

## NOTES ON NEOTROPICAL MALPIGHIACEAE—V

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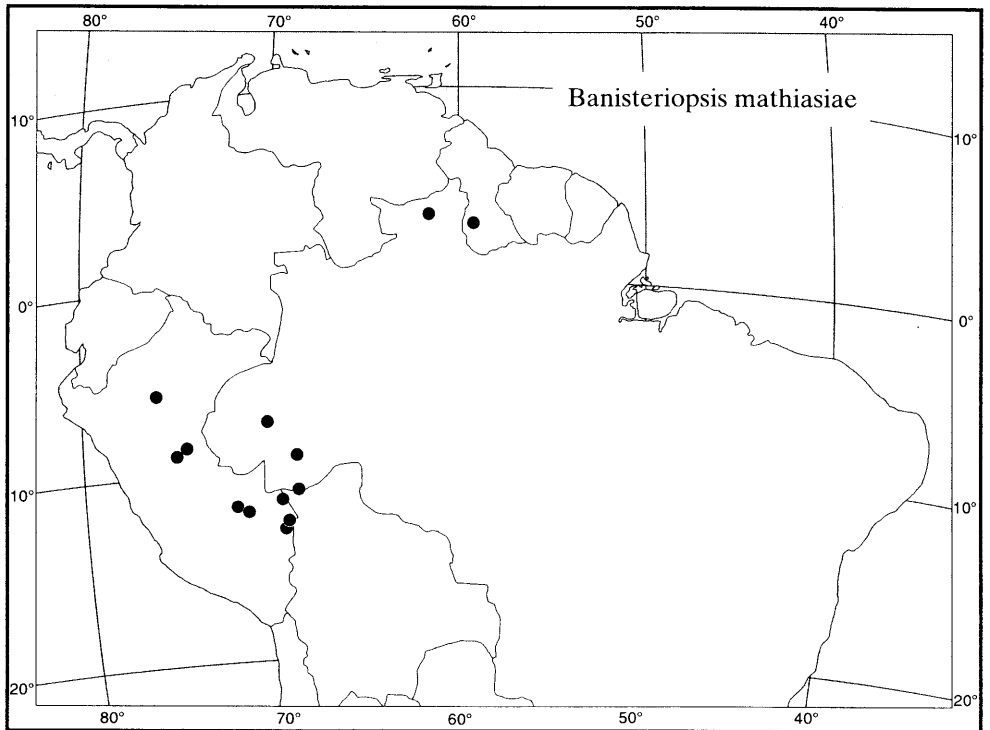
This paper contains another miscellany of new species, new combinations, and lectotypifications. It is clear that many undescribed Malpighiaceae still await our attention, especially in South America. This modest contribution represents one step in the long journey toward the goal of knowing and understanding the Malpighiaceae of the New World.

**Banisteriopsis cornifolia** (H. B. K.) C. B. Rob. ex Small var. **maracaybensis** (Adr. Juss.) W. R. Anderson, comb. nov. *Banisteria maracaybensis* Adr. Juss., Ann. Sci. Nat. Bot., Sér. 2, 13: 285. 1840. *Banisteria maracaybensis* var. *elliptica* Nied., Ind. Lect. Lyc. Reg. Hos. Brunsberg. p. hiem. 1900–1901: 5. 1900. *Banisteria cornifolia* var. *elliptica* (Nied.) Nied. in Engler, Pflanzenreich IV. 141: 405. 1928. *Banisteriopsis cornifolia* var. *elliptica* (Nied.) B. Gates, Fl. Neotr. 30: 42. 1982.—TYPE: VENEZUELA. Zulia: Maracaibo, *Plée s.n.* (holotype: P!; isotypes: BR! [lectotype of *Banisteria maracaybensis* var. *elliptica*], F!, P!, P-JU!).

**Banisteriopsis mathiasiae** (W. R. Anderson) W. R. Anderson, comb. nov. *Stigmaphyllon mathiasiae* W. R. Anderson, Bol. Mus. Bot. Munic. (Curitiba) 43: 3. 1981.—TYPE: PERU. Ucayali (formerly Loreto): Pucallpa–Aguaytía road, Km 34 just W of Tournavista, *Mathias & Taylor 6078* (holotype: MICH!; isotypes: COL!, F!, LA!, MBM!, MO!, NY!, RB!, U!, US!, USM!).

This anomalous species bears resemblances to both *Banisteriopsis* and *Stigmaphyllon*. I originally described it in *Stigmaphyllon* because Bronwen Gates did not welcome it in *Banisteriopsis*. Now Christiane Anderson, who is completing a monograph of *Stigmaphyllon*, adamantly rejects it as a member of that genus, and B. Gates, while still not keen, is willing to tolerate it in *Banisteriopsis*.

*Banisteriopsis mathiasiae* seems to belong in subgenus *Banisteriopsis*, and to be most closely related to *B. megaptera* B. Gates and *B. ferruginea* (Cav.) B. Gates, both species of eastern Brazil. It is easily distinguished by its much larger leaves with large protruding glands at the apex of the petiole, one character that makes it look like a *Stigmaphyllon*. However, the most dramatic character of this species, and the one that most recalls *Stigmaphyllon*, is the structure of the inflorescence. In *B. mathiasiae* the inflorescence is strongly cymose—the first flowering axis is relatively short and densely flowered, while the subtending secondary branches are long-stalked and generally overtop it. This pattern may be repeated as the inflorescence continues development, producing the kind of dichasial effect that gives species of *Stigmaphyllon* their characteristic aspect. In related species of *Banisteriopsis* the side branches are shorter, producing an effect that is more paniculate than cymose, and in at least some cases the maturation of flowers

FIG. 1. Distribution of *Banisteriopsis mathiasiae*.

seems to be from the lower branches toward the upper, or truly paniculate. So the inflorescence that gives *B. mathiasiae* its distinctive resemblance to a *Stigmaphyllon* may result from a fundamental change in the timing of its development, or from a simple difference in the amount of elongation of side branches, but in any case I am now satisfied by the other evidence, especially from the flowers, that this species belongs in *Banisteriopsis*.

*Banisteriopsis mathiasiae* has a rather wide distribution in southwestern Amazonia (Fig. 1), being known now from the departamentos of Loreto, Ucayali, Huánuco, and Madre de Dios in Peru, and from Acre and nearby Amazonas in Brazil. It also occurs in northeastern Amazonia, in the Reserva Ecológica Maracá, Ilha de Maracá, Território Roraima, Brazil, and in the Rupununi district of Guyana. Such transamazonian disjunctions are known in other groups of Malpighiaceae, so while this pattern is surprising and fascinating, it is not without precedent. In fact, *Banisteriopsis cinerascens* (Benth.) B. Gates, another species of subgenus *Banisteriopsis*, has a very similar distribution.

***Bunchosia anomala*** W. R. Anderson, sp. nov.—TYPE: COLOMBIA. Antioquia: Mpio. Pto. Berrío, vereda Alicante, 1 km S de finca Pénjamo, en la via de San Juan de Bedout—La Cabaña, 6°39'N, 74°33'W, 500 m, bosque perturbado, frecuente, 2 Mar 1990 fl, *Callejas, Roldán & Maza* 9292 (holotype: MICH!; isotype: NY!).

Fig. 2.

Arbor 12 m alta, ramis primo sparsim sericeis mox glabratiss. Lamina foliorum majorum 8.5–10.5 cm longa, 4.5–5.5 cm lata, sparsim sericea vel glabrata. Inflorescentia ramum bifoliatum terminans, ex minimum 24–30 floribus constans. Petalum

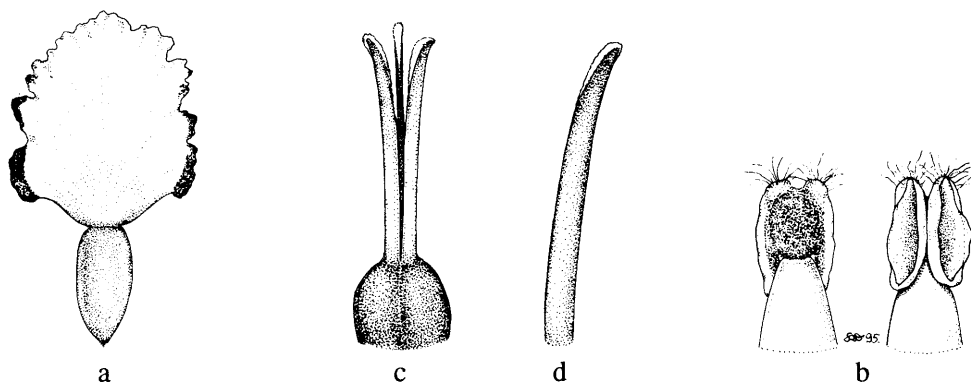


FIG. 2. *Bunchosia anomala*. a) posterior petal, adaxial view,  $\times 4.7$ ; b) anthers, abaxial view (left) and adaxial view (right),  $\times 10$ ; c) gynoecium,  $\times 6.7$ ; d) style tip, lateral view, showing the elongated stigma,  $\times 13.3$ . Drawn by Karin Douthit from the holotype.

posticum ungue 3 mm longo, 1.8 mm lato, crassissimo, apice constricto, limbo 6 mm longo, 5 mm lato, margine proximaliter crasse glanduloso. Antherae 1.2–1.5 mm longae, apice tomentosae, connectivo brunneolo. Ovarium 3-carpellatum, glabrum; styli 3, liberi, 3.5 mm longi, stigmatibus elongatis, 0.7–0.9 mm longis.

