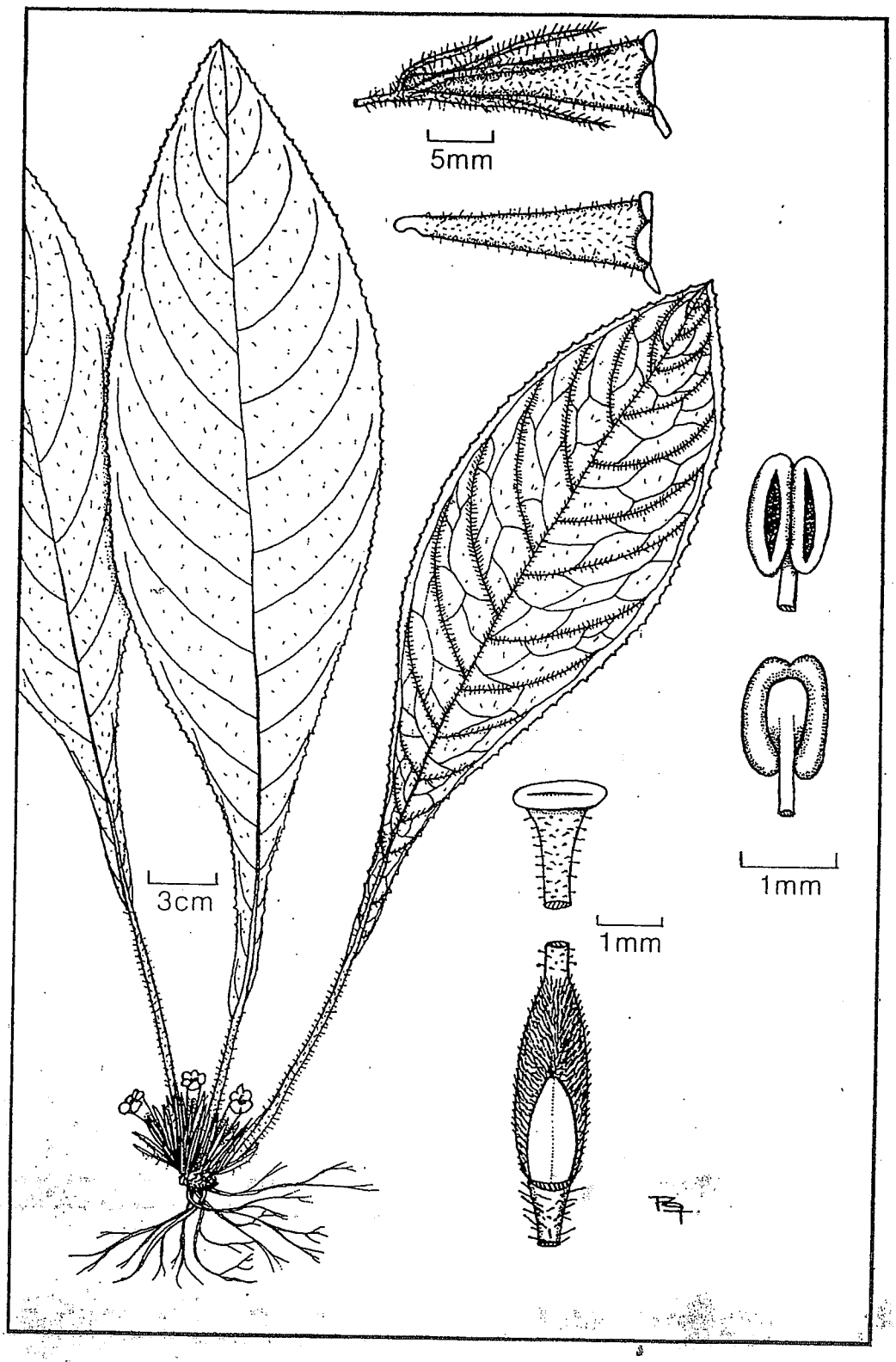

Figure 22: **Paradrymonia ulei** Wiehler
Voucher specimen: *Ule 6328* (HBG)
Illustrator: *Robert Scott Thompson*, 1982
Sponsor: *Vancouver African Violet Club, BC, Canada*

Peru

DISTRIBUTION: Known only from the type locality in Amazonian Peru.

ETYMOLOGY: Named for its discoverer, Ernst H.G. Ule (1854-1915), a German botanist and avid explorer, collector and observer of the neotropical flora. He made several trips to Brazil, lived from 1883 to 1900 in southeastern Brazil, and later collected in the vast Amazon region, travelling by boat (1900-1903, 1908-1912) and in Bahia (1906). Ule made important contributions to our knowledge of plant geography and the biology of epiphytes with his discovery and description of the "Ameisengärten" (ant gardens in trees) which include several gesneriads. The majority of his plant collections are housed at Hamburg (HBG). Ule died in Berlin before the publication of his fourth volume of *Plantae Uleanae*.

Paradrymonia ulei is related to *P. ciliosa* (Amazonian Brazil, Peru, Guyana, northern Venezuela) which has fimbriate corolla lobes, bearded anther cells, and glabrous to sparsely pubescent ovary styles. In Ule's species the corolla lobes are entire, the anther cells without beards, and the style covered with capitate-glandular trichomes.

Pentadenia hypocyrtantha Wiehler, Phytologia 73(3): 234. 1992.

Differt a congeneris omnibus forma corallae saccata, *P. trollio* (Mansfeld) Wiehler excepto, quae folii elliptici papyraceique, calicibus lobi denticulati, et corollae dense pilosae habet.

Epiphytic, perennial suffrutescent herb or vine, stems ascending, spreading or descending, sparsely branching, 0.7-1.3 cm in diameter, green, tawny or maroon, pubescent to glabrescent, with internodes 1-4 cm long; leaf pairs unequal, the petiole 0.9-1.5 cm long, maroon, pubescent, the lamina of the larger leaf of a pair 6-8.5 by 3.5-5.5 cm, acute, entire, oblique or rounded, fleshy, green suffused with red, sparsely pubescent above, glabrescent below, with 5 pairs of reddish secondary veins, the lamina of the smaller leaf of a pair similar, ca. 5 by 3 cm. Inflorescence a reduced axillary cyme of 1-2 flowers, the pendent pedicels 2-7 cm long, maroon, glabrescent; calyx conical, maroon, sparsely pilose to pubescent, the lobes subequal, lanceolate, yellow-green flushed with maroon, the tips bright red, glabrescent, each lobe ca. 1 by 0.3 cm; corolla tubular, but with a prominent pouch as in the (now defunct) genus *Hypocyrta*, ca. 4 cm long, 2 cm wide, rose-red, glabrescent, the green throat constricted to a diameter of 0.5 cm, the small green lobes subequal, 1.4 by 1.5 mm, the tube inside glabrous; stamens 4, included, the white, pubescent filaments ca. 3 cm long, adnate to the base of the corolla tube for 6 mm, the anthers syngenesious, 1.2 by 1.2 mm; ovary superior, 5 mm long at anthesis, pubescent, the style ca. 3 cm long; nectary consisting of 5 maroon glands, the two posterior ones partially fused. Fruit not seen.

TYPE: *BOLIVIA*: SANTA CRUZ: Road Cochabamba to Santa Cruz, between Siberia and Comarapa, near Fortaleza, cloud forest, 2500 m altitude, 15 Jan. 1965, *S. Vogel 498* (HOLOTYPE: US; ISOTYPES: A, F, Z).

ADDITIONAL MATERIAL EXAMINED: *BOLIVIA*: COCHABAMBA: Coraní (Valle), about 60 km NE of Cochabamba, 28 Nov. 1965, *H. Adolfo M. 390* (US). Prov. Chaparé: *C.A.Luer, J. Luer & Velasques 4877* (SEL).

DISTRIBUTION: Growing at altitudes of around 2500 m on the northeastern slope of the Sierra de Cochabamba in the departments of Cochabamba and Santa Cruz in central Bolivia. The related, also hypocyrtoid species *P. trollii* (Mansfeld) Wiehler, is found in the same area, but at higher elevations, around 3100-3500 m.

ETYMOLOGY: From the Greek "hypo," below, under, "kurtos," gibbous, with a pouch-like swelling, and "anthos," flower, meaning the flower with the pouch below the throat. In 1829, Martius published the genus *Hypocyrta* for plants with such an odd corolla shape from southeastern Brazil, now synonomized under the genus *Nematanthus* Schrader. These hummingbird-pollinated hypocyrtoid corollas occur also in the neotropical gesneriad genera *Alloplectus, Besleria, Corytoplectus, Drymonia, Gasteranthus, Neomortonia, Paradrymonia, Parakohleria*, and *Pearcea*. The function of the pouch within the strategy of hummingbird pollination is not yet understood.

RELATIONSHIPS: *Pentadenia hypocyrtantha* appears to be closely related to *P. trollii* (Mansfeld) Wiehler which has a very similar shape of the corolla.
Both occur in the same area, but the latter at much higher altitudes. The differences between the two species are as follows (Table 2):

Table 2: Comparison of characters.

Character	*P. trollii*	*P. hypocyrtantha*
Stems:	villous-puberulous	pubescent, glabrescent
Leaves:	elliptic, papyraceous	ovate, fleshy
Calyx:	margins denticulate	margins entire
Corolla:	densely pilose, pouch less extended	glabrescent, pouch more extended
Ovary:	densely pilose	pubescent

Pentadenia katzensteinii Wiehler, Phytologia 73(3): 235. 1992. *Columnea lavendulacea* Kvist & L. Skog, Allertonia 6:387. 1993.

Figure 23

Differt a *P. byrsina* Wiehler caulibus rectis, corollis purpureis, antheris inclusis et baccis lavendulaceis.

Epiphytic, perennial, suffrutescent herb with stiff, ascending, spreading and branching stems, to ca. 2 m long, 0.5-1.3 cm in diameter, brownish tan, apically maroon, sericeous, with internodes 1-3.8 cm long; leaf pairs very unequal, the petiole 2-4 mm long, tan, densely sericeous, the lamina of the larger leaf of a pair lanceolate, 5-7 by 1.5- 3 cm, acuminate, entire, ciliate, strongly oblique, darker green above, lighter green below, glabrescent, sericeous along the maroon veins, with 4-6 pairs of secondary veins; the lamina of the smaller leaf of a pair similar, proximally caducous, distally ca. 1-2 by 0.5-1 cm. Inflorescence a reduced axillary cyme of 1-4 flowers, in the axils of the larger leaf of a pair, the peduncle absent, the prophylls subulate, 0.7-1 cm long, the pedicels 4-6 mm long, light green with a pink flush, sericeous; calyx conical, light green with a pink flush, sericeous, the lobes spreading, subequal, narrowly lanceolate to linear, 1.5 by 0.15 cm; corolla oblique in the calyx, tubular, slightly sigmoid, ca. 3 cm long, constricted above the cream-colored, glabrous spur, the tube inflated above mid-point, lavender-purple, sericeous, the subequal lobes spreading, ca. 2 by 3 mm, deeper purple, edged with yellow, the tube inside glabrous; stamens 4, included, the white, pubescent filaments ca. 2 cm long, adnate to the base of the corolla tube for 4 mm, the anthers syngenesious, 1 by 1 mm; ovary superior, 3 mm long at anthesis, sericeous, the style ca. 2.5 cm long, white, glabrous, the stigma stomatomorphic; nectary consisting of 5 glands, with the 2 dorsal ones and the 3 ventral ones connate, the latter much larger. Fruit a globose pale lavender blue berry, ca. 1 cm in diameter; seed fusiform, striate, tan, 1.1 mm long, with a fleshy funicle 2.5 mm long.

TYPE: *ECUADOR*: MORONA-SANTIAGO: Cordillera del Boliche, about 60 km from Limón south to Gualaquiza, cloud forest, 1650 m altitude, 5 m up on trees within forest, 21 April 1988, *Wiehler & GRF Expedition 88128* (HOLOTYPE: GES; ISOTYPES: QCA, F, K, MO, NY, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: ZAMORA-CHINCHIPE: 15 km past Zamora, on road to Loja, sub-cloud forest, 1250 m altitude, one single corolla fallen from tall trees, 23 April 1988, *Wiehler & GRF Expedition 88203* (GES, pickled collection); Cordillera del Condor, road Chuchumbleza - Tundeimi, 1450-1650 m altitude, 21 May 1988, *A. Hirtz 3820* (GES). PICHINCHA: all but the last-cited of the following collections are from the area around Volcán Atacazo: "In silvis prope San Florencio," Jan. 1889, *Sodiro 119/30* (P, 2 sheets); wet forested slopes between km 37 and 50 along Río Saloya, 1830 - 2430 m altitude, 22 April 1943, *Steyermark 52572* (F); San Ignacio, road Aloag - Santo Domingo, km 23, upper subtropical rain forest, 2000 m, 4 March 1967, *B. Sparre 14693* (S); 10 to 15 km from San Miguel de los Bancos on road to Mindo, cultivated, agricultural area, rambling vines on tree trunks on edge of meadows, corollas fallen off, fruit still immature, 1 May 1990, *Wiehler & GRF Expedition 90145* (GES) and *90151* (GES, QCA, US).

DISTRIBUTION: In cloud forests on both sides of the Ecuadorian Andes: in the south, on the eastern slope in the provinces Morona-Santiago and Zamora-Chinchipe, and on the western slope, just southwest of Quito, in the province Pichincha. Still poorly collected, *Pentadenia katzensteinii* may be expected in other localities. This trans-Andean distribution is unusual among the Gesneriaceae of Ecuador. It may be attributed to the dispersal of the berry-fruit by migrating birds, sometime way in the past. All collections of *P. katzensteinii* seen on the eastern slope have lance-shaped leaves, while those on the western slope are ovate.

