

Excerpt from:

Anderson, W. R. 1981. Malpighiaceae in The botany of the Guayana Highland, Part XI. Mem. New York Bot. Gard. 32: 21–305.

2. **Lophanthera** Adr. Jussieu, Ann. Sci. Nat. 2<sup>o</sup> Sér. Bot. 13: 328. 1840.

Shrubs or trees, the stems often containing white latex, the leaves bearing glands on the petiole or lamina or both; stipules intra- and slightly epipetiole,  $\frac{2}{3}$  to completely connate. Inflorescence terminal (rarely axillary in *L. spruceana*), a thyse composed of few-flowered cincinni or dichasia or a pseudoraceme, the bracts and bracteoles persistent, 1 or both bracteoles usually bearing a large gland. Petals entire or at most minutely denticulate, deciduous, the posterior petal moderately to strongly differentiated from the other 4. Stamens 10,  $\pm$  in 1 whorl, the filaments distinct or slightly connate basally, glabrous, those opposite the sepals longer than those opposite the petals; anthers alike, glabrous, deciduous, 4-locular, the outer locules bearing dark longitudinal wings, the connective shorter than the locules; pollen tricolporate. Receptacle glabrous or with a row of short, basifixed hairs between filaments and ovary. Ovary of 3 uniovulate carpels, the carpels laterally somewhat to quite free but connate along a narrow to broad central axis; styles 3, apical or subapical, inbent in bud, subulate with minute apical stigmas, glabrous, often persistent in fruit. Fruit schizocarpic, breaking apart into 3 (or fewer due to abortion) dry, unwinged, 1-seeded cocci, the mericarps indehiscent or slightly dehiscent along the keel but not enough so to release the spheroid seed.

Type. *Lophanthera longifolia* (H.B.K.) Grisebach.

*Lophanthera* is a lowland genus of four species, three of which occur in or near Guayana.

### Key to the Species of *Lophanthera*

1. Stipules up to 3 mm long; inflorescence erect, shorter than the subtending leaves; one bracteole bearing a large sessile gland covering much of its abaxial surface; petals white or pink. 1. *L. spruceana*.
1. Stipules 5–12 mm long; inflorescence more or less pendulous, often longer than the subtending leaves; one or both bracteoles usually bearing an apical, often stalked gland; petals yellow.
  2. Glands of the calyx 1–4, borne on 1–3 adjacent posterior sepals; ovary and fruit densely pilose. 2. *L. pendula*.
  2. Glands of the calyx usually 10 (often connate in pairs), symmetrically distributed on all 5 sepals; ovary and fruit glabrous.
    3. Primary peduncle of the cincinni (from bract to joint of first flower) 2.5–8.5 mm long; anthers 2–2.5 mm long, with wings ca 0.5 mm wide; cocci 7–9 mm long, the proximal half filled with aerenchyma. 3. *L. longifolia*.
    3. Primary peduncle 9–20 mm long; anthers 0.8–1.0 mm long, with wings 0.1–0.2 mm wide; cocci ca 5 mm long, containing only the seed, no aerenchyma. 4. *L. lactescens*.