Tree 12 m tall; stems initially very sparsely sericeous with short translucent appressed hairs, soon glabrate. Lamina of larger leaves 8.5–10.5 cm long, 4.5–5.5 cm wide, elliptical, cuneate at base, acuminate at apex with the very tip glandular and often slightly retuse, bearing 2 (–3) large glands abaxially near midrib ca 1 cm above base, very sparsely sericeous to glabrate on both sides, the hairs persisting longer above than below; petiole 5–7 mm long, sparsely sericeous to glabrate, eglandular or bearing a small bulbous gland at base just above one of the stipules; stipules 0.5–0.8 mm long, borne on adaxial face of petiole at base, ovate, abaxially hairy, adaxially glabrous. Inflorescence a pseudoraceme terminating a lateral shoot with a pair of full-sized vegetative leaves, loosely sericeous, ca 10 cm long (very young, surely not fully elongated), the 24–30 or more flowers mostly decussate but with the regularity sometimes decaying distally; bracts (except the proximal pair, which are often 5–9 mm long and linear) 1.5–2 (–2.5) mm long, triangular or ovate; peduncle 3–4.5 mm long; bracteoles apical, 1–1.2 mm long, triangular or ovate, one or occasionally both bearing an eccentric abaxial gland 0.7–1.2 mm in diameter; pedicel 2.5–3.5 mm long. Sepals 1.5–2 mm long beyond glands, rounded, glabrous except for the ciliate margin, appressed in anthesis, the glands 10, 3–4 mm long, some connate in pairs, glabrous. Petals yellow, glabrous, the lateral 4 reflexed with the slender claw 3 mm long, the limb 7–8 mm long, most deeply concave in outermost petal, coarsely erose or toothed with the marginal divisions more or less glandular in the proximal half; posterior petal erect, the claw 3 mm long, 1.8 mm wide, very thick, constricted at apex, the limb 6 mm long, 5 mm wide, flat, roughly pentagonal, the margin irregularly dissected and proximally thickly glandular, the glandularity diminishing distally. Filaments 2.2–3 mm long, glabrous, ca 1/2 connate; anthers 1.2–1.5 mm long, each bearing an apical tuft of hairs, pressed against styles in anthesis, the connective light brown. Ovary 1.5 mm high, cylindrical, 3-carpellate, glabrous; styles 3, free, 3.5 mm long, glabrous, each stigma elongated, 0.7–0.9 mm long, linear or slightly dilated at apex, receptive on the internal face, spreading or recurving. Fruit unknown.

*Bunchosia anomala* belongs to a small group of species that have a three-carpellate gynoeceum with free styles and the inflorescence terminating a leafy shoot. It most resembles *B. diphylla* (Jacq.) Cuatr. & Croat, but it differs dramatically from that species, and from all other species in the genus, in two characters, the hairy anthers and the elongated stigmas. The latter are most peculiar. In most species of *Bunchosia* the styles have large apical stigmas that appear to be capitate or triangular. In a few the stigma is slightly extended abaxially, e.g., *B. macilentata* Dobson, as described and illustrated in my 1987 article in this series (pp. 60, 65). A somewhat elongated stigma is also found in *B. hartwegiana* Benth., another Colombian species of this complex. However, nothing I have seen approaches the long, slender stigma found in *B. anomala*. *Bunchosia anomala* is also interesting for the flag petal of its flowers, which has an extraordinarily wide, thick claw that is constricted at the apex. The hairy anthers and long stigmas of this anomalous species will force us to expand somewhat our concept of the morphology of this genus, but there can be no doubt that it belongs in *Bunchosia*, and when it is found with fruits they will probably be similar to those of *B. diphylla*. The type is very young, with only the lowest flowers in each pseudoraceme open, so some of the measurements given above (especially length of the inflorescence, peduncle, and pedicel) will surely change when more mature material is available.

***Bunchosia brevistyla*** W. R. Anderson, sp. nov.—TYPE: COLOMBIA. Valle: Mpio. Darién, Hda. Abraham Domínguez, 1800 m, 29 Jun 1988 fl, *Devia A. 2208* (holotype: MICH!; isotype: MO!).

Frutex vel arbor?, ramis primo sericeis mox glabratis. Lamina foliorum majorum 12.3–14.4 cm longa, 5.5–6.7 cm lata, basi cuneata vel rotundata, margine plana, apice late obtusa vel rotundata, maturitate glabra vel costa abaxiali paucipilifera. Inflorescentia ramum bifoliatum terminans, ex 10–21 floribus constans. Petalum posticum ungue 3.5 mm longo, 1.2 mm lato, crassissimo, apice aliquantum constricto, limbo 4 mm longo, 3 mm lato, margine distaliter glanduloso-eroso. Antherae 0.9–1.1 mm longae, glabrae, connectivo luteo. Ovarium 2- vel 3-carpellatum, dense tomentosum; styli 2 vel 3, liberi, 1.5–2 mm longi, stigmatibus triangulari-peltatis.

Shrub or tree?, the stems initially sericeous, soon glabrate. Lamina of larger leaves 12.3–14.4 cm long, 5.5–6.7 cm wide, elliptical or somewhat ovate, broadly cuneate or rounded at base, nearly flat at margin, broadly obtuse or rounded at apex, eglandular at apex or with an obscurely glandular tip, bearing 2 abaxial glands at very base beside midrib, glabrous at maturity or with a few appressed hairs on abaxial midrib near base; petiole 8–10 mm long, sparsely sericeous to glabrate, apparently eglandular; stipules ca 1 mm long, borne on adaxial face of petiole at base, ovate, glabrous or abaxially sericeous. Inflorescence a pseudoraceme terminating a lateral shoot with a pair of full-sized vegetative leaves, thinly sericeous with the hairs mostly tightly appressed, 4–8.5 cm long, the 10–21 flowers proximally decussate, distally decussate or in no regular order; bracts (except the proximal pair, which may be up to 4 mm long) 1–2 mm long, ovate; peduncle 1.5–5 mm long; bracteoles apical, 1–1.5 mm long, broadly ovate, one or both bearing 1–2 eccentric abaxial glands 0.5–1.4 mm in diameter; pedicel 2.5–3.5 mm long, loosely sericeous. Sepals 1.5–2 mm long beyond glands, rounded, glabrous except for the ciliate margin, appressed in anthesis, the glands 10, 2.7–3.5 mm long, some connate in pairs, glabrous. Petals yellow, glabrous, the lateral 4 reflexed, the

posterior erect; anterior-lateral petals with the claw slender, 2.5 mm long, the limb ca 5 mm long, concave (especially in the outermost petal), erose at the margin and eglandular or irregularly glandular; posterior-lateral petals with the claw 2 mm long, ca 1 mm wide, constricted at apex, the limb 3.5–4 mm long, nearly flat, erose with the divisions often glandular, especially distally; posterior petal erect, the claw 3.5 mm long, 1.2 mm wide, very thick, somewhat constricted at apex, the limb 4 mm long, 3 mm wide, flat, elliptical, the margin glandular-erose around the distal 2/3. Filaments 2.5–3 mm long, glabrous, ca 1/2 connate; anthers 0.9–1.1 mm long, glabrous, pressed against styles in anthesis, the connective yellow. Ovary 1.7–2 mm high, globose, 2- or 3-carpellate, densely tomentose, especially on the distal 2/3; styles 2 or 3 (as many as the carpels), free, 1.5–2 mm long, glabrous, the stigmas triangular-peltate. Fruit unknown.

*Bunchosia brevistyla* belongs to the same group of species as *Bunchosia anomala*, discussed above. Its closest relative is probably *B. hartwegiana* Benth, also of Colombia, which differs from *B. brevistyla* in that its leaves have undulate margins, its filaments are about 3.5 mm long, its ovary is glabrous, and its styles are about 3.5 mm long; the epithet *brevistyla* draws attention to the last differentiating character. *Bunchosia hartwegiana* has consistently three-carpellate flowers, whereas in *B. brevistyla* they may be either two- or three-carpellate. Such inconsistency is unusual in this genus, but I have seen it before in *B. mollis* Benth and *B. plowmanii* W. R. Anderson. One might also compare *B. brevistyla* to *B. cestrifolia* Benth, another species of Colombia with inflorescences terminating leafy shoots. That species has consistently two-carpellate flowers. Its ovary is loosely hairy, in which it resembles *B. brevistyla*, but the leaves in *B. cestrifolia* are much smaller, with the lamina up to 8 cm long and 3.5 cm wide.

The label with the only known collection of *B. brevistyla* describes the plant as an epiphyte, which seems unlikely to be correct; I expect it to prove to be a shrub or small or medium-sized tree like other species in the genus.

**Byrsonima baccae** W. R. Anderson, sp. nov.—TYPE: VENEZUELA. Amazonas: Depto. Atures, Sierra Maiqualida, sector noroccidental, en pequeño valle afluente izquierdo del Caño Iguana medio, 5°30'N, 65°15'W, 2000 m, sobre rocas y en islas arbóreas adyacentes, 2 Mar 1991 fl, Huber, Berry & Rosales 13112 (holotype: VEN!; isotype: MICH!).

Frutex vel arbor parva 1–6 m alta, ramis vegetativis glabris. Lamina foliorum majorum 3–4 cm longa, 1.5–2.2 cm lata, basi cuneata, valde revoluta, coriacea, glabra; petiolus 6–8 mm longus; stipulae 1.5–2 mm longae, liberae, rotundatae, abaxialiter glabrae. Inflorescentia floribus singulis vel in cincinnis sessilibus bifloris portatis, bracteis bracteolisque persistentibus; pedicellus 2.5–3 mm longus, rectus in alabastro. Sepala per anthesin appressa. Petala rosea. Antherae 1.4–1.5 mm longae, glabrae, loculis 1–1.2 mm longis, cylindricis et non alatis, apice rotundatis, connectivo loculos 0.3–0.4 mm superanti. Ovarium glabrum, loculis omnibus fertilibus.

Shrub or small tree 1–6 m tall; vegetative internodes glabrous. Lamina of larger leaves 3–4 cm long, 1.5–2.2 cm wide, elliptical or slightly ovate, cuneate and often somewhat decurrent at base, strongly revolute at margin, broadly obtuse to rounded at apex, coriaceous, glabrous, the lateral veins 5–8 on each side of the midrib, obscure or prominent above and below, the lesser veins and reticulum generally not visible; petiole 6–8 mm long, glabrous; stipules 1.5–2 mm long, free,

33 mm longus, hispido-tomentosus vel glabrescens; stipulae 5–9 mm longae, connatae, in petiolo persistentes. Inflorescentia 10–22 cm longa, velutina, floribus singulis, bracteis 2–6 mm longis, bracteolis 1.5–3 mm longis, bracteis bracteolisque deciduis; pedicellus 8–12 mm longus (–15 mm in fructu), leviter circinatus in alabastro, decurvatus vel tortus in fructu. Flores fructusque eis *B. stipulaceae* similes.