ETYMOLOGY: This species is named in honor of Jeanne Katzenstein of Rockaway, New Jersey. An avid grower of gesneriads and an eager collector of botanical prints of Gesneriaceae, Jeanne has participated on all GRF expeditions and seminars since 1986. She was the first to find the type collection of this undescribed species on the 1988 trip.

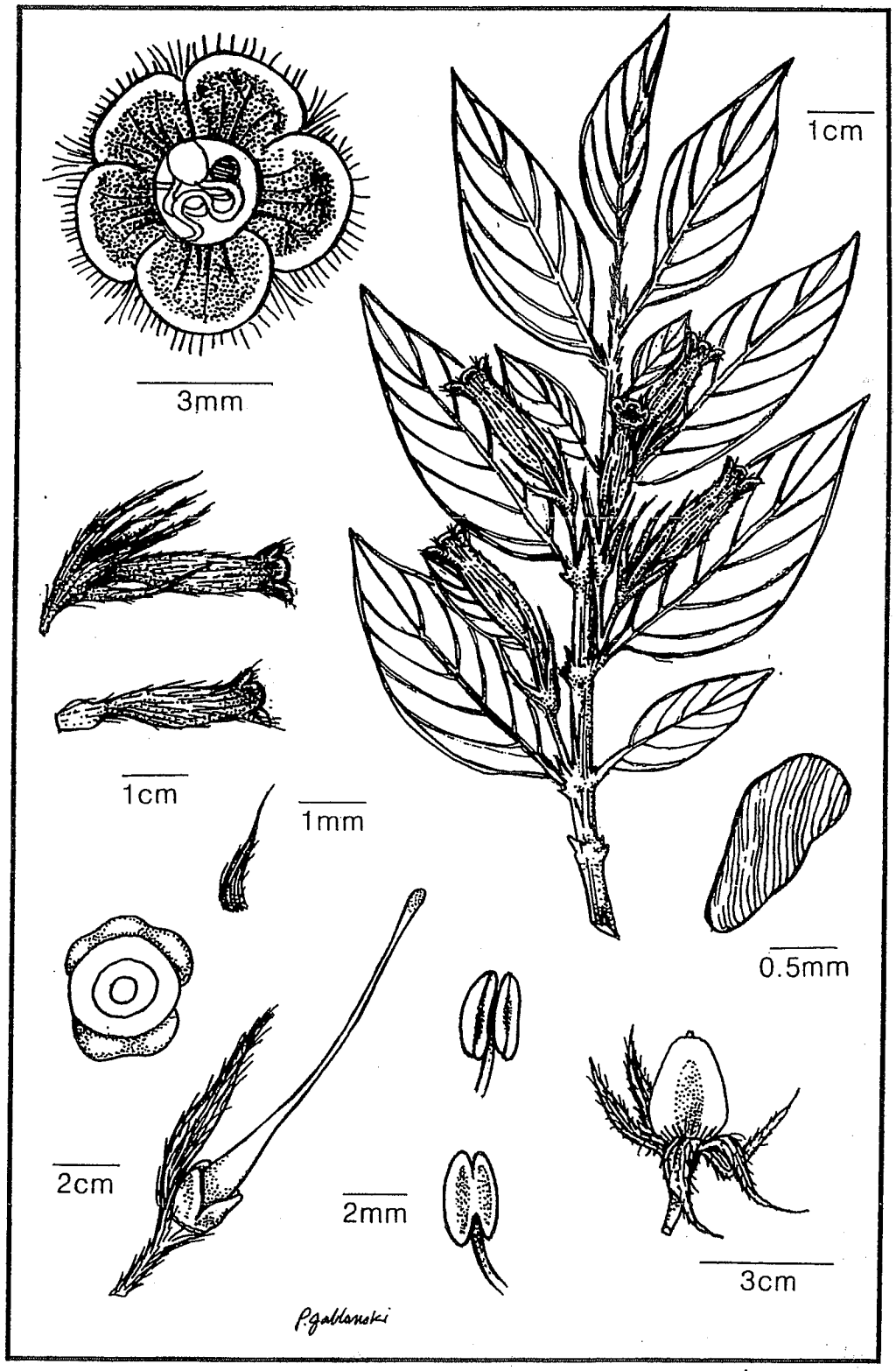

Figure 23: **Pentadenia katzensteinii** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 88128* (GES)
Illustrator: *Pamela Jablonski*, 1993
Spoonsor: *Michael A. Riley, New York City*

With its purple corolla, *Pentadenia katzensteinii* stands unique among the pentadenias and within the whole *Dalbergaria* alliance. In its general habit (semi-woody, stiff, sprawling) and in the manner in which leaves and flowers are borne, it is related to the red-flowered and leathery-leaved *P. byrsina* Wiehler, another species with trans-Andean distribution from northern Ecuador and adjacent Colombia. The differences between these two species are as follows:

Table 3: Comparison of characters

Character	*P. katzensteinii*	*P. byrsina*
Stem growth pattern:	straight	zig-zag
Leaves, sun-exposed:	papyraceous	leathery
Color of corolla:	purple	red
Indumentum of cor. tube:	eglandular	glandular
Anther position in cor.:	included	excluded
Color of berry:	lavender-blue	white

A hybrid of *P. katzensteinii* (rooted cuttings of the type collection) with the yellow-flowered *P. zapotalana* Wiehler (clonotype) was produced by Maryjane Evans of Randolph, New Jersey, in 1989, grown in the GRF greenhouse under accession number G-3783.

Pentadenia manabiana Wiehler, Phytologia 73(3): 236. 1992.

Figure 24

Ex affinitate *P. zapotalanae* Wiehler, a qua imprimis differt foliis sine apicibus rubris corolisque brevioribus non flexis, limbis majoribus patentibus.

Epiphytic, perennial herb or vine with erect, ascending, spreading or descending, branching stems, from 60 cm to 1 m long, ca. 0.8 cm in diameter, green or tawny, glabrescent, with internodes 2-4 cm long; leaf pairs very unequal, the petiole 0.7-1.9 cm long, green, glabrescent, the lamina of the larger leaf of a pair elliptic, 9-15 by 3-5 cm, acuminate, weakly serrulate, ciliate, strongly oblique, green and glabrescent on both surfaces, the abaxial surface sometimes flushed with red, or completely reddish, with 6-7 pairs of secondary veins; the lamina of the smaller leaf of a pair similar, ca. 4.5 by 2 cm. Inflorescence a reduced axillary cyme of 1-4 flowers (always in the axil of the larger leaf of a pair), the prophylls, pedicels and calyces light green, glabrescent to sparsely sericeous, ciliate, with the broadly lanceolate prophylls ca. 1.8 by 0.7 cm, the subtending bracts minute, lanceolate, 0.9 by 0.2 cm, the pedicel 0.5-0.7 cm long; calyx conical, the lobes unequal, lanceolate, entire, ciliate, sparsely pilose, 4 of the lobes almost equal, 1.5 by 0.2 cm, one of the two lower lobes larger, 1.8 by 0.5 cm; corolla erect in the calyx, tubular, light yellow, sparsely pilose, 2.2 cm long, constricted above the spur, the lobes 2 by 3 mm, the limb spreading, ca. 1 cm in diameter, the tube inside glabrous; stamens 4, included, the white, pubescent filaments 1.8 cm long, adnate to the base of the corolla for 5 mm, the anthers syngenesious, 1 by 1 mm; ovary superior, 2 mm long at anthesis, pubescent, the glabrous style 1.7 cm long, white, the stigma bifid; nectary consisting of 5 grey-white, separate glands. Fruit a globose, white, pilose berry, 1.2 cm in diameter; seed fusiform, striate, yellow, 1.1 mm long, with a fleshy funiculus 1.9 mm long.

TYPE: *ECUADOR*: MANABÍ: at km 67 on road from Chone to Santo Domingo, 500 m altitude. Epiphyte on old cacao tree. Live material collected by *C.H.Dodson, # 6791*, on 31 July 1977, grown at the greenhouses of Selby Gardens and GRF under accession # G-2462. Type material from cultivated plants: 8 July 1987, *Wiehler 87102* (HOLOTYPE: GES; ISOTYPES: QCA, B, F, HBG, K, MO, NY, SEL, U, US, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: MANABÍ: Naranja, N of Paján, altitude 500 m, epiphytic scrambler, corolla red, 17 July 1942, *Oscar Haught 3408* (3 sheets, US); GUAYAS: 3 km E of Olon (5 km N of Manglaralto on the beach), in humid valley, 75-190 m altitude, vine to 3 feet long, calyx and corolla pink, 20 Dec. 1961, *Dodson & Thien 1674* (US). LOS RIOS: Hacienda Clementina, 30 m altitude, on cacao trees, corollas light yellow, 7 Aug. 1947, *Harling 1674* (S).

DISTRIBUTION: In the coastal area of Ecuador, in the provinces of Manabí, Los Rios and Guayas, at altitudes from 30 to 500 m.

ETYMOLOGY: Named for the province in which this species was first found.

RELATIONSHIPS: *Pentadenia manabiana* is related to *P. zapotalana* Wiehler from which it differs by the absence of the prominent red abaxial leaf tips. The presence or absence of such abaxial red leaf tips (or translucent red leaf tips) is a strong specific character in the neotropical Gesneriaceae, especially in the genera *Pentadenia, Dalbergaria*

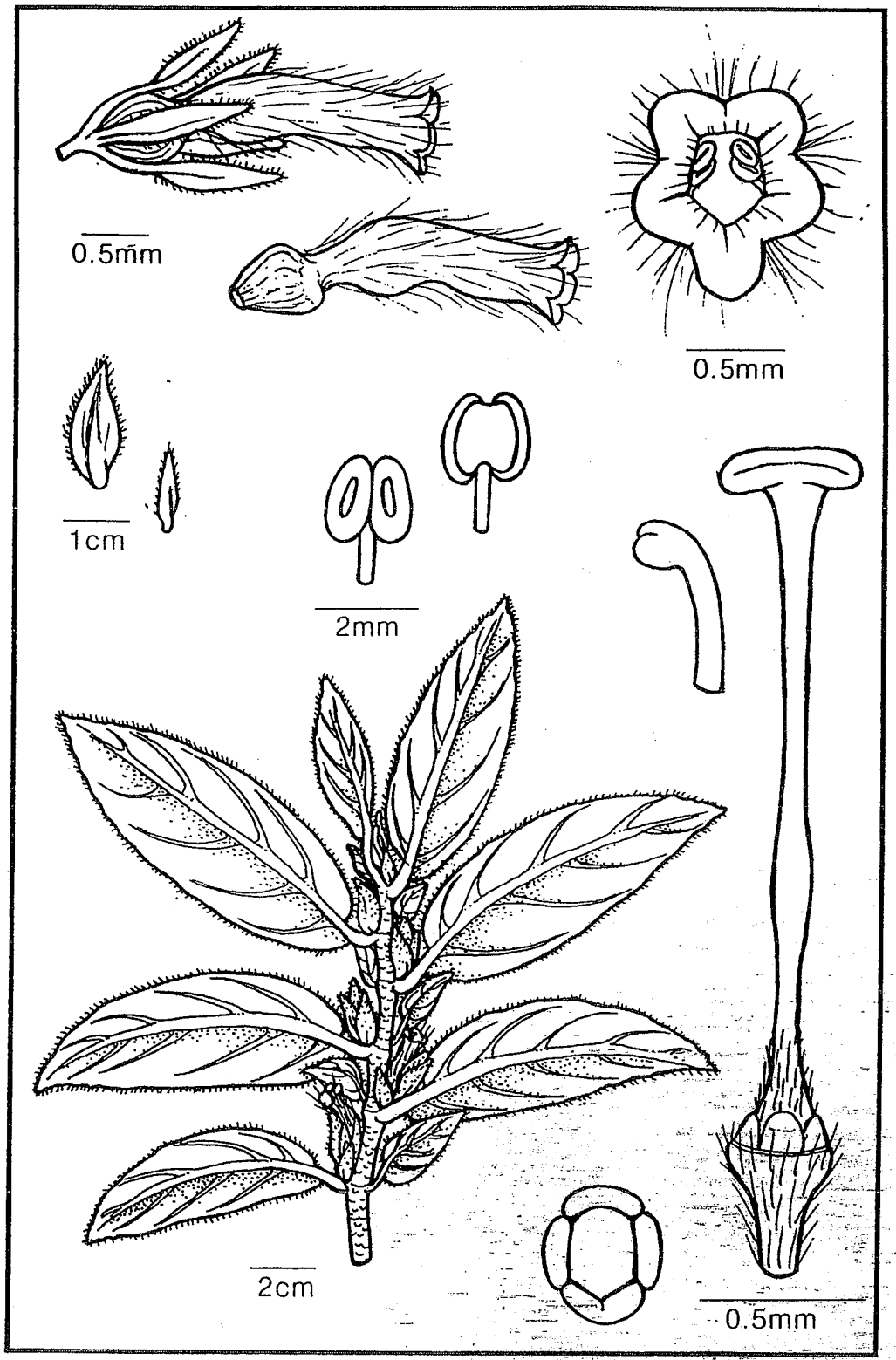

Figure 24: **Pentadenia manabiana** Wiehler Ecuador
Voucher specimen: *Wiehler 87102* (GES; G-2462)
Illustrator: *Sara Honeycutt*, 1994
Sponsor: *George R. Berdan, Sarasota, Florida,*
in honor of Warren & Dorothy Nickel, Ludington, Michigan

and *Trichantha*. While the rest of the abaxial leaf surface in such species with red tips may be green, spotted with red, or completely red in different local populations, the red tips remain constant and can be seen as a darker red if the whole abaxial lamina is colored red. The abaxial green leaf surface of *P. manabiana* may be suffused with a faint or strong flush of red, but the sharply marked red leaf tips are absent in this new species. Such abaxial red leaf tips are also absent from *Pentadenia spathulata* (Mansfeld) Wiehler, and from *P. microsepala* (Morton) Wiehler. The color of the corolla of *P. manabiana* may vary from yellow to pink to red between different populations.

