

Studies in Annonaceae. IX
New species from the Neotropics and miscellaneous notes

by P.J.M. Maas, E.C.H. van Heusden, J. Koek-Noorman, A.K. van Setten,
and L.Y.Th. Westra

Institute of Systematic Botany, Utrecht, the Netherlands

Communicated by Prof. F.A. Stafleu at the meeting of November 30, 1987

SUMMARY

This paper follows upon an earlier paper in the series "Studies in Annonaceae" (Maas et al. 1986). Twelve new species are described, viz. 2 in *Duguetia*, 1 in *Ephedranthus*, 5 in *Guatteria*, 2 in *Hornschuchia*, 1 in *Tetrameranthus*, and 1 in *Unonopsis*. A new combination is made in *Enicosanthellum*. Some amendments and additions to the revision of *Tetrameranthus* (Westra 1985), including an updated key, are given. *Monocarpia euneura* Miq. appears to have priority over *M. marginalis* (R. Scheffer) James Sincl. Additional collections have been made of the rare species *Bocagea longepedunculata* Martius, *Xylopia crinita* R.E. Fries, and *Xylopia excellens* R.E. Fries. Attention is drawn to several recent collections from Bahia, Brazil, which are perhaps referable to *Unonopsis stipitata* Diels.

H. León, Popayán, and D. Sánchez S., Medellín, contributed to three of the new species.

***Bocagea longepedunculata* Martius in Martius, Fl. bras. 13(1): 45. 1841. —**
Type: Brazil. Bahia: Porto Seguro, 1816 (fl), *Wied zum Neuwied s.n.* (holo-
type?, BR).

Recently, a second collection of this rare species was made. The typification, however, has not been cleared up sufficiently yet. The only specimen we have been able to trace is a sheet in the herbarium at Brussels with a label in Wied zum Neuwied's handwriting, but without any data. This is apparently also the only material that Fries has seen. All information concerning locality, etc., including details on floral morphology, comes from Martius's protologue.

Material examined. BRAZIL. Minas Gerais: Mun. Ataleia, Frei Gaspar, 28 Aug 1962 (fl), *M. Magalhães 18868* (RB, U).

Duguetia antioquiensis H. León¹ & P. Maas, sp. nov. — Type: Colombia. Antioquia: Mun. San Luís, Cañon del Río Claro, 28 Jan 1984 (fr), A. Cogollo 1260 (holotype, JAUM). Figs. 1, 2.

Arbor foliis (anguste) ellipticis vel ovato-ellipticis vulgo 13–23 cm longis et 4–8 cm latis tenuiter coriaceis supra glabris subtus squamulis usque ad 0.5 mm in diametro modice vel sparse obtectis, petiolis 5–10 mm (vel paulo ultra) longis et 3 mm crassis; flores succedanei rhachidi sympodiali usque ad c. 20 mm longa inserti pedicellis c. 5 mm longis et dimidio crassis basi articulatis, sepalis liberis ovatis usque ad 13 mm longis et c. 9 mm latis, petalis exterioribus et interioribus similibus ovato-spathulatis usque ad 17 mm longis et 13 mm latis ut sepala dense lepidotis; fructus globosus vel depresso globosus ad 7 cm in diametro, carpidiis 70–100 in tertia parte (vel infra) basali coalitis partibus liberis bene disjunctis, semen singulum basi affixum continentia.

Tree, 5–30 m tall. Young twigs striate to finely longitudinally ribbed, rather densely to densely lepidote with yellow-grey scales 0.1–0.5 mm in diam.; older twigs rugulose to scurfy, glabrous, greyish. Petioles blackish, 5–11 mm long, to ca. 3 mm in diam., lepidote with grey-brown to yellow-grey scales 0.1–0.5 mm in diam. Lamina (narrowly) elliptic to ovate-elliptic, (9–)13–23 cm long, (2–)4–8 cm wide, thinly coriaceous, grey-green — sometimes somewhat shiny — above, yellow-green to grey-brown below, glabrous above except for occasional stellate hairs at the base of the primary vein, moderately to rather sparsely lepidote below with pale yellow scales to ca. 0.1–0.5 mm in diam., the larger ones with rays connate over most of the length, the smaller ones with rays connate up to about 1/2 of the length, base narrowly cuneate to acuminate, decurrent along the petiole, apex acuminate to obtuse, the extreme tip acute to obtuse; primary vein impressed above; secondary veins curved, 9–13(–16) on either side of primary vein, prominulous above, angles with primary vein 50–60(–70)°, arching toward the margin to sometimes loop-forming at acute angles, loops indistinct, smallest distance between loops and margin 3–9 mm, tertiary veins reticulate, tertiary and higher-order venation prominulous above.

Inflorescences axillary, below foliate zone, single, with up to numerous flowers in succession on sympodially elongating rachis to ca. 20 mm long and 8 mm in diam. Pedicels 5–6 mm long, 2–3 mm in diam., with basal articulation, densely lepidote with yellow-grey scales to 0.5 mm in diam., glabrescent in fruiting stage, fruiting pedicel to 12 mm long, to 7 mm in diam. Upper pedicel bract at up to 1/2 of the length of the pedicel, shallowly triangular, 1–2 mm long, densely lepidote, caducous.

Flowers yellow and fragrant (*in vivo*), densely lepidote with shiny yellowish scales on outer side of sepals and petals, inner side of sepals and petals covered with stellate hairs in apical part, glabrous toward the base. Sepals free, ovate, (8–)12–13 mm long, ca. 9 mm wide, densely lepidote with silvery-yellow to golden scales 0.2–0.7 mm in diam. Petals free, outer and inner petals about

¹ Fundación Universitaria de Popayán, Apartado Aéreo 742, Popayán, Colombia.

equal in size and shape, outer petals obovate-spathulate, 14–17 mm long, 10–13 mm wide, rounded, outer side densely lepidote with yellow-grey scales 0.1–0.5 mm in diam., inner side rather densely beset with yellow-grey stellate hairs with 2–10(–15) rays 0.1–0.2 mm long, the basal part glabrous, dark reddish-brown. Inner petals on the outer side densely lepidote with yellow-grey scales 0.1–0.5 mm in diam., inner side glabrous, dark reddish-brown except for some stellate, yellow-grey hairs along margins like those on outer petals. Stamens 1–1.2 mm long, apex of connective discoid, almost flat.

Fruit green to yellowish, maturing pink-red to red (*in vivo*), globose to transversely broadly ellipsoid, 5–6 cm long, 6–7 cm in diam., the basal collar of the fruit formed by 8–16 connate, sterile carpels, conical to very broadly ovoid, not or slightly protruding below the fruit, 10–20 mm in diam., with the same indument as fertile carpels; carpels 70–100, 15–27 mm long with largest diameter of 5–10(–12) mm, fused for up to 1/3 of their length with well-spaced free parts, ellipsoid to obovoid, (often) somewhat constricted just below the apex, densely covered with (scaly) tufts of bristle-like, brownish hairs to 0.2 mm long in apical part, glabrous toward base, the apex deltoid with a ridge just above the constriction, 3–6 mm long, rugose (shrivelled) to finely irregularly ridged. Seed 1 per carpel, basal, vertically oriented, filling up the basal half to 2/3 of the cavity, obovoid, 14–18 × 6–7(–8) mm, smooth, with inconspicuous transmedian rib when mature (?), pale brown to dark brown.

Distribution: Colombia, the departments of Antioquia, Chocó, and Santander; in forest, alt. from sea level to ca. 1200 m.

Material examined. COLOMBIA. Antioquia: Mun. de San Luís, Sector Río Samaná – Río Claro, trail near “vereda” Tulipán, alt. 935 m, 12 Nov 1982 (fl), *A. Cogollo & C.C. Estrada 190* (MO); Mun. de San Luís, Sector Río Samaná – Río Claro, Autopista Medellín-Bogotá, trail near “vereda” La Josefina, alt. 790 m, 16 Dec 1982 (fl), *A. Cogollo & C.C. Estrada 250* (MO); Mun. de San Luís, 2 km from Río Claro, near Río Samaná, alt. 790 m, 13 Jan 1983 (fr), *A. Cogollo & J. Brand 358* (MO); Mun. de San Luís, Cañon del Río Claro, N sector, alt. 340–500 m, 24 Dec 1983 (fr), *A. Cogollo 1059* (JAUM); ibidem, NW sector, alt. 325–500 m, 1 Apr 1984 (fl), *A. Cogollo 1536* (JAUM); ibidem, 31 May 1984 (fl), *A. Cogollo 1741* (JAUM); Mun. de San Luís, Sector Río Samaná – Río Claro, road from Medellín to Bogotá, alt. 400 m, 11 Oct 1981 (fr), *J.J. Hernandez & S.E. Hoyos 60* (HUA, MEDEL); ibidem, alt. 650 m, 19 Mar 1982 (fr), *J.J. Hernandez et al. 202* (HUA); ibidem, alt. 700 m, 21 Jun 1982 (fr), *J.J. Hernandez & S.E. Hoyos 357* (HUA); ibidem, alt. 750 m, 10 Nov 1982 (fr), *J.J. Hernandez et al. 549* (HUA); ibidem, alt. 740 m, 13 Dec 1982 (fl), *J.J. Hernandez et al. 591* (HUA); ibidem, alt. 800 m, 4 Dec 1982 (fl), *J.J. Hernandez & S.E. Hoyos 642* (HUA); ibidem, alt. 380 m, 15 Jan 1983 (fr), *J.J. Hernandez et al. 694* (HUA); ibidem, alt. 380 m, 15 Jan 1983 (yfl), *J.J. Hernandez et al. 697* (HUA); Mun. de San Luís, Río Claro, alt. 700–1200 m, 20 Feb 1982 (fl, fr), *E. Rentería A. et al. 3007* (JAUM); Mun. de San Luís, Autopista Medellín-Bogotá, right bank of Río Samaná, alt. 350 m, 12 May 1983 (fl), *D.*

Sánchez S. & S.E. Hoyos 498 (MEDEL). Chocó: between Río Curiche and Alto Curiche, alt. 10–100 m, 31 Jan 1967 (yfr), *J.A. Duke 9591* (US); trail between Alto Curiche and Camp Curiche, E of Boca Curiche, alt. ca. 150–300 m, 20 May 1967 (fr), *J.A. Duke & J. Idrobo 11271* (NY); Mecana, on pacific coast N of Bahía Solano, alt. 1–100 m, 1 Jan 1984 (fr), *A. Juncosa 1611* (MO, U). Santander: Campo Capote (“Carare Opón”), alt. 240 m, 8 Jun 1979 (fr), *E. Rentería A. et al. 1515* (HUA, MO); road to Cimitarra, alt. 200 m, 9 Dec 1979 (fr), *E. Rentería A. et al. 2092* (HUA, JAUM).

Vernacular names: Piño, Yaya (Colombia, Antioquia); Corobá (Colombia, Chocó); Anón (Colombia, Santander).

This species has to be placed in Section *Duguetia* because of the indument of the floral parts (sepals and petals with scales on the outer side), free sepals, and outer and inner petals equal in size and shape. It differs from all species in this section by the well-spaced free parts of the carpels.

Duguetia caniflora H. León & P. Maas, sp. nov. — Type: Colombia. Antioquia: Municipio de Anorí, Corregimiento de Providencia, valley of Río Anorí between Dos Bocas and Anorí, Buenos Aires, 4 km from Providencia, alt. 400–900 m, 24–31 May 1973 (fl), *Soejarto et al. 4044* (holotype, HUA; isotypes, A, COL, F, MO). Figs. 3, 4.

Arbor parva vel mediocris foliis plerumque ellipticis vel anguste ellipticis 14–24 cm longis et 3–7 cm latis herbaceis supra costa plusminusve stellato-lepidota excepta glabris subtus squamulis minutis modice obtectis, petiolis usque 3–6 mm longis et c. 2 mm crassis; flores ad c. 10 succedanei pedicellis 6–10 mm longis et 1.5–2.5 mm crassis, sepalis liberis late ovatis ad 12 mm longis et 10 mm latis extus dense lepidotis, petalis exterioribus et interioribus similibus ovato-ellipticis usque ad 15 mm longis et 7 mm latis extus dense cano-lepidotis; fructus completus desideratur, carpidiis ut videtur basi coalitis vel fere liberis obrulloideis vel late obrulloideis ad 23 mm longis et 13 mm crassis apice acutis, semen singulum basi affixum continentibus.

Small to medium-sized tree, to 15 m tall. Young twigs smooth to finely striate, densely to rather densely lepidote with yellow-grey scales 0.1–0.2(–0.3) mm in diam.; older twigs rather smooth to rugulose, glabrous or nearly so, grey-brown. Petiole 3–6 mm long, ca. 2 mm in diam., densely to rather densely lepidote with yellow-grey scales as the twigs. Lamina elliptic to narrowly elliptic (to narrowly elliptic-obovate), 14–24 cm long, 3–7 cm wide, herbaceous, grey-green to yellow-green on both sides, sometimes somewhat shiny above, glabrous above except for primary vein rather densely to sparsely covered with scales and stellate hairs, moderately lepidote below with yellow-grey scales 0.1–0.3 mm in diam., base acute to cuneate, decurrent along the petiole, apex (abruptly) acuminate (acumen to ca. 2.5 cm long), the extreme tip acute (to obtuse); primary vein impressed (in the basal half) above; secondary veins curved (to straight), 12–15 on either side of primary vein, with or without (distinct) in-

tersecondaries, flat to prominulous above, angles with primary vein 70–80°, loop-forming at acute to right (to obtuse) angles to arching, loops indistinct to distinct, smallest distance between loops and margin (1–)2–4 mm, tertiary veins reticulate.

Inflorescences leaf-opposed or nearly so, often at or near the base of lateral shoots, single, with up to ca. 10 flowers in succession. Peduncle 1–3 mm long, with sympodial rachis up to ca. 8 mm long, to 3 mm in diam. Pedicels 6–10 mm long, 1.5–2.5 mm in diam. Upper pedicel bract at about 1/3–2/3 of the pedicel length, ovate, clasping the pedicel, 3–4 mm long, caducous. Pedicels and bracts densely lepidote with yellow-white to silvery scales 0.1–0.2(–0.3) mm in diam.

