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New Taxa and Combinations in Moraceae and Cecropiaceae from Central and South America

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In connection with floristic treatments (Flora Mosoamericana and the Flora of Ecuador), a revision of the genus Cecropia, and less specific studies on Moraceae and Cecropiaceae of the Andean region, several new taxa have been found in the material studied. Some new combinations have to be made in addition to those of Cecropia, Coussapoa, and Pourouma recently published in the Flora of Ecuador (Berg & Franco, 1993).

Moraceae

1. Brosimum multirnervium C. C. Berg, sp. nov.
   TYPE: Ecuador. Pastaza: road Coca–Aueca, ca.

115 km S of Coca, 4–6 km S of Río Tigüino, 22–28 Feb. 1989 (infl.), Zak 3955 (holotype, QCNE; isotype, BG). Figure 1.

Brosimino parinaroides et B. utili affinis, divergens ab utraque venis lateralibus magis numerosis.

Tree up to 40 m tall. Leafy twigs 3–5 mm thick, sparsely to rather densely brown-puberulous to whitish-pubescent. Lamina coriaceous, elliptic to oblong to (sub)ovate, 12–30 × 6–19 cm, apex shortly and abruptly acuminate, base cordate to truncate (to obtuse), margin entire, often ± revolute; upper surface puberulous on the midrib, lower surface densely brown-puberulous to subvelutinuous on the veins; lateral veins (30–)40–50 pairs, often some of them furcate, tertiary venation for the greater part scalariform; petiole 0.5–1.5 cm long, densely brown-puberulous, epidermis flaking off; stipules 4.5–9 cm long, densely brown-puberulous to brown- to whitish-pubescent. Inflorescences solitary in the leaf axils, initially deflexed; peduncle 2–6.5 cm long, the lower part sparsely puberulous, the upper part densely minutely puberulous and with a few bracts, the uppermost part broadened; staminate inflorescences discoid to subulate, ca. 1 cm diam.; perianth lacking (?); stamen 1, filament ca. 0.5 mm long, anther ca. 0.2 mm long; pistillate inflorescences subglobose to subulate, 0.8–1.2 cm diam., with a single pistillate flower in the center; stigmas 1–2 mm long; bracts ca. 1 mm diam., minutely puberulous.

This new species is related to Brosimum parinaroides Ducke and B. utile (HBK) Pittier. It can be easily recognized by the great number of lateral veins (30–40–50 pairs). In the two related species the number of lateral veins varies between 12 and 32.

Paratypes. ECUADOR. Pastaza: as the type locality, 7–9 Jan. 1989 (?), Hurtado et al. 1300 (BG, MO, QCNE).

Figure 1 (left). Brosimum multinervium C. C. Berg. Leafy twig with inflorescence (Hurtado et al. 1300). Figure 2 (right). Ficus carachiana C. C. Berg. —1. Leafy twig with inflorescence (Rubio et al. 661). —2. Staminate flower and stamen (Pennington et al. 10501). —3. Long-styled pistillate flower and interfloral bract (Pennington et al. 10501).
2. **Ficus carchiana** C. C. Berg, sp. nov. TYPE: Ecuador. Carachi: below Maldonado, 1300 m, 9 Oct. 1982, Pennington et al. 105101 (holotype, QCA; isotypes, BG, K, QCNE). Figure 2.

Ceteris speciebus consubgeneribus cum stipulis longis (ca. 10 cm) distinguenda, paginis latio ribus et bracteis basalibus grandibus.

Tree up to 25 m tall. Leafy twigs 8–10 mm thick, glabrous. Lamina coriaceous, elliptic to ovate, 18–30 × 11–21 cm, apex obtuse to subacute to subcuminate, base rounded to subcordate (ulate), upper surface glabrous, lower surface with sparse brown elongate pluricellular hairs on (the lower parts of the) main veins, white capitate pluricellular hairs in the areoles; lateral veins 14–20 pairs, tertiary venation reticulate; petiole 3.5–4.5 cm long, glabrous; stipules 10–11 cm long, glabrous, drying dark brown. Figs solitary in the leaf axils, sub sessile; basal bracts 3, ca. 10–12 mm long; receptacle ellipsoid to subglobose, when dry ca. 3.5–4 × 2–3 cm, in fruit up to 5 × 4.5 cm (when fresh 5.5 × 5.5 cm), puberulous to subhispidulous; wall rather thick; ostiole ca. 1 mm diam. in plane or apiculate apex of the receptacle. Stamine flowers pedicellate; perianth tubular, ca. 3.5 mm long, 3–4-lobed, glabrous. Pistillate flowers pedicellate or sessile; tepals 4, free, lanceolate, ca. 2.5 mm long, sparsely minutely puberulous; stigmas 2. Interfloral bracts numerous, lanceolate, 2–2.5 mm long, sparsely minutely puberulous.

**Ficus carchiana** belongs to subgenus *Pharmacosycea*. It can be distinguished from other species of this subgenus by the broad and thickly coriaceous leaves and the long stipules, both drying brownish instead of greenish, as often occurs in subgenus *Pharmacosycea*.

The species is apparently a component of submontane wet forest.

**Paratypes.** PANAMA. Darién: Serranía del Darién, trail Cerro Malí–Río Pucuro, ca. 1200 m, 20 July 1976 (st), Gentry et al. 16833A (MO). COLOMBIA. Nariño: La Planada Reserve, 7 km from Chucunes, 1800 m, 22 Dec. 1987, Gentry et al. 59733 (MO), ECUADOR. Carachi: trail Chical–Maldonado, 1250–1400 m, 26 Sep. 1979, Gentry et al. 26618 (BG, QCA). **Esmeraldas**: cantón Esmeraldas, 10 km SW of Lita, 800 m, 10 Sep. 1990, Rubio et al. 661 (BG, MO, QCNE); Alto Tambo, near Lita, 13 Apr. 1992, Tipaz et al. 788 (QCA).


This variety is distinct from the typical variety in the pedunculate figs.


As a consequence of the lectotypification, the name will be transferred into the synonymy of *Coussapea villosa* Poeppig & Endlicher, in accordance with the suggestion by Standley (1937). The other part of the type collection, a leafless twig with some figs, probably belongs to *Ficus turrialbana* W. Burger (Burger, 1977).

5. **Ficus oensis** C. C. Berg, sp. nov. TYPE: Costa Rica. Puntarenas; Punta Banco, 22 Aug. 1988 (fl), Chavarría Díaz 307 (holotype, MO). Figure 3.

**Fico americanae** probabiliter affinis, a qua differit stipulis satiis longioribus et ficis subsessilis.

Tree up to 30 m tall. Leafy twigs 1.5–3 mm thick, glabrous. Lamina 6.5–12 × 1.7–4.2 cm, obovoid to lanceolate, apex acuminate, base obtuse; both surfaces glabrous; lateral veins 10–16 pairs, the basal pair unbranched, tertiary venation reticulate; pediole 0.4–1.8 cm long; stipules 0.9–2 cm long, glabrous, drying blackish to dark brown. Figs in the leaf axils; peduncle up to ca. 0.2 mm long; basal bracts 2, 1.5–2 mm; receptacle 0.6–0.7 cm diam. (when dry), globose, glabrous, at maturity green (?); ostiole ca. 1.5 mm diam., umbonate.

**Ficus oensis** belongs to subgenus *Urostigma* and is probably related to *F. americanae* Aublet, from which it differs in its leaf venation, the relatively long stipules, and the subsessile figs.
The state of the type specimen did not allow dissection of the fig to describe the floral structures.


6. Ficus rieberiana C. C. Berg, sp. nov. TYPE: Ecuador. Carchi: Reserva Awa, 1500 m, 16–30 Nov. 1990, Rubio et al. 1068 (holotype, QCNE; isotype, BG). Figure 4.

Ceteris speciebus consubgeneribus distinguenda, paginis chartaceis vel subcoriaceis subter indumentis densis; vena submarginali distincta venas laterales connectenti; maculis glandulosis ceraceis irregulariter formatis et vel locatis.

Tree up to 25 m tall. Leafy twigs 2–4 mm thick, white hirtellous. Lamina chartaceous to subcoriaceous, oblong to lanceolate to subobovate, 6–24 × 2–9 cm, acuminate to subcaudate, base acute to subobtuse; upper surface glabrous, lower surface ± densely white hirtellous to subomentum on the veins, ± sunken capitulate pluricellular hairs in the areoles; lateral veins ca. 15–25 pairs, connected by rather distinct submarginal veins, lower lateral veins rather weak and usually running perpendicular to the midrib, tertiary venation reticulate; waxy glandular spots irregularly extended along the midrib, or (also) additional spots up to the 5th pair of lateral veins; petiole 0.7–2.5 cm long, hirtellous; stipules 1–2.5–(4) cm long, sparsely or densely hairy. Figs solitary or in pairs in the leaf axils; peduncle 0.3–0.6 cm long, sparsely puberulous; basal bracts 3, ca. 1–1.5 mm long, glabrous; receptacle when dry ca. 0.8–1.2 cm diam., often very short (= ca. 1 mm long) stipitate, puberulous to subhirtellous, maculate; ostiole 0.5–1 mm diam. in the apical apex of the receptacle. Staminate flowers pedicellate; tepals 4, ca. 2.5 mm long, basally connate, glabrous; stamens 2, anthers lanceolate to oblong, ca. 1.8 mm long. Pistillate flowers pedunculate or sessile; tepals 4, ca. 1.5 mm long, basally connate, glabrous; stigma 1, or in short-styled flowers sometimes a very short second stigmatic branch. Interfloral bracts few, oblong to lanceolate, ca. 1.5 mm long, glabrous.

Ficus rieberiana belongs to subgenus Pharmacosycea. It can be distinguished from other species of this subgenus by the rather dense indumentum on the veins of the lower surface of the chartaceous to subcoriaceous lamina and the distinct submarginal veins connecting the lateral veins, and irregular number, shape and/or position of the waxy glandular spots along the midrib beneath. Species of subgenus Pharmacosycea normally have two similar glandular spots at the base of the midrib beneath. A characteristic feature of subgenus Pharmacosycea is the presence of two stigmas; in F. rieberiana, however, the style bears only one stigma.

Gentry et al. 24343 (BG, HUA) [from Colombia. Chocó: Río Yuto, between Lloró and La Vuelta, 100 m, 18 Jan. 1979 (st)] probably belongs to this species. The lower lateral veins are somewhat different from the collections listed below and, according to the label, it has figs turning red, an unusual phenomenon in subgenus Pharmacosycea.

The epithet rieberiana is chosen to commemorate the contribution of Bjarne Rieber to the establishment of university greenhouse research facilities for *Ficus* at the Norwegian Arboretum at Store Milde, Norway.

Paratypes. ECUADOR. Carchi: cantón Tulcan, Tobar Donoso, 650–1000 m, 19–28 June 1992, Tipaz et al. 1358 (QCNE) and 1546 (QCNE). Pichincha: Macuipueña, 5 km E of Nanegal, 1550 m, 11 Feb. 1991 (st), Gentry et al. 73216 (MO); Reserva Forestal ENDESA, Río Silanche, 10 km N of km 113 on road Quito–Puerto Quito, 650–700 m, 7 Dec. 1984, Jaramillo 7411 (GB, MO, NY, QCA); old road Quito–Santo Domingo de los Colorados, km 59, Reserva Florística-Ecológica “Río Guajalito,” 1800–2000 m, 24 Sep. 1988, Zak & Jaramillo 3829 (BG, JUAM, MO).


In the revision of Maquira (Berg, 1972) five species were distinguished within the genus. The two closely related taxa, *M. guianensis* and *M. costaricana*, could be readily told apart, both morphologically and geographically. However, more recent collections made in western Ecuador and in the Upper Amazon Basin reduced considerably the geographical gap between the two taxa, as well as their morphological distinctness, as can be perceived from the descriptions and distributions of the two taxa presented below. These aspects support treatment of the two taxa at the rank of subspecies.

7a. Maquira guianensis Aublet subsp. guianensis

Tree up to 25 m tall. Involucral bracts densely brownish puberulous. Peduncle of the staminate inflorescence 0.5–2 cm long. Peduncle of the pistillate inflorescence 0.5–1.6 cm long; pistillate flowers usually more than 20 (up to 50). Fruiting perianth subovoid, often ± distinctly ribbed, brown velutinous, with a ± truncate apex.

Tree up to 15(−30) m. Involucral bracts (rather) sparsely whitish puberulous. Peduncle of the staminate inflorescence 0.2−0.8 cm long. Peduncle of the pistillate inflorescence up to 0.8 cm long; flowers ca. 10−35; fruiting perianth ellipsoid to obovoid, not or hardly ribbed, (sub)glabrous or sparsely to densely yellowish puberulous, with an obtuse to rounded apex.

Distribution. Nicaragua through western Colombia to western Ecuador, and in the Upper Amazon Basin, extending to eastern Venezuela (Bolivar).

In western Ecuador the fruiting perianth of Maquira guianensis subsp. costaricana is often sparsely to densely yellow puberulous, and some of the specimens from this area (Rio Palenque Biological Station) have been distributed under the name M. grandis Gentry. In Central America the pistillate inflorescences often contain more than 20 flowers, while in western Ecuador and east of the Andes the inflorescences usually contain less than 20.

In Central America and western Colombia, the trees appear to start flowering when small, a feature shared with some other species of the same tribe, e.g., Helicostylis tomentosa (Poeppig & Endlicher) Rusby and Persea angustifolia (Poeppig & Endlicher) C. C. Berg.

8. Naucleopsis capirensis C. C. Berg, sp. nov. TYPE: Panama. Panamá: W of Interamerican Hwy., near Capira, ca. 60 km W of Panama City, on road to Cerro Campana, ca. 800 m, 21 Mar. 1985 (‡), McPherson 6913 (holotype, MO; isotypes, BG, BM, CR, MEXU, PMA). Figure 5.

Naucleopsis naga affinis, a qua differt e.g. absentia bractearum in pedunculis staminarum inflorescentarum, sepalis brevioribus pistillarum florum et stipulis brevioribus.

Tree up to 15 m tall. Leafy twigs 2−3 mm thick, (sparsely) puberulous, periderm flaking off. Lamina oblong, (5)−18−15(−21) × (1.7)−3−5.5(−7.5) cm, coriaceous, apex acuminate to subacute, base obtuse to rounded, margin (in dry material) often ± revolute; upper surface glabrous (or sparsely puberulous at the base of the midrib), lower surface glabrous or sparsely puberulous on the (base of) the midrib; lateral veins 10−16 pairs, tertiary venation reticulate; petiole 0.2−0.8 cm long, epidermis flaking off; stipules 0.3−1 cm long, puberulous, caduous. Staminate inflorescences in the leaf axils and below the leaves, ca. 1−1.5 cm diam.; peduncle 0.2−0.3 mm long, not bracteate; involucral bracts in 5−9 series, broadly ovate to saccate to suborbicular, the outer ones minutely puberulous, the inner ones only ciliolate; perianth ca. 2 mm long, tepals 2−7, often ± cucullate, minutely puberulous in the upper part; stamens 3−5, filaments 0.6−0.8 mm long; anthers oblong to elliptic, 0.7−1 × 0.3−0.4 mm. Pistillate inflorescences 1.5−5 cm, in fruit (3)−5.5−9 cm diam., subsessile or peduncle up to 0.6 cm long; involucral bracts in 6−8 series, broadly to narrowly ovate, minutely puberulous to submuriculate, the inner ones up to 1.5 cm long; flowers numerous; free parts of the tepals spire-like to pyramidal, minutely puberulous to submuriculate; style 2−5 mm long, stigmas filiform, 4−7 mm long. Inflorescences 4−7(−10) cm diam., free parts of the tepals up to 1 cm long.


The cited collections from Costa Rica and Panama are quite uniform. Several specimens from Co-
lombia and Ecuador probably belong to this species and may represent two subspecies:

**COLOMBIA. Antioquia:** mun. Frontino, coto. Nutibara, Río Cuevas, 1800–2000 m, 17 Mar. 1984 (³), D. Sánchez et al. 60 (BG, MEDEL), 1700 m, 18 Mar. 1985 (³ fr), D. Sánchez et al. 166 (BG, MEDEL); mun. Fron- timio, vrd. Venados, Parque Nacional Natural “Las Orquideas,” 880 m, June 1988 (³ juv.), H. Triana et al. 56 (COL). These specimens differ from the Central American ones in: (1) the trees becoming up to ca. 35 m tall, (2) the fully mature infructescences becoming probably about 10 cm diam., with the free parts of tepals becoming up to 2.5 cm long, and (3) the fruits ca. 2.5 × 1.5 cm. The stigmas are conical and similar to those found in the collections cited below. The petiole can be up to 1.5 cm long. The stamine infructescences are subsessile.