Pentadenia rileyi Wiehler, Phytologia 73(3): 236. 1992. *Columnea leucerinea* Kvist & L. Skog, Allertonia 6: 398. 1993.

Figure 25

P. isernii (Cuatrecasas) Wiehler affinis, sed foliorum marginibus integris, floribus non solitariis, et calicum lobis sine laciniis notabilis.

Epiphytic, perennial herb, the stems ascending, spreading, rarely branching, 2-3 m long, defoliated except for ca. 20 cm, 0.6-1.5 cm in diameter, brownish tan, sericeous-wooly (the prominent indumentum of stems, petioles, abaxial leaf laminae, prophylls, pedicels and calices appearing white), with internodes 1-5 cm long; leaf pairs equal or subequal, the petiole ca. 1.5 cm long, white-wooly, the lamina lanceolate, 4-7 by 2-3.5 cm, acuminate, entire, ciliate, cuneate, darker green and sericeous above, lighter green and sericeous-wooly (white-wooly along the veins) below, with 5-6 pairs of secondary veins. Inflorescence a reduced axillary cyme of 1-4 flowers, the peduncle absent, the prophylls lanceolate-subulate, 8 by 1 mm, white-wooly, the pedicels ca. 1.2 cm long, white-wooly; calyx conical, white-wooly, the lobes equal, lanceolate, spreading, 8 by 3 mm, entire, the margins of the red apices recurved, causing the tips of the lobes to be concave; corolla erect in the calyx, tubular, ca. 2.3 cm long, slightly constricted above the cream-white, sericeous spur, the tube pale orange-pink, densely covered with 4 mm long red-celled trichomes, inflated at mid-point, again constricted below the small (1.5 by 1.5 mm), barely spreading red-marked lobes, the inside of the tube pubescent; stamens 4, included, the white, pubescent filaments ca. 1.6 mm long, adnate to the base of the corolla tube for 6 mm, the anthers syngenesious, 1 by 1 mm; ovary superior, 2 mm long at anthesis, glabrous, the style ca. 1.3 cm long, white, glabrous, the stigma stomatomorphic; nectary consisting of 5 glands, with the 2 dorsal ones connate. Fruit a globose, white, glabrous berry, ca. 9 mm in diameter; seed fusiform, striate, tan, 1 mm long, with a fleshy funicle 2.3 mm long.

TYPE: *ECUADOR*: NAPO: 37 km from Baeza on road to Lago Agrio, epiphyte on trees in open meadow, 1500 m altitude, 24 April 1986, *Wiehler & GRF Expedition 86243* (HOLOTYPE: GES; ISOTYPES: QCA, F, K, MO, NY, SEL, U, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: NAPO: San Francisco de Borja, along edge of Río Quijos, 1650 m altitude, epiphyte, 15-26 Jan. 1959, *Harling 3863* (S). PICHINCHA: road Aloag - Santo Domingo: Tandapi, at confluence between Ríos Tandapi and Pilatón, subtropical rain and gallery forest, 1500 m, 1 Oct. 1967, *Sparre 14002* (S); 6-20 km E of Tandapi, 1500-2000 m, terrestrial on bank by mountain stream, Jan. 1979, *Besse, Tan & Halton 172* (QCA, SEL); rain forest 3 km N of Tandapi, N of Río Pilatón, 1500 m, epiphyte on tree in open meadow, 25 April 1979, *Wiehler & Masterson 7955* (GES); 34 km below Nono on road to Mindo, 1400 m, deforested agricultural area, on roadside trees, 27 April 1986, *Wiehler & GRF Expedition 86256* (GES, QCA).

DISTRIBUTION: The same distance below the equator, on both sides of the Andes, in the provinces of Napo and Pichincha. The collections from the two separate areas look quite similar.

ETYMOLOGY: Named for Michael A. Riley of New York City who discovered the type collection of this species. An eager student of gesneriads and a collector of botanical prints of Gesneriaceae, Michael has participated in many GRF expeditions and seminars, and generously supported research in this plant family.

With its wooly indumentum on stems, leaves and calices, its concave calyx lobes, long-haired corolla and glabrous berry, *Pentadenia rileyi* is closely related to *P. isernii* from the Amazonian slope of the Andes of Ecuador, northeast of Tena. But the latter has serrated leaf margins, solitary flowers and laciniated calyx lobes. Juan Isern collected Gesneriaceae and other plant families in eastern Ecuador in 1864 and 1865.

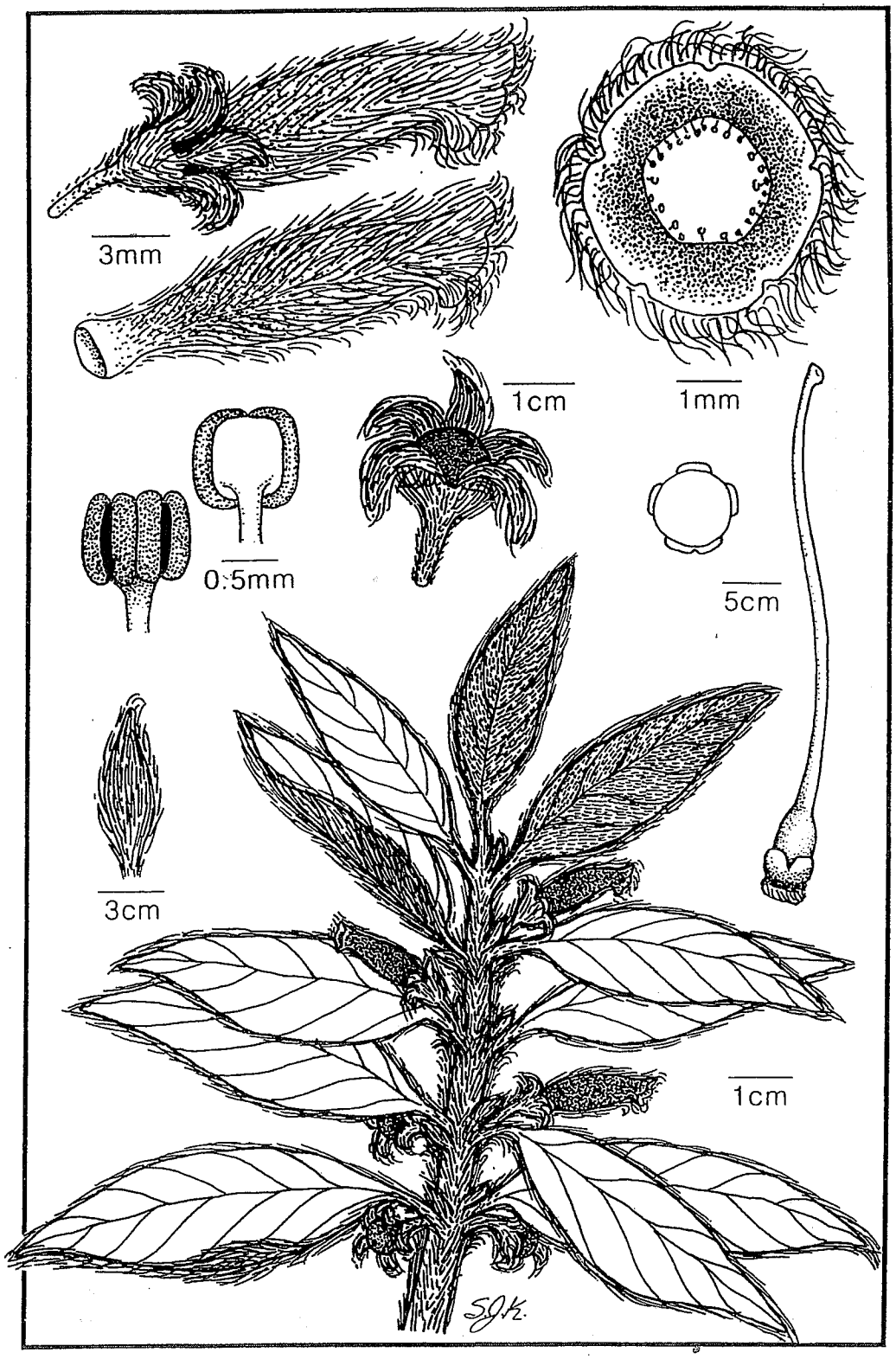

Figure 25: **Pentadenia rileyi** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 86243* (GES)
Illustrator: *Sandra J. Koop*, 1993
Sponsor: *Beth Weissman of New York City and Linda Jorgenson of Vancouver, Canada, in honor opf Michael A. Riley of New York City*

Pentadenia rubriacuta Wiehler, Phytologia 73(3): 237. 1992.

Figure 26

A *P. zapotalana* Wiehler magnitudine coloreque corollarum, calicum lobis ellipticis et prophyllis ovatis recedit.

Epiphytic (occasionally terrestrial in disturbed areas) perennial herb, the stems erect, spreading or ascending, 0.6 to 1.2 m long, 0.7-1 cm in diameter, tawny, covered with small scales, sparsely pilose, with internodes ca. 2 cm long; leaf pairs very unequal, the petiole 0.9-1.2 cm long, green, pilose, the lamina of the larger leaf of a pair oblanceolate or elliptic, 10-12 by 4-6 cm, acute, weakly serrulate, ciliate, strongly oblique, green and sericeous on both surfaces, the abaxial tip red, with 5-7 pairs of secondary veins; the lamina of the smaller leaf of a pair similar, ca. 1.5 by 1 cm. Inflorescence a reduced axillary cyme of 1-4 flowers, in the axil of the larger leaf of a pair, the peduncle absent, the prophylls ovate, ca. 1.3 by 0.8 cm, yellow-green, distally flushed with rose-pink, the subtending bracts similar, ca. 6 by 2 mm, the pedicels 3 mm long; calyx conical, cream-white, sericeous, the lobes unequal, elliptic, entire, ciliate, cream-white or yellow-green near the base, but mostly rose-pink, pilose-sericeous, the dorsal and the 2 lateral lobes smaller, 6-9 by 2-3 mm, the lower 2 lobes larger, 8-12 by 3-5 mm; corolla oblique in the calyx, tubular, 1.5-1.8 cm long, constricted above the cream-colored and glabrous spur, bent above the constriction, red, pink or orange-pink, pilose-sericeous, the lobes equal, not spreading, 1 by 1 mm, orange, the tube inside glabrous; stamens 4, included, the white, pubescent filaments ca. 1.7 cm long, adnate to the base of the corolla for 4-5 mm, the anthers syngenesious, 1 by 1 mm; ovary superior, 2-3 mm long at anthesis, green, pubescent, the style ca. 1.5 cm long, white, pubescent and with short capitate-glandular hairs, the stigma bifid; nectary consisting of 5 white, glabrous glands, the dorsal 2 connate. Fruit a globose, white, pilose berry, ca. 1 cm in diameter; seed fusiform, striate, tan, 0.9 mm long, with a fleshy funiculus 1.6 mm long.

TYPE: *ECUADOR*: EL ORO: road Loja - Santa Rosa, ca. 20 km past Piñas, below cloud forest, 1000 m altitude, on slope of road-cut, 17 April 1986, *Wiehler & GRF Expedition 8648* (GES). Grown from live cuttings of this collection in GRF greenhouse, accession number G-3200, type specimens prepared 8 July 1990, *Wiehler 90175* (HOLOTYPE: GES; ISOTYPES: QCA, B, F, HBG, K, MO, NY, SEL, U, US, others to be distributed).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: LOJA: Chiguango, some 70 km west of Loja, 1600 m altitude, yerba epífita, *Reinaldo Espinosa* (US). EL ORO: Piñas, epiphytic in cloud forest along new road west of town, 1000 m altitude, *Dodson et al. 8463, 9138* (SEL), 25 Sept. 1980, *Luer et al. 5555* (GES). AZUAY: dense rich jungle between Río Blanco and Río Norcay on road between Chacanceo and Molleturo, altitude 1520 m, 4 June 1943, *Steyermark 52825* (F).

DISTRIBUTION: In cloud forests of the western slope of the Andes, parallel to the coast of southern Ecuador, in the provinces of Loja, El Oro and Azuay, at altitudes between 1000 and 1600 m. Chiguango is about 50 km SW of Piñas, and the Azuay locality about 90 km NNE of Piñas.

ETYMOLOGY: Named for the distinctive red tips on the underside of the leaves of this species.

SPECIAL CHARACTERS: A distinguishing feature of *Pentadenia rubriacuta* is a size-differentiation in the lobes of the calyx. The two lower lobes are much larger than the three narrow, equal-sized upper lobes.

Pentadenia rubriacuta is closely related to *P. zapotalana* Wiehler from west-central Ecuador. It differs in the shape, size and color of the corolla, and in the shape of the calyx lobes and the prophylls:

Table 4: Comparison of characters

Character	*P. rubriacuta*	*P. zapotalana*
Corolla shape:	(see illustration)	(see illustration)
Corolla length:	1.5-1.8 cm	2.8-3.2 cm
Corolla color:	red, pink or orange-pink	light yellow
Calyx lobes:	elliptic	oblanceolate
Prophyll shape:	ovate	oblanceolate

Another collection of *P. rubriacuta* from the same area near Piñas, *Wiehler & GRF Expedition 8649* (GES) and the live material of this collection grown in the GRF greenhouse, accession number G-3201, is a miniaturized version of the type collection. The branches and leaves are half the size, but the flowers have about the same dimensions. This cultivar from the wild has horticultural potential and has been given the name *Pentadenia rubriacuta* 'Petite.'

