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PLANTAE AUSTRO-AMERICANAE IX

PLANTARUM NOVARUM VEL NOTABILIUM NOTAE DIVERSAE

BY

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CONTINUED studies of recent collections from northwestern South America, chiefly from Colombia, have disclosed a number of plants which are, for one reason or another, of importance to our growing understanding of the flora of this critical part of the New World tropics. Most of the plants herein discussed are from Amazonian Colombia.

I acknowledge with thanks the collaboration of Dr. Lyman B. Smith, of the Smithsonian Institution, who is responsible for the work on the *Bromeliaceae*, and of Dr. Alicia Lourteig, Guggenheim Fellow in Botany at the Gray Herbarium of Harvard University, who has contributed the section on *Cuphea*.

ARACEAE

Anthurium atropurpureum *Schultes & Maguire*
ex Schultes in Bot. Mus. Leafl. Harvard Univ. 16 (1953)
60.

Further studies on the aroids of Amazonian Colombia have made it seem advisable to publish a drawing of *An-*

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thurium atropurpureum (Pl. XXII). Later studies may indicate that this species represents a very important complex on the Cretaceous quartzitic hills and savannahs of the Vaupés and Amazonas.

Anthurium atropurpureum *Schultes & Maguire*
var. ***apertum*** *Schultes var. nov.*

Haec varietas ab *Anthurio atropurpureo* nervis secundariis arcuatis apertis vel non confluentibus spatha spadicisque majoribus differt.

It might at first seem that the venation character upon which this newly described variety is based is trivial. Notwithstanding its rather unobtrusive nature on superficial examination, I have found that it is stable. Having no other morphological characters of importance to differentiate it as a species, this concept is probably best treated as a variety of *Anthurium atropurpureum*.

The secondary veins of *Anthurium atropurpureum*, as can be seen in the figure published herewith, are arcuate and run together near the margin of the leaf-blades to form a continuous and stout nerve parallel to the margin. In the new varietal concept here described, the secondary veins are also arcuate, but they are not confluent and, consequently, do not form a continuous nerve along each margin. The varietal epithet has reference to the open appearance of the veins in contrast to the closed appearance which the confluent veins of the species exhibit.

Like *Anthurium atropurpureum*, this new variety is an inhabitant of the curious xerophytic islands of savannah or scrubby vegetation that are found scattered here and there in the Colombian Amazonia. *Anthurium atropurpureum* var. *apertum* is probably much more abundant and perhaps more widespread than is *A. atropurpureum* itself.

COLOMBIA: Comisariás del Amazonas-Vaupés, Rio Apaporis, Raudal de Jirijirimo. Extensive white-sand savannah or caatinga on right

bank. "Spike purple. Leaves stiff. In sterile white sand." March 1951, *Richard Evans Schultes 12094* (TYPE in Herb. Gray).—Same locality. August 12, 1951, *Richard Evans Schultes & Isidoro Cabrera 13517*.—Comisaría del Vaupés, Río Vaupés, Raudal de Yuruparí (\pm 350 kts. arriba de Mitú). Alt. 220 m. "Espata verdosa; espádice amarillo-violáceo." September 24, 1939, *J. Cuatrecasas 6963*.

***Anthurium crassinervium* (Jacq.) Schott Melet.**
1 (1832) 22.

Anthurium crassinervium appears to be rather widespread in northern South America, but in the northwest Amazon basin it is confined to the granitic, pre-Cambrian, dome-shaped mountains, where it occurs often in great abundance under conditions of extreme xerophytism. The collection *Cuatrecasas 6885* establishes its occurrence in the Colombian Amazonia.

COLOMBIA: Comisaría del Vaupés, Río Vaupés, Cerro de Mitú. Alt. 380 m. "Espadice pardo-violáceo." September 17, 1939, *J. Cuatrecasas 6885*.

VENEZUELA: Territorio del Amazonas, Río Negro, Piedra del Cocuí. "Terrestrial." December 22-23, 1947, *Richard Evans Schultes & Francisco López 9423*.

***Anthurium gracile* (Rudge) Engler** in Bot. Jahrb. 25 (1898) 370.

A widespread plant of the rain tropics of South America, *Anthurium gracile* has apparently not hitherto been reported from eastern Colombia.

COLOMBIA: Intendencia del Meta, Sabanas de San Juan de Arama, margen izquierda del Río Güejar, alrededores del aterrizaje "Los Micos." Alt. ca. 500 m. "Epífita. Espata purpúreo-grisácea." January 22, 1951, *Jesús M. Idrobo & Richard Evans Schultes 1268*.

***Anthurium Idroboanum* R. E. Schultes sp. nov.**

Herba terrestris, usque ad $2\frac{1}{2}$ pedes alta, in coloniis in silvis densis pluviosisque crescens. Caudiculus magno-pere abbreviatus, robustus, internodiis brevissimis. Folia rigidissime erecta, valde coriacea, supra atroviridia, sub-

tus pallide viridia, cum petiolis strictis crassioribus sulcate subtetragonisque, basi latiuscule dilatatis, usque ad 31 cm. longis, 8–10 mm. in diametro; angulis praecipue apicem versus inconspicue alatis; lamina adulta glabra, supra atroviridis, subtus pallidior, cordato-ovata, apice rotundato-obtusa, leviter marginata, lobis posticis circiter 10 cm. longis, 2–3 cm. latis, rotundatis, sinu angusto acuto sejunctis, nervo centrali robusto recto (siccitate substramineo) usque ad apicem penetrante, supra leviter sed subtus valde elevato, nervis secundariis vel lateralibus arcuatis, non confluentibus, e basi nascentibus utrinque tribus centralibus similibus, transversis paucis paullo tenuioribus conjunctis. Inflorescentia erecta, pedunculo aliquid carnosulo, usque ad 60 cm. longo, 5–8 mm. in diametro. Spatha late lanceolata, glaberrima, utrinque flavo-viridis, basi cordato-amplexicaulis, apice acuta, usque ad 9 cm. longa, inferne 2 cm. lata, vivo non recurva. Spadix erectus, caudiformis vel cylindricus, apice plusminusve truncatus, apparenter estipitatus, 7–10 cm. longus, atropurpureus.

Anthurium Idroboanum, belonging to Engler's section *Cardiolonchium*, seems to resemble most closely *A. magnificum* Linden, native of the eastern cordillera of Colombia, a species which has been important in hybridization for horticultural work in the genus. The former may be distinguished from the latter at once by differences in the size and venation of the leaves, by having an estipitate spadix which is only half as long and by having much shorter and more membranaceous, yellowish green spathes. The leaf of the newly described species is also far more coriaceous than that of *Anthurium magnificum*, and the plant seems to be humbler.

The base of the leaf of *Idrobo & Schultes 957* is far more deeply cordate than in the type collection, but all other essential characters exhibit an unusual stability in

the three collections which are at present available.

COLOMBIA: Intendencia del Meta, Cordillera La Macarena (extremo nordeste), Macizo Renjifo, cumbre y alrededores. Alt. 1300–1900 m. “En colonias. Sobre capa de hojas secas. Espádice purpúreo.” January 6–20, 1951, *Jesús M. Idrobo & Richard Evans Schultes 1162* (TYPE in Herb. Gray).—Same locality and date. “Terrestrial. Spathe green, bent back. Leaf discolourous, very dark green above, lucid above, pale green and punctate beneath. Basic colour of spadix reddish brown.” *Jesús M. Idrobo & Richard Evans Schultes 957*.—Intendencia del Meta, Sierra de La Macarena, Central Mountains, North Ridge. Alt. 1400 m. “Dense humid forest. Terrestrial; leaves coriaceous. Spathe green, tinged with red; spike brown.” December 25, 1949, *W. R. Philipson & J. M. Idrobo 1926*.

***Anthurium macarenense* R. E. Schultes & Idrobo**
sp. nov.

Anthurio cabrerensi proxima sed principaliter lamina membranacea (non coriacea), apice abrupte et longe attenuata (non acuta), spathe atosanguinea venis viridibus elongato-lanceolata spadici subaequali (non spathe cuprea ovato-lanceolata spadici longitudinis $\frac{2}{3}$ aequanti) differt.

Anthurium macarenense would seem to be very closely allied to *A. cabrerense* Engl. from the Departamento del Tolima in Colombia, which is described and well illustrated in Engler Pflanzenreich IV. 23B (Heft 21) (1905) 208.

The former species differs from the latter primarily in having a more delicate leaf-blade which is abruptly and attenuately tipped, and in having a spathe which differs in size, shape and color.

COLOMBIA: Intendencia del Meta, Cordillera La Macarena (extremo nordeste), Macizo Renjifo, cumbre y alrededores. Alt. 1300–1900 m. “Spathe deep red or maroon both sides with veins greenish. Epiphyte. Fruits pink. Peduncle and petioles red. Spathe arcuate.” January 6–20, 1951, *Richard Evans Schultes & Jesús M. Idrobo 954* (TYPE in U. S. Nat. Herb. No. 2029669).—Intendencia del Meta, Sierra La Macarena, selva densa entre los Ríos Gúejar y Sansa. Sobre la mesa nordeste. Alt. 500–1,000 m. August 29, 1950, *J. M. Idrobo 527*.

***Anthurium macrocephalum* R. E. Schultes sp. nov.**

Herba terrestris, ut videtur usque ad $2\frac{1}{2}$ vel 3 pedes alta, in silvis umbrosis humidisque crescens. Caudiculus probabiliter abbreviatus. Folia rigide erecta, coriacea, supra vivo apparenter atroviridia, subtus pallidiora, cum petiolis crassis, lateraliter compressis, sulcatis, quam lamina longioribus, 55 cm. longis vel longioribus, 10 mm. in diametro vel vivo majoribus; lamina adulta glabra, utrinque minutissime (subtus densius) nigropunctulata, ovata, apice rotundata, basi breviter attenuata, margine aliquid incrassata, plusminusve 44 cm. longa, 35 cm. lata, cum costa sex-nervia, nervis lateralibus primariis intimis in apicem exeuntibus, duobus extimis in infima media parte margine crassiore approximatis et in eo evanescentibus, secundariis parallelis, tenuibus inter se 1.5–2 cm. distantibus, tertiis pluribus tenuissimis. Inflorescentiae usque ad 62 cm. altae vel altiores, erectae sed apparenter spadice nutanti, pedunculis petiolis similibus, usque ad 12 cm. in diametro. Spadix cylindricus, apice rotundato-obtusus, 20–22 cm. longus, siccitate 3.5 cm. in diametro, estipitatus, viridis. Spatha coriacea, late lanceolata, apice acuta, 8–9 cm. longa, 2–2.4 cm. lata, glaberrima, viridis. Baccae oblongae, tetragonae, in stylum prismaticum productae.

Anthurium macrocephalum belongs to Engler's section *Digitinervium* and seems to be closely related to *A. pangoanum* Sod. of Ecuador. The former can be distinguished from the latter principally by having leaves which, while shorter, are wider, giving them a truly ovate shape; by having a much longer petiole; by having a much thicker spadix which is green, not rose-colored; and by having a much longer and wider spathe. *Anthurium pangoanum* is described as being "nigropunctata" on both surfaces of the leaf, but in *A. macrocephalum* the

upper surface, although extremely remotely beset with minute black dots, cannot be compared with the lower surface, which is rather densely ornamented with these glandular (?) structures.

COLOMBIA: Departamento del Cauca, El Tambo, Cordillera Occidental, vertiente oriental, La Paz y alrededores, Las Juntas. Alt. 1400–1700 m. “En riachuelo, parte sombrosa. Espata verde, espádice verde.” August 29, 1949, *J. M. Idrobo 280* (TYPE in U.S. Nat. Herb. No. 2029344).

Anthurium nemoricola *Schultes & Maguire ex Schultes* in Bot. Mus. Leaflet. Harvard Univ. 16 (1953) 61.

It has been considered advisable to publish the accompanying drawing (Pl. XXII) of this curious little xerophytic species of *Anthurium*.

Anthurium oblongo-cordatum *Engler* in Pflanzenr. IV, 23B (1905) 110.

This species was first described from the Quindío region of Colombia. The collection cited below, in spite of slight differences from the type, would seem to be easily accommodated in *Anthurium oblongo-cordatum*.

COLOMBIA: Departamento del Cauca, Cordillera Occidental, vertiente oriental. Cuchilla del Tambo. Alt. 1750 m. August 1949, *Jesús M. Idrobo & Alvaro Fernández 44*.

Anthurium panduratum *Martius ex Schott* in Oestr. Bot. Wochenbl. (1855) 273.

Anthurium panduratum was described from material collected by Martius on the “Japurá” (Río Caquetá), probably in Colombian territory. The collections cited below indicate that the concept is relatively widely distributed in Amazonian Colombia.