Tree 7–25 m tall; stems initially hispid-tomentose with a mixture of long spreading basifixed or sub-basifixed hairs and a tight underlayer of minute stellate scale-like hairs, the long hairs mostly deciduous early and the stems glabrescent in subsequent seasons. Lamina of larger leaves on sexually mature trees (11–) 14–27 cm long, 6–12.5 cm wide (up to 45 × 15 cm on immature trees), elliptical or obovate, gradually tapered to cuneate at base, slightly revolute at margin, rounded, obtuse, acute, or abruptly short-acuminate at apex, initially hispid-tomentose on both sides but at maturity thinly stellate-tomentose to glabrate above and persistently brown-tomentose below with a dense, tight covering of minute (ca 0.1 mm in diameter), sessile or subsessile, stellate hairs plus often an admixture of long basifixed hairs on the midrib, the midrib and lateral veins very prominent below, the scalariform tertiary veins moderately prominent below; petiole 17–33 mm long, hispid-tomentose to glabrate; stipules 5–9 mm long, amplexicaulous, abaxially hispid-tomentose to glabrescent, adaxially glabrous or tomentose distally, completely and smoothly connate, rounded or obtuse at apex, lineate with many fine parallel veins, persistent on the petiole and falling with the leaf. Inflorescence 10–22 cm long, velutinous, the flowers borne 1 per bract; bracts 2–6 mm long, ca 2 mm wide, ovate to narrowly triangular, straight or somewhat reflexed but not revolute, abaxially tomentose, adaxially tomentose to glabrescent, deciduous before or during anthesis, well before enlargement of the fruits; peduncle 0–1 mm long (–2 mm in fruit); bracteoles like the bracts but shorter, 1.5–3 mm long, ca 2 mm wide, deciduous; pedicel 8–12 mm long (–15 mm in fruit), velutinous, slightly circinate in bud, decurved or twisted in old flowers and fruits. Sepals all biglandular or all eglandular, ca 3 mm long, 2–2.4 mm wide, lingulate, rounded at the apex, already revolute in bud and strongly revolute in anthesis, stellate-tomentose on both sides, accrescent and somewhat auriculate in fruit, the glands 2–3 mm long. Petals yellow, glabrous, erose to subentire, the lateral 4 with the claw 2.5–3 mm long, the limb 4.5–6 mm long, 6–7 mm wide; posterior petal with the claw 2.7–3 mm long, very thick, the limb 2.5–3 mm long, 3–4 mm wide, crumpled, strongly reflexed. Filaments 1.5–2 mm long, basally connate, abaxially glabrous or nearly so, adaxially short-hirsute at the base; anthers 2.2–3.2 mm long, heterogeneous in the same flower, the locules linear, 1.7–2.6 mm long, loosely sericeous on both sides, free at the apex, the connective exceeding the locules by 0.4–1.1 mm, rounded or obtuse and often somewhat reflexed at the apex. Ovary conical, 1.5–2 mm high, densely tomentose, all 3 locules fertile; styles 3.2–3.5 mm long, basally pilose. Fruit globose, 11–18 mm in diameter (dried), with a short apical beak ca 1–2 mm long formed by the thickened bases of the persistent styles, orange-yellow, densely stellate-pilose when immature, with some hairs persisting even at maturity.

ADDITIONAL SPECIMENS EXAMINED. **Brazil:** AMAZÔNAS: Reserva Florestal Ducke, Km 26 on Manaus–Itacoatiara Hwy, *Anderson 13767* (MICH); Mpio. Pres. Figueredo, Rio Uatumã, 1–2°S, 59–60°W, *Cid Ferreira et al. 6714* (MICH); Mpio. Manaus, 80 km N of Manaus, *Dick 207* (MICH); Manaus, Colonia Campos Salles, *Ducke s.n.* (MG 11149); [Mpio. Manaus], Distr. Agropecuário, *Freitas da Silva et al. 558* (MICH); Manaus, R. F. Ducke, *Freitas & Rodrigues 1046* (NY); Mpio. Manaus, Distr. Agropecuário, *Martins et al. 105* (NY) & *189* (MICH), *Mori et al. 20556* (MICH); Manaus, Reserva Ducke, *Mota & Coelho 68* (MO); Reserva Florestal Ducke, *Nascimento & Damião s.n.* (INPA 66283);

(usque ad 11 mm in fructu), circinatus in alabastro, rectus in fructu. Sepala per anthesin appressa. Petala rosea vel primum alba demum rosea. Filamenta 1.4–1.6 mm longa; antherae 1.2–1.7 mm longae, glabrae, loculis 1–1.5 mm longis, cylindricis, apice rotundatis vel mucronulatis, connectivo loculos aequanti in stamine petalo postico opposito, cetera 0.3–0.6 mm superanti. Ovarium glabrum, loculis omnibus fertilibus.

Tree 12–20 m tall; stems sericeous to glabrescent. Lamina of larger leaves 7.5–13 cm long, 3.3–6 cm wide, elliptical or somewhat obovate, cuneate at base, flat at margin, mostly abruptly short-acuminate at apex, sparsely sericeous to glabrate above, thinly but persistently sericeous below or eventually glabrescent, thin, the lateral veins and reticulum visible and prominent on both sides but especially below; petiole 15–32 mm long, sericeous to glabrate; stipules 1.5–3 mm long, completely and smoothly connate, the pair ovate or triangular, obtuse or acute at apex, abaxially sericeous, adaxially glabrous. Inflorescence 7–14 cm long, sericeous, the flowers borne 1 per bract; bracts and bracteoles 0.5–1 mm long and wide, triangular to broadly ovate, persistent past maturity of the fruit; peduncle none; pedicel 5–6 mm long in flower, up to 11 mm long in fruit, loosely sericeous, circinate in bud, straight in fruit. Sepals all biglandular, 1.5–1.7 mm long beyond glands, 1.5–2 mm wide, broadly triangular with obtuse or rounded apex, appressed in anthesis, enlarging and becoming somewhat auriculate in fruit, abaxially sericeous, adaxially glabrous; glands white or pink, 1.5–2 mm long. Petals pink or white turning pink, glabrous, the lateral 4 with the claw 1.5–2 mm long, the limb 3.5–4 mm long, 3.5–5 mm wide; posterior petal with the claw 2 mm long, the limb 3 mm long and wide. Filaments 1.4–1.6 mm long, straight, abaxially glabrous, adaxially hirsute at base; anthers 1.2–1.7 mm long, glabrous; locules 1–1.5 mm long, cylindrical, detached at apex and rounded or (in the same flower) minutely mucronate; connective exceeding locules by 0.3–0.6 mm with the extension bulbous or tapered, straight or recurved, except for the stamen opposite the posterior petal, in which the short connective is equalled by the locule tips. Ovary 1 mm high, glabrous, conical, all 3 locules fertile; styles 2.5 mm long. Fruit 7.5–8.5 mm in diameter (dried, immature), 8.5 mm high, ovoid and slightly peaked at apex, glabrous.

ADDITIONAL SPECIMENS EXAMINED. **Costa Rica.** LIMÓN: Cantón de Talamanca, Bratsi, Alto Lari, entre Río Dapari y Río Lari, 9°25'50"N, 83°03'20"W, 450 m, Mar fl, *Aguilar 1032* (MICH); Cantón de Limón, El Progreso, 9°47'19"N, 83°08'30"W, 1200 m, bosque transicional, Apr fr, *Herrera 2709* (MICH). **Panama.** CHIRIQUÍ, vicinity of Fortuna Dam, 8°45'N, 82°15'W: valley S of lake, 1200–1300 m, Dec imm fr, *McPherson & Aranda 10119* (MICH); trail from road across Río Hornito, 1100–1250 m, Aug imm fl, *McPherson 12834* (MICH) & *12843* (MO).

The epithet of this species honors Gerardo Herrera, who has collected the type and many other valuable records of Costa Rican plants. It is known only from the above-cited localities in southeastern Costa Rica and western Panama. *Byrsonima herrerae* is most closely related to *B. trinitensis* Adr. Juss. of the Lesser Antilles and *B. karstenii* W. R. Anderson of northern Venezuela. Both of those species have the leaf lamina thicker, mostly obtuse or rounded at the apex, and soon nearly or quite glabrate, and the petiole shorter. Their pedicels are decurved in fruit and their flowers are larger, with longer filaments, anthers, and extensions of the anther connectives. *Byrsonima trinitensis* is further distinguished by its sepals, which are revolute at the apex in anthesis, and in *B. karstenii* the bracts and bracteoles are longer than those of *B. herrerae* and the inflorescence and

pedicels are tomentose. The only other pink/white-flowered species of *Byrsonima* in Panama is *B. dressleri* W. Lewis, which has glabrous leaves with a thick lamina in which the reticulum is obscure, petioles only 3–8 mm long, glabrous (or immediately glabrate) stems, bracts that are 1.5–2 mm long, and the pedicels straight in bud and decurved in fruit. No other species with pink or white flowers are known to occur in Costa Rica.

***Byrsonima krukoffii*** W. R. Anderson, sp. nov.—TYPE: BRAZIL. Rondônia (“Matto Grosso”): near Tabajara (“Tabajaza”), upper Machado River region, Nov–Dec 1931 fl, *Krukoff 1360* (holotype: MICH!; isotypes: BM!, G!, K (2 sheets)!, MO!, NY!, P!).

*Byrsonimae stipulaceae* Adr. Juss. affinis sed pilis foliaribus basifixis vel sub-basifixis vel V-formibus, nunquam stellatis, differt.