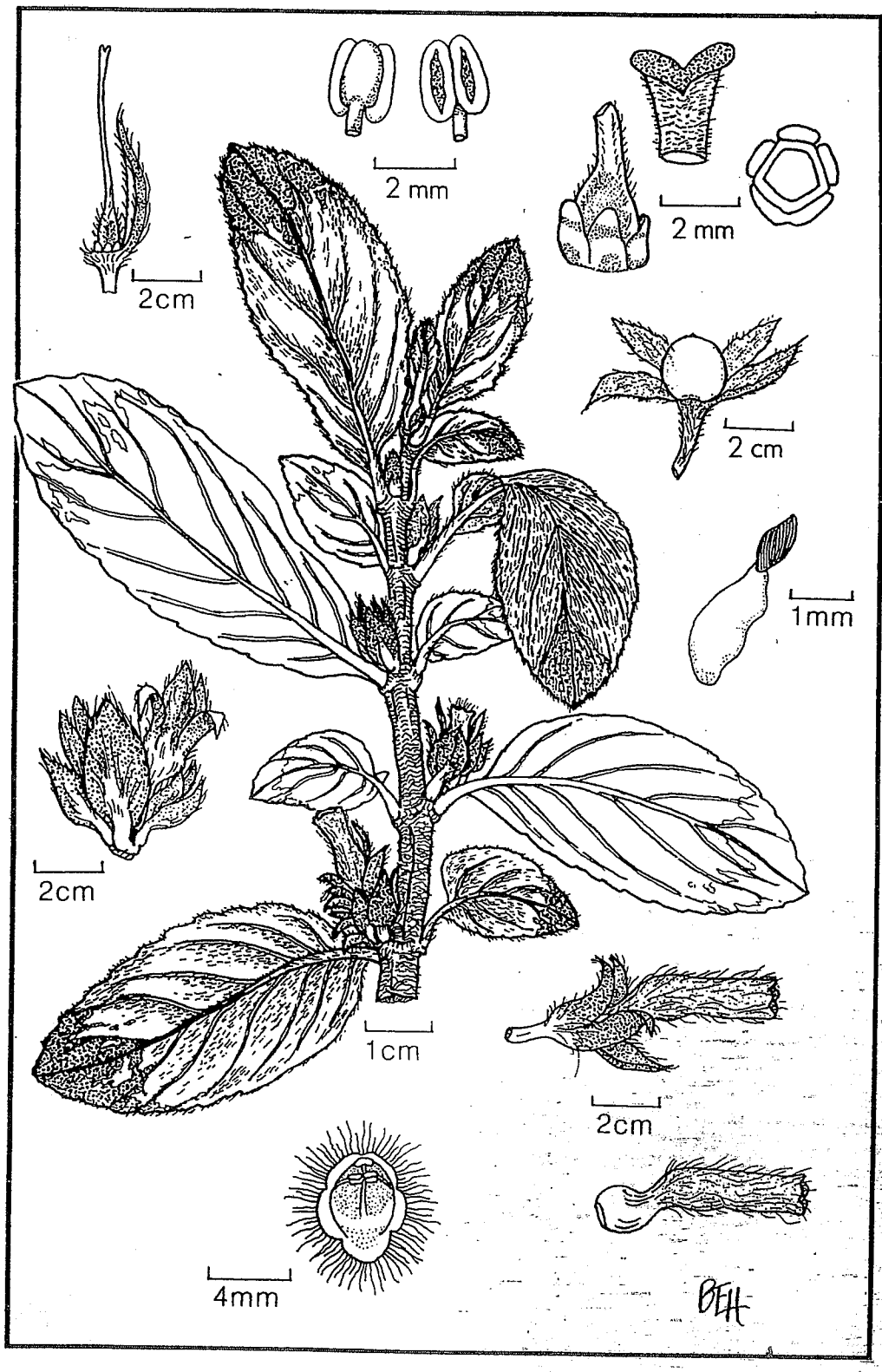

Figure 26: **Pentadenia rubriacuta** Wiehler Ecuador
Voucher specimen: *Wiehler 90175*, (GES, G-3200)
Illustrator: *Barbara Harrison*, 1991
Sponsor: *Jeanne Katzenstein, Rockaway, New Jersey*

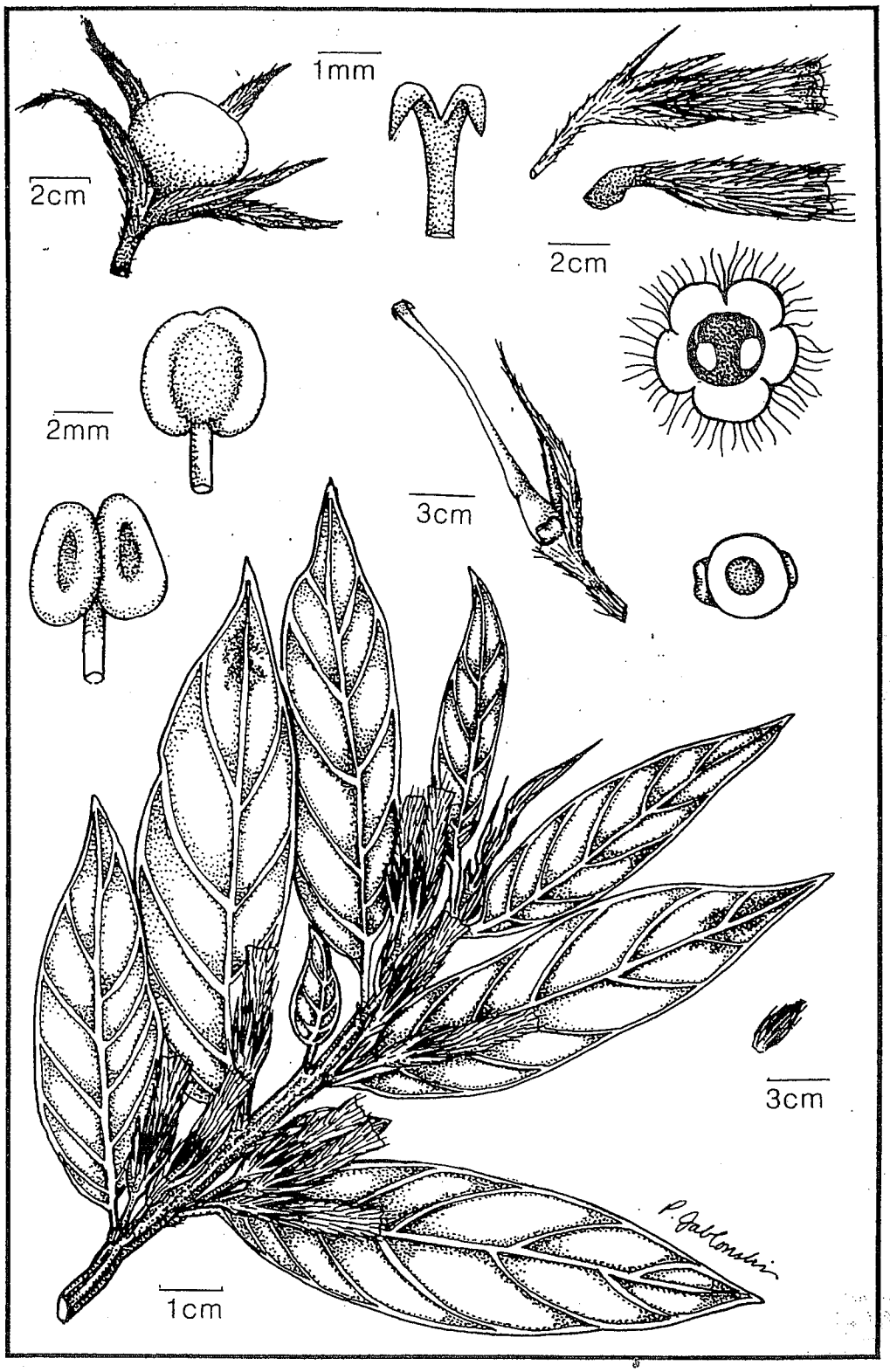

Figure 27: **Pentadenia tandapiana** Wiehler Ecuador
Voucher specimen: *Wiehler & GRF Expedition 8604* (GES)
Illustrator: *Pamela Jablonski*, 1993
Sponsor: Patricia M. Sisson, Englewood, Florida

Pentadenia tandapiana Wiehler, Phytologia 73(3): 238. 1992. *Columnea inconspicua*, Kvist & L. Skog, Allertonia 6: 385. 1993.

Figure 27

A *P. ecuadorana* Wiehler calicum lobis integris et corollis parvioribus luteis statim dignoscenda.

Epiphytic, perennial herb, the stems ascending, spreading, branching, to 30 cm long, often defoliated near the base, 0.5-1.3 cm in diameter, brownish tan, scaly, glabrescent, with internodes 1.5-5 cm long; leaf pairs strongly unequal, the petiole ca. 7 mm long, green, sericeous, the lamina of the larger leaf of a pair elliptic or lanceolate, 6-9 by 2-3 cm, acuminate, entire, ciliate, oblique, green, sparsely sericeous on both surfaces, occasionally with abaxial red spots or with red margins (in sun-grown specimens), with 4-6 pairs of secondary veins. Inflorescence a reduced axillary cyme of 1-8 flowers, the peduncle absent, the prophylls minute, subulate, 3 by 1 mm, often caducous, the pedicels 5-7 mm long, green sericeous; calyx conical, green, sericeous, the lobes subequal, lanceolate-linear, slightly spreading, 1 by 0.15 cm, entire, green; corolla erect in the calyx, tubular, 1.8-2.1 cm long, constricted above the cream-white, glabrous spur, the tube yellow, sericeous-pilose, the equal-sized lobes, 2 by 2 mm, slightly spreading, the tube inside pubescent; stamens 4, included, the white, glabrous filaments ca. 1.9 cm long, adnate to the base of the corolla tube for 4 mm, the anthers syngenesious, 1 by 1 mm; ovary superior, 3 mm long at anthesis, glabrous, the style ca. 1.7 cm long, white, glabrous, apically bent like a shepherd's crook, the stigma bilobed; nectary consisting of 5 glands, the dorsal 2 connate. Fruit a globose, glabrous berry, ca. 7 mm in diameter; seed fusiform, striate, tan, 0.9 mm long, with a fleshy funicle 1.8 mm long.

TYPE: *ECUADOR*: PICHINCHA: 7 km from San Miguel de los Bancos on road to Mindo, deforested, agricultural area, on tree in meadow along roadside, corollas yellow, 30 April 1990, *Wiehler & GRF Expedition 90133* (HOLOTYPE: GES; ISOTYPES: QCA, US).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: PICHINCHA: in decl. Monte Atacazo, prope Canzacoto, May 1882, *Sodiro 119/33* (P); Tandapi, at confluence between Ríos Tandapi and Pilatón, subtropical rain and gallery forest, 1500 m, 23 July 1967, *Sparre 17761* (S); same area, *Dodson & Gentry 9592* (SEL); 3 km N of village of Tandapi, N of Río Pilatón, on trees in open meadow, 1500 m, shaded plants without red leaf spots, also some sun-exposed plants with abaxial red leaf spots, 25 April 1979, *Wiehler & Masterson 7954* (GES, SEL, US); same area, along road along Río Pilatón, epiphyte, leaves with red margins, corolla yellow, 10 April 1986, *Wiehler & GRF Expedition 8604* (GES, US); 36 km below Nono, on road to Mindo, agricultural area, on tree along roadside, 27 April 1986, *Wiehler & GRF Expedition 86261* (GES, QCA).

DISTRIBUTION: On the Pacific slope of the Ecuadorian Andes, in the province of Pichincha, at altitudes between 1200 to 1800 m.

ETYMOLOGY: *Pentadenia tandapiana* has been collected most frequently in the Tandapi rain forest area, a famous spot for botanists in Ecuador. The village of Tandapi along the new road between Quito and Santo Domingo is now listed on maps as "Cornejo Astorga", but the road sign states "Tandapi," and the local inhabitants prefer that name.

It is not easy to state to which species in the genus this novelty is most closely related. It is distinct by its fairly compact habit, the red spotting on sun-exposed leaves, the small and narrow corolla, and the slender calyx lobes. It is sympatric with *P. ecuadorana* Wiehler, with which it shares the scaly appearance of the stems. The latter has pronounced teeth on the broad calyx lobes, and a much larger, red corolla. These two species probably employ different hummingbirds as pollinators.

Phinaea ecuadorana Wiehler, sp. nov.

Figure 28

A. *P. divaricata* (Poeppig) Wiehler caulium, petiolorum calycumque indumento velutino, foliorum trichomatibus glanduliferibus, et ovario sericeo differt.