#### 1. *Lophanthera spruceana* Niedenzu, Arb. Bot. Inst. Ak. Braunsberg 5: 30. 1914.

Shrubs or small trees to 6 m tall; stems sericeous to glabrate, the hairs short, straight, sessile, reddish-brown. Lamina of the larger leaves 15–22 cm long, 5–10 cm wide, elliptical or slightly ovate or obovate, obtuse or attenuate at the base, revolute at the margin, abruptly short-acuminate at the apex, glabrate above, very sparsely but persistently sericeous below, usually bearing 2 large impressed glands below at the base and several small glands in a row on each side; petiole 5–12 mm long, eglandular, sericeous to glabrate; stipules 1.5–3 mm long, connate, obtuse or rounded at the apex, abaxially sericeous. Inflorescence terminal or rarely axillary, simple, binate, or ternate, each axis 5–15 cm long, with a pair of sterile, much-reduced leaves 1–15 mm above the base, erect, reddish-brown-sericeous, a thyrse composed of ascending 1–5-flowered cincinni 1–2.5 cm long; bracts 1–2 mm long, triangular, sericeous, eglandular; primary peduncle (from base to joint of first flower) 4–8(–11) mm long, bearing at its apex 2 bracteoles similar to the bract, one of these bearing a large round gland over most of the abaxial surface, the other, eglandular bracteole usually fertile (i.e. subtending a lateral branch). Pedicel 4–6 mm long, sericeous. Sepals extending 1–2 mm beyond the glands, obtuse or rounded at the apex, sericeous to glabrate abaxially, ciliate on the margin, glabrous adaxially, all biglandular or very rarely 1 of the anterior-lateral sepals eglandular, the glands circular or obovate, 0.8–1.5 mm long, often so compressed as to appear confluent in open flowers. Petals white or pink, 4–6 mm long, dorsally smooth or slightly carinate at base of limb, glabrous, the posterior petal with a much longer and thicker claw than the others. Stamens with the filaments 1.5–2 mm long, the anthers 1.5–2 mm long, the wings 0.3–0.6 mm wide, widest distally and exceeding the locules. Ovary ca 1 mm high, densely sericeous; styles 2–2.5 mm long, slightly incurved at the apex or straight, apical. Cocci separating from each other along a broad zone of contact and leaving a plane base, 8–10 mm long, 5–6 mm wide, thinly sericeous, irregularly ovoid, containing the seed in a globose distal chamber above a broad, empty or aerenchymatous base ca 2–3 mm high.

Type. *Spruce 2518/2632*, prope Panuré ad Rio Uaupés, Amazonas, Brazil, Oct 1852–Jan 1853 fl/frt (isotypes CP, NY!).

Distribution. BRAZIL. Amazonas, Rio Uaupés: caatinga, Rio Tikie at Iripipy, May fl, *Fróes 12548/242* (A); caatinga, Panuré, *Pires 1052*, Nov fl, (IAN), *1070* (IAN), *1080*, Nov fl/frt, (IAN, NY), *Pires & Silva 7950*, Jun fl/frt, (IAN, UB); solo úmido arenoso, Vila Iauareté, May fl, *Ribeiro 995* (MICH); Ipanoré, Nov fl, *Schultes & Pires 9090* (GH, US); type, q v.

## 2. *Lophanthera pendula* Ducke, Tropical Woods 50: 34. 1937.

Shrubs or small trees, the stems sericeous to glabrate and eventually lenticellate. Lamina of the larger leaves 14–23 cm long, 5.5–10.5 cm wide, elliptic or broadly elliptic, cuneate or slightly decurrent at the base, usually abruptly short-acuminate at the apex with the acumen ca 5 mm long, glabrate except loosely sericeous on the midrib, especially below, and on the margins, bearing small impressed glands below near the base and often distally in a row on each side; petiole 2–2.7 cm long, loosely sericeous to glabrate, eglandular or rarely bearing 1–2 glands near the apex on decurrent laminar tissue; stipules 5–8 mm long, abaxially sericeous, adaxially nearly or quite glabrous, the pair triangular, 2-ribbed, quite connate or free at the apex. Inflorescence 25–65 cm long, with a pair of sterile, much-reduced leaves 3–6 cm above the base,  $\pm$  pendulous, an open pseudoraceme of 1-flowered cymules, with often 1 cm or more between pairs or groups of flowers, tomentose with basifixed or medifixed hairs; bracts 2–3 mm long, triangular, tomentose, eglandular or with marginal glandular spots; peduncle 2–5 mm long, bearing at the apex 2 minute reduced bracteoles and well below the apex 2 larger bracteoles 1–2 mm long, often with marginal glandular spots, 1 bracteole terminating in a large stalked gland. Pedicel 6–9 mm long, pilose. Sepals 2–3 mm long, triangular, acute at the apex, flat, appressed-pilose on both sides, bearing 1–4 glands on 1–3 adjacent posterior sepals, the glands 1–1.3 mm long, flat, circular. Petals yellow, 4–5 mm long, cucullate, dorsally alulate or carinate, glabrous, the posterior petal with a larger, more spreading limb. Stamens with the filaments 2–3 mm long, the anthers 1.5 mm long, the wings ca 0.3 mm wide, widest distally. Ovary ca 1.5 mm high, densely pilose with mostly basifixed hairs; styles ca 4 mm long, persistently bent. Cocci separating from a short pyramidal axis, ca 6 mm long, 4–5 mm wide, pilose, laterally compressed, with a flattened arching dorsal keel, containing only the seed (no aerenchyma).

