

Excerpt from:

Flora of the Pico das Almas, Chapada Diamantina - Bahia, Brazil,
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MALPIGHIACEAE

W. R. Anderson

Anderson, W.R. (1981). Malpighiaceae. In Maguire, B. & collaborators, The botany of the Guayana Highland, Part XI. Mem. New York Bot. Gard. 32: 21–305.

Niedenzu, F. (1928). Malpighiaceae. In Engl., Pflanzenr. IV. 141: 1–870.

Key to the genera for specimens with flowers:

1. Styles slender and subulate, tapering to minute stigmas. Stipules intra- and epipetiolar, i.e. borne on inner face of petiole at its base. Leaves eglandular 2
 Styles slender to stout, of uniform thickness or widened at apex, the stigmas large. Stipules borne on stem between petioles, or apparently lacking, or if epipetiolar not intrapetiolar but borne on outer edge of petiole. Leaves mostly bearing glands on petiole or abaxial surface of lamina or both 3

2. Anthers bearing a line or cluster of vesicular outgrowths on each side toward apex **Verrucularia**
 Anthers without vesicular outgrowths **Byrsonima**
3. Styles with stigmas quite terminal and without any sort of dorsal extension at apex 4
 Styles with stigmas internal, the apex dorsally rounded, truncate, or extended into a hook or flap **Camarea** 5
4. Style 1 in each flower
 Styles 3 in each flower
5. Androecium of 5 fertile stamens opposite petals, alternating with 5 sterile staminodes opposite sepals. Stipules large (3–10 mm long and wide), those of opposite leaves connate, leaving 1 wide interpetiolar scar **Peixotoa**
 Androecium of 10 fertile stamens. Stipules small, distinct, leaving tiny scars **Banisteriopsis**
6. Apex of styles dorsally extended into a large flap-bearing appendage **Stigmaphyllon**
 Apex of styles dorsally rounded, truncate, acute, or short-hooked 7
7. Petals pink and/or white **Heteropterys** 8
 Petals yellow **Heteropterys**
Tetrapteryx
8. Sepals revolute in anthesis
 Sepals appressed in anthesis

Key to the genera for specimens with fruits:

1. Fruit fleshy, indehiscent **Byrsonima** 2
 Fruit dry, schizocarpic
2. Mericarps smooth or bearing only ribs, crests, or setae no higher than diameter of nut 3
 Mericarps bearing well-developed wings at least twice as long as diameter of nut 5
3. Leaves alternate, opposite, or (often) whorled, sessile or subsessile, up to 1.2 cm long. Flowers borne singly in axils of vegetative leaves. Mericarp covered with many stout seta-like processes **Camarea**
 Leaves always opposite, more than 2.5 cm long. Flowers borne in thyrses or umbels of 3–15 or more. Mericarp smooth or bearing a single dorsal rib or crest 4
4. Mericarp a coccus 4–5 × 3 mm, dorsally smooth or bearing only a rib up to 0.2 mm high. Stipules intra- and epipetiolar, i.e. borne on inner face of petiole at its base. Petiole 2–6 mm long. Leaves eglandular **Verrucularia**
 Mericarp a spheroidal nut 5–7 mm in diameter, bearing a triangular apical-dorsal crest 1.3–2 mm high. Stipules interpetiolar. Petiole 5–15 mm long. Leaves biglandular at apex of petiole or at base of lamina beneath **Stigmaphyllon**
5. Each mericarp bearing 4 principal lateral wings and a short dorsal winglet **Tetrapteryx**
 Each mericarp bearing 1 large dorsal wing, the sides of the nut smooth or at most bearing small crests or winglets 6

6. Wing of samara with the abaxial edge thickened, the veins diverging and branching from it toward the thinner adaxial edge. Pedicel (in our species) pedunculate **Heteropterys**
Wing of samara with the adaxial edge thickened, the veins diverging and branching from it toward the thinner abaxial edge. Pedicel (in our species) sessile 7
7. Stipules large (3–10 mm long and wide), those of opposite leaves connate, leaving 1 wide interpetiolar scar **Peixotoa**
Stipules small, distinct, leaving tiny scars **Banisteriopsis**

BANISTERIOPSIS C.B. Rob. ex Small

Gates, B. (1982). *Banisteriopsis*, *Diplopterys* (Malpighiaceae). Fl. Neotrop. 30: 1–237.

This genus is defined by its small distinct interpetiolar stipules, 3 styles with the stigmas terminal and without any sort of dorsal extension, 10 fertile stamens and samaras with the principal wing dorsal, thickened on the adaxial edge, the veins bending toward the thinner abaxial edge. In all our species the pedicels are sessile, the 4 lateral sepals are biglandular while the anterior is eglandular, the stamens are $\pm$ heteromorphic in length and thickness of filaments and size and shape of anthers, and the stigmas are capitate.

- Leaves glabrous or very sparsely sericeous at maturity. Vines, or shrubby when support is unavailable 2
Leaves densely and persistently tomentose or sericeous, at least beneath. Subshrubs, shrubs, or bushy trees, the branch ends sometimes weakly twining 3
- Petals yellow, abaxially densely sericeous. Leaf-lamina bearing a row of minute glands on or just within margin beneath. Bracts and bracteoles persistent in fruit. Nut of samara bearing 2–3 winglets on each side **B. pubipetala**
Petals white or white with a pink center, glabrous. Leaf-lamina bearing 1–2(–4) pairs of stipitate glands beneath on lateral veins in proximal half. Bracts and bracteoles deciduous before or during anthesis, rarely persistent. Nut of samara with the sides rugose, muricate, or tuberculate **B. stellaris**
- Leaf-lamina more than 3 times as long as wide. Anther locules glabrous. Bracts and bracteoles persistent past maturity of fruits. Locule of samara nut glabrous within **B. angustifolia**
Leaf-lamina generally no more than twice as long as wide. Anther locules sparsely pilose. Bracts and bracteoles deciduous before anthesis. Locule of samara nut densely hairy within **B. malifolia** var. **malifolia**

Banisteriopsis angustifolia (A. Juss.) B. Gates, Fl. Neotrop. 30: 98 (1982).