Flowers bright yellow (*in vivo*). Sepals free, broadly ovate, 10–12 mm long, 9–10 mm wide, acute, densely lepidote with yellow-grey scales 0.1–0.3 mm in diam. on the outer side, the inner side densely covered with yellow-grey stellate hairs with 2–10, somewhat crisped rays 0.1–0.2 mm long. Petals imbricate. Outer petals and inner petals subequal, ovate-elliptic, 13–15 mm long, 6–7 mm wide, acute, densely lepidote with silvery-grey scales 0.1–0.2 mm in diam. on the outer side, the inner side rather densely covered with silvery-grey stellate hairs with 2–10 rays 0.1–0.2 mm long in upper half, and glabrous, reddish-brown to dark brown in basal half. Stamens 0.9–1.1 mm long, apex of connective dilatate. Carpels ca. 2 mm long, stigma cylindrical.

No complete fruit seen. Basal collar of fruit formed by ca. 10 connate, sterile carpels, the whole depressed ovoid to conical, 16–17 mm in diam., sparsely lepidote at the base with yellow-grey scales 0.1 mm in diam. Carpels fused only at the base to almost free, obtrulloid to broadly obtrulloid, 19–23 mm long, 11–13 mm in diam., acute at the apex, often with small apicule to 1 mm long, glabrous except for sparsely to rather densely lepidote apical part with yellow-grey scales 0.1–0.2 mm in diam. Seed 1 per carpel, basal, vertically oriented, filling up 2/3–5/6 of the cavity, obovoid, 15–16 × 8–9 mm, nearly smooth to finely longitudinally striate, blackish-brown.

Distribution: only known from the department of Antioquia, Colombia; in forest; alt. 400–900 m.

Material examined. COLOMBIA. Antioquia: Municipio de Anorí, Corregimiento de Providencia, valley of Río Anorí between Dos Bocas and Anorí, Buenos Aires, alt. 400–700 m, 26 Apr–3 May 1973 (fl, fr), *D.D. Soejarto et al. 3980* (GH, HUA).

This species seems to be closest to *D. panamensis* (sect. *Duguetia*), but it differs from that by ovate-elliptic (vs. narrowly elliptic) petals and the indument on outer side of flowers being yellow-white to silvery (vs. golden-yellow).

Etymology: “canus” (L) = “greyish-white”. Referring to the hair-covering of the flowers (particularly the petals).

Vernacular name: Veraquillo (Colombia, Antioquia).

Enicosanthellum pulchrum (King) van Heusden, comb. nov.

Polyalthia pulchra King, J. Asiat. Soc. Bengal. Pt. 2, Nat. Hist. 61: 55. 1892.

— Type: Malaysia. Perak: at Weld's Rest, *Scortechini* 824 (holotype, K).

Disepalum pulchrum (King) James Sincl., Gard. Bull. Straits Settle. ser. 3. 14: 333. 1955.

Sinclair's transfer of *Polyalthia pulchra* King to the genus *Disepalum* may seem curious, as *Disepalum* is highly distinct in its floral characters from any other genus in the Annonaceae.

Walker, in his extensive pollen morphological survey of the Annonaceae (1971), remarked that pollen and floral morphology of two *Polyalthia* species, viz. *P. plagioneura* Diels and *P. petelotii* Merrill, required their removal from *Polyalthia* and transference to *Disepalum*, without actually making the transfer, however. A little later, Ban (1975) placed these two species in a new genus *Enicosanthellum*.

Worldwide flower morphological investigations by van Heusden on the family show that *Disepalum pulchrum* (King) James Sincl. closely resembles the two species of *Enicosanthellum*, and should be transferred to it. This transfer, at the same time, leaves *Disepalum* again in its former circumscription as a very natural-looking genus.

The genus *Enicosanthellum* needs further monographic examination in order to find out whether truly three different species are involved, or only one species with local, morphologically more or less constant, populations. These occur in isolated areas at higher altitudes (1400–2000 m in Malaysia and Indochina, 600–700 m in Hainan). This is noteworthy, as Annonaceae are largely confined to the tropical lowlands.

Ephedranthus columbianus P. Maas & van Setten, sp. nov. — Type: Colombia. Antioquia: Municipio de San Luís, Cañon del Río Claro, NW sector, left bank, alt. 375–600 m, 9 Mar 1984 (fl), *A. Cogollo* 1448 (holotype, JAUM). Figs. 5, 6, 7.

Arbor foliis vulgo anguste ellipticis 10–20 cm (vel ultra) longis et 3.5–7.5 cm (vel ultra) latis tenuiter coriaceis glabris petiolis 6–10 mm longis et 1.5–2 mm vel paulo ultra crassis; inflorescentiae axillares in ramulis vetustioribus e rhipidiis (plerumque) 1- vel 2-floris confertis formatae; flores ut videtur unisexuales (solum pistillati visi) pedicellis 6–10 mm longis et 1–1.5 mm crassis basi articulatis, sepalis liberis ovatis ad 7 mm longis et 5 mm latis, petalis exterioribus et interioribus similibus anguste obovatis vel anguste ellipticis ad 15 mm longis et 5 mm latis; monocarpia 1–10 late ellipsoidea vel oblongoidea ad 30 mm vel paulo ultra longa et c. dimidio crassa apiculo perdepresse pyramidalis vel late deltoideo munita stipite ad 10 mm vel paulo ultra longa et ad 2 mm crassa, semen singulum basi affixum continentia.

Tree, to 23 m tall, to 35 cm in diam. Young twigs finely striate, covered with more or less granular, rusty brown hairs 0.1–0.5(–1) mm long, soon glabres-

cent, grey to black; older twigs finely striate to finely longitudinally ribbed, sometimes rather smooth and with small lenticels, grey to greyish-brown. Petioles 6–10 mm long, 1.5–2(–3) mm in diam., glabrous. Lamina narrowly elliptic (to narrowly obovate-elliptic), thinly coriaceous, grey-green, 10–21(–27) cm long, 3.5–7.5(–10) cm wide, glabrous, base obtuse to rounded, apex (long) acuminate, the extreme tip acute; primary vein flat above; secondary veins curved, 8–14 on either side of primary vein, prominent above, angles with primary vein 30–60°, loop-forming near the apex only, loops very indistinct, smallest distance between loops and margin 2–4 mm, tertiary veins more or less percurrent to reticulate, higher order venation densely reticulate.

Inflorescences axillary, on older branchlets, fasciculate, 1- or 2(?)-flowered rhipidia. Pedicels 6–10 mm long, 1–1.5 mm in diam., with basal articulation, fruiting pedicel to 40 mm long, 2–3.5 mm in diam. Bracts 2 to each flower, the upper bract at 1/4–1/3 of the pedicel length, very broadly ovate to transversely broadly elliptic, 1.5–2 mm long and wide, with rounded apex. The inflorescence, including the outer side of the sepals, densely covered with strongly crisped, brown hairs <0.5 mm long.

Flowers apparently unisexual (only pistillate ones seen), white, very fragrant (*in vivo*). Sepals free, ovate, to 7 mm long, to 5 mm wide, with obtuse apex, the inner side rather densely covered with more or less crisped, yellowish hairs <0.5 mm long. Outer and inner petals narrowly obovate to narrowly elliptic, to 15 mm long, 4–5 mm wide, the outer side (rather) densely covered with crisped, brownish-ochraceous hairs <0.5 mm long, the inner side glabrous. Carpels ca. 10, ca. 2 mm long, densely brown-hairy, stigma sessile, capitate, ovule 1 per carpel, basal.

Fruiting receptacle transversely broadly ellipsoid to depressed ovoid, (2–)7–11 mm in diam. Monocarps 1–10, green, turning brownish (*in vivo*), broadly ellipsoid to oblongoid, 18–32 mm long, 13–16 mm in diam., rather densely covered with more or less granular, rusty brown hairs, soon glabrescent, smooth, often with a very shallowly pyramidal to broadly deltoid apicule 1–3 mm long and 2–3 mm in diam., wall crustaceous to woody, rather tough, ca. 1 mm thick; stipe 5–12 mm long, 1.5–2 mm in diam., rather densely covered with more or less granular, rusty brown hairs 0.1–1 mm long. Seed 1 per monocarp, basal, vertically oriented, filling up the entire cavity, broadly ellipsoid to oblongoid, 16–28 × 10–14 mm, transversely striate, and with a shallow, sinuous, transmedian groove, pale brown, the testa thin-walled.

Distribution: Colombia, the departments of Antioquia, Chocó, and Santander; in forest; alt. from sea level to 600 m.

Material examined. COLOMBIA. Antioquia: Municipio de San Luís, Cañon del Río Claro, N sector, left bank, alt. 325–360 m, 8 Jul 1983 (fr), *A. Cogollo & R. Borja 503* (JAUM); ibidem, SW sector, alt. 330–400 m, 14 Aug 1983 (fr), *A. Cogollo 631* (JAUM); near Vijagual, 30 km S of Turbo, alt. ca. 50 m, 12 Apr 1945 (fl), *O. Haught 4558* (S, US); El Río-Segovia, alt. 330–400 m, 20 Jun 1980 (fr), *E. Rentería A. et al. 2364* (HUA); Municipio de San Luís, Cañon del

Río Claro, S sector, 18 Sep 1986 (fr), *D. Sánchez S. & L. Pelaez 1058* (ex MEDEL, U). Chocó: Río Ciego, 17 Jun 1967 (fr), *J.A. Duke 13280* (US). Santander: vicinity of Cimitarra, road N from airport between Río Guasualito and 5 km beyond bridge, alt. 200 m, 27 Jul 1975 (fr), *A.H. Gentry & L. Forero 15471* (COL, ex MO, U).

This new species seems to come closest to *Ephedranthus amazonicus* R.E. Fries, from which it differs by its strongly reticulate venation notably on the upper side of the leaf. Moreover, it is remarkable for its large-sized sepals which, in this genus, generally do not exceed 2.5 mm in length.

Gutteria alata P. Maas & van Setten, sp. nov. — Type: Panama. Cocle: Alto Calvario, 0.5–2 km N of Rivera sawmill, on summit and Caribbean slope of continental divide, approx. 7 km N (by air) of El Copé, alt. 700–900 m, 27 Oct 1982 (fl, fr), *W.S. Alverson et al. 1955* (holotype, WIS: 2 sheets). Figs. 8, 9.

Arbor ramulis acutangulis alatisve foliis obovato-ellipticis vel obovatis 20–34 cm longis et 10–16 cm latis coriaceis pilis nonnullis appressis minutis in nervis validis ceterum glabris venis secundariis utrinque 18–20, petiolis ad 15 mm longis et 7 mm crassis; flores axillares pedicellis 12–33 mm longis et ad 3 mm latis (in statu fructifero ad 45 mm longis et 5 mm crassis) in quarta parte basali usque ad in dimidio articulatis, sepalis liberis late ovatis ad 13 mm longis et 10 mm latis, petalis latissime ovatis ad 15 mm longis et 13 mm latis, staminibus numerosis apice discoideis papillois; monocarpia 6–20 ellipsoidea ad 2.5 cm longa et fere dimidio crassa stipite 4–22 mm longo suffulta, semen singulum basi affixum continentia.

Tree, to 15 m tall, to 25 cm in diam., bark smooth, grey. Young twigs smooth, with sharp wings decurrent from the petioles, sparsely to rather densely covered with appressed, brownish hairs 0.1–0.3 mm long, at last glabrescent, dark brown to black; older twigs rugose, the wings persistent for some time, with many lenticels, grey to pale brown. Petiole 13–15 mm long, 5–7 mm in diam., incrassate toward the base, canaliculate above, sparsely covered with hairs as on the twigs. Lamina obovate-elliptic to obovate, 20–34 cm long, 10–16 cm wide, coriaceous, rather densely to densely verruculose on the upper side and also, though less conspicuously so, on the lower side, pale green to medium brown both above and below, sparsely covered with appressed, brownish hairs to 0.3 mm long on large veins on upper side, and on the lower side, to glabrous, base acute, or cuneate, to obtuse (to rounded), the extreme base attenuate and decurrent as wings on the petiole, apex (very) shortly acuminate, the extreme tip acute; primary vein impressed above, prominent and sharp-angled below; secondary veins straight to (slightly) curved, 18–20 on either side of primary vein, without or with mostly weak intersecondaries, flat to prominulous above, angles with primary vein 70–80°, loop-forming at (mostly) right angles to arching, loops indistinct to distinct, smallest distance between loops and margin 2–3 mm, tertiary veins percurrent to reticulate, the tertiary veins and higher order venation flat and inconspicuous above, prominent below.

Inflorescences axillary, in foliate zone or on older branchlets, single, single-flowered (always?). Pedicels 12–33 mm long, 3 mm (to 5 mm under the fruit) in diam., with articulation at 1/4–1/2 of the length, fruiting pedicel to 45 mm long, to 5 mm in diam. Bracts several on the pedicel, all below the articulation, caducous. Pedicels densely covered with appressed, pale brown to ferruginous hairs 0.1–0.4 mm long, glabrescent in fruit.

Flowers with yellowish petals (*in vivo*). Sepals free, broadly ovate, 10–13 mm long, 9–10 mm wide, acute, densely covered with appressed, light brown hairs to ca. 0.5 mm long outside, densely covered with minute, appressed to erect, light brown to whitish hairs inside, glabrous at the extreme base. Petals very broadly ovate, distinctly unguiculate, 13–15 mm long, 10–13 mm wide, acute to rounded, densely covered with appressed, somewhat crisped, orange-brown hairs to ca. 0.5 mm long outside, densely covered with minute, whitish hairs inside, glabrous toward the base. Stamens 400–500, with discoid, 5–6-angled, papillose apex. Carpels 20–30, the stigma densely covered with minute, yellowish-grey hairs.

Fruiting receptacle very broadly ovoid, depressed ovoid, to transversely ellipsoid, 10–15 mm in diam. Monocarps 6–20, green to purple (*in vivo*), ellipsoid, 18–24 mm long, 12–13 mm in diam., sparsely covered with appressed, ferruginous hairs 0.1–0.3 mm long, to glabrous, smooth to somewhat shrivelled and/or with some indistinct longitudinal grooves, wall soft-woody, 1.5–2.5 mm thick; stipe 4–22 mm long, 1.5–3 mm in diam., with indument as on monocarp body. Seed 1 per monocarp, basal, vertically oriented, filling up the entire cavity, ellipsoid to ovoid, somewhat flattened, 15–19 × 8–10 × 7–8 mm, somewhat foveolate changing to irregularly striate toward indistinct, 2–3 mm broad transmedian rib, brown.

Distribution: Panama: in forest; alt. 400–900 m.