Small terrestrial or lithophytic herb with underground rhizomes consisting of a small stem axis compacted with tiny, thick, succulent leaf scales, each rhizome ca. 2-3 by 0.4 cm, cream-white or pinkish, externally glabrous; stems erect or ascending, rarely branching, 10-15 cm tall, ca. 3 mm in diameter, reddish maroon, puberulous-velutinous, the internodes 1-4 cm long; leaves opposite-decussate, equal or unequal (depending on

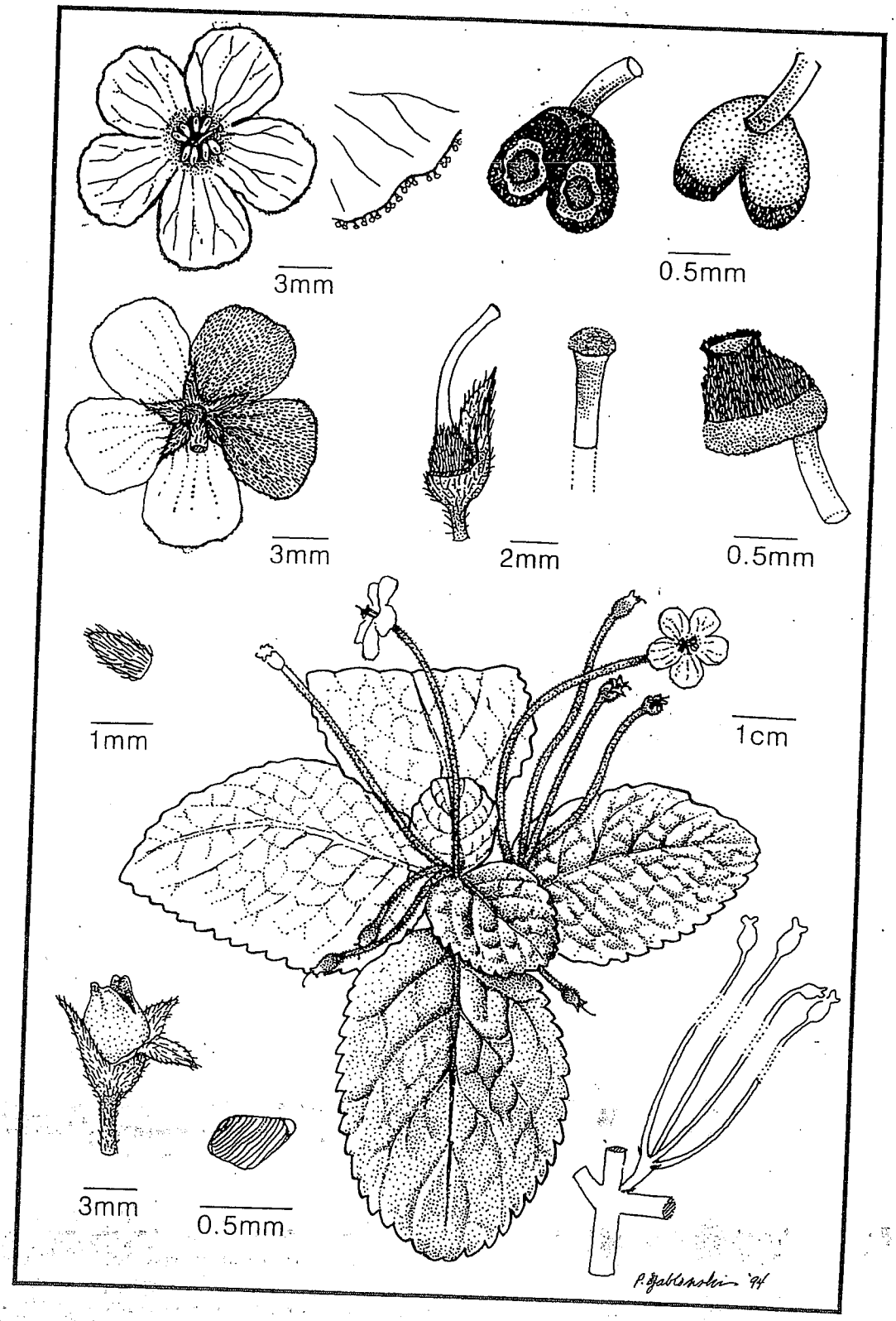

Figure 28: **Phinaea ecuadorana** Wiehler
Voucher specimen: *Wiehler & GRF Expedition 8652* (GES; G-3123)
Illustrator: *Pamela Jablonski*, 1984
Sponsor: *Dr. Peter Shalit, Seattle, Washington*

Ecuador

degree of crowdedness of plants in colony), the petioles ca. 2 cm long, reddish-maroon, pilose, the lamina ovate or elliptic, acute, crenate, rounded at the base, adaxially bluish green and velvety, abaxially lighter green or flushed with maroon and pilose, the secondary pairs of veins 7-8. Inflorescences axillary cymes of 1-4 flowers, the short peduncle ca. 2 mm long, the prophylls minute, barely visible, the pedicels 4-6 cm long, reddish maroon, puberulous-pilose, interspersed with capitate-glandular trichomes; calyx turbinate, the lobes equal, ca. 4 mm long, lanceolate, entire, green, abaxially puberulous-pilose, with capitate-glandular trichomes; corolla rotate, nearly actinomorphic, pure white, but with a yellow area in the center of the shallow tube, externally pubescent, with capitate-glandular hairs, the lobes ca. 5 by 4 mm, rounded, entire, the margins with short, capitate-glandular trichomes, the lower lobe somewhat larger, the base of the short tube yellow; stamens 4, connate to the base of the corolla tube, the filaments ca. 2 mm long, yellow, glabrous, the anthers free or partially connate, bright yellow, grouped around the style, each anther cell dehiscing by an apical pore; ovary semi-inferior, turbinate, green, sericeous, the style ca. 4 mm long, green, glabrous, the stigma stomatomorphic; nectary absent. Fruit an ovoid dry capsule, ca. 3 mm long, splitting loculicidally; seed irregularly rhomboid, 0.5 mm in diameter, striate, light brown.

TYPE: *ECUADOR:* EL ORO: along road from Loja to Santa Rosa, 20 km past Piñas, below cloud forest, on moist roadside cuts, in shade and dripping wet clay soil, 17 April 1986, *Wiehler & GRF Expedition 8652* (HOLOTYPE: QCNE; ISOTYPES: B, E, GES, K, MO, NY, QCA, SEL, US).

DISTRIBUTION: Known only from the type collection in southern Ecuador.

ETYMOLOGY: As the first species of *Phinaea* Bentham described from Ecuador, named after the country of its origin.

Phinaea ecuadorana differs from *P. divaricata* by the latter displaying villous indumentum on stems, petioles and calices, lacking capitate-glandular trichomes on petioles and leaf blades, having ovate calyx lobes, anther cells dehiscing by longitudinal slits, and a glabrous ovary and capsule.

Both species are now in cultivation in North America. These two and the following species exhibit the syndrome of "buzz" bee pollination (in their native habitats). This intricate and unique method of pollen transfer occurs in all species of *Phinaea, Niphaea* Lindley and *Bellonia* Linnaeus among the neotropical Gesneriaceae.

Phinaea macrophylla Wiehler, sp. nov.

Figure 29

Species haec foliis grandibus a congeneribus diversa.

Tender lithophytic herbs with small, pink, "sticky," underground rhizomes, ca. 5-16 by 3 mm, the stickiness caused by capitate-glandular trichomes covering the tiny leaf scales; stems erect, rarely branching, to 4 cm tall, (but on some creeping plants, searching for more light, to 25 cm long), ca. 5 mm in diameter, reddish, sparsely strigose, with scattered capitate-glandular trichomes, the internodes 0.5 to 2 cm long; leaves opposite-decussate, equal to strongly unequal, the petioles from 0.2 to 1.5 cm long, olive-green to maroon, strigose, with glandular trichomes, the lamina of the larger pair of a leaf elliptic-lanceolate, to 29 cm long, 10 cm wide, dentate, acuminate to acute, oblique or decurrent, adaxially olive-green, strigose, with glandular trichomes, abaxially maroon or greenish, with strigose and glandular trichomes mainly along the veins and veinlets, the secondary pairs of veins 10 to 17. Inflorescences cymes of 1-4 flowers in the upper leaf axils, and continuing along the shoot apex for ca. 1 cm, without leaves or bracts, the peduncle 1 mm long or absent, the prophylls apparently absent, the pedicels ca. 4 cm long, maroon or green, puberulous, with glandular and eglandular trichomes; calyx turbinate, pilose, with glandular trichomes, the lobes subequal, 3 x 1.5 mm, lanceolate, entire; corolla rotate, nearly actinomorphic, pure white, but with the center of the shallow tube yellow, mostly glabrous, the lobes subequal, ca. 4 by 3 mm, rounded, entire, the margins with short, capitate glandular trichomes, the lower lobe somewhat larger, with a few glandular hairs on the adaxial surface; stamens 4, connate to the base of the corolla tube, the filaments ca. 2.4 mm long, yellow, glabrous, the anthers free, touching or partially connate, bright yellow, grouped around the style or adjacent to it, each anther cell dehiscing by central apical pore which in late maturity turns into a longitudinal slit; ovary semi-inferior, turbinate, green, glabrous, the style ca. 3 mm long, white, glabrous, the stigma stomatomorphic; nectary absent. Fruit an ovoid dry

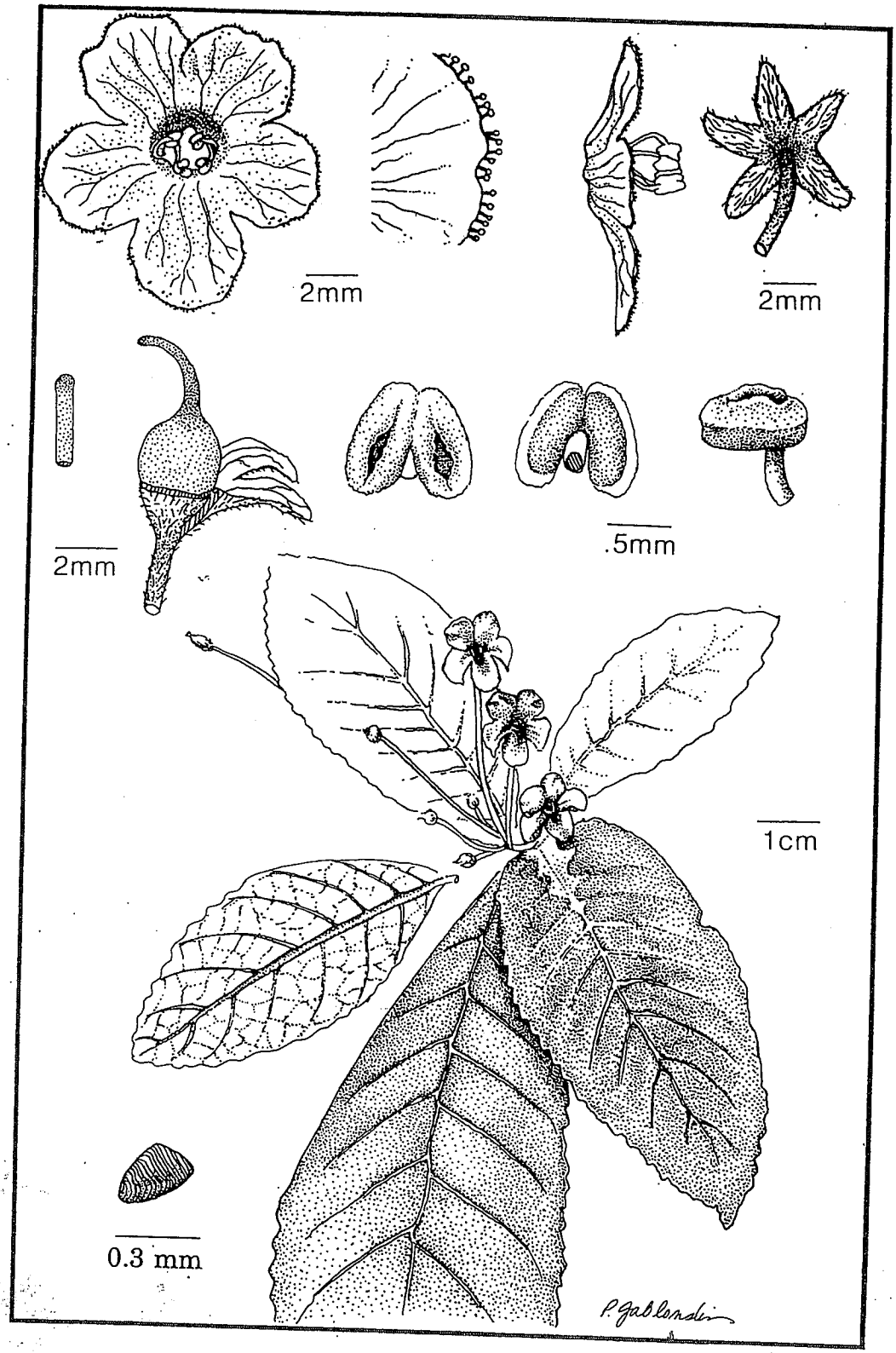

Figure 29: **Phinaea macrophylla** Wiehler
Voucher specimen: *Wiehler 86299* (GES; G-3230)
Illustrator: *Pamela Jablonski*, 1994
Sponsor: *Nellie D. Sleeth, in memory of Philip Aaron*

Colombia

capsule, ca. 3 mm long; seed irregularly rhomboid, 0.3 mm in diameter, striate, tan.

TYPE: *COLOMBIA*: ANTIOQUIA: Road Medellín - Bogota, at Refugio Ecologico del Cañon del Río Claro, a tributary of Río Magdalena; colonies on vertical rock walls of marble in the canyon, in little crevices, also in fairly dark caves; some plants in dry areas, others in moist and dripping soil, 21 Nov. 1986, *Wiehler 86299* (HOLOTYPE: HUA; ISOTYPES: COL, GES, NY, US).

ADDITIONAL MATERIAL EXAMINED: *COLOMBIA*: ANTIOQUIA: Río Claro gorge, same area, 22 March 1987, *Wiehler & GRF Expedition 8748* (GES, K, MO).

ETYMOLOGY: Named for the unusual size of the leaves of this species, to 29 cm long, much larger than any of its 16 congeners.

Another unusual feature of *Phinaea macrophylla* is that, in its native habitat, the seed pods are borne underneath the olive-green leaves, close to or touching the damp, often vertical rock formations. Rain washes probably help to disperse the dust seed into other rock cracks.

Rhoogeton panamensis Wiehler, Phytologia 73(3): 239. 1992.

Figure 30

Differt a *Rhoogeto viviparo* Leeuwenberg foliis longioribus lanceolatis decurrentibus et corollis albis.