Type. *Ducke* [RB 29041], Rio Curicuriary afl. Rio Negro super., ad ripas inundatas, Amazonas, Brazil, 4–X–1935 fl/frt (holotype RB! isotypes NY! US!).

Distribution. Upper Rio Negro and its tributaries. BRAZIL. Amazonas: Rio Curicuriary, 23 Dec 1931 frt, *Ducke* [RB 24164] (RB), type, q v; Igarapé Caburí, igapó, Sep frt, *Fróes 28746* (IAN); Tapuruquara, mata da ilha, Apr frt, *Pires 250* (IAN, NY, US); San Felipe and vicinity, below mouth of Rio Içana, Jan frt, *Schultes & López 9600* (GH, IAN, US) & *9601* (US).

## 3. *Lophanthera longifolia* (Humboldt, Bonpland & Kunth) Grisebach in Martius, Fl. Bras. 12(1): 25. 1858. Fig 9a–h.

*Galphimia longifolia* Humboldt, Bonpland & Kunth, Nov. Gen. Sp. Pl. 5: 173 (4° ed.). 1821 [1822].

*Lophanthera kunthiana* Adr. Jussieu, Ann. Sci. Nat. 2° Sér. Bot. 13: 329. 1840 [nom superfl].

Shrubs or small trees 1–6(–10) m tall, the branchlets loosely sericeous, often containing some white latex. Lamina of the leaves 12–30 cm long, 4–10 cm wide, obovate, gradually narrowed at the base, acute or short-acuminate at the apex, glabrate above or sparsely sericeous on the midrib, thinly sericeous below, at least on the veins, usually bearing few to many small impressed glands below near the midrib or distant from it; petiole (1–)1.4–3 cm long,  $\pm$  persistently sericeous, usually bearing 2(–4) flat glands above near the middle; stipules (6–)7–10 mm long, narrowly triangular, quite connate or bidentate at the apex, abaxially sericeous to glabrate, adaxially glabrous. Inflorescence 12–35 cm long, with a pair of usually sterile, much-reduced leaves about midway between the base and the first cincinni, usually pendulous, loosely sericeous or tomentose, a thyrse composed of 15–70 horizontal or reflexed, 1–4-flowered cincinni; bracts 2–4 mm long, triangular, abaxially loosely sericeous, eglandular; primary peduncle (from base to joint of first flower) 2.5–8.5 mm long, bearing 0.5–1.5 mm below its apex 2 triangular bracteoles, one of these terminating in a sessile or stalked gland, the other, eglandular bracteole subtending a lateral branch. Pedicel (3–)5–8 mm long, loosely sericeous. Sepals extending 2–2.5 mm beyond the glands, triangular, acute at the apex, flat, thinly sericeous distally to glabrate on both sides, all biglandular, the glands 1–2 mm long, obovate, strongly lateral, neighboring glands of adjacent sepals often  $\pm$  connate. Petals yellow, 5–8 mm long, dorsally carinate and somewhat cucullate, glabrous. Stamens with the filaments 1.5–3 mm long, the anthers 2–2.5 mm long, the wing 0.5 mm wide, widest distally and exceeding the locules. Ovary 1.5–2 mm high, glabrous; styles 3.5–4.5 mm long, apical or slightly sub-apical. Cocci separating from a pyramidal axis, 7–9 mm long, 3–4 mm wide, glabrous, sub-cylindrical, the proximal half filled with aerenchyma, the distal half bearing the seed and carinate.