Material examined. PANAMA. Cocle: trail from Caño Blanco del Norte to continental divide N of El Copé, alt. 400–600 m, 5 Feb 1983 (fl, fr), *G. Davidse & C.W. Hamilton 23656* (MO, U) and *23697* (MO, U); along Llano Grande to Coclesito road, above Cascajal, near divide, ca. 8°42'N, 80°28'W, alt. ca. 500 m, 12 Jan 1986 (fr), *G. McPherson 7995* (ex MO, U). Panamá: El Llano-Carti Road, 10–12 km from junction with Inter-American Hwy., alt. ca. 410 m, 31 Oct 1974 (fr), *S.A. Mori & J. Kallunki 2894* (MO, U).

This species is related to *G. pacifica*, but it differs from that by sharp wings on the branchlets decurrent from the petioles, much smaller leaf warts, and larger and pitted seeds. A rather conspicuous feature in the material examined is the frequent occurrence of articulations in the branchlets, especially at the base of lateral shoots, together with the presence of cataphylls. Whether the development of dormant (?) vegetative buds, together with possibility of twig abscission, has any connection with (seasonal?) climatic conditions or not, is not clear yet. There is one report of a gnarled tree habit (*Alverson et al. 1955*).

Etymology: “alatus” (L) = “winged”. Refers to the wings on the branchlets.

Guatteria chrysophylla P. Maas & van Setten, sp. nov. — Type: Ecuador. Napo: confluence of Quiwado and Tiwaeno Rivers, 22 Apr 1981 (fr), *E.W. Davis & J. Yost 1011* (holotype, NY; isotype, U). Fig. 10.

Arbor foliis ellipticis 24–29 cm longis et 10–13 cm latis coriaceis supra costa excepta glabra vel glabrescentia subtus ut ramulis pilis chryseis vel cinnamomeis dense obtectis nervis secundariis utrinque 15–18, petiolis c. 1.5–2.5 cm longis et c. 0.5 cm crassis; inflorescentiae axillares, solum in statu fructifero visae, pedicellis ad 2 cm vel paulo ultra longis in quarta usque ad tertia parte basali articulatis; monocarpia 3–20 ellipsoidea vel plusminusve obovoidea ad 2.5 cm longa et c. dimidio crassa apice rotundata vel acuta stipite 11–18 mm longo suffulta, semen singulum basi affixum continentia.

Tree, ca. 30 m tall. Young twigs finely striate, densely covered with gold- to cinnamon-coloured, erect, straight to crisped hairs 0.2–0.7 mm long, tardily glabrescent, dark brown; older twigs striate to finely longitudinally ribbed, dark brown to black. Petiole 15–26 mm long, 4–6 mm in diam., canaliculate above, with same indument as on the twigs. Lamina elliptic, 24–29 cm long, 10–13 cm wide, coriaceous, grey-green above, densely to moderately covered with hairs on the primary vein, otherwise glabrescent or glabrous above, densely covered with gold- to cinnamon-coloured hairs similar to those on twigs below, base acute to cuneate, the extreme base decurrent along the petiole, apex acuminate, the extreme tip acute, obtuse, to slightly mucronate; primary vein flat (to slightly immersed or raised) above; secondary veins slightly curved, 15–18 on either side of primary vein, without intersecondaries, angles with primary vein 45–55°, arching, to loop-forming near the apex at obtuse to right angles, loops indistinct to distinct, smallest distance between loops and margin 0.5–1.5 mm, tertiary veins percurrent (to more or less reticulate), prominulous above.

Inflorescences axillary, single. Fruiting pedicel with articulation at 1/4–1/3 of the length, 12–22 mm long, 3–6 mm in diam. Bracts not seen.

Flowers not seen.

Fruiting receptacle depressed ovoid, 5–15 mm in diam. Monocarps 3–20, green (*in vivo*), ellipsoid to slightly obovoid, 17–25 mm long, 12–13 mm in diam., glabrous or nearly so, smooth to shrivelled on the surface, apex rounded to acute, wall woody (tough) to horny, ca. 1.5 mm thick; stipe 11–18 mm long, 2–2.5 mm in diam., very sparsely to rather densely covered with patent, brown hairs 0.1–0.2 mm long. Seed 1 per monocarp, basal, vertically oriented, filling up the cavity, broadly ellipsoid with acute apex, 13–21 × 9–12 mm, rugulose to verrucose, red brown, somewhat shiny.

Distribution: Upper Amazon region in Ecuador and Peru; in forest.

Material examined. PERU. Loreto: Prov. Maynas, Cahuide (Río Itaya), 9 Oct 1984 (fr), *R. Vásquez & N. Jaramillo 5667* (U).

A species distinct from other *Guatteria* species because of the discoloured leaves with gold- to cinnamon-coloured indument at the underside. Another

characteristic feature are the very large, almost pear-shaped monocarps with rugose seed.

Etymology: "chryso-" and "phyllon" (Gr) = "golden" and "leaf". Refers to the colour of the underside of the leaves.

Vernacular name: Meñadowé (Waorani, "The jaguar's tree"). Bark crushed and mixed with water, rubbed over head and shoulders, is applied against fever (according to Davis & Yost).

Guatteria cuatrecasii D. Sánchez S.¹, sp. nov. — Type: Colombia. Chocó: Mun. Lloró, road from Yuto to Lloró, 2.8 km from Ferry, 15 Sep 1985 (fl, fr), D. Sánchez S. et al. 907 (holotype, MEDEL; isotypes, COL, HUA, U). Fig. 12.

Arbor ramulis anguste sed distincte alatis pilis mollibus brunneis dense ob-
sitis, foliis anguste oblongo-ellipticis vel anguste ovatis vulgo 17–29 cm longis
et 3–7 cm latis subcoriaceis dense verrucosis supra glabris subtus pilis
plusminusve appressis iis ramulorum similibus dense obtectis, petiolis brevibus
crassis; flores plerumque solitarii pedicellis vulgo 20–30 mm longis et ad 4 mm
crassis in tertia parte basali usque ad in medio articulatis, sepalis liberis deltatis
ad 15 mm (vel ultra) longis et latis, petalis exterioribus late obovatis vel late ob-
trullatis ad 20 mm (vel ultra) longis et ad 15 mm (vel ultra) latis, petalis in-
terioribus late obovatis ad 20 mm longis et ad 13 mm (vel ultra) latis, staminibus
numerosis apice paululo umbonatis; monocarpia sat numerosa (vulgo 25–65)
ellipsoidea ad 10 mm vel paulo ultra longa et 6 mm crassa stipite 3–5 mm longo
suffulta, semen singulum basi affixum continentia.

Tree, 3–20 m tall, 5–85 cm in diam., large trees often with stiltroots. Young
twigs with narrow wings decurrent from the petioles, the young twigs and
petioles densely covered with patent to semi-appressed, shiny brown hairs to
2–3 mm long. Petioles to 4 mm long, 3 mm in diam. Lamina narrowly oblong-
elliptic to narrowly ovate, 17–29(–34) cm long, 3–7 cm wide, subcoriaceous,
densely verrucose on both sides, strongly discolorous, upper side pale green to
blackish-brown, glabrous, lower side densely covered with appressed to semi-
appressed, shiny brown hairs 2–3 mm long, base acute to obtuse, often slightly
oblique, apex long-acuminate (acumen 10–20 mm long) to rarely acute; sec-
ondary veins straight to rarely curved, 22–29 on either side of primary vein, with
numerous intersecondaries often exceeding 1/2 of the length of the secondary
veins, mostly flat and often inconspicuous above, angles with primary vein
60–75(–80)°, loop-forming over most of the length at (acute to) obtuse angles,
the loops more or less forming a marginal vein, smallest distance between loops
and margin 1–5 mm, tertiary veins coarsely reticulate mainly toward the
margin, mostly inconspicuous above, higher order venation scarcely visible.

Inflorescences axillary, 1(–2)-flowered. Pedicels (15–)20–30 mm long, to 4

¹ Herbario "Gabriel Gutierrez V.", Facultad de Ciencias, Universidad Nacional de Colombia, Sec-
cional Medellín, Apartado 568, Medellín, Antioquia, Colombia.

mm in diam., with articulation at 1/3–1/2 of the length = (5–)10–18 mm from the base, rather densely to densely covered with semi-appressed, shiny brown hairs to 1.5–2 mm long, fruiting pedicel to 45 mm long. Bracts 2–4 per flower, 15–25 mm long, caducous.

Flowers greenish to brownish (*in vivo*). Sepals free, deltate, fleshy, 5–15(–22) mm long and wide, outer side covered with appressed, shiny brown hairs 0.5–1.5 mm long, soon becoming glabrous at the base, inner side covered with crisped, shiny brown hairs 0.1–0.3 mm long mainly along the margins. Outer petals broadly obovate to broadly obtrullate, (10–)15–20(–25) mm long, 10–15(–20) mm wide, obtuse to acute. Inner petals broadly obovate, 10–20 mm long, 10–13(–18) mm wide, rounded to acute, outer side of both outer and inner petals densely covered with appressed, shiny brown hairs 0.5–1.5 mm long, the inner side with crisped, shiny brown hairs 0.1–0.3 mm long, the basal part glabrous. Stamens numerous (ca. 400), ca. 1.5 mm long, apex of connective weakly umbonate.

Fruiting receptacle transversely ellipsoid to depressed ovoid, 10–14 mm in diam. Monocarps (10–)25–65, green, maturing violet (*in vivo*), ellipsoid, 8–11 mm long, 4–6 mm in diam., glabrous, smooth, wall papyraceous, brittle, 0.5 mm thick; stipe 3–5 mm long, 1–1.5 mm in diam., glabrous. Seed 1 per monocarp, basal, vertically oriented, ellipsoid, 7–10 × 3–4 mm, foveolate, with small aril.

Distribution. Colombia: department of Chocó, where it is particularly abundant in the municipalities of Condoto and Nóvita. Also in Ecuador: province of Esmeraldas. Found at low altitudes (collections at 40–120 m) on flat to hilly, non-inundated ground. Although found in disturbed primary forest, it is most frequently encountered in secondary forest.

Material examined. COLOMBIA. Chocó: Quibdó, road from Quibdó to Guayabal, 23 Feb 1985 (fl, fr), *J. Espina et al. s.n.* (CHOCO); Istmina, Río San Juan, foothills of Cerro de La Mojarrá, 25 Jun 1983 (fr), *E. Forero et al. 9499* (COL, U); road from Quibdó to Yuta, km 8, side road to Real de Tanando, 29 Jun 1983 (fl), *E. Forero et al. 9570* (COL, U); 48 km S of Quibdó, on Quibdó-Istmina road, near Certegui, 8 Jan 1971 (fr), *A.H. Gentry & E. Renteria A. 23832* (ex MO, U); Quibdó, Corregimiento de Tutunendo, Quebrada del progreso, 4 km from Medellín-Quibdó road, 9 Nov 1985 (fl), *S.E. Hoyos 1175* (COL, HUA, MEDEL); road from Istmina to Las Animas, 5 Nov 1983 (fl, fr), *A. Juncosa 1236* (CHOCO, ex MO, U); right bank of Río Quito, 10 km from Quibdó, 22 Apr 1982 (fl), *D. Sánchez S. et al. 299* (MEDEL); right side of road from Quibdó to Yuto, 23 Apr 1982 (fl, fr), *D. Sánchez S. et al. 300* (HUA, MEDEL); Corregimiento de Guayabal, right bank of Río Atrato, Loma de Belén, 24 Apr 1982 (fl), *D. Sánchez S. et al. 307* (HUA, MEDEL); Yuto, road to Lloró, 2 km from Ferri, 7 Aug 1982 (fl, fr), *D. Sánchez S. et al. 318* (HUA, MEDEL); ibidem, 1.5 km from Ferri, 7 Aug 1982, *D. Sánchez S. et al. 324* (HUA, MEDEL); right side of road from Quibdó to Yuto, 100 m after Campin, 7 Oct 1983 (st), *D. Sánchez S. et al. 630* (MEDEL); left side of

road from Quibdó to Tutunendo, 5 km after La Troje, Los Estancos, 9 Oct 1983 (st), *D. Sánchez S. & Rendón 654* (MEDEL); Mun. Condoto, left side of road from Iró to Chambón, 1 May 1985 (fl, fr), *D. Sánchez S. & C.A. Velasquez 878* (COL, HUA, MEDEL, U); Mun. Nóvita, San Lorenzo, Quebrada Máncamo, San Miquel, 2 May 1985 (st), *D. Sánchez S. & C.A. Velasquez 885* (MEDEL); Mun. Condoto, left side of road to Opogodó, 3 May 1985 (fl), *D. Sánchez S. & C.A. Velasquez 888* (COL, HUA, MEDEL) and *D. Sánchez S. & C.A. Velasquez 894* (COL, HUA, MEDEL, U).

ECUADOR. Esmeraldas: Río Palabí, 27 May 1986 (st), *Janse 21289* (MO).

Guatteria cuatrecasasii closely resembles *G. elegantissima* R.E. Fries (Sect. *Chasmantha*), which is endemic to the Department of El Valle del Cauca. *G. cuatrecasasii* distinguishes itself from *G. elegantissima* by much larger leaves (often > 20 cm long, vs. mostly not exceeding 15 cm in length), more secondary veins (ca. 24–28 vs. ca. 17–22), softer hairs, larger monocarps (≥ 9 mm, vs. ≤ 8 mm in diam.), and distinctly winged twigs.

This species is named in honour of Dr. José Cuatrecasas, eminent botanist, explorer, and authority on the flora of Colombia.

Vernacular names and uses: Cargadero blanco (Nóvita), Cargadero punta de lanza (Condoto); Cebo (Ecuador). Mainly used for timber.

Guatteria rotundata P. Maas & van Setten, sp. nov. – Type: Panama. Panamá: along El Llano-Carti Road, 16–18.5 km by road N of Panamerican Hwy. at Llano, alt. 400–450 m, 28 Mar 1974 (fl), *M. Nee & E.L. Tyson 10999* (holotype, MO; isotypes, B, U). Fig. 11.

Arbor foliis obovatis vel obovato-ellipticis plerumque 5–12 cm longis et 2–5 cm latis tenuiter coriaceis venis secundariis utrinque 7–10 (vel ultra) supra glabris subtus pilis parvis adpressis modice vel sparse obtectis, petiolis 6–8 mm longis et 2 mm crassis; flores axillares pedicellis 4–10 mm longis et 1–2 mm crassis in quatuor parte basali usque ad in media articulatis, sepalis liberis triangulari-ovatis ad 4 mm longis et 5 mm latis, petalis exterioribus (late) elliptico-ovatis vel rhombeis ad 17 mm longis et 12 mm latis, petalis interioribus similibus sed minoribus, staminibus c. 40–60 apice haud vel leviter umbonatis, carpellis c. 6–10; fructus non visus.

