

Novelties in *Mascagnia* (Malpighiaceae)

CHRISTIANE ANDERSON

Anderson, C. (University of Michigan Herbarium, North University Building, Ann Arbor, Michigan 48109-1057, U.S.A.). Novelties in *Mascagnia* (Malpighiaceae). *Brittonia* 53: 405–415. 2001. Seven new species of *Mascagnia* are described: ***M. tomentosa*** from southern Mexico and Central America; ***M. arenicola*** from the Guianas; ***M. riparia***, ***M. tucuruensis***, and ***M. velutina*** from Brazil; ***M. boliviana*** from Bolivia; and ***M. australis*** from Argentina and Paraguay. These novelties were previously included in the “*M. sepium*-complex,” an omnium-gatherum comprising superficially similar yellow-flowered taxa.

Key words: Malpighiaceae, *Mascagnia*, Mexico, Central America, South America.

Mascagnia (Bertero ex DC.) Colla (Malpighiaceae) is a genus of ca. 50–60 species, distributed from Mexico to Argentina; the greatest diversity occurs in Brazil. It is a difficult and probably unnatural group, in dire need of revision. The last monograph (Nieden zu, 1928) is of limited utility, because the material available to Niedenzu constituted a woefully inadequate sample. As circumscribed now, the majority of species of *Mascagnia* have pink to bluish to violet petals, and the remainder have yellow petals. The name *M. sepium* (Adr. Juss.) Griseb. (Grisebach, 1858), based on a St.-Hilaire collection from the area of Rio de Janeiro (Jussieu, 1833), is commonly applied to yellow-flowered collections from southern Mexico to Argentina, because many yellow-flowered representatives of *Mascagnia* are superficially similar, and because Niedenzu’s concept of *M. sepium* was very broad. Floristicians (e.g., Cuatrecasas, 1958; Anderson, 1981) have noted that what has become known as the “*M. sepium*-complex” is a mélange of diverse elements, its resolution beyond the scope of any flora. An example of the disparity among these elements is the diverse leaf vestiture. Jussieu’s species is characterized by sparsely sericeous laminas, but many specimens traditionally assigned to *M. sepium* have variously and abundantly pubescent laminas.

The many collections now available, owing to the increased field activity in Latin America over the past 50 years, permit segregation of well-defined species, such as *Mascagnia leonii* W. R. Anderson (Anderson, 1993), from the amalgam that is the “*M. sepium*-complex.” Seven additional new species are described here, so that the names will be available to current floristic endeavors. Six of these novelties are most readily separated from true *M. sepium* by the nature of the laminar vestiture. The laminas are velutinous above and below in *M. tucuruensis* and *M. velutina*, very sparsely velutinous to glabrescent above and abundantly velutinous below in *M. australis*, *M. boliviana*, and *M. riparia*, and glabrous above and tomentose below in *M. tomentosa*. The mature laminas of *M. arenicola* are coriaceous and glabrous above; the abaxial surface also appears glabrous to the naked eye, but may be sprinkled with tiny reddish hairs. Also, the inflorescence is usually compound, i.e., a thyrses. The laminas of *M. sepium* are membranous and sparsely sericeous on both surfaces, the vestiture composed of evenly distributed, appressed, white hairs; the flowers are grouped into axillary, solitary umbels. Although these seven new species have similar inflorescences, flowers, and samaras, they differ in the length of the peduncles vs. that of the ped-

icels, the shape and ornamentation of the bracteoles, and the dimensions of the reproductive structures.

Mascagnia arenicola C. Anderson, sp. nov. (Fig. 1q-t)

TYPE: GUYANA. Pomeroun-Supenaam region, Mainstay Village, 07°15'N, 58°32'W, 21 Apr 1989, *L. J. Gillespie 1086* (HOLOTYPE: MICH).

Liana lignosa. Lamina foliorum majorum 6.5–12.5 × 4–8 cm, elliptica, late elliptica, vel suborbicularis, coriacea, supra glabra, subtus sparsim sericea; petiolus 0.7–2 cm longus. Inflorescentia ex pseudoracemo solitario vel pseudoracemis in thyrso axillari dispositis constans, floribus in quoque pseudoracemo 10–22(–35); pedunculi 3–5.5 mm longi, pedicelli 8–14 mm longi. Bracteae 0.8–1.3 mm longae, bracteolae 0.4–0.9 mm longae, lineares vel anguste triangulares, bracteae bracteolaeque glandulosae. Petala lutea, glabra, limbo abaxialiter carinato. Samara (2.5–)3–4 cm diametro, ala laterali basi continua, crista dorsali 3–5.5 mm lata.

Woody vine to 7 m. Laminas of the larger leaves 6.5–12.5 × 4–8 cm, elliptical to broadly so to suborbicular, apex apiculate to short-acuminate, base truncate to cordate, becoming coriaceous, adaxially glabrous, abaxially very sparsely sericeous to glabrescent to glabrous, the hairs straight or slightly crisped and sessile, usually reddish, (0.1–)0.3–0.9(–1.1) mm long, with (0–)2(–4) impressed glands near the base and 0–2(–3) additional glands distally, usually with 2 marginal glands just below the apex; petiole 0.7–2 cm long, sericeous, eglandular; stipules 0.5–0.7 mm long, linear to narrowly triangular, interpetiolar. Inflorescence unit a pseudoraceme of 10–22(–35) flowers, borne on an axis 0.8–1.5(–3) cm long, sometimes solitary but usually several arranged in an axillary thyrs. Peduncles 3–5.5 mm long, 0.3–0.6 × as long as pedicels, sericeous; pedicels 8–14 mm long, sparsely sericeous. Bracts 0.8–1.3 × 0.3–0.4 mm, narrowly triangular, eglandular or sometimes with an inconspicuous callose area at the base. Bracteoles subequal, 0.4–0.9 × 0.2–0.3 mm, linear or narrowly triangular, eglandular or sometimes with an inconspicuous callose area at the base; pair of bracteoles subopposite or sometimes to 0.5 mm apart, inserted at about the middle of the peduncle or sometimes near the apex. Calyx

of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands ca. 2 mm long, decurrent. Petals 5, yellow, glabrous, the limb abaxially carinate, eglandular; lateral petals: claw 1.5–1.8 × 0.5 mm, limb ca. 6 × 6 mm, orbicular, margin denticulate or sometimes erose; posterior petal: claw 1.8–2 × 0.6 mm, limb 6 × 6 mm, orbicular, margin denticulate-erose. Androecium of 10 subequal stamens; filaments 1.5–2.3 mm long, the anterior one the longest, the posterior one the shortest, connate at base; anthers ca. 1.4 mm long, glabrous. Ovary tomentose-sericeous; styles erect or slightly divergent, subequal, 2.3–2.4 × 0.4 mm, the apex dorsally blunt or rounded. Samara (2.5–)3–4 cm diam., suborbicular to orbicular, the lateral wing continuous at base and at apex except for a distal shallow notch 1–2 mm deep or entirely continuous, sericeous; central dorsal winglet 9–15.5 × 3–5.5 mm, sometimes extended into the apical notch as a spur to 0.8 mm long; nut 4–4.5 mm high; torus ca. 3 mm high, surrounded by a wide, glabrous, 3-lobed, disciform outgrowth of the receptacle.