COLOMBIA: Comisaría del Vaupés, San José del Guaviare. November 12, 1939, *J. Cuatrecasas 7444*.—Comisaría del Amazonas, Río Loretoyacu, September 1945, *Richard Evans Schultes 6071*.—Comisaría del Amazonas, Río Loretoyacu, October 21, 1946, *Richard Evans Schultes & George Black 8549*.—Comisaría del Amazonas, Río Boiauasú, October 27, 1946, *Richard Evans Schultes & George Black 8606*.

***Anthurium pentaphyllum* (Aubl.) G. Don** in Sweet Hort. Brit. ed. 3 (1834) 633.

Widespread in tropical South America, *Anthurium pentaphyllum* has hitherto not been recorded from Amazonian Colombia.

COLOMBIA: Comisariás del Amazonas-Vaupés, Río Apaporis, entre el Río Pacoa y el Río Kananarí. Soratama. Alt. ca. 250 m. "Climbing epiphyte. Spathe greenish, yellow near tip. Spadix green-grey, reflexed." August 27, 1951, *Richard Evans Schultes & Isidoro Cabrera 13786*.

***Anthurium popayanense* Engler** in Bot. Jahrb. 6 (1885) 274.

Anthurium popayanense has hitherto been known only from the region around Popayán in Colombia.

COLOMBIA: Intendencia del Chocó, Corcovada Region, upper Río San Juan. Ridge along Yeracüí Valley. Alt. 200–275 m. Dense forest. "On tree. Spathe green. Spadix pinkish yellow." April 24–25, 1939, *E. P. Killip 35315*.

***Anthurium reticulatum* Benth**am Pl. Hartweg. (1846) 255.

Anthurium reticulatum has previously been known from the regions near Cali and Popayán in Colombia.

COLOMBIA: Intendencia del Chocó, dense forest south of Río Condoto, between Quebrada Guarapo and Mandinga. Alt. 120–180 m. "Terrestrial. Spathe green. Spadix pink." April 22–28, 1939, *E. P. Killip 35439*.

***Anthurium scolopendrinum* (Ham.) Kunth** Enum. Pl. 3 (1841) 68.

Notwithstanding the fact that this species is rather widespread in tropical South America, it has apparently not hitherto been reported from eastern Colombia.

COLOMBIA: Intendencia del Meta, Sabanas de San Juan de Arama, margen izquierda del Río Güejar, alrededores del aterrizaje "Los Micos." Alt. ca. 500 m. "Espata roja. Espádice rojo." January 22, 1951, *Jesús M. Idrobo & Richard Evans Schultes 1203*.

Paepalanthus Moldenkeanus *R. E. Schultes* sp.
nov.

Planta frutescens, robusta, sublignosa, breviter caulescens. Folia prope rami simplicis apicem rosulate disposita, firmissime chartacea, plana, attenuato-lineararia, 18–21 cm. longa, basi 1.5–2.3 cm. (parte centrali 1–1.5 cm.) lata, basi dense longeque albo-pilosa, infra medium margine (et raro in lamina) maxime sparsissime breviterque setosa, demum utrinque glabra nitidaque. Caulis florifer erectus, robustior, sublignosus, usque ad 1.80 m. altus, 1–1.5 cm. in diametro, bracteis multis foliaceis, chartaceis, lanceolato-triangularibus, usque ad 13.5 cm. longis, basi 2.4 cm. latis, apicem versus minoribus, margine remotissime albo-ciliatis, utrinque glabris nitidisque, spiraliter obtectus. Pedunculi plusminusve centum quadraginta, filiformes, 30–35 cm. longi, 1.5–2 mm. in diametro, glabri, obscure bicostati, conspicue contorti, vaginis gracillimis, cylindricis, chartaceis, stramineis, apice bifidis, basi dense albo-pilosis, contortis, 4.5 cm. longis. Capitula perfecte globosa, luteo-albida, 10–12 mm. in diametro. Bracteolae stramineae, triangulares, circiter 2 mm. longae, 1–1.5 mm. latae. Flores staminiferi basi dense longeque albo-barbati, sepalis hyalinis, oblongis, apice acutis et barbellatis, 3 mm. longis, 1 mm. latis, petalis in tubum infundibuliformem, 3.5–4 mm. longum connatis, staminibus circiter 1 mm. longis. Flores pistillati basi dense longeque albo-barbati, sepalis hyalinis, late spatulatis, 4.5 mm. longis, 2–2.5 mm. latis, petalis similibus sed paulo majoribus, apice barbellatis, stigmatibus 2 mm. longis, ovario elongato-ovoideo, 2 mm. longo, 1 mm. in diametro, glabro sed basi densissime albo-barbato.

Paepalanthus Moldenkeanus is set apart from all other known species of the genus from Colombia and northern

South America by its unusual size. It is a robust plant that normally reaches a height of five and a half or six feet.

This extraordinary plant inhabits the immense sandstone savannahs to the north of the Colombian part of the Río Vaupés above Mitú. It has been collected at Yapobodá at the headwaters of the Río Kuduyarí and at Kañendá on the Río Kubiyú. An aeroplane reconnaissance has shown that these two savannahs are continuous. I have seen this plant, but was unable to collect it, on the great savannahs of Goo-rán-hoo-da on the Río Karurú in the upper Vaupés. The Karurú savannahs may possibly be continuous with Kañendá and Yapobodá. *Paepalanthus Moldenkeanus* undoubtedly represents another of the curious endemic plants which have turned up during our investigation of these ancient quartzitic savannah formations in the Vaupés.

Growing in close proximity to *Vellozia lithophila*, *Bombax coriaceum*, *Hevea nitida* var. *toxicodendroides*, *Leitgebia colombiana* and *Styrax rigidifolius* forma *yapobodensis*,¹ *Paepalanthus Moldenkeanus* is admirably adapted to the extreme conditions of xerophytism which obtain on these savannahs. It occurs in isolated colonies of from ten to fifty individuals in slight depressions or swales on the usually flat savannah. These swales are moist and highly acidic and are repositories of very interesting grasses and sedges, as well as xyridaceous, lentibulariaceous and erio-caulaceous species. There are a number of other species of *Paepalanthus* in the same localities, but all are diminutive plants.

It is appropriate that I dedicate this majestic new species to my friend, Dr. Harold N. Moldenke, in recognition of his extensive researches in the family *Eriocaulaceae*.

¹ Steyermark (in *Fieldiana* 28 (1953) 492) considers *Styrax yapobodensis* (Idrobo & R. E. Schultes) Steyermark to be a distinct species.

COLOMBIA: Comisaría del Vaupés, Río Kuduyarí (tributary of Río Vaupés), Yapobodá. Quartzite savannah near headwaters. Alt. about 900–1000 feet. General location: Lat. $1^{\circ}20'$ N, Long. $70^{\circ}30'$ W. “From 4 to 6 feet tall. Flowers white.” October 4–5, 1951, *Richard Evans Schultes & Isidoro Cabrera 14351* (TYPE in Herb. Gray).—Comisaría del Vaupés, Río Kuduyarí (tributary of Río Vaupés), Yapobodá, quartzite savannah near headwaters. Alt. about 900–1000 ft. General location: Lat. $1^{\circ}20'$ N, Long. $70^{\circ}30'$ W. “Up to 6 feet tall. Flowers yellow-white.” October 5–6, 1951, *Richard Evans Schultes & Isidoro Cabrera 14265*.—Comisaría del Vaupés, Río Kubiyú (tributary of Río Vaupés), Cerro Kañendá, savannahs about 15 miles upstream from mouth. Quartzite base. Alt. about 800–900 feet. General location: Lat. $1^{\circ}0'$ N, Long. $70^{\circ}15'$ W. November 10, 1952, *Richard Evans Schultes & Isidoro Cabrera 18385*.—Comisaría del Vaupés, Río Kubiyú (tributary of Río Vaupés), Cerro Kañendá, savannahs about 15 miles upstream from mouth. Quartzite base. Altitude about 800–900 feet. General location: Lat. $1^{\circ}0'$ N, Long. $70^{\circ}15'$ W. “Four feet tall. Flowers yellow-white.” May 5, 1953, *Richard Evans Schultes & Isidoro Cabrera 19239*.—Comisaría del Vaupés, Río Kuduyarí (tributary of Río Vaupés) Yapobodá. Quartzite savannah near headwaters. Alt. about 900–1,000 feet. “Four feet tall. Common in swales.” April 1953, *Richard Evans Schultes & Isidoro Cabrera 19975*.—Comisaría del Vaupés, Río Kubiyú, Cerro Kañandá. Alt. más o menos 380 m. “Dos metros alto, erecto; flores blancas.” November 2–4, 1952, *Hernando García-Barriga 15088*.

THURNIACEAE

***Thurnia sphaerocephala* (Rudge) Hooker filius** in Hooker Icon. Pl. (1883) t. 1407.

The collections *Schultes & Cabrera 17568* and *19853* establish for the first time the occurrence in Colombia of the monogeneric family *Thurniaceae*, allied to the *Juncaceae* and the *Rapateaceae*.

The genus *Thurnia* comprises two species. *Thurnia Jenmani* occurs in British Guiana, where the type was found “thickly choking the Potaro river above and below the Kaieteur falls.” The range of *Thurnia sphaerocephala* is greater, including British Guiana and in scattered localities in the Brazilian Amazonia south to the Xingú and west to the Solimões. The range extension

herewith reported to Amazonian Colombia greatly amplifies the known distribution of this rare plant.

In the small creeks and rills forming in the headwaters of the Río Piraparaná, *Thurnia sphaerocephala* grows in extraordinary abundance in the shallow waters, together with a species of *Pontederia*. It often grows so thickly that it impedes canoe travel completely. This habitat is unusual, for the type and numerous later collections of the species from British Guiana report the habitat as "savannahs."

I have seen *Thurnia sphaerocephala*, but did not collect it, in Caño Paca, one of the rills forming the headwaters of the Río Papurí, and in the very sources of the Río Dji. Both the Papurí and the Dji, rising in an area near the headwaters of the Río Piraparaná, are affluents of the Río Vaupés.

The westernmost locality of the family is that of *Schultes & Cabrera 19853*, in the headwaters of the Caño Churruco, a brook of clear water, draining a quartzitic area. It is not abundant, however.

COLOMBIA: Comisarias del Amazonas-Vaupés, Río Apaporis, Soratama (above mouth of Río Kananarí) and vicinity, Caño Churruco. Alt. about 900 feet. General location: Lat. $0^{\circ}5' N$, Long. $70^{\circ}40' W$. "In water." January 1952, *Richard Evans Schultes & Isidoro Cabrera 19583*. —Comisaría del Vaupés, Río Piraparaná (tributary of Río Apaporis), Caño Paca. General location between Lat. $0^{\circ}15' S$, Long. $70^{\circ}30' W$ and Lat. $0^{\circ}25' N$, Long. $70^{\circ}30' W$. September 19, 1952, *Richard Evans Schultes & Isidoro Cabrera 17568*.

RAPATEACEAE

Schoenocephalium Martianum *Seubert* in *Martius Fl. Bras.* 3, pt. 1 (1847) 130, t. 19.

The curious and beautiful genus *Schoenocephalium* was based on material collected at Araracuara on the Río Caquetá, Colombia, by Martius in 1820. Two species were described: *Schoenocephalium Martianum* and *S. arthrophyllum*.

In 1944, I collected for a week at Araracuara, Martius' westernmost station in the Amazon and the type locality for a large number of endemics, some of which, like *Schoenocephalum Martianum*, had never subsequently been found. I found this species to be one of the dominant plants on the high, flat savannah of white sand at the picturesque chasm called "Angostura." Unfortunately, my collections of the plant from that trip were lost in an aeroplane accident.

In December 1951, Dr. García-Barriga and I spent an afternoon at Araracuara whilst emergency repairs were being made on our aeroplane. We were able to make an interesting collection of about fifty numbers which will be reported later. Amongst these was an ample topotypical collection of *Schoenocephalum Martianum*.

As we stepped off the aeroplane at the prison colony at Araracuara, we saw, near the shore, a small portable altar set up by visiting clerics for Christmas. This altar was extravagantly decorated with the beautiful pink-red wax-like inflorescences of *Schoenocephalum Martianum*, one of the rarest plants of the world!

A number of months later, we were astonished to find a florist shop in Bogotá with a window full of *Schoenocephalum Martianum* heads. It appears that a lucrative commerce has grown up. Every time a Colombian government flight goes to the prison colony at Araracuara to relieve the guards, the returning police bring back enormous bundles of the long-lasting heads for sale to florists in the nation's capital under the common name *estrellitas del sur* ("little stars from the south"). The retail price in Bogotá in January 1953 was three pesos a dozen (approximately \$1.20 in U.S. money).

I collected seed of *Schoenocephalum Martianum* and sent it to the Bureau of Plant Industry of the United States Department of Agriculture and the Royal Botanic

Gardens at Kew, in the hope that this precious little gem might be introduced to horticulture, but both attempts were failures.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, Araracuara. Sabana de Angostura. Alt. 400 m. Suelo pedregoso, con arena blanca. "Yerba erecta. Inflorescencia 0.48 m. Flores blancas en el ápice, en la base rojas." December 21, 1951, *H. García-Barriga & Richard Evans Schultes 14172*.