Tree, to 20 m tall, to ca. 40 cm in diam. Young twigs smooth to finely striate, sparsely (to rather densely) covered with appressed, whitish hairs 0.1–0.2 mm long, becoming glabrous, brown to black; older twigs rugose to scurfy, greyish. Petiole 6–8 mm long, ca. 2 mm in diam., incrassate toward the base, canaliculate above, sparsely covered with hairs as on the twigs. Lamina obovate to obovate-elliptic, 4.5–12(–14) cm long, 2–5(–6.5) cm wide, (chartaceous to) thinly coriaceous, moderately verruculose on the upper side and same, though inconspicuously so, on the lower side, greyish-brown to dark brown above, green to pale or medium brown below, glabrous above, moderately to rather sparsely covered with appressed, whitish hairs 0.1–0.4(–0.5) mm long below,

base acute to cuneate, the extreme base acute to attenuate, decurrent on the petiole, apex shortly acuminate, obtuse, to broadly rounded, the extreme tip obtuse, or not protruding; primary vein flat above, prominent and with rather sharp edge below; secondary veins straight (to slightly curved), 7–10(–12) on either side of primary vein, often with well-developed intersecondaries, prominulous above, angles with primary vein 45–70°, loop-forming at acute to right angles, loops mostly distinct, enclosed by secondary arches, smallest distance between loops and margin 2.5–4 mm, tertiary veins reticulate, the tertiary and higher order venation prominulous on both sides.

Inflorescences axillary, in (or just below) foliate zone, single, single-flowered. Pedicels 4–10 mm long, 1–2 mm in diam., with articulation at 1/4–1/2 of the length, rather densely to moderately covered with appressed, pale brown hairs 0.1–0.4 mm long. Bracts 2–3 to the pedicel, all below the articulation, caducous.

Flowers yellow-green to yellow (*in vivo*). Sepals free, very broadly triangular-ovate, 3–4 mm long, 4–5 mm wide, acute to obtuse, moderately covered with appressed hairs as on the pedicel on the outer side, glabrous on the inner side. Outer petals slightly imbricate to valvate, (broadly) elliptic-ovate to rhomboid, 10–17 mm long, 5–12 mm wide, with a short and broad claw, the apex obtuse, rather densely covered with yellow-orange hairs, with prominent midvein on the abaxial side. Inner petals 10–12 mm long, 4.5–5 mm wide, otherwise like the outer petals, glabrous in the lower part on the inner side. Stamens ca. 40–60, obtrapezoid, 1–2 mm long, extrorse, thecae reaching down almost to base, apex of connective depressed trullate, reflexed, not or very slightly umbonate, rather densely covered with erect, stiff hairs under 0.1 mm long over most of the center, otherwise finely papillose above. Carpels ca. 6–10, 1.5–2 mm long, (rather) densely covered with stiff, brownish hairs, stigma sessile, capitate, with minute yellow hairs, ovule 1 per carpel, basal.

Fruits not seen.

Distribution: Panama, provinces of Panamá and San Blas; in forest; alt. to 500 m.

Material examined. PANAMA. Panamá: valley of Río Mamoni, near continental divide, 10 miles by road N of Chepo, alt. 400 m, 21 Feb 1986 (fl), *G. McPherson 8475* (ex MO, U). San Blas: El Llano-Carti Road, 24.5–25 km from Interamerican Hwy., near continental divide, 12 Apr 1975 (fl), *S.A. Mori & J. Kallunki 5531* (MO, U); El Llano-Carti Road, 19.1 km from Interamerican Hwy., Plot # 762, alt. 350 m, 18 Nov 1984 (st), *G. de Nevers 4303* (ex MO, U); El Llano-Carti Road, km 26.5, alt. 200 m, 9 Apr 1985 (fl), *G. de Nevers et al. 5258* (MO, U).

This species probably belongs in Sect. *Chasmantha*. It is distinct by small, obovate, reticulately veined leaves with shortly acuminate to rounded apex and a sharp-edged primary vein on the lower side. Superficially, the leaves look like those of *G. coriacea* R.E. Fries (described from an unknown locality in Colombia), but the latter are not verrucose.

Etymology: "rotundatus" (L) = "rounded". Refers to the leaf shape.

Guatteria sessilicarpa P. Maas & van Setten, sp. nov. — Type: Panama. Colón: Santa Rita Ridge Road, 17 km from Boyd-Roosevelt Hwy., alt. 450 m, 14 Mar 1975 (fr), S.A. Mori & J. Kallunki 5037 (holotype, MO; isotype, U). Figs. 13, 14, 15.

Arbor foliis plerumque ellipticis vel elliptico-obovatis 21–26 cm longis et 7–9 cm latis tenuiter coriaceis vel coriaceis glabris costa subtus acutangula venis secundariis utrinque 17–20, petiolis 4–10 mm vel paulo ultra longis et ad 4 mm crassis; flores axillares pedicellis 7–18 mm longis et ad 3 mm (ad 4 mm in statu fructifero) crassis in tertia parte basali usque ad in media articulatis, sepalis liberis late triangularibus vel deltatis ad 9 mm longis et 10 mm latis, petalis exterioribus ellipticis ad c. 20 mm longis et dimidio latis, petalis interioribus aequilongis sed paulo latioribus, staminibus 150–250 apice haud umbonatis; monocarpia plerumque 4–15 late ellipsoideo-rhomboidea vel late ellipsoidea ovoideave ad 20 mm longa et 14 mm crassa sessilia vel stipite ut plurimum 2 mm longa et crassa suffulta, semen singulum basi affixum continentia.

Tree, up to 20 m tall, up to 30 cm in diam., aromatic (fide *Duke & Dwyer*). Young twigs smooth to very finely striate, more or less ancipitous, but soon becoming terete, often with articulations with 3–4 caducous cataphylls, rather densely covered with appressed (to semipatent), grey to brown hairs 0.1–0.3 mm long, to glabrous, dark brown to black; older twigs smooth to coarsely striate, grey, grey-black, or dark brown. Petiole 4–10(–12) mm long, 3–4 mm in diam., incrassate toward the base, canaliculate above, with indument as on the twigs, to glabrous. Lamina (narrowly) elliptic to (narrowly) elliptic-obovate, (11–)21–26(–32) cm long, (4.5–)7–9(–10) cm wide, thinly coriaceous to coriaceous with margin often revolute at the base, moderately verruculose above, densely verruculose below, to almost smooth (esp. on upper side), greenish-brown to dark brown, with ciliate margin especially near the base and apex when young, otherwise glabrous, base acute to cuneate, the extreme base decurrent along the petiole, apex acuminate, the extreme tip acute, obtuse, or mucronate; primary vein impressed above, prominent and sharp-angled to carinate below; secondary veins straight to curved, 17–20 on either side of primary vein, often intermixed with intersecondaries, prominent above, angles with primary vein (50–)60–80(–85)°, loop-forming at acute angles to arching, loops indistinct to distinct, usually with secondary arches, smallest distance between loops and margin 6–10 mm, tertiary veins reticulate, the tertiary veins and higher order venation prominulous on both sides.

Inflorescences axillary, in foliate zone or on older branchlets, single, single-flowered (always?). Fruiting pedicel with articulation at 1/3–1/2 of the length, rather densely covered with appressed (to semi-patent), grey to brown hairs 0.1–0.3 mm long, to glabrous, 7–18 mm long, 2–4 mm in diam. Bracts several on the pedicel, all below the articulation, transversely elliptic to depressed ovate, or leaf-like and (ovate-) elliptic, to ca. 5(–18) mm long, caducous.

Flowers green (*in vivo*). Sepals free, triangular, reflexed, 7–9 mm long, 8–10 mm wide, acute, the outer side (rather) densely covered with appressed, brown hairs to 0.5(–1) mm long, the inner side glabrous over the most part. Outer petals elliptic, 11–21 mm long, 6.5–10 mm wide, with short and broad claw, with obtuse to rounded apex, outside (rather) densely covered with appressed, ochraceous-brownish hairs to 0.5 mm long, inside moderately covered with more or less crisped, brown hairs to 0.3 mm long. Inner petals 16–20 mm long, 10–13 mm wide, with broadly rounded apex, moderately covered with straight to more or less crisped, brown hairs to 0.3 mm long over most of the surface, densely covered with straight, appressed, ochraceous-brownish hairs to 0.5 mm long on the lower part on the outer side (the area not covered by outer petals in young bud stage), glabrous toward the base on the inside. Stamens about 150–250, ca. 2 mm long, apex of connective disk-shaped, papillose. Carpels about 12–15(–20), stigmatic surface with minute, pale yellowish hairs.

Fruiting receptacle very broadly ovoid to transversely ellipsoid, 6–10 mm in diam. Monocarps 4–15(–20), green to shiny green (*in vivo*), broadly ellipsoid-rhomboid to broadly ellipsoid (or broadly ovoid), 12–20 mm long, 8–14 mm in diam., glabrous (to sparsely covered with appressed, greyish hairs 0.1–0.3 mm long), rugulose to rugose, sessile or with short stipe up to 2 mm long and 2 mm in diam., wall woody, tough (white-pulpy *in vivo* fide *Dwyer*), 1.5–4 mm thick. Seed 1 per monocarp, basal, vertically oriented, filling up the entire cavity, broadly ovoid, ovoid, to angular-ovoid, somewhat flattened, 12–15 × 8 × 5–6 mm, foveolate to transversely interrupted striate, with transmedian rib, brown, somewhat shiny when mature.

Distribution: Panama, provinces of Colón and Panamá; in forest; alt. up to 1000 m.

Material examined. PANAMA. Colón: Santa Rita Ridge Road, 8.3 road-miles E of Transistmian Hwy., alt. 350–400 m, 15 Nov 1985 (fr), *G. McPherson 7466* (MO, U). Panamá: beyond Cerro Jefe, alt. 700–1000 m, 17 Jan 1968 (fr), *J.A. Duke & J.D. Dwyer 15067* (MO); Cerro Jefe, alt. to 1000 m, 5 Jan 1972 (fr), *J.D. Dwyer & A.H. Gentry 9483* (F); Cerro Jefe, 0.5 miles beyond cattle chute, 1 Apr 1972 (fr), *A.H. Gentry 4886A* (MO); El Llano-Carti Road, 7.8 km N of Panamerican Hwy., 8 Jun 1977 (fr), *J.P. Folsom 3560* (U); Cerro Jefe region, along road to Río Cristobal, in chagras drainage, alt. 600 m, 24 Feb 1986 (fr), *G. McPherson 8497* (ex MO, U); along El Llano-Carti road, ca. 4.6 miles from Panamerican Highway, alt. 350 m, 22 Aug 1986 (fl), *G. McPherson 9944* (ex MO, U); Gorgas Memorial Labs yellow fever research camp “Campamento Quatro”, 5–10 km NE of Altos de Pacora, alt. 600 m, 21–24 Nov 1974 (fr), *S.A. Mori & J. Kallunki 3319* (MO, U); 5–10 km NE of Altos de Pacora, alt. 750 m, 7 Mar 1975 (fr), *S.A. Mori & J. Kallunki 4981* (MO, U).

This species belongs in Sect. *Chasmantha*, but differs from all species by the combination of coriaceous leaves with a knife-like primary vein and revolute margins, and sessile or nearly sessile, rough monocarps.

Etymology: "sessilis" (L) = "sessile", and "carpos" (Gr) = "fruit". Refers to the (almost) sessile monocarps.

Hornschuchia cauliflora P. Maas & van Setten, sp. nov. — Type: Brazil. Bahia: Km 5–15 of BR 101 S of Ubaitaba, 18 Nov 1971 (fl, fr), *T.S. dos Santos 2193* (holotype, CEPEC). Figs. 16, 17.

Frutex vel arbor parva foliis ellipticis vulgo 14–35 cm longis et 4–14 cm latis coriaceis glabris venis secundariis utrinque 11–13, petiolis 4–10 mm longis et 2–5 mm crassis; inflorescentiae axillares vel interdum interaxillares saepe cauliflorae flores succedaneos in monochasiis valde contractis gerentes, pedicellis 3–5 mm (ad 8 mm in statu fructifero) longis et 0.5 mm crassis basi articulatis, sepalis in calicem cupuliformem ad 2.5 mm longum et 3 mm latum persistentem connatis, petalis lineari-ovatis ad 10 mm longis, staminibus 6, carpello 1 (an semper?); monocarpia cylindrica vel plusminusve torulosa ad 6 cm longa et 7 mm crassa apiculo pyramidalis 3–4 mm longo basi in stipitem brevem attenuata, semina 3–7 parietalia uniserialiter disposita continentia.

Shrub to small tree, 3–4 m tall. Young twigs finely striate to finely longitudinally ribbed, glabrous, blackish; older twigs finely longitudinally ribbed, with inconspicuous lenticels and large leaf scars of 4–9 mm in diam., pale whitish-brown. Petioles 4–10 mm long, 2–5 mm in diam. Lamina elliptic, (11–)14–35 cm long, 4–14 cm wide, coriaceous, dark grey-green on both sides, glabrous, base acute to rounded (to cordate), apex acute to obtuse with the extreme tip acute to obtuse, to rounded; primary vein impressed above; secondary veins straight to curved, 11–13 on either side of primary vein, alternating mostly with prominent intersecondaries, raised above, angles with primary vein 55–70°, loop-forming at obtuse (to right) angles, loops fairly distinct, enclosed by secondary arches, smallest distance between loops and margin 7–9 mm.

Inflorescences axillary (mostly) to interaxillary, in foliate zone to cauliflorous, flowers borne on highly contracted, branched (lignified) systems, appearing monochasially in succession. Pedicels 3–5 mm long, ca. 0.5 mm in diam., with basal articulation, sparsely covered with appressed, pale brown hairs 0.1–0.2 mm long, becoming glabrous, fruiting pedicel to 8 mm long, to 2.5 mm in diam. Bracts depressed ovoid to semicircular, flat to navicular, to 0.5(–1) mm long, persistent to caducous or withering, sparsely to moderately covered with brown hairs up to 0.2 mm long.

Flowers white (*in vivo*). Sepals connate into a cup-shaped, persistent calyx of 1.5–2.5 mm long and 2.5–3 mm wide, the free parts indistinct, with the same indument on the outside as the pedicel. Petals linear-ovate, 8–10 mm long, acute to obtuse, densely (on parts exposed in bud stage) to rather sparsely covered with appressed, brownish hairs to 0.2 mm long. Torus almost flat. Stamens 6, to ca. 3 mm long, with very short filament, extrorse, thecae septate, apex of connective small, knob-shaped, densely papillose. Carpel 1 (as far as seen), with longitudinal ciliate lines, otherwise glabrous, ca. 4 mm long, stigma with two narrowly ellipsoid, hairy lobes, ovules (about) 6 per carpel, lateral.

Fruiting receptacle transversely broadly ovoid, ca. 3 mm in diam. Monocarps cylindrical to more or less torulose, 45–60 mm long, 6–7 mm in diam., glabrous or almost so, with inconspicuous longitudinal (to oblique) grooves, gradually narrowing into the stipe, with pyramidal apicule of 3–4 mm long and 1–2 mm in largest diam., wall crustaceous, ca. 0.5 mm thick; stipe 1–4 mm long, 2–2.5 mm in diam., sparsely to densely covered with appressed, pale brown hairs 0.1–0.2 mm long. Seeds 3–7 per monocarp, in one row with the lowermost basal, vertically oriented, filling up the cavity, oblongoid, 8–10 × 5 mm, finely transversely striate, with a transmedian rib and a rather conspicuous, more or less swollen, hilum, dull brown.

Distribution: State of Bahia, Brazil.

Material examined. BRAZIL. Bahia: Uruçuca/Ubaitaba, 20 Apr 1970 (fl), *T.S. dos Santos* 752 (CEPEC); BR 101 from Ubaitaba to Porta Santo Antonio do Sul, 22 Jun 1972 (fl), *T.S. dos Santos* 2336 (CEPEC).

This species is characterized by rather small, highly contracted inflorescences with a strong tendency toward cauliflory. Vegetatively, it resembles *Hornsuchia obliqua* (see next species), but it does not have an oblique leaf base.

Hornsuchia obliqua P. Maas & van Setten, sp. nov. — Type: Brazil. Bahia: Município de Cairú, road from Cairú to Ituberá, km 8, S of Cairú, 26 Jul 1981 (fl), *A.M. Carvalho & J. Gatti* 798 (holotype, CEPEC; isotype, U). Figs. 18, 19.

Arbor mediocris foliis anguste ellipticis 20–30 cm (vel ultra?) longis et 7–9 cm latis tenuiter coriaceis glabris basi conspicue inaequilateris venis secundariis utrinque 8–10 (vel ultra?); inflorescentiae paniculatae terminales vel in axillis foliorum superiorum floribus succedaneis numerosis in monochasiis elongatis praeterea in rhipidiis secundariis compactis in axillis bractearum, bracteis persistentibus vel tarde deciduis (late) ellipticis plerumque (i.e. in rhipidiis primariis:) 2–6 mm longis, pedicellis 3–11 mm longis et c. 1 mm crassis basi articulatis, sepalis in calycem cupuliformem ad 3 mm longum et 4 mm latum conatis supra perdepreste triangularibus, petalis vulgo anguste triangularibus ad 10 mm longis, staminibus 6, carpellis 3 (an semper?); fructus non visus.

Tree, to ca. 6 m tall. Young twigs finely striate, glabrous (or nearly so), green-brown. Petioles ca. 2 mm long, ca. 3 mm in diam. Lamina narrowly elliptic, 20–30 cm (or more?) long, 7–9 cm wide, thinly coriaceous, greyish-green above, pale brownish-green below, glabrous, base markedly asymmetrical with one half (sub)cordate, the other half rounded, (apex not available); primary vein flat above; secondary veins straight to slightly curved, 8–10 (ore more?) on either side of primary vein, mostly alternating with distinct intersecondaries, flat above, angles with primary vein 25° (near the base) to 50°, loop-forming at obtuse angles, loops enclosed by secondary arches, smallest distance between loops and margin 5–7 mm.

Inflorescences panicle-like, terminal and in axils of upper leaves, with monochasially elongating branches with numerous flowers appearing in succession, the flowers opposite bracts (supra-axillary), and also in second-order (1-several-flowered), very compact rhipidia in axils of bracts. Pedicels 3–11 mm long, ca. 1 mm in diam., with basal articulation, densely to rather densely covered with yellowish-green to brownish, appressed (to semi-patent) hairs of 0.1–0.5 mm long. Bracts (broadly) elliptic, persistent or tardily deciduous, first-order bracts (1–)2–6(–8) mm long, (1–)1.5–4(–6) mm wide, second-order bracts ovate to very broadly ovate, 0.5–1.5 mm long and wide. Inflorescence incl. outer side of bracts densely to moderately covered with brown to whitish, appressed hairs to 0.3 mm.

Flowers with green calyx and white petals (*in vivo*). Sepals connate into a cup-shaped, fleshy to coriaceous calyx of 2–3 mm long, 3–4 mm wide, the free parts very depressed triangular, densely to rather densely covered with hairs outside as on the pedicels, glabrous inside. Petals narrowly triangular(–ovate), fleshy to coriaceous, 6–10 mm long, densely covered with shiny, appressed hairs to ca. 0.5 mm long outside, densely covered with papillose hairs ca. 0.1–0.2 mm long over most of the inner side, becoming glabrous toward the apex. Torus depressed ovoid. Stamens 6 (?), ca. 3–4 mm long, thecae septate, apex of connective a minute hairy knob. Carpels 3 (as far as seen), ca. 3.5 mm long, densely covered with yellowish hairs, stigma narrowly ellipsoid, ovules about 3 per carpel (as far as seen), lateral.

Fruits not seen.

Distribution. Brazil: state of Bahia, only known from the type collection; in restinga vegetation.

This species is distinct by leaves with a markedly asymmetrical base, a conspicuous feature not encountered in other *Hornschuchia* species so far and not often seen in Annonaceae either. The very rich inflorescences at the end of the branchlets equally draw attention. Similar compound, panicle-like, inflorescences resulting from the apparent reduction of foliage-leaves are found in *H. bryotrophe* Nees and *H. polyantha* P. Maas.

Etymology: “obliquus” (L) = “oblique”. Refers to the asymmetry of the leaf base.

Monocarpia euneura Miq., Ann. Mus. Bot. Lugduno-Batavum 2: 12. 1865.
Cyathocalyx marginalis R. Scheffer, Ann. Jard. Bot. Buitenzorg 2: 6. 1885.
Monocarpia marginalis (R. Scheffer) James Sincl., Gard. Bull. Straits Settlements, ser. 3. 14: 273. 1955.

Scheffer’s publication of *Cyathocalyx marginalis* dates from 1885, not from 1855 as erroneously listed in Index Kewensis and assumed by Sinclair. So *Monocarpia euneura* Miq. now has priority, and therefore it is the correct name for the type species of this genus.

Tetrameranthus globuliferus Westra, sp. nov. — Type: Ecuador. Napo: Añangu, Parque Nacional Yasuní, alt. 260–350 m, 1986 (fr), *J. Lawesson et al. SEF 8779* (holotype, AAU). Figs. 20, 21, 22.

Arbor mediocris foliis ad apicem ramulorum spiraliter confertis anguste obovatis 27–37 cm longis et 9–15 cm latis chartaceis basim obtusam rotundatamve versus longe cuneatis pilis stellatis 0.5 mm vel ultra metientibus hispidis venis secundariis utrinque 23–25, petiolis brevibus crassis; flores singuli, axillares, pedunculis ad 5 mm longis et c. 3 mm (ad 5 mm in statu fructifero) crassis, pedicellis (vulgo) 12–15 mm longis et 2.5–3 mm (ad 5 mm in statu fructifero) crassis, (flos unico verisimiliter juvenilis suppetebat) sepalis petalisque in quoque verticillo (5–)6 (an semper?), sepalis liberis (vel basi tantum connatis?), petalis exterioribus ovatis, petalis interioribus (triangulari-)ovatis, staminibus crebris (ultra 200) apice connectivi pulviniformi, ceterum modo generis; monocarpia (fere) spherioidea ad 4 cm in diametro pericarpio in statu sicco rugoso, seminibus 1 vel 2 modo generis ad 3 cm in diam. et ad 2 cm crassis.

Tree, to about 12 m tall, about 11 cm in diam. Branchlets ca. 5 mm thick below the apex, increasing to 7–10 mm, terete, internodes 0.5–1 cm long, the young twigs and petioles densely covered with light brown, erect (to more or less appressed) stellate hairs with rays to ca. 1 mm long. Petiole 5–8 mm long, 4–6 mm in diam., slightly thickened toward the base to almost equal in diameter throughout, shallowly concave above. Lamina narrowly obovate, chartaceous, 27–37 cm long, 9–15 cm wide, rather densely covered on primary vein (decreasing to rather sparsely covered on smallest veins) with brownish to whitish stellate hairs with 2–6(–more) erect to erecto-patent rays ca. 0.2–0.7(–1) mm long (with few intermixed simple hairs) on both sides (becoming glabrous above), long and narrowly cuneate toward the base, rather abruptly changing to obtuse or rounded at the base, the extreme base more or less decurrent along the petiole, apex acute to acuminate; primary vein flat to slightly prominent above, prominent below; secondary veins curved to straight (to recurved), 23–25 on either side of primary vein, with some (mostly) very short intersecondaries, flat to slightly impressed above, prominent below, angles with primary vein (50°, near apex, –)60–80°(–90°, near base), loop-forming at acute (to right) angles (to arching), loops indistinct to distinct, smallest distance between loops and margin (1.5–)2–3(–4) mm, tertiary veins percurrent to somewhat reticulate: pocket domatia often manifest in axils of secondary veins below.

Inflorescences 1-flowered, in axils of some of the leaves. Peduncle ca. 4–5 mm long, ca. 3 mm in diam., fruiting peduncle, to ca. 5 mm in diam. Pedicel (6: juvenile? –)12–15 mm long, 2.5–3 mm in diam., fruiting pedicel to 4–5 mm in diam. Bracts (4?) caducous, (as far as seen:) (narrowly) triangular, 4–5 mm long. Peduncles, pedicels, and bracts densely covered with brownish stellate hairs with rays \leq 1 mm.

Flowers (only one, juvenile?, flower and two deflorate pedicels seen) light green (*in vivo*). Sepals 6, free (or connate at the extreme base?), triangular, 5–8

mm long, 4–5 mm wide, herbaceous, obtuse at the apex. Outer petals 6, ovate, 15–17 mm long, 7–8 mm wide, carnose, subacute to rounded at the apex, inner side with small callus ca. 3–4 mm long at the base. Inner petals 5 (one aborted?), (triangular-)ovate, unguiculate, 12–13 mm long including claw (the claw ca. 3 mm long), 5–6 mm wide, carnose, obtuse to acute at the apex, inner side with callus extending up to 1/2 of the total length at the base (covering the claw). Sepals densely covered with whitish to brownish hairs ≤ 0.5 mm, the inner side grading to glabrous at the base, outer and inner petals same except for the glabrous callus, hairs predominantly stellate except for inner side of sepals with mainly simple hairs. Torus more or less elevated, (6?-)lobed. Stamens about 250–300, ca. 1–2 mm long, latrorse(-extrorse), apex of connective flat, cushion-shaped, 0.5–1 \times 0.2–0.6 mm in top view. Carpels 10–16, 2–3 mm long, densely covered with stiff brown hairs, stigma with shape of an irregular disk, verrucose.

Monocarps green (*in vivo*), spherical or almost so, with strongly shrivelled fruit wall (*in sicco*), to ca. 4 mm in diam. (two-seeded). Seeds 1 or 2 per monocarp, to about 30 mm in diam. (or length), to about 20 mm thick.

Distribution. Only known so far from the Yasuní National Park in the province of Napo, eastern Ecuador. In forests at altitudes below 500 m. Flowering material has been collected from January through June; fruiting material was collected once, in January (K. Thomsen, pers. comm.).

Material examined. ECUADOR. Napo: Añangu, Parque Nacional Yasuní, alt. 260–350 m, 30 May–21 Jun 1982 (yfr), *J. Lawesson et al. SEF 8779* (AAU), 28 Apr 1983 (st), *idem* (AAU), 1986? (fl), *idem* (AAU); NW corner of Parque Nacional Yasuní, KTH tree nr. 218, alt. 355–365 m, 1–15 Feb 1986 (st), *J. Korning & K. Thomsen 47626* (U).

This species, which brings the number of species described in this genus (see Westra 1985) to 6, is easily distinguished from its fellow-members by the (almost) spherical monocarps (“like pingpong balls”, K. Thomsen, pers. comm.) and the rather large leaves which are long-tapering toward the base, but then change to obtuse or rounded at the base. No less striking, at first glance, are the apparently hexamerous perianth whorls in the material examined (the number of 5 inner petals counted may be due to abortion). This, though, needs further investigation of more individuals. The number of perianth members is generally four, but both trimerous and pentamerous perianths have been observed as well on the intraspecific level (Westra op. cit.). Perhaps less conspicuous, but equally noteworthy, in *T. globuliferus* is the combination of a flat (to slightly prominent) primary vein on the adaxial side with the rather large stellate hairs and flat-topped stamens. In the species described earlier it is either a flat (to slightly prominent) primary vein with minute stellate hairs and flat-topped stamens (*T. laomae*, *T. umbellatus*) or an impressed primary vein with comparatively large stellate hairs and conical-topped stamens (*T. duckei*, *T. macrocarpus*, *T. pachycarpus*). Further features of *T. globuliferus* worth noting are the lobed floral receptacle (torus) the incisions of which apparently

correspond to the insertions of inner petals, the large number of stamens (over 200, vs. rarely exceeding 100 in other species), and the shrivelled fruit wall in dried state.

Etymology: “globulus” and “-ferus” (L) = “globular” and “-bearing”. Refers to the shape of the monocarps.

Tetrameranthus pachycarpus Westra, Proc. Kon. Ned. Akad. Wetensch. Ser. C. 88(4): 477. pl. 2, f. 1, pl. 12 & 13. 1985.

Several additional collections, all from the surroundings of Iquitos, were examined. The description should be modified as follows: “Peduncle 1–5 mm long, ...”, and “Pedicel 10–25 mm long, (1–)1.5–2 mm in diam., to 3–4 mm in diam. when in fruit, ...”.

Material examined. PERU. Loreto: prov. Maynas, Puerto Almendras, alt. 100 m, 2 Oct 1986 (fr), *P. Díaz et al.* 81 (U), ibidem, alt. 122 m, 11 Nov 1983 (fl), *R. Vásquez & N. Jaramillo* 4619 (U); prov. Maynas, Dtto. Iquitos, Carretera de Peña Negra at 2 km from Quisto Cocha, alt. ca. 180 m, 10 Aug 1979 (fl), *M. Rimachi Y.* 4537 (NA).

Tetrameranthus umbellatus Westra, Proc. Kon. Ned. Akad. Wetensch. Ser. C. 88(4): 479. pl. 1, 14 & 15. 1985.

Modify the description as follows: “Lamina narrowly elliptic-obovate to narrowly obovate, ...”.

This species has now been collected in the Río Pachitea region, S of Pucallpa, Peru, thereby extending the known range considerably to the south.

Material examined. PERU. Huanuco: S (“SE”) of Pucallpa, next to the junction of the Río Pachitea and the Río Yuyapichis, village of Panguana and surroundings, alt. ca. 260 m, 8 Oct 1985 (fl), *W. Morawetz & B. Wallnöfer* 14–81085 (U).

Amended key to species of *Tetrameranthus*

1. Primary vein of leaves prominent to flat above. Apex of connective flat 2
– Primary vein of leaves impressed above. Apex of connective conical ... 4
2. Monocarps spherical or almost so. Lamina gradually narrowing toward the base, then becoming obtuse to rounded at the base. Stellate hairs with rays to 0.5 mm (or more) long..... *T. globuliferus*
– Monocarps ellipsoid to oblongoid. Stellate hairs minute, with rays <0.2 mm long..... 3
3. Inflorescences umbellate with (up to) 5 flowers. Peduncle manifest, ≥ 15 mm long..... *T. umbellatus*
– Inflorescences single-flowered. Peduncle rudimentary, <0.1 mm long....
..... *T. laomae*
4. Callus area on inner side of petals mostly ≤ 3 mm long, i.e. <1/6 of total length of petal. Monocarps with inconspicuous constriction (two-seeded specimens)..... *T. pachycarpus*

- Callus area on inner side of petals >4 mm long, i.e. $\geq 1/6$ of total length of petal. Monocarps with obvious oblique constriction (two-seeded specimens) 5
- 5. Monocarps, ≥ 3.5 cm in diam. Outer petals to 30 mm long. Tree *T. macrocarpus*
- Monocarps ≤ 2.5 cm in diam. Outer petals ≤ 25 mm long. Shrub to small tree *T. duckei*

When using this key, please note that measurements refer to dried material! For comparison of monocarps, two-seeded specimens should preferably be examined.

Unonopsis macrocarpa P. Maas & van Setten, sp. nov. — Type: Panama. Darién: Cerro Pirre, ridge top near Rancho Plastico, alt. 1200 m, 10–20 Jul 1977 (fr), *J.P. Folsom 4324* (holotype, MO). Fig. 23.

Arbor parva vel mediocris foliis ellipticis 33–42 cm longis et 13–17 cm latis chartaceis glabris venis secundariis utrinque c. 18–20, petiolis 5–9 mm longis et 4–5 mm crassis; pedicelli (solum specimina in statu fructifera nobis suppetebant) 20–35 mm longi et 3–5 mm crassi basi articulati; monocarpia 2–9 transverse late ellipsoidea ad 3 cm longa et 3.5 cm crassa in siccitate valde rugosa stipite 6–14 mm longo et 4–5 mm crasso, semen singulum parietale continentia.

Small to medium-sized tree, to 12 m tall, to 15 cm in diam. Young twigs smooth to finely striate, glabrous to sparsely covered with appressed, pale brown hairs 0.1–0.3 mm long, brown to blackish. Petiole 5–9 mm long, 4–5 mm in diam., incrassate, glabrous. Lamina elliptic, 33–42 cm long, 13–17 cm wide, chartaceous, pale greenish on both sides, glabrous, minutely and densely verruculose on both sides, base acute, obtuse, to rounded, sometimes slightly asymmetrical, apex short – to long – acuminate, the extreme tip (mostly) obtuse; primary vein raised above; secondary veins straight to slightly curved, ca. 18–20 on either side of primary vein, slightly raised above, angles with primary vein 60–70°, arching, to loop-forming under the apex only, loops indistinct, smallest distance between loops and margin 1–1.5 mm.

Flowers not seen.

Fruiting pedicels with basal articulation, glabrous, 20–35 mm long, 3–5 mm in diam. Bracts caducous.

Fruiting receptacle transversely broadly ellipsoid, 9–13 mm in diam, surrounded by connate, persistent, (very) broadly ovate-triangular sepals ca. 1.5 mm long and 3.5–4.5 mm wide. Monocarps 2–9, green, maturing pinkish (*in vivo*), transversely broadly ellipsoid (globose *in vivo*, *fide Folsom et al. 4364*), 24–29 mm long, 32–35 mm in diam., glabrous, strongly rugose when dry, wall crustaceous, 0.5–1 mm thick; stipe 6–14 mm long, 4–5 mm in diam., glabrous. Seed 1 per monocarp, lateral, horizontally oriented, filling up the whole cavity or almost so, broadly ellipsoid to disc-shaped, 25–27 × 20–24 × 15–16 mm, the

surface somewhat striate, and with more or less distinct transmedian rib, brownish.

Distribution: Panama and, possibly, Colombia (Antioquia).

Material examined. PANAMA. Darién: valley in between Cerro Pirre and mountain directly south, 10–20 Jul 1977 (fr), *J.P. Folsom et al. 4364* (MO, U); Coasi-Cana Trail on Cerro Campamiento E of Tres Bocas, headwaters of Río Coasi, 29 Apr 1968 (fr), *J.H. Kirkbride & J.A. Duke 1222* (MO, U).

A species distinct by the large, transversely broadly ellipsoid, and strongly shrivelled (in dry condition) monocarps, in combination with extremely large leaves for this genus. Fresh monocarps are reported to be soft and pulpy at maturity (*J.P. Folsom et al. 4364*), with a very hard seed “brown and rugose inside” (*J.H. Kirkbride & J.A. Duke 1222*).

The following collection probably belongs to this species: COLOMBIA. Antioquia: Mun. de Anorí, Corregimiento de Providencia, Tirana Creek, alt. 400–700 m, 24 Oct 1972 (fr), *D.D. Soejarto 3488* (COL). According to the label, the bark has dull brownish-orange, lightly sticky sap.

This collection differs slightly from material collected in Panama in the following characters:

1. Leaf shape: leaves are slightly narrower by comparison (to 10 cm wide).
2. Leaf surface microscopy: leaves are only sparsely verruculose on both sides, mainly along the primary and secondary veins.

Etymology: “macro-” (Gr) = “long”, “great”, and “carpos” (Gr) “fruit”. Refers to the large monocarps.

Unonopsis stipitata Diels, Verh. Bot. Vereins Prov. Brandenburg 47: 130. 1905. Fig. 24.

This species is readily recognized by often obovate leaves with distinctly acuminate to cuspidate apex and an often shiny upper surface. The monocarps are deviating from those in most other species of the genus by their ellipsoid shape and the possession of only one, basal, seed. *U. stipitata* is a very common species throughout most of tropical South America.

Recent fruiting collections from the State of Bahia, Brazil (where *U. stipitata* is not known to occur so far), match with *U. stipitata* in vegetative characters, but not in the globose monocarps with nearly twice the size of those in *U. stipitata* and with always only one, basal, seed. The affinity, nevertheless, seems obvious. The question remains whether we are dealing with a distinct subspecies of *U. stipitata* or a closely related undescribed species.

Material examined. BRAZIL. Bahia: Reserva Biológica de Pau Brasil, km 16 on road from Porto Seguro to Eunápolis, 14 Jun 1973 (fr), *J.A. de Jesus 2343* (ex RB, U); Mun. de Canavieiras, km 21 on road from Canavieiras to Una, 4 Jun 1981 (fr), *J.L. Hage & E.B. dos Santos 881* (ex CEPEC, U); Mun. de Ilhéus, road of Olivença to Vila Brasil, 6 km SW of Olivença, alt. 60 m, 8 Feb

1982 (fr), *G.P. Lewis et al. 1173* (CEPEC, K, U); Mun. de Ilhéus, km 3 on road from Olivença to Povoado de Vila Brasil, alt. 70 m, 6 Oct 1980 (fr), *L.A.M. Silva et al. 1215* (ex CEPEC, U); Mun. de Ilhéus, near km 10 on road from Pontal to Olivença, 5 Feb 1982 (fr), *L.A.M. Silva et al. 1392* (ex CEPEC, U); Mun. de Ilhéus, road from Olivença to Maruim, 6–8 km W of Olivença, alt. 10 m, 10 May 1981 (fr), *S.A. Mori & B.M. Boom 13937* (CEPEC, U); Mun. de Belmonte, near km 30 on road from Belmonte to Itapebi, 27 Sep 1979 (fr), *L.A.M. Silva & J.L. Hage 615* (ex CEPEC, U); Mun. de Belmonte, near km 23 on same road, alt. 80 m, 10 Jul 1980 (fr), *L.A.M. Silva & H.S. Brito 978* (ex CEPEC, U); Mun. de Valença, near km 9 on road from Valença to Guaibim, alt. 10 m, 12 Aug 1980 (fr), *L.A.M. Silva et al. 1041* (ex CEPEC, U); Mun. de Valença, near km 9 on road from Valença to Guaibim, alt. 10 m, 11 Dec 1980 (fr), *L.A.M. Silva et al. 1269* (ex CEPEC, U); Mun. de Prado, km 45 on Hwy. BA 001, 45 km N of Alcobaça, alt. 25–75 m, 19 Mar 1978 (fl), *S.A. Mori et al. 9727* (ex CEPEC, U); Mun. de Sta. Cruz de Cabralia, Estação Ecológica de Pau Brasil and surroundings, ca. 16 km W of Porto Seguro, 21 Mar 1978 (fr), *S.A. Mori et al. 9766* (ex CEPEC, U), *ibidem*, alt. 40 m, 18 Sep 1984 (fr), *F.S. Santos et al. 341* (ex CEPEC, U).

Vernacular names: Pindaíba, Pindaíba preta.

Xylopia crinita R.E. Fries, *Ark. Bot. n.s.* 1(11): 447. f. 1a–e. 1950. — Type: Brazil, Amazonas: Ilha das Flores, Rio Negro, foz do Rio Vaupés, in catinga forest, 20 Oct 1947 (fl), *J. Murça Pires 683* (holotype, K). Figs. 25, 26.

This species is related to *X. excellens* R.E. Fries, *X. macrantha* Triana & Planchon, and *X. xylantha* R.E. Fries, all having in common very thick petals and a large cup-shaped calyx. *X. crinita* differs from the others by leaves with cordate to rounded base.

X. crinita up until shortly was represented by the type collection only. Due to recent collections, we now know the species to occur in Venezuela, French Guiana, and Brazil.

Material examined. VENEZUELA. Amazonas: 0–3 km S of San Carlos de Río Negro, alt. 120 m, 20 May 1979 (fl), *R.L. Liesner 7578* (ex MO, U).

FRENCH GUIANA. Piste de St. Elie, 21 Dec 1983 (fr), *H. de Foresta 468* (ex CAY, U), *ibidem*, 4 Mar 1982 (fl), *D. Sabatier 159* (ex CAY, U).

Xylopia excellens R.E. Fries, *Acta Horti Berg.* 12(1): 210. 1934. — Type: Brazil. Amazonas: km 5 of Estrada do Aleixo, near Manaus, 26 Nov 1932 (fl, fr), *A. Ducke RB 23902* (holotype, S). Figs. 27, 28, 29.

This species is well-marked by large, coriaceous leaves and a dense ferruginous indument covering young twigs, calyx, and even the fruit. It has various features in common with *X. macrantha*, a.o. the large cup-shaped calyx, but it is immediately different by its wider leaves (5–8 cm, vs. 3–4 cm in *X. macrantha*).

Like the preceding species, *X. excellens* for some time was known from the type collection only. There are now several recent finds from the Amazon region (collected in Venezuela, Peru, and Brazil), as well as one from French Guiana.

Material examined. VENEZUELA. Amazonas: 0–3 km SE of San Carlos de Río Negro, alt. 120 m, 21 Jan 1980 (fr), *R.L. Liesner 8539* (ex MO, U).

FRENCH GUIANA: falls above Touinké, Itany River, Upper Maroni River, 26 Nov 1977 (fr), *G. Cremers 5127* (ex CAY, U).

PERU. Loreto: Prov. Maynas, Estación Biológica Callicebus, Río Nanay-Mishana, alt. 130 m, 31 Dec 1981 (fr), *R. Vásquez et al. 2791* (ex MO, U).

BRAZIL. Amazonas: km 500 of Manaus-Humaitá Road, 17 Sep 1980 (fl), *S.R. Lowrie et al. 60* (ex NY, U); 150 km from Humaitá, 27 Sep 1979 (fr), *M.G. Vieira et al. 208* (ex NY, U).

ACKNOWLEDGEMENTS

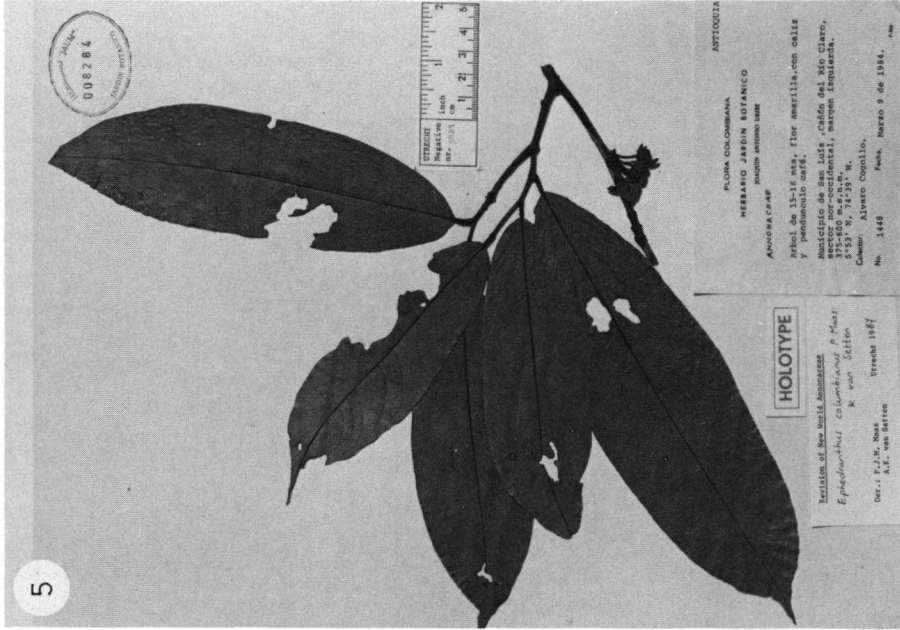
The authors are indebted to Prof. K.U. Kramer, Zürich, for critically reading Latin descriptions.