Phenology.—Collected in flower from February to September, in fruit from February to December.

Distribution and habitat.—Guyana, Suriname, and French Guiana; in swamp and riverine forest in sandy soils, especially white sand, also at roadsides; 0–600 m.

Selected specimens examined: GUYANA. Cuyuni-Mazaruni region, Cuyuni River, between Aurora & ca. 7 km upstream, 06°47'N, 59°44'W, 10 Oct 1989, *Gillespie 2257* (MICH); Upper Demerara region, Mabura Hill, 05°25'N, 58°40'W, *Hahn 5833* (MICH); Potaro-Siparuni region, Iwokrama, Siparuni River, Pakatau Falls, 5 km upstream, 04°43'N, 59°01'W, *Mutchnick 513* (MICH); Cuyuni River, Oko Creek, *Tutin 349* (K).

SURINAME. Lucie River, 2–20 km below confluence of Oost River, 03°20–32'N, 56°26–49'W, *Irwin et al. 55533* (K); Lely Mtns., SW plateaus, along forest rd. from airstrip to Camp 4, *Lindeman 87* (K); Nickerie distr., Kabalebo Dam project, between Km 50–51, 04°–05'N, 57°30'–58'W, *Lindeman et al. 126* (K, MICH).

FRENCH GUIANA. Piste entre St. Laurent et Paul Isnard, environ de PK 40, *Cremers 8134* (MICH); piste de St. Elie, Km 17, *Prévost 691* (MICH); piste de St. Elie, Km 167, *Puig 10248* (MICH); Sinnemary, route de St. Elie, *Sastre 5458* (MICH).

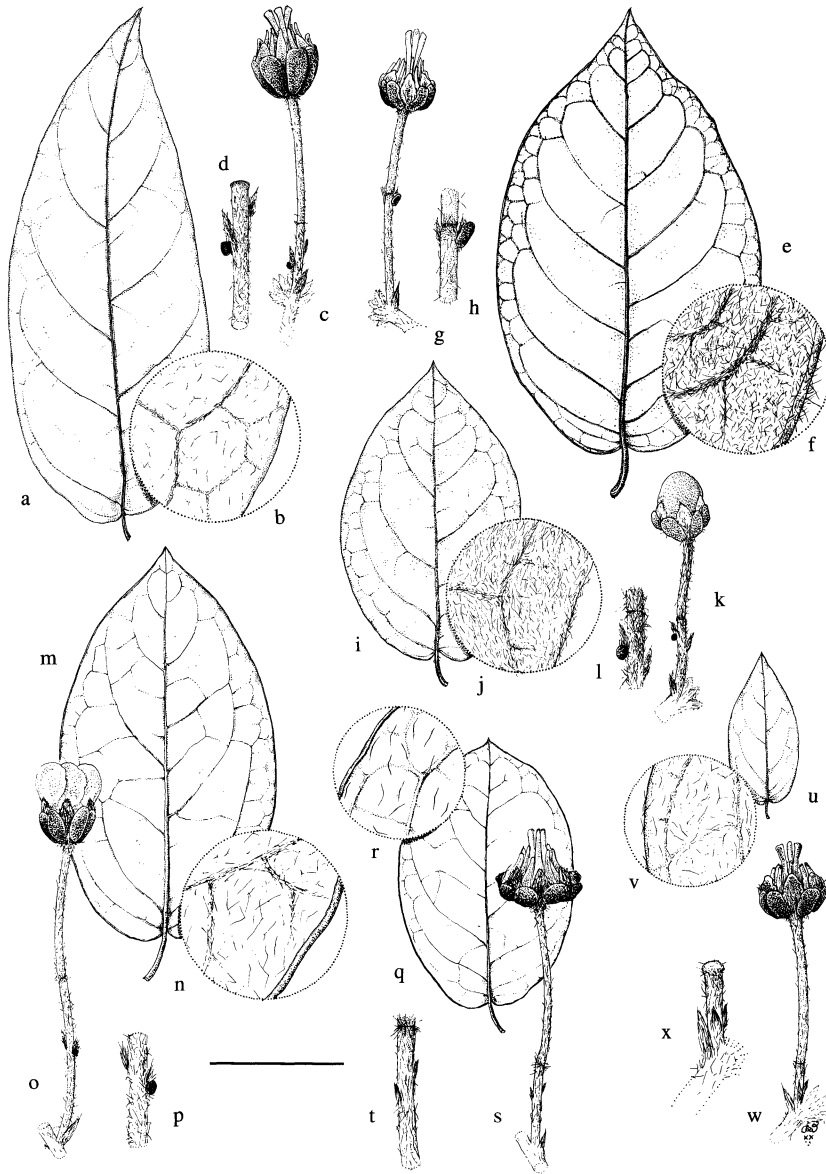


FIG. 1. Leaves and details of inflorescences of *Mascagnia arenicola*, *M. australis*, *M. boliviana*, *M. riparia*, *M. tucuruensis*, and *M. velutina*. **a-d.** *M. riparia*. **a.** Leaf. **b.** Detail of abaxial laminar surface. **c.** Detail of inflorescence, showing an old flower with pedicel and peduncle. **d.** Peduncle with bracteoles. **e-h.** *M. tucuruensis*. **e.** Leaf. **f.** Detail of abaxial laminar surface. **g.** Detail of inflorescence, showing an old flower with pedicel and peduncle. **h.** Distal portion of peduncle with bracteoles. **i-l.** *M. velutina*. **i.** Leaf. **j.** Detail of abaxial laminar surface. **k.** Detail of inflorescence, showing a flower bud with pedicel and peduncle. **l.** Distal portion of peduncle with bracteoles. **m-p.** *M. australis*. **m.** Leaf. **n.** Detail of abaxial laminar surface. **o.** Detail of inflorescence, showing an expanding flower with pedicel and peduncle. **p.** Distal portion of peduncle with bracteoles. **q-t.** *M. arenicola*. **q.** Leaf. **r.** Detail of abaxial laminar surface. **s.** Detail of inflorescence, showing an old flower with pedicel and peduncle. **t.** Distal portion of peduncle with glandular bracteoles. **u-x.** *M. boliviana*. **u.** Leaf. **v.** Detail of abaxial laminar surface. **w.** Detail of inflorescence, showing an old flower with pedicel and peduncle. **x.** Peduncle with basal glandular bracteoles and bract. **Scale bars:** a, e, i, m, q, v: 4 cm; b, d, f, h, j, l, n, p, r, t, v, x: 4 mm; c, g, k, o, s, w: 8 mm. (a-d, *Prance et al.* 5289; e-h, *Anderson* 13749; i-l, *Leoni* 1970; m, *Schulz* 18387; n-p, *Schulz* 14299; q-t, *Gillespie* 1086; u-x, *Saldías* P. 582.)