Type. *Humboldt & Bonpland*, locis umbrosis, ad ripam fluminis Cassiquiare (Misiones del Orinoco), Amazonas, Venezuela (P).

Distribution. Along the Alto Río Orinoco, Casiquiare, and Río Negro in Amazonas, Venezuela; widespread along rivers in Amazônia, Brazil; and occasional in Rondônia and Pará. Representative collections: VENEZUELA. Amazonas: Orinoco, Isla del Ratón, *Breteler* 4718 (US, VEN, WAG); La Esmeralda, *Fariñas et al* 295 (VEN); São José do Casiquiare, *Fróes* 21500 (NY, US); Río Orinoco between San Fernando de Atabapo and Tamatama, *Level* L-25 (F, MICH, NY, VEN); Danta Falls, Cuao River, *Maguire & Politi* 27321 (NY, VEN); W of Santa Barbara, *Maguire et al* 32077 (NY, VEN); Río Casiquiare 4 hours below origin, *Maguire et al* 36604 (MICH, NY, US, VEN); Caño Cupueni at mouth of Río Atabapo, *Maguire et al* 37683 (NY, VEN); San Carlos de Río Negro, *Ll. Williams* 14563 & 14721 (US, VEN); El Cucuy, Río Negro, *Ll. Williams* 14716 (US, VEN); Alto Orinoco, Esmeralda, *Ll. Williams* 15314 (VEN), 15361 (NY, US, VEN), 15414 (US, VEN). BRAZIL. Amazônia: Rio Jamundá [Nhamundá], Aminarú-Assú, *Black & Ledoux* 50–10865 (IAN); Borba, Rio Madeira, *Ducke* 76 (NY); Faro, *Ducke* [MG 3719 & 6921] (MG); Manaus, *Fróes* 20846 (NY); Sucurijú, Rio Urubú, *Fróes* 25430 (IAN); Barcelos, Rio Negro, *Fróes* 28439 (IAN); Rio Canumã, Rio Madeira, *Fróes* 33748 (IAN); near Tres Casas, mun. Humaitá, *Krukoff* 6269 (NY); Itacoatiara-Manaus, *Oliveira* 2948 (IAN); Rio Juruá, mata da várzea, *Pena* 573 (MICH); Maués, *Pires* 80 (IAN, NY); Tefé, *Pires* 1413 (IAN); Rio Negro between mouth of Rio Caures and Barcelos, *Prance et al* 15136