BROMELIACEAE

(Contributed by Lyman B. Smith)

***Pitcairnia macarenensis* L. B. Smith sp. nov.**

Pitcairniae pungenti HBK. in systema Mezii proxima, sed foliis majoribus integerrimis petiolatis, vaginis foliorum atro-castaneis, laminis foliorum lineari-lanceolatis canaliculatis differt.

Stemless, the flowering shoot 55 cm. high; leaves entire, dimorphic, some reduced to broadly ovate apiculate dark castaneous sheaths, others over 1 meter long with slender elongate petioles, the blades linear-lanceolate with a strong median channel, filiform-acuminate, 30–35 mm. wide, flat, glabrous; scape erect, slender, sparsely white-flocculose; scape-bracts erect, imbricate, lanceolate, acuminate, sparsely pale-lepidote; inflorescence simple, dense, 7–9 cm. long, white-flocculose except for the petals; floral bracts narrowly triangular, much exceeding the pedicels, pale green; pedicels slender, 8 mm. long; flowers suberect; sepals lance-oblong, acute, 28 mm. long, the posterior ones strongly carinate; petals slightly zygomorphic, linear, obtuse, 45 mm. long, red, bearing a large oblong truncate scale at base; stamens included; ovary three-fifths superior; ovules caudate.

COLOMBIA: Intendencia del Meta, northeastern end of Cordillera La Macarena, slopes of Cuchillo Palmitas, Macizo Renjifo. Alt. 1,500 m. "On rocks." March 1951, *Richard Evans Schultes 12126* (TYPE in U.S. Nat. Herb. No. 2048070).

Pitcairnia patentiflora *L. B. Smith* in *Contrib. Gray Herb.* 127 (1939) 18, t. 1, fig. 4.

This species, one of those with a distribution on the Guiana-Venezuela land-mass, has been reported from Colombia as far west as Cerro Chiribiquete (in *Bot. Mus. Leafl. Harvard Univ.* 12 (1946) 121). The collection cited below is intermediate between the type locality, Cerro Duida, and Chiribiquete.

COLOMBIA: Comisaría del Vaupés, Río Naquieni, Cerro Monachí. "Flowers and axis of inflorescence red." June 1948, *Richard Evans Schultes & Francisco López 10082*.

Brocchinia hechtoides *Mez* in *Fedde Rep. Spec. Nov.* 12 (1913) 414.

The specimen cited below is the first record for Colombia of a species previously known from Mount Roraima and the Amazonas Territory of Venezuela.

COLOMBIA: Comisaría del Vaupés, Río Kananarí, Cerro Isibukuri. Alt. 250 m. above the river, 700 m. above sea-level. Crest of the cerro in rocky sandstone soil. November 29-30, 1951, *H. García-Barriga 13796*.

Navia caulescens *Martius ex Schultes filius* var. **minor** *Schultes & Schultes filius* in *Roem. & Schult. Syst.* 7 (1830) 1195.

The species and its variety *minor* were described together and, in default of any designation to that effect, the inference is that the second locality mentioned, Araracuara, applies to the variety. The recent collections cited below would tend to confirm this view and also to show a large extension of the range of the variety. There is a considerable variation in the dimensions of the leaves but no notable difference in the flowers.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, Araracuara: Sabana de La Angostura. Alt. ca. 400 m. December 21, 1951, *H. García-Barriga & Richard Evans Schultes 14171*.—Comisaría del Vaupés, Río Kananarí, Cerro Isibukurí. November 29-30, 1951, *H.*

García-Barriga 13798, 13816.—Comisaría del Vaupés, Río Karurú, Savannah of Goo-rán-hoo-da. Alt. ca. 240 m. "In large mats on sandstone rocks exposed to sun." April 15–16, 1953, *Richard Evans Schultes & Isidoro Cabrera 19168.*

***Navia García-Barrigae* L. B. Smith sp. nov.**

Ab omnibus speciebus adhuc descriptis inflorescentia magna, laxe ampleque tripinnatim paniculata differt.

Stemless (! *García-Barriga*), the flowering plant over 8 dm. high; leaves rosulate, the sheaths unknown, the blade linear, acuminate, 22 cm. long, 8 mm. wide, very laxly serrate with minute curved ascending spines, covered on both sides with white appressed scales, roseate for 2 cm. at base; scape unknown; inflorescence nearly 8 dm. long, amply and laxly tripinnate, glabrous, red-brown when dry; primary bracts narrowly triangular, 16 mm. long, much shorter than the naked flattened sterile bases of the branches, entire, nerved; branches spreading, to 25 cm. long, their axes straight and very slender; racemes to 9 cm. long including the short sterile base, subdensely many-flowered; floral bracts broadly ovate, acuminate, 2 mm. long, thin; flowers obscurely pedicellate, spreading; sepals homomorphic, subtriangular, obtuse, 2 mm. long, ecarinate; petals 3.5 mm. long, white; ovary superior; ovules unappendaged.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, Araracuara, Sabana de La Angostura. In white sand among rocks. December 21, 1951, *H. García-Barriga & Richard Evans Schultes 14137* (TYPE in U.S. Nat. Herb. No. 2057246).

***Navia heliophila* L. B. Smith sp. nov.**

Herba plusminusve caulescens sed foliis vivis apice solum praedita; foliis multis, rosulatis, pro genere amplis, dense serrulatis, glabris; scapo brevissimo; inflorescentia densissime paniculata, globosa; sepalis oblongo-lanceolatis, minimis.

Somewhat caulescent; most of the stem covered with

decayed leaf-bases; living leaves many in a spreading rosette at the apex of the stem, the sheaths completely covered, the blades linear, acute, pungent, 25 cm. long, 17 mm. wide, flat, densely serrulate, glabrous; scape very short; inflorescence very densely paniculate, globose, 25 mm. in diameter; primary bracts lance-triangular, pungent, serrate, shorter than the globose short-stipitate spikes; floral bracts ovate, acute, slightly but consistently shorter than the sepals, ferruginous-flocculose at base; pedicels short and inconspicuous; sepals lance-oblong, acute, 6 mm. long, the posterior ones sharply carinate and connate for 2 mm.; petals white (! Schultes), the blades spreading, narrowly elliptic.

In habit, *Navia heliophila* closely resembles *N. angustifolia* (Bak.) Mez of Guiana and *N. xyridiflora* L. B. Smith of Venezuela, but it differs from the former in its much smaller flowers and from the latter in its sharply acute sepals.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Raudal de Jiririmo. "On exposed ledge in savannah and caatinga." March 1951, *Richard Evans Schultes 12085* (TYPE in U.S. Nat. Herb. No. 2048050).—Same locality. November 25–26, 1951, *H. García-Barriga 13712, 13735*.

***Navia Lopezii* L. B. Smith ex Schultes** in Bot. Mus. Leaflet. Harvard Univ. 15 (1951) 40.

It is now possible to publish the plate (XXVIII) prepared to illustrate this species.

***Navia Lopezii* L. B. Smith ex Schultes var. colombiana** L. B. Smith var. nov.

A *Navia Lopezii* inflorescentiae bracteis exterioribus quam sepalis brevioribus, petalis albis differt.

COLOMBIA: Comisaría del Vaupés, Río Kananarí, Cerro Isibukuri. Alt. 250–700 m. "On cliff in shade. Bracts of flowers purple outside, pinkish or yellowish inside. Flowers white. Leaves almost membranaceous." August 4, 1951, *Richard Evans Schultes & Isidoro Cabrera 13342* (TYPE in U.S. Nat. Herb. No. 2120933).

Navia myriantha L. B. Smith ex Schultes in Bot. Mus. Leaflet. Harvard Univ. 15 (1951) 41.

Herewith is a drawing (Pl. XXVIII) which inadvertently was not published with the original description.

Navia reflexa L. B. Smith *sp. nov.*

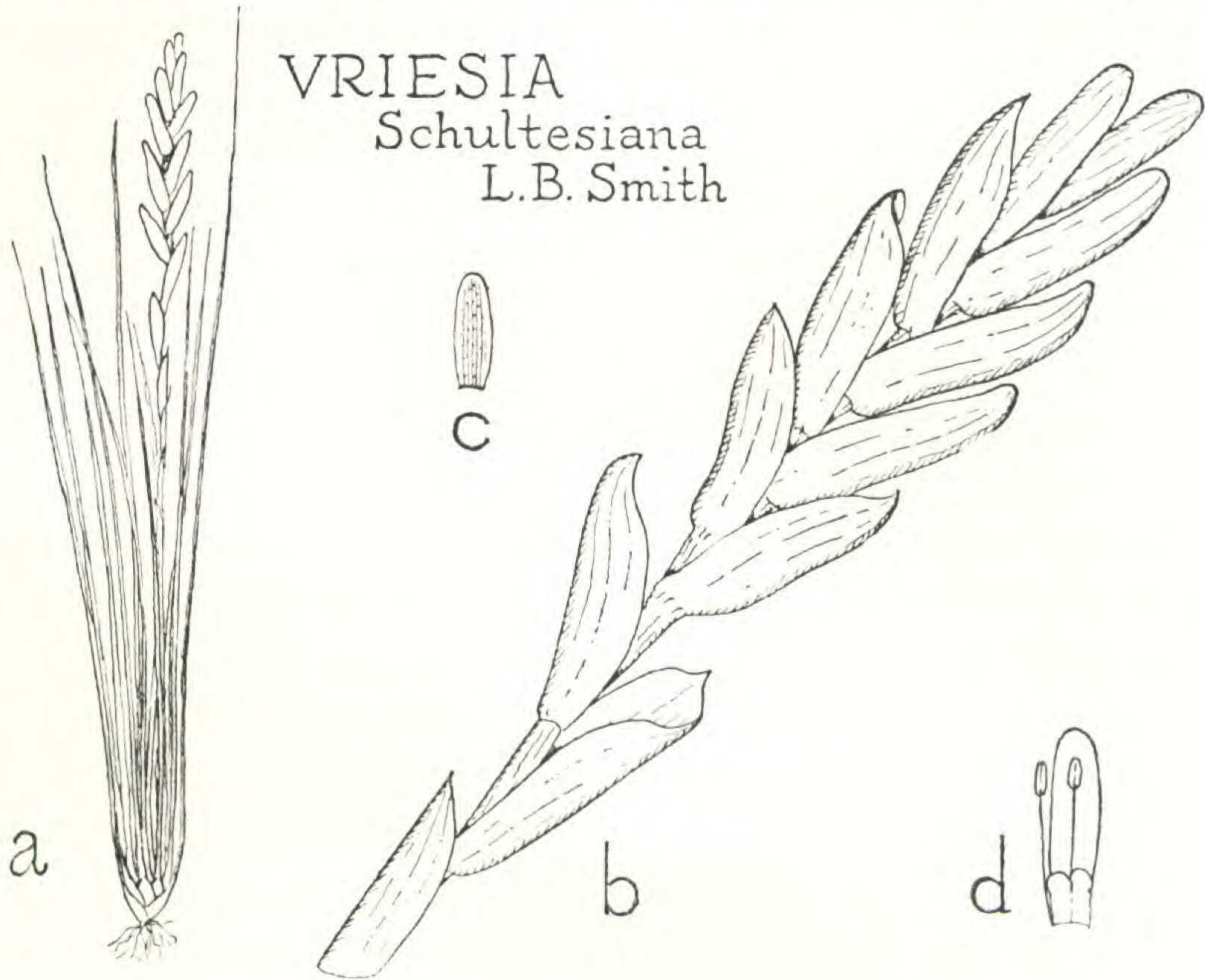
A *Navia Garcia-Barrigae* L. B. Smith, supra descripta, omnibus partibus multo majoribus, ramulis ultimis pendulis, floribus reflexis, ovario $\frac{1}{3}$ infero differt.

Terrestrial, the flowering plant over 3 m. high; leaves (only one known) 9 dm. long, the sheath subquadrate, 5 cm. long, barely wider than the blade, white except for the lustrous brown apex, entire, nearly glabrous, the blade linear with a long entire acuminate pungent apex, 5 cm. wide, flat, closely sulcate, laxly serrate with dark ascending spines 1.5 mm. long, covered above with a very fine white membrane of coalesced scales, glabrous beneath; scape erect, over 14 mm. in diameter, glabrous (at least in age); scape-bracts erect, foliaceous but much reduced, much exceeding the internodes, but so narrow as to leave most of the scape exposed; inflorescence ample, lax, at least tripinnate (only the apical part known), glabrous (at least in age); primary bracts broadly triangular, several times shorter than the naked flattened sterile bases of the branches, entire; branches spreading with the ultimate divisions pendent; racemes to 20 cm. long including the short naked sterile base, densely many-flowered, the rachis strongly angled; floral bracts broadly ovate, acuminate, 7 mm. long, entire, subcoriaceous; flowers obscurely pedicellate, reflexed; sepals free, heteromorphic, unequal, elliptic, the anterior one shorter than the others, ecarinate, the posterior ones 6 mm. long, alate-carinate; ovary $\frac{1}{3}$ inferior; seeds wingless.