As the name implies, *Mascagnia arenicola* is a species of sandy substrates and is commonly found in white sand areas. The coriaceous laminas appear glabrous to the naked eye but commonly are beset abaxially with scattered, tiny, appressed hairs. Collections from Guyana and Suriname usually have the mature laminas abaxially very sparsely sericeous, whereas those from French Guiana are commonly glabrescent to glabrous. The pedicels are always longer than the peduncles. The bracts and bracteoles are eglandular but sometimes have some inconspicuous callose tissue near the base.

The description presented here is based only on material from the Guianas; however, similar collections from eastern Amazonia, northern Venezuela, and Trinidad may also belong here. Whether the description of *M. arenicola* should be amplified to include these collections will have to await a detailed review of yellow-flowered *Mascagnias* from this region. In these plants the laminas often are not quite as coriaceous as in the Guianas material, and the abaxial vestiture tends to be more abundant and/or persistent. Also, the inflorescences are often solitary, axillary pseudoracemes of up to ca. 50 flowers.

Mascagnia australis C. Anderson, sp. nov.
(Fig. 1m-p)

TYPE: ARGENTINA. Chaco: Depto. Primero de Mayo, Colonia Benítez, 14 Dec 1964, A. G. Schulz 14299 (HOLOTYPE: MICH).

Liana. Lamina foliorum majorum 4.5–12 × 2.7–6.6 cm, elliptica vel obovata vel ovata, supra sparsim velutina vel glabrescens, subtus velutina, pilis V-formibus; petiolus 0.5–1.5 cm longus. Inflorescentia ex pseudoracemo corymboso solitario constans, floribus in quoque pseudoracemo (7–)9–12(–16); pedunculi 5–9 mm longi, pedicelli 9–15 mm longi. Bracteae 1.3–2.2(–3) mm longae, eglandulosae; bracteolae 1–1.3(–1.6) mm longae, lineares, una bracteola cujusque paris uniglandulosa vel raro ambae eglandulosae. Petala lutea, glabra, limbo abaxialiter carinato. Samara 2.2–3 cm diametro, ala laterali basi continua, crista dorsali 1.5–2 mm alta.

Vine to 20 m; branches velutinous when young, becoming glabrous in age; flowering shoots leafy. Lamina of the larger leaves 4.5–12 × 2.7–6.6 cm, elliptical to obovate

or sometimes ovate, apex acuminate, base rounded to truncate or shallowly cordate, adaxially sparsely velutinous to glabrescent, abaxially white-velutinous, the hairs V-shaped and sessile, the arms (0.3–)0.5–1.8 mm long, with 0–2(–3) impressed glands distally but not near the base, with 2 marginal glands just below the apex; petiole 0.5–1.5 cm long, densely sericeous to velutinous, eglandular; stipules 0.8–1.3 mm long, linear, interpetiolar. Inflorescence an axillary, solitary, congested corymbose pseudoraceme of (7–)9–12(–16) flowers, borne on an axis (0.3–)0.6–1.7 cm long, the two lowest flowers usually separated a short distance from the aggregate. Peduncles 5–9 mm long, 0.5–0.8× as long as pedicels, velutinous; pedicels 9–15 mm long, velutinous, sometimes less densely so than the peduncles. Bracts 1.3–2.2(–3) × ca. 0.3 mm, linear, eglandular. Bracteoles subequal, 1–1.3(–1.6) × 0.3(–0.5) mm, linear, commonly one bracteole of each pair with a prominent to stalked gland near the base, rarely both eglandular, the gland 0.2–0.4(–0.6) mm diam., to 0.3 mm high; pair of bracteoles subopposite or sometimes to 1 mm apart, inserted usually at or near the apex of the peduncle or sometimes to 4 mm below it. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands ca. 2 mm long, decurrent. Petals 5, yellow, glabrous, the limb abaxially carinate, briefly hastate at base, margin erose-denticulate, eglandular; lateral petals: claw ca. 1.6 × 0.4 mm, limb ca. 4.5 × 4.5 mm, orbicular or suborbicular; posterior petal: claw ca. 2 × 0.5 mm, limb ca. 5 × ca. 4 mm, elliptical. Androecium of 10 subequal stamens; filaments 2–2.7 mm long, the anterior one the longest, the posterior one the shortest, slightly connate at base; anthers ca. 0.9 mm long, glabrous. Styles erect to slightly divergent, anterior style ca. 2.2 × 0.4 mm, posterior styles ca. 2.7 × 0.4 mm, the apex dorsally rounded to acute. Samara 2.2–3 cm diam., suborbicular to orbicular, the lateral wing continuous at base and at apex except for a distal notch 1.5–3(–4) mm deep, sparsely sericeous; central dorsal winglet 6.5–8.2 × 1.5–2 mm; nut 4–4.5 mm high; torus 2.5 mm high, surrounded

by a wide, glabrous, 3-lobed, disciform outgrowth of the receptacle.

Phenology.—Collected in flower and fruit from September to March.

Distribution and habitat.—Argentina and Paraguay; in forest and gallery forest; 65–250 m.

Selected specimens examined: ARGENTINA. **Chaco**: Depto. Primero de Mayo, Colonia Benítez, 8 Jan 1965, *Schulz 14300* (MICH), 20 Nov 1972, *18387* (MICH); Depto. Primero de Mayo, Campo Antequera, 7 Dec 1965, *Schulz 15251* (MICH). **Corrientes**: Depto. San Cosme, near the Arroyo San Juan and the Río Paraná, 12 Jan 1990, *Anderson 13592* (MICH); Garuchos, Cabaña San Juan Bautista, 9 Dec 1976, *Quarín 3432* (MICH, WIS); Isla Agipé Grande, ca. 5 km de Pto. Arazá, 26 Nov 1988, *Tressens et al. 3503* (MICH).

PARAGUAY. **Central**: Cerro Kof-Areguá, *Schinini 4078* (P); Estero del Ypoá, Cerro Pé, 25°40'S, 57°27'W, 5 Nov 1992, *Zardini & Aquino 33467* (MICH). **Cordillera**: Cerros de Tobaty, Sep 1900, *Hassler 6092* (G); Cerro Tobatí, 18 Nov 1987, *Zardini & Degen 3784* (MICH, MO). **Paraguari**: Parque Nacional Ybycu'i, 5 km N of administration buildings, 26°03'S, 56°48'W, 31 Oct 1989, *Zardini & Velásquez 15418* (MICH); Acahuay Massif, easternmost peak of massif, 25°52'S, 57°08'W, 11 Nov 1989, *Zardini & Velásquez 16274* (MICH).