Shrub or tree 8–30 m tall; stems velutinous with a mixture of short hairs up to 1 mm long and long, straight, basifixed, spreading hairs up to 3 mm long, eventually (usually in subsequent seasons) glabrescent. Lamina of larger leaves (11–) 13–27.5 cm long, 6–13 cm wide, elliptical or obovate, cuneate at base, usually slightly revolute at margin, rounded, obtuse, acute, or occasionally abruptly short-acuminate at apex, initially velutinous on both sides with many erect, straight or somewhat sinuous, basifixed or sub-basifixed hairs 1–3 mm long and usually, proximally on the midrib, many short basifixed or sub-basifixed or V-shaped hairs up to 1 mm long, some hairs lost, especially adaxially, at maturity but never completely glabrate, the hairs especially persistent on midrib, the midrib, lateral veins, and  $\pm$  scalariform tertiary veins prominent below; petiole (18–) 20–30 mm long, velutinous like stems; stipules 13–25 mm long, amplexicaulous, abaxially appressed-velutinous, adaxially glabrous, completely and smoothly connate, rounded or obtuse at apex, lineate with many fine parallel veins, deciduous independently of and well before the leaf. Inflorescence 9–21 cm long, velutinous, the flowers borne 1 per bract; bracts (3–) 4–10 mm long, 1.5–2.8 mm wide, narrowly elliptical or triangular to almost linear, straight or spreading but not revolute from the apex, tomentose on both sides, more densely so abaxially, deciduous before or during anthesis, almost always well before enlargement of the fruits; peduncle 0–1 mm long; bracteoles like the bracts but shorter and relatively broader, 2–4 (–5) mm long, 1–3 mm wide, deciduous; pedicel 10–14 mm long (–16 mm in fruit), velutinous, not or slightly circinate in bud, decurved or twisted in old flowers and fruits. Sepals all biglandular or all eglandular, 2.5–3.5 mm long, 2 mm wide, lingulate, rounded at the apex, already revolute in bud and strongly revolute in anthesis, tomentose on both sides, accrescent and somewhat auriculate in fruit, the glands 2.5–3 mm long. Petals yellow, glabrous, denticulate or erose to subentire, the lateral 4 with the claw 3–4 mm long, the limb 5.5–7 mm long, 6–10 mm wide; posterior petal with the claw 3.5–4 mm long, thick, the limb 3.5 mm long, 3.5–5 mm wide, crumpled, strongly reflexed. Filaments ca 2 mm long, basally connate, abaxially glabrous, adaxially short-hirsute at the base; anthers 2.5–4 mm long, heterogeneous in the same flower, the locules linear, 1.7–3 mm long, loosely sericeous on both sides, free at the apex, the connective exceeding the locules by 0.7–1.4 mm, rounded or obtuse and often reflexed at the apex. Ovary conical, 1–2 mm high, densely tomentose, all 3 locules fertile; styles 3.5–5 mm long, glabrous. Immature fruit ovoid, 13–15 mm high and 9 mm in diameter (dried), tomentose to glabrate; mature fruit unknown.



ADDITIONAL SPECIMENS EXAMINED. **Brazil.** ACRE: Mpio. Mancio Lima, road from Isac, 7 km from the city, 7°37'S, 72°55'W, *Cid Ferreira 10918* (MICH); Cruzeiro do Sul, near airport, *Marinho 208* (MICH), *Monteiro & Damião 436* (INPA), *Rosa 753* (MICH).—AMAZÔNAS: Mpio. São Paulo de Olivença, Rio Jandiatuba, *Cid et al. 8583* (MICH); Tocantins, Solimões, *J. G. Kuhlmann 1258* (MICH); Mpio. Coari, Rio Coari, *Magnago et al. s.n.* (INPA 58047).—PARÁ: Cuiabá–Santarém Highway, BR 163, Km 1225, *Prance 25623* (MICH). **Peru.** HUÁNUCO: Leoncio Prado, 640 m, *Gutiérrez 33* (K). **Ecuador.** PASTAZA: Curaray, ridge NE of Destacamento, 1°21'S, 76°56'W, 250 m, *Holm-Nielsen et al. 21964* (AAU); 20 km S of Curaray, 1°32'S, 76°51'W, 300 m, *Zak & Espinoza 4980* (MICH).

Collected in wet tropical forest on “terra firme,” with flowers from November to March and fruits from January to May; central and western Amazonia. The epithet honors the collector of the type, Boris A. Krukoff (1898–1983).

*Byrsonima krukoffii*, like *B. duckeana* (described above), is a member of the *B. stipulacea* complex. It shares with *B. stipulacea* the synapomorphy of deciduous stipules, which *B. duckeana* lacks, but whereas *B. stipulacea* and *B. duckeana* have many of the leaf hairs stellate, in *B. krukoffii* the hairs on the leaves are mostly basifixed or sub-basifixed; I have found no stellate hairs on these plants. *Byrsonima krukoffii* seems to be the western and southwestern analogue of *B. stipulacea*, which is found mostly east and north of where the new species has been collected. The type of *B. krukoffii* has glandular sepals.

**Gaudichaudia albida** Schlecht. & Cham., *Linnaea* 5: 217. 1830.—TYPE: MEXICO. Veracruz: Hacienda de la Laguna, Sep 1828 fl, *Schiede & Deppe* (lecto-type, here designated: HAL 074279, assigned the number “445” by Chamisso, photocopy at MICH!; isolectotypes: GOET!, P-JU 11745+B!).

The authors cited two collections in the protologue, so it is necessary to select one as the lectotype. The collection by Schiede & Deppe is surely the one that served as the basis for the description in the protologue. Schiede's label bears the number 591.

**Heteropterys fruticosa** W. R. Anderson, sp. nov.—TYPE: BRAZIL. Pará: Alto Tapajós, region of Missão Velha, a Mundurukú village ca 2 km N of the Rio Cururú, 7°45'S, 57°20'W, 200 m, sandy floodplain between the river and the village, with scattered shrubs and small trees, partly inundated with runoff water at this season, 13 Feb 1974 fl, *Anderson 10923* (holotype: IAN!; isotype: NY!).

Fig. 3, a–g.

*Heteropterydi nervosae* Adr. Juss. affinis sed habitu fruticoso et foliis appressis petiolis 1–2 (–3) mm longis differt.

Low shrub to 1 m tall, with erect stems from a woody base, the stems glabrous or initially very sparsely sericeous and soon glabrate. Leaves opposite, whorled, or alternate on the same stems, ± appressed; lamina of larger leaves 6.5–10.5 cm long, 2.4–4.7 cm wide, elliptical or somewhat ovate or obovate, broadly cuneate, rounded, or slightly cordate at base, acute or obtuse to rounded and very abruptly short-acuminate at apex, glabrous, with 2 large impressed glands abaxially at base and usually a row of smaller glands near or somewhat inside margin, the lateral veins and reticulum ± equally prominent on both sides; petiole 1–2 (–3) mm long, glabrous or initially sparsely sericeous and soon glabrate, eglandular; stipules not found. Inflorescence an elongated, open panicle, loosely sericeous, with the flowers borne ultimately in groups 1–2 cm long, comprising typically a terminal umbel

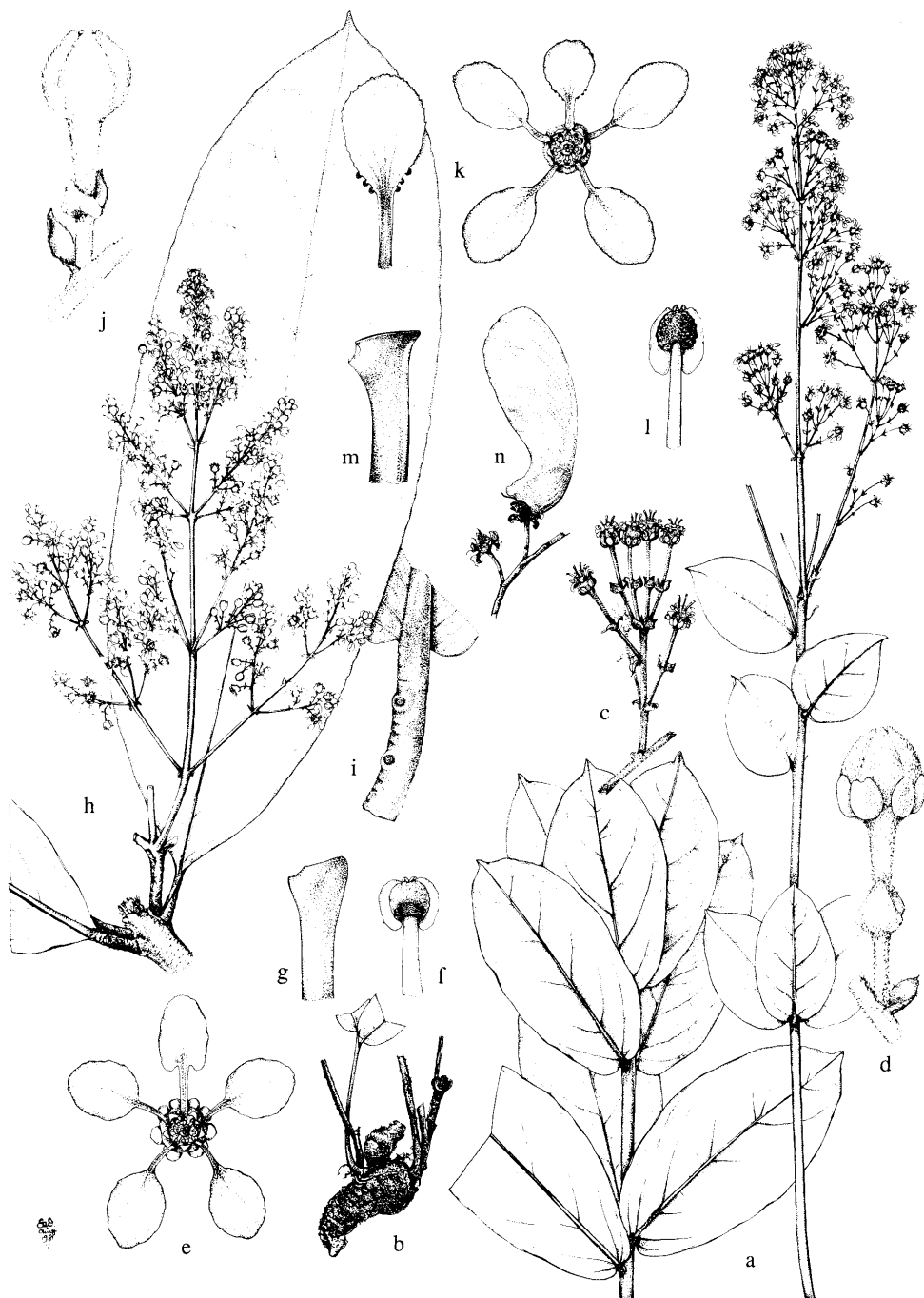


FIG. 3. *Heteropterys fruticosa* and *H. prancei*. a–g, *H. fruticosa*: a) leafy and flowering stems,  $\times 0.5$ ; b) rootstock,  $\times 0.5$ ; c) branch of inflorescence,  $\times 1.5$ ; d) flower bud,  $\times 5$ ; e) flower with posterior petal uppermost,  $\times 2.5$ ; f) anther, abaxial view,  $\times 10$ ; g) style tip, lateral view,  $\times 20$ . h–n, *H. prancei*: h) leaf and partial inflorescence,  $\times 0.5$ ; i) petiole showing sunken glands,  $\times 1.5$ ; j) flower bud,  $\times 5$ ; k) flower with posterior petal uppermost,  $\times 2.5$ , and posterior petal enlarged,  $\times 5$ ; l) anther, abaxial view,  $\times 10$ ; m) style tip, lateral view,  $\times 20$ ; n) samara,  $\times 0.75$ . Drawn by Karin Douthit, a, c & d from Anderson 10923, b & e–g from Pires et al. 6083, h–m from Prance et al. 6788, n from Zarucchi et al. 2759.