COLOMBIA: Comisaría del Vaupés, Río Negro below its confluence with Río Casiquiare, San Felipe (El Castillo). December 12, 1947, Richard Evans Schultes & Francisco López 9321 (TYPE in U.S. Nat. Herb. Nos. 1989460, 1989461).

Vriesia Schultesiana *L. B. Smith sp. nov.*

Acaulis; foliis haud bulbose rosulatis, vaginis distinctis, dense ferrugineo-lepidotis, laminis linearibus, planis; scapi vaginis haud vel vix imbricatis; inflorescentia simplicissima; rhachi subtereti; bracteis florigeris laxe imbricatis, late ellipticis, sepala multo superantibus, ecarinatis, nervatis; floribus distichis; sepalis liberis, oblongis,



a, habit, one third natural size. b, inflorescence, about natural size.
c, sepal, natural size. d, petal and stamens, natural size.

subtruncatis, parvis, sparse lepidotis; petalis basi ligulis binis obtusis auctis; staminibus inclusis.

Stemless, 12–23 cm. high; leaves 8–15 in a fasciculate rosette, 22 cm. long, sometimes exceeding the inflorescence, green, concolorous, the sheaths broadly ovate, covered with coarse subappressed ferruginous scales, the blades linear, acuminate, 3.5 mm. wide, ferruginous-lepidote, soon becoming glabrous; scape erect or ascend-

ing, very slender, glabrous; scape-bracts erect and enfolding the scape, barely or not imbricate and exposing sections of the scape but their caudate apices always exceeding the internodes, very obscurely lepidote; inflorescence simple, linear, complanate, 4–6 cm. long, 1–1.5 cm. wide; rhachis slender, subterete; floral bracts laxly imbricate and exposing parts of the rhachis, broadly elliptic, subacute, 15–18 mm. long, much exceeding the sepals, ecarinate, subcoriaceous, nerved when dry, glabrous outside or sparsely lepidote near the apex, pale yellow (! Schultes); pedicels very short, broadly obconic; sepals free, oblong, obliquely subtruncate, 8.5 mm. long, ecarinate, thin, nerved, sparsely lepidote; petals oblong, obtuse, 13 mm. long, bearing 2 large, obtuse, entire scales at base; stamens included; capsules shorter than the floral bracts.

In my key to the *Tillandsiae* (in *Contributions from the U.S. National Herbarium* 29 (1951) 448–455) this species would fall next to *Tillandsia incurva* Griseb. and *T. patula* Mez, since the arrangement is frankly artificial. Its pale leaf-sheaths and small dimensions throughout easily distinguish it from both without reference to its appendaged petals. The nearest species of *Vriesia* is *V. Barclayana* (Baker) L. B. Smith, but this last differs basically in its alate rhachis, while also being immediately distinguishable by size and brown leaf-sheaths.

COLOMBIA: Comisaría del Amazonas, Río Apaporis, Raudal de Jirijirimo. "On ledge of conglomerate quartzite. Savannah (caatinga)." March 1951, *Richard Evans Schultes* 12088 (TYPE in U.S. Nat. Herb. No. 2048059).—Same locality. November 25–26, 1951, *H. García-Barriga* 13710.

VELLOZIACEAE

Vellozia Maudeana *R. E. Schultes* sp. nov.

Frutex usque ad duos pedes altus. Caudex sublignosus, erectus vel saepe procumbens, basi ad 6–8 cm. in

diametro, quinque- vel sex-furcatus, apparenter fibrosus cum radicibus internis foliorum vaginis circumdatis, vaginis comparate parvis, griseo-stramineis, persistentibus, arcte adpressis, subspiraliter imbricatim dispositis, vestigiorum apicibus laciniatis et valde revolutis obtectus, in parte superiore distincte lineatis. Folia in apice ramorum subrosulata conferta, non numerosa (plusminusve decem ad quattuordecim), rigide erecta, sicca, firme coriacea, utrinque glabra, margine infra medium et in foliis juvenilibus omnino pilis conspicuis albis, simplicibus vel irregulariter plurichotome ramosis, usque ad 2 mm. longis armata, utrinque sed subtus spiraliter sulcata cum vena centrali atque venis minoribus viginti octo valde elevatis, pallide viridia sed basim versus paullo rubentia, linearia, margine integra, valde stramineo-revoluta, apice longissime et sensim attenuata, basi non dilatata, plerumque 27–34 cm. longa (sed vulgo breviora), 6–8 mm. lata. Flores fragrantis, solitarii, pseudoterminalis, magni speciosissimique, albi sed basim versus pallide rosei vel pallide rubri, foliis paullo breviores, longe pedunculati; pedunculo filiformi, triquetro, inferne glabro sed superne viscoso-glanduloso, minute squamoso-echinato, rubro-purpureo, usque ad 14 cm. longo sed saepe breviora. Perigonii tubus tenuis gracilisque, cylindricus, 75 mm. longus et 4 mm. in diametro, extus densissime purpureo-viscoso-glandulosus, ovarii regione valde inflatus; limbus infundibuliformis, vivo 6.5–7 cm. in diametro, segmentis membranaceis, imbricatis, subspathulato-ellipticis, apice irregulariter rotundatis, vivo 45 mm. longis, basi 3–4 mm. (sed in parte latiore usque ad 12–15 mm.) latis, glabris sed extus in parte inferiore glandulosis. Stamina duodecim, tepalis multo breviora; antherae subaequales, elongissime cylindricae, 9 mm. longae (8–10 mm.), glabrae, flavae, filamentis 1 mm. longis. Ovarium oblongo-clavatum, apice truncatum, paleis illis pedunculi similibus sed multo

robustioribus, viscoso-glandulosis, luteis, dense ornatum. Stylus flavus, robustius filiformis, 8.5 cm. longus, 1–1.3 mm. in diametro, trigonus, inclusus, stamina multo superans. Stigma flavum, trilobatum, crassissimum, 4–4.5 mm. in diametro. Capsula elongato-ovata, 10 mm. × 6 mm., dense et grossiuscule glanduloso-echinulata, conspicue trivalvata, protractione usque ad 6 cm. longa, basi 4–5 mm. in diametro sed apice filiformi, dense echinulata, nunc aliquantulum arcuata, nunc stricta coronata.

Vellozia Maudeana, one of the most beautiful species of the genus, can easily be distinguished from other Colombian species by the unusual coloration of its flowers. In all other known species of northern South America, the flowers are entirely white, but those of *Vellozia Maudeana* are a deep pink or red towards the base, with a red-purple peduncle. Some of the flowers are a pale pink for fully half their length. This tendency towards a pink or red coloration can be seen even in the vegetative parts of the plant, for the basal portions of the leaves are likewise of a slightly reddish hue. I have studied a number of individuals at the type locality and find that this is a constant character.

There are, nevertheless, other important characters which serve to set *Vellozia Maudeana* apart. The number of the stamens is twelve, whereas all other species from Colombia have either fifteen or eighteen. The subspatulate-elliptic shape of the segments of the tube is also apparently peculiar to this species. The flowers of *Vellozia Maudeana* have a strawberry-like fragrance which I have never before noted in the genus. The flowers of other Colombian species seem to lack any odor.

In habit, *Vellozia Maudeana* approaches perhaps most closely to *V. macarenensis* Philipson, for it is small and does not branch so profusely as do most of the other species. There are, however, no indications that these two

concepts are morphologically closely allied. In some respects, *Vellozia Maudeana* resembles *V. Dumitiana* R. E. Schultes, especially in having a small number of leaves at the apex of each stem; but the latter is, in general, a much more robust plant than the former, and there are significant differences in floral structure.

Vellozia Maudeana grows on the grotesquely eroded quartzitic mounds of the extensive savannahs of the Río Karurú which are known by the Kubeo Indian name of *Goo-rán-hoo-da*, meaning "savannah of the deer." These savannahs are ecologically the same and, as I have ascertained from reconnaissance flights, are continuous with the savannahs of the Ríos Kubiyú and Kuduyarí-Kañendá and Yapobodá respectively. *Vellozia Maudeana* has not been found at Kañendá nor at Yapobodá, where *V. lithophila* R. E. Schultes, the only representative of the genus at these localities, is one of the dominant shrubs. These two species, notwithstanding their geographical proximity, are not closely related.

Vellozia usually prefers rocky habitats where conditions of chersophytic or psammophytic drought prevail, but the xerophytism which *Vellozia Maudeana* withstands at Goo-rán-hoo-da is extreme even for this genus. The plant seems to prefer craggy exposures or knobs of bare quartzite which erosion has left standing here and there on the flat sandy stretches in the extensive savannah. Most closely associated with *Vellozia Maudeana*, a shrub which usually stands quite alone amidst a harsh or gorsey growth of grasses, sedges and prostrate creepers, are *Navia caulescens* var. *minor* (filling in cracks and crevices in the rocks) and *Leitgebia colombiana*, *Bombax coriaceum* and a red-flowered *Calliandra* (on the flat expanses). All of these plants are, like *Vellozia Maudeana*, adapted to withstand extreme radiation and heat in an area where no shade whatsoever lessens the strength of the tropical sun.

I have named this beautiful novelty in honor of my mother, Maude Bagley Schultes.

COLOMBIA: Comisaría del Vaupés, Río Karurú (tributary of Río Vaupés), Mesa de Yambí, quartzite savannah Goo-rán-hoo-da. Alt. about 950 feet. General location: Lat. $1^{\circ}20'$ N, Long. $71^{\circ}20'$ W. "Flowers fragrant, with scent of strawberries, white, base of tube red outside, becoming dark purple at very base, often very pale pink even half way up tube. Stigmas bright yellow. Plants in clusters, much-branched, leaves all short, marginal hairs very prominent. Plants many-flowered. Basal diameter at ground up to $3\frac{1}{2}$ -4 inches. Kubeo name = *dá-ko-ree*." April 15-16, 1953. *Richard Evans Schultes & Isidoro Cabrera 19120* (TYPE in Herb. Gray).

LORANTHACEAE

Psittacanthus peronopetalus *Eichler* in *Martius Fl. Bras.* 5, pt. 2 (1868) 31, t. 9, fig. 4.

This species has not hitherto been collected from Colombia. The material cited in the original description came from Manáos and Teffé (Ega) in Amazonian Brazil.

COLOMBIA: Comisaría del Vaupés, Río Naquieni, Cerro Monachí. June 1948, *Richard Evans Schultes & Francisco López 10086*.

MALPIGHIACEAE

Tetrapteris methystica *R. E. Schultes sp. nov.*

Frutex scandens robustior, trunco nigro cum cortice. Rami cinereo-fulvi, internodiis 4-10 cm. longis. Ramuli teretes, obscurissime canaliculati, novellissimi minute incano-sericei vel leviter schistacei, 0.8-3.3 mm. in diametro. Folia firme papyracea vel chartacea, ovata, apice longiuscule acuminata, basi plerumque bene rotundata, margine integra sed saepe leviter revoluta, 6-8.5 cm. longa, 2.5-5 cm. lata, valde discoloria, supra vivo viridia clara (sed siccitate glaucino-straminea), minute et remote sericea, subtus vivo cinereo-viridia, densius sericea et cerae lamina obtectae; nervis secundariis arcuatis, utrinque sex ad octo, supra prominulis, subtus prominentibus sed non conspicue elevatis, nervis tertiis inconspicuis, densis-

sime reticulatis, petiolo usque ad 5 mm. longo, canaliculato, aliquid incrassato, dense cinereo-sericeo. Stipulae mox caducae, parvae. Inflorescentiae pseudocorymbosae, pauciflorae (ut videtur usque ad quattuor- vel quinqueflorae), in paniculis axillaribus, foliis multo brevioribus, usque ad 2.5 vel 3 cm. longis, vivo probabiliter plusminusve 15 mm. in diametro, apparenter sine foliolis (?); pedunculi internodio inferiore 10 mm., pedicellis plusminusve 5 mm. longis, pedunculis pedicellisque densius sericeis. Bracteae subulatae, plerumque 1.5 mm. longae. Bracteolae breviter ovato-triangulares vel saepe suborbiculares, plusminusve 1.5 mm. longae. Sepala crassa, extus pilosa, ovato-lanceolata, apice subacuta, usque ad circiter 3 mm. longa, nigris cum glandulis octo, ovalibus, plerumque 2.5 cm. longis, basi extus pilosis, plusminusve 0.5 mm. superantibus. Petala patentia, membranacea, maxima pro parte lutea sed parte centrali fulva vel rubra, limbo elongato-orbiculari vel ovali, apice rotundato, basi obtuso vel rotundato, margine subcrenulato (rarenter sub-integro), parte centrali dorsali aliquid carinato-incrassato, 4 mm. longo, plerumque 2.5 mm. lato, ungui crasso, 0.5 mm. longo, aliquid reclinato. Stamina non inclusa, aequalia; antherae allantoidae, 1.3 mm. longae, 0.4 mm. in diametro, valde arcuatae, filamentis bene complanatis, 1.3 mm. longis, basi usque ad 0.4 mm. latis. Styli aequilongi, apice leviter recurvi. Ovarium densissime albobilosum. Samarae ad nucem sericeae, demum glabrae; nux fere complanato-ovoidea, 5 mm. \times 6 mm. \times 2 mm.; areola ventralis ovata, circiter 3 mm. alta; alae chartaceae, fulvae, laterales inferiores obcuneiformes, apice truncato-rotundatae, 12 mm. longae, apicem versus 2.5 mm. latae, superiores similes sed saepe subovoideae et paulo majores; alula dorsalis subsemiorbicularis, 3.5–4 mm. longa, illae intermediae ovatae, 7–8 mm. longae.