Mascagnia australis is a common species of northeastern Argentina and Paraguay, which W. R. Anderson (1999) referred to *M. sepium* in the *Catálogo de las Plantas Vasculares de la República Argentina*. The laminae are covered abaxially by sessile, V-shaped hairs, which form the distinctive vestiture. The pedicels always exceed the peduncles. The bracteoles are linear, and usually one of each pair bears a raised gland.

Six collections appear to be aberrant in that the samaras, all very young, have the wings thicker in texture than in other species, but do not differ in any other aspects from typical representatives of *M. australis*. These collections are *Neiff 1466* (CTES), *Pedersen 4528* (CTES), *Rojas 13790* (CTES), *Schulz 8106* (MICH), *Tressens & Schinini 3225* (CTES) from Argentina, and *Zardini & Velásquez 16603* (MO) from Paraguay. In the MICH sheet of *Zardini & Velásquez 16603* the samaras are more mature and the wings are intermediate in texture.

Mascagnia boliviana C. Anderson, sp. nov. (Fig. 1u–x)

TYPE: BOLIVIA. Depto. Beni, Prov. Cercado, Puerto Almadén, 8 km al SW del centro de la ciudad de Trinidad, 230 m, 14°52'S, 64°58'W, 7 Jan 1989, *Saldías P. 582* (HOLOTYPE: MICH).

Liana. Laminae foliorum majorum 4.5–5.2 × 1.7–2.5 cm, anguste ovata vel elliptica, supra sparsim velutina vel glabra, subtus velutina, pilis V-formibus; petiolus 0.4–0.5 cm longus. Inflorescentia in thyrse terminalibus dispositis constans, floribus in quoque pseudoracemo 12–16; pedunculi 3–4 mm longi, pedicelli 8.5–11.3 mm longi. Bracteae 1–1.3 mm longae, eglandulosae; bracteolae 0.7–1 mm longae, anguste ovatae vel ellipticae, eglandulosae. Petala lutea, glabra, limbo abaxialiter carinato. Samara ignota.

Vine. Laminae of the larger leaves 4.5–5.2 × 1.7–2.5 cm, narrowly ovate to elliptical, apex acuminate to briefly caudate, base cordate or shallowly so, adaxially sparsely velutinous to glabrate, abaxially velutinous, the hairs V-shaped, sessile or subsessile, the arms unequal, 0.2–0.6 mm long, with 2 impressed glands near the base and 2 additional glands distally just below the apex; petiole 0.4–0.5 cm long, tomentose, eglandular; stipules 1.5–1.6 mm long, linear, interpetiolar. Inflorescence unit a congested pseudoraceme of 12–16 flowers, the pseudoracemes aggregated in a simple or compound terminal thyrse. Peduncles 3–4 mm long, 0.3–0.4 × as long as pedicels, appressed-tomentose; pedicels 8.5–11.3 mm long, appressed-tomentose. Bracts 1–1.3 × 0.3–0.4 mm, narrowly ovate or elliptical with scarious margins, eglandular. Bracteoles equal, 0.7–1 × ca. 0.4 mm, narrowly ovate or elliptical with scarious margins, eglandular, the pair subopposite, inserted at or near the base of the peduncle. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands ca. 2 mm long, decurrent. Petals 5, yellow, glabrous, the limb orbicular, abaxially slightly carinate, the margin erose, eglandular; lateral petals: claw 2 × 0.5 mm, limb ca. 4.5 × ca. 4.5 mm; posterior petal: claw 1.5 × 0.6 mm, limb ca. 4.3 × ca. 4.3 mm. Androecium of 10 subequal stamens; filaments 1.8–2.2 mm long, the anterior one the longest, the posterior one the shortest and ca. 1.5 × as wide as the rest, connate at base; anthers 1.6–1.8 mm long, glabrous.

Ovary tomentose-sericeous; styles erect or slightly divergent, anterior style ca. 2×0.3 mm, the apex dorsally rounded or acute, posterior styles $2.5\text{--}2.6 \times 0.5$ mm, the apex dorsally acute. Samara unknown.

Mascagnia boliviana is known only from the type, collected in wet places on a bank of the Río Mamoré. It is distinguished from other species by having the bracteoles inserted at the base of the peduncle rather than at the apex or near the middle. The bracts and bracteoles are eglandular and have a scarious margin. The pedicels greatly exceed the peduncles. The type consists only of the terminal parts of flowering branches, and it is possible that the leaves of vegetative shoots are larger than indicated here. The laminae become glabrescent adaxially with age, but remain velutinous abaxially.

***Mascagnia riparia* C. Anderson, sp. nov.**
(Fig. 1a–d)

TYPE: BRAZIL. Rondônia: 4 km above Jaciparaná on Rio Jaciparaná, 28 Jun 1968, G. T. Prance et al. 5289 (HOLOTYPE: NY; ISOTYPE: MICH).

Liana lignosa. Lamina foliorum majorum $8.5\text{--}15.3 \times 4\text{--}6.8$ cm, lanceolata vel elliptica, supra sparsim velutina vel glabrata vel glabra, subtus velutina, pilis V-formibus; petiolus $0.9\text{--}1.4$ cm longus. Inflorescentia ex pseudoracemo axillari solitario vel pseudoracemis in thyrsis terminalibus dispositis constans, floribus in quoque pseudoracemo $12\text{--}20$; pedunculi $(2\text{--})3\text{--}7$ mm longi, pedicelli $(4\text{--})5\text{--}9$ mm longi. Bracteae $1.3\text{--}1.5$ mm longae, eglandulosae; bracteolae $1.2\text{--}1.7$ mm longae, oblongae, una bracteola cujusque paris uniglandulosa, altera bracteola eglandulosa. Petala lutea, glabra, limbo abaxialiter carinato. Samara ignota.

Woody vine. Laminae of the larger leaves $8.5\text{--}15.3 \times 4\text{--}6.8$ cm, lanceolate to elliptical, apex acuminate to briefly caudate, base cordate to rounded, adaxially sparsely velutinous but soon glabrate to glabrous except for hairs retained on the costa and major veins, abaxially velutinous, hairs V-shaped and sessile or subsessile, the arms $0.1\text{--}0.6$ mm long, with $1\text{--}2(3)$ impressed glands near the base and $0\text{--}2$ additional glands distally, usually with $(1\text{--})2$ glands on the surface ca. $1\text{--}2$ cm below the apex and with 2 marginal glands just below the apex; petiole $0.9\text{--}1.4$ cm long, tomentulose, eglandular;