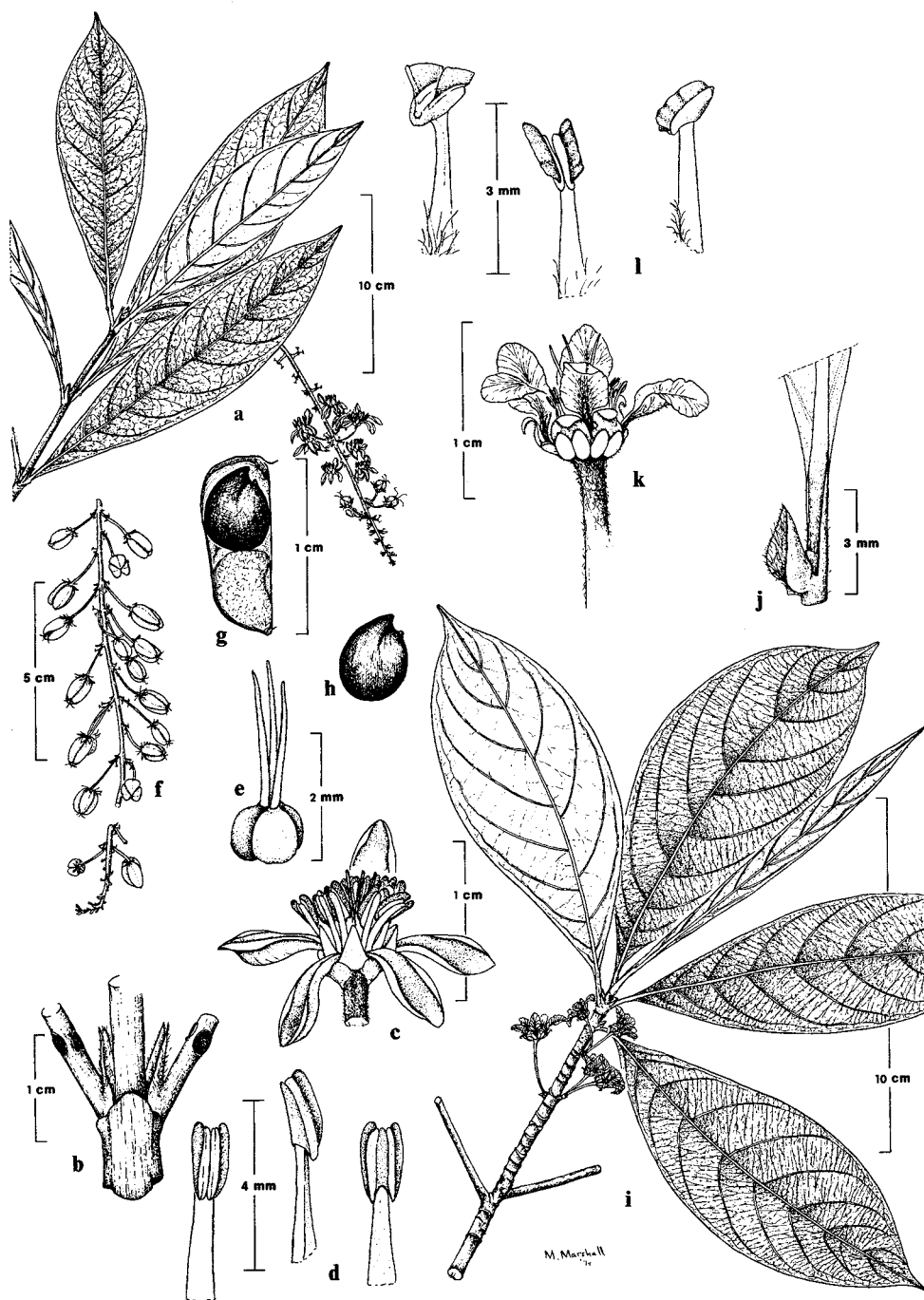


Fig 9. *Lophanthera longifolia* and *Pterandra guianensis*. a–h, *L. longifolia*: a) Flowering branch; b) stipules and petioles; c) flower; d) stamens, left to right adaxial, lateral, and abaxial views; e) gynoeceum; f) infructescence; g) seed in locule with proximal aerenchyma; h) seed. i–m, *P. guianensis*: i) flowering branch; j) connate stipules; k) flower; l) stamens, left and center adaxial views, right abaxial view. Drawn by Melissa Marshall, a–e from Breteler 4718, f–h from Maguire et al 32077, i–m from Tillett et al 45011.

(MICH, NY, U, US); Rio Uatumã, mun. Parintins, *Rodrigues* 259 (IAN); Rio Negro, Muyrapenima [Mirapinima], *Tate* 53 (NY, US). Pará: São Miguel do Guamá, Rio Guamá, *Dardano & Black* 48–3139 (IAN); Rio Trombetas, acima de Oriximiná, *Ducke* [MG 7893] (MG); Rio Cuminá, *Ducke* [MG 7963] (MG); Rio Tocantins, região de Tucuruí, *Oliveira* 1203 (IAN); Monte Dourado, Rio Jarí, *Silva* 982 & 1112 (NY). Terr. Rondônia: Pôrto Velho, *Baldwin* 3151 (IAN) & *Black & Cordeiro* 52–14509 (IAN); source of Jatuaraha River, Machado River region, *Krukoff* 1546 (NY).

Collected in flower and fruit in almost all months, most frequently from November to March.

*Lophanthera longifolia* is usually collected along rivers. Its fruit appears to be well adapted to dispersal by water, in that half the volume of each coccus is filled with aerenchyma.