Tetrapteris methystica is sharply set apart from almost

all other South American species of the genus by its strongly discoloured leaves. In many respects, it seems to approach most closely to *Tetrapteris discolor* (G. F. W. Meyer) DC., a rather polymorphic species which, with its several varieties, occurs from Guatemala and the West Indies south to Bolivia. *Tetrapteris methystica* may be distinguished from *T. discolor* by its smaller and more long-acuminate leaves which are, even in the adult stage, sericeous on both surfaces and which are covered beneath with a thick layer of wax; by its apparent lack of foliaceous stipules (which, if they do occur, are extremely caducous); by having a more corymbiform inflorescence; by its long allantoid (instead of obovoid) and recurved or arcuate anthers; by its rather acute and loosely sericeous (instead of rounded and glabrous) sepals with smaller glands; by its basally rounded (instead of strongly sagittate) petal-blades; and by the shape of the upper lateral wings of the samara, which are obtuseiform in outline.

Tetrapteris methystica has been so named because it is employed by the Makú Indians of the Ira-Igarapé (and possibly by other tribes of the upper Río Negro-Vaupés area) as the source of a strong narcotic drink. It is known as *caapi*, the same name which is applied to the related *Banisteriopsis Caapi* (Spruce ex Griseb.) Morton, the source of the well known narcotic discovered by Spruce a century ago in the same region (cf. Spruce, R. [ed. A. R. Wallace] "Notes of a botanist on the Amazon and Andes" 2 (1908) 414 ff.).

Inasmuch as I am preparing a comprehensive article on the malpighiaceae narcotics of South America, a discussion of the use of *Tetrapteris methystica* will be deferred for that general paper. The use of a member of the genus *Tetrapteris* as a narcotic was first reported in the literature in 1952 (Hill, A. F. "Economic Botany"

ed. 2 (1952) 283, t. 143), on the basis of the collection described above.

BRAZIL: Estado do Amazonas, Upper Rio Negro Basin, Ira-Igarapé, affluent of Rio Tikié, Porto Makús, June 25, 1948, *Richard Evans Schultes & Francisco López 10184* (TYPE in Herb. Gray).

EUPHORBIACEAE

Senefelderopsis *Steyermark ex Schultes* in Bot. Mus. Leaflet. Harvard Univ. 15 (1951) 45.

Senefelderopsis chiribiquetensis (*Schultes & Croizat*) *Steyermark ex Schultes* *ibid.* 47.

Senefelderopsis Croizatii *Steyermark ex Schultes* *ibid.* 46, t. 16.

Through an editorial error, the generic and specific descriptions cited above were published under the family heading *Anacardiaceae*. The genus is a member of the *Euphorbiaceae*.

STERCULIACEAE

Recent investigations of *Herrania* in the field and herbarium have led to several additions to our knowledge of this interesting sterculiaceous genus.

To the best of my knowledge, the first analysis of the pollen-grains of *Herrania* is that effected by Dr. Thomas van der Hammen of the Servicio Geológico Nacional de Colombia and published herewith. The species studied was *Herrania tomentella* which is described in this paper.

Herrania tomentella R. E. Schultes.

Pollen collection Serv. Geol. Nac. IV 86. Collection Col. 34377.

Pollen grains: tricolporate, reticulate, subsphaeroidal; granulae of the muri visible but not separated. Lumina of reticulum \pm irregular of size, rather large, polygonal, smaller near the colpae. In the lumina, rather faint granulae are visible.

Colpae clear, edges separated; pores clear, without ectexine ele-

ments; sometimes indications of small transversal furrows.
Magnitudo pollinis: media (28–33 μ).
Magnitudo luminum: meso-macra (2–4.7 μ) and smaller.
Index pollinis: subsphaeroidea (1–1.12); ('prolate sphaeroidal' of Erdtman).
Index areae poli: middle (0.30–0.35).
Index exinae: middle (0.05–0.08).

Van der Hammen further reports that *Theobroma*, *Guazuma*, *Sterculia* and *Herrania* have tricolporate and reticulate pollen-grains, but that the grains of *Waltheria* and *Helicteres* are of different types. A comparison of the four genera which have tricolporate and reticulate grains leads to the really unexpected conclusion that, insofar as pollen morphology is concerned, there is no evidence that *Herrania* and *Theobroma* are very close allies. On the contrary, the pollen-grains of *Theobroma* resemble those of *Guazuma* rather than those of *Herrania*. He compares the grains of *Theobroma Cacao* L. and of *Herrania tomentella* as follows: "The grains of *Theobroma Cacao* are subsphaeroidal ('oblate sphaeroidal' of Erdtman); index pollinis 0.8–0.9; magnitudo pollinis \pm 22 μ . The polar area is relatively much larger than in those of *Herrania*, the colpae are very narrow, unclear and short. Pores are small and not very clear; lumina of ret much smaller than in those of *Herrania* (greatest size measured 1–1.75 μ), and more regular. Exine (including sculpture) relatively thicker than in those of *Herrania*."

This evidence of relationship drawn from a study of pollen-grains should be of interest, inasmuch as there has been a strong tendency in the past to treat the species of *Herrania* as constituting a section of *Theobroma*.

The following notes comprise the description of an hitherto unknown species, reports of new range extensions for several species and miscellaneous information resulting from the collection of more complete material of several concepts.

Some of the observations have arisen from my own studies in the Amazonian areas of Colombia. Others represent the work of the Anglo-Colombian Cacao Collecting Expedition which has been exploring the forests of Colombia for material of *Theobroma* and *Herrania* since July 1952, and which it has been my good fortune to accompany on several trips into the Comisariás del Amazonas, Putumayo and Vaupés.

Herrania albiflora Goudot in Ann. Sci. Nat. Paris, sér. 3, 2 (1844) 230, t. 5, figs. 1-10.

In spite of the reddish hue reported for the flowers by the collector (I suspect that this refers to the outside of the calyx-lobes), *Aristeguieta 1598* is referable to *Herrania albiflora*. It represents the second Venezuelan collection of this species, the first being *Tejera 268* from near Perijá in the Estado de Zulia. At the present time only two species of *Herrania* are known from Venezuela: *H. albiflora* and *H. lemniscata* (Schomb.) R. E. Schult. *H. kanukuensis* R. E. Schult. and *H. Camargoana* R. E. Schult., from boundary regions of adjacent countries, are also to be expected in the Venezuelan flora.

VENEZUELA: Estado de Barinas, Fundo Paiva, Santa Bárbara de Barinas. "Arbusto de más o menos 2 m. de alto. Fls. caulinares, rojizas. Frutos de más o menos 10 cm. de largo, amarillentos, encierran una pulpa agri-dulce, comestible. Abunda en el estrato arbustiforme de la selva. N.v. : *cacaíto*." February 1952, *L. Aristeguieta 1598*.

Herrania breviligulata R. E. Schultes in *Caldasia* no. 4 (1942) 20. t.p. 21, 24; *Bot. Mus. Leafl. Harvard Univ.* 16 (1953) 78, t. 12.

On a recent trip to the Comisaría del Putumayo additional material of *Herrania breviligulata* was found at Mocoa, the type locality of this species. Hitherto, this strikingly distinct concept has been known through but two collections: the type, *Schultes & Smith 2050*, a flow-

ering collection; and *Mexia* 7328, from Ecuador, which is sterile. The fruit has not been known, but several of the collections made in March 1953 and cited below, are in fruit. We are, therefore, able to offer the following description of the capsule:

Capsula (unica visa non matura) oblongo-ovoidea, 10 cm. longa, 5 cm. in diametro, apice abruptissime acuminata, basi haud indentata, petiolo robusto usque ad 2 cm. longo, quinque cum costis primariis regularibus, grossiuscule hebetato-rotundatis, usque ad 7 mm. altis et basim versus usque ad 8–10 mm. latis, et cum quinque costis secundariis similibus sed paulo minoribus, costis omnibus proximis sine costis fibrosis horizontalibus, pericarpio duro, omnino densissime atque molliter stellato-velutino.

COLOMBIA: Comisaria del Putumayo, Mocoa. "Suckers, 3 m. tall, from an old tree. One immature fruit, no flowers. In second growth." March 17, 1953, *F. W. Cope & P. Holliday* (*Anglo.-Col. Cacao Coll. Exped.*) 78.—Comisaria del Putumayo, Río Caquetá, Puerto Limón. "Fruit 10 cm. long \times 5 cm. in diameter." March 17, 1953, *Richard Evans Schultes & Isidoro Cabrera* 18720.

Herrania Camargoana *R. E. Schultes* in Bot. Mus. Leaf. Harv. Univ. 14 (1950) 120, t. 29, 32.

Herrania Camargoana, hitherto known only from the Brazilian basin of the upper Río Negro, has recently been collected in Colombia along the lower course of the Río Vaupés, on the Río Papurí and on the Río Negro, just below the confluence of the Río Guainía and the Casiquiare.

This species, in Brazil, was always found in association with granitic mountains, occurring most frequently near or at the summits. The Anglo-Colombian Cacao Collecting Expedition found the tree growing in sandy situations along the river banks of the Vaupés and Papurí, and the material from the Río Negro was collected along

the main river and in abandoned house sites on an affluent creek.

All of the fruits of the many Brazilian collections were a brilliant blood-red, a character which was especially emphasized in the original description, for the reason that only one other species—*Herrania laciniifolia* Goudot ex Triana & Planch. of the Colombian Andes—is known to have capsules of this color. It is important now to note that all of the fruiting Colombian collections cited below have capsules which give definite evidence of ripening yellow. It is obvious, then, that two colors are assumed by the fruit of *Herrania Camargoana*. Whether the red color is due to some mineral deficiency (inasmuch as the plants with fruits of this unusual color grow on very sterile granite rock-soil) or not we are, as yet, unable to say.

COLOMBIA: Comisaría del Vaupés, Río Negro, Caño Maiyabo, near San Felipe. "Tree 16 ft., first collection of this species in Colombia. Leaves and one ripe fruit (sent to Trinidad); native, in forest. Flowers pale yellow." October 27, 1952, R. E. D. Baker (*Anglo-Col. Cacao Coll. Exped.*) 38.—Same locality and date. Richard Evans Schultes & Isidoro Cabrera 18050.—Comisaría del Vaupés, Río Negro, San Felipe. "Tree 15 feet, in full flower, no fruit. On old house site; seed said to have been brought from the locality of No. 35." November 5, 1952, R. E. D. Baker (*Anglo-Col. Cacao Coll. Exped.*) 39.—Comisaría del Vaupés, caño opposite Inambú. November 18, 1952, B. G. Bartley & P. Holliday (*Anglo-Col. Cacao Coll. Exped.*) 45.

BRAZIL: Estado do Amazonas, creek near north end of Inambú, Río Uaupés. "Tree 4 m. Fls. Cal. purple-crimson; pet. deep crimson on dull yellow; ligules whitish and purple-crimson at extremities, 9–12 cm. long. Fruit 8–8.7 × 6 cm." November 17, 1952, B. G. Bartley & P. Holliday (*Anglo-Col. Cacao Coll. Exped.*) 56.

Herrania nycterodendron R. E. Schultes in *Caldasia* no. 6 (1943) 21, t. p. 22, 26; Bot. Mus. Leaflet Harvard Univ. 14 (1950) t. 35.

Known hitherto only from the Putumayo River, the boundary between Perú and Colombia, *Herrania nycterodendron* has recently been collected on the Caquetá

at La Pedrera and on the Río Caguán, an affluent of the upper Caquetá. It is relatively frequent in these localities. At La Pedrera, it occurs with *Herrania nitida* (Poepp.) R. E. Schult. on flood-banks and islands.

From the collection *Schultes & Cabrera 17778*, we now know that the capsule of *Herrania nycterodendron* ripens yellow, as in most other species of the genus. The buds of *Schultes & Cabrera 17773* had been attacked by insects and were hollow and devoid of most floral parts. We can say, however, that the buds are conic, almost pointed, not globose as in most species.