stipules $1\text{--}2$ mm long, linear, interpetiolar. Inflorescence unit a pseudoraceme of $12\text{--}20$ flowers, borne on an axis $1\text{--}3$ cm long, either axillary and solitary, or several arranged in a terminal thyrsis. Peduncles $(2\text{--})3\text{--}7$ mm long, $0.4\text{--}0.9(1.4) \times$ as long as pedicels, tomentulose; pedicels $(4\text{--})5\text{--}9$ mm long, very sparsely tomentulose. Bracts $1.3\text{--}1.5 \times 0.3\text{--}0.5$ mm, narrowly triangular, eglandular or sometimes with an inconspicuous callose region at the base. Bracteoles subequal, $1.2\text{--}1.7 \times 0.4\text{--}0.6$ mm, oblong, one of each pair with a discoid gland $0.3\text{--}0.5$ mm diam., the second bracteole eglandular or sometimes with an inconspicuous glandular region at the base; pair of bracteoles subopposite or sometimes to 1 mm apart, inserted at about the middle of the peduncle or sometimes in the distal $1/4$. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands ca. 2.5 mm long, decurrent. Petals 5 , yellow, glabrous, the limb abaxially carinate, the margin erose, eglandular; lateral petals: claw $1.5\text{--}2 \times 0.5$ mm, limb $4\text{--}4.5 \times 4\text{--}4.3$ mm, suborbicular; posterior petal: claw 2×0.7 mm, limb ca. $5 \times$ ca. 4.5 mm, broadly obovate to suborbicular. Androeceum of 10 subequal stamens; filaments $(1.5\text{--})2\text{--}2.5$ mm long, the anterior one the longest, the posterior one the shortest and ca. $1.5 \times$ as wide as the rest, connate at base; anthers ca. 1.3 mm long, glabrous. Ovary tomentose-sericeous; styles erect or slightly divergent, subequal, $2.7\text{--}2.8 \times 0.4$ mm, the apex dorsally blunt or acute. Samara not seen.

Phenology.—Collected in flower and young fruit from June to October.

Distribution and habitat.—Brazil (Amazônias and Rondônia); along river margins in inundated forests at low elevations.

Additional specimens examined: BRAZIL. **Amazônias**: Rio Negro by Archipelago Anavilhanas, 100 m, $02^{\circ}49'S$, $60^{\circ}37'W$, 19 Aug 1996, *Acevedo et al.* 8460 (MICH); Mpio. Maués, Rio Parauarí, $04^{\circ}45'S$, $57^{\circ}55'W$, *Cid* 4155 (MICH); Rio Negro, near Ponto de Pagodão in the Paraná de Anavilhanas, $02^{\circ}45'S$, $60^{\circ}55'W$, 9 Jun 1990, *Mori et al.* 21244 (MICH); Rio Negro, near Ponto de Pagodão, $02^{\circ}52'S$, $60^{\circ}29'W$, 20 Jun 1992, *Mori & Gracie* 22406 (MICH); Rio Negro between Ilha Jacaré and Airão, 11 Oct 1971, *Prance et al.* 15056 (NY); Mpio. Maués, basin of Rio Maués, along Rio Parauarí above mouth of Rio Amanã,

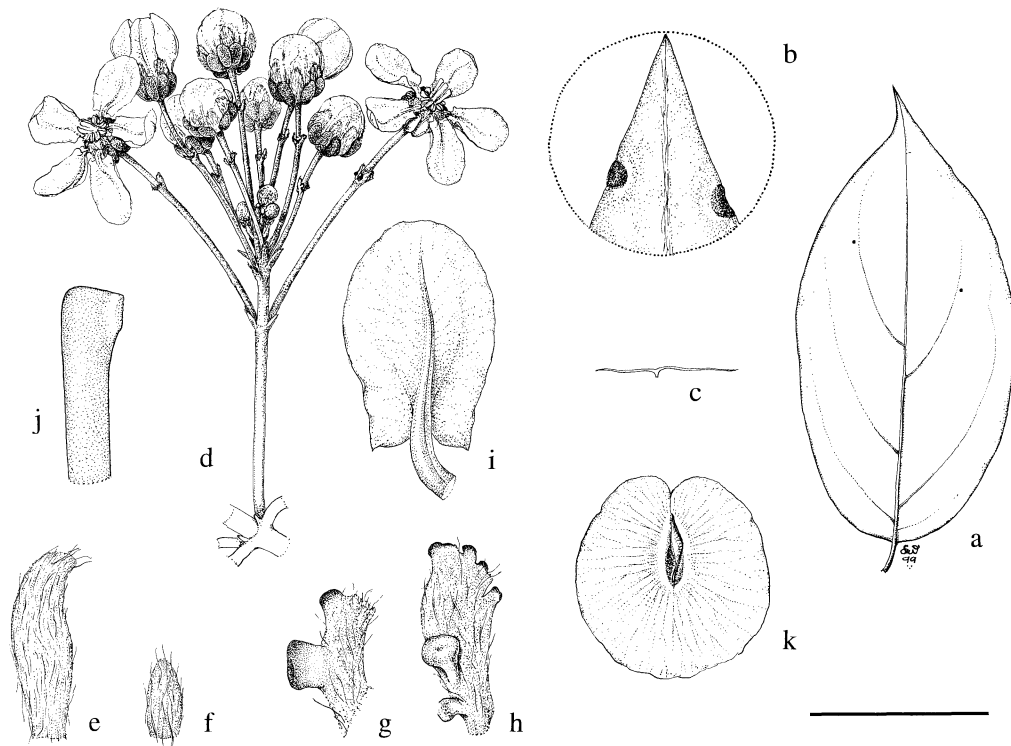


FIG. 2. *Mascagnia tomentosa*. a. Leaf, abaxial view. b. Detail of lamina apex, showing the two glands that flank the tip. c. Hair from abaxial laminar vestiture. d. Inflorescence. e-h. Bracteoles, illustrating the variation in shape and ornamentation. i. Posterior petal, abaxial view. j. Distal portion of style. k. Samara, abaxial view. Scale bars: a, 4 cm; b, 1 mm; c, e-h, 2 mm; d, 1.3 cm; i, 4 mm; j, 1.3 mm; k, 2.6 cm. (a-c, Matuda 868; d-j, Ventura & López 3167; k, Chinchilla s.n.)

04°40'S, 57°55'W, 13 Jul 1983, Zarucchi et al. 3025 (MICH).

Mascagnia riparia is similar to *M. tucuruensis*, also of the Amazon basin, in that one bracteole of each pair bears a large discoid gland and the laminae are velutinous abaxially. It is readily distinguished from *M. tucuruensis* by the adaxial surface of the mature laminae, which are glabrate to glabrous, and the peduncles, which are shorter than the pedicels. In *M. tucuruensis* the laminae are velutinous on both surfaces, and the peduncles exceed the pedicels. The two collections from the area of Maués (Mori et al. 21244 and Zarucchi et al. 3025) differ somewhat in that the peduncles are mostly shorter (2–4 mm long) than those in the other specimens seen.

***Mascagnia tomentosa* C. Anderson, sp. nov.** (Fig. 2)

TYPE: MEXICO. Chiapas: Mpio. Tuxtla Chico, Cantón El Sacrificio, 100 m, 30 Jan 1986, E. Ventura & E. López 3167 (HOLOTYPE: MICH).

Hiraea cycloptera Ramírez Goyena, Fl. Nicarag. 1: 235. 1911, non *Hiraea cycloptera* DC., 1824.—TYPE: unknown.