Terrestrial, perennial, tuberous, acaulescent herb, to 35 cm tall, the underground tuber ca. 2.5 cm in diameter (or larger), the leaves erect or spreading, longer than the inflorescences, with 9-14 blades per plant; petioles ca. 6 cm long, reddish maroon, glabrescent, the lamina lanceolate-elliptic, ca. 25 by 6 cm, acuminate (occasionally acute), double-serrate, long-decurrent, green, glabrous to glabrescent, the mid-vein abaxially as maroon as the petiole, the secondary pairs of veins 8-11. Inflorescences pseudo-umbellate, compound, pair-flowered cymes arising on long peduncles from the leaf axils, each umbel with 10-20 flowers, the peduncle ca. 18 cm long, reddish maroon, glabrescent, the prophylls and subtending bracts lanceolate-elliptic, 1.6-2.1 by 0.3-0.4 cm, entire, green, sparsely sericeous, the pedicels ca. 1 cm long, green, glabrescent; calyx lobes equal-sized, lanceolate, ca. 1.2 by 0.4 cm, with a few teeth near the apex, green, sericeous; corolla oblique in the calyx, tubular-infundibular, ca. 2.5-3.5 cm long, with a small spur and a flaring limb, white (pale pink in strong sunlight), sparsely sericeous-pilose, the upper 4 lobes of the limb subequal, ca. 7 by 7 mm, the lower lobe ca. 9 by 9 mm, the margins wavy, entire, the face of the limb with a pink flush, the tube inside with rose longitudinal lines and a ventral yellow nectar-guide; stamens 4, included, ca. 1.4 cm long, white, glabrous, adnate to the base of the corolla tube for 4 mm, the anthers coherent into a square, each anther 0.8 by 0.8 mm, the thecae dehiscing by longitudinal slits; ovary superior, turbinate, 3 mm long, sericeous, the style ca. 1.2 cm long, white, with capitate-glandular trichomes, the stigma stomatomorphic; nectary a double-connate, dorsal gland, 1 by 1.4 mm, maroon. Fruit a bivalved capsule; seed not seen.

TYPE: *PANAMA*: COCLÉ: El Valle de Anton: La Mesa, 19 June 1978, *Dressler s.n.*, live material cultivated at SEL and GRF greenhouses, accession no. G-2633, type material prepared 8 July 1985, *Wiehler 8536* (HOLOTYPE: GES; ISOTYPES: PMA, K, MO, NY, SEL, US).

ADDITIONAL MATERIAL EXAMINED: *COSTA RICA*: Province (?): "Terres, rochers humides des plaines de Surubres," July 1890, *Biolley 343* or *Pittier & Durand 2654* (US).

DISTRIBUTION: At higher altitudes in Panama and Costa Rica.

ETYMOLOGY: Named for the country of Panama. This is the first record of the genus *Rhoogeton* Leeuwenberg for Central America. The other two species are endemics of the ancient Guiana Shield Flora (Pakaraima Mountains) in Guyana and adjacent Venezuela (Cerro Venamo).

Rhoogeton panamensis is related to *R. viviparus* Leeuwenberg from Guyana (including *R. leeuwenbergianus* Morton from Cerro Venamo) which has much smaller, oblong-ovate leaves with cuneate bases (not long-decurrent for 9 cm), less congested umbels with fewer flowers (1-6), and an orange-red corolla with a straight tube. The corolla tube in *R. panamensis* is somewhat convoluted, white, and with rose-pink lines inside.

Rhoogeton viviparus in Guyana grows on wet rocks and has the special faculty to produce new plantlets from the teeth on the lamina of the

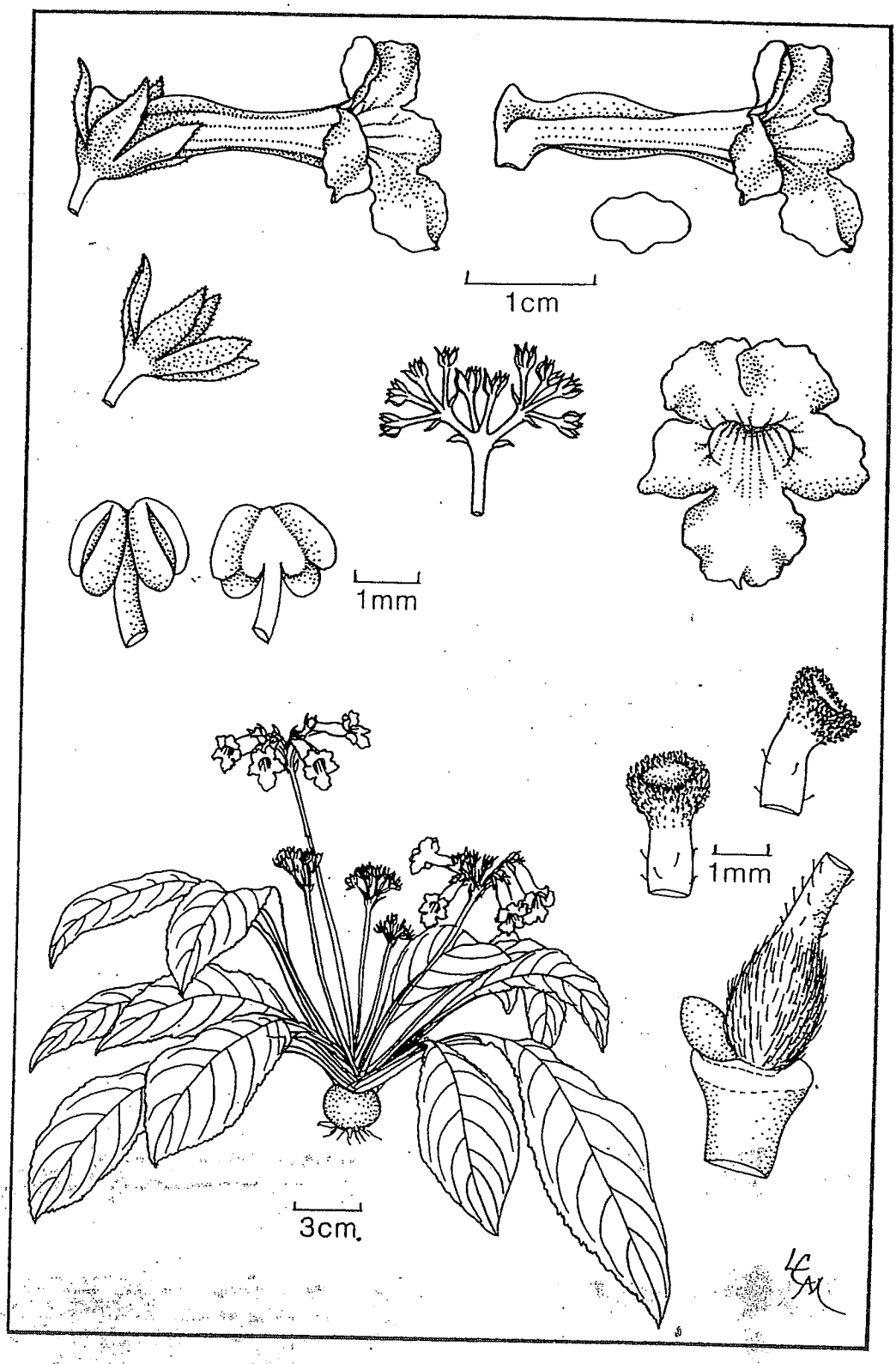

Figure 30: **Rhoogeton panamensis** Wiehler Panama
Voucher specimen: *Wiehler 8536* (GES; G-2633)
Illustrator: *Lisa C. Megahee*, 1980
Sponsor: *Mel Sater, Minneapolis, Minnesota*

leaves. *Rhoogeton panamensis* has the same kind of biserrate teeth on the leaves. It is not yet known whether these teeth in the Panamanian species possess the same ability for meristematic activity and asexual reproduction.

Smithiantha aurantiaca Wiehler, sp. nov.

Figure 31

Species haec ab *Smithiantha cinnabarina* (Lind.) Kuntze differt colore corollarum aurantiacis, et lobis lateralis corollarum triangularis et reflexis.

Terrestrial and lithophytic herbs with underground scaly rhizomes; stems erect or ascending, rarely branching, 60-80 cm tall, ca. 9-12 in diameter, light green, covered with reddish hairs, the internodes 1-4 cm long, the leaves opposite-decussate, of equal size, the petioles ca. 4 cm long, pale green to reddish, with prominent red hairs (hirsute), the lamina cordate, ca. 7 by 8 cm, obtuse, coarsely crenate to serrate, the large teeth with some secondary serration, adaxially pale green to reddish, hirsute, abaxially lighter green to maroon, hirsute, the secondary pairs of veins 4-5. Inflorescence an apical raceme of 25+ flowers in an alternate arrangement (= typically for the genus), ca. 28 cm long, light maroon, the indumentum consisting mostly of capitate-glandular trichomes, the bracts near the base leaf-like (petiole 8 mm, lamina 7 by 7 mm, green), the bracts above awl-shaped, 6 mm long, orange; the peduncles ca. 2.5 cm long maroon, hirsute, mixed with capitate-glandular trichomes; calyx hypanthium 2 mm long, the lobes triangular, 5 mm long, orange-maroon, the indumentum mixed with capitate-glandular hairs; corolla infundibular, nodding, ca. 2.5 cm long, light orange (R.H.S. Colour Chart: Orange Group 25 A), the tube dorsally pilose, with capitate-glandular trichomes, ventrally glabrescent, the dorsal lobes patent, triangular or rounded, the lateral lobes triangular, recurved, the rounded ventral lobe enlarged and stretched out like a landing platform, the tube inside ventrally with a prominent red-speckled nectar guide, the entrance guarded with scattered, short, capitate-glandular trichomes; stamens 4, included, adnate to the base of the corolla tube for 2 mm, ca. 1.9 cm long, white, glabrous, the anthers coherent into a square, each anther ca. 1.2 by 1 mm, the thecae parallel, dehiscing by longitudinal slits; ovary semi-inferior, turbinate, ca. 5 mm long, green, glabrous, the style ca. 1.8 cm long, pale orange, glabrous (distally sparsely pilose), the stigma stomatomorphic yet bilobed; nectary a narrow, 5-lobed ring, white, glabrous. Fruit a dry, bivalved capsule, ca. 1 cm long; seeds fusiform, ca. 0.5 by 0.2 mm, striate, dark brown.

TYPE: *MEXICO:* OAXACA: Rain forests of Uxpanapan, near Matias Romero and Rt. 185, also near Veracruz state border, on rock outcroppings and cliff sides. Seed collected by *Dr. Alfred Lau* (# *9410002*) in Febr. 1994. Sown and grown at GRF greenhouse, first flowers in June 1995, specimens prepared 8 July 1995, *Wiehler 95159* (HOLOTYPE: MEXU; ISOTYPES: GES, BH, K, NY, SEL, US, others to be distributed).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The most striking aspect of this species is the orange color of the corolla. Aurantiacus in Latin means orange.

Smithiantha aurantiaca appears to be related to *S. cinnabarina* (Lind.) Kuntze, the most widely spread of all species of this Mexican genus. Both species share the red-speckled or barred nectar guide inside the corolla tube. *Smithiantha aurantiaca* differs from *S. cinnabarina* by the orange color of the corolla and the oval shape of the limb of the corolla, caused by the completely reflexed lateral lobes.

All leaves in the cultivated specimens appear solidly green. In photographs produced by Dr. Lau (deposited at the GRF) several plants in the same population also exhibit leaves mottled with maroon.

Smithiantha canarina Wiehler, Phytologia 73(3): 239. 1992.

Figure 32

A *S. multiflora* (Martens & Galeotti) Fritsch corollis canarinis, tubis angustioribus longioribusque, ventraliter sine sulcis prominentibus, et lobis parvioribus bene distincta.

Terrestrial herb with underground rhizomes consisting of compacted, thick, succulent leaf-scales, each rhizome ca. 2.3 by 1 cm, cream-white, glabrous; stems erect or ascending, rarely branching, 50-60 cm tall, ca. 9 mm in diameter, pale green, with elongated whitish lenticels, puberulous, the internodes 4-5 cm long, the leaves opposite-decussate, of equal size, the petioles 4-5