Thanks are due to all curators of the herbaria from which we received material, both on loan and as duplicates.

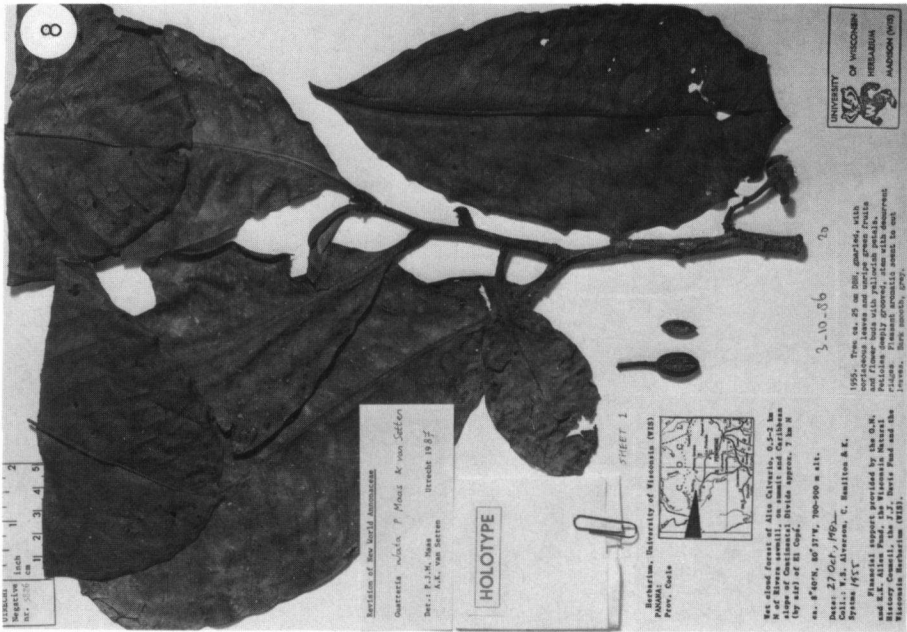
The photographs were made by P.C. Postema. The drawings were made by T. Schipper, P. Pardoën, and Olga Beatriz.

REFERENCES

- Ban, Nguyen T'ien — A new genus of Annonaceae Juss. — *Enicosanthellum* Ban. Bot. Zhurn. **60**, 808–812 (1975).
- King, G. — Materials for a Flora of the Malay Peninsula, J. Asiat. Soc. Bengal. Pt. 2, Nat. Hist. **61**, 55 (1893).
- Maas, P.J.M., et al. — Studies in Annonaceae. VII. New species from the Neotropics and miscellaneous notes. Proc. Kon. Ned. Akad. Wetensch. Ser. C. **89**(3), 249–278 (1986).
- Merrill, E.D. — New species of plants from Indo-China 2. Univ. Calif. Publ. Bot. **13**, 131–132 (1926).
- Miquel, F.A.W. — Anonaceae Archipelagi Indici. Ann. Mus. Bot. Lugduno-Batavum **2**, 1–45 (1865).
- Scheffer, R.H.C.C. — Sur quelques plantes nouvelles ou peu connues de l'Archipel Indien (Annonaceae). Ann. Jard. Bot. Buitenzorg **2**, 1–31 (1885).
- Sinclair, J. — A revision of the Malayan Annonaceae. Gard. Bull. Straits Settlement. ser. 3, **14**, 149–516 (1955).
- Walker, J.W. — Pollen morphology, phytogeography, and phylogeny of the Annonaceae. Contr. Gray Herb. **202**, 1–132 (1971).
- Westra, L.Y.Th. — Studies in Annonaceae. IV. A taxonomic revision of *Tetrameranthus* R.E. Fries. Proc. Kon. Ned. Akad. Wetensch. Ser. C. **88**(4), 449–482 (1985).



Figs. 5 and 6. *Ephedranthus columbianus*, holotype specimen (A. Cogollo 1448, JAUM).
 Fig. 7. *Ephedranthus columbianus* (A.H. Gentry & L. Forero 15471, COL).



Figs. 8 and 9. *Guatteria alata*, holotype specimen, first sheet (W.S. Alverson et al. 1955, WIS).

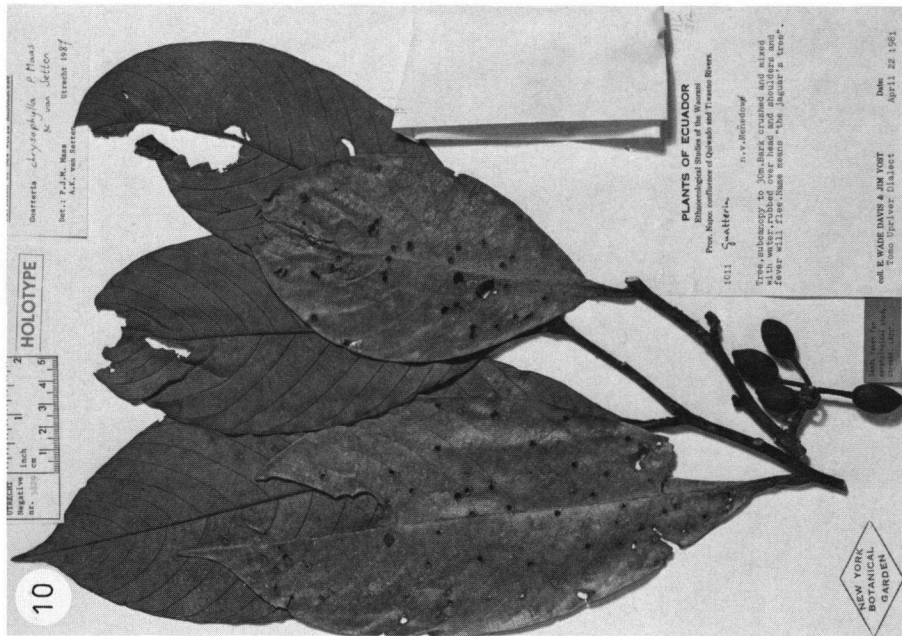


Fig. 10. *Guatteria chrysophylla*, holotype specimen (E. W. Davis & J. Yost 1011, NY).
 Fig. 11. *Guatteria rotundata*, holotype specimen (M. Nee & E. L. Tyson 10999, MO).

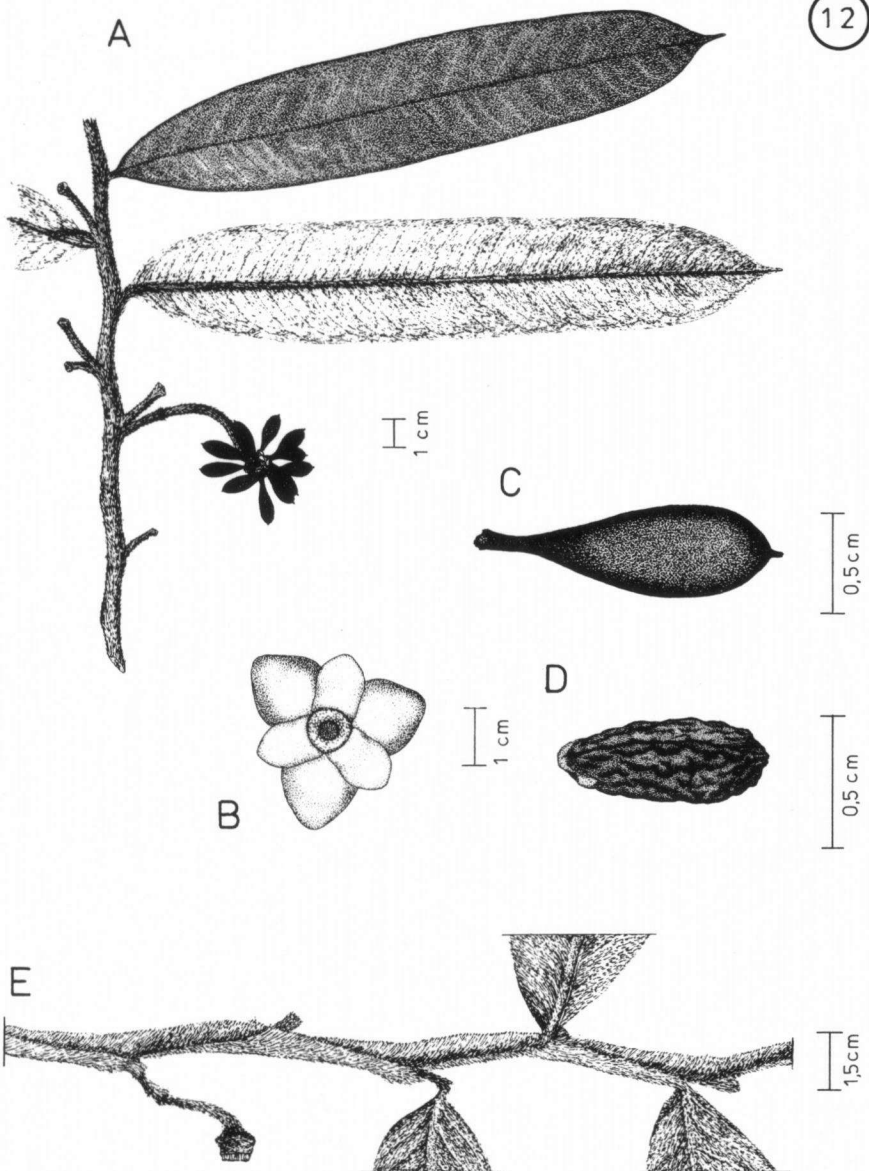


Fig. 12. *Guatteria cuatrecasatii*: A, holotype specimen (*D. Sánchez S. et al. 907*, MEDEL); B, flower of same; C, monocarp of same; D, seed of same; E, detail of branchlet with old flower (*D. Sánchez S. et al. 300*, MEDEL).

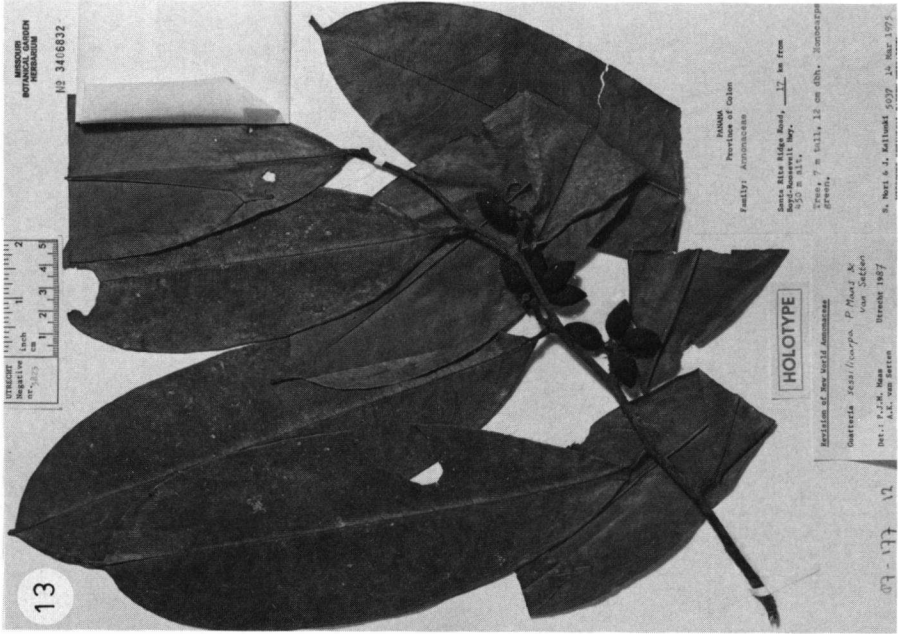


Fig. 13. *Guatertia sessilicarpa*, holotype specimen (S.A. Mori & J. Kallunki 5037, MO).



Fig. 14. *Guatertia sessilicarpa* (G. McPherson 8497, U).