#### 4. *Lophanthera lactescens* Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 103. 1925.

Trees to 15 m tall; stems lactiferous, very finely sericeous, soon glabrate and coarsely lenticellate. Lamina of the larger leaves (12–)15–24 cm long, (5–)9–12 cm wide, obovate, decurrent at the base, rounded or obtuse or apiculate at the apex, glabrate except for very fine subappressed hairs on the midrib, usually bearing several small impressed glands below in a row on each side; petiole 1.5–2.5 cm long, finely sericeous to glabrate, eglandular or bearing 2 large flat glands above in the middle; stipules 8–12 mm long, abaxially gray-sericeous, adaxially very sparsely sericeous, the pair triangular, 2-ribbed, quite connate or free at the apex. Inflorescence 30–40 cm long or longer, with a pair of sterile, much-reduced leaves 1–3 cm above the base, pendulous, gray-sericeous to reddish-subvelutinous, a thyrse composed of many crowded, horizontal or reflexed, 1–3-flowered dichasia or cincinni 2–4 cm long; bracts 1.5–3 mm long, narrowly triangular, loosely sericeous, eglandular; primary peduncle (from base to joint of first flower) 9–20 mm long, bearing at its apex 2 minute bracteoles (hardly more than swellings in some) and well below the apex 2 large triangular bracteoles, one or both of these usually terminating in a large stalked gland, one or both often fertile (i.e. subtending lateral flowers). Pedicel 4–7 mm long, sparsely velutinous. Sepals extending 1–2 mm beyond the glands, triangular, acute at the apex, flat, appressed-tomentose on both sides especially distally, all biglandular, the glands 2–2.5 mm long, obovate, laterally compressed, somewhat decurrent, neighboring glands of adjacent sepals sometimes partially to completely connate. Petals yellow, 5–7 mm long, dorsally carinate, pilose on the margin. Stamens with the filaments 2–2.5 mm long, the anthers 0.8–1 mm long, the wings 0.1–0.2 mm wide, widest distally. Ovary ca 1.3 mm high, glabrous; styles ca 2.3 mm long, incurved at the apex or straightening, subapical. Cocci separating from a very short pyramidal base, ca 5 mm long and 3.5 mm wide, glabrous, obovoid, containing only the seed (no aerenchyma). Chromosome number:  $n = 6$  (voucher: *Anderson 11665*, MICH).

Type. *Ducke* [RB 17698], silva non inundata, Bella Vista, Rio Tapajós, Pará, Brazil, 31–V–1923 fl/frt (holotype RB!).

Distribution. This very rare species is known in the wild only from the lower Rio Tapajós, where Ducke found it and where collectors from IAN have recently

re-collected it. However, Ducke brought it into cultivation in Rio de Janeiro, where it has proved to be an attractive street tree capable of withstanding pollution, neglect, and the other rigors of urban life. The above description was based on specimens from cultivated trees; the vouchers are *Anderson 11665*, *Gates s n*, and *Occhioni 3563*, all at MICH.

Two aspects of this plant's morphology are particularly noteworthy. One is the inflorescence, in which the cymules are often dichasia (i.e. both bracteoles subtend lateral branches). Most byrsonimoids with several-flowered cymules have cincinni instead of dichasia, but I have long thought that both bracteoles might have been fertile in an ancestor, and the fact that this species has dichasia shows at least that both bracteoles can be fertile. The other point of interest is that the anther wings in this species are narrow and rather similar to the "verrucae" of *Verrucularia*, which suggests the homology of the outgrowths on the anthers in the two genera and supports a close relationship of the genera that can be inferred from other characters.

This species is also of interest for its chromosome number ( $n = 6$ ). This is the lowest number known for the Malpighiaceae. It is almost certainly the base number for the subfamily Byrsonimoideae (Anderson, 1978), and may well be the base number for the family. (The other likely base number is five, since many non-byrsonimoids have chromosome numbers based on ten pairs. No count of five pairs is known, and it may be that a number of ten, derived by aneuploidy from twelve, is basic to the non-byrsonimoids.) The chromosomes of *Lophanthura lactescens* are unusually fat for this family.