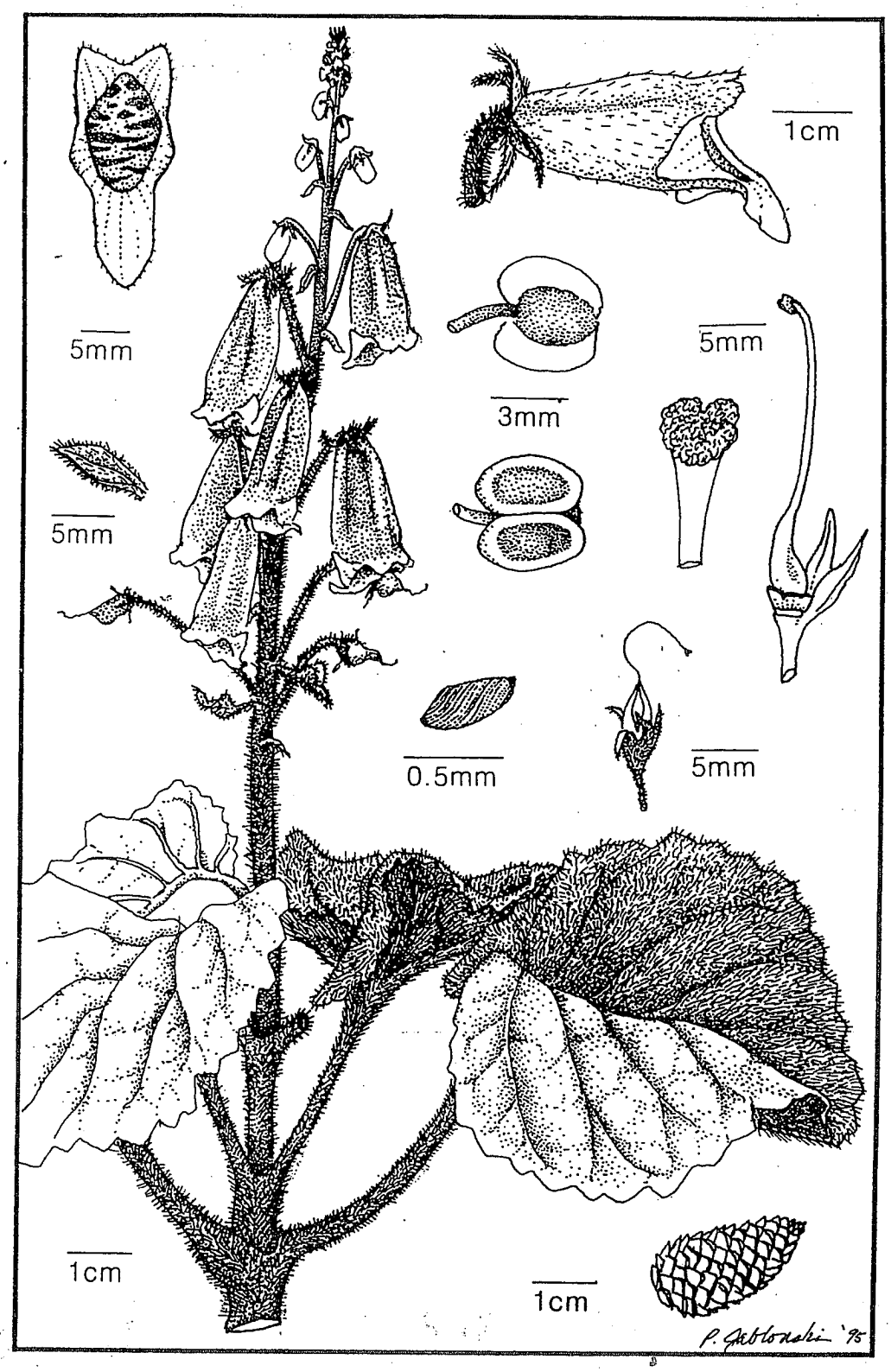

Figure 31: **Smithiantha aurantiaca** Wiehler Mexico
Voucher specimen: *Wiehler 95159* (GES; G-3878)
Illustrator: *Pamela Jablonski*, 1995
Sponsor: *Margarete Cass, Lafayette Hill, Pennsylvania, in memory of Elisabeth Hansen*

cm long, ca. 5 mm in diameter, pale green, puberulous, the lamina cordate, ca. 5 by 5 cm, acute, crenate, leathery-stiff, adaxially dark green, hirsute, abaxially lighter green suffused with maroon, puberulous, the secondary pairs of veins 4. Inflorescence an apical raceme of 20+ flowers in an alternate arrangement, ca. 36 cm long, all green parts puberulous, with scattered capitate-glandular trichomes, the bracts lanceolate, green, the pedicels ca. 1 cm long, green, the hypanthium at anthesis 4 mm long, dark green, the calyx lobes equal, lanceolate, 5 by 3 mm, medium green; corolla almost erect in the calyx, tubular-infundibular, the tube nodding, gradually widening, distally bent upwards, dorsally with 2 prominent longitudinal grooves, ca. 3.5 cm long, proximally 0.7 cm, distally 1.1 cm in diameter, canary yellow (R.H.S. Colour Chart: Yellow Group 9 C), puberulous, with scattered capitate-glandular trichomes, the limb ca. 1.5 cm in diameter, deeper canary yellow (Yellow Group 9 A), with short capitate-glandular trichomes, the lobes equal, rounded, ca. 6 by 6 mm, the tube inside yellow, ventrally with 3 faint orange nectar-guides, the throat covered with short capitate-glandular trichomes; stamens 4, included, adnate to the base of the corolla tube for 2 mm, ca. 2.6 cm long, white, pilose, the anthers coherent into a square, each anther 1.0 by 0.9 mm, the thecae parallel, dehiscing by longitudinal slits; ovary semi-inferior, turbinate, ca. 7 mm long, pale green, pubescent, the style ca. 2.3 cm long, white, pubescent-pilose, the stigma stomatomorphic; nectary a ring, ca. 1.5 mm high, with thickenings in the 2 lateral and the dorsal areas, grayish white, glabrous. Fruit a dry, bivalved capsule, ca. 1.4 cm long, splitting loculicidally; seeds fusiform, ca. 0.6 by 0.3 mm, striate, light brown.

TYPE: *MEXICO*: OAXACA: Area of Temaxcal, near dam overflow of Presa Miguel Alemán, on rock outcroppings in forest above road; whitish rhizomes of dormant plants and dried up stalks with seed pods in small crevices filled with humus, 24 April 1991, *Wiehler, Lau & GRF Expedition 9105* (GES). Grown from same rhizomes in GRF greenhouse, accession number G-3584, first flowers 24 Nov. 1991; specimens prepared 6 Dec. 1991, *Wiehler 91240* (HOLOTYPE: GES; ISOTYPES: BH, K, MEXU, NY, SEL, US, others to be distributed).

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: The specific epithet comes from the Latin word canarinus, meaning canary-yellow, with reference to the color of the corolla.

Smithiantha canarina appears to be closely related to *S. multiflora*. Both have about the same plant habit, plant size and leaf shape. In the latter, the corolla is white, with a prominent golden-yellow nectar guide. The broader corolla tube has a distinct "pinched-in" longitudinal furrow at midpoint on the ventral side, and the corolla lobes are larger and of unequal size. Capitate-glandular trichomes are absent on the inflorescence.

This yellow-flowered new species is today seemingly very rare, known only from a single collection. The locality is in the center of distribution of *S. multiflora*, which is native to northern Oaxaca and south-central Veracruz, having been collected there at about 10 different sites.

Smithiantha laui Wiehler, Phytologia 73(3): 240. 1992.

Figure 33

Inter species generis corollarum forma et colore purpurea differt.

Terrestrial herb with underground scaly rhizomes, ca. 2.5 by 1 cm, cream-white, glabrous; stems erect or ascending, rarely branching, 30-50 cm tall, 0.5-1.4 cm in diameter, succulent, pale green or deep maroon with elongated green lenticels, densely hirsute, the multicellular, uniseriate trichomes clear-celled or filled with anthocyanin, the internodes 2-4 cm long; the leaves opposite-decussate, of equal size or unequal, the petioles 2.5-5.5 cm long, near the base 0.8 cm in diameter, succulent, of the same color and indumentum as the stems, the lamina broadly cordate, 9-12 by 9-12 cm, acute, crenate, adaxially dark green or maroon, hirsute, abaxially lighter green or lighter maroon, hirsute, the secondary pairs of veins 4-6. Inflorescence an apical raceme of 18+ flowers in an alternate arrangement, to 40 cm long, green or maroon, hirsute, mixed with capitate-glandular trichomes, bracts 0.4 cm long, lanceolate, pedicels 2-3.5 cm long, green or maroon, hypanthium at anthesis conical, 4 mm long, calyx lobes broadly lanceolate, spreading, almost equal in size, 3 by 1.5 mm, green or maroon, hirsute, with capitate-glandular trichomes; corolla nearly erect in the calyx, infundibular, 4 cm long, the tube ca. 1.3 cm in diameter at mid-point, lavender-purple (Purple Group 77 C), sparsely hirsute, with capitate-glandular trichomes, the limb ca. 2.3 cm in

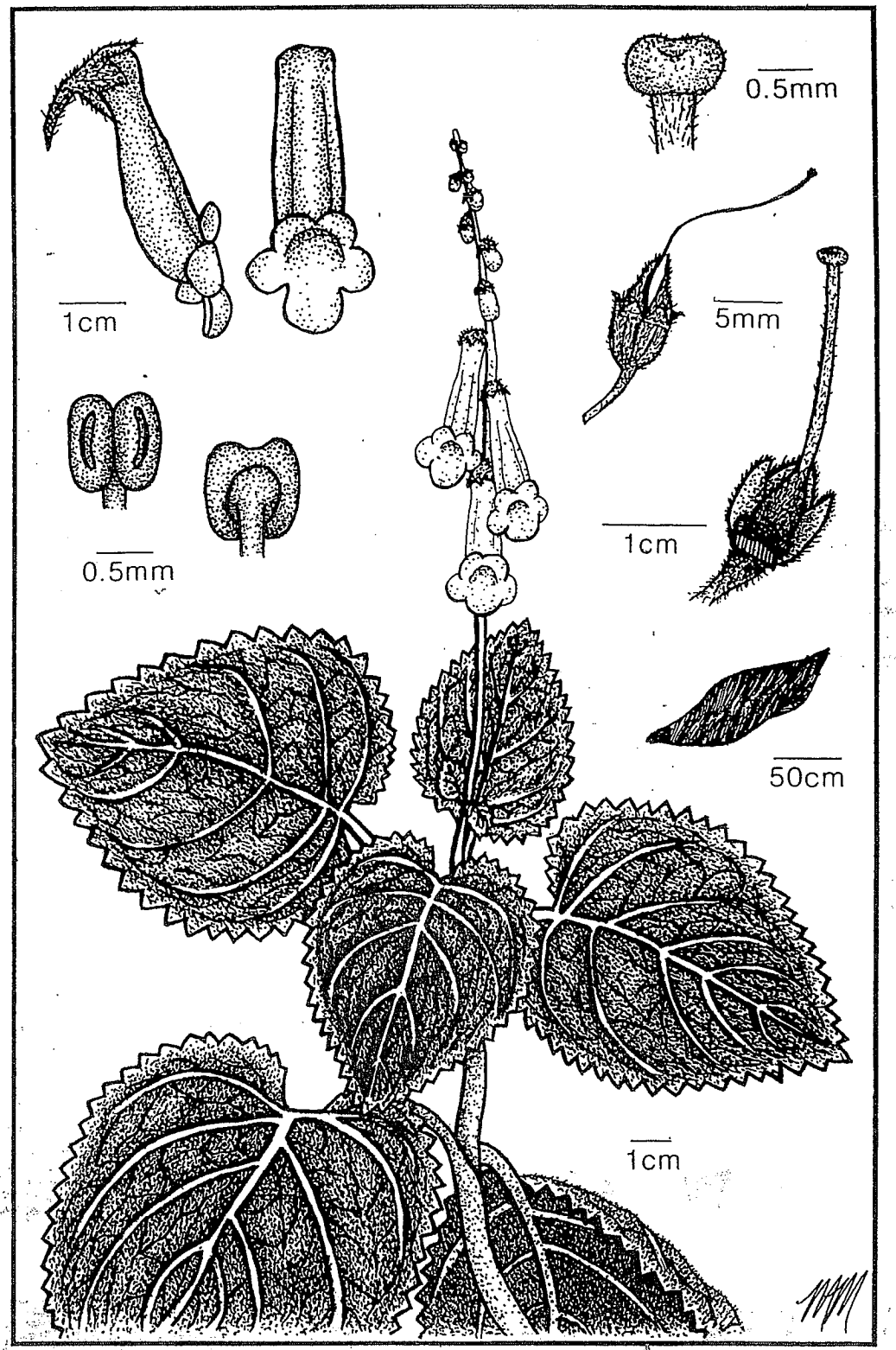

Figure 32: **Smithiantha canarina** Wiehler Mexico
Voucher specimen: *Wiehler, Lau & GRF Expedition 9105* (GES; G-3584)
Illustrator: *Merrillee Malwitz*, 1993
Sponsor: *Maryjane & John G. Evans, Randolph, New Jersey*

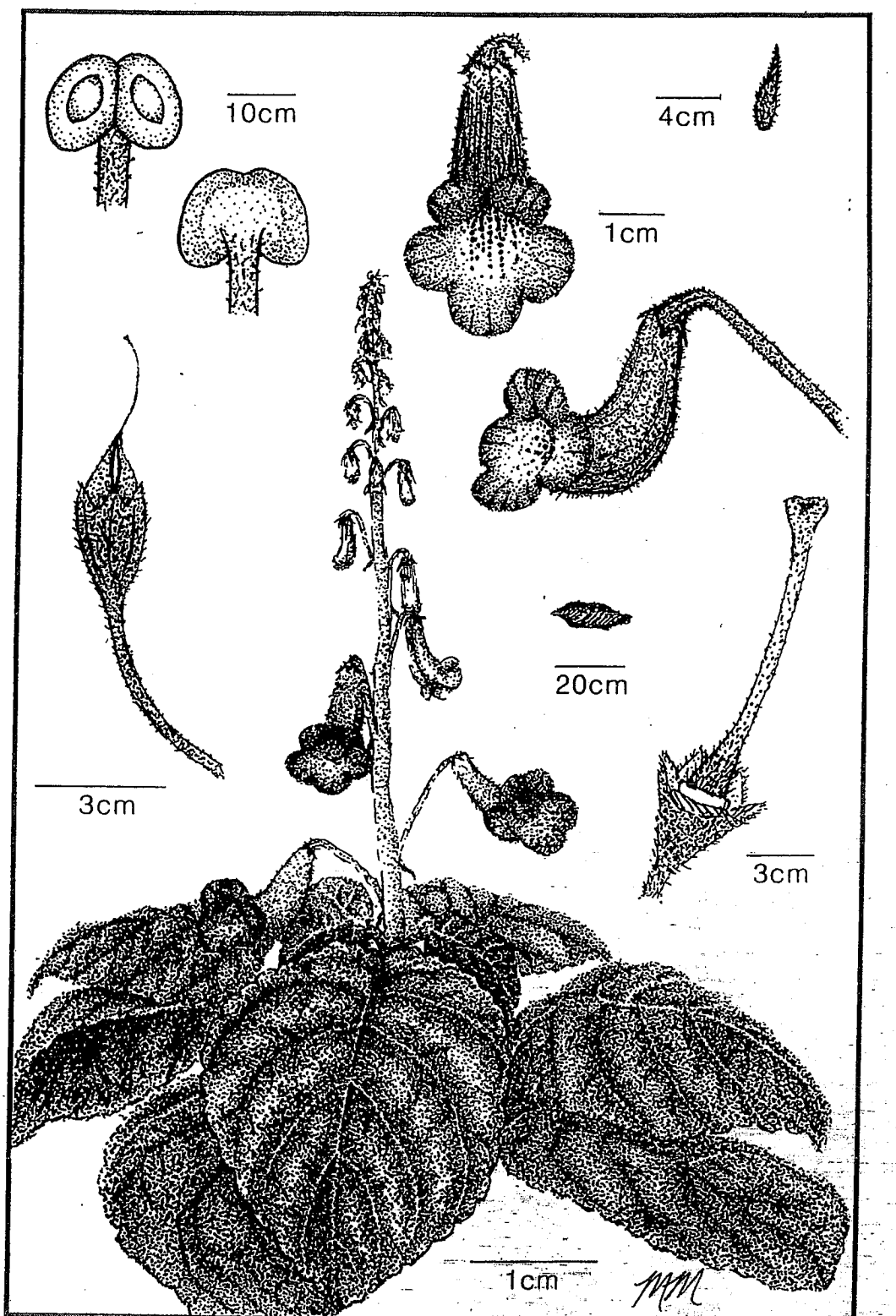

Figure 33: **Smithiantha laui** Wiehler Mexico
Voucher specimen: *Wiehler, Lau & GRF Expedition 9117* (GES; G-3588)
Illustrator: *Merrillee Malwitz*, 1994
Sponsor: *Keith Jacobson, Fargo, North Dakota*