Subshrub or slender shrub to 1.5(–2) m. Leaves usually opposite, rarely ternate; petiole 2–5(–8) mm long; lamina 4–16 $\times$ 0.2–2(–3) cm, narrowly elliptic to

linear, 3–30 times as long as wide, obtuse to rounded at base, flat or revolute at margin, acute at apex, eglandular or bearing 1 pair of peltate glands beside midrib abaxially at base, thinly sericeous and rugose above, densely and persistently white-tomentose-sericeous beneath. Flowers c. 25 mm in diameter, borne in 4(–6)-flowered umbels, the umbels terminal or disposed in terminal dichasia; bracts and bracteoles persistent. Petals pink, fading somewhat with age, glabrous. Anther locules glabrous. Samara with the dorsal wing 13–22 $\times$ 10–17 mm, the nut rugose to tuberculate, its locule glabrous within. Fig. 27A–C, p. 421.

Grassland and cerrado, on sandy or rocky substrates.

Mun. Água Quente: Pico das Almas. Vertente norte. Vale ao noroeste do Pico. 1400 m. *Harley et al.* 26506. **Mun. Rio de Contas:** Pico das Almas. E. slopes. Area of campo and woodland to NW of Campo do Queiroz. 1550 m. *Fothergill et al.* 101; Middle NE slopes of the Pico das Almas c. 25 km WNW of the Vila do Rio de Contas. 1500–1600 m. *Harley et al.* 19619; Ao norte da cidade, ramal à direita da estrada para o povoado do Mato Grosso. 1050 m. *Harley et al.* 26943; Pico das Almas, a 18 km ao NW de Rio de Contas. 1300–1600 m. *Mori et al.* 12517.

Banisteriopsis malifolia (Nees & Mart.) B. Gates, Fl. Neotrop. 30: 76 (1982).

var. **malifolia**

Subshrub, shrub, or bushy tree to 3 m, the branch ends weakly twining. Petiole 2–7 mm long; lamina 2.8–7.4(–10.2) $\times$ 1.7–5.7 cm, ovate or narrowly to broadly elliptic, obtuse to cordate at base, flat or revolute at margin, acute to rounded and apiculate at apex, bearing 1 pair of peltate glands beside midrib abaxially at base, short-velutinous or subsericeous and rugose above, persistently tomentose beneath, the short-stalked hairs with long flexuous arms. Flowers c. 20–25 mm in diameter, borne in 4-flowered umbels mostly disposed in axillary or terminal cymes; bracts and bracteoles deciduous before anthesis. Petals white or pale pink, turning pale yellow with age, glabrous. Anther locules sparsely pilose. Samara with the dorsal wing (10–)15–25 $\times$ 7–14 mm, the nut rugose or occasionally bearing irregular lateral outgrowths, its locule densely hairy within.

Cerrado with sandy soil.

Mun. Rio de Contas: Pico das Almas. Vertente leste., c. 3 km da Fazenda Brumadinho na estrada para Junco. 1250 m. *Harley et al.* 27610.

Banisteriopsis pubipetala (A. Juss.) Cuatrec., Ciencia (Mexico) 23: 142 (1964).

Woody vine, or shrub with twining branches. Petiole 2–8(–12) mm long; lamina of larger leaves 5–13 $\times$ 2–6 cm, narrowly to broadly elliptic or obovate, cuneate to cordate at base, short- to long-acuminate at apex, glabrous, bearing a row of minute glands on or just within margin beneath. Flowers c. 25 mm in diameter, borne in 2–3 axillary condensed (often umbellate or corymbose) racemes of 4–6(–10) flowers; bracts and bracteoles persistent. Petals yellow, abaxially densely sericeous. Anther locules sparsely to densely pilose. Samara with the dorsal wing 20–40(–65) $\times$ 9–16(–23) mm, the nut bearing 2–3 winglets 1–3(–5) mm high on each side.

In thickets on sandy soil.

Mun. Rio de Contas: 9 km ao norte da cidade na estrada para o povoado de Mato Grosso. 1250 m. *Harley et al.* 25634.

Banisteriopsis stellaris (Griseb.) B. Gates, Fl. Neotrop. 30: 71 (1982).

Vine, shrubby when support is unavailable. Leaves usually opposite, rarely 3 or 4 at a node; petiole 1–4 mm long; lamina 1.5–12.2 × 1–6.5 cm, lanceolate to ovate to rotund, truncate to cordate at base, flat or slightly revolute at margin, acute or obtuse at apex, bearing 1–2(–4) pairs of stipitate glands beneath on lateral veins in proximal half, glabrous or very sparsely sericeous on both sides at maturity. Flowers c. 15 mm in diameter, borne in 4-flowered umbels disposed in terminal and axillary cymes; bracts and bracteoles deciduous before or during anthesis, rarely persistent. Petals white or white with a pink center, glabrous. Anther locules densely pilose. Samara with the dorsal wing 15–21 × 8–11 mm, the nut with the sides rugose, muricate, or tuberculate.

In cerrado and campo rupestre.