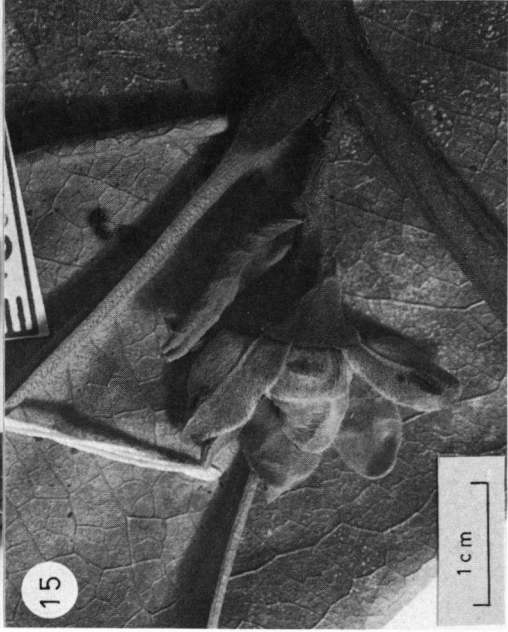
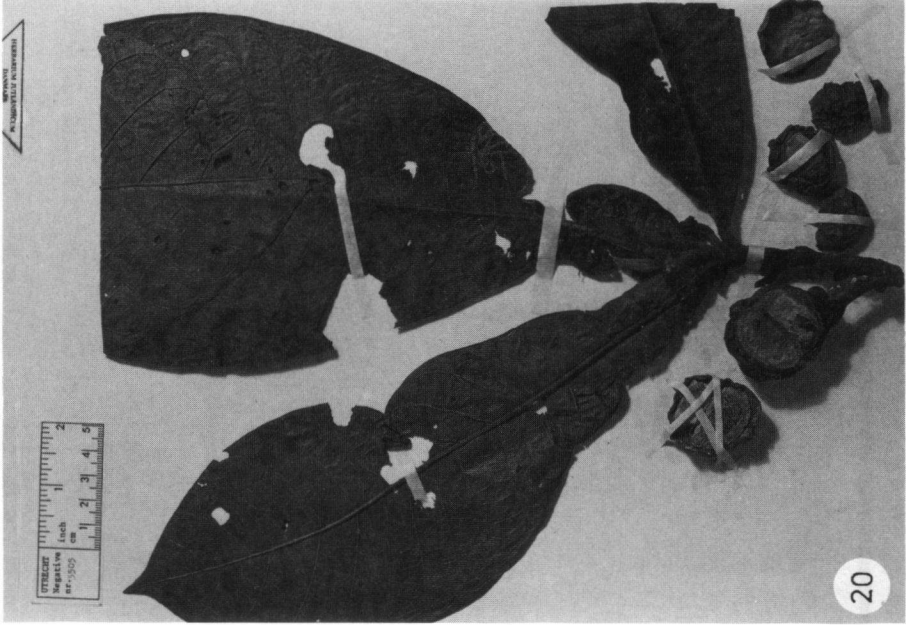
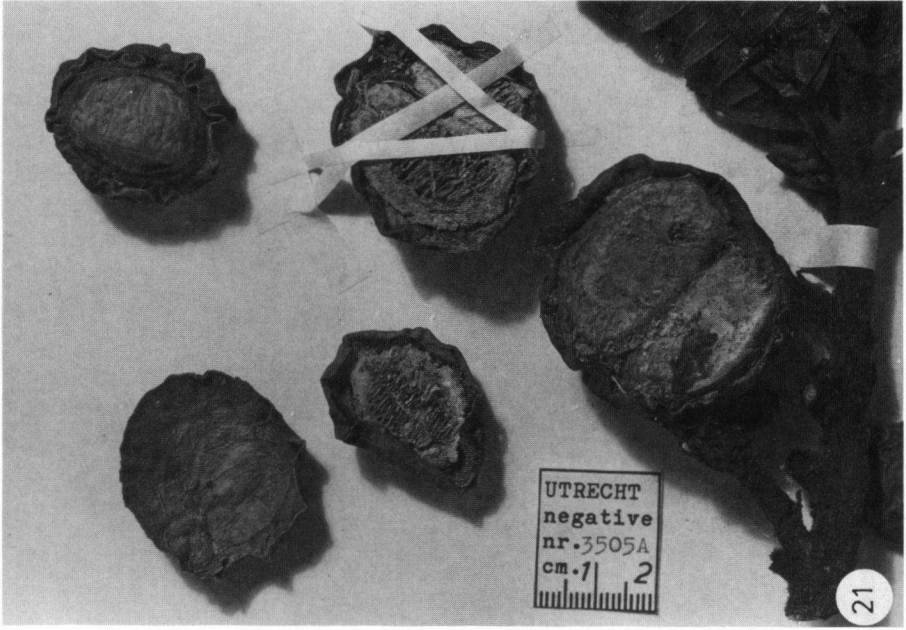


Fig. 15. *Guatertia sessilicarpa* (G. McPherson 9944, U).



Figs. 18 and 19. *Hornsuschuchia obliqua*, holotype specimen (A.M. de Carvalho & J. Gatti 798, CEPEC).



Figs. 20 and 21. *Tetrameranthus globuliferus*, holotype specimen (J. Lawesson et al. SEF 8779, AAU).

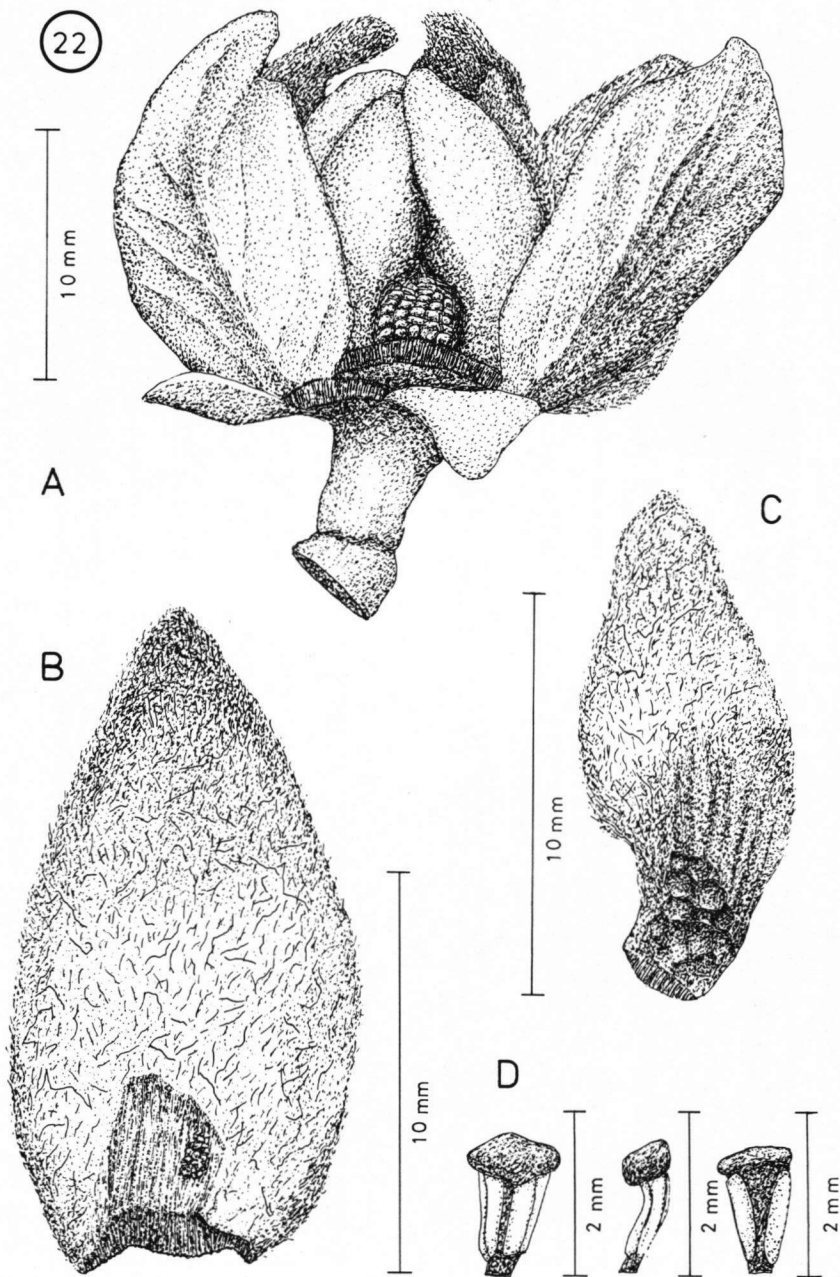


Fig. 22. *Tetrameranthus globuliferus*: A, flower with one sepal and one outer petal removed (*J. Lawesson et al. SEF 8779* [1986?], AAU); B, outer petal in adaxial view, from same; C, inner petal in adaxial view, from same; D, stamen in abaxial, lateral, and adaxial view, from same.

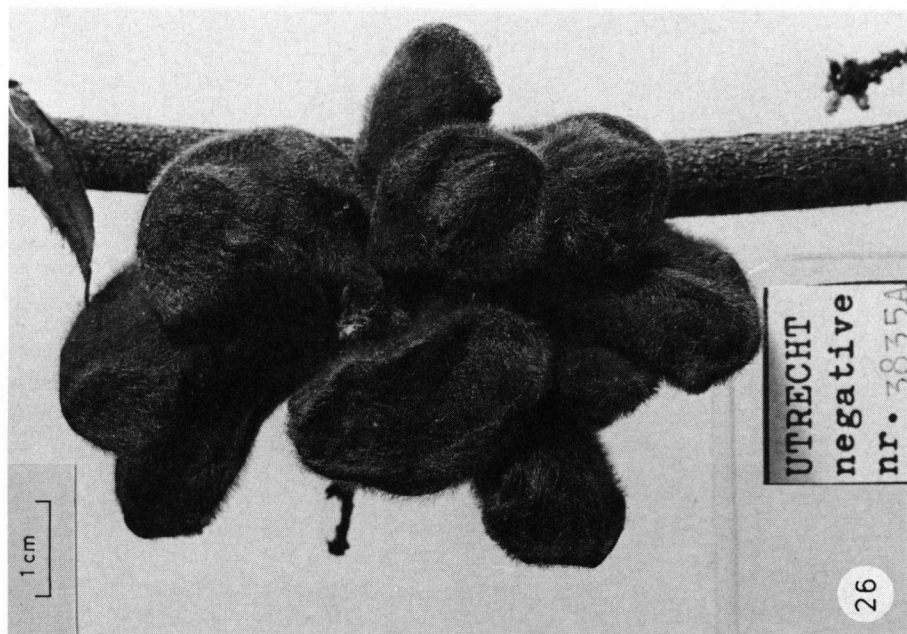


Fig. 26. *Xylopia crinita* (H. de Foresta 468, U).

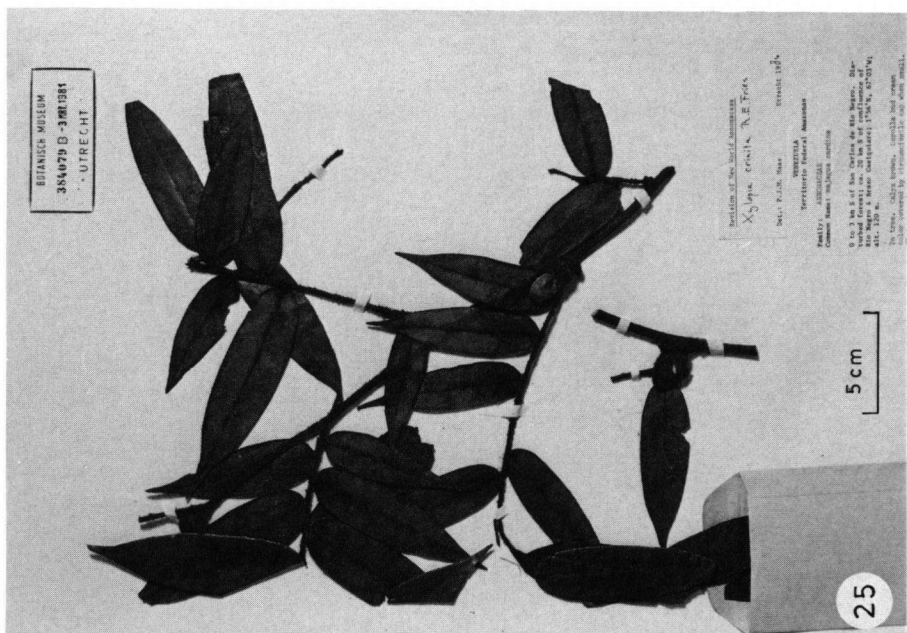
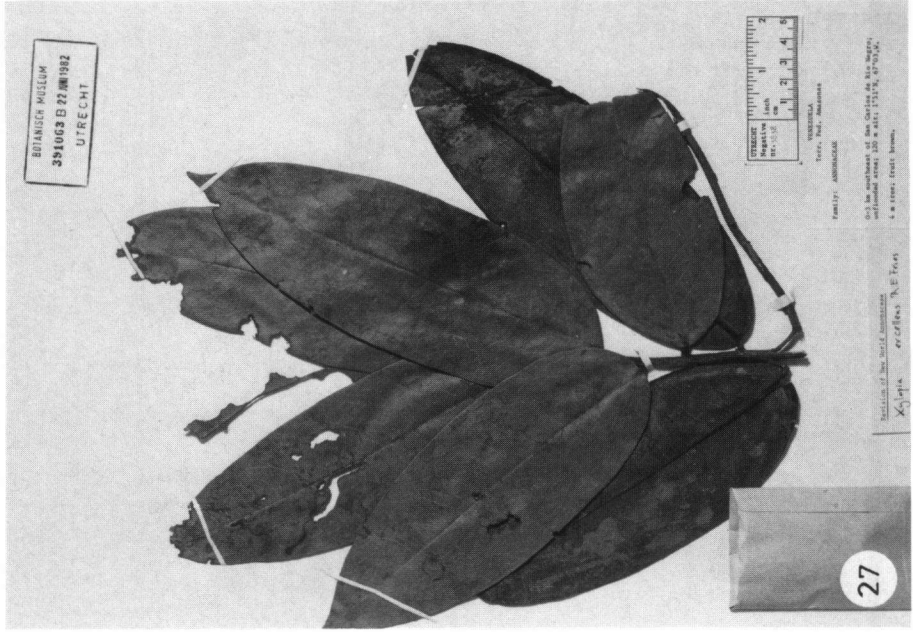


Fig. 25. *Xylopia crinita* (R.L. Liesner 7578, U).



Figs. 27 and 28. *Xylopia excollens* (R.L. Liesner 8539, U).

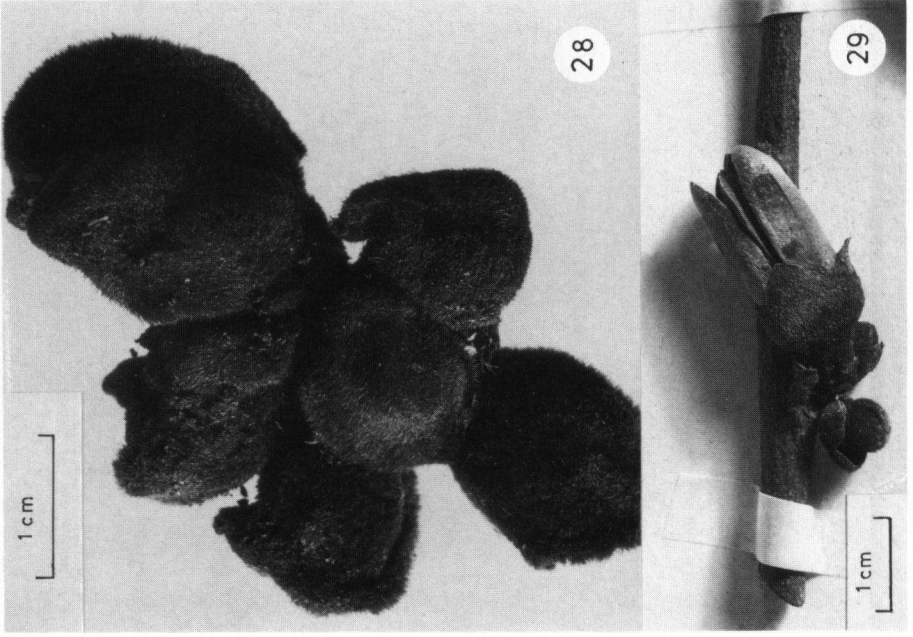


Fig. 29. *Xylopia excollens* (S.R. Lowrie et al. 60, U).