of 4 flowers plus another pair of flowers below but the exact numbers varying by several flowers; bracts 1–1.5 mm long, ca 0.8 mm wide, ovate or elliptical, eglandular, persistent or irregularly deciduous in old flowers; peduncle 2–4 mm long; bracteoles apical, like the bracts or slightly larger, persistent; pedicel 2.5–4.5 mm long. Sepals 2–2.5 mm long, 1.5 mm wide, narrowly ovate, revolute in anthesis, abaxially sericeous, adaxially glabrous, the anterior eglandular or rarely biglandular, the lateral 4 biglandular with the glands 0.9–1.3 mm long. Petals yellow, glabrous, the lateral 4 spreading to reflexed, with the claw 2–2.5 mm long, the limb 3–3.5 mm long, 2.5–3 mm wide, erose and eglandular at the margin; posterior petal erect, with the claw 2.5–3 mm long, the limb 3–3.5 mm long, 2.5–3 mm wide, coarsely dentate and eglandular at the margin. Stamens glabrous; filaments 2–2.5 mm long, all straight and slender, longer opposite sepals than petals, basally connate; anthers 0.5–0.9 mm long, the connective proximally dark red, distally yellow. Ovary ca 1 mm high, sericeous; styles 2–2.5 mm long, the anterior erect and straight, the posterior 2 divergent or somewhat arcuate, glabrous or proximally sericeous, dorsally truncate or short-apiculate at apex. Fully-formed fruits not seen.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** AMAZÓNAS: Rodovia do Estanho, margem da rodovia a 12 km de Humaitá, campo, solo arenoso, branco, Sep fl, *Vieira et al.* 167 (MICH).—PARÁ: Serra do Cachimbo, 425 m, Dec fl/imm fr, *Pires et al.* 6083 (NY, UB).—RONDÔNIA: Abunã, Madeira–Mamoré Railway, Sep fl, *Maguire et al.* 56642 (NY).

This species belongs to subgenus *Parabanisteria*, which is characterized by its long, valvate sepals that completely conceal the petals in bud; in anthesis the sepals are strongly revolute, which makes the subgenus easy to recognize. *Heteropterys fruticosa* resembles *H. nervosa* Adr. Juss., a polymorphic species found throughout Amazonia. The latter differs from *H. fruticosa* in being a woody vine that climbs trees, and in having spreading leaves with petioles at least 5 mm long and usually 8 mm or longer. *Heteropterys fruticosa*, which is named for its shrubby habit, is also notable for its eglandular bracts and bracteoles.

***Heteropterys prancei* W. R. Anderson, sp. nov.**—TYPE: BRAZIL. Rondônia: Rio Bananeiras at crossing of road Guajará-Mirim to Abunã, disturbed forest on terra firme, 5 Aug 1968 fl, *Prance et al.* 6788 (holotype: INPA!; isotypes: MICH!, NY!). Fig. 3, h–n.

Liana lignosa, ramis sericeis demum glabratis. Lamina foliorum majorum 15–24.5 cm longa, 6–10 cm lata, sericea mox glabrata; petiolus 10–17 mm longus, 2 (–4) glandulis immersis instructus. Inflorescentia panicula ex pseudoracemis 8–50-floris constans; bracteae 1.5–3 mm longae, 1–1.5 mm latae, bracteolae 1.5–2 mm longae, 0.8–1.3 mm latae, bracteae bracteolaeque deciduae; pedunculus 2–3 mm longus; pedicellus (2–) 2.5–4.5 mm longus. Sepala apice revoluta; petala flava, glabra, petalum posticum basi limbi glanduliferum; antherae glabrae. Samara 35–42 mm longa, nuce cylindracea.

Woody liana climbing high in trees (described once as a shrub, once as a small tree), the stems initially sericeous with straight, sessile, tightly appressed hairs 0.15–0.4 mm long, soon glabrate and finely to coarsely lenticellate. Lamina of larger leaves 15–24.5 cm long, 6–10 cm wide, elliptical or widest near the apex, cuneate to nearly rounded at base, very abruptly short-acuminate at apex with acumen 3–15 mm long, initially sericeous on both sides like stem but soon gla-

brate or persistently sericeous below on midrib, with an abaxial row of small impressed glands at or somewhat inside margin and at  $\pm$  regular intervals from base to apex, and sometimes with 2 larger glands at very base, the reticulum concolorous or whitish and raised  $\pm$  equally on both sides; petiole 10–17 mm long, sericeous like stems to glabrate, often horizontally fissured in age, bearing 2 (–4) glands usually sunk in pits; stipules ca 0.2 mm long, triangular, borne on stem beside petiole, seldom evident, probably caducous. Inflorescence a panicle, loosely sericeous, with the flowers borne in pseudoracemes (1–) 3–10 cm long and containing 8–50 or more flowers; bracts 1.5–3 mm long, 1–1.5 mm wide, ovate or elliptical, eglandular or bearing 1–several small marginal glands on each side, deciduous during anthesis or at latest before maturity of the fruit; peduncle 2–3 mm long; bracteoles apical or slightly subapical, 1.5–2 mm long, 0.8–1.3 mm wide, otherwise like the bracts; pedicel (2–) 2.5–4.5 mm long. Sepals all eglandular or the lateral 4 biglandular, 2.5–3 mm long, 1.5–1.7 mm wide, narrowly ovate, revolute in anthesis, abaxially sericeous, adaxially glabrous, the glands when present 1.5–2 mm long. Petals yellow, glabrous, the lateral 4 spreading, with the claw 1.7–2.3 (–2.8) mm long, the limb 3.5–4.5 mm long, 3–3.5 mm wide, erose and eglandular at the margin or occasionally bearing 1 tiny gland near base; posterior petal erect (?), with the claw 2–3 mm long, the limb 2.5–3 mm long, 2–2.5 mm wide, erose and usually bearing several small marginal glands near base. Stamens glabrous; filaments 1.5–2.8 mm long, all straight and slender, longest opposite the anterior and anterior-lateral sepals, basally connate; anthers 0.7–1 mm long, the connective red to black. Ovary ca 1 mm high, sericeous; styles 2–2.5 mm long, divergent or somewhat arcuate and the posterior 2 rotated so that all 3 stigmas face toward the posterior petal, glabrous or proximally sericeous, dorsally short-hooked at apex, the hook 0.1–0.2 mm long. Samara 35–42 mm long; dorsal wing 28–36 mm long, 11–16 mm wide, the abaxial edge curved or bent upward  $\pm$  abruptly; nut 6–10 mm long, 3–5 mm high, cylindroidal.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** ACRE: Basin of Rio Purus, near mouth of Rio Macaúhan (tributary of Rio Yaco), 9°20'S, 69°W, *Krukoff 5750* (MICH, NY).—AMAZONAS: Basin of Rio Madeira, Mpio. Humaitá, near Livramento, on Rio Livramento, *Krukoff 7012* (MICH, NY).—MATO GROSSO: Rio Aripuanã, bay near Igarapezinho, 10°12'S, 59°21'W, *Berg et al. P18428* (INPA, MICH); Mpio. Alta Floresta, 3 km N of road from Alta Floresta to Rio Apicá (MT 208), 44.5 km E of Rio Apicá, 9°56'S, 56°38'W, *Thomas et al. 4094* (MICH).—RONDÔNIA: Bananeiras to Abunã, along Madeira–Mamoré Railway, *Maguire et al. 56622* (MICH, NY); 18 km E of Mineração Campo Novo (100 km SW of Ariquemes), 10°34'S, 63°28'W, *Zarucchi et al. 2759* (MICH). **Colombia.** AMAZONAS: Amazon River, Leticia, *Schultes 6193A* (NY, US). **Peru.** LORETO, Maynas: Río Itaya near Palo Seco, 40 river km above Iquitos, *Gentry et al. 18478* (MICH); Quebrada Tamshiyacu E of Tamshiyacu below Serafin Filomeno, 4°10'S, 72°50'W, *Gentry et al. 25827* (MICH); Indiana, Explorama Reserve, 3°28'S, 72°50'W, *Vásquez & Jaramillo 13563* (MICH).

Collected in forests on “terra firme” or on seasonally inundated land, at elevations of 100–130 m, with flowers in March, August, and September, and with fruits in October. I name this species in honor of Ghilleen T. Prance, one of the most important collectors ever to work in Brazilian Amazonia.

*Heteropterys prancei* is another member of subgenus *Parabanisteria*. It is especially notable for the large leaves, the petiole glands sunk in pits, the deciduous bracts and bracteoles, and the posterior (flag) petal with marginal glands at base. It most resembles *H. mathewsana* Adr. Juss., another large-leaved species of western Amazonia, which is immediately distinguished from *H. prancei* by its sessile pedicels. *Heteropterys mathewsana* also has bracts and (especially) bracteoles that

are narrower relative to their length, and the petals are eglandular and (at least sometimes) abaxially sericeous. As in most species of this subgenus, in *H. prancei* the lateral sepals may bear abaxial glands or lack them. I consider that character to have no taxonomic significance in this group, but for the record I should note that in the type collection the sepals are all eglandular.

***Heteropterys rudasii*** W. R. Anderson, sp. nov.—TYPE: COLOMBIA. Amazonas: Mpio. Leticia, Corregimiento de Tarapacá, Parque Nacional Natural Amacayacu, Río Cotuhé entre la Cabaña Lorena (Inderena) y Caña Brava, en el margen izquierdo del río, 03°01'S, 70°02'W, 100 m, 20 Jun 1991 fl. *Rudas et al.* 2221 (holotype: COL, photocopy MICH!; isotype: MICH!).

*Heteropterydi macradenae* (DC.) W. R. Anderson affinis sed pilis foliaribus 0.5 mm longis, sessilibus vel brevistipitatis, rectis vel tortis differt.

Woody vine, the stems initially loosely subsericeous to subvelutinous with sessile or short-stalked hairs, some straight and appressed, others more or less twisted and raised, becoming glabrate and coarsely lenticellate in age. Lamina of larger leaves 8–12.8 cm long, 3–6 cm wide, elliptical, broadly cuneate to rounded at base, abruptly short-acuminate at apex, initially loosely subsericeous to tomentose on both sides with hairs ca 0.5 mm long, sessile or short-stalked, straight to twisted, glabrate in age, with an abaxial inframarginal row of several very small impressed glands in the distal half, the reticulum not white but visible and raised on both sides, equally so or moreso below than above; petiole 4–5 mm long, loosely subsericeous or tomentose to eventually glabrate, eglandular; stipules ca 0.3 mm long, triangular, borne on stem beside petiole. Inflorescence a panicle, with the flowers borne in pseudoracemes 3–6 cm long and containing 6–14 flowers, tomentose-sericeous or subvelutinous; bracts 2–3.5 mm long, 1.5–2 mm wide, ovate or elliptical, mostly bearing 1–several small marginal glands on each side near middle, persistent; peduncle 2–3.5 mm long; bracteoles apical, 1.5–2 mm long, 1–1.2 mm wide, otherwise like the bracts; pedicel 2.4–2.9 mm long. Sepals eglandular, 3 mm long, 1.5–1.7 mm wide, narrowly ovate, strongly revolute in anthesis, abaxially tomentose, adaxially glabrous. Petals yellow, glabrous, the lateral 4 spreading, with the claw ca 2.5 mm long, the limb 3.5–4.5 mm long, 2.5–3.5 mm wide, erose and eglandular at the margin; posterior petal erect, with the claw 2.2 mm long, the limb 3 mm long, 2.5 mm wide, erose and eglandular at the margin. Filaments glabrous, 2–3.5 mm long, short and slender opposite anterior-lateral and posterior petals, long and slender opposite sepals, longest, thickest, and strongly bowed opposite posterior-lateral petals; anthers 0.8–1 mm long, glabrous (? or sparsely tomentose), the connective dark red. Ovary ca 1 mm high, sericeous; styles ca 2.8 mm long, arcuate, glabrous, dorsally hooked at apex, the hook ca 0.3 mm long. Fruit unknown.

This species is named for Agustín Rudas, collector of the type and only known collection. In most of its characters it fits into *Heteropterys macradena* (DC.) W. R. Anderson *sens. lat.*, but its peculiar leaf hairs make it distinctive. In *H. macradena* the hairs are very short, quite sessile and straight, and very strongly appressed. In *H. rudasii* the hairs are relatively long, some of them are stalked, and many are more or less twisted and raised from the surface of the lamina. I cannot recall seeing hairs like that in any other species of subgenus *Parabanisteria*, so although I hesitate to describe yet another slightly different species in this most difficult complex, I see no alternative; with those hairs *Rudas et al.* 2221 would be most

anomalous in *H. macradena*. Note that the material available to me is rather young, so I cannot be certain that the bracts and bracteoles persist in fruit; that important character-state requires confirmation when older specimens are collected.

**Malpighia davilae** W. R. Anderson, sp. nov.—TYPE: MEXICO. Oaxaca: Distr. Teotitlán, 2 km al O de San Gabriel Casa Blanca, 920 m, selva baja caducifolia, 1 Jul 1987 fl, *Salinas T. 4173* (holotype: MICH!; isotype: MEXU!).

Frutex vel arbor parva 1–3 m alta, internodiis vegetativis primo tomentosis mox vel demum glabrescentibus laevibus vel minute papillosis. Lamina foliorum majorum 2–6.5 cm longa, 1–4 cm lata, elliptica vel paene orbicularis, abaxialiter plus minusve pertinaciter tomentosa et usque ad 12 mm supra basim inter costam et marginem glandulifera. Inflorescentia axillaris, stipitata stipite 3–18 mm longo, umbella (2–) 3–4-flora vel corymbus 6-florus, bracteis 0.5–1 mm longis, pedunculo florifero 3–7.5 (–11) mm longo, bracteolis 0.4–0.5 mm longis, pedicello 3.5–6 (–14) mm longo. Petala lateraliter erosa vel dentata, petalum posticum fimbriatum. Styli 2–2.5 mm longi, graciles et recti vel parum arcuati, apice in angulo interno stigmatici, abaxialiter minute apiculati. Fructus siccatus 13–15 mm latus, ca 10 mm altus.

Shrub or small tree 1–3 m tall; vegetative internodes initially densely tomentose, soon or eventually glabrescent, the hairs when falling leaving the epidermis smooth or minutely papillose, not covered with prominent peglike hair-bases. Lamina of larger leaves 2–6.5 cm long, 1–4 cm wide, elliptical to nearly orbicular, broadly cuneate to rounded at base, obtuse to rounded or emarginate and often apiculate at apex, bearing 1 (–2) small glands abaxially on each side of midrib, between midrib and margin, up to 12 mm above base, adaxially tomentose to often glabrate at maturity, abaxially  $\pm$  persistently tomentose or appressed-tomentose with the hairs sinuous to strongly twisted, or sometimes those near the margins straight and appressed but never bristles dramatically stouter than hairs on the midrib; petiole 1.7–2.5 (–3.5) mm long, tomentose to eventually glabrescent; stipules distinct, interpetiolar, 0.5–1.4 mm long, narrowly triangular, persistent or eventually deciduous. Inflorescence axillary and usually unbranched (rarely ternate), with a slender stalk 3–18 mm long, persistently tomentose, bearing an umbel of (2–) 3–4 flowers or a corymb of 6 flowers; bracts 0.5–1 mm long, triangular; peduncle 3–7.5 (–11) mm long, persistently tomentose; bracteoles 0.4–0.9 mm long, triangular or rounded at apex; pedicel 3.5–6 (–14) mm long, sericeous to glabrate. Sepals ca 2.5 mm long, 1–1.5 mm long beyond glands, 0.8–1 mm wide, ovate or triangular, abaxially densely sericeous or appressed-tomentose, adaxially glabrous, bearing 10 glands 1.5–2.3 mm long, the glands smallest on the anterior sepal. Petals pink, glabrous or sparsely sericeous abaxially on the midrib, abaxially slightly carinate near base of limb with the keel decurrent onto claw; lateral petals with the claw ca 2 mm long, the limb ca 3 mm long, 3.5 mm wide, rhomboid, erose or dentate; posterior petal similar to lateral petals but with the claw stouter and longer (2.5–3 mm long) and the limb ca 4 mm long and wide, fimbriate. Stamens glabrous; filaments 2–2.5 (–3) mm long, nearly straight, ca 1/2 connate, alternately longer opposite sepals and shorter opposite petals, all slender; anthers 1–1.2 mm long, subequal. Gynoecium glabrous; ovary 1.2–1.5 mm high, the carpels completely connate; styles 2–2.5 mm long, the anterior slightly shorter and slenderer than the posterior 2, slender and straight or slightly bowed, diverging in age, stigmatic on the internal angle, the apex dorsally minutely apiculate, the

apiculum more evident in the posterior 2 than in the anterior. Fruit red (or orangish?) and glabrous at maturity, 13–15 mm wide and ca 10 mm high when dried, the pyrenes held in a common flesh at maturity; pyrene with low but well-defined dorsal and lateral ribs, connected by several ribs or outgrowths at right angles to them.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** OAXACA: 1 km al SE de San Martín Toxpalan, *Chiang C.* 2383 (XAL); 3 km adelante de Tomellín, rumbo a V. Trujano, 17°46'N, 96°57'W, *Chiang C. et al.* F-2501 (MEXU); Distr. Teotitlán, 2 km al O de San Gabriel Casablanca, camino a Axuxco, *García* 3449 (MEXU, MICH); 9 km al NE de Cuicatlán, rumbo a Concepción Pápalo, *González Medrano et al.* F-1717 (MEXU, MICH); Barranca del Río Chico, Cuicatlán, *Miranda* 4602 (MEXU); Mpio. Cuicatlán, 8 km al N de Cuicatlán, rumbo a San Pedro Jocotipac, *Sánchez-Ken* 216 (MEXU); Mpio. Cuicatlán, 6 km del entronque de la brecha a San Pedro Jocotipac con la carretera Tehuacán–Cuicatlán, *Tenorio L.* 17919 (MEXU, MICH). PUEBLA: Coxcatlán, Tehuacán, *Boege* 796 (MEXU); Mpio. Coxcatlán, Rancho El Aguaje, ca 4 km al S de la cabecera municipal de Coxcatlán, 18°14'N, 97°09'W, *Valiente B.* 143 (MEXU).

Endemic to the *selva baja caducifolia* of the Tehuacán-Cuicatlán Valley of Puebla and Oaxaca, at elevations of 650–1220 m, collected with flowers from late May to late September and with fruits from June to late October. I am delighted to name this species in honor of my friend and collaborator, Patricia D. Dávila Aranda, in recognition of her dedicated industry in support of the project to prepare and publish the *Flora del Valle de Tehuacán-Cuicatlán*.

Large-leaved plants of *Malpighia davilae* resemble small-leaved plants of the extremely variable species *M. mexicana* Adr. Juss., which generally has a longer inflorescence stalk, more flowers in the inflorescence, a peduncle that is short relative to the pedicel, longer bracts and bracteoles, erect straight styles, and larger fruits. Small-leaved plants of *M. davilae* resemble *M. galeottiana* Adr. Juss., but that species is usually easily distinguished by the stout, straight, appressed, golden, bristlelike hairs borne abaxially on its leaves, and by the prominent peglike bases left on its stems when the hairs fall.

Two of the collections cited above (*Chiang C. et al.* F-2501 and *Sánchez-Ken* 216) are somewhat intermediate between *M. davilae* and *M. galeottiana* in having the leaf hairs relatively straight and appressed and, in *Sánchez-Ken* 216, approaching the bristles of *M. galeottiana*. Both species occur in the area of Cuicatlán, and these two collections may result from hybridization between them. Such intermediates also raise the possibility that *M. davilae* arose as the result of hybridization between *M. galeottiana* and *M. mexicana*, which also grows in the area of Cuicatlán.

Another species that resembles *Malpighia davilae* is *M. diversifolia* Brandegee, which is endemic to Baja California Sur. In *M. diversifolia* all the petals except the outermost are deeply fimbriate, at least in the proximal half, whereas only the posterior petal of *M. davilae* is fimbriate. The leaves of *M. diversifolia* are more densely and persistently hairy, and on the adaxial surface the hairs are mostly V- or Y-shaped, producing a velutinous effect. Also, the abaxial glands are borne very near the base of the lamina in *M. diversifolia*, on or just within the margin, while those of *M. davilae* are borne well above the base and farther from the margin.

***Malpighia sessilifolia*** W. R. Anderson, sp. nov.—TYPE: MEXICO. Veracruz: Mpio. Minatitlán, Cerro Blanco, 7 km al NE de Uxpanapa, 17°14'N, 94°09'W, 200 m, pendientes ligeras inferiores del lado S del cerro, selva alta perennifolia, 19 Oct 1983 fl, *Wendt et al.* 4220 (holotype: MICH!; isotype: CHAPA!).

*Malpighiae romeroanae* Cuatr. affinis sed foliis latioribus basi cordatis sessilibus vel subsessilibus et floribus fructibusque majoribus differt.

Shrub or small tree 1–3 (–4) m tall; vegetative internodes thinly sericeous to soon glabrate, often flattened below nodes. Lamina of larger leaves 14–32 cm long, 6.5–13 cm wide, elliptical or slightly obovate, cordate at base, acuminate at apex, bearing 1–3 (–4) glands below between midrib and margin in the proximal half, glabrous at maturity; petiole 0–1 (–2) mm long, when developed mostly hidden by cordate base of lamina, glabrous at maturity; stipules connate in interpetiolar pairs, the pair narrowly triangular, 2–3.5 mm long, 0.7–1.5 mm wide at base, persistent or eventually deciduous. Inflorescence sparsely sericeous to glabrate, axillary and usually unbranched (very rarely ternate), 2.5–7 cm long, with a stalk 2–5 cm long and a dense pseudoraceme or interrupted corymb of 10–25 flowers; bracts 1–2 mm long, triangular; peduncle (1–) 2.5–6 mm long; bracteoles 0.7–1 mm long, triangular; pedicel 6–14 mm long, sparsely sericeous to glabrate. Sepals ca 3 mm long, 0.8–1.5 mm long beyond glands, ca 1.5 mm wide, ovate, abaxially glabrous or more commonly bearing a few appressed hairs, adaxially glabrous, bearing 6 glands 2–3.3 mm long on the 4 lateral sepals, the 2 sepals adjacent to the eglandular anterior sepal bearing only 1 gland, on the side away from the anterior sepal. Petals pink, glabrous; lateral petals spreading, abaxially prominently carinate with the keel up to 0.4 mm wide and often decurrent on claw but not reaching apex of petal, the claw 3–4 mm long, the limb 4.5–6 mm long, 3.5–6 mm wide, often asymmetrical, distally entire, proximally erose; posterior petal erect, abaxially with the midrib raised or slightly keeled proximally, the claw 4.5–5.5 mm long, thick, the limb 6–8 mm long and wide, symmetrical, coarsely dentate all around the margin. Stamens glabrous; filaments 3–5 mm long, straight or the 2 largest somewhat arcuate, connate basally, very unequal in length and thickness in the same flower, the 2 opposite the posterior-lateral petals longer and thicker than others; anthers 1.1–2 mm long, heterogeneous in the same flower, longest opposite the posterior-lateral petals. Gynoecium glabrous; ovary 1–1.5 mm high (not including the thickened style-bases), the carpels completely connate; styles 4–5 mm long, thick and bowed (the posterior 2 more strongly arcuate than the anterior) with the base especially thickened, the stigma strongly internal, the apex dorsally extended in a hook 0.3–0.5 mm long. Fruit red and glabrous at maturity, 17 mm wide and 12–13 mm high when dried, the pyrenes held in a common flesh at maturity; pyrene with a well-developed dorsal crest 1.5–2 mm wide and several prominent ribs at right angles to it, these often fusing to form an ill-defined lateral rib on each side.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** OAXACA: Mpio. Sta. María Chimalapa, Arroyo de la Cascada (afluente del Arroyo Chicolín), Congregación de Nicolás Bravo, 3.5 km al S de Pob. de Río Alegre, 17°10'N, 94°42'W, *Wendt et al.* 4492 & 4744 (CHAPA, MICH).—VERACRUZ: Mpio. Jesús Carranza, Plan de Arroyos, *Castillo C.* 397 (XAL); Mpio. Jesús Carranza, Km 3–5 camino a Río Alegre, 17°20'N, 94°45'W, *Dorantes* 3657 (MEXU, XAL); Mpio. Hidalgotitlán, alrededores del Campamento Hnos. Cedillo, *Dorantes* 3742 (MEXU); Mpio. Hidalgotitlán, camino Cedillo–La Laguna, 17°16'N, 94°37'W, *Dorantes* 4154 (XAL); Mpio. Hidalgotitlán, Brecha Cedillo–A. Melgar, 17°13'N, 94°35'W, *Vázquez* 1330 (MEXU, XAL); Mpio. Hidalgotitlán, Río Soloxuchil entre Hnos. Cedillo y la Escuadra, 17°16'N, 94°37'W, *Vázquez* 1374 (MEXU, XAL); Mpio. Jesús Carranza, 3 km al E de Río Chalchijapa por carr. Sarabia–Cedillo, *Vázquez* 1588 (MEXU, XAL).

Collected in *selva alta perennifolia* at elevations of 100–200 m, with flowers from October to December and with fruits in December and January.

*Malpighia sessilifolia* is closely related to *M. romeroana* Cuatr., which occurs



from Colombia through Central America to Oaxaca and Veracruz in eastern Mexico and has a disjunct variety (var. *nayaritensis* Vivaldi) in western Mexico (Jalisco, Nayarit, and Sinaloa). In *M. romeroana* the leaf lamina is narrower and basally cuneate to a definite petiole, the flowers are distinctly smaller in most of their parts (petals, stamens, and styles), and the fruits are smaller.

**Mascagnia discolor** W. R. Anderson, sp. nov.—TYPE: BOLIVIA. La Paz: Inquisivi Province, 19 km N of Choquetanga, 16°41'S, 67°20'W, 1800 m, matorral, 27 Nov 1991 fl, *M. Lewis 40696* (holotype: MICH!; isotypes: MO!, NY!).

Frutex 2 m altus, ramis tomentosis. Lamina foliorum majorum 7–8 cm longa, 4.7–5.8 cm lata, adaxialiter tomentosa pilis pro parte maxima brunneis, abaxialiter densissime lanata pilis pro parte maxima stramineis vel albidis; petiolus 9–14 mm longus, brunneo-tomentosus, plerumque prope apicem biglandulosus glandulis nigris, protuberantibus; stipulae ut videtur nullae. Inflorescentia pseudoracemus axillaris, 7–13 cm longus, rufo-tomentosus; bracteae per anthesin deciduae; pedunculus (2–) 3–7 mm longus; bracteolarum altera eglandulosa, altera uniglandulosa; pedicellus 1.5–3 mm longus. Petala aurea, abaxialiter laevia; stamina glabra; styli 1.5–1.8 mm longi, divergentes, apice dorsaliter apiculati.

Shrub 2 m tall, the stems tomentose with strongly twisted reddish-brown hairs, eventually glabrescent. Lamina of larger leaves 7–8 cm long, 4.7–5.8 cm wide, ovate or broadly elliptical, broadly cuneate or truncate at base, abruptly short-acuminate to rounded at apex, smooth (not rugose) above, eglandular (?), persistently tomentose above with the epidermis visible between the mostly brown, stalked, strongly twisted hairs, persistently tomentose below, the hairs mostly pale yellow to near-white except brown along veins, very fine, with a sinuous or twisted crosspiece 1–2.2 mm long raised on a stalk 0.5–1 mm long, the hairs in aggregate producing a dense woolliness that nearly or completely hides the epidermis; petiole 9–14 mm long, densely and persistently brown-tomentose, bearing (0–1–) 2 bulging black glands at apex or up to 2.5 mm below apex; stipules not found. Inflorescence an axillary pseudoraceme, unbranched, 7–13 cm long, reddish-brown-tomentose, the 15–40 flowers borne ascending to nearly horizontal and evenly distributed, not congested except for very immature buds at apex; bracts 1.5–2.5 mm long, subulate or narrowly triangular, deciduous during anthesis; peduncle (2–) 3–7 mm long, tomentose; bracteoles 1–1.7 mm long, triangular or ovate, persistent, borne at or slightly below apex of peduncle, one eglandular and the other bearing 1 large eccentric abaxial gland; pedicel 1.5–3 mm long, tomentose. Lateral 4 sepals bearing 8 glands 2.5–3 mm long, the sepals 1.5–2 mm long beyond the glands; anterior sepal eglandular but partially covered by the 2 adjacent glands; all sepals ovate or elliptical with minutely denticulate margin and rounded apex, abaxially loosely sericeous in center and glabrous toward margin, adaxially glabrous, appressed in anthesis. Petals “yellow-orange,” glabrous, exposed in enlarging bud, abaxially smooth, the lateral 4 strongly reflexed in the claw, with the limb 4.5–5 mm long, 3–3.2 mm wide, obovate or elliptical, minutely denticulate, truncate or slightly hastate at the base, the claw 1.3–1.5 mm long; posterior petal hardly different, but with the claw spreading, not reflexed, and the limb spreading to reflexed. Filaments 2.5–3 mm long, slightly longer opposite sepals than petals, glabrous, connate in the basal 1 mm; anthers 1.3–1.6 mm long, glabrous, reflexed in anthesis. Ovary ca 2 mm high, densely hirsute; styles 1.5–1.8 mm long, divergent distally, with a short dorsal hook (0.1–0.2 mm long) at the apex. Fruit unknown.