Mun. Rio de Contas: Perto do Pico das Almas, em local chamado Queiroz. 1400 m. *Harley et al.* 24579; Pico das Almas. Vertente leste. Entre Junco-Faz. Brumadinho, 9–14 km ao NO da cidade. 1200–1250 m. *Harley et al.* 27097.

BYRSONIMA Rich. ex Kunth

Distinguished by the shrubby or arborescent habit, intrapetiolar stipules, eglandular leaves, terminal pseudoracemose inflorescences, sepals all biglandular or all eglandular, 10 ± similar stamens, 3 subulate styles and fleshy indehiscent fruits.

1. Leaves very sparsely sericeous to quite glabrate 2
Leaves densely and persistently hairy, at least beneath 3
2. Lamina of larger leaves 7–14 × 5–9 cm. Inflorescence (4–)8–17 cm long. Anthers sericeous on both sides of locules, the connective usually extended 0.2–1.3 mm beyond locules. Stipules completely connate, the pair broadly rounded. Bracts and bracteoles mostly deciduous before maturity of fruits. Dried fruit 7–8 mm in diameter **B. coccolobifolia**
Lamina of larger leaves up to 5 cm long and 3.5 cm wide. Inflorescence 2–5 cm long. Anthers glabrous, the connective not or hardly exceeding locules. Stipules distinct or only slightly connate at base. Bracts and bracteoles persistent past maturity of fruits. Dried fruit up to 5 mm in diameter **B. triopterifolia**
3. Petals white, turning pink or red in age. Leaves velutinous beneath, the hairs mostly Y-shaped, with the straight erect stalk longer than the branches **B. correifolia**
Petals yellow, or yellow turning orange or red with age. Leaves sericeous, tomentose, or woolly beneath, the hairs with the stalk much shorter than the branches 4

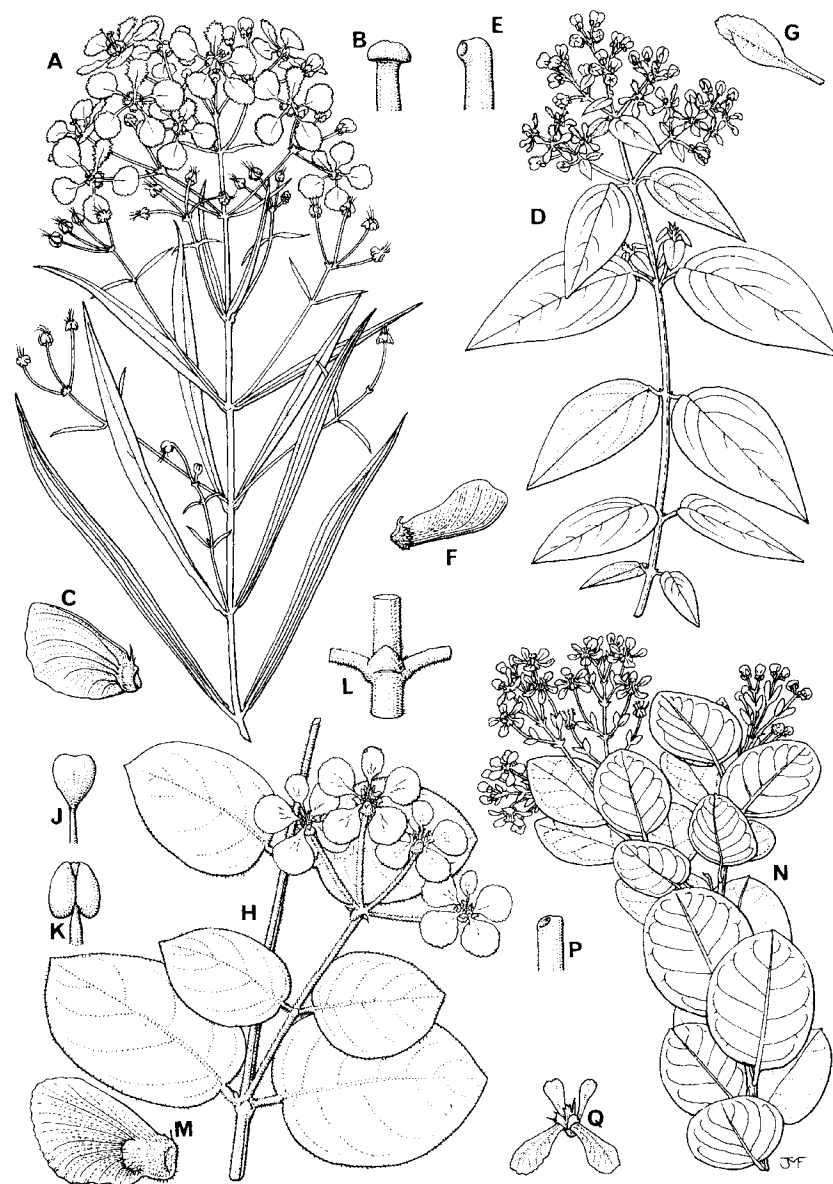


FIG. 27. MALPIGHIACEAE I. A–C *Banisteriopsis angustifolia*. A flowering branch × ½; B stigma × 16; C samara × 1. D–G *Heteropterys rubiginosa*. D flowering branch × ½; E stigma × 16; F samara × 1; G abaxial wing on a lateral petal × 4. H–M *Peixotoa spinensis*. H flowering branch × ½; J staminode × 8; K fertile stamen × 8; L stipule × 2; M samara × 1. N–Q *Tetraapterys cardiophylla*. N flowering branch × ½; P stigma × 16; Q samara × 1. A–C from *Fothergill et al.* 101 and *Harley et al.* 26943, D–G from *Harley et al.* 19631, H–M from *Harley et al.* 26308, N–Q from *Harley et al.* 25673. Drawn by Mark Fothergill.

4. Ovary and fruit glabrous. Dried fruit 8–16 mm in diameter. Leaf-lamina woolly beneath, the hairs strongly twisted **B. stannardii**
Ovary hairy, at least distally. Fruit sericeous or tomentose to glabrescent. Dried fruit 5–8 mm in diameter. Leaf-lamina appressed-tomentose, subsericeous, or sericeous beneath 5
5. Petiole (2–)4–13 mm long, usually longer than the stipule-pair. Leaf-lamina usually over twice as long as wide. Posterior (“flag”) petal bearing 2 or more glands at apex of claw **B. sericea**
Petiole 0–2 mm long, usually shorter than the stipule-pair. Leaf-lamina usually less than twice as long as wide. Posterior petal eglandular **B. dealbata**

Byrsonima coccolobifolia Kunth in Humb., Bonpl. & Kunth, Nov. gen. sp. 5 (quarto ed.): 148 (1822).

Shrub or small tree to 5 m. Stems glabrous or soon glabrate, the bark exfoliating. Stipules connate, the pair broadly rounded. Petiole 0–2 mm long; lamina of larger leaves 7–14 × 5–9 cm, ovate, rhomboidal, or obovate, rounded or slightly cordate at base, acute, obtuse, rounded, or emarginate at apex, soon glabrate. Inflorescence (4–)8–17 cm long; bracts and bracteoles mostly deciduous before maturity of fruits. Flowers c. 13 mm in diameter. Petals pink and white. Anther locules sericeous on both sides, usually exceeded by the connective by 0.2–1.3 mm. Ovary glabrous. Fruit (dried) 7–8 mm in diameter, glabrous.

Cerrado.

Mun. Rio de Contas: Near Junco, c. 15 km WNW of the town of Rio de Contas. 1200 m. *Harley et al.* 15595; Pico das Almas. Vertente leste. Perto da Faz. Brumadinho, estrada para Junco. 1200 m. *Harley et al.* 27086.

Byrsonima correifolia A. Juss. in A. St.-Hil., Fl. Bras. mer. 3: 78 (1833).

Shrub to 3 m. Stems velutinous. Stipules connate. Petiole 2–5 mm long; lamina of larger leaves 3–6(–10) × 1.5–4(–5) cm, ovate, elliptic, or obovate, rounded or somewhat cordate at base, revolute at margin, acute to rounded at apex, subvelutinous to glabrescent above, densely and persistently velutinous beneath, the hairs mostly Y-shaped with the straight stalk longer than the straight to sinuous or twisted branches. Inflorescence 3–10 cm long; bracts and bracteoles persistent past maturity of fruits. Flowers c. 13 mm in diameter. Petals white, turning pink or red with age. Anther locules sericeous on both sides, somewhat to greatly exceeded by the connective. Ovary glabrous. Fruit (dried) 5–7 mm in diameter, glabrous.

Campo rupestre.

Mun. Rio de Contas: Pico das Almas, 18 km from Rio de Contas. 1200–1500 m. *Hage et al.* 294; Lower NE slopes of the Pico das Almas c. 25 km WNW of the Vila do Rio de Contas. 1400 m. *Harley et al.* 19747.

Byrsonima dealbata Griseb., Linnaea 13: 253 (1839).

Subshrub or shrub to 2 m. Stems densely tomentose or subsericeous. Stipules connate. Petiole 0–2 mm long, usually shorter than the stipule-pair; lamina of larger leaves 3–7 × 2.5–5 cm, generally less than twice as long as wide, ovate, broadly elliptic, or obovate, cuneate or rounded at base, obtuse or rounded and apiculate at apex, appressed-tomentose to glabrate above, densely and persistently appressed-tomentose or subsericeous beneath with the hairs white or brownish. Inflorescence 3–8 cm long; bracts and bracteoles persistent or deciduous before maturity of fruits. Flowers c. 13 mm in diameter. Petals yellow, turning orange or reddish with age. Anther locules glabrous or sparsely to densely pilose, not or only slightly exceeded by the connective by up to 0.3 mm. Ovary densely hairy. Fruit (dried) 6–8 mm in diameter, distally sericeous or tomentose to glabrescent.

Cerrado and sandy campo rupestre.

Mun. Rio de Contas: 12–14 km N of town of Rio de Contas on road to Mato Grosso. 1200 m. *Harley et al.* 15205; Pico das Almas. Encosta do Pico. 1550 m. *Harley et al.* 24510; Pico das Almas. Vertente leste. Fazenda Silvina. 19 km ao NO da cidade. 1420 m. *Harley et al.* 25324; Pico das Almas. Vertente leste. Campo do Queiroz. 1500 m. *Harley et al.* 25995; 6–10 km NW of Rio de Contas on road to Pico das Almas. 1000 m. *Mori et al.* 12435.

A variable species, with some populations from other areas having larger leaves with longer petioles.

Byrsonima sericea DC., Prodr. 1: 580 (1824).

Shrub or tree to 6 m. Stems persistently sericeous. Stipules connate. Petiole (2–)4–13 mm long, usually longer than the stipule-pair; lamina of larger leaves 6–12 × 2–4 cm, usually over twice as long as wide, elliptic or somewhat ovate or obovate, cuneate at base, acute, obtuse, or acuminate at apex, subsericeous to glabrate above, densely and persistently sericeous beneath, the hairs nearly to quite straight and ± strongly appressed, giving the surface a bronze, golden, or silvery sheen. Inflorescence 6–12 cm long; bracts and bracteoles persistent or more commonly deciduous before maturity of fruits. Flowers c. 14 mm in diameter. Petals yellow, the posterior (“flag”) petal with 2 or more glands at apex of claw. Anthers sericeous between locules, the locules not or hardly exceeded by the connective. Ovary sericeous, at least distally. Fruit (dried) 5–7 mm in diameter, sericeous to glabrescent.

On sandy soil, in campo rupestre or open woodland or at edge of gallery forest.

Mun. Rio de Contas: Pico das Almas. Eastern slopes. Eastern side of Campo do Queiroz. 1500 m. *Fothergill et al.* 20; 12–14 km N of Rio de Contas on road to Mato Grosso. 1200 m. *Harley et al.* 15172; Pico das Almas. 1400 m. *Harley et al.* 24410; 17 km ao N da cidade na estrada para o povoado de Mato Grosso. Perto do rio. 1000 m. *Harley et al.* 26058; Serra das Almas, 5 km NW of Rio de Contas. 1000–1200 m. *Mori & Benton* 13513.

Byrsonima stannardii W.R. Anderson, Kew Bull. 47(4): 725 (1992).

Shrub or tree to 10 m. Stems densely and persistently tomentose or subvelutinous to eventually glabrescent. Stipules connate. Petiole 3–8 mm long;

lamina of larger leaves $6.5\text{--}12.5 \times 2.5\text{--}6.5$ cm, elliptic or somewhat ovate or obovate, cuneate or rounded at base, acute to rounded at apex, tomentose to glabrate and shining and rugose above, densely and persistently woolly beneath, the hairs strongly twisted, brownish or whitish. Inflorescence 4–9 cm long; bracts and bracteoles persistent or irregularly deciduous before maturity of fruits. Flowers c. 13 mm in diameter. Petals yellow, turning orange or red with age, the posterior petal eglandular. Anthers sericeous between locules, the locules not or hardly exceeded by the connective. Ovary glabrous. Fruit (dried) 8–16 mm in diameter, glabrous. Fig. 28Q–W, p. 425

In woods associated with campo rupestre.

Mun. Rio de Contas: Lower NE slopes of the Pico das Almas c. 25 km WNW of the Vila do Rio de Contas. 1500 m. *Harley et al.* 19547; Perto do Pico das Almas, em local chamado Queiroz. 1400 m. *Harley et al.* 24603; Pico das Almas. Vertente norte. Area de campos e mata, noroeste do Campo do Queiroz. 1550 m. *Harley et al.* 26292; Pico das Almas. Vertente leste. Campo do Queiroz, parte ao sudoeste. 1500 m. *Harley et al.* 27317 (Type); Pico das Almas, a 18 km ao NW de Rio de Contas. 1300–1600 m. *Mori et al.* 12530.

***Byrsonima triopterifolia* A. Juss., Ann. Sci. Nat. 2° Sér. Bot. 13: 334 (1840).**

Shrub or small tree to 3 m. Stems sericeous to glabrate. Stipules distinct or only slightly connate at base. Petiole 1.5–3 mm long; lamina 2–5 × 1–3.5 cm, elliptic or obovate to orbicular, cuneate or rounded at base, obtuse to rounded and apiculate at apex, soon glabrate or with scattered appressed hairs persisting beneath, the reticulum prominent on both sides. Inflorescence 2–5 cm long; bracts and bracteoles persistent past maturity of fruits. Flowers c. 10–12 mm in diameter. Petals pink to nearly white. Filaments white turning red with age; anther locules glabrous, not or hardly exceeded by the connective. Ovary glabrous. Fruit (dried) up to 5 mm in diameter, glabrous.

Campo rupestre.

Mun. Rio de Contas: Pico das Almas. Eastern slopes. Path between Faz. Silvina and Campo do Queiroz. 1300–1500 m. *Fothergill et al.* 77; lower slopes of the Pico das Almas, c. 25 km WNW of the town of Rio de Contas. 1500 m. *Harley et al.* 15481; Pico das Almas. Vertente leste. Na parte norte do vale abaixo do pico. 1575–1600 m. *Harley et al.* 26200.

CAMAREA A. St.-Hil.

This genus is defined by its androecium, which is reduced to 6 stamens opposite the 5 sepals and the posterior petal, with the 2 opposite the anterior-lateral sepals sterile, their anthers replaced by large frilly ornate bodies, the

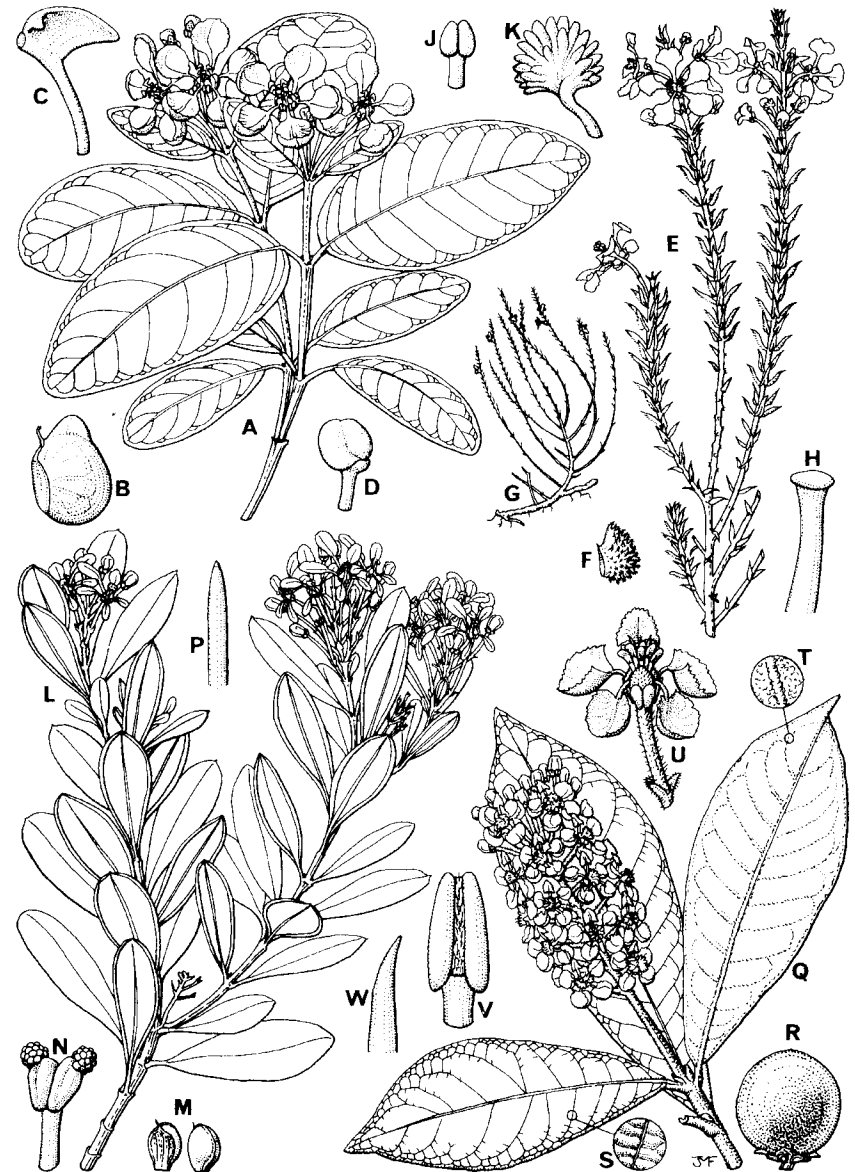


FIG. 28. MALPIGHIACEAE II. A–D *Stigmaphyllon paralias*. A flowering branch $\times \frac{1}{2}$; B fruit $\times 2$; C posterior style tip $\times 6$; D anterior style tip $\times 6$. E–K *Camarea axillaris*. E flowering branch $\times \frac{1}{2}$; F fruit coccus $\times 2$; G habit $\times \frac{1}{10}$; H stigma $\times 16$; J fertile stamen $\times 8$; K staminode $\times 8$. L–P *Verrucularia glaucophylla*. L flowering branch $\times \frac{1}{2}$; M fruit coccus $\times 2$; N anther $\times 8$; P stigma $\times 16$. Q–W *Byrsonima stannardii*. Q flowering branch $\times \frac{1}{2}$; R fruit $\times 2$; S detail of upper leaf surface; T detail of lower leaf surface; U whole flower $\times 2$; V anther $\times 8$; W stigma $\times 16$. A–D from *Harley et al.* 27091, E–K from *Fothergill et al.* 3, *Harley et al.* 19361 (Morro do Chapéu, Bahia) and *Harley et al.* 25689, L–P from *Harley et al.* 27567 and *Hatschbach* 47931 (Mun. Mucugê, Bahia), Q–W from *Harley et al.* 27317. Drawn by Mark Fothergill.

other 4 bearing small anthers; also notable for the habit of a suffrutex or perennial herb, the carrot-yellow petals, the single style with a large capitate stigma and the schizocarpic fruit with the mericarps lacking functional wings.

Camarea axillaris A. St.-Hil., Bull. Sci. Soc. Philom. Paris 1823: 133 (1823).

Camarea triphylla A. Juss., Ann. Sci. Nat. 2° Sér. Bot. 13: 254 (1840).

Perennial herb with wiry erect stems to 50 cm from a trailing or knotted rhizome. Stipules borne on stem beside petiole, 0.2–0.5 mm long. Leaves alternate, opposite, or borne in whorls of 3 or 4, varying on the same plant; petiole 0–1 mm long; lamina 3–12 × 1–4 mm, ovate or triangular, truncate or subcordate at base, revolute at margin, acute or obtuse at apex, loosely sericeous or tomentose to glabrescent, often bearing a stalked gland beneath near base on 1 or both sides of midrib. Flowers c. 18–22 mm in diameter, borne singly in axils of vegetative leaves. 4 lateral sepals biglandular, the anterior eglandular or bearing 1 or 2 usually smaller glands. Mericarp of fruit a coccus c. 2.5 mm in diameter, densely covered by many vascularized seta-like processes c. 1 mm long. Fig. 28E–K, p. 425.

Sandy campo, among rocks.

Mun. Rio de Contas: Middle NE slopes of the Pico das Almas c. 25 km WNW of the Vila do Rio de Contas. 1500–1600 m. *Harley et al.* 19627; Pico das Almas. Queiroz. 1400 m. *Harley et al.* 24525; 10–13 km ao norte da cidade na estrada para o povoado de Mato Grosso. 1120 m. *Harley et al.* 25689; Pico das Almas. Vertente leste. Campo do Queiroz. 1500 m. *Harley et al.* 26284; Pico das Almas. Vertente leste. Subida do pico do campo norte do Queiroz. 1600 m. *Harley et al.* 26349.

HETEROPTERYS Kunth

Unique in the family in its samara, which has the elongated dorsal wing thickened on the abaxial edge, the veins diverging from it toward the thinner adaxial edge; in most species the styles are stigmatic on the internal angle of the apex and in our species the pedicel is raised on a peduncle.

1. Petals pink and/or white, each of the 4 lateral petals with a well-developed abaxial wing, the posterior ("flag") petal with a narrower abaxial crest or winglet. Sepals appressed in anthesis. Nut of the samara usually bearing several to many small irregular outgrowths

H. rubiginosa

Petals yellow, abaxially smooth. Sepals revolute in anthesis. Nut of the samara smooth-sided

2

2. Shrub or bushy tree. Leaf-lamina persistently tomentose beneath or only belatedly glabrescent, mostly obtuse or rounded at the apex

H. byrsonimifolia

Woody vine or shrub with twining branches. Leaf-lamina very early glabrescent and soon nearly or quite glabrate, acuminate or acute at the apex

H. eglandulosa

Heteropterys byrsonimifolia A. Juss., Ann. Sci. Nat. 2° Sér. Bot. 13: 276 (1840).

Shrub or bushy tree to 3(–5) m. Petiole 3–6 mm long; lamina of larger leaves 4–10 × 2.5–5.5 cm, elliptic, cuneate to rounded at base, mostly obtuse to rounded at apex, appressed-tomentose to soon glabrate above, ± persistently tomentose beneath to glabrescent with age, eglandular or more commonly bearing 1–several small impressed glands beneath in an inframarginal row. Flowers c. 16–18 mm in diameter, borne in short racemes of 4–10 flowers, the racemes disposed in lateral and terminal panicles. Sepals revolute in anthesis. Petals yellow, abaxially smooth. Samara with the dorsal wing 20–28 × 10–14 mm, the nut smooth-sided.

Secondary woods.

Mun. Rio de Contas: Pico das Almas. Vertente leste. Campo do Queiroz. 1500 m. *Harley et al.* 27412.

Heteropterys eglandulosa A. Juss. in A. St.-Hil., Fl. Bras. mer. 3: 27 (1833).

Woody vine, or shrub with twining branches. Petiole 2–8 mm long; lamina of larger leaves 6–13(–16) × 2–5 cm, elliptic, cuneate to rounded at base, acuminate or acute at apex, initially finely sericeous but very early glabrescent and soon nearly or quite glabrate, eglandular or more commonly bearing several small impressed glands beneath in an inframarginal row. Flowers c. 12–15 mm in diameter, borne in short racemes of (4–)6–16 flowers, the racemes disposed in lateral and terminal panicles. Sepals revolute in anthesis. Petals yellow, abaxially smooth. Samara with the dorsal wing c. 20 × 8–10 mm, the nut smooth-sided.

Margin of gallery forest.

Mun. Rio de Contas: Pico das Almas. Vertente leste. Junco. 9–11 km ao NO da cidade. 1120 m. *Harley et al.* 25959.

Heteropterys rubiginosa A. Juss., Ann. Sci. Nat. 2° Sér. Bot. 13: 278 (1840).

Woody vine. Petiole 3–7 mm long; lamina of larger leaves 3–7 × 2–3.7 cm, ovate or elliptic, rounded or subcordate at base, acute to rounded and apiculate at apex, tomentose or subvelutinous to glabrate above, persistently tomentose beneath, mostly bearing 1 or 2 pairs of glands beneath near base. Flowers c. 10–12 mm in diameter, borne in short, dense, often umbellate or corymbose racemes of (4–)6–8(–10) flowers, the racemes disposed in lateral and terminal panicles. Sepals appressed in anthesis. Petals pink and/or white, each of the 4 lateral petals with a well-developed abaxial wing, the posterior ("flag") petal with a narrower abaxial crest or winglet. Samara with the dorsal wing 17–25 × 8–12 mm, the nut usually bearing several to many small irregular outgrowths on the sides. Fig. 27D–G, p. 421.

On rocks, in campo rupestre.

Mun. Rio de Contas: Middle NE slopes of the Pico das Almas c. 25 km WNW of the Vila do Rio de Contas. 1500–1600 m. *Harley et al.* 19631; arredores de Pico das Almas. 1400 m. *Mori & Benton* 13626.

PEIXOTOA A. Juss.

Anderson, C. (1982). A monograph of the genus *Peixotoa* (Malpighiaceae). Contr. Univ. Michigan Herb. 15: 1-92.

Very distinctive due to large interpetiolar cordate or triangular stipules, formed through the fusion of the stipules of opposite leaves and leaving a wide interpetiolar scar. Also notable for the 4-flowered umbels, the large lemon-yellow petals, the 3 styles with capitate stigmas, the valvate sepals, of which the lateral 4 are biglandular, and the 10 stamens, of which only the 5 opposite the petals are fertile, the 5 opposite sepals bearing large globular modified connectives without locules.

Peixotoa spinensis C.E. Anderson, Contr. Univ. Michigan Herb. 15: 69 (1982).

Shrub with ascending, prostrate, or twining stems to 2 m. Stems densely velutinous. Stipules 3-10 mm long and wide. Petiole 2-8 mm long, velutinous; lamina 3.6-9.3 × 1.8-6.5 cm, elliptic or ovate, cordate at base, obtuse to rounded and apiculate at apex, velutinous above, tomentose or woolly beneath, bearing 1(-2) pairs of glands beneath above base and away from midrib. Inflorescence terminal or axillary, the umbels borne singly or in dichasia; pedicels sessile. Flowers c. 30 mm in diameter. Fruit dry, breaking apart into 3 samaras; samara bearing 1 large dorsal wing 15-24 × 14-16 mm, with the adaxial edge thickened, the veins diverging and branching from it toward the thinner abaxial edge; lateral winglets small, 1 on each side. Fig. 27H-M, p. 421.