**COLOMBIA. Nariño:** mun. Barbacanoas, coto. Altaguera, vrd. El Barro, Reserva Natural Río Nambú, 1325 m, 5 Dec. 1993 (st), Betancur et al. 4631 (COL). **Valle:** Alto Río Anchicayá, Yatacú, 17 July 1984 (³ fr), Gentry & Moseley 48200 (BG, JUAM, MO), EUCADOR. **Carchi:** Awá Reserve, Guapi-Checo area, 1330 m, 20 Jan. 1998 (³ fr), Hoover et al. 2827 (BG, QCA); cantón Tulean, Guapi Alto, 1800 m, 15–28 June 1991 (³), Rubio et al. 1723 (QCNE), (³ fr), Rubio et al. 1746 (QCNE); cantón Tulean, Reserva Indigena Awá, Guapi Medio, 900 m, 21 May 1992 (³), Quetel et al. 576 (QCNE); cantón Tulecan, Tobar Donoso, 650–1000 m, 19–28 June 1992 (³), Tipaz et al. 1309 (QCNE), (³ fr), Tipaz et al. 1362 (QCNE). **Carchi/Escamaderas:** near Lita, 20 May 1987 (³ fr), van der Weg 9525 (BG, MO, QAME) and 9527 (AAU, BG). **Escamaderas:** cantón San Lorenzo, Reserva Indigena Awá, Río Mira, 10 km W of Alto Tambo, 16–26 Mar. 1991 (³), Rubio et al. 1268 (BG, QCNE); cantón San Lorenzo, Reserva Indigena Awá, Ricaurte, Balsareño, Río Palabi, 15–29 Apr. 1992 (³), Rubio et al. 1409 (BG). These specimens differ from the Central American ones in: (1) the free parts of the tepals being distinctly broadened at the base, (2) the conical stigmas, (3) the narrower lamina (lan- coleolate to oblanceolate), and (4) longer petioles. In addition, the infructescences and infructescences appear to be smaller, down to 0.5 cm and ca. 2.5 cm in diameter.

Further exploration may provide material eliminating the morphological discontinuities between the groups of specimens cited above.

**Naucleopsis caperensis** is related to *N. naga*, from which it differs, e.g., in the absence of bracts on the peduncle of the stamine infructescences, the shorter tepals of the pistillate flowers, and the shorter stipules.

9. **Naucleopsis herreraensis** C. C. Berg, sp. nov. **TYPE:** Peru. Loreto: prov. Requena, Jenaro Herrera, arboretum (tree 7/65), Aug.–Sept. 1976 (³), Bernardi 16201 (holotype, G; isotype, BG). Figure 6.

Folia margine parte plus minusve revoluta, involuto basi versus; venae laterales 12–26 binatae; stipulae 1–1.8 cm longae.

Tree up to ca. 25 m. Leafy twigs 1.5–3.5 mm thick, sparsely to densely appressed-puberulous, periderm in older parts flaking off. Lamina lanceolate, 6.5–24 × 1.3–6 cm, coriaceous, apex acuminate to subacute, acumen often acute, base acute to obtuse, margin partly ± revolute, but always at the base involute; both surfaces glabrous; lateral veins 12–26 pairs, tertiary venation reticulate or partly scalariform; petiole 0.5–1.8 cm long, appressed-puberulous, epidermis often ± flaking off; stipules 1–1.5 cm long, (brownish) appressed-puberulous. Stamine infructescences on distinct spurs in the leaf axils, up to 6 together, ca. 1 cm diam.; peduncle 0.2–0.3 cm long; involucral bracts in 5 series, broadly ovate to semicircular to suborbicular, appressed-puberulous; perianth 1.5–2 mm long, tepals 4–5, free or basally connate; stamens 3–4, filaments 0.3–0.4 mm long, anthers oblong to elliptic, 0.6–0.8 × 0.3–0.4 mm. Pistillate infructescences (juvenile!) below the leaves. Infructescences (immature!) ca. 6 cm diam., sessile; involucral bracts in 6 series, broadly to narrowly ovate, puberulous; flowers numerous; free parts of the tepals aculate to subulate, up to 1 cm long, minutely puberulous to subhispidulous; style 5–6 mm long, stigmas subulate, 2–3 mm long.

**Naucleopsis herreraensis** can be recognized by the relatively narrow leaves with the margin (partly) more or less revolute, but toward the base distinctly involute. It is possibly related to *N. ulei* (Warburg) Ducke, resembling in vegetative parts the small-leaved form of this species occurring in the Middle and Lower Amazon Basin (see below). However, it is clearly different in the shape and size of the stamine infructescences, the absence of very short internodes, and the distinctly loop-connected lower lateral veins of the lamina.

10. **Naucleopsis humilis** C. C. Berg, sp. nov.  
**TYPE:** Ecuador. Pastaza: Río Curaray, near Laguna Garzayacu, 20–26 Aug. 1985 (♀), Neil et al. 6663 (holotype, QCNE; isotypes, BG, MO, QAME). Figure 7.

**Naucleopsis ulei** similis, a qua differt, e.g. statura parva arborum, stipulis inflorescentisque minoribus.

Treelet up to 3 m tall. Leafy twigs 3–5 mm thick, appressed-puberulous, periderm flaking off. Lamina coriaceous, subobovate to oblongaceous, (9.5)–20–45 × (2)–5–10 cm, apex subacuminate to acuminate, base subacute to obtuse (to rounded), margin entire; upper surface glabrous, lower surface puberulous on the base of the midrib; lateral veins ca. (15)–25–30 pairs, tertiary venation largely scalariform to largely reticulate; petiole 1–2.5 cm long, minutely puberulous; stipules 0.5–1.5 cm long, striate, yellowish appressed-puberulous, subpersistent or caducous. Staminate inflorescences on up to 0.4–cm-long spurs, ca. 0.2–0.3 cm diam.; peduncle ca. 0.2 cm long, bracteate; involucral bracts in ca. 5 series, broadly ovate to oblong, the inner ones glabrous; flowers 4–6; perianth 2.5–2.5 mm long, tepals 3–5, basally connate, glabrous; stamens 1 or 2, filaments 3–3.5 mm long, thick, anthers elliptic, 0.5–0.6 × 0.3–0.4 mm. Pistillate inflorescences solitary in the leaf axils, ca. 1 cm diam., sessile; involucral bracts in ca. 6 series, broadly ovate, minutely puberulous; flowers few; free parts of the tepals subulate to acutate, 0.3–0.6 cm long, minutely puberulous; stigmas vittiform, ca. 3 mm long. Infrutescences subglobose, 2–3 cm diam., at maturity yellow; free parts of the tepals 0.5–0.7 cm long; fruits 3–6, ca. 0.6–0.7 cm long.

**Naucleopsis humilis** is apparently an element of periodically inundated riverine forest. It is closely related to *N. ulei* (Warburg) Dockey, from which it differs in the small size of the trees, the smaller stipules, and the smaller inflorescences.


Two subspecies can be recognized:

11a. **Naucleopsis naga** Pittier subsp. **naga**

Lamina at the lower surface glabrous and the smaller veins plane; stipules up to 3.5 cm long.

**Distribution.** Honduras to Colombia: Antioquia, Chocó, and Valle.


Pagina inferna folii puberula vel subhispidula (turn scabridula); venae parviores plus minusve prominentes; stipulae usque ad 1.5 cm longae.

Lamina at the lower surface puberulous or subhispidulous (and then scabridulous) and the smaller veins ± prominent; stipules up to 1.5 cm long.

Figure 7 (left). *Naucleopsis humilis* C. C. Berg. —1. Leafy twig with pistillate inflorescence (*Gentry et al. 61645*). —2. Parts of twigs with stipules only (*Vásquez et al. 5173*). —3. Leafless twig with staminate inflorescences (*Neill et al. 6663*). —4. Staminate flower (*Neill et al. 6663*). Figure 8 (right). *Naucleopsis straminea* C. C. Berg. Leafy twig with fruiting pistillate inflorescence (*Gentry et al. 36924*).
2200 m, Palacios et al. 9691 (QCN). Cotopequi: road Quevedo–Latacunga, 3 km E of El Palmar, 800 m, 5 Apr. 1980 (♀), Dodson & Gentry 10240 (BG, MO, QCN). Esmeraldas: Rio Lita, 4.5 km WNW of Lita, 600 m, 8 May 1987 (♀), Daly & Acevedo R. 5150 (BG, MO, NY, QCA).

The two subspecies occur sympatrically in Ecuador and Colombia. The differentiation into an entity with glabrous leaves and one with leaves being hairy beneath is similar to the situation found in *N. ulei*. However, in *N. naga* the two morphological entities are more different than in *N. ulei*, and may prove to be distinct at the species level.

12. *Nauculeopsis straminea* C. C. Berg, sp. nov. TYPE: Colombia. Chocó: 31 km E of Quibdó, ca. 14 km E of Tutunendo, 300–450 m, 14 June 1982 (♀ fl-fr), Gentry et al. 36924 (holotype, COL; isotypes, BG, JUAM, MO). Figure 8.

*N. krukovi* affinis, a qua differt in numero parviore venarum laterialium et partibus longioribus liberales tepalorum florum pistillorum.

Tree up to 15 m tall. Leafy twigs 1.5–2.5 mm thick, puberulent to hirtellous, periderm flaking off. Lamina elliptic to oblom to subobovata, 6–15 × 1.8–5 cm, subcoriaceous, apex (sub)acutata, base (sub)acuta; both surfaces glabrous; lateral veins 8–13 pairs, tertiary venation reticulate; petiole 0.3–0.8 cm long, puberulent, epidermis ± flaking off; stipules 0.5–1 cm long, sparsely puberulent, subpersistent or caducous. Pistillate inflorescences in the leaf axils or just below the leaves, 1.2–2 cm diam., subsessile; involucre with broadly ovate to oblom bracts in ca. 5 rows, the inner ones ± scarious and subglabrous (and straw-colored when dry); flowers ca. 5–10; free parts of the tepals subulate, sparsely minutely puberulent, ca. 0.3–0.6 cm long (and straw-colored when dry); stigmas ca. 2 mm long. Infrutescences subglabose, 2.5–4 cm diam.; free parts of the tepals up to 1 cm long, subulate (to acuminate).

*Nauculeopsis straminea* is related to the Amazonian *N. krukovi* (Standley) C. C. Berg, from which it differs in the smaller number of lateral veins (8–13 vs. 15–23 pairs) and the longer and more slender free parts of the tepals of the pistillate flower (up to at least 1 cm and subulate vs. up to 0.7 cm and conical).


Two subspecies can be recognized.


Lamina at the lower surface glabrous (except for the minute brown or whitish pluricellular trichomes) or only hairy at the base of the midrib; base cordate to subacute; lower lateral veins often not distinctly loop-connected, particularly if the base of the lamina is rounded to subacute.

**Distribution.** Upper Amazon Basin (Brazil, Ecuador, Peru, and Bolivia).

This taxon may include *Nauculeopsis amara* Ducke (recognized as a distinct species by Berg (1972)) and may represent a form from the Lower and Middle Amazon Basin with relatively small leaves (mostly up to 30 cm long) and often with a rounded to subacute base. This form gradually passes into the more typical form from the Upper Amazon Basin with larger leaves (mostly up to 50 cm long) and often with a rounded to cordate base.


Pagina inferna folii veneris puberulis vel hispidulis (tum scabridulis); basis cordata vel rotundata; venae laterales infernera distincte brochidodromae.

Lamina at the lower surface (sparsely) puberulous or subhispidulous (and then scabridulous) on the veins; base cordate to rounded (to obtuse); lower lateral veins distinctly loop-connected.

**Paratypes.** COSTA RICA. Limón: Reserva Indígena Talamanca, road Ambuí–Cachabí, 27 June 1989 (♀ fl), Chacon 28 (BG). **Puntarenas:** Reserva Forestal Golfo Dulce, Osa Península, 15 km W of Rincón, 3 June 1988 (♀ fl-fr), Hammel et al. 16990 (MO); Parque Nacional Corcovado, Gira de Corcovado, Arco de Piedras–Rio Corocavo, 16 June 1989 (♀ fl-fr), Kernen 1150 (BG). **PANA- MA. Cocle:** 9.4 km above El Cope, 20 Jan. 1978 (♀), Croat 44752 (MO). **Colón:** Santa Rita Ridge road, between Transisthmian Hwy, and Agua Clara, 11 Dec. 1973 (♀), Berg & Nee 301 (AAU, BG), Berg & Dressler 307 (BG, MO, NY); Santa Rita East Ridge, 23 Mar. 1968 (♀ fl), Correa & Dressler 891 (MO); Santa Rita Ridge, 20.7 km from Transisthmian Hwy., 22 Mar. 1992 (♀), Foster 14079 (SCZ); Santa Rita Ridge road, 4 mi. from Transisthmian Hwy., 11 Dec. 1973 (♀), Gentry et al. 8825 (MO).
Santa Rita Ridge, 11 Jan. 1987 (♀ fl), McPherson 10262 (MO).


14. Naucleopsis velutina C. C. Berg, sp. nov.


*Naucleopsis macrophylla* et *N. riparia* affinis, divergens ab utraque stipulis petiolisque brevibus; inflorescentias pistillatis partibus liberen tepalorum dispersis.

Tree up to 25 m tall. Leafy twigs 3–4 mm thick, brown (sub)velutinous. Lamina coriaceous, oblong, 22–40 × 8–14 cm, apex acuminate, base obtuse to rounded; upper surface sparsely puberulous on the midrib, lower surface brownish (sub)velutinous on the veins; lateral veins 18–26 pairs, tertiary venation largely scalariform; petiole 0.5–1 cm long, brown velutinous; stipules 0.5–1 cm long, densely brownish to whitish hirtellous to subvelutinous. Stamina inflorescences 2–5 together in the leaf axils and below the leaves, 0.8–1.3 cm diam.; peduncle 0.3–0.5 cm long, bracteate; involucral bracts in ca. 7 series, broadly ovate to semicircular, densely yellowish to brownish puberulous to subvelutinous; perianth ca. 2.5–3 mm long, tepals 4–6, basally connate (or free), ± densely yellow hairy. Infructescences 6–8 cm diam., (sub)sessile; involucral bracts in 6–8 series, ovate to lanceolate, yellow strigose to subsericeous, the inner ones up to 2 cm long; flowers/fruits numerous; free parts of the tepals dispersed, aculate, yellow strigose to subsericeous; style ca. 4 mm long, stigmas 2–3 mm long, long-tongue-shaped.

*Naucleopsis velutina* is related to *N. macrophylla* Miquel and *N. riparia* C. C. Berg. It differs from both in the short stipules and petioles. The pistillate inflorescences are clearly different in the absence of distinct perianths, the slender aculeate, yellow subsericeous, loosely arranged free parts of the tepals, and the short stigmas.

*Paratype.* PERU. Loreto: prov Maynas, Quebrada Yanomono, Río Amazonas, above mouth of Río Napo, 5 Nov. 1979 (♀ fr), Gentry et al. 27466 (BG, MO).


The description of *Trophis glabrata* is based on two sterile collections (Liebmann 14274 and 14276), both belonging to the *Pseudolmedia* species treated as *Pseudolmedia oxyphyllaria* Donnell Smith in Berg (1972: 31).

16. Sorocoea jaramilloi C. C. Berg, sp. nov.

**Type:** Ecuador. Pichincha; road Quito–Puerto Quito, km 113, 10 km N of road, Reserva Forestal ENDESA, 22 Aug. 1984 (♀ fl-fr), Jar- amillo 7055 (holotype, QCA; isotypes, AAU, GB, MO, QCA). Figure 9.

*Lamini* grandibus, inaequalilabialis et inflorescentias pistillatis longis distincta.

Tree up to 20 m tall. Leafy twigs 2–5 m thick, minutely puberulous, the older parts conspicuously lenticellate. Lamina elliptic, 5–10–35 × 3–17 cm, ± inequilateral, (sub)coriaceous, apex ± abruptly acuminate, base rounded to obtuse at the broad side, acute to obtuse at the narrow side, margin entire; upper surface minutely puberulous, ± densely so on the main veins, lower surface minutely puberulous on the (main) veins; lateral veins 8–10 pairs, tertiary venation reticulate or partly scalariform; petiole (1.5–)2.5–3.5–(5) cm long, minutely puberulous; stipules 0.3–0.8 cm long, puberulous. Stamina inflorescences in the leaf axils,
pendulous, ca. 15–45 cm long, including a 0.5–1.8-

cm-long, sparsely puberulous peduncle; rachis
sparsely puberulous; flowers ± spaced, broadly
sessile; perianth 4-parted, 2.5–3 mm high, sparsely
ciliolate; stamens 4, isomorphic or anisomorphic,
with anthesis straight or slightly incurved, filaments
0.2–

0.6 mm long, anthers 0.8–1.2 × 0.7–1.2 mm,
connective broad, not apiculate. Pistillate infor-
cences in the leaf axils or below the leaves,
penduncle, ca. 6–17 cm, in fruit up to 40 cm long;
peduncle 0.5–3 cm long, minutely puberulous;
rachis minutely yellowish puberulous; flowers ca. 20–
60; pedicel 0.1–0.2 cm, in fruit up to 1.5 cm long,
yellowish puberulous; perianth 2–2.5 mm high,
minutely puberulous, in the upper part ± ruminate;
stigmas ovate, ca. 0.5 mm long. Fruiting perianth
ellipsoid to globose, 2–2.5 cm long, black.