The epithet of this distinctive species refers to the striking vesture of the leaves, which is brownish above and stramineous to whitish below. Even in the absence of fruits I am confident that it is a species of *Mascagnia* subgenus *Mascagnia*, belonging to the assemblage of species including *M. cordifolia* (Adr. Juss.) Griseb., *M. strigulosa* (Rusby) Nied., and *M. schunkei* W. R. Anderson. From those taxa and their relatives *Mascagnia discolor* is immediately set apart by its long twisted leaf-hairs of two colors, the raised black glands near the apex of the petiole, the lack of stipules, the deciduous bracts, the short pedicel, and the yellow petals that are abaxially smooth, not carinate.

***Tetrapteryx dillonii*** W. R. Anderson, sp. nov.—TYPE: PERU. Piura: Huancabamba, ca 12 km E of Canchaque on route to Huancabamba, 5°24'S, 79°36'W, 1800 m, SW-facing slopes near waterfall, 21 Jul 1991 fl, *Dillon & Sánchez* V. 6291 (holotype: MICH!).

Liana lignosa, ramis tomentoso-sericeis, demum glabratiss. Lamina foliorum majorum 5.5–8.5 cm longa, 3.5–4.8 cm lata, adaxialiter sericea mox vel demum glabrescens, abaxialiter dense et plus minusque pertinaciter sericea, margine prope basim pauciglandulifera; stipulae in paribus interpetiolaribus connatae, pari 1–2.5 mm longo, 0.8–1.8 mm lato. Sepala glabra vel margine et circa glandulas paucipilifera, glandulis 1.2–2.5 mm longis. Styli 1.3–1.5 mm longi, crassi.

Woody vine; stems tomentose-sericeous to eventually glabrescent, initially with an underlayer of whitish, sessile,  $\pm$  tightly appressed hairs and an overlay of stalked, spreading, often twisted hairs. Lamina of larger leaves 5.5–8.5 cm long, 3.5–4.8 cm wide, elliptical or obovate, cuneate to nearly rounded at base, obtuse to rounded and emarginate at apex, initially sericeous above with straight or sinuous  $\pm$  appressed hairs but soon or eventually glabrescent and becoming glabrate in age, densely and  $\pm$  persistently whitish or metallic-sericeous below with the hairs sessile,  $\pm$  straight, and mostly appressed, the surface eglandular but the margin usually bearing 1–3 impressed glands on each side within 2 cm of base; petiole 6–18 mm long, sericeous or tomentose-sericeous to glabrate, eglandular; stipules connate in interpetiolar pairs, the pair 1–2.5 mm long, 0.8–1.8 mm wide, smallest in inflorescence, ovate, sparsely pilose or glabrous, proximally dark-colored and often glandular-thickened, distally light-colored and membranous. Inflorescence tomentose-sericeous like stem, cymose-paniculate with the branches terminating in an umbel (or occasionally a corymb) of 4–6 flowers; floriferous bracts 1.3–1.7 mm long, ovate, pilose to nearly glabrous, proximally often dark and glandular-thickened or biglandular, distally often light-colored and membranous, persistent; peduncle 2–7 mm long; bracteoles like bracts but slightly shorter, apical; pedicel 3.5–9 mm long. Sepals 1–1.5 mm long beyond glands, ca 1.5 mm wide, broadly rounded, glabrous except for hairs around glands and a few hairs on margin, pressed against filaments in anthesis, the anterior eglandular, the lateral 4 biglandular with the glands 1.5–2.5 mm long, obovate, the longest glands decurrent on pedicel. Petals yellow (turning reddish in age?), glabrous, obovate, truncate or slightly cordate at base, the lateral spreading to reflexed, with claw 1–1.5 mm long and limb 4–5 mm long, 2.5–3 mm wide, subentire or minutely denticulate or erose; posterior petal erect, similar to lateral petals but with the claw thicker and often longer and the limb sometimes coarsely dentate. Filaments 1.5–2.3 mm long, glabrous, 1/3–1/2 connate; anthers 1.2–1.4 mm long, glabrous, alike, the connective only slightly swollen. Ovary 1–1.5 mm high, sericeous, showing already in flower

the precursors of the 4 lateral wings; styles 1.3–1.5 mm long, glabrous, stout with the anterior slenderer than the posterior 2, divergent, truncate at apex with the stigma internal. Fruit unknown.

ADDITIONAL SPECIMEN EXAMINED. **Peru.** CAJAMARCA: Santa Cruz, ca 2.5 km ENE of Monteseco, 1700 m, Jun fl, *Santisteban C. & Guevara B. 160* (MICH).

This distinctive species is named in honor of M. O. Dillon, one of the collectors of the type and an astute student of the plant taxonomy of western Peru. *Tetrapteryx dillonii* belongs to section *Tetrapteryx* (called section *Lophogynixa* by Niedenzu), as defined by the stipules connate in interpetiolar pairs and the flowers borne mostly in umbels, but it differs from most members of that group in its marginal leaf glands. The usual condition in the section is for the impressed glands to be borne in the abaxial surface of the lamina between the midrib and the margin. *Tetrapteryx dillonii* is also interesting for its failure to make large membranous fugacious bracts in the inflorescence one or two nodes below the umbels, and for its short stout styles. It most resembles *T. jamesonii* Turcz., another species of northwestern Peru and adjacent Ecuador, which has similar marginal leaf glands. In *T. jamesonii* the lamina is abaxially velutinous or subtomentose, with most hairs V-shaped. Another member of this complex is *T. benthamii* Tr. & Pl. of Colombia.

***Tetrapteryx heterophylla*** (Griseb.) W. R. Anderson, comb. nov. *Malpighia heterophylla* Griseb., *Linnaea* 22: 2. 1849.—TYPE: MEXICO. *Ehrenberg 624* (holotype: B†, F neg. 12833!; isotype: MEXU!).

*Tetrapteryx nelsonii* Rose, *Contr. U.S. Natl. Herb.* 5: 143. 1897.—TYPE: MEXICO. Oaxaca: between Nopala and Mixtepec [“Mixistepec”], *Nelson 2431* (holotype: US!; isotype: NY!).

*Tetrapteryx emarginata* Bartlett, *Proc. Amer. Acad. Arts* 43: 53. 1907.—TYPE: GUATEMALA. Zacapa: Gualán, *Deam 150* (holotype: GH!; isotypes: F!, MICH!, MO!, NY!, US!).

*Tetrapteryx nummularia* Nied., *Verz. Vorles. Königl. Lyceums Hosianum Braunsberg* 1909/10: 38. 1909.—TYPE: MEXICO. Oaxaca: near San Bartolo Yautepec, *Seler & Seler 1699* (lectotype, here designated: GH!).

There may be, at GOET or elsewhere in Europe, an isotype of *Malpighia heterophylla* that was seen and annotated by Grisebach, and if so that would be the appropriate choice for lectotype. If no such candidate can be found, then the isotype at MEXU can be designated lectotype.

***Tetrapteryx schiedeana*** Schlecht. & Cham., *Linnaea* 5: 218. 1830.—TYPE: MEXICO. Veracruz: in sylvis prope Jalapam in arboribus scandens, Aug 1828, *Schiede & Deppe* (lectotype, here designated: HAL 074280, assigned the number “447” by Chamisso, photocopy at MICH!; isolectotypes, all “447”: MO!, NY!, P-JU 11710+B!).

*Malpighia dasycarpa* J. D. Smith, *Bot. Gaz. (Crawfordsville)* 24: 390. 1897.—TYPE: GUATEMALA. Retalhuleu: Río Samalá, elev. 1700', Oct 1891, *Shannon 217* (lectotype, here designated: US 1362414!; isolectotype: US 210009!).

The protologue of *Tetrapteryx schiedeana* cites both Jalapa and Hacienda de la Laguna for this species. Both localities are represented by syntypes in HAL, the

one from Hacienda de la Laguna being HAL 074281 (photocopy at MICH!). Schiede's label on the latter specimen bears the number 593.

When J. D. Smith published the name *Malpighia dasycarpa* he had three syntypes, two of which represented *Tetrapteryx schiedeana*; the third was another species of *Tetrapteryx*. Small named the latter in 1910 as *T. donnell-smithii*, its type being the third syntype of *M. dasycarpa*, a Pittier collection from San Juan del Norte, Nicaragua. That leaves *M. dasycarpa* in need of a lectotype, one that will dispose of this never-adopted name. This note should accomplish that.

### ACKNOWLEDGMENTS

Karin Douthitt drew the illustrations reproduced in Figures 2 and 3. The curators of the following herbaria sent gifts and loans for my study, and many of them have extended gracious hospitality during visits: AAU, BM, BR, CHAPA, COL, CTES, F, G, GH, IAN, INPA, K, LA, MBM, MEXU, MG, MO, NY, P, P-JU, RB, U, UB, US, USM, VEN, and XAL. Dr. Uwe Braun at the Institut für Geobotanik of the Martin-Luther-Universität in Halle, Germany, very kindly sent photocopies of the types of *Gaudichaudia albida* and *Tetrapteryx schiedeana*, and Agustín Rudas sent a photocopy of the specimen at COL here designated holotype of *Heteropteryx rudasii*.

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