Liana; rami floriferi aphylli. Lamina foliorum majorum 6–10 × 3.5–5 cm, elliptica, supra glabra, subtus tomentosa, pilis T-formibus; petiolus 0.6–0.9 cm longus. Inflorescentia ex pseudoracemo corymboso solitario axillari constans, floribus in quoque pseudoracemo 14–20(–27); pedunculi 7.5–15.5 mm longi, pedicelli (3–)5–10 mm longi. Bracteeae 1.4–3 mm longae, eglandulosae; bracteolae inaequales, una bracteola cujusque paris (0.6–)1–1.3(–2) mm longa, linearis vel oblonga vel anguste triangularis, eglandulosa vel uniglandulosa, altera bracteola 1.5–2.2 mm longa, elliptica, ovata, obovata, oblonga, vel obtriangularis, 1–3 glandulis abaxialibus et interdum margine aliquot glandulis minutis instructa. Petala lutea, glabra, limbo abaxialiter carinato. Samara 2.5–3.5 cm diametro, ala laterali basi continua, crista dorsali 6 mm lata.

Vine; branches tomentulose when young, becoming glabrous in age; flowering shoots leafless or bearing expanding leaves. Lamina of the larger leaves 6–10 × 3.5–5 cm, elliptical, apex acuminate to sometimes caudate, base truncate to shallowly cordate, adaxially glabrous or the costa proximally tomentulose, abaxially white-tomentose (sometimes glabrescent in age), the hairs T-shaped, mostly with a stalk to 0.1 mm long or sometimes sessile, the trabecula (1–)1.2–2.1 mm long, with 0–2 impressed glands near the base and 0–3 additional impressed glands on the abaxial surface, with 2 marginal glands just below the apex; petiole 0.6–0.9 cm long, densely velutinous, eglandular; stipules 0.7–0.8 mm long, linear, interpetiolar. Inflorescence an axillary, solitary, congested corymbose pseudoraceme of 14–20(–27) flowers, borne on an axis (0.6–)1.2–2.5 cm long, the 2 lowest flowers usually separated a short distance from the aggregate. Peduncles 7.5–15.5 mm long, (1.3–)1.6–2.6× as long as pedicels, velutinous-tomentulose; pedicels (3–)5–10 mm long, sparsely sericeous to glabrate. Bracts 1.4–3 × 0.3–0.5 mm, linear to narrowly triangular, eglandular. Bracteoles usually unequal or rarely subequal; of each pair usually one bracteole (0.6–)1–1.3(–2) × 0.2–0.3 mm, linear or oblong to narrowly triangular, eglandular or sometimes with a prominent basal gland, the other 1.5–2.2 × 0.5–1.2 mm, irregularly shaped from elliptical to ovate to obovate to oblong to obtriangular, abaxially with a large basal gland (0.4–0.5 mm diam., to 0.3 mm high) and usually also with 1–2 smaller glands, often also with several minute marginal glands; pair of bracteoles subopposite or sometimes to 3.5 mm apart, inserted usually at or near the apex of the peduncle or sometimes to 5 mm below it. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands 3–3.5 mm long, decurrent. Petals 5, yellow, glabrous, the limb abaxially carinate, briefly hastate at base, the margin erose-denticulate, eglandular; lateral petals: claw ca. 1.5 × 0.5–0.6 mm, limb ca. 5.5 × 4–4.2 mm, ovate; posterior petal: claw ca. 1.5 × ca. 0.7 mm, limb ca. 6.5 × ca. 4 mm, oblong. Androecium of 10 subequal sta-

mens; filaments 1.5–2.7 mm long, the anterior one the longest, the posterior one the shortest, slightly connate at base; anthers 1.2–1.3 mm long, glabrous. Styles erect to slightly divergent, subequal, 3.2–3.5 × 0.4–0.5 mm, the anterior one slightly shorter and slenderer than the posterior two, the apex dorsally rounded to acute. Mature samara 2.5–3.5 cm diam., suborbicular to orbicular, the lateral wing continuous at base and at apex except for a distal notch 1–2.2 mm deep, sericeous; central dorsal winglet 6–8 × 2.5–3.3 mm; nut ca. 6 mm high; torus 2.8–3 mm high, surrounded by a wide, glabrous, 3-lobed, disciform outgrowth of the receptacle.

Phenology.—Collected in flower and fruit from January to July.

Distribution and habitat.—Southern Mexico (Chiapas, Oaxaca, Veracruz) to Nicaragua; limestone outcrops, matorral, dry thickets, tropical deciduous forest; 0–1900 m.

Selected specimens examined. MEXICO. **Chiapas:** Mpio. Arriaga, 6 km N of Arriaga, 250 m, 5 Mar 1972, *Breedlove 24438* (DS, MICH); Mpio. Chiapa de Corzo, above El Chorreadero, 800 m, 18 Mar 1981, *Breedlove 50168* (CAS); Mpio. Angel Albino Corzo, between Finca Cuxtepeque & Finca Cabañas, 1100 m, 9 May 1988, *Breedlove 67434* (CAS); Escuintla, 4 Apr 1936, *Matuda 868* (MEXU, MICH, NY), 160 m, Jul 1938, 2629 (MEXU, MICH); Mpio. Unión Juárez, Colonia 11 de Abril, 1000 m, 5 Mar 1985, *Ventura & López 1251* (MICH). **Oaxaca:** Cuicatlán, 550 m, Apr 1899, *Conzatti 914* (GH); Mpio. Soyaltepec, Dto. Tuxtepec, cerca la Presa Temascal, 200 m, 3 Apr 1987, *Cortes 728* (MICH); 5 mi E of Temascal, ca. 45 ft, 20 May 1964, *Janzen s.n.* (MICH). **Veracruz:** Montes de Oca, 1884, *Altamirano s.n.* (MEXU); Mpio. Puente, Potrerillo, 150 m, 1 Apr 1975, *Ventura A. 11158* (MICH); Mpio. Actopan, Paso de la Milpa, 200 m, 18 Mar 1980, *Ventura A. 16964* (MICH).

GUATEMALA. **El Progreso:** Vic. of Jícaro, 260 m, 14 Feb 1942, *Steyermark 43862* (F, NY). **San Marcos:** Between Ocos & Ayutla, 5–20 m, 15 Mar 1940, *Steyermark 37925* (F). **Retalhuleu:** Champerico, sea level, 26 Feb 1939, *Standley 66636* (F).