Paratypes. COLOMBIA. Valle: ca. 16 km NW of Bue-
naventura, 28 May 1987 (st), Faber-Langendoen et al. 751
(BG); mun. Buenaventura, Bajo Anochí, 19 Oct. 1989
(st), Gentry et al. 63492 (COL). ECUADOR. Carchi:
Guapá Alto, 18–25 May 1985 (5), Thomsen 58289 (QCA,
QCNE); cantón Tulcan, Reserva Indígena Awá, Gualpí
Medio, 23–27 May 1992 (5 fl-fr), Tipaz et al. 1041
(QCNE), (5). Tipaz et al. 1044 (QCNE). Esmeraldas:
cantón Eloy Alfaro, Reserva Ecológica Cotacachi-Cajapás,
Charco Vicente, Río Sun Miguel, 20–27 Mar. 1993 (st),
Méndez et al. 116 (QCNE), 6–9 Sep. 1993 (5 fr), Palacios
et al. 11356 (QCNE); Alto Tambo, 13 May 1992 (5 fr),
Quedal et al. 521 (QCNE). Los Ríos/Pichincha: El Cen-

tinela, Montañas de Ila, road Patricia Pilar–24 Mayo, km
12, 6 Apr. 1980 (5), Dodson et al. 10278 (MO), 23 May
1983 (st), Dodson et al. 13806 (MO). Pichincha:
road Quito–Puerto Quito, km 113, 10 km N of road,
Reserva Forestal ENDESA, Río Silanchí, 26 May 1984
(2 fl-fr), Jaramillo 6597 (QCA, mixed with Naucleopsis
chiguila Benoist), 10 July 1984 (6 fl-fr), Jaramillo 6791
(AAU, GB, MO, NY, QCA).

Amer. Bot. 3: 150. 1883. TYPE: "Guatemala,"
(?), Friedrichsthal s.n. (holotype, K).

Some species of Soroea (S. cufoconditii W. Bur-
ger, S. frustiana Cuatrecasas, S. hirtella Mildbraed,
and S. pubivena Hemsley) that have been treated as
distinct previously (Berg & Akkermans, 1985),
have proven to belong to a single taxonomical entity
with at least three subdivisions.

17a. Soroea pubivena Hemsley subsp. pubi-
vena

Puntarenas: Puerto Jiménez, 4 Apr. 1930 (5), Cu-
ofonditii 200 (holotype, F).

Leafy twigs puberulous to hirtellous. Lamina
subcoriaceous to chartaceous, margin ± distinctly
denate to denticate or (especially if the lower
lamina surface is sparsely puberulous) entire; up-
per surface minutely puberulous on the midrib,
lower surface hirtellous or densely to sparsely
pat-
ter-puberulous. Pistillate inflorescences in fruit up
to 20 cm long; flowers ca. 15–60 (–100). Fruiting
perianth ellipsoid to (sub)ovoid to subglobose, 1–
1.4 × 0.8–1.2 cm, (partly) ± densely puberulous,
distinctly pedicellate.

Distribution. Nicaragua to western Panama.

17b. Soroea pubivena Hemsley subsp. oligo-
tricha (Akkermans & C. C. Berg) C. C. Berg,
comb. nov. Basionym: Soroea hirtella Mild-
braed subsp. oligotricha Akkermans & C. C. Berg,
Biol. 88: 383. 1985. TYPE: Brazil, Amazonas:
mun. São Paulo de Oliveira, Palmares, 11
Sep.–26 Oct. 1936 (2 fl-fr), Krukoff 8157
(holotype, U; isotypes, BM, F, GH, K, LE,

Soroea fustiana Cuatrecasas, Ciencia (Mexico) 24(56):
Anchéyá, El Prado, 4 Aug. 1943 (2 fr-fr), Cuat-
recasas 14336 (holotype, F).

Leafy twigs sparsely appressed- (to patent-)pu-
berulous. Lamina subcoriaceous to coriaceous,
margined usually entire; upper surface minutely
puberulous on the midrib or entirely glabrous,
lower surface sparsely appressed- (or patent-)puberulous
on the main veins. Pistillate inflorescence in fruit
up to 10 cm long; flowers ca. 5–25; fruiting peri-
anth (sub)ovoid, 1–2.5 × 1–2 cm, subglabrous,
mostly distinctly pedicellate.

Distribution. Upper Amazon Basin, Guyana,
and northern Venezuela, northern and western
Colombia, eastern Panama, and northwestern
Ecuador.

The material from Guyana, eastern Venezuela,
and the adjacent parts of Brazil has lamina com-
pletely glabrous above. The fruiting perianth tends
to be somewhat smaller than elsewhere in the range
of distribution.

17c. Soroea pubivena Hemsley subsp. hirtel-
la (Mildbraed) C. C. Berg, comb. et stat. nov.
Basionym: Soroea hirtella Mildbraed, Notizbl.
TYPE: Peru. Loreto: Pongo de Manseriche,
(5), Tessmann 4016 (holotype, B; isotypes, F,

Ser. 11: 64. 1931. TYPE: Peru. Loreto: Caballo-Co-
Leafy twigs whitish to brownish subhirsute to hirtellous. Lamina chartaceous to subcoriaceous (or coriaceous), margin entire (or obscurely) dentate to denticulate; upper surface minutely puberulous on the midrib; lower surface (rather) densely hirtellous to puberulous on the veins or at least on the midrib; lateral veins often connected with a slightly arcuate submarginal vein. Pistillate inflorescences in fruit up to 10 cm long; flowers 3–15–(–25). Fruiting perianth usually subglobose, sometimes ovoid, subglobose or oblurate, 1–2(–2.5) × 1–2(–2.5) cm, puberulous to hirtellous, sometimes subsessile.

**Distribution.** Upper Amazon Basin: Peru, Ecuador, Colombia, Venezuela, and adjacent parts of Amazonian Brazil.

Taking into account the total morphological variation within subspecies *hirtella* and subspecies *oligotricha*, the differences between the two taxa seem to be quite small. It is, therefore, noteworthy that in a locality in Ecuador (Río Cuyabeno, Laguna Grande) the two taxa occurred side by side and were in flower simultaneously, yet intermediates were lacking. Another difference between the two taxa in that locality could be that the subspecies *hirtella* starts flowering earlier, as much smaller trees, than subspecies *oligotricha*. Whether this species-like behavior can also be found in other regions where the ranges of the two taxa overlap is not known, nor whether this might represent a case (in Moraceae and other families) in which infraspecific entities are morphologically clearly distinct in one area, but intergrade in another.

18. **Soroea ruminata** C. C. Berg, sp. nov.

**Type:** Panama. Darién: Parque Nacional Darién, between Campamento Casa Vieja and Cerro Sapo, 22 May 1991 (♀ fl-fr), *Herrera et al.* 975 (holotype, MO; isotypes, BG, BM, CR, MEXU, PMA). Figure 10.

*Soroea affinis* affinis, a qua differt, e.g. marginibus folii semper integris, floribus sessilibus sub anthesi et perianthio statu fruticero ruminato glabratro.

Shrubs or trees up to 12(–20) m tall. Leafy twigs 1–2.5 mm thick, sparsely minutely puberulous. Lamina oblong to elliptic (to lanceolate), 3.5–17 × 1.5–6.5 cm, broadest at or above the middle, ± inequilateral, coriaceous, apex acuminate, base acute to rounded, margin entire; upper surface minutely puberulous on midrib, lower surface sparsely, minutely puberulous on the (base of the) midrib; venation (almost) plane above, prominent beneath; lateral veins 8–12 pairs, tertiary venation reticulate (or tending to scalariform); petiole 0.3–0.8 cm long, 1–2 mm thick, (minutely) puberulous; stipules 0.3–0.5 mm long, (minutely) puberulous, caducous. Stamine inflorescences (in fruit) 0.8–4.5 cm long, including the 0.1–0.2-cm-long, puberulous peduncle; flowers rather crowded to disperse, narrowly to broadly sessile; perianth 4-parted, 1–1.5 mm high, ciliolate, outside sparsely minutely puberulous; stamens (3–)4, straight, isomorphic, filaments 0.5–1.2 mm long, anthers ca. 0.3–0.7 × 0.4–0.7 mm, connective broad, apiculate. Pistillate inflorescences (in fruit) 0.5–3 cm, in fruit up to 5 cm long, including the 0.1–0.8-cm-long, puberulous peduncle; rachis sparsely, minutely puberulous; flowers 3–12, (sub)sessile, in fruit up to 1 cm long, pedicellate, pedicel (very) sparsely hispidulous to minutely puberulous; perianth ca. 2 mm high, glabrous, the upper part hemispherical to broadly ovoid; stigmas tongue-shaped, ca. 1 mm long, coarsely papillate. Fruiting perianth subglobose, ca. 1.5 × 1–1.5 cm, with the apical part ± discoid and the lower part with a ruminate, almost glabrous surface.

*Soroea ruminata* differs from *S. affinis* Hemsl. in the consistently entire leaf margins, the flowers being sessile at anthesis, and the ruminate and glabrous fruiting perianth. The inflorescences are more compact and the lamina more coriaceous than in *S. affinis*. The fruiting perianth is sometimes covered by white mycelium, as found in several other *Soroea* species.

Most of the material referred to this new species has been initially identified (Berg & Akkermans, 1985) as *S. faustiana* Cuatrecasas, which proved to be a synonym of *Soroea pubivena* subsp. *oligotricha* (Akkermans & C. C. Berg) C. C. Berg (see above).

Paratypes. PANAMA. **Canal Zone:** Barro Colorado Island, 1960 (♀), Ebinger 161 (MO), Cocle: road to Culebra, 12 mi from Llano Grande, 16 Dec. 1983 (♀), Churchill et al. 4117 (MO). **Colón:** Santa Rita Ridge road, between Transisthmian Hwy. and Agua Clara, 11 Dec. 1973 (♀), Berg et al. 302 (♀) and 309 (♀), Santa Rita Ridge, E of Transisthmian Hwy., 15 Dec. 1972 (♀), Gentry 6559 (NY); Santa Rita Ridge, E of Panama–Colón Hwy., 19 May 1986 (♀), McPherson 9166 (♀), MG. **Darién:** Cerro Pirre, 4 Aug. 1967 (♀), Britán 1231 (♀), MO, US; Manenc, mouth of Río Quisal, 28 Apr. 1968 (♀ fl), Kirkbridie et al. 1393 (MO, NY); Cerro Pirre, above Renare camp, 28 July 1986 (♀ fl), McPherson 122640 (♀, BM, BM); Río Tuquesa, lower Tuquesa mining camp “Choco Chiva,” 5 July 1975 (♀ fl), Mori 6984 (♀, MO, BM, US); Río Tuquesa, middle Tuquesa mining camp “Choco Peje,” 8 July 1975 (♀ fl), Mori 7033 (♀, MO, PMA); near Caña, 23 June 1950 (♀ fl), Stearn et al. 663 (♀), MO. **Panamá:** ca. 20 km NE of Chepo, 12 Dec. 1973 (♀), Berg et al. 336 (♀, BM, U); El Llano–Cari road, km 8.7, 3 Sep. 1977 (♀), Berg et al. 403 (♀) and 405 (♀), Cerro Campana, 22 June 1972 (♀), Croat 17191 (MO); Cerro Jefe, La


In addition to the typical subspecies, ranging from Venezuela to northern Brazil and Colombia and occurring disjunctly in Peru (San Martín), and subspecies saxicola (Hassler) C. C. Berg, ranging from Bolivia to Argentina (cf. Berg & Akkermans, 1985), a third subspecies from drier parts of western Ecuador and the adjacent part of Peru, can be recognized.  


Inflorescences pistillate subumbellatis cum pedicellis in fructu usque ad 3.5 cm longis distincta. 

Shrub or treelet up to 8 m tall, sometimes lianescent. Lamina oblong to elliptic to (sub)obovate, 3–11 × 1.5–5.5 cm, apex acuminate to subacute, base rounded (to obtuse), margin faintly to distinctly (serrate-)dentate; venation ± impressed above, prominent beneath. Pistillate inflorescences subumbellate; peduncle 0.3–1, in fruit up to 3.5 cm long; flowers 3–12(–18); pedicels 1–1.8 cm, in fruit up to 3.5 cm long; pedicels and immature fruiting perianths (brownish) red.

An illustration of a leafy twig with pistillate inflorescences can be found in Berg and Akkermans (1985: 388, fig. 4, 2). Stamine material of this taxon has not yet been collected.  

**Paratypes. ECUADOR. El Oro**: Santa Rosa, 17 Mar. 1955 (♀ fl–fr), Asplund 15775 (S); 60 km SE of Arenillas, on road to Loja, ca. 400 m, 13 Nov. 1982 (♀ fl–fr), Pennington et al. 10720 (QCA, QCNE, U); cantón Arenillas, road Arenillas–Piedras, 16 Feb. 1976 (♀ fl–fr), Plowman 5471 (GH, S, U); road Guayaquil–Salinas, km 7, 18 Mar. 1980 (♀ fl–fr), Dodson et al. 9601 (F, MO, U). **Guayas**: Chongón, 4 Feb. 1955 (♀ fl–fr), Asplund 15330 (S); Cerro Azul, W of Guayaquil, 8 Feb. 1955 (♀ fl–fr), Asplund 15361 (S), 10 Feb. 1955 (♀ fl–fr), Asplund 15389 (S); road Guayaquil–Daule, km 21, Capeira, 23 Sep. 1981 (♀), Dodson et al. 11454 (♀); **Loja**: Puesto Chico, 12 km N of Alamar, 760 m, 9 Aug. 1975 (♀), Samaniego et al. 50 (LOJA, QAME, US), PERU. **Tumbes**: prov. Tumbes, Pampas de Hospital, El Cauche, 22 Jan. 1989 (♀ fl), Díaz et al. 3224 (BG, MO).  

**CECROPIDAE.**  


Cecropiae englerianaet C. polystachyae similis; a C. engleriana e.g. stigmatibus comosis vel subpellatis, a C. polystachya e.g. venis lateralis marginalis brachiodromis differt. 

Tree up to 25 m tall; trunk with prominent (anular) scars of the stipules. Leafy twigs 2–4.5 cm thick, (dark) green, hispidulous with curved to uncinate hairs. Lamina subcoriaceous to coriaceous, ca. 30 × 30–75 × 75 cm, segments 8–10, free parts of the upper segments obvate to elliptic, the upper ones sometimes slightly lobate, incisions \( \gamma_0 = \pi/2 \pm 8^\circ \) to \( \pi/2 \leq \gamma_0 = \pi/2 \) the distance to the petiole, apices obtuse; upper part smooth to scabridulous, sparsely to rather densely minutely puberulous to strigillose on the (main) veins, initially sparse arachnoid indumentum, lower surface sparsely puberulous to strigillose with straight or uncinate hairs on the (main) veins, arachnoid indumentum (almost) confined to the areoles or almost absent; lateral veins 11–16 (–20) pairs, marginally loop-connected, the lower ones branched; petiole ca. 25–70 cm long, sparsely (minutely) puberulous and also with sparse arachnoid indumentum; trichilia fused, the brown indumentum intermixed with (rather) short white hairs; stipules 12–20(–28) cm long, orange-red to pinkish or partly whitish, caducous, outside (appressed–)puberulous to hirtellous, or on the ribs to subhirsute, also with dense arachnoid indumentum and rather dense brown pubilcellular hairs, inside ± densely hairy. Stamine inflorescences solitary or in pairs, peduncle patent, spikes ± spreading to pendulous; peduncle 9–13 cm long, with sparse arachnoid indumentum and brown pubilcellular hairs; spathe 12–15 cm long, white, outside with dense arachnoid indumentum and sparse brown pubilcellular hairs, inside glabrous or sparsely hairy; spikes
ca. 10–25, 6–17 × ca. 0.3 cm (yellow to pale orange), stipules 0.8–1.3 cm long, sparsely puberulous in the upper part; rachis hairy; periarch tubular, 1–1.5 mm long, glabrous; anthers ca. 0.5 mm long, detached at anthesis. Pistillate inflorescences solitary or in pairs, pendulous; peduncle 9.5–19 cm long, sparsely puberulous to hirtellous (to subhispid); spathe not seen; spikes 4–5(–6), 9–17 × (0.5–) 0.7–0.8 cm, sessile or with up to 0.5 cm-long, minutely puberulous stipes; rachis hairy; periarch 1.5–2 mm long, apex convex, punctate to muriculate, arachnoid hairs below the apex or also on the margin of the apex; stigma comose to subpeltate. Fruit ellipsoid, ca. 1.8 mm long, smooth.

*Cecropia annulata* is apparently closely related to *C. polystachya* Trécul. It differs from the latter in the marginally loop-connected lateral veins in the free part of the midsegment in the (very) sparse arachnoid indumentum on the petiole, in the short or rather short white (unicellular) hairs in the trichilia, and in the midsegment being not (or rarely slightly) lobate. However, *C. annulata* also resembles *C. engleriana* Stehlach, from which it differs in the less deeply incised lamina, in the smaller number of lateral veins in the free part of the midsegment, and in the non-peltate stigmas. The characters of this species look like a mixture of the two species named above and could indicate an origin by hybridization. The species is relatively rare in secondary growth. In the field it can be easily recognized by the orange to pinkish young leaves.


2. *Cecropia heterochroma* C. C. Berg & P. Franco, sp. nov. TYPE: Panama. Veraguas: road Escuela Agrícola Alto Piedra–Río Dos Bocas, km 10, 26 July 1974 (♀ fr), Croat 25880 (holotype, MO; isotype, BG). Figure 11.

Lamina cum incisiuris paucis subbus indumento arachnoido sparsissimo. Inflorescences pistillatae patentis 2–4 spicis, 3–10 cm longis.

Tree up to 8 m tall. Leafy twigs 2–5 cm thick, green or purplish, densely hirtellous with unicinate hairs. Lamina chartaceous, ca. 35 × 35–75 × 75 cm, green or purplish beneath, segments 6–8, incisions γ₁₀–γ₁₀, the distance to the petiole, apices subacuminate to rounded; upper surface minutely hispidulous, scabridulous, lower surface minutely puberulous with curved hairs on the veins, arachnoid indumentum very sparse, soon disappearing; lateral veins in the free part of the midsegment ca. 10–12 pairs, submarginally loop-connected, some of them branched; petiole 30–55 cm long, green or purplish, puberulous, partly hirtellous to subhispid with uncinate hairs; trichilia fused, brown indumentum intermixed with short white hairs; stipules 5–10 cm long, green or reddish, outside subhirtellous to subhispid with uncinate hairs, inside glabrous. Staminate inflorescences in pairs, patent; peduncle 3–6.5 cm long, reddish or purplish, hirtellous to subhirtellous to subhispid; spathe 8–14 cm long, reddish, purplish, or greenish, outside sparsely hirtellous and often with dense brown pluricellular trichomes, inside glabrous; spikes 4–5, 3–6.5 × 0.3–0.4 cm, stipules up to 0.5 cm long; rachis glabrous; periarch 1.5–2 mm long, glabrous; anthers 0.6–0.8 mm long, oblong to lanceolate in outline, not detached at anthesis. Pistillate inflorescences solitary, patent; peduncle 8–12 cm, red to purplish, puberulous to hirtellous; spathe ca. 10–15 cm, color and indumentum as in the staminate ones; spikes (1–)2–4, 3–10 × 0.4–0.6 cm, in fruit up to 15 × ca. 1 cm, (sub)sessile; rachis glabrous; periarch 1.5–2 mm long, arachnoid hairs below the apex, apex convex, glabrous; stigmas penicillate. Fruit ellipsoid, 2.5–3 mm long, smooth, brown.

*Cecropia heterochroma* has a form with the lamina purplish underneath, occurring side by side with a form with the lamina pale green underneath.

**Paratypes.** PANAMA. Boca de Toro: Islas Bastimentos, 22 Mar. 1993 (♀ fr-fr), Foster et al. 14728 (SCZ). COLÓN: Santa Rita Ridge road, between Transisthmian Hwy. and Agua Clara, 11 Dec. 1973 (♀ fr), Berg 299 (BG); Santa Rita Ridge, 1 Mar. 1971 (♀ fr), Croat 13887 (BG, MO); Santa Rita Ridge road, 4–6 km from Transisthmian Hwy., 13 Apr. 1976 (♂), Croat 34288 (MO); Santa Rita Ridge, 20 Sep. 1972 (♀), Gentry 6109 (BG, MO); Santa Rita Ridge road, 21–26 km from Transisthmian Hwy., 4 July 1982 (♀ fr), Knapp 5844 (BG, MO). DARIÉN: Parque Nacional Darién, Cruce de Mono, 5 Nov. 1989 (♀), Fisher 52 (BG). PANAMA: Cerro Jefe, 30 Aug. 1977 (♀ fr-fr), Berg et al. 393 (BG), (♂), Berg et al. 394 (BG); El Llanito-Carti road, km 7, 3 Sep. 1977 (♀), Berg et al. 401 (BG); Cerro Jefe, 27 Jan. 1966 (♀), Blum et al. 2097 (MO), 12 Feb. 1966 (♀), Blum et al. 2205 (MO), (♀ fr), Blum et al. 2206 (MO); Campo Tres, 5 km NE of Altos de Pacora, 9 Mar. 1973 (♀), Buser 822 (BG, MO); Cerro Jefe, 1000 m, Carraquisquilla 2177 (MO, PMA); Cerro Jefe, 25 Aug. 1972 (♀ fr), Correa et al. 1806 (MO, PMA); 3 mi. N of Cerro Azul, 26 July 1970 (♀ fr-fr), Croat 11587 (BG, MO); Cerro Jefe, 23 June 1972 (♀ fr), Croat 17338 (MO); El Llanito-Carti road, km 12, 1 Aug. 1974 (♀ fr), Croat 26079 (MO), 6 Apr. 1973 (♀ fr), Dressler 4326 (PMA); 3 mi. N of Cerro Azul, 1 Jan. 1972 (♀ fr), Dwyer et al. 3447 (US); Cerro Jefe, 19 Aug. 1989 (♀ fr), Fisher 23 and 31 (BG); El


Cecropiaceae latilobae affinis, a qua differt venis lateralis submarginale brochiodromis.

Tree up to 15 m tall. Leafy twigs 1.5–5 cm thick, green or slightly bluish, puberulous to subhispidulous (with curved to uncinate hairs) and also with dense brown puberulaceous hairs, sometimes young parts bluish due to a waxy layer; internodes 0.5–1 cm long. Lamina chartaceous to subcoriaceous, ca. (10 × 10–25 × 25–60 × 60) cm, segments (5–)9–11, free part of upper segments ovate to elliptic, incisions γ₀/₀/₀ the distance to the petiole, apices short-acuminate to obtuse to rounded; upper surface scabrous, (rather sparsely) hispidulous; lower surface rather densely minutely puberulous on the veins and (especially on the smaller veins) also sparse much longer (uncinate to straight) hairs, arachnoid indument in the areoles and on the smaller veins or almost confined to the leaf margin; lateral veins in the free part of the midsegment ca. 11–16 pairs, 0.5–1.5 cm from each other, submarginally (to almost marginally) loop-connected, most of them branched; petiole ca. 15–40 cm long, minutely puberulous; trichila fused, only with brown indumento of pluricellular hairs; stipules 5–12 cm long, green, reddish or red-brown to brown, subpersistent, outside puberulous to subhirtellous, inside densely sericeous to subvillose. Stamine inflorescences in pairs, pendulous; peduncle 6–9 cm long, puberulous; spathe 7–18 cm long, greenish, outside puberulous and with sparse arachnoid indumentum, inside glabrous; spikes 8–15, 4–8 × 0.2–0.3 cm, sessile, rachis (sub)glabrous; perianth ca. 1 mm high, puberulous on the margin of the apex; anthers ca. 0.3–0.5 mm long, detached at anthesis. Pistillate inflorescences in pairs, pendulous; peduncle 15–25 cm long, puberulous to hispidulous; spathe 9–16 cm long, greenish, outside puberulous (to hirtellous) or also with sparse to rather dense arachnoid indumentum, inside glabrous or sparsely puberulous; spikes 4–5, 12–20 × 0.8–1 cm, in fruit up to 35 × 1.2 cm, sessile; rachis hairy; perianth ca. 2 mm high, apex convex, sparsely muricate, arachnoid hairs below the apex; stigma comose-paniculate. Fruit oblongoid to subobovoid, ca. 2 mm long, smooth.

Cecropia perebula shows strong similarities to C. latiloba, from which it differs in the lateral veins being more or less distinctly submarginally loop-connected. Moreover, C. latiloba Miquel is a species occurring in periodically inundated places, while C. perebula is a species of non-inundated places, probably a tree-fall-gap pioneer. The morphological differences are so small that one could consider them as only valid for distinction at the subspecific level.


4. Cecropia tamae C. C. Berg & P. Franco, sp. nov. TYPE: Peru. Pasco: prov. Oxapampa, 5 km E of Oxapampa, 1850 m, 23 May 1983 (? fl-fr), D. N. Smith 4179 (holotype, MO; isotypes, BG, K). Figure 13.

Indumento viloso in diversis partibus et foliis grandidibus cum incisuris numerosis distincta.
Tree up to ca. 30 m tall. Leafy twigs 4–8 cm thick, green, densely villous and with filiform brown pluricellular hairs. Lamina (sub)coriaceous, ca. 50 × 50–100 × 100 cm, segments 13–18 (on new shoots down to 8), incisions ca. 1/10–1/10 the distance to the petiole, segments oblanceolate, apices subacuminate to acute; upper surface scabrous to scabridulous, sparsely to rather densely hispidulous to subhispid or largely hirsute to subvillous and with sparse to dense filiform, brown pluricellular hairs, “umbilicus” very prominent and villous, lower surface ± sparsely subvillous and with filiform brown pluricellular hairs or also sparse white arachnoid indumentum on the main veins, varying to pilose (to submentosely) on the lesser veins, arachnoid indumentum in the areoles and on the reticulum; lateral veins in the free part of the mid-segment 30–35 pairs, up to 1.3 cm from each other, mostly unbranched, submarginally (and ± faintly) loop-connected; petiole 40–80 cm long, ± densely (sub)villus and with filiform brown pluricellular hairs and sparse white arachnoid indumentum, glabrescent; trichilia absent or sometimes present (?); stipules 15–30 cm long, caducous, outside densely white villous, inside sparsely hairy. Stamine inflorescences in pairs, patent with the spikes curved upwards, subtended by up to 13-cm-long bracts; peduncle 5–12 cm long, ± densely white villous (at least in the upper part) and also or only with filiform brown pluricellular hairs, often also with sparse white arachnoid indumentum; spathe 14–20 cm long, green, with dense filiform brown pluricellular hairs and sparsely villous, glabrescent; spikes ca. 10–20, 12–19 × 0.3–0.5 cm, with 0.5–1-cm-long stipules; perianth ca. 1.2 mm long, apex plane, sparsely to densely muriculate, below the apex short arachnoid indumentum; anthers ca. 0.5 mm long, detached at anthesis, theca appendiculate. Pistillate inflorescences in pairs, patent with the spikes curved upward, subtended by up to 13-cm-long bracts; peduncle 5–9 cm long, with indumentum similar to the staminate inflorescence; spathe 9–14 cm long, green, with dense filiform brown pluricellular hairs and sparsely villous; spikes 3–7, (sub)sessile, 6–13 × 0.5 cm, in fruit up to 21 × 1.5 cm; perianth ca. 1.5 mm long; apex plane, muriculate, long white arachnoid indumentum below the apex; stigma small, comose. Fruit narrowly ellipsoid, ca. 1.5 mm long, finely tuberculate.

**Cecropia tacana** is the montane species in the southern Andean part of Peru and is easily recognizable by the villous indumentum on various young plant parts and the large leaves with numerous segments. It seems to be related to the Bolivian montane species *C. elongata* Rusby.

The epithet chosen is the local name often cited on the labels of the collections of this species.

**Paratypes.** PERU. **Ayacucho**: between Huanta and Río Apurímac, 750–1000 m, 7–17 Nov. 1929 (juv.), Killip et al. 23117 (NY, US). **Cuzco**: prov. Paucartambo, road Pilarcopata–Paucartambo, ca. 2000 m, 2 Aug. 1988 (3), Berg et al. 1634 (BG, USM), 2200–2300 m, 2 Aug. 1988 (2), Berg et al. 1635 (BG, COL, USM); prov. Paucartambo, km 132, 2260–2290 m, 27 June 1978 (st), Gentry et al. 23564 (BG); prov. Urubamba, near Machu Picchu, 2000 m, 4 July 1972 (1), Muller 2861 (LZ); prov. Urubamba, near Machu Picchu, Río Mandor, 2055 m, 2 June 1982 (3), Peyton et al. 374 (MO); prov. Paucartambo, Koshpata, 2700 m, 4 July 1972 (3), Vargas C. 15490 (US). **Huánuco**: Huánuco–Tingo Maria road, Caripish, 2400 m, 10 Mar. 1982 (2), Gentry et al. 36153 (BG, MO). **Pasco**: prov. Oxapampa, Río Boguería, ca. 26 km from Oxapampa via Río Yamaquiqui, 2040 m, 3 June 1982 (3), D. N. Smith et al. 1832 (BG, MO); prov. Oxapampa, 5 km SE of Oxapampa, 1850 m, 9 Apr. 1983 (3), D. N. Smith 3663 (BG, MO); prov. Oxapampa, Huancabamba, Río Yanachaga, 2280 m, 26 May 1983 (3 fr), D. N. Smith et al. 4196 (BG, MO); prov. Oxapampa, Oxapampa–Villa Rica road, 29 Sep. 1983 (2 fr), D. N. Smith et al. 5340 (BG, MO); prov. Oxapampa, Río San Albert valley, E of Oxapampa, 2300 m, 4 July 1984 (st), D. N. Smith et al. 7606 (BG, MO); prov. Oxapampa, Yonachaga via Río San Daniel, 2500 m, 17 July 1984 (st), D. N. Smith et al. 7848 (BG, MO); prov. Oxapampa, Río Alberto valley, E of Oxapampa, slopes of Cord. Yonachaga, 2400 m, 23 July 1984 (st), D. N. Smith et al. 7974 (MO); prov. Oxapampa, Palmazá, 2100 m, 28 Sep. 1984 (2 fr), D. N. Smith 8555 (BG, MO).

5. **Coussapoa david-smithii** C. C. Berg, sp. nov.

**TYPE:** Bolivia. La Paz: prov. Sud Yungas, road Huancané–San Isidro, km 7, 2300 m, 13 Dec. 1989 (2 fr), D. N. Smith 13919 (holotype, MO; isotypes, BG, LPB). Figure 14.

**Coussapoa jutun-sachensii** similis, a qua differt e.g. stipulis glabris ramunculiscis foliatis.

Tree 13 m tall. Leafy twigs 4–8 mm thick, glabrous. Lamina oblong to subobovate, 11–22 × 4.5–12 cm, coriaceous, apex short-acuminate to subacute, base (sub)acute; both surfaces glabrous; lateral veins 4–5 pairs, basal pair (and mostly also other pairs) branched, usually departing from the midrib well above the base, reaching the margin above or at the middle of the lamina; petiole 2.5–6.5 cm long, glabrous; stipules 1.2–2.5 cm long, glabrous. Pistillate inflorescences unbranched (or branched); (common) peduncle 1.5–3 cm long, glabrous; head(s) 1 (or 2), hemispherical to subglobose, 0.8–1.2 cm diam. (in fruit); perianth (sub)glabrous. Interfloral bracts absent.

This montane species resembles the lowland Ec-

The epithet is chosen to commemorate the collecting activities of the late David N. Smith, who provided so much useful material to science.


Plurimus venis lateralibus ramosis et usque ad viginti capitulis in inflorescentia pistillata distincta.

Most lateral veins branched (furcate). Pistillate inflorescences with 10–20 flower heads, in fruit up to ca. 1 cm in diameter; common peduncle 3–6 cm long. Peduncle of staminate inflorescences 1.2–4 cm long.

In most of the collections of *Coussapoa villosa* the lateral veins are usually unbranched, except for the basal pair, and the pistillate inflorescences are unicapitate. However, in some lowland collections from Central America the pistillate inflorescences may have more than one flower head, occasionally up to four heads. The combination of multicapitate pistillate inflorescences and the commonly branched lateral veins, as found in the material listed above, justifies recognition of a distinct subspecies, apparently confined to a small area and occurring at altitudes between 1600 and 2200 m. This subspecies appears to be identical to the Late Pleocene leaf material from the Guasca Valley in Colombia, described and discussed by Wijninga and Kuhry (1993).

Recognition of subspecies *polycephala* may lead to reconsidering the rank of *C. duqueii* Standley (Berg et al., 1990), and possibly reducing it to another (sub)montane subspecies of *C. villosa*.

Paratypes. COLOMBIA. Cundinamarca: mun. Tena, 2200 m, 14 May 1983 (♀), Barrera et al. 62 (COL); between El Salto and El Colegio, 1470 m, 10 Mar. 1940 (♀), Cuatrecasas 8291 (COL); near Albán, Aug. 1962 (♀ fl-fr), Fernández-Peñalver F-3 (COL); mun. Tena, near Laguna Pedro Palo, 3 km N of Tena, 2080 m, 19 May 1952 (♀), Fernández-Pérez et al. 1438 (COL); Tena, Río Bogotá, below Santanderito, 1650 m, 15 Mar. 1986 (♀), Franco et al. 2410 (COL); mun. Tena, Laguna Pedro Palo, 2000–2100 m, 7 Mar. 1988 (♀), Franco et al. 2422A (BG, COL); Río Bogotá, 1600 m, 1939 (♀), Uribe-Urbez 364 (COL).

Tolima: near Juntas, (♀), Sapvedra s.n. (COL).

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New Taxa and Combinations in Moraceae and Cecropiaceae from Central and South America

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In connection with floristic treatments (Flora Mesoamericana and the Flora of Ecuador), a revision of the genus Cecropia, and less specific studies on Moraceae and Cecropiaceae of the Andean region,
several new taxa have been found in the material studied. Some new combinations have to be made in addition to those of Cecropia, Coussapoa, and Pourouma recently published in the Flora of Ecuador (Berg & Franco, 1993).

MORACEAE

1. Brosimum multinervium C. C. Berg, sp. nov.
   TYPE: Ecuador. Pastaza: road Coca-Auca, ca.

   115 km S of Coca, 4-6 km S of Rio Tigiino, 22-28 Feb. 1989 (infl.), Zak 3955 (holotype, QCNE; isotype, BG). Figure 1.

   Brosimo parinarioidi et B. utili affinis, divergens ab utraque venis lateralibus magis numerosis.

   Tree up to 40 m tall. Leafy twigs 3-5 mm thick, sparsely to rather densely brown-puberulous to whitish-pubescent. Lamina coriaceous, elliptic to oblong to (sub)ovate, 12-30 X 6-19 cm, apex shortly and abruptly acuminate, base cordate to truncate (to obtuse), margin entire, often + revolute; upper surface puberulous on the midrib, lower surface densely brown-puberulous to -subvelutinous on the veins; lateral veins (30-)40-50 pairs, often some of them furcate, tertiary venation for the greater part scalariform; petiole 0.5-1.5 cm long, densely brown-puberulous, epidermis flaking off; stipules 4.5-9 cm long, densely brown-puberulous to brown- to whitish-pubescent. Inflorescences solitary in the leaf axils, initially deflexed; peduncle 2-6.5 cm long, the lower part sparsely puberulous, the upper part densely minutely puberulous and with a few bracts, the uppermost part broadened; staminate inflorescences discoid to subturbinate, ca. 1 cm diam.; perianth lacking (?); stamen 1, filament ca. 0.5 mm long, anther ca. 0.2 mm long; pistillate inflorescences subglobose to subturbinate, 0.8-1.2 cm diam., with a single pistillate flower in the center; stigmas 1-2 mm long; bracts ca. 1 num diam., minutely puberulous.

   This new species is related to Brosimum parinarioides Ducke and B. utile (HBK) Pittier. It can be easily recognized by the great number of lateral veins ((30-)40-50 pairs). In the two related species the number of lateral veins varies between 12 and 32.

   Paratypes. ECUADOR. Pastaza: as the type locality, 7-9 Jan. 1989 (9), Hurado et al. 1300 (BG, MO, QCNE),

Figure 1 (left). Brosimum multinerrrium C. C. Berg. Leafy twig with inflorescence (Hurtado et al. 1300). Figure 2 (right). Ficus carchiana C. C. Berg. -1. Leafy twig with inflorescence (Rubio et al. 661). -2. Staminate flower and stamens (Pennington et al. 10501). -3. Long-styled pistillate flower and interfloral bract (Pennington et al. 10501).
Novon


2. Ficus carchiana C. C. Berg, sp. nov. TYPE: Ecuador. Carchi: below Maldonado, 1300 m, 9 Oct. 1982, Pennington et al. 10501 (holotype, QCA; isotypes, BG, K, QCNE). Figure 2.

Ceteris speciebus consubgeneribus cum stipulis longis (ca. 10 cm) distinguenda, paginis latioribus et bracteis basalisibus grandibus.

Tree up to 25 m tall. Leafy twigs 8-10 mm thick, glabrous. Lamina coriaceous, elliptic to ovate, 18-30 x 11-21 cm, apex obtuse to subacute to subacuminate, base rounded to subcord(ul)ate; upper surface glabrous, lower surface with sparse brown elongate pluricellular hairs on (the lower parts of the) main veins, white capitate pluricellular hairs in the areoles; lateral veins 14-20 pairs, tertiary venation reticulate; petiole 3-4.5 cm long, glabrous; stipules 10-11 cm long, glabrous, drying dark brown. Figs solitary in the leaf axils, subses- sile; basal bracts 3, ca. 10-12 mm long; receptacle ellipsoid to subglobose, when dry ca. 3.5-4 X 2-3 cm, in fruit up to 5 x 4.5 cm (when fresh 6.5 X 5.5 cm), puberulous to subhispidulous; wall rather thick; ostiole ca. 1 mm diam. in plane or apiculate.
apex of the receptacle. Staminate flowers pedicellate: perianth tubular, ca. 3.5 mm long, 3-4-lobed, glabrous. Pistillate flowers pedicellate or sessile; tepals 4, free, lanceolate, ca. 2.5 mm long, sparsely minutely puberulous; stigmas 2. Interfloral bracts numerous, lanceolate, 2-2.5 mm long, sparsely minutely puberulous.

Ficus carchiana belongs to subgenus Pharmacosycea. It can be distinguished from other species of this subgenus by the broad and thickly coriaceous leaves and the long stipules, both drying brownish instead of greenish, as often occurs in subgenus Pharmacosycea.

The species is apparently a component of submontane wet forest.


3. Ficus cotinifolia Kunth var. hondurensis

This variety is distinct from the typical variety in the pedunculate figs.


As a consequence of the lectotypification, the name will be transferred into the synonymy of Coussapoa villosa Poeppig & Endlicher, in accordance with the suggestion by Standley (1937). The other part of the type collection, a leafless twig with some figs, probably belongs to Ficus turrialbana W. Burger (Burger, 1977).

5. Ficus osensis C. C. Berg, sp. nov. TYPE: Cos-
1988 (fl), Chavarrta Dzaz 307 (holotype, MO).

Figure 3.

Fico americanae probaliter affinis, a qua differt stipulis
satis longioribus et ficis subsessillis.

Tree up to 30 m tall. Leafy twigs 1.5-3 mm thick,
glabrous. Lamina 6.5-12 X 1.7-4.2 cm, oblong to
lanceolate, apex acuminate, base obtuse; both sur-
faces glabrous; lateral veins 10-16 pairs, the basal
pair unbranched, tertiary venation reticulate; peti-
ole 0.4-1.8 cm long; stipules 0.9-2 cm long, gla-
brous, drying blackish to dark brown. Figs in the
leaf axils; peduncle up to ca. 0.2 mm long; basal
bracts 2, 1.5-2 mm; receptacle 0.6-0.7 cm diam.
(when dry), globose, glabrous, at maturity green (?);
ostiole ca. 1.5 mm diam., umbonate.

Ficus osensis belongs to subgenus Urostigma and
is probably related to F americana Aublet, from
which it differs in its leaf venation, the relatively
long stipules, and the subsessile figs.
The state of the type specimen did not allow dissection of the fig to describe the floral structures. Paratype. COSTA RICA. Puntarenas: cantón Osa, Campanario o Playa San Josecito, Sierpe, 13 Oct. 1990 (st), Harmon 148 (MO).

6. Ficus rieberiana C. C. Berg, sp. nov. TYPE: Ecuador. Carchi: Reserva Awa, 1500 m, 16-30 Nov. 1990, Rubio et al. 1068 (holotype, QCNE; isotype, BG). Figure 4.

Ceteris speciebus consubgeneribus distinguenda, paginis chartaceis vel subcoriaceis subter indumentis densis; vena submarginali distincta venas laterales connectenti; maculis glandulosis ceraceis irregulariter formatis et vel locatis.

Tree up to 25 m tall. Leafy twigs 2-4 mm thick, white hirtellous. Lamina chartaceous to subcoriaceous, oblong to lanceolate to subobovate, 6-24 X 2-9 cm, acuminate to subcaudate, base acute to subobtuse; upper surface glabrous, lower surface densely white hirtellous to subtomentose on the veins, sunken capitate pluricellular hairs in the areoles; lateral veins ca. 15-25 pairs, connected by rather distinct submarginal veins, lower lateral veins rather weak and usually running perpendicular to the midrib, tertiary venation reticulate; waxy glandular spots irregularly extended along the midrib, or (also) additional spots up to the 5th pair of lateral veins; petiole 0.7-2.5 cm long, hirtellous; stipules 1-2.5(-4) cm long, sparsely or densely hairy. Figs solitary or in pairs in the leaf axils; peduncle 0.3-0.6 cm long, sparsely puberulous; basal bracts 3, ca. 1-1.5 mm long, glabrous; receptacle when dry ca. 0.8-1.2 cm diam., often very short (= ca. 1 mm long) stipitate, puberulous to subhirtellous, maculate; ostiole 0.5-1 mm diam. in the apiculate apex of the receptacle. Staminate flowers pedicellate; tepals 4, ca. 2.5 mm long, basally connate, glabrous; stamens 2, anthers lanceolate to oblong, ca. 1.8 mm long. Pistillate flowers pedunculate or sessile; tepals 4, ca. 1.5 mm long, basally connate, glabrous; stigma 1, or in short-styled flowers sometimes a very short second stigmatic branch. Interfloral bracts few, oblong to lanceolate, ca. 1.5 mm long, glabrous.

Ficus rieberiana belongs to subgenus Pharmacosycea. It can be distinguished from other species of this subgenus by the rather dense indumentum on the veins of the lower surface of the chartaceous to subcoriaceous lamina and the distinct submarginal veins connecting the lateral veins, and irregular number, shape and/or position of the waxy glandular spots along the midrib beneath. Species of subgenus Pharmacosycea normally have two sim-
ilar glandular spots at the base of the midrib beneath. A characteristic feature of subgenus Pharmacosycea is the presence of two stigmas; in E rieberiana, however, the style bears only one stigma.

Gentry et al. 24343 (BG, HUA) [from Colombia. Chocó: Río Yuto, between IUor6 and La Vuelta, 100 m, 18 Jan. 1979 (st)] probably belongs to this species. The lower lateral veins are somewhat different from the collections listed below and, according to the label, it has figs turning red, an unusual phenomenon in subgenus Pharmacosycea.

The epithet rieberiana is chosen to commemorate the contribution of Bjarne Rieber to the establishment of university greenhouse research facilities for Ficus at the Norwegian Arboretum at Store Milde, Norway.

Paratypes. ECUADOR. Carchi: canton Tulcan, Tobar Donoso, 650-1000 m, 19-28 June 1992, Ttpaz et al. 1358 (QCNE) and 1546 (QCNE). Pichincha: Maquipucuna, 5 km E of Nanegal, 1550 m, 11 Feb. 1991 (st), Gentry et al. 73216 (MO); Reserva Forestal ENDESA, Rio Silanche, 10 km N of km 113 on road Quito-Puerto Quito, 650-700 m, 7 Dec. 1984, Jaramillo 7411 (GB, MO, NY, QCA); old road Quito-Santo Domingo de los Colorados, km 59, Reserva Floristica-Ecologica "Rto Guajalito." 1800-2000 m, 24 Sep. 1988, Zak & Jaramillo 3829 (BG, JUAM, MO).


In the revision of Maquira (Berg, 1972) five species were distinguished within the genus. The two closely related taxa, M. guianensis and M. costaricana, could be readily told apart, both morphologically and geographically. However, more recent collections made in western Ecuador and in the Upper Amazon Basin reduced considerably the geographical gap between the two taxa, as well as their morphological distinctness, as can be perceived from the descriptions and distributions of the two taxa presented below. These aspects support treatment of the two taxa at the rank of subspecies.

7a. Maquira guianensis Aublet subsp. guianensis

Tree up to 25 m tall. Involucral bracts densely brownish puberulous. Peduncle of the staminate inflorescence 0.5-2 cm long. Peduncle of the pistillate inflorescence 0.5-1.6 cm long; pistillate flowers usually more than 20 (up to 50). Fruiting perianth subobovoid, often distinctly ribbed, brown velutinous, with a truncate apex.
Distribution. Guianas, eastern Venezuela (Bo-
livar), and Amazonian Brazil (AmapA, Para, Mato
Grosso, and Roraima).

7b. Maquira guianensis Aublet subsp. costarici-
cana (Standley) C. C. Berg, comb. et stat. nov.
Basionym: Perebea costaricana Standley, Publ.
Maquira costaricana (Standley) C. C. Berg,
Rica. Lim6n: near Guapiles, Standley 37037
(holotype, US).

Tree up to 15(-30) m. Involucral bracts (rather)
sparsely whitish puberulous. Peduncle of the sta-
minate inflorescence 0.2-0.8 cm long. Peduncle of
the pistillate inflorescence up to 0.8 cm long; flow-
ers ca. 10-35; fruiting perianth ellipsoid to obo-
void, not or hardly ribbed, (sub)glabrous or sparsely
to densely yellowish puberulous, with an obtuse to
rounded apex.

Distribution. Nicaragua through western Co-
lombia to western Ecuador, and in the Upper Am-
azon Basin, extending to eastern Venezuela (Bol-
livar).

In western Ecuador the fruiting perianth of Ma-
quira guianensis subsp. costaricana is often sparse-
ly to densely yellow puberulous, and some of the
specimens from this area (Rfo Palenque Biological
Station) have been distributed under the name M.
grandis Gentry. In Central America the pistillate
inflorescences often contain more than 20 flowers,
while in western Ecuador and east of the Andes the
inflorescences usually contain less than 20.

In Central America and western Colombia, the
trees appear to start flowering when small, a feature
8. Naucleopsis capirensis C. C. Berg, sp. nov.
   TYPE: Panama. Panama: W of Interamerican Hwy., near Capira, ca. 60 km W of Panama City, on road to Cerro Campana, ca. 800 m, 21 Mar. 1985 (d), McPherson 6913 (holotype, MO; isotypes, BG, BM, CR, MEXU, PMA).

   Naucleopsis nagae affinis, a qua differt e.g. absentia bractearum in pedunculis staminarum inflorescentarum, sepalis brevioribus pistillatatum florum et stipulis brevioribus.

   Tree up to 15 m tall. Leafy twigs 2-3 mm thick, (sparsely) puberulous, periderm flaking off. Lamina oblong, (5-)8-15(-21) X (1.7-)3-5.5(-7.5) cm, coriaceous, apex acuminate to subcaudate, base obtuse to rounded, margin (in dry material) often revolute; upper surface glabrous or sparsely puberulous at the base of the midrib, lower surface puberulous on (the base of) the midrib; lateral veins 10-16 pairs, tertiary venation reticulate; petiole 0.2-0.8 cm long, epidermis flaking off; stipules 0.3-1 cm long, puberulous, caducous. Staminate inflorescences in the leaf axils and below the leaves, ca. 1-1.5 cm diam.; peduncle 0.2-0.3 mm long, not bracteate; involucral bracts in 4-5 series, broadly ovate to semicircular to suborbicular, the outer ones minutely puberulous, the inner ones only ciliolate; perianth ca. 2 mm long, tepals 2-7, often cucullate, minutely puberulous in the upper part; stamens 3-5, filaments 0.6-0.8 mm long, anthers oblong to elliptic, 0.7-1 X 0.3-0.4 mm. Pistillate inflorescences 1.5-3 cm, in fruit (3-)5.5-9 cm diam., subsessile or peduncle up to 0.6 cm long; involucral bracts in 6-8 series, broadly ovate, minutely puberulous to submuriculate, the inner ones up to 1.5 cm long; flowers numerous; free parts of the tepals spinelike to pyramidate, minutely puberulous to submuriculate; style 2-5 mm long, stigmas filiform, 4-7 mm long. Inflorescences 4-7(-10) cm diam., free parts of the tepals up to 1 cm long.

   Paratypes. COSTA RICA. Alajuela: Reserva de Arenal, Rfo Penas Blancas, Quebrada Aguagata, Finca "Villalobos," 1000 m, 20 Apr. 1990 (st), Bello et al. 2218 (MO); Reserva Forestal San Ramón, Campamento Rfo Lorenco, 900-1000 m, 2 Sep. 1989 (st), Gdmez-Laurito 11828 (F); San Carlos, Pefias Blancas, 10 July 1985 (9

The cited collections from Costa Rica and Panama are quite uniform. Several specimens from Co-

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Iombia and Ecuador probably belong to this species and may represent two subspecies:

COLOMBIA. Antioquia: mun. Frontino, cgto. Nutibara, Rfo Cuevas, 1800-2000 m, 17 Mar. 1984 (6), D. Sanchez et al. 60 (BG, MEDEL), 1700 m, 18 Mar. 1985 (9 fr), D. Sanchez et al. 166 (BG, MEDEL); mun. Frontino, vrda. Venados, Parque Nacional Natural "Las Orquideas," 880 m, June 1988 (3 juv.), H. Triana et al. 56 (COL). These specimens differ from the Central American ones in: (1) the trees becoming up to ca. 35 m tall, (2) the fully mature infructescences becoming probably about 10 cm diam., with the free parts of tepals becoming up to 2.5 cm long, and (3) the fruits ca. 2.5 x 1.5 cm. The stigmas are conical and similar to those found in the col-
lections cited below. The petiole can be up to 1.5 cm long. The staminate inflorescences are subsessile.