COLOMBIA: Comisaría del Amazonas, Río Caquetá, La Pedrera. "Tree 6-7 m., 10 cm. diam. at base. Flowers not seen." September 25, 1952, *R. E. D. Baker & F. W. Cope* (*Anglo-Col. Cacao Coll. Exped.*) 14.—Same locality. "A young plant without flowers or fruit." September 27, 1952, *R. E. D. Baker & F. W. Cope* (*Anglo-Col. Cacao Coll. Exped.*) 20.—Comisaría del Caquetá, Río Caucaya, Laguna Primavera. "Tree 6-8 m., unbranched. In forest. Ripe fruit 13.5 × 4.5 cm." April 3, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 93.—Comisaría del Caquetá, Río Caguán, Cartagena. "Tree 4-5 m., unbranched. In forest. Ligules of dead flowers 12 cm." April 20, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 108.—Comisaría del Caquetá, Río Caguán (camp 2). "Tree 6-8 m., unbranched. In forest. Flowers and fl. buds, but no fruits. Cushions whole length of trunk, infl. with about 45 fls. Fls. deep dull purplish crimson and cream. Ligules 7 cm." April 22, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 109.—Comisaría del Caquetá, Río Caguán (camp 2). April 22, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 110.—Comisaría del Caquetá, Río Caquetá (camp 6). May 9, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 128.—Comisaría del Caquetá, Río Caquetá, Piedra Blanca. May 11, 1953, *F. W. Cope & P. Holliday* (*Anglo-Col. Cacao Coll. Exped.*) 131.—Comisaría del Amazonas, Río Caquetá, La Pedrera. "On low flood-bank. Hairs soft, golden brown." October 6, 1952, *Richard Evans Schultes & Isidoro Cabrera 17771*.—Same locality. "Treelet 18 ft. tall. Basal diameter 6 inches. Hairs golden brown. Buds purplish maroon, conic, almost pointed." October 7, 1952, *Richard Evans Schultes & Isidoro Cabrera 17773*.—Same locality. "Treelet 18 ft. tall." October 7, 1952, *Richard Evans Schultes & Isidoro Cabrera 17776*.—Same locality. "Fruit yellow. Tree 20 feet tall. Diameter 6 inches." October 7, 1952, *Richard Evans Schultes & Isidoro Cabrera 17778*.

Herrania pulcherrima Goudot in Ann. Sci. Nat. Paris, sèr. 3, 2 (1844) 232, t. 5, figs. 11-12.

Theobroma pulcherrimum (Goudot) de Wildeman Pl. Trop. Grande Cult. (1902) 89.

It is often overlooked that de Wildeman made the combination *Theobroma pulcherrimum* half a century ago. This combination is usually attributed to Pittier (Man. Pl. Usuales Venez. (1926) 147).

The type specimen of *Herrania pulcherrima* has always been thought to be in Paris, but, as in the case of *H. albiflora* (cf. Schultes in Bot. Mus. Leaf. Harvard Univ. 16 (1953) 75), there is material in Geneva which may well be the true type from which Goudot's description and illustrations (at least of the flowers) were made. Goudot (*loc. cit.* 232) spoke of the type as inhabiting the great forests situated between the Ríos Ariari and Guayabero, affluents of the upper Orinoco system in the Colombian Llanos.

The Geneva material consists of two sheets. It is labelled in Goudot's hand: "*Herrania pulcherrima* mihi. An. Sci. Nat. 1844. Llanos del Orinoco, pueblo d'Iraca, San Juan. Flos. Dec." One sheet consists of a length of golden-tomentose stalk about one foot long, a very young leaf and young capsules. One of the envelopes on the sheet has the Koregwahe Indian name (reported by Goudot in the original description): "*cacao cahouai*—Llanos." Another envelope, on the outside of which Goudot has written "CN. 2 theobroma affinis *Herrania pulcherrima*," has a completely and beautifully dissected flower, the separate parts glued to the inside of the envelope. There can be no doubt but that Goudot made his drawing of the flower of *Herrania pulcherrima* (*loc. cit.* t. 5, figs. 11-12) from this same dissection.

The leaf which is preserved at Geneva could hardly have served as a basis for Goudot's excellent description,

but a study of the material and the description would seem to indicate that the Paris material represents the type of the leaf.

It may be of value to publish a few notes on Goudot's dissection of the flower. The three sepals are laid flat, the very slightly puberulent inner surface exposed. Two are rather broadly ovate, about 15 mm. long and 5 mm. wide (all measurements taken on dried material), apically rounded; the third, somewhat elliptic, 18 mm. long and 4 mm. wide, apically blunt-pointed. The five petals are all about equal, strongly cucullate, very densely muricate-papillose or granulose externally, papillose internally in six longitudinal lines, the ligules up to 90 mm. long, 2.5 mm. wide immediately above the constriction at the junction with the petal. The staminodes are lanceolate-elliptic, 15 mm. long, 4-4.5 mm. wide, muricate-granulose and apically so strongly trifid that the tip appears to be mucronate. This was noted by Goudot, when he described the staminodes as apically "mucronés et échanrés"; but, in this drawing, he indicated the tip as extremely acute. The ovary is very densely yellowish tomentose.

It is unusual to find a species of *Herrania* which occurs both east and west of the Andes, as well as in the valley between the several Andean chains in Colombia. Yet that is apparently the distribution of *Herrania pulcherrima*. Goudot said that he had found it in the deep valleys of the eastern Andean chain, near Savana Grande and Payme where, however, it seemed to be rare and isolated. I have seen no Goudot specimen from this locality; but it is very significant, I think, to note that all earlier and a number of later collections were made, not in the eastern Llanos, but within the Andean cordillera itself.

Vegetatively, *Herrania pulcherrima* can easily be con-

fused (and has been) with *H. tomentella*, a species growing on the eastern Llanos at the foothills of the Andes where the type of *H. pulcherrima* was collected. The differences between these two species are discussed below under *Herrania tomentella*.

The earliest reference to *Herrania pulcherrima* is Eloy Valenzuela's minute description of the plant written in Mariquita in the Departamento del Tolima, Colombia, in 1784, while he was engaged in the work of the Mutis Botanical Expedition in New Granada.

The specific name *pulcherrima*, meaning "very beautiful," could not be more appropriate. It recalls Valenzuela's picturesque remark that the flower of *Herrania pulcherrima* or *cacao esquinado* "could be considered as the greatest marvel of the plant kingdom and one can hardly believe that nature, as frugal and simple as she is, would have used so many ribbons and so much ornamentation to adorn herself almost as ostentatiously as in the fashions."

COLOMBIA: Intendencia del Meta, Iraca, San Juan [de Arama], Llanos Orientales. December 1844. *J. Goudot s.n.*—Departamento de Boyacá, region of Mount Chapon, extreme western part of the department, northwest of Bogotá. Heavy forest. El Umbo region. Alt. 3000 feet. "Tree 10 feet high. Flowers blood red." September 13, 1932, *A. E. Lawrence 437*.—Departamento de Cundinamarca, Municipio de El Peñon, Hacienda "Curiche." Alt. 1000 meters. "Varas altas y delgadas, de 4 metros." September 2, 1942, *R. Jaramillo-Mejía 202*.

Herrania tomentella *R. E. Schultes sp. nov.*

Herrania nitida (Poeppig) *R. E. Schultes var. aspera* (Karsten & Triana) *R. E. Schultes in Bot. Mus. Leafl. Harvard Univ.* 14 (1950) 130, *pro parte*.

DISTRIBUTION: Eastern foothills of the Andes, in the Orinoco drainage area of Colombia.

COMMON NAMES: *cacao de monte; cacaoito*.

Arbuscula parva, tenuis, venusta, vulgo plusminusve octo ad duodecim pedes alta; erecto cum trunco tereti, circiter tria pollices in diametro, cortice nigro oblecto; prope trunci apicem parce ramosa vel eramosa; ramis tomentosus. Ramuli dense villosi, ferrugineo-aureis cum pilis persistentibus. Folia amplissima, digitata, septemfoliolata, longissime petiolata. Petioli teretes, basi aliquid constricti, densissime et molliter aureo-ferrugineo-tomentelli, usque ad 60 cm. longi, 9–10 mm. in diametro. Stipulae persistentes, lineares, dense aspero-tomentellae, usque ad 3 cm. longae, 2 mm. latae. Foliola sessilia, oblanceolata vel late lanceolato-ovata, erecta, valde inaequalia, membranaceo-papyracea, apice acuminata, basi attenuata, margine dimidio superiore regulariter et leviter (praesertim apicem versus) sinuato-dentata et omnino pilis vel pseudociliis stellatis armata, 30–50 cm. longa, 13–20 cm. lata, supra aspera, sparse cum pilis fuscis solitariis, subtus submolliter et dense tomentella cum pilis longis stellatis ferrugineo-aureis. Inflorescentiae fasciculatae, comparate pauciflorae, e trunci partibus inferioribus prorumpentes. Pedicelli articulati, 7 mm. longi, 1.5 mm. in diametro, stellato-pilosi. Alabaster floris globosus, 15 mm. in diametro, dense stellato-pilosus. Calyx trifidus, fere usque ad basim divisus, subcymbiformis. Sepala vulgo inaequalia, subcrassa, atropurpurea, in alabastro valde valvata, extus grossiuscule stellato-pilosa, intus minutissime granuloso-pulverulenta, duo interiora rotundato-ovata, margine integra, apice perfecte rotundata, plusminusve 14 mm. longa, 10 mm. lata; sepalum exterius vulgo triangulari-ellipticum, margine integrum, apice subacutum, 13–14 mm. longum, basi 6–7 mm. latum. Petala quinque, basi sessilia, obovata vel ovata, apice valdissime concavo-cucullata, circiter 8 mm. longa, 7 mm. (saepe usque ad 8 mm.) lata, atosanguinea cum nervis purpureis, extus minute muricato-verrucosa, su-

perne in ligulam extensa. Ligulae lineares, plusminusve 70 mm. longae, basi 3 mm. latae, apicem versus filiformes, atrosanguineae sed apicem versus roseae. Tubus stamineus quinque-divisus cum staminibus invicem uno- et duo-antheriferis et cum filamentis brevibus liberisque. Staminodia petaloidea, atrosanguinea, membranacea, elliptica, margine integra, apice acuta, 14–15 mm. longa, 6–7 mm. lata, utrinque aliquid subverrucosa. Fructus non numerosi, ellipsoidei, usque ad 9 cm. longi, 4 cm. in diametro, apice longe attenuati sed prope apicem aliquid constricti, apice ipso obtuso et saepe contorto, basi non indentati, pedunculati, cum sepalorum vestigiis persistentibus, pedunculo articulato, 3 cm. longo, 4 mm. in diametro, omnino dense et minutissime velutino-pilosiusculi, tactu molles et sine pilis urticantibus, profundissime decem-costati, quinque cum costis primariis crassis et hebetato-rotundatis, 8 mm. altis, atque quinque cum costis secundariis similibus sed minoribus, 4–5 mm. altis, transverse leviter fibroso-rugosi, pericarpio crassiusculo, sublignoso, maturitate flavi dicitur. Semina plusminusve sexaginta, in pulpa alba inclusa.

A small tree, slender and graceful, commonly about eight to twelve feet in height. Trunk erect, about three inches in diameter, covered with blackish bark, sparsely branched near the top or unbranched. Branches tomentose. Branchlets densely villose, with golden-rust-colored and persistent hairs. Leaves very large, digitate, seven-foliate, very long-petiolate. Petioles round, somewhat constricted at the base, very densely and softly golden or ferruginous, tomentellous, up to 60 cm. long, 9–10 mm. in diameter. Stipules persistent, linear, densely rough-tomentellous, up to 3 cm. long, 2 mm. wide. Leaflets sessile, oblanceolate or broadly lanceolate-ovate, erect, strongly unequal, membranaceous to papyraceous, apically acuminate, basally attenuate, the margin both

regularly and lightly sinuate-dentate in the upper half, but especially towards the apex, and everywhere armed with cilia-like stellate hairs, 30–50 cm. long, 13–20 cm. wide, above rough to the touch with sparse single brown hairs, beneath rather softly and densely tomentellous with long golden-rust-colored stellate hairs. Inflorescence fasciculate, relatively few-flowered, growing from the lower portion of the trunk. Pedicels articulate, 7 mm. long, 1.5 mm. in diameter, stellate-pilose. Buds globose, 15 mm. in diameter, densely stellate-pilose. Calyx three-parted, divided almost to the base, subcymbiform. Sepals commonly unequal, rather carnose in life, dark purplish, strongly valvate in bud, externally rather coarsely stellate-pilose, internally very minutely granulate-pulverulent; the two interior sepals round-ovate, the margins entire, apically perfectly rounded, about 14 mm. long, 10 mm. wide; the exterior sepal usually triangular-elliptic, the margin entire, apically subacute, 13–14 mm. long, basally 6–7 mm. wide. Petals five, basally sessile, obovate or ovate, apically very strongly concave-cucullate, about 8 mm. long, 7 mm. (often up to 8 mm.) wide, dark blood-red with purple nerves, externally minutely muriculate-verrucose, ligulate. Ligules linear, about 70 mm. long, basally 3 mm. wide, filiform near the apex, dark blood-red, but pinkish near the tip. Staminal tube five-parted with stamens bearing one and two anthers alternately and with short, free filaments. Staminodes petaloid, dark blood-red, membranaceous, elliptic, marginally entire, apically acute, 14–15 mm. long, 6–7 mm. wide, somewhat verrucose on both surfaces. Fruits not numerous, ellipsoid, up to 9 cm. long, 4 cm. in diameter, apically long-attenuate, but near the tip slightly constricted, the tip itself obtuse and frequently twisted, basally not indented, pedunculate, with remnants of the persistent sepals (peduncle articulate,

3 cm. long, 4 mm. in diameter), everywhere densely and very minutely velvety-pilose, soft to the touch and without stinging hairs, very deeply ten-costate, the five primary ribs thick and bluntly rounded, 8 mm. high, the five secondary ribs similar but smaller, 4–5 mm. high, transversely lightly fibrous-rugose, the pericarp rather thick, almost woody, reported to ripen yellow. Seeds about sixty, embedded in a white pulp.