Dry woodland on rocky campo.

Mun. Rio de Contas: Pico das Almas. Vertente leste. Subida do pico do campo norte do Queiroz. 1500 m. *Harley et al.* 26308.

STIGMAPHYLLON A. Juss.

Most species have internal stigmas and dorsal flaps or hooks on the 3 styles and very large lemon-yellow petals. Our species is typical in those characters, but in other ways it is quite different from most members of the genus, which are usually vines producing samaras with a long dorsal wing.

Stigmaphyllon paralias A. Juss. in A. St.-Hil., Fl. Bras. mer. 3: 59 (1833).

Brachypterys australis A. Juss. in Deless., Icon. sel. pl. 3: 20, t. 34 (1838), nom. superfl.

Brachypterys paralias (A. Juss.) Hutch., Gen. fl. pl. 2: 589 (1967).

Subshrub or shrub 30-150 cm tall. Stems flattened, sericeous. Stipules interpetiolar, 0.5-1.5 mm long. Leaves biglandular at apex of petiole or on base of lamina beneath; petiole 5-15 mm long; lamina of larger leaves 6-13 × 3-7 cm, ovate or elliptic, rounded or subcordate at base, usually obtuse or rounded at apex, glabrate above at maturity, thinly sericeous to glabrate beneath. Flowers c. 30-35 mm in diameter, borne in umbels of 3-15. Lateral 4 sepals biglandular, the

anterior eglandular or sometimes bearing 1 small gland, rarely 2. Stamens 10, extremely unequal in length and stoutness of filaments, size of anther connectives and size of locules, the 3 posterior stamens smallest with the locules usually absent, sometimes present but much reduced. 2 posterior styles bearing large unilateral flaps dorsally at apex, the anterior style bearing a smaller bilateral apical flap. Mericarp 5-7 mm in diameter, a reticulate-sided nut bearing a single bluntly triangular apical-dorsal crest 1.3-2 mm high. Fig. 28A-D, p. 425.

Cerrado with rocky outcrops.

Mun. Rio de Contas: Pico das Almas. Vertente leste. Entre Junco-Faz. Brumadinho, 9-14 km ao NO da cidade. 1200-1250 m. *Harley et al.* 27091.

TETRAPTERYS Cav.

This genus is defined by its fruit, which breaks apart into 3 X-shaped samaras, each with 4 elongated lateral wings and a short dorsal crest or winglet. In flower, *Tetrapteryx* can be difficult to distinguish from yellow-flowered species of other genera with the 3 styles stigmatic on the internal angle of the apex, especially *Heteropteryx*.

Tetrapteryx cardiophylla Nied., Arbeiten Bot. Inst. Königl. Lyceums Hosianum Braunsberg 8: 60 (1926).

Shrub to 3 m. Stipules interpetiolar, minute. Leaves somewhat appressed and imbricated; petiole 1-3 mm long; lamina 2.2-3.2 × 2-2.8 cm, broadly ovate or suborbicular, truncate to shallowly cordate at base, obtuse or rounded at apex, glabrate, bearing 1-several small glands beneath set in from margin, the reticulum prominent on both sides. Inflorescence a corymb or dense raceme of 2-10 flowers terminating a short leafy axillary shoot; bracteoles leaf-like, bearing 1 or 2 marginal glands, about 3 times as long as the bracts. Flowers c. 13 mm in diameter. Sepals appressed in anthesis, the lateral 4 biglandular, the anterior eglandular. Petals bright yellow. Stamens 10, alike, glabrous. Styles with the apex dorsally truncate, the stigma internal but only subtly so. Samara with the upper wings 5-7 mm long, sometimes irregularly split, the lower wings 7-10 mm long. Fig. 27N-Q, p. 421.

Sandy campo with outcrops of quartzite and sandstone.

Mun. Rio de Contas: 10-13 km ao norte da cidade na estrada para o povoado de Mato Grosso. 1120 m. *Harley et al.* 25673.

VERRUCULARIA A. Juss.

Resembling *Byrsonima* in most characters, but readily distinguished by the anthers with vesicular outgrowths and the dry schizocarpic fruits.

Verrucularia glaucophylla A. Juss., Ann. Sci. Nat. 2° Sér. Bot. 13: 327 (1840).

MALPIGHIACEAE

Shrub to 3 m. Stipules intrapetiolar, distinct or basally connate. Leaves eglandular; petiole 2–6 mm long; lamina 2.5–6(–7.5) × 1.2–4(–5.5) cm, elliptic or obovate, broadly rounded and often apiculate or emarginate at apex, revolute at margin, initially tomentose or subsericeous, soon glabrescent above, soon or eventually glabrescent beneath, whitish beneath. Inflorescence a terminal raceme of 1–several-flowered cincinni (i.e. a thyrses). Flowers c. 14–18 mm in diameter. Sepals all biglandular, the neighbouring glands of adjacent sepals sometimes connate. Petals lemon-yellow. Stamens glabrous; filaments yellow turning red with age; anthers bearing vesicular outgrowths on each side toward apex. Styles slender and subulate, tapering to minute stigmas. Fruit breaking apart into 3 dry cocci, each coccus 4–5 × 3 mm, dorsally smooth or with a rib up to 0.2 mm high. Fig. 28L–P, p. 425.

Cerrado with rocky outcrops.

Mun. Água Quente: Pico das Almas. Vertente oeste. Entre Paramirim das Crioulas e a face NNW do pico. 1100 m. *Harley et al.* 27567.