COLOMBIA. Nariño: mun. Barbacoas, cngto. Altaquer, vrd. El Barro, Reserva Natural Rfo Nambí, 1325 m, 5 Dec. 1993 (st), Betancur et al. 4631 (COL). Valle: Alto Rio Anchicaya, Yatacú, 17 July 1984 (9 fl), Gentry & Monsalve 48260 (BG, JUAM, MO). ECUADOR. Carchi: Awa Reserve, Gualp Chico area, 1330 m, 20 Jan. 1988 (9 fl-fr), Hoover et al. 2827 (BG, QCA); cant6n Tulcan, Gualp Alto, 1800 m, 15-28 June 1991 (d), Rubio et al. 1723 (QCNE), (9 fl-fr), Rubio et al. 1746 (QCNE); cant6n Tulcan, Reserva Indígena Awa, Gualp Medio, 900 m, 21 May 1992 (9), Quelal et al. 576 (QCNE); cant6n Tulcan, Tobar Donosom, 650-1000 19-28 June 1992 (), paz et al. 1309 (QCNE), (9 fr), 7ipaz et al. 1362 (QCNE). Carehi/Esmeraldas: near Lita, 20 May 1987 (9 fl-fr), van der Werff 9525 (BG, MO, QAME) and 9527 (AAU, BG). Esmeraldas: cant6n San Lorenzo, Reserva Indígena Awa, Rio Mira, 10 km W of Alto Tambo, 16-26 Mar. 1991 (6), Rubio et al. 1268 (BG, QCNE); cant6n San Lorenzo, Reserva Indígena Awa, Ricaurte, Balsarefto, Rfo Palabí, 15-29 Apr. 1992 (st), Rubio et al. 1409 (BG). These specimens differ from the Central American ones in: (1) the free parts of the tepals being distinctly broadened at the base, (2) the conical stigmas, (3) the narrower lamina (lanceolate to oblong), and (4) longer petioles. In addition, the inflorescences and infructescences appear to be smaller, down to 0.5 cm and ca. 2.5 cm in diameter.

Further exploration may provide material eliminating the morphological discontinuities between the groups of specimens cited above.

Naucleopsis capirensis is related to N. naga, from which it differs, e.g., in the absence of bracts on the peduncle of the staminate inflorescences, the shorter tepals of the pistillate flowers, and the shorter stipules.

9. Naucleopsis herrerensis C. C. Berg, sp. nov.


Folia margine in parte plus minusve revoluto, involuto basi versus; venae laterales 12-26 binatae; stipulae 1-1.8 em longae.

Tree up to ca. 25 m. Leafy twigs 1.-3.5 mm thick, sparsely to densely appressed-puberulous, periderm (in older parts) flaking off. Lamina lanceolate, 6.5-24 X 1.3-6 cm, coriaceous, apex acuminate to subacute, acumen often acute, base acute to obtuse, margin partly revolute, but always at the base involute; both surfaces glabrous; lateral veins 12-26 pairs, tertiary venation reticulate or
partly scalariform; petiole 0.5-1.8 cm long, appressed-puberulous, epidermis often flaking off; stipules 1-1.5 cm long, (brownish) appressed-puberulous. Staminate inflorescences on distinct spurs in the leaf axils, up to 6 together, ca. 1 cm diam.; peduncle 0.2-0.3 cm long; involucral bracts in ca. 5 series, broadly ovate to semicircular to suborbicular, appressed-puberulous; perianth 1.5-2 mm long, tepals 4-5, free or basally connate; stamens 3-4, filaments 0.3-0.4 mm long, anthers oblong to elliptic, 0.6-0.8 X 0.3-0.4 mm. Pistillate inflorescences (juvenile!) below the leaves. Infructescences (immature!) ca. 6 cm diam., sessile; involucral bracts in ca. 6 series, broadly to narrowly ovate, puberulous; flowers numerous; free parts of the tepals aculeate to subulate, up to 1 cm long, minutely puberulous to subhispidulous; style 5-6 mm long, stigmas subulate, 2-3 mm long.

Naucleopsis herrerensis can be recognized by the relatively narrow leaves with the margin (partly) more or less revolute, but toward the base distinctly involute. It is possibly related to N. ulei (Warburg) Ducke, resembling in vegetative parts the small-leaved form of this species occurring in the Middle and Lower Amazon Basin (see below). However, it is clearly different in the shape and size of the staminate inflorescences, the absence of very short internodes, and the distinctly loop-connected lower lateral veins of the lamina.


Naucleopsis humilis C. C. Berg, sp. nov.  

Naucleopsis ulei similis, a qua differt, e.g. statura parva arborum, stipulis inflorescentiisque minoribus. Treelet up to 3 m tall. Leafy twigs 3-5 mm thick, appressed-puberulous, periderm flaking off. Lamina coriaceous, subobovate to oblanceolate, (9.5-)20-45 x (2-)5-10 cm, apex subcaudate to acuminate, base subacute to obtuse (to rounded), margin entire; upper surface glabrous, lower surface puberulous on the base of the midrib; lateral veins ca. (15-)25-30 pairs, tertiary venation largely scalariform to largely reticulate; petiole 0.5-1.5 cm long, striate, yellowish appressed-puberulous, subpersistent or caducous. Staminate inflorescences on up to 0.4-cm-long spurs, ca. 0.2-0.3 cm diam.; peduncle ca. 0.2 cm long, bracteate; involucral bracts in ca. 5 series, broadly ovate to oblong, the inner ones glabrous; flowers 4-6; perianth 2-2.5 mm long, tepals 3-5, basally connate, glabrous; stamens 1 or 2, filaments 3-3.5 mm long, thick, anthers elliptic, 0.5-0.6 X 0.3-0.4 mm. Pistillate inflorescences solitary in the leaf axils, ca. 1 cm diam., sessile; involucral bracts in ca. 6 series, broadly ovate, minutely puberulous; flowers few; free parts of the tepals subulate to acutate, 0.3-0.6 cm long, minutely puberulous; stigmas vittiform, ca. 3 mm long. Infertescences subglobose, 2-3 cm diam., at maturity yellow; free parts of the tepals 0.5-0.7 cm long; fruits 3-6, ca. 0.6-0.7 cm long.

Naucleopsis humilis is apparently an element of periodically inundated riverine forest. It is closely related to N. ulei (Warburg) Ducke, from which it differs in the small size of the trees, the smaller
stipules, and the smaller inflorescences.


Two subspecies can be recognized:

1 la. Naucleopsis naga Pittier subsp. naga
Lamina at the lower surface glabrous and the smaller veins plane; stipules up to 3.5 cm long.

Distribution. Honduras to Colombia: Antioquia, Chocó, and Valle.
Pagina inferna folii puberula vel subhispidula (tum scabridula); venae parviores plus minusve prominentes; stipulae usque ad 1.5 cm longae.

Lamina at the lower surface puberulous or subhispidulous (and then scabridulous) and the smaller veins prominent; stipules up to 1.5 cm long.

Figure 7 (left). Naucleopsis humilis C. C. Berg. -1. Leafy twig with pistillate inflorescence (Gentry et al. 61645). -2. Parts of twigs with stipules only (Vdsquez et al. 5173). -3. Leafless twig with staminate inflorescences (Neill et al. 6663). --4. Staminate flower (Neill et al. 6663). Figure 8 (right). Naucleopsis straminea C. C. Berg. Leafy twig with fruiting pistillate inflorescence (Gentry et al. 36924).

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2200 m, Palacios et al. 9691 (QCNE). Cotopaxi: road Quevedo-Latacunga, 3 km E of El Palmar, 800 m, 5 Apr. 1980 (d), Dodson & Gentry 10240 (BG, MO, QCNE). Esmeraldas: Rfo Lita, 4.5 km WNW of Lita, 600 m, 8 May 1987 (6), Daly & Aceedo R. 5150 (BG, MO, NY, QCA).

The two subspecies occur sympatrically in Ecuador and Colombia. The differentiation into an entity with glabrous leaves and one with leaves being hairy beneath is similar to the situation found in N. ulei. However, in N. naga the two morphological entities are more different than in N. ulei, and may prove to be distinct at the species level.

12. Naucleopsis straminea C. C. Berg, sp. nov.
   TYPE: Colombia. Choc6: 31 km E of Quibd6, ca. 14 km E of Tutunendo, 300-450 m, 14 June 1982 (9 fl-fr), Gentry et al. 36924 (holotype, COL; isotypes, BC, JUAM, MO). Figure 8.

Naucleopsis krukovii affinis, a qua differt in numero parviore venarum lateritalium et partibus longioribus liberales tepalorum florum pistillorum.

Tree up to 15 m tall. Leafy twigs 1.5-2.5 mm thick, puberulous to hirtellous, periderm flaking off. Lamina elliptic to oblong to subobovate, 6-15 X 1.8-5 cm, subcoriaceous, apex (sub)caudate, base
(sub)acute; both surfaces glabrous; lateral veins 8-13 pairs, tertiary venation reticulate; petiole 0.3-0.8 cm long, puberulous, epidermis flaking off; stipules 0.5-1 cm long, sparsely puberulous, subpersistent or caducous. Pistillate inflorescences in the leaf axils or just below the leaves, 1.2-2 cm diam., subsessile; involucre with broadly ovate to oblong bracts in ca. 5 rows, the inner ones scarious and subglabrous (and straw-colored when dry); flowers ca. 5-10; free parts of the tepals subulate, sparsely minutely puberulous, ca. 0.3-0.6 cm long (and straw-colored when dry); stigmas ca. 2 mm long. Infructescences subglobose, 2.5-4 cm diam.; free parts of the tepals up to 1 cm long, subulate (to aculeate).

Auculeopsis straminea is related to the Amazonian N. krukauii (Standley) C. C. Berg, from which it differs in the smaller number of lateral veins (8-13 vs. 15-23 pairs) and the longer and more slender free parts of the tepals of the pistillate flower (up to at least 1 cm and subulate vs. to 0.7 cm and conical).


Two subspecies can be recognized.

13a. Naucleopsis ulei (Warburg) Ducke subsp. ulei

Lamina at the lower surface glabrous (except for the minute brown or whitish pluricellular trichomes) or only hairy at the base of the midrib; base cordate to subacute; lower lateral veins often not distinctly loop-connected, particularly if the base of the lamina is rounded to subacute.

Distribution. Upper Amazon Basin (Brazil, Ecuador, Peru, and Bolivia).

This taxon may include Naucleopsis amara Ducke (recognized as a distinct species by Berg (1972)) and may represent a form from the Lower and Middle Amazon Basin with relatively small leaves (mostly up to 30 cm long) and often with a rounded to subacute base. This form gradually passes into the more typical form from the Upper Amazon Basin with larger leaves (mostly up to 50 cm long) and often with a rounded to cordate base.
13b. Naucleopsis ulei (Warburg) Ducke subsp. puberula C. C. Berg, subsp. nov. TYPE: Panama. Panama: Cordillera de San Bias, ca. 20 km NE of Chepo, 12 Dec. 1973 (9 fl), Berg & Nee 313 (holotype, MO; isotypes, AAU, BG).

Pagina inferna folii veneris puberulis vel hispidulis (tum scabridulis); basis cordata vel rotundata; venae laterales infernae distincte brochidodromae.

Lamina at the lower surface (sparsely) puberulous or subhispidulous (and then scabridulous) on the veins; base cordate to rounded (to obtuse); lower lateral veins distinctly loop-connected.

dencia, 11 Feb. 1971 (9 fl), Soejarto et al. 2760 (COL).

14. Naucleopsis velutina C. C. Berg, sp. nov.


Naucleopsi macrophyllae et N. riparui affinis, divers-gens ab utraque stipulis petioliisque brevibus; inflorescen-tis pistillatis partibus liberos tepalorum dispersis.

Tree up to 25 m tall. Leafy twigs 3-4 mm thick, brown (sub)velutinous. Lamina coriaceous, oblong, 22-40 X 8-14 cm, apex acuminate, base obtuse to rounded; upper surface sparsely puberulous on the midrib, lower surface brownish (sub)velutinous on the veins; lateral veins 18-26 pairs, tertiary vena-tion largely scalariform; petiole 0.5-1 cm long, brown velutinous; stipules 0.5-1 cm long, densely brownish to whitish hirtellous to subvelutinous. Stan-nate inflorescences 2-5 together in the leaf axils and below the leaves, 0.8-1.3 cm diam.; peduncle 0.3-0.5 cm long, bracteate; involucral bracts in ca. 7 sries, broadly ovate to semicircular, densely yellowish to brownish puberulous to subvelutinous; perintha ca. 2.5-3 mm long, tepals 4-6, basally

connate (or free), densely yellow hairy. Infrec-
tessences 6-8 cm diam., (sub)sessile; involucral bracts in 6-series, ovate to lanceolate. Yellow stri-gose to subsericeous, the inner ones up to 2 cm long; flowers/fruits numerous; free parts of the te-pals dispersed, aculeate, yellow strigose to subsericeous; style ca. 4 mm long, stigmas 2-3 mm long, long-tongue-shaped.

N. velutina is related to N. mawrophylla Miquel and N. riparia C. C. Berg. It differs from both in the short stipules and petioles. The pistil-late inflorescences are clearly different in the ab-sence of distinct perianths, the slender aculeate, yellow subsericeous, loosely arranged free parts of the tepals, and the short stigmas.

Paratype. PERU. Loreto: prov Maynas, Quebrada Yan-omono, Rio Amazonas, above mouth of Río Nape, 5 Nov. 1979 (9 fr), Gentry et al. 27466 (BG, MO).


The description of Trophis glabrata is based on two sterile collections (Liebmann 14274 and 14276), both belonging to the Pseudolmedia spe-cies treated as Pseudolmedia oxyphyllaria Donnell Smith in Berg (1972: 31).

16. Soroeea jaramilloi C. C. Berg, sp. nov. TYPE: Ecuador. Pichincha: road Quito-Puerto Quito, km 113, 10 km N of road, Reserva For-estal ENDESA, 22 Aug. 1984 (9 f-fr), Jar-millo 7055 (holotype, QCA; isotypes, AAU. GB, MO. QCA). Figure 9.

Laminis grandibus, inaequalateralibus el inflorecvntiis pistillatis longis distincta.

Tree up to 20 m tall. Leafy twigs 2-5 m thick, minutely puberulous, the older parts conspicuously lenticellate. Lamina elliptic, (5-)10-35 x (3-)7-17 cm, inequalateral. (sub)coriaceous, apex abruptly acuminate, base rounded to obtuse at the broad side, acute to obtuse at the narrow side. mar-gin entire; upper surface minutely puberulous, 1 densely so on the main veins, lower surface mi-nutely puberulous on the (main) veins; lateral veins 8-10 pairs, tertiary venation reticulate or partly scalariform; petiole (1.5-)2.5-3.5(-5) cm long, mi-nutely puberulous; stipules 0.3-0.8 cm long, pu-berulous. Staminate inflorescences in the leaf axils,
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pendulous, ca. 15-45 cm long, including a 0.5-1.8-cm-long, sparsely puberulous peduncle; rachis sparsely puberulous; flowers spaced, broadly sessile; perianth 4-parted, 2.5-3 mm high, sparsely ciliolate; stamens 4, isomorphic or anisomorphic, at anthesis straight or slightly incurved, filaments 0.2-0.6 mm long, anthers 0.8-1.2 x 0.7-1.2 mm, connective broad, not apiculate. Pistillate inflorescences in the leaf axils or below the leaves, pendulous, ca. 6-17 cm, in fruit up to 40 cm long; peduncle 0.5-3 cm long, minutely puberulous; rachis minutely yellowish puberulous; flowers ca. 20-60; pedicel 0.1-0.2 cm, in fruit up to 1.5 cm long, yellowish puberulous; perianth 2-2.5 mm high, minutely puberulous, in the upper part ruminate; stigmas ovate, ca. 0.5 mm long. Fruiting perianth ellipsoid to globose, 2-2.5 cm long, black.

tinela, Montanas de Ila, road Patricia Pilar-24 Mayo, km 12, 6 Apr. 1980 (d), Dodson et al. 10278 (MO), 23 May


Some species of Sorocea (S. cufodontisii W. Burger, S. faustiana Cuatrecasas, S. hirtella Mildbraed, and S. pubivena Hemsley) that have been treated as distinct previously (Berg & Akkermans, 1985), have proven to belong to a single taxonomical entity with at least three subdivisions.