COLOMBIA: Intendencia del Meta, Cordillera La Macarena, trocha entre el Río Güejar y el Caño Guapayita. Alt. ca. 500–600 m. "Small tree, 12 feet tall. Fruit with soft velvety indumentum, ribs bluntly rounded, unequal." January 22, 1951. *Jesús M. Idrobo and Richard Evans Schultes 1192* (TYPE in Herb. Gray; DUPLICATE TYPE in Herb. Nac. Colomb.).—Intendencia del Meta, Sabanas de San Juan de Arama, márgen izquierda del Río Güejar, alrededores del aterrizaje "Los Micos." Alt. ca. 500 m. "Small tree. All parts of flowers deep scarlet." March 15, 1951, *Richard Evans Schultes 11821* (FLORAL TYPE in Herb. Gray).—Intendencia del Meta, Villavicencio. Alt. 300 m. "Cacaoito de monte." 1851–1857, *J. Triana s.n.*—Intendencia del Meta, Villavicencio. January 24, 1899, *T. A. Sprague 135*.—No precise locality. "Colombia." February 1899, *Rocha s.n.*—Intendencia del Meta, forest near Villavicencio. February 1943, *M. Bates s.n.*—Intendencia del Meta, Sierra de La Macarena. Playa Bonita. Alt. 400 m. "Dense, humid forest. Erect shrub." November 14, 1947, *W. R. Philipson, J. M. Idrobo & A. Fernández 1420*.—Intendencia del Meta, Sierra de La Macarena, Caño Entrada. Alt. 550 m. "Dense, humid forest. Unbranched slender tree, 8 m. high; fruits green." January 22, 1950, *W. R. Philipson, J. M. Idrobo & R. Jaramillo 2199*.—Intendencia del Meta, Sabanas de San Juan de Arama, márgen izquierda del Río Güejar, alrededores del aterrizaje "Los Micos." Alt. ca. 500 m. "Small tree, 12 feet tall." December 9, 1950, *Jesús M. Idrobo & Richard Evans Schultes 612*.—Same locality. "Arbolito de 2 m. Frutos caulinares." December 18, 1950, *Jesús M. Idrobo & Richard Evans Schultes 721*.—Intendencia del Meta, Cordillera La Macarena, trocha entre el Río Güejar y el Caño Guapayita. Alt. ca. 500–600 m. "Foliolos muy largos, pubescentes. Pequeño arbolito de 3.5 m." December 24, 1950, *Jesús M. Idrobo & Richard Evans Schultes 787*.—Intendencia del Meta, Cordillera La Macarena, trocha entre el Río Güejar y el Caño Guapayita, Caño Yerly. "Fruit dull green." March 9, 1951, *Richard Evans Schultes 11629*.

Herrania tomentella resembles, in its foliage, *H. pul-*

cherrima and *H. Cuatrecasana*. It differs from the former in having a much more finely sinuate margin, in having a smooth (instead of a rather muricate-subtuberculate) upper surface, in being more finely tomentose beneath, and in being membranaceous (rather than coriaceous) and generally smaller. From the latter, it can be distinguished by differences in the shape and margin of the leaflets. *Herrania Cuatrecasana* is conspicuously and gradually decurrent towards the base and has a very remotely and obscurely crenate-denticulate margin.

In the form of its fruit, *Herrania tomentella* approaches *H. Cuatrecasana* more closely than *H. pulcherrima*. The capsule of *Herrania pulcherrima* has strongly cultriform ribs with stinging hairs, whereas that of *H. tomentella* has broadly rounded ribs without stinging hairs. Furthermore, floral differences between *H. pulcherrima* and *H. tomentella* are marked, especially in the staminodes, which are apically trifid in the former but acute in the latter.

Although there are a number of resemblances between the capsules of *Herrania tomentella* and *H. Cuatrecasana*, the soft indumentum and lack of stinging hairs in the former are in sharp contrast to the condition in the latter where, except for stinging hairs along the ribs, the surface is glabrous or glabrescent. There are likewise several floral differences.

The leaflets of *Herrania tomentella* are borne in a partly erect position. This is also true of *Herrania Cuatrecasana* and *H. pulcherrima* and possibly of all species which have a noticeably swollen callus at the base of the leaflets. In this erect position of the leaflets, *Herrania tomentella* differs strikingly in habit from the only other species known in the Macarena, *H. nitida*, which has leaflets which tend to be rather reclinate.

A study of the fruit of the material from the Macarena has clarified a confusion of long standing. Although

specimens of *Herrania tomentella* have, in the past, been referred to *H. pulcherrima* or to *H. nitida* (as *H. nitida* var. *aspera*), a study of the capsule, until recently unknown, shows conclusively that *H. tomentella* has its relationships in other directions.

GUTTIFERAE

Clusia chiribiquetensis *Maguire ex Schultes* in Bot. Mus. Leaf. Harvard Univ. 15 (1951) 56, Pl. XVIII, upp. fig.

We now publish a drawing (Pl. XXXIII) of the type specimen of this interesting endemic *Clusia*.

Clusia Schultesii *Maguire ex Schultes* in Bot. Mus. Leaf. Harvard Univ. 15 (1951) 65.

Clusia Schultesii was not figured when it was described, but the concept is of such phytogeographical interest that the accompanying plate (XXXIV) is now offered.

LYTHRACEAE

(Contributed by Dr. Alicia Lourteig)

Cuphea sunubana *Lourteig sp. nov.*

Suffrutex (alt. ignota), ramis sublignosis, profuse ramificatis, flavo-vel ferrugineo-setosis (setis basi incrassatis, adpresso-adscendentibus) et minutissime pubescentibus, glabrescentibus. Internodia 4–6 mm. longa, quam folia minora. Folia decussata, subsessilia, conferta, discoloria, lanceolata (10–20 × 1.5–5 mm.), acuta, margine reflexa, nervo centrali rubente, subtus conspicuo, nervis secundariis plusminusve conspicuis, subtus setis in nervis atque marginem versus sed supra rarius in nervo centrali atque in lamina sparsis. Flores alterni inter folia. Pedunculi 3–5 mm. longi, tenues, setosi, apicem versus bibracteolati. Bracteolae ovato-acuminatae, plusminusve pubescentes. Calyx 5.5–6.5 mm. longus, fauce paulo dilatatus,

calcare recto, nervis copiosissime setosis (setis illis ramorum similibus) atque minutissime pubescentibus in lobulis appendicibusque, illo sub staminibus interne pubescente sed ceterum glabro. Petala sex, lilacea, obovato-subspathulata, 4-5 × 2-2.5 mm. Stamina 11, prope partem centram calycis inserta, duo dorsalia brevissima, alia longiora, horum tria ventralia glabra cetera pubescentia. Ovarium oblongum, in stylum inclusum, minute pubescentem attenuatum. Stigma capitatum. Ovulum carnosum, grossum, subhorizontale. Semen immaturum suborbiculare, complanatum, carunculatum, marginatum, minute foveolatum.

It is unfortunate that no mature seeds are available for this species, for it is difficult to place the concept, which is quite distinct, in any section of the genus. I believe, nevertheless, that it belongs to Sect. 5 *Brachyandra*, Subsect. 2 *Melanium*, Ser. 3 in Koehne's system (in Engler Pflanzenr. IV. 216 (1903) 82). It would fall between *Cuphea ciliata* Ruiz & Pav. (*C. microphylla* HBK.) and *C. fuscinerwis* Koehne. From the former, it differs in its inflorescence and pubescence and in having a red median nerve; from the latter, a Brazilian species, in its simple inflorescence.

The specific epithet refers to the locality where the type was taken—the Río Súnuba.

COLOMBIA: Departamento de Boyacá, Cordillera Oriental, vertiente oriental. Entre Gueteque y Guayatá, márgenes del Río Súnuba. Alt. 1500 m. June 30, 1940, *J. Cuatrecasas* 9698 (TYPE in Herb. Field Mus.).

The other new species of *Cuphea* herewith described belong in Section 6: *Euandra*, Subsection 2: *Hyssopocuphea* in Koehne's System.

It is regrettable that in almost all of the material available to me the seeds are immature. My studies, however, indicate that it is very probable that they would

not measure more than 2 mm. at maturity, a character used in Koehne's key to the Subsections.

The appearance of the seeds, as well as the general characters of the plants and their malpighiaceus type of pubescence, agrees with those for Section *Hyssopocuphea*.

As no species of this group has previously been recorded from Colombia, it would seem to be of interest to give a key for these five species.

Stems and branches only malpighiaceus-pubescent.

Calyx only malpighiaceus-pubescent. Ovules 2-4.

Seeds usually 3 *kubeorum*

Calyx malpighiaceus and setaceous-pubescent.

Ovules 5-6 *stygialis*

Stems and branches with another type of pubescence intermixed with the malpighiaceus.

Calyx-appendage long-setaceous. Ovules 12-15 . *philombria*

Calyx-appendage short-ciliate or glabrous.

Ovary glabrous with sparse short hairs.

Disk deflected, narrowly triangular.

Ovules 10-12 *sucumbiensis*

Ovary densely pubescent. Disk reflexed, ovoid-

complanate. Ovules 4-6 *beneradicata*

Cuphea kubeorum *Lourteig* sp. nov.

Suffrutex usque ad 1½ pedes altus, carnosio-malpighiaceo-pubescentis (pilorum brachiis in angulo acuto, hirsutis), plusminusve glabrescens. Rhizoma cylindricum, quam 20 cm. longius, cum ramulis fibrosis. Caulis basis sublignosa, crassa, brevis, e superficie terrae in caules secundarios numerosos divisa. Caules tenues, decumbentes, usque ad 20 cm. longi. Internodia variabilia, 3 mm. usque ad 2 cm. longa. Folia vulgo conferta, decussata, discoloria, parva, linealia, usque ad 8×1 mm., obtusa, supra pubescentia, subtus glabra, subsessilia cum petiolis brevissimis et angustissimis, margine reflexa, nervo centrali lato supra impresso sed subtus conspicue elevato. Flores alterni vel decussati. Pedunculi plerumque infrapetiolares, plusminusve 2 mm. longi, bibracteolati. Bracteolae

ovatae, pubescentes, plusminusve 0.3 mm. longae. Calyx 4.5 mm. longus, parte mediana constrictus, fauce dilatatus, cum calcare conspicuo, oblique incurvato, obtuso; lobulis latis, acuminatis; appendicibus quam lobulis minoribus, incrassatis; pilis malpighiaceis, uniformibus, brevibus; intus in nervis dense pubescens, sub staminibus lanosus. Petala sex, violacea, elliptica vel oblonga, 2–2.5 × 0.25–1 mm., obtusa. Stamina 11, inclusa, duo dorsalia brevissima, alia paulo majora, maturitate vulgo calycis marginem attingentia, horum tria ventralia glabra cetera lanosa. Ovarium asymmetrico-semiovoideum, dense pubescens, in stylum tenuem, inclusum, pubescentem attenuatum. Stigma capitatum. Discus crassus, deflexus, latus, obtusus. Ovula 2–4. Semina vulgo tria (non matura), suborbicularia, complanata, plusminusve 1.5 mm., leviter marginata, minute foveolata.

The specific epithet has reference to the Kubeo Indians who inhabit the general area where *Cuphea kubeorum* is known to grow.

COLOMBIA: Comisaria del Vaupés, Río Kubiyú (tributary of Río Vaupés), Cerro Kañendá, savannahs about 15 miles upstream from mouth. Quartzite base. Alt. about 800–900 feet. November 10, 1952, *Richard Evans Schultes & Isidoro Cabrera 18306* (TYPE in Herb. Gray). —Comisaria del Vaupés, Río Paraná Pichuna (tributary of Río Vaupés). Alt. about 700 feet. General location: Lat. 1° 10' N, Long. 70° 30' W. June 1953, *Richard Evans Schultes & Isidoro Cabrera 19913*.