EL SALVADOR. **Ahuachapán:** San Benito, P.N. El Imposible, 13°49'N, 89°56'W, 10 Feb 1990, *Sermeno s.n.* [JBL 993] (MICH, MO); San Benito, 13°49'N, 89°56'W, 1900 m, 5 Feb 1994, *Chinchilla s.n.* [LAGU 00039] (MICH, MO). **Cuscatlán:** Las Panas, Cajutepeque, 950 m, 25 Mar 1985, *Montalvo 6597* (US). **La Libertad:** Laguna de Chanmico, 13°47'N, 89°22'W, 6 Mar 1992, *Villacorta et al. 1071* (MICH, MO). **San Salvador:** Vic. of San Salvador, 650–850 m, 30 Mar–24 Apr 1922, *Standley 22753* (NY), 23129 (NY). **Sonsonate:** Vic. of Izalco, 19 Mar 1922, *Standley 21864* (NY).

HONDURAS. **Comayagua:** Comayagua, 1800 ft,

22 Feb 1933, *Edwards P-574* (A, F, US); vic. of Comayagua, ca. 600 m, 12–23 Mar 1947, *Standley & Chacón P. 5516* (F). **Copán:** Valley of Ruinas de Copán, 7 May 1970, *Barkley & Hernández M. 40285* (F, GH); Copán Ruinas, 650 m, 17 Apr 1956, *Molina R. 6625* (F). **El Paraíso:** Choluteca River, near Ojo de Agua, 500 m, 18 Mar 1951, *Morton 7133* (US). **Francisco Morazán:** Vic. of Curaren village, 800 m, 21 Feb 1971, *Molina R. 25944* (F, NY).

NICARAGUA. **Carazo:** Mpio. Diriamaba, 6 km S de La Trinidad, 11°41'N, 86°19'W, ca. 50 m, 5 Jun 1984, *Moreno 24202* (MICH). **Chinandega:** Volcán Coseguina, 24 Apr 1975, *Neill 7103* (MICH). **Estelí:** Valle el Jocote, a orillas del Río Jocote, 13°22'N, 86°16'W, 720–760 m, 9 Apr 1981, *Moreno 8012* (MICH). **Granada:** Camino a Casa Teja, desvío entre Santa Rosa y Santa Margarita, 11°47'N, 85°56'W, 110–200 m, 19 Mar 1982, *Moreno 15972* (MO). **Masaya:** Laguna de Apoyo, 11°55'N, 86°03'W, 60–80 m, 18 Mar 1983, *Moreno 21311* (MICH). **Nueva Segovia:** El Terreno, 4 km NE de El Jícaro, 13°45'N, 86°97'W, 500–600 m, 18 Apr 1980, *Araquistain & Moreno 2228* (MICH).

In *Mascagnia tomentosa* the flowering shoots are leafless or bear very young, expanding leaves, but the leaves appear to be mature by the time the samaras are formed. The laminae are covered abaxially with short-stalked T-shaped hairs, which form the tomentose vestiture. The peduncles always exceed the pedicels. The bracteoles are greatly variable in size, shape, and ornamentation (Fig. 2e–h), even within an inflorescence, but tend to show a basic pattern. One bracteole of a pair varies from linear to oblong to very narrowly triangular and may bear a prominent basal gland or be eglandular. The second bracteole, greatly variable in size and irregular in shape, is always glandular, but varies as well in the size and number of glands it bears. Most commonly the second bracteole has a prominent to stalked basal gland as well as 1–2 smaller glands; additionally, sometimes the margin is beset with several minute glands.

W. R. Anderson (pers. comm.), in his treatment of the Malpighiaceae for the forthcoming *Flora de Nicaragua*, notes that Ramírez Goyena (1911) published the name *Hiraea cycloptera* for the species described here. Only two species of *Mascagnia* with an orbicular samara occur in Nicaragua, and the description of "*Hiraea cycloptera*" could apply only to *Mascagnia tomentosa*.

Mascagnia tucuruensis C. Anderson, sp. nov. (Fig. 1e–h)

TYPE: BRAZIL. Pará: Tucuruí, roadside thickets & cleared areas just outside airport, 10 Feb 1990, W. R. Anderson 13749 (HOLOTYPE: MICH).

Liana. Lamina foliorum majorum 9–18.5 × 4.8–8 cm, elliptica, utrinque velutina, pilis plerumque Y-formibus; petiolus 0.8–1.5 cm longus. Inflorescentia axillaris, aut ex pseudoracemo corymboso solitario constans, aut thyriformis, floribus in quoque pseudoracemo (12–)15–26; pedunculi 6.5–11.3 mm longi, pedicelli 3.5–6.5 mm longi. Bracteae 1–1.5 mm longae, eglandulosae; bracteolae 0.6–0.9 mm longae, triangulares vel ovatae, una bracteola cujusque paris vel raro ambae uniglandulosae. Petala lutea, glabra, limbo abaxialiter carinato. Samara ignota.

Vine; young branches velutinous, vestiture abraded in age; flowering shoots with expanding leaves. Lamina of the larger leaves 9–18.5 × 4.8–8 cm, elliptical, rugose, apex briefly acuminate to briefly caudate, base shallowly cordate to cordate, adaxially and abaxially velutinous, the hairs Y-shaped, mostly with a stalk to 0.1 mm long or sometimes sessile and then V-shaped, the arms 0.2–0.7 mm long, with (0–)1–2 impressed glands near the base and 2–5 additional impressed glands distally, with 2 marginal glands just below the apex; petiole 0.8–1.5 cm long, densely velutinous, eglandular; stipules 1.2–1.5 mm long, linear or very narrowly triangular, interpetiolar. Inflorescence unit a congested corymbose pseudoraceme of (12–)15–26 flowers, borne on an axis 0.7–1 cm long, either solitary or several arranged in a thyrse. Peduncles 6.5–11.3 mm long, 1.3–1.8 × as long as pedicels, velutinous; pedicels 3.5–6.5 mm long, sparsely velutinous to glabrate. Bracts 1–1.5 × 0.4–0.6 mm, linear, eglandular. Bracteoles subequal, 0.6–0.7(–0.9) × 0.4–0.6 mm, triangular to ovate, one of each pair with a discoid, thick-margined gland 0.9–1 mm diam., the proximal half of the gland borne on the peduncle and the distal half on the bracteole and obscuring it, the second bracteole eglandular or with an inconspicuous basal gland (0.2 mm diam.) or very rarely with a discoid gland 0.5 mm diam.; pair of bracteoles subopposite or sometimes to 1 mm apart, inserted near the apex of the peduncle or sometimes to 1.5 mm below it. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the

glands by ca. 1 mm, the glands 2–2.2 mm long, decurrent. Petals 5, yellow, glabrous, the limb abaxially carinate, briefly hastate at base, the margin erose-denticulate, eglandular; anterior-lateral petals: claw $1 \times 0.3\text{--}0.4$ mm, limb $4.3\text{--}4.5 \times 3.2\text{--}3.5$ mm, ovate to suborbicular, not or slightly abaxially carinate; posterior-lateral petals: claw $1\text{--}1.2 \times 0.3\text{--}0.4$ mm, limb $4.3\text{--}4.5 \times 3\text{--}3.2$ mm wide, elliptical-oblong, abaxially carinate; posterior petal: claw $1.2\text{--}1.5 \times 0.5\text{--}0.6$ mm, limb $4.5\text{--}4.8 \times 2.4\text{--}2.8$ mm, oblong, abaxially carinate. Androecium of 10 unequal stamens, filaments connate at base, those opposing the posterior-lateral petals stouter than the rest, anthers glabrous; stamen opposite anterior sepal: filament 2 mm long, anther 1.6 mm long; stamens opposite anterior-lateral petals: filaments 1.5 mm long, anthers 1.4 mm long; stamens opposite anterior-lateral sepals: filaments 2 mm long, anthers 1.2 mm long; stamens opposite posterior-lateral petals: filaments 2.1 mm long, anthers 1.6 mm long; stamens opposite posterior-lateral sepals: filaments 2 mm long, anthers 1 mm long; stamen opposite posterior petal: filament 1.1 mm long, anther 1 mm long. Styles erect or slightly divergent, subequal, $2\text{--}2.2 \times 0.3\text{--}0.4$ mm, the anterior one slightly shorter and slenderer than the posterior two, the apex dorsally rounded. Samara not seen.