17a. Sorocea pubivena Hemsley subsp. pubivena

Leafy twigs puberulous to hirtellous. Lamina subcoriaceous to chartaceous, margin distinctly dentate to denticate or (especially if the lower lamina surface is sparsely puberulous) entire; upper surface minutely puberulous on the midrib, lower surface hirtellous or densely to sparsely patent-puberulous. Pistillate inflorescences in fruit up to 20 cm long; flowers ca. 15-60(-100). Fruiting perianth ellipsoid to (sub)ovoid to subglobose, 1-1.4 X 0.8-1.2 cm, (partly) densely puberulous, distinctly pedicellate.

Distribution. Nicaragua to western Panama.


Leafy twigs sparsely appressed- (to patent-)puberulous. Lamina subcoriaceous to coriaceous, margin usually entire; upper surface minutely puberulous on the midrib or entirely glabrous, lower surface sparsely appressed- (or patent-)puberulous
on the main veins. Pistillate inflorescence in fruit up to 10 cm long; flowers ca. 5-25; fruiting perianth (sub)globose, 1-2.5 X 1-2 cm, subglabrous, mostly distinctly pedicellate.

Distribution. Upper Amazon Basin, Guyana, eastern and northern Venezuela, northern and western Colombia, eastern Panama, and northwestern Ecuador.

The material from Guyana, eastern Venezuela, and the adjacent parts of Brazil has laminas completely glabrous above. The fruiting perianth tends to be somewhat smaller than elsewhere in the range of distribution.

17c. Sorocea pubivena Hemsley subsp. hirtella (Mildbraed) C. C. Berg, comb. et stat. nov.


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Leafy twigs whitish to brownish subhirsute to hirtellous. Lamina chartaceous to subcoriaceous (or coriaceous), margin entire (or obscurely) dentate to denticulate; upper surface minutely puberulous on the midrib; lower surface (rather) densely hirtellous to puberulous on the veins or at least on the midrib; lateral veins often connected with a slightly arcuate submarginal vein. Pistillate inflorescences in fruit up to 10 cm long; flowers 3-15(-25). Fruiting perianth usually subglobose, sometimes ovoid, subcylindrical or oblate, 1-2(-2.5) X 1-2(-2.5) cm, puberulous to hirtellous, sometimes subsessile.

Distribution. Upper Amazon Basin: Peru, Ecuador, Colombia, Venezuela, and adjacent parts of Amazonian Brazil.

Taking into account the total morphological variation within subspecies hirtella and subspecies oli-
gotricha, the differences between the two taxa seem to be quite small. It is, therefore, noteworthy that in a locality in Ecuador (Rio Cuyabeno, Laguna Grande) the two taxa occurred side by side and were in flower simultaneously, yet intermediates were lacking. Another difference between the two taxa in that locality could be that the subspecies hirtella starts flowering earlier, as much smaller trees, than subspecies oligotricha. Whether this species-like behavior can also be found in other regions where the ranges of the two taxa overlap is not known, nor whether this might represent a case (in Moraceae and other families) in which (infra-specific) entities are morphologically clearly distinct in one area, but intergrade in another.

18. Sorocea ruminata C. C. Berg, sp. nov.
   TYPE: Panama. Darien: Parque Nacional Darien, between Campamento Casa Vieja and Cerro Sapo, 22 May 1991 (9 fl-fr), Herrera et al. 975 (holotype, MO; isotypes, BG, BM, CR, MEXU, PMA). Figure 10.
   Soroceae affini affinis, a qua differt, e.g. marginibus folii semper integris, floribus sessilibus sub anthesi et perianthio statu fructifero ruminato glabratoque.
   Shrubs or trees up to 12(-20) m tall. Leafy twigs 1-2.5 mm thick, sparsely minutely puberulous. Lamina oblong to elliptic (to lanceolate), 3.5-17 X 1.5-6.5 cm, broadest at or above the middle, inequilateral, coriaceous, apex acuminate, base acute to rounded, margin entire; upper surface minutely puberulous on midrib, lower surface sparsely, minutely puberulous on the (base of the) midrib; venation (almost) plane above, prominent beneath; lateral veins 8-12 pairs, tertiary venation reticulate (or tending to scalariform); petiole 0.3-0.8 cm long, 1-2 mm thick, (minutely) puberulous; stipules 0.3-0.5 mm long, (minutely) puberulous, caducous. Staminate inflorescences patent (?), 0.8-4.5 cm long, including the 0.1-0.2-cm-long, puberulous peduncle; flowers rather crowded to disperse, narrowly to broadly sessile; perianth 4-parted, 1-1.5 mm high, ciliolate, outside sparsely minutely puberulous; stamens (3-)4, straight, isomorphic, filaments 0.5-1.2 mm long, anthers ca. 0.3-0.7 X 0.4-0.7 mm, connective broad, apiculate. Pistillate inflorescences patent (?), 0.5-3 cm, in fruit up to 5 cm long, including the 0.1-0.8-cm-long, puberulous peduncle; rachis sparsely, minutely puberulous; flowers 3-12, (sub)sessile, in fruit up to 1 cm long, pedicellate, pedicel (very) sparsely hispidulous to minutely puberulous; perianth ca. 2 mm high, glabrous, the upper part hemispherical to broadly ovoid; stigmas tongue-shaped, ca. 1 mm long, coarsely papillate. Fruiting perianth subglobose, ca. 1-1.5 X 1-1.5
cm, with the apical part discoid and the lower part with a ruminate, almost glabrous surface.

Sorocea ruminata differs from S. affinis Hemsley in the consistently entire leaf margins, the flowers being sessile at anthesis, and the ruminate and glabrous fruiting perianth. The inflorescences are more compact and the lamina more coriaceous than in S. affinis. The fruiting perianth is sometimes covered by white mycelium, as found in several other Sorocea species.

Most of the material referred to this new species has been initially identified (Berg & Akkermans, 1985) as S. faustiana Cuatrecasas, which proved to be a synonym of Sorocea pubivena subsp. oligotricha (Akkermans & C. C. Berg) C. C. Berg (see above).

Paratypes. PANAMA. Canal Zone: Barro Colorado Island, 1960 (d), Ebinger 161 (MO). Coce: road to Celestino, 12 mi. from Llano Grande, 16 Dec. 1983 (6), Churchill et al. 4117 (MO). Colon: Santa Rita Ridge road, between Transisthmian Hwy. and Agua Clara, 11 Dec. 1973 (st), Berg et al. 302 (U) and 309 (BG, U); Santa Rita Ridge, E of Transisthmian Hwy., 16 Dec. 1972 (d), Gentry 6554 (NY); Santa Rita Ridge, E of Panama-Col6n Hwy., 13 May 1986 (9 fl-fr), McPherson 9166 (BG, MO). Darien: Cerro Pirre, 4 Aug. 1967 (9 fr), Bristan 1231 (MO, US); Manene, mouth of Rio Cuasi, 28 Apr. 1968 (9 fl), Kirkbride et al. 1393 (MO, NY); Cerro Pirre, above Renare camp, 28 July 1988 (9 fl-fr), McPherson 12640 (BG, BM); Rio Tuquesa, lower Tuquesa mining camp "Charco Chiva," 5 July 1975 (9 fl-fr), Mor 6984 (BG, MO, U); Rio Tuquesa, middle Tuquesa mining camp "Charco Peje," 8 July 1975 (9 fr), Mori 7033 (MO, PMA); near Cana, 23 June 1959 (9 fr), Stem et al. 662 (MO, US). Panam: ca. 20 km NE of Chepo, 12 Dec. 1973 (st), Berg et al 336 (BG, U); El Iano-Carti road, km 8.7, 3 Sep. 1977 (st), Berg et al. 403 (BG) and 405 (BG); Cerro Campana, 22 June 1972 (d), Croat 17191 (MO); Cerro Jefe, La
   **TYPE:** Peru. San Martin: near Tarapoto, (9), Spruce 4483 (holotype, P; isotypes, B, BM, C, F, G, K, LE, NY).

    In addition to the typical subspecies, ranging from Venezuela to northern Brazil and Colombia and occurring disjunctly in Peru (San Martin), and subspecies saxicola (Hassler) C. C. Berg, ranging from Bolivia to Argentina (cf. Berg & Akkermans, 1985), a third subspecies from drier parts of western Ecuador and the adjacent part of Peru, can be recognized.


    Inflorescentii is pistillatissimum subumbellatis cum pedicellis in fructu usque ad 3.5 cm longis distincta.

    Shrub or treelet up to 8 m tall, sometimes lianescent. Lamina oblong to elliptic to (sub)obovate, 3-11 X 1.5-5.5 cm, apex acuminate to subacute, base rounded (to obtuse), margin faintly to distinctly (serrate-)dentate; venation impressed above, prominent beneath. Pistillate inflorescences subumbellate; peduncle 0.3-1, in fruit up to 3.5 cm long; flowers 3-12(-18); pedicels 1-1.8 cm, in fruit up to 3.5 cm long; pedicels and immature fruiting perianths (brownish) red.

    An illustration of a leafy twig with pistillate in-
Florescences can be found in Berg and Akkermans (1985: 388, fig. 4, 2). Staminate material of this taxon has not yet been collected.

Paratypes. **ECUADOR.** El Oro: Santa Rosa, 17 Mar. 1955 (9 fl-fr), Asplund 15775 (S); 60 km SE of Arenillas, on road to Loja, ca. 400 m, 13 Nov. 1982 (9 fl-fr), Pennington et al. 10720 (QCA, QCNE, U); cantón Arenillas, road Arenillas-Piedras, 16 Feb. 1976 (9 fl-fr), Plowman 5471 (GH, S, U); road Guayaquil-Salinas, km 7, 18 Mar. 1980 (9 fl-fr), Dodson et al. 9601 (F, MO, U). Guayas: Chongón, 4 Feb. 1955 (9 fl-fr), Asplund 15330 (S); Cerro Azul, W of Guayaquil, 8 Feb. 1955 (9 fl-fr), Asplund 15361 (S), 10 Feb. 1955 (9 fl-fr), Asplund 15389 (S); road Guayaquil-Daule, km 21, Capeira, 23 Sep. 1981 (st), Dodson et al. 11454 (F). Loja: Pueblo Chico, 12 km N of Alamar, 760 m, 9 Aug. 1975 (st), Samaniego et al. 50 (LOJA, QAME, US). **PERU.** Tumbes: prov. Tumbes, Pampas de Hospital, El Caucho, 22 Jan. 1989 (9 fl), Dfaz et al. 3224 (BG, MO).

**CECROPIACEAE**


*Cecropiae englerianae* et *C. polystachyae* similis; a *C. engleriana* e.g. stigmatibus comosis vel subpeltatis, a *C. polystachya* e.g. venis lateralis marginalis brochidodromis differt.

Tree up to 25 m tall; trunk with prominent (annular) scars of the stipules. Leafy twigs 2-4.5 cm thick, (dark) green, hispidulous with curved to uncinate hairs. Lamina subcoriaceous to coriaceous, ca. 30 X 30-75 X 75 cm, segments 8-10, free parts of the upper segments obovate to elliptic, the upper ones sometimes slightly lobate, incisions 0--% of the distance to the petiole, apices obtuse; upper surface smooth to scabridulous, sparsely to rather densely minutely puberulous to strigillose on the (main) veins, initially sparse arachnoid indumentum, lower surface sparsely puberulous to strigillose with straight or uncinate hairs on the (main) veins, arachnoid indumentum (almost) confined to the areoles or almost absent; lateral veins 11-16 (-20) pairs, marginally loop-connected, the lower ones branched; petiole ca. 25-70 cm long, sparsely (minutely) puberulous and also with sparse arachnoid indumentum; trichilia fused, the brown indumentum intermixed with (rather) short white hairs; stipules 12-20 (-28) cm long, orange-red to pinkish or partly whitish, caducous, outside (appressed-)pu-
berulous to hirtellous, or on the ribs to subhirsute, also with dense arachnoid indumentum and rather dense brown pluricellular hairs, inside densely hairy. Staminate inflorescences solitary or in pairs, peduncle patent, spikes spreading to pendulous; peduncle 9-13 cm long, with sparse arachnoid indumentum and brown pluricellular hairs; spathe 12-15 cm long, white, outside with dense arachnoid indumentum and sparse brown pluricellular hairs, inside glabrous or sparsely hairy; spikes

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ca. 10-25, 6-17 X ca. 0.3 cm (yellow to pale orange), stipes 0.8-1.3 cm long, sparsely puberulous in the upper part; rachis hairy; perianth tubular, 1-1.5 mm long, glabrous; anthers ca. 0.5 mm long, detached at anthesis. Pistillate inflorescences solitary or in pairs, pendulous; peduncle 9.5-19 cm long, sparsely puberulous to hirtellous (to subhirsut); spathe not seen; spikes 4-5(-6), 9-17 X (0.5-)0.7-0.8 cm, sessile or with up to 0.5-cm-long, minutely puberulous stipes; rachis hairy; perianth 1.5-2 mm long, apex convex, punctate to muriculate, arachnoid hairs below the apex or also on the margin of the apex; stigma comose to subpeltate. Fruit ellipsoid, ca. 1.8 mm long, smooth.

Cecropia annulata is apparently closely related to C. polystachya Tr6cul. It differs from the latter in the marginally loop-connected lateral veins in the free part of the midsegment, in the (very) sparse arachnoid indumentum on the petiole, in the short or rather short white ( unicellular) hairs in the trichilia, and in the midsegment being not (or rarely slightly) lobate. However, C. annulata also resembles C. engleri ana Snethlage, from which it differs in the less deeply incised lamina, in the smaller number of lateral veins in the free part of the midsegment, and in the non-peltate stigmas. The characters of this species look like a mixture of the two species named above and could indicate an origin
by hybridization. The species is relatively rare in secondary growth. In the field it can be easily recognized by the orange to pinkish young leaves.

Paratypes. BOLIVIA. Beni: prov. Balliviin, Serranfa del Pil6n, 8-10 km from, Yucumo, 19 May 1989 (9 fl-fr), D. N. Smith et al. 13264 (BG, LPB). La Paz: prov. Sud Yungas, near Sapecho, 26-28 Feb. 1994 (st), Berg 1698A (BG), (d), Berg 1699 (AAU, BG, LPB, MO), (d), Berg 1701 (BG, COL, LPB); near Tucupi (= Tullupi), ca. 30 km SE of Palos Blanco, near Rfo Beni, 5 Mar. 1994 (9), Berg 1717 (AAU, BG, LPB, MO, NY).

2. Cecropia heterochroma C. C. Berg & P. Franco, sp. nov. TYPE: Panama. Veraguas: road Escuela Agricola Alto Piedra-Rfo Dos Bocas, km 10, 26 July 1974 (9 fl), Croat 25880 (holotype, MO; isotype, BG). Figure 11.

Lamina cum incisuris paucis subtus indumento arachnoideo sparsissimo. Inflorescentiae pistillatae patennis 2-4 spicos, 3-10 cm longis.

Tree up to 8 m tall. Leafy twigs 2-5 cm thick, green or purplish, densely hirtellous with uncinate hairs. Lamina chartaceous, ca. 35 X 35-75 X 75 cm, green or purplish beneath, segments 6-8, incisions Y)-y0, the distance to the petiole, apices subacuminate to rounded; upper surface minutely hispidulous, scabridulous, lower surface minutely puberulous with curved hairs on the veins, arachnoid indumentum very sparse, soon disappearing; lateral veins in the free part of the midsegment ca. 10-12 pairs, submarginally loop-connected, some of them branched; petiole 30-55 cm long, green or purplish, puberulous, partly hirtellous to subhirsipid with uncinate hairs; trichilia fused, brown indumentum intermixed with short white hairs; stipules 5-10 cm long, green or reddish, outside subhirtellous to subhirsipid with uncinate hairs, inside glabrous. Staminata inflorescences in pairs, patent; peduncle 3-6.5 cm long, reddish or purplish, hirtellous to subhirsute to subhirsipid; spathe 8-14 cm long, reddish, purplish, or greenish, outside sparsely hirtellous and often with dense brown pluricellular trichomes, inside glabrous; spikes 4-5, 3-6.5 X 0.3-0.4 cm, stipes up to 0.5 cm long; rachis glabrous; perianth 1.5-2 mm long, glabrous; anthers 0.6-0.8 mm long, oblong to lanceolate in outline, not detached at anthesis. Pistillate inflorescences solitary, patent; peduncle 8-12 cm, red to purplish, puberulous to hirtellous; spathe ca. 10-15 cm, color and indument as in the staminate ones; spikes (1-)2-4, 3-10 x 0.4-0.6 cm, in fruit up to 15 X ca. 1 cm, (sub)sessile; rachis glabrous;
perianth 1.5-2 mm long, arachnoid hairs below the apex, apex convex, glabrous; stigmas penicellate. Fruit ellipsoid, 2.5-3 mm long, smooth, brown.

Cecropia heterochroma has a form with the lamina purplish underneath, occurring side by side with a form with the lamina pale green underneath.