diameter, the lobes rounded, of almost equal size, each 7 by 8 mm, entire, lavender-purple, with deeper purple spots outlined in white, pubescent, the throat and tube inside ventrally with three golden yellow nectar guide lines and spotted with purple; stamens 4, included, adnate to the base of the corolla tube for 2 mm, ca. 2.8 cm long, white, pubescent, the anthers coherent into a square, each anther 1 by 1.8 mm, the thecae parallel, dehiscing by longitudinal slits; ovary semi-inferior, turbinate, ca. 4 mm long, green, pubescent, the style ca. 1.6 cm long, white, sparsely pilose, the stigma stomatomorphic; nectary ring-shaped, ca. 1.5 mm tall, enlarged in the 2 lateral and in the dorsal areas, white, glabrous. Fruit a dry, bivalved, pointed capsule, ca. 1.6 cm long, splitting loculicidally; seeds fusiform, 0.5 by 0.2 mm, striate, reddish brown.

TYPE: *MEXICO:* OAXACA: About half-way between Valle Nacional and Oaxaca on road no. 75. On almost vertical rocks of roadside cut, dripping with water. Whitish rhizomes, dried up plant stalks, and a few small plants in flower. Area wet, at the beginning of the rainy season. Plants fully sun-exposed or in partial shade, altitude 1100 m; 25 April 1991, *Wiehler, Lau & GRF Expedition 9117* (GES). Grown from the above-cited rhizomes in GRF greenhouse, accession number G-3588, first flowers 29 November 1991; specimens prepared 6 December 1991, *Wiehler 91241* (HOLOTYPE: GES; ISOTYPES: BH, K, MEXU, NY, SEL, US, others to be distributed.)

DISTRIBUTION: Known only from the type locality.

ETYMOLOGY: Named in honor of Dr. Alfred B. Lau, of Fortín, Veracruz, Mexico, who discovered this species in 1989 and sent photos of it to the Gesneriad Research Foundation in Florida for identification. Don Alfredo is a well-known collector of Mexican cacti and succulents (as well as bromeliads, orchids, etc.) and is now also interested in gesneriads. He and his wife Annie very courageously run a school for boys from local Indian tribes. The boys help to collect the rare plants and also help to tend them in Fortín.

Probably pollinated by male and female Euglossine bees in search of nectar, *Smithiantha laui*, with its widely flaring, lavender-purple, spotted corollas, is quite distinct from the other five species of *Smithiantha*, all endemic to southern Mexico.

During its one-week stay to Mexico, the GRF Expedition was also able to find *S. zebrina* (Paxton) Kuntze, which is known only from five different collections between 1838 and 1914, and with the material in cultivation degenerated. After communicating to Dr. Lau the old collection sites, all in the state of Veracruz, he and his boys were able to find live plants at one site, and half a year later lead the GRF group to it to dig some rhizomes.

All six species are now in cultivation. They and their hybrids provide excellent horticultural material, flowering in late fall and winter. Some of the species have also produced sterile intergeneric hybrids with the genera *Achimenes* Persoon, *Eucodonia* Hanstein, *Gloxinia* L'Heritier, *Heppiella* Regel, and *Moussonia* Regel (Wiehler, 1983). Other combinations are possible.

Table 5: Floral Key to the Species of *Smithiantha*

Species	Corolla	Distribution
1. *S. aurantiaca* Wiehler	orange	Oaxaca
2. *S. canarina* Wiehler	yellow	Oaxaca
3. *S. cinnabarina* (Linden) Kuntze [synonyms: S. fulgida (Ortgies) Voss; *Koellikeria mexicana* Matuda]	red	Chiapas, Oaxaca, Tabasco, Veracruz
4. *S. laui* Wiehler	purple	Oaxaca
5. *S. multiflora* (Martens & Galeotti) Fritsch	white	Oaxaca, Veracruz
6. *S. zebrina* (Paxton) Kuntze	red & yellow	Veracruz

Trichantha tenella Wiehler, sp. nov.

Figure 34

Trichanthae gracili Wiehler aemulans, differt calicum lobis lanceolatis, corollarum lobis aequilongis concavis, et calcaribus grandibus.

Epiphytic or lithophytic, perennial, suffrutescent herb; stems erect or spreading, freely branching, to ca. 20 cm long, ca. 3-5 mm in diameter, green and tan, velutinous-hirsute, with internodes 1.5 to 2.5 cm long; leaf pairs very unequal, the petiole of the larger leaf ca. 2-4 mm long, green, hirsute, the lamina elliptic, ca. 6 by 1.5 cm, acuminate, serrate, oblique, papyraceous, green, hirsute, with 7-8 pairs of secondary veins, the smaller leaf of a pair similar, lanceolate, ca. 0.5 cm long. Inflorescence an axillary cyme of 1-4 flowers, propylls and subtending bracts lanceolate, ca. 2.5 mm long, early caducous, peduncle 1-3 mm long, pedicels ca.

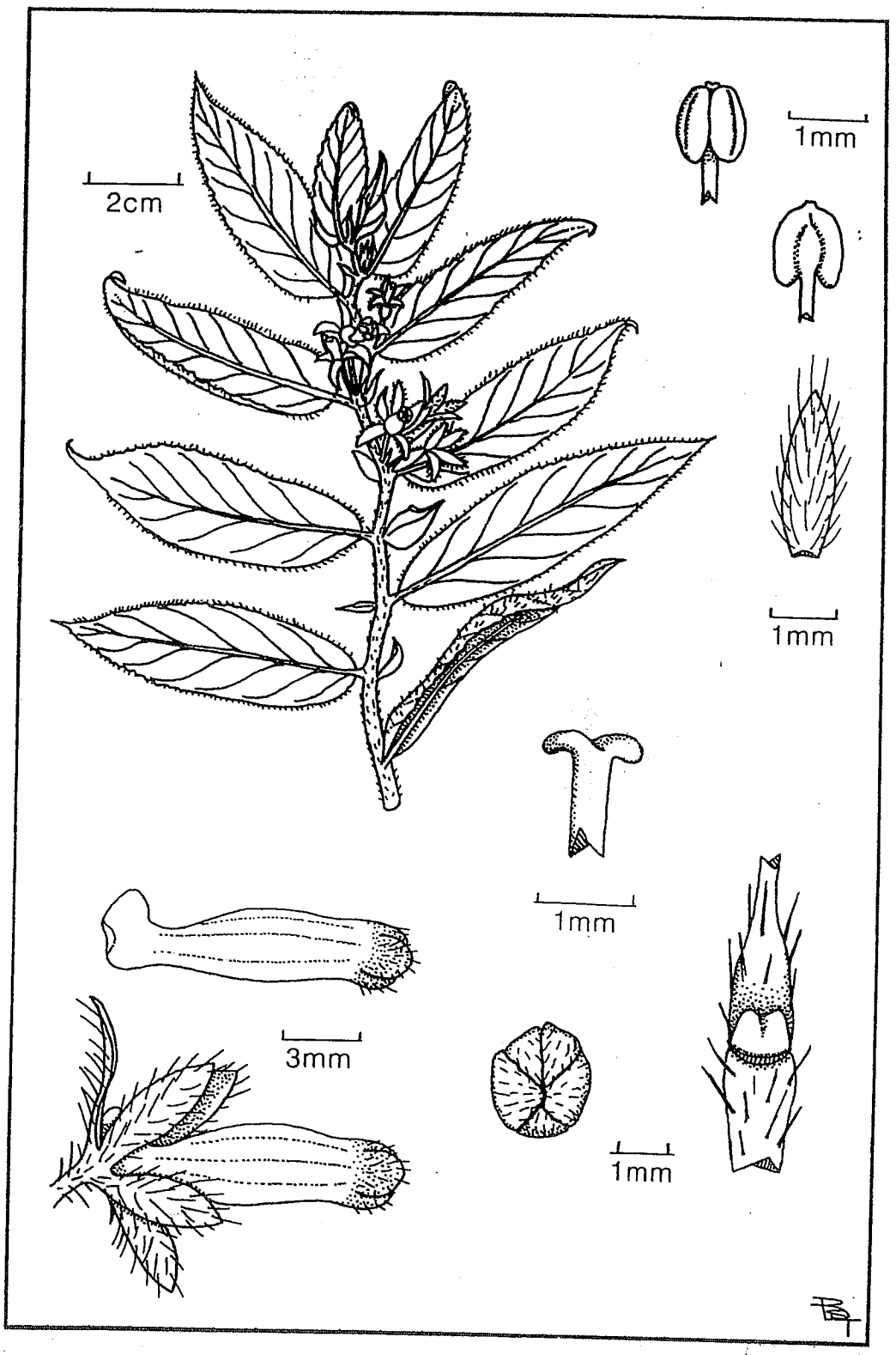

Figure 34: **Trichantha tenella** Wiehler Ecuador
Voucher specimen: *Madison & Besse 7011* (SEL; G-2876)
Illustrator: *Robert Scott Thompson*, 1982
Sponsor: *Vancouver African Violet Society, British Colombia, Canada*

8 mm long, reddish, hirsute; calyx turbinate, the lobes subequal, lanceolate, 10 by 3 mm, acute, entire, red, velutinous, with trichomes ca. 3 mm long; corolla erect in the calyx, tubular, ca. 1.2 cm long, with a prominent spur, cream-white at base, rose-red above, the equal-sized lobes deep purple-red, each lobe ovate, 2 by 2 mm. entire, concave-incurved, hiding the pubescent inside of the tube at anthesis; stamens 4, included, the filaments ca. 9 mm long, white, glabrous, the anthers syngenesious, each anther about 1 mm long; ovary cone-shaped, 2.5 mm long, yellow-green, sparsely pilose, the style ca. 11 mm long, white, glabrous, the stigma bilobed; nectary a double-connate, dorsal, bilobed, grey, glabrous gland. Fruit a globose, somewhat elongated berry, ca. 8 mm in diameter, white, pilose; seeds oblong, striate, reddish, ca. 1mm long.

TYPE: *ECUADOR*: CARCHI: Maldonado, 2 km E of town, on boulders along Río San Juan, in disturbed forest area, 19 April 1993, *Wiehler & GRF Expedition 93129A* (grown and flowered in GRF greenhouse from 1 small cutting, (HOLOTYPE: GES).

ADDITIONAL MATERIAL EXAMINED: *ECUADOR*: CARCHI: Environs of Chical, 12 km below Maldonado, on Río San Juan, 1200 m altitude, wet montane forest, epiphyte, 29 May 1978, *Madison, Plowman, Kennedy & Besse 4756* (QCNA, SEL); below Maldonado, El Pailon, *Madison & Besse 7011* (SEL); area of Lita, March 1990, *Determan et al, s.n.* (GES). *COLOMBIA*: VALLE: Westandiner feuchter Bergwald bei Anchicayá, zwischen Cali und Bonaventura, 400 m, kleiner epiphyt mit roten Blüten, 3 Sept. 1956, *St. Vogel 97* (US).

DISTRIBUTION: Along the Pacific slope of the wet Andean rainforests, from northwestern Ecuador to the Chocó in Colombia, at altitudes from 400 to 1200 m.

Trichantha tenella looks similar in habit and flower to *Trichantha gracilis* Wiehler from around Medellín in Colombia, but in that species the calyx lobes are rounded, the 2 upper corolla lobes are enlarged, the tube is not enclosed by concave lobes, and the spur is quite minute.

ACKNOWLEDGEMENTS

I want to thank the curators of the herbaria cited for the loan of their gesneriad specimens, and for the chance to photograph *in sito* type specimens and other critical material. The many members of the 10 GRF Expeditions to Latin America since 1986 need recognition for their enthusiastic help in collecting and processing gesneriad specimens. The GRF illustrator team in Sarasota deserves gratitude for their many pen and ink drawings, from live greenhouse specimens, pickled material and dried herbarium collections. The Foundation is also indebted to the many sponsors of gesneriad illustrations. Their contribution of illustration fees enables the artist's project to continue into further issues of this magazine.

Last of all, I want to thank the volunteers at the Gesneriad Research Foundation for their unending effort to keep the precious and historic gesneriad collection alive and well, and to help the Foundation to fulfill its mission.

LITERATURE CITED

WIEHLER, H. 1983. A Synopsis of Neotropical Gesneriaceae. Selbyana 6:1-219.