***Cuphea stygialis* Lourteig sp. nov.**

Suffrutex usque ad pedem altus. Planta omnino aequaliter adpresso-malpighiaceo-pubescens, pilis crassis, albocerosis cum fundamento brevi et ramis inaequalibus rigidis. Rhizoma tortuosum, cylindricum, usque ad plusminusve 20 cm. longum, 8 mm. in diametro, cum ramis longis fibrosisque. Caules e basi in ramos divisi, recti vel aliquid decumbentes, basi usque ad 4 mm. Internodia quam folia minora, 4–8 mm. Folia decussata, rareriter verticillata (3 in verticillo), discoloria, lanceolata vel line-

alia, 8–18 × 1.5–3 mm., subsessilia, obtusa, marginata, nervo centrali fusco utrinque conspicuo, subtus cum pilis sparsis sed ceterum glabro. Flores alterni vel decussati, inter folia. Pedunculi 2–4.5 mm. longi, apicem versus bibracteolati. Bracteolae crassae, ovatae vel oblongae. Calyx 4.5–5.5 mm. longus, fauce dilatatus, calcare incurvato, lobulis triangulari-acuminatis, brevissime ciliatis, appendicibus crassis, quam lobulis brevioribus, dense adpresso-malpighiaceo-pubescentibus et hispido-fusco-glandulosis in parte mediana inferiore; intus dense pubescens. Petala sex, alba et purpureo-striata, obovato-subspathulata, 2.5–2.6 × 1.5–1.75 mm., obtusa. Stamina 11, inclusa, duo dorsalia brevissima, alia paulo majora, horum tria ventralia glabra, cetera lanosa. Pistillum inclusum, plusminusve 3 mm. longum. Ovarium dense pilosum, semiovoideum, in stylum pilosum attenuatum. Stigma capitatum. Ovula 5–6. Discus crassus, deflexus, complanato-ovoideus. Semina parva, 1–1.5 m., suborbicularia, plano-convexa, minutissime foveolata, caruncula conspicua.

Cuphea stygialis grows in dense carpets along the very edge of the great waterfall, where it is constantly under a spray of moisture.

The specific epithet *stygialis* has been chosen because, according to Dr. Schultes, the Raudal de Jirijirimo is a sacred place to the Indians of the Río Apaporis, who believe that it is the home of the dead leaders of their tribes.

COLOMBIA: Comisariás Amazonas-Vaupés, Río Apaporis, Raudal de Jirijirimo (below mouth of Río Kananari). Quartzite base. Alt. about 900 feet. February 14, 1952, *Richard Evans Schultes & Isidoro Cabrera 15330* (TYPE in Herb. Gray).

***Cuphea philombria* Lourteig sp. nov.**

Frutex plusminusve 50 cm. altus, pilis setosis malpighiaceisque obtectus. Radices fibrosae, profuse ramificatae,

usque ad 30 cm. longae. Caules basi sublignosi, 5 mm. in diametro, dichotome ramificati. Rami inaequales, rubicundulo-setosi et cano-malpighiaceo-pilosi. Internodia 0.5–1 mm. longa, quam folia breviora. Folia discoloria, lineari-lanceolata (15–30 × 4.5–8 mm.), sessilia vel subsessilia, petiolo crasso, uninervia, subtus cum pilis malpighiaceis et nervo conspicuo, supra leviter strigosa cum nervo aliquid impresso, apice acuta vel obtusa. Flores alterni vel rarer decussati, inter folia. Pedunculi infra-petiolares, 4 mm. longi, tenues, pubescentes, apicem versus bibracteolati. Bracteolae crassae, parvae (circiter 0.5 mm. longae), suborbiculares, rubicundulae. Calyx atro-violaceus, a fauce longitudinis $\frac{1}{3}$ constrictus, fauce ampliata, viscido-setulosus (setis violaceis) atque cum pilis canis malpighiaceisque, calcare obliquo subacutoque; lobulis pubescentibus, inter sepala appendicibus subulatis, setosis, quam lobulis aliquid minoribus; intus ubique minute pubescens et parte superiore sub staminibus lanato-pubescens. Petala sex, violacea, obovato-cuneata (4.5–7 × 2.5–3.5 mm.), obtusa. Stamina 11: duo dorsalia brevissima, alia majora (sed calycem non excedentia), horum tria glabra, cetera pilosa. Discus carnosus, crassus, reflexus, obtusus. Ovarium asymmetrico-semiovoideum, plusminusve 5 mm. longum, breviter pubescens, in stylum inclusum attenuatum, plusminusve pilosum. Stigma subcapitatum, papillosum. Ovula 12–15. Semen castaneum, complanato-suborbiculare (circiter 1.5 mm. statu immaturo), minute foveolatum.

The specific epithet *philombria* is derived from the Greek meaning “lover of rain” and refers to the high rain-forest habitat where the plant grows abundantly along fast-running rills.

COLOMBIA: Intendencia del Meta, Cordillera La Macarena, Macizo Renjifo. Alt. 1,300–1,900 m. “On rocky banks at river’s edge, roots imbedded in moss; in shaded, damp areas.” January 20, 1951, *Jesús M. Idrobo & Richard Evans Schultes 1062* (TYPE in Herb. Gray).—Same

locality. "On rocks, with roots imbedded in moss; very full, in clumps; in sunny spots." January 20, 1951, *Jesús M. Idrobo & Richard Evans Schultes 1061*.

***Cuphea sucumbiensis* Lourteig sp. nov.**

Suffrutex (alt. ignota), omnino cano-malpighiaceo-pubescentibus, basi sublignosus, ramificatus. Rami tenues, setis ferrugineis, basi incrassatis, adscendentibus copiose obtecti. Internodia quam folia minora, 3 mm. longa. Folia decussata, conferta, sessilia vel subsessilia. Petioli lati, rubicunduli, setosi, ramis similes. Lamina linealis vel lineali-lanceolata, 5–14 × 0.6–2 mm., discolor, obtusa vel acuta, intus pubescentior, glabrescens, nervo centrali subtus prominenter elevato, fusca, setosa, margine reflexa. Flores decussati, alterni, apice ramorum inter folia positi. Pedunculi infrapetiolares, 2.5 mm. longi, pubescentes, ramis similes, partem centralem superiorem versus bibracteolati. Bracteolae crassae, ovatae, 0.5 mm. longae, obtusae. Calyx gracilis, 4–5 mm. longus, fauce dilatatus, calcare conspicue producto, lobulis acutis, appendicibus incrassatis, lobulis aequalibus vel paulo longioribus, adpresse cano-malpighiaceo-pubescentibus et inferne cum setis brevibus fuscis commixtis; intus in nervis dorsalibus pubescens et in ceteris plusminusve minute puberulentus, sub staminibus lanosus. Petala sex, lilacina, obovata vel oblonga, duo dorsalia aliquid majora, 2.5–2.75 × 1–2 mm. Stamina 11, in parte mediana superiore calycis inserta, inclusa, duo dorsalia brevissima, alia majora, horum tria ventralia glabra, cetera plusminusve grosse pilosa. Ovarium asymmetrico-ovoideum, glabrum vel pilis brevibus sparse ornatum. Stylus tenuis, inclusus, plusminusve pubescens. Stigma subcapitatum. Ovula 10–12. Discus magnus, 0.5–0.6 mm., triangulari-cordiformis, complanatus, abrupte deflexus. Semina (immatura) parva, suborbicularia, complanata, paulo marginata, minute foveolata.

Cuphea sucumbiensis is named for the type locality, the Río Sucumbíos, which forms part of the boundary between Colombia and Ecuador. The species should be recorded also for the flora of Ecuador, for, doubtless, it occurs on both banks of this river.

COLOMBIA: Comisaría del Putumayo, frontera Colombo-ecuatoriana. Selva higrófila del Río Sucumbíos (San Miguel), entre los afluentes Conejo y Hormiga. Alt. 300 m. December 15, 1940, *J. Cuatrecasas 11069a* (TYPE in Herb. Field Mus.).

***Cuphea teneradicata* Lourteig sp. nov.**

Suffrutex 20–25 cm. altus, basi lignosus, crassus, tortuosus, in saxorum fissuris crescens, cano-malpighiaceo-pubescentia et in caulibus juvenilibus etiam cum pilis purpureo-hispido-glandulosis. Internodia quam folia minora, 2–4 mm. longa. Folia lanceolata vel linealia, obtusa, margine reflexa, 8–11 × 1–3 mm., subsessilia, petiolis crassis, plusminusve 0.6 mm. longis, nervo centrali lato, fusco, infra conspicuo, subtus densius adpresso-cana, malpighiaceo-pubescentia et margine (statu juvenili) cum ciliis longis, tenuibus et glandulosis, caducis. Flores decussati, in ramorum apice. Pedunculi 2–2.5 mm. longi, in parte mediana superiore bibracteolati. Bracteolae ovato-acuminatae, 0.5 mm. longae, pubescentes. Calyx 5–5.5 mm. longus, malpighiaceo-pilosus (pilis plusminusve hirsutis) et copiose purpureo-hispido-glandulosus in parte inferiore; lobulis latis, acuminatis; appendicibus crassis, pubescentibus, lobulis aequalibus; calcare conspicuo incurvato, obtuso; intus in nervis pubescens, sub staminibus lanosus. Petala sex, roseo-purpurea, 3.5 × 1.5 mm., oblonga vel obovato-oblonga. Stamina 11, duo dorsalia brevissima, alia majora, calycis marginem attingentia, horum tria ventralia glabra, cetera lanosa. Pistillum 3.5 mm. longum, inclusum. Ovarium asymmetrico-semiovoideum, dense pubescens. Pistillum tenue, pubescens. Stigma subcapitatum. Discus complanato-ovoid-

eus, deflexus, obtusus. Ovula 4–6. Semina adhuc ignota.

I have chosen the specific epithet because, according to the three collectors of the material cited below, this little shrub is anchored so firmly by its fibrous roots in the cracks of the bare sandstone where it grows that it could not be collected with the roots but had to be cut off at the surface of the ground.

COLOMBIA: Comisaría del Vaupés, Mesa La Lindosa, 15–20 km. de San José del Guaviare. Alt. 400–600 m. December 13–15, 1950, *Jesús M. Idrobo & Richard Evans Schultes 640* (TYPE in Herb. Gray).—Comisaría del Vaupés, San José del Guaviare. Alt. 270 m. November 12, 1939, *J. Cuatrecasas 7691*.

***Cuphea annulata* Koehne** in Martius Fl. Bras. 13, pt. 2 (1877) 304, t. 56, f. 5.

Although the type of this species bears a label reporting the “calyx coccineus,” and the collection cited below states “flowers basally green-yellow, remainder (about $\frac{3}{4}$ of length) red,” their identity is unquestionable.

The petals and stamens are red. The ovules are five, reducing to two or three seeds at maturity. As Koehne did not see the seeds, having only the type material, it seems to me advisable to describe them:

Seeds dark brown, complanate-suborbiculate (± 3 mm.), slightly marginate, border somewhat concave at the place of the caruncle, apex broadly retuse, surface finely foveolate.

The type of *Cuphea annulata* was collected in 1820 by Martius at Araracuara on the Río Caquetá in Colombia, not from Brazil nor from the Río Negro as stated on the label: “Alto Amazonas, Río Negro bei Araracoara.” It is of interest to note that the locality of *Schultes & Cabrera 17509* is an isolated mountain not far in a straight line from Araracuara and belonging geologically to the same formation. The species is one of the characteristic endemics of the ancient cretaceous sandstone Venezuela-

Guiana land-mass and has recently turned up on Cerro Duida, as I shall point out in detail in another paper.

COLOMBIA: Comisaría del Vaupés, Río Piraparaná (tributary of Río Apaporis), Cerro E-ree-kö-mee-ö-kee. General location: between Lat. $0^{\circ}15' S$, Long. $70^{\circ}30' W$ and Lat. $0^{\circ}25' N$, Long. $70^{\circ}30' W$. "Somewhat scandent shrub 4 feet tall. Flowers basally green-yellow, remainder (about $\frac{3}{4}$ of length) red. Leaves very bright green." September 18, 1952, *Richard Evans Schultes & Isidoro Cabrera 17509*.

APOCYNACEAE

***Couma catingae* Ducke** in Archivos Inst. Biol. Veg. Rio Janeiro 4 (1938) 59.

The collection cited below extends the range of this species, hitherto reported only from the Amazonas of Brazil, into Colombia.

COLOMBIA: Comisarias del Amazonas-Vaupés, Río Apaporis, Cachivera de Jirijirimo y alrededores. Alt. c. 250 m. "Small caatinga tree. Latex white. Puinave = *hwãn-hwãn*." June 13, 1951, *Richard Evans Schultes & Isidoro Cabrera 12461*.