Paratypes. PANAMA. Bocas del Toro: Isla Bastimentos, 22 Mar. 1993 (9 fl-fr), Foster et al. 14728 (SCZ). Colon: Santa Rita Ridge road, between Transisthmian Hwy. and Agua Clara, 11 Dec. 1973 (9 fl), Berg 299 (BG); Santa Rita Ridge, 1 Mar. 1971 (9 fl), Croat 13887 (BG, MO); Santa Rita Ridge road, 4-6 km from Transisthmian Hwy., 13 Apr. 1976 (d), Croat 34288 (MO); Santa Rita Ridge, 20 Sep. 1972 (d), Gentry 6109 (BG, MO); Santa Rita Ridge road, 21-26 km from Transisthmian Hwy., 4 July 1982 (9 fr), Knapp 5844 (BG, MO). Darien: Parque Nacional Darien, Cruce de Mono, 5 Nov. 1989 (st), Fisher 52 (BG). Panama: Cerro Jefe, 30 Aug. 1977 (9 fl-fr), Berg et al. 393 (BG), (d), Berg et al. 394 (BG); El Llano-Carti road, km 7, 3 Sep. 1977 (d), Berg et al. 401 (BG); Cerro Jefe, 27 Jan. 1966 (d), Blum et al. 2097 (MO), 12 Feb. 1966 (6), Blum et al. 2205 (MO), (9 fl), Blum et al. 2206 (MO); Campo Tres, 5 km NE of Altos de Pacora, 9 Mar. 1973 (d), Busey 822 (BG, MO); Cerro Jefe, 1000 m, Carrasquilla 2177 (MO, PMA); Cerro Jefe, 25 Aug. 1972 (9 fr), Correa et al. 1806 (MO, PMA); 3 mi. N of Cerro Azul, 26 July 1970 (9 fl-fr), Croat 11587 (BG, MO); Cerro Jefe, 23 June 1972 (9 fl), Croat 17338 (MO); El Llano-Carti road, km 12, 1 Aug. 1974 (9 l), Croat 26079 (MO), 6 Apr. 1973 (9 fr), Dressier 4326 (PMA); 3 mi. N of Cerro Azul, 1 Jan. 1972 (9 fl), Dwyer et al. 3447 (US); Cerro Jefe, 19 Aug. 1989 (9 fl), Fisher 23 and 31 (BG); El

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Llano-Carti road, km 8.7, 31 Oct. 1977 (9 fl), Folsom et al. 6161 (BG, MO); Cerro Jefe, 13 Sep. 1970 (9 fl-fr), Foster et al. 1896 (PMA, US), 1 Jan. 1972 (9 fl-fr), Gentry et al. 3447 (NY), 1 Apr. 1972 (9 fl), Gentry 4895 (MO); Cerro Jefe, Altos de Pacora, 18.2 km E of Cerro Azul village, 5 Jan. 1975 (st), Gentry et al. 13422 (F, MO); Cerro Jefe, 15 Aug. 1982 (9 fl), Hamilton et al. 616 (MO); Cerro Jefe, 29 July 1967 (9 fl-fr + d), Kirkbride et al. 21 (MO, NY); Campo Tres, 3 mi. NE of Altos de Pacora, 10 Mar. 1973 (8), Liesner 517 (BG, MO); El Llano-Carti road, km 18, 2 Mar. 1975 (9 fl-fr), Mori et al. 5122 (BG, MO); El Llano-Carti road, km 14, 28 Mar. 1974 (9 fl), Nee et al. 11004 (BG, MO, NY, PMA); Cerro Azul, 24 Mar. 1969 (9 fl-fr), Porter et al. 4068 (BG, MO). San Bias: Nusagandi, 16 Aug. 1989 (9 fl), Fisher 19 (BG), (8), Fisher 20 (BG), 18 Aug. 1989 (st), Fisher 29 and 30
(BG); Nusagandi, NW of Punta Mama, 13 Aug. 1984 (9 fl-fr), de Nevers et al. 3731 (MO, PMA); El Llano-Carti road, Continental Divide, 25 Aug. 1984 (6), de Nevers 3752 (BG, MO); El Llano-Carti road, km. 19.1, 4 Mar. 1985 (9 fl), de Nevers et al. 4953 (BG, MO, PMA); El Llano-Carti road, 13 Mar. 1986 (9), de Nevers et al. 7378 (BG, MO, PMA); Nusagandi, El Llano-Carti road, ca. km 20, 29 Apr. 1992 (8), Paredes 680 (SCZ), (9 fl), Paredes 681 (SCZ), 1 May 1992 (9 fl), Paredes 924 (SCZ). Veraguas: road Escuela Agricola Alto Piedra-Calovebora, km 11, 30 Aug. 1974 (9 fl-fr), Croat 27567 (MO); Río Dos Bocas, 15.6 km NW of Santa Fe, 31 Aug. 1974 (d), Croat 27627 (MO).


Cecropiae latilobae affinis, a qua differt venis lateralis submarginale brochidodromis.

Tree up to 15 m tall. Leafy twigs 1.5-5 cm thick, green or slightly bluish, puberulous to subhispidulous (with curved to uncinate hairs) and also with dense brown pluricellular hairs, sometimes young parts bluish due to a waxy layer; internodes 0.5-1 cm long. Lamina chartaceous to subcoriaceous, ca. (10 x 10-25) X 25-60 X 60 cm, segments (5-)9-11, free part of upper segments ovate to elliptic, incisions Yo-7/io the distance to the petiole, apices short-acuminate to obtuse to rounded; upper surface scabrous, (rather sparsely) hispidulous; lower surface rather densely minutely puberulous on the veins and (especially on the smaller veins) also sparse much longer (uncinate to straight) hairs, arachnoid indument in the areoles and on the smaller veins or almost confined to the leaf margin; lateral veins in the free part of the midsegment ca. 11-16 pairs, 0.5-1.5 cm from each other, submarginally (to almost marginally) loop-connected, most of them branched; petiole ca. 15-40 cm, long, minutely puberulous; trichilia fused, only with brown indument (of pluricellular hairs); stipules 5-12 cm long, green, red(dish) or red-brown to brown, subpersistent, outside puberulous (to subhirtellous), inside densely sericeous to subvillous. Staminate inflorescences in pairs, pendulous; peduncle 6-9 cm long, puberulous; spathe 7-18 cm long, greenish, outside puberulous and with sparse arachnoid indumentum, inside glabrous; spikes 8-15, 4-8 X 0.2-0.3 cm, sessile, rachis (sub)glabrous; perianth ca. 1 mm high, puberulous on the margin of the apex; anthers ca. 0.3-0.5 mm long, detached at an-
thesis. Pistillate inflorescences in pairs, pendulous; peduncle 15-25 cm long, puberulous to hispidulous; spathe 9-16 cm long, greenish, outside puberulous (to hirsute) or also with sparse to rather dense arachnoid indumentum, inside glabrous or sparsely puberulous; spikes 4-5, 12-20 X 0.8-1 cm, in fruit up to 35 X 1.2 cm, sessile; rachis hairy; perianth ca. 2 mm high, apex convex, sparsely muriculate, arachnoid hairs below the apex; stigma comose-penicillate. Fruit oblongoid to subobovoid, ca. 2 mm long, smooth.

Cecropia puberula shows strong similarities to C. latiloba, from which it differs in the lateral veins being more or less distinctly submarginally loop-connected. Moreover, C. latiloba Miquel is a species occurring in periodically inundated places, while C. puberula is a species of non-inundated places, probably a tree-fall-gap pioneer. The morphological differences are so small that one could consider them as only valid for distinction at the subspecific level.


4. Cecropia tacuna C. C. Berg & P. Franco, sp. nov. TYPE: Peru. Pasco: prov. Oxapampa, 5 km E of Oxapampa, 1850 m, 23 May 1983 (9 fl-fr), D. N. Smith 4179 (holotype, MO; isotypes, BG, K). Figure 13.

Indumentum villoso in diversis partibus et foliis grandibus cum incisuris numerosis distincta.
Tree up to ca. 30 m tall. Leafy twigs 4-8 cm thick, green, densely villous and with filiform brown pluricellular hairs. Lamina (sub)coriaceous, ca. 50 X 50-100 X 100 cm, segments 13-18 (on new shoots down to 8), incisions ca. 7/10-% the distance to the petiole, segments oblanceolate, apices subacuminate to acute; upper surface scabrous to scabridulous, sparsely to rather densely hispidulous to subhispid or largely hirsute to subvillous and with sparse to dense filiform, brown pluricellular hairs, "umbilicus" very prominent and villous, lower surface sparsely subvillous and with filiform brown pluricellular hairs or also sparse white arachnoid indumentum on the main veins, varying to pilose (to submentose) on the lesser veins, arachnoid indumentum in the areoles and on the reticulum; lateral veins in the free part of the mid-segment 30-35 pairs, up to 1.3 cm from each other, mostly unbranched, submarginally (and faintly) loop-connected; petiole 40-80 cm long, densely (sub)villous and with filiform brown pluricellular hairs and sparse white arachnoid indumentum, glabrescent; trichilia absent or sometimes present (?); stipules 15-30 cm long, caducous, outside densely white villous, inside densely white villous, inside sparsely hairy. Staminate inflorescences in pairs, patent with the spikes curved upwards, subtended by up to 13-cm-long bracts; peduncle 5-12 cm long, densely white villous (at least in the upper part) and also or only with filiform brown pluricellular hairs, often also with sparse white arachnoid indumentum; spathe 14-20 cm long, green, with dense filiform brown pluricellular hairs and sparsely villous, glabrescent; spikes ca. 10-20, 12-19 X 0.3-0.5 cm, with 0.5-1-cm-long stipules; perianth ca. 1.2 mm long, apex plane, sparsely to densely muriculate, below the apex short arachnoid indumentum; anthers ca. 0.5 mm long, detached at anthesis, thecae appendiculate. Pistillate inflorescences in pairs, patent with the spikes curved upward, subtended by up to 13-cm-long bracts; peduncle 5-9 cm long, with indumentum similar to the staminate inflorescence; spathe 9-14 cm long, green, with dense filiform brown pluricellular hairs and sparsely villous; spikes 3-7, (sub)sessile, 6-13 X ca. 0.5 cm, in fruit up to 21 X 1.5 cm; perianth ca. 1.5 mm long; apex plane, muriculate, long white arachnoid indumentum below the apex; stigma small, comose. Fruit narrowly ellipsoid, ca. 1.5 mm long, finely tuberculate.

Cecropia tacuna is the montane species in the southern Andean part of Peru and is easily recognizable by the villous indumentum on various
young plant parts and the large leaves with numerous segments. It seems to be related to the Bolivian montane species *C. elongata* Rusby.

The epithet chosen is the local name often cited on the labels of the collections of this species.

**Paratypes.** PERU. Ayacucho: between Huanta and Río Apurímac, 750-1000 m, 7-17 Nov. 1929 (juv.), Killip et al. 23117 (NY, US). Cuzco: prov. Paucartambo, road Pilcopata-Paucartambo, ca. 2000 m, 2 Aug. 1988 (d), Berg et al. 1634 (BG, USM), 2200-2300 m, 2 Aug. 1988 (9), Berg et al. 1635 (BG, COL, USM); prov. Paucartambo, km 132, 2260-2290 m, 27 June 1978 (st), Gentry et al. 23564 (BG); prov. Urubamba, near Machu Picchu, 2000 m, 4 July 1972 (d), Muller 2861 (LZ); prov. Urubamba, near Machu Picchu, Río Mandor, 2055 m, 2 June 1982 (d), Peyton et al. 374 (MO); prov. Paucartambo, Kosnipata, 2700 m, 4 July 1972 (d), Vargas C. 15490 (US). Huanuco: HuAnuco-Tingo Maria road, Carpish, 2400 m, 10 Mar. 1982 (d), Gentry et al. 36153 (BG, MO). Pasco: prov. Oxapampa, Río Boquería, ca. 26 km from Oxapampa via Río Yamaquizu, 2040 m, 3 June 1982 (o), D. N. Smith et al. 1832 (BG, MO); prov. Oxapampa, 5 km SE of Oxapampa, 1850 m, 9 Apr. 1983 (d), D. N. Smith 3663 (BG, MO); prov. Oxapampa, Huancabamba, Río Yanachaga, 2280 m, 26 May 1983 (2 fl), D. N. Smith et al. 4196 (BG, MO); prov. Oxapampa, Oxapampa-Villa Rica road, 29 Sep. 1983 (2 fl-fr), D. N. Smith et al. 5340 (BG, MO); prov. Oxapampa, Río San Albert valley, E of Oxapampa, 2300 m, 4 July 1984 (st), D. N. Smith et al. 7608 (BG, MO); prov. Oxapampa, Yanachaga via Río San Daniel, 2500 m, 17 July 1984 (st), D. N. Smith et al. 7848 (BG, MO); prov. Oxapampa, Río Alberto valley, E of Oxapampa, slopes of Cord. Yanachaga, 2400 m, 23 July 1984 (st), D. N. Smith et al. 7974 (MO); prov. Oxapampa, Palmazd, 2100 m, 28 Sep. 1984 (9 fl-fr), D. N. Smith 8555 (BG, MO).

5. *Coussapoa david-smithii* C. C. Berg, sp. nov.

**TYPE:** Bolivia. La Paz; prov. Sud Yungas, road Huancan--San Isidro, km 7, 2300 m, 13 Dec. 1989 (9 fr), D. N. Smith 13919 (holotype, MO; isotypes, BG, LPB). Figure 14.

*Coussapoeae* jatun-sachensi similis, a qua differt e.g. stipulis glabris ramunculisque foliatis.

Tree 13 m tall. Leafy twigs 4-8 mm thick, glabrous. Lamina oblong to subobovate, 11-22 X 4.5-12 cm, coriaceous, apex short-acuminate to sub-acute, base (sub)acute; both surfaces glabrous; lateral veins 4-5 pairs, basal pair (and mostly also other pairs) branched, usually departing from the midrib well above the base, reaching the margin above or at the middle of the lamina; petiole 2.5-
6.5 cm long, glabrous; stipules 1.2-2.5 cm long, glabrous. Pistillate inflorescences unbranched (or branched); (common) peduncle 1.5-3 cm long, glabrous; head(s) 1 (or 2), hemispherical to subglobose, 0.8-1.2 cm diam. (in fruit); perianth (sub)glabrous. Interfloral bracts absent.

This montane species resembles the lowland Ec-

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The epithet is chosen to commemorate the collecting activities of the late David N. Smith, who provided so much useful material to science.

6. Coussapoa villosa Poeppig & Endlicher
   subsp. polycephala C. C. Berg, subsp. nov.
   TYPE: Colombia. Cundinamarca: mun. Tena, Laguna Pedro Palo, 2000-2100 m, 7 Mar. 1988 (2 fl-fr), Franco et al. 2422 (holotype, COL; isotype, BG). Figure 15.
   Plurimis venis lateralibus ramosis et usque ad viginti capitulis in inflorescentia pistillata distincta.
   Most lateral veins branched (furcate). Pistillate inflorescences with 10-20 flower heads, in fruit up to ca. 1 cm in diameter; common peduncle 3-6 cm long. Peduncle of staminate inflorescences 1.2-4 cm long.
   In most of the collections of Coussapoa villosa the lateral veins are usually unbranched, except for the basal pair, and the pistillate inflorescences are unicapitate. However, in some lowland collections from Central America the pistillate inflorescences may
have more than one flower head, occasionally up to four heads. The combination of multicapitate pistillate inflorescences and the commonly branched lateral veins, as found in the material listed above, justifies recognition of a distinct subspecies, apparently confined to a small area and occurring at altitudes between 1600 and 2200 m. This subspecies appears to be identical to the Late Pliocene leaf material from the Guasca Valley in Colombia, described and discussed by Wijninga and Kuhry (1993).

Recognition of subspecies polycephala may lead to reconsidering the rank of C. duquei Standley (Berg et al., 1990), and possibly reducing it to another (sub)montane subspecies of C. villosa.

Paratypes. COLOMBIA. Cundinamarca: mun. Tena, 2200 m, 14 May 1983 (d), Barrera et al. 62 (COL); between El Salto and El Colegio, 1470 m, 10 Mar. 1940 (d). Cuatrecasas 8291 (COL); near AlbAn, Aug. 1962 (d fl-fr), Fernández-Pérez F-3 (COL); mun. Tena, near Laguna Pedro Palo, 3 km N of Tena, 2080 m, 19 May 1952 (d), Fernández-Pérez et al. 1458 (COL); Tena, Río Bogota, below Santandercito, 1650 m, 15 Mar. 1986 (d), Franco et al. 2410 (COL); mun. Tena, Laguna Pedro Palo, 2000-2100 m, 7 Mar. 1988 (S), Franco et al. 2422A (BG, COL); Río Bogota, 1600 m, 1939 (S), Uribe-Uribe 364 (COL). Tolima: near Juntas, (d), Saavedra s.n. (COL).

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