Additional specimens examined: BRAZIL. Pará: AMZA camp 3-Alfa, $05^{\circ}48'S$, $50^{\circ}33'W$, 300–475 m, forested slopes on ridgetop, 8 Jun 1982, *Sperling 5995* (MICH).

Mascagnia tucuruensis is known from only two collections. Its rugose laminae are densely velutinous above and below. The vesture is composed of mostly Y-shaped hairs, each with a clearly defined stalk to 0.1 mm long, but some hairs are sessile and thus V-shaped. The peduncles exceed the pedicels. One of each pair of ovate bracteoles bears a large discoid gland (ca. 0.5 mm diam.), which essentially hides the bracteole except for its tip.

Mascagnia velutina C. Anderson, sp. nov. (Fig. 1i–l)

TYPE: BRAZIL. Minas Gerais: Carangola, Fazenda São Martinho, $20^{\circ}43'S$,

$42^{\circ}01'W$, 500 m, 6 Nov 1992, *L. S. Leoni 1970* (HOLOTYPE: MICH).

Liana lignosa. Lamina foliorum majorum $6.5\text{--}9.6 \times 3.5\text{--}5.4$ cm, ovata vel late elliptica, utrinque velutina, pilis V-formibus; petiolus $0.6\text{--}1$ cm longus. Inflorescentia ex pseudoracemo corymboso solitario constans, floribus in quoque pseudoracemo 8–10; pedunculi $4\text{--}7.5$ mm longi, pedicelli $7.5\text{--}9.5$ mm longi. Bracteae $1\text{--}1.5$ mm longae, eglandulosae; bracteolae $0.8\text{--}1.2 \times 0.4\text{--}0.5$ mm, oblongae vel ovatae, una bracteola cujusque paris vel ambae uniglandulosae. Petala lutea, glabra, limbo abaxialiter carinato. Samara $1.8\text{--}2.2$ cm diametro, ala laterali basi continua, crista dorsali $2\text{--}2.5$ mm alta.

Woody vine to 9 m; branches tomentulose when young, becoming glabrous in age; flowering shoots leafy. Lamina of the larger leaves $6.5\text{--}9.6 \times 3.5\text{--}5.4$ cm, ovate or broadly elliptical, apex acuminate or briefly so, base truncate to cordate, adaxially and abaxially velutinous, the hairs V-shaped and sessile, each arm $(0.2\text{--})0.4\text{--}0.6(-0.7)$ mm long, with 1–2 impressed glands near the base and 1–2 impressed additional glands distally or eglandular, with 2 marginal glands just below the apex; petiole $0.6\text{--}1$ cm long, densely reddish velutinous, eglandular; stipules $1.2\text{--}1.5$ mm long, linear, interpetiolar. Inflorescence axillary, solitary, congested corymbose pseudoraceme of 8–10 flowers, borne on an axis $0.6\text{--}1.3$ cm long, the 2 lowest flowers not distinctly separated from the aggregate. Peduncles $4\text{--}7.5$ mm long, $0.5\text{--}0.8 \times$ as long as pedicels, densely velutinous; pedicels $7.5\text{--}9.5$ mm long, densely velutinous. Bracts $1\text{--}1.5 \times 0.6\text{--}0.7$ mm, oblong to sometimes ovate, eglandular. Bracteoles subequal, $0.8\text{--}1.2 \times 0.4\text{--}0.5$ mm, oblong to ovate, one or both with a prominent gland to 0.2 mm diam.; pair of bracteoles subopposite or to 0.5 mm apart, inserted usually at or near the apex of the peduncle or sometimes to 3.5 mm below it. Calyx of 4 biglandular lateral sepals and 1 eglandular anterior sepal; lateral sepals exceeding the glands by ca. 1 mm, the glands ca. 1.5 mm long, decurrent. Petals 5, yellow, glabrous, the limb abaxially carinate, briefly hastate at base, the margin erose, eglandular; lateral petals: claw ca. $1.5 \times$ ca. 0.4 mm, limb ca. $4.5 \times$ ca. 4.5 mm, orbicular; posterior petal: claw ca. $2 \times$ ca. 0.6 mm, limb ca. $4.3 \times$ ca. 3 mm, oblong. Androecium of 10 sub-

equal stamens; filaments 2–2.7 mm long, the anterior one the longest, the posterior one and those opposing the posterior-lateral petals the shortest; anthers 0.9–1 mm long, glabrous. Styles erect and slightly divergent, subequal, $2.3\text{--}2.5 \times 0.3\text{--}0.4$ mm, the anterior one slightly longer and stouter than the posterior two, the apex dorsally blunt. Samara 1.8–2.2 cm diam., suborbicular to orbicular, the lateral wing continuous at base and at apex except for a distal shallow notch ca. 2 mm deep, sericeous; central dorsal winglet $(4.5\text{--})5.5\text{--}7 \times 2\text{--}2.5$ mm; nut 3–3.5 mm high; torus 2 mm high, surrounded by a wide, glabrous, 3-lobed, disciform outgrowth of the receptacle.

Additional specimens examined: BRAZIL. **Espírito Santo**: Mpio. Conceição do Castelo, Alto Bananal, 800 m, 18 Oct 1985, *Hatschbach 49939* (MICH). **Minas Gerais**: Carangola, Rio Carangola, $20^{\circ}43'S$, $42^{\circ}01'W$, 400 m, 25 Oct 1988, *Leoni 480* (MICH); Dist. Rio Branco, rd. from Viçosa to Barroso, Fazenda de Reserva, 740 m, 24 Oct 1930, *Mexia 5217* (MICH).

Mascagnia velutina, like *M. tucuruensis*, is characterized by laminas that are densely velutinous on both surfaces, but in this species the vestiture is composed of sessile, V-shaped hairs. The pedicels exceed the peduncles. The oblong to ovate bracteoles are subequal, and one or both of a pair may bear a small gland ca. 0.2 mm diam.

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