

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

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SUMMARY

Several species in neotropical genera are described, viz. 1 in *Bocageopsis*, 2 in *Crematosperma*, 1 in *Hornschuchia*, 1 in *Oxandra*, 4 in *Pseudoxandra*, and 2 in *Unonopsis*. *Crematosperma anomalum* R.E. Fries is transferred to *Malmea*. *Crematosperma pacificum* R.E. Fries is recorded for Panama for the first time. *Xylopia ulei* Diels, *X. neglecta* (O. Kuntze) R.E. Fries, and *X. intermedia* R.E. Fries are brought into synonymy with *X. benthamii* R.E. Fries, *X. parviflora* Spruce, and *X. sericea* A. St.Hil. respectively. The African *Xylopia parviflora* (A. Rich.) Benth., non Spruce, now has to bear the name *X. longipetala* De Wild. et T. Durand.

1. ***Bocageopsis pleiosperma*** P. Maas, *spec. nov.* Type: *M.G. Silva & C. Rosário* 3927. Brazil. Pará: Parque Nacional do Tapajós, km 60 of Estrada Itaituba-Jacarecanga, 24 Nov 1978, fl, fr (holotype, U; isotypes, MO, NY, US). Figs. 1, 3a.

A speciebus ceteris huius generis monocarpiis pluriseminalibus pariete crassa bene distincta.

Tree, 5–25 m tall, stems to 40 cm in diam. Young twigs subtomentose, soon glabrescent, green-brown; older twigs with fine, irregularly longitudinal ribs and indistinct, brown lenticels, dark brown (to greyish-brown). Petiole 4–6 mm long, ≤ 1 –1.5 mm in diam., canaliculate above, covered with short hairs. Lamina elliptic to narrowly elliptic, (5–)9–15 cm long, (2.2–)3–4.5 cm wide, pubescent below especially along larger veins, glabrous and shiny above, base decurrent, asymmetrical, apex short acuminate (to acute), the tip itself obtuse

to acute; primary vein flat above, moderate; secondary veins slightly curved to straight, abruptly curved towards the margin, 11–14 on either side of primary vein, angles with primary vein 60°–65°, eucamptodromous to loop-forming at right to acute angles, loops very fine to indistinct, smallest distance between loops and margin 1–2 mm.

Inflorescences axillary, in foliate zone, single or sometimes 2(-several?) fascicled, consisting of rhipidia branching from a common rhachis. Rhachis fractiflex, (including very short peduncle:) to ca. 5 mm long, 0.5 mm in diam., densely short pubescent, fruiting peduncle to ca. 2 mm in diam. Pedicel slender, to ca. 10 mm long, ca. 0.5 mm in diam. at the base, to ca. 0.7 mm in diam. below the flower, with basal articulation, densely short pubescent, fruiting pedicel 10–18 mm long, to ca. 2 mm in diam. Bracts 2 to each pedicel, one basal below the articulation, one in the upper half of the pedicel (occasionally missing), and several on the rhachis, broadly ovate-elliptic, 0.5–1 mm long and wide, the upper pedicel bract persistent, other bracts persistent or deciduous after flowering; bracts densely short pubescent.

Perianth 3-merous. Sepals almost free to connate over 1/4 of their length, very broadly triangular, 1 mm long, ca. 1.2 mm wide, acute, golden-brown sericeous. Outer petals very broadly ovate, 3–4 mm long, ca. 3 mm wide, acute, pale yellowish-sericeous outside, glabrous inside. Inner petals broadly ovate (?), 2.8–3 mm long, ca. 2 mm wide, sparsely puberulous on midrib and towards apex, otherwise glabrous outside, glabrous inside. Torus concave. Stamens several (to numerous), 1.5 (outer stamens)–1.8 (inner stamens) × 0.8 mm, thecae ca. 1 mm long, apical prolongation of connective tongue-shaped. Carpels 3 (?), pale yellowish-sericeous, stigma bilobed, ciliate, style absent.

Fruiting receptacle irregularly shaped, 1.2–4 mm in diam. Monocarps 1–3(–4), yellow, maturing red (*in vivo*), transversely broadly ellipsoid, cubical, or oblong, (7–)9–19 mm long, (9–)11–15 mm in diam., glabrous except for some minute, pale brown hairs at the apex, smooth, base acutish to truncate, apex rounded to truncate, with slight constrictions on the side (>1-seeded specimens), wall indurate, rather tough, 0.5–0.7 mm thick; stipe absent or up to 2 mm long, 1.2–1.5 mm in diam., sparsely pale yellow appressed puberulous. Seeds 1–4 per monocarp, lateral, uniseriate, horizontally oriented, tightly packed and close to the wall, discoid, 3–7 × 9–11 mm, irregularly punctate to ruminate, rough (as if already decaying), dull brown.

Distribution: The Brazilian states of Amazonas and Pará; in forest on terra firme, one collection from sandy soil.

Specimen examined: BRAZIL. Amazonas: km 204 of Manaus-Itacoatiara Road, 21 Dec 1966, *G.T. Prance et al.* 3791 fr (GH, S, US).

This species is readily distinguished from other species of *Bocageopsis* (*B. canescens*, *B. mattogrossensis*, and *B. multiflora*) by several-seeded, thick-walled monocarps.

2. *Crematosperma macrocarpum* P. Maas, *spec. nov.*

Type: *H. van der Werff & B. Vera, Flora Falcón 937*. Venezuela. Falcón: Sierra de San Luis, above Santa María, alt. 1300 m, 26 Jul 1979, fl, fr (holotype, 2 sheets, U). Figs. 2, 3b.

Species monocarpis pro genere magnis distincta.

Tree, 5–10 m tall. Young twigs finely striate, glabrous, (brown to) blackish-brown, often somewhat shiny; older twigs with fine, irregularly longitudinal ribs, greyish-brown to blackish-brown. Petiole 5–7(–10) mm long, 1.5–2(–3) mm in diam., canaliculate on upper side, glabrous. Lamina narrowly elliptic, 15–23(–30) cm long, 5.5–7(–11) cm wide, glabrous on both sides, base obtuse to rounded (sometimes slightly asymmetrical), apex acute, obtuse at the tip itself; primary vein raised on upper side, weak; secondary veins curved, 6–9 on either side of primary vein, raised on upper side, angles with primary vein 50°–60°, loop-forming at right angles, loops distinct but sometimes weak, smallest distance between loops and margin 2–4 mm.

Inflorescences axillary, in foliate zone, single, single-flowered, sessile or with peduncle up to 3 mm long, the peduncle to ca. 0.8 mm in diam., glabrous, to 2 mm in diam. in fruit. Pedicel slender, 35–60 mm long, to ca. 0.8 mm in diam. over most of the length, to 2 mm in diam. below the flower, with basal articulation, glabrous. Bracts 2 to the pedicel, one basal, below the articulation, and one basal to sub-basal above the articulation, and 1(–several?) tiny bracts on the peduncle, triangular-ovate, to ca. 1 mm long, 0.7 mm wide, (more or less) persistent; bracts ciliate, otherwise glabrous.

Flowers creamy to greenish-yellow (*in vivo*). Perianth 3-merous. Sepals free, depressed ovate to semicircular, 0.5–1 mm long, 2–3 mm wide, rounded, glabrous on both sides, margins ciliate. Outer petals broadly elliptic-ovate, 10–13 mm long, 8–9 mm wide, rounded, glabrous on both sides, margins thin, (sparsely) ciliate. Inner petals oblong-ovate to obovate, 14 mm long, 6–7 mm wide, rounded, glabrous on both sides, inner side slightly ridged, margins thin, (sparsely) ciliate. Stamens numerous, ca. 1.6 mm long, ca. 0.5 mm wide, thecae ca. 1 mm long, apical prolongation of connective truncate, 6-angled, 0.8 mm wide.

Fruiting receptacle depressed ovoid to transversely ellipsoid, 5.5–9 mm in diam. Monocarps 4–16, yellowish-brown, maturing purplish-black (*in vivo*), ellipsoid, (17–)19–25 mm long, 13–15 mm in diam. (25 mm long and 15–20 mm in diam. *in vivo*), glabrous, smooth; stipe 7–14 mm long, 1.8–2.4 mm in diam., becoming somewhat thicker toward apex, glabrous. Seed pale brown to brown, 1 per monocarp, vertically oriented, free from wall, apical, ellipsoid, 13–20 mm long, 9–13 mm in diam., foveolate.

Distribution: The North Venezuelan states of Falcón and Yaracuy; in cloud forest at 800–1500 m altitude.

Specimens examined: VENEZUELA. Falcón: Cerro Galicia, near the touristic stop of Curimagua, alt. 1500 m, 10 Jun 1978, *T. Ruiz et al. 3499* fr

(U); Sierra de San Luis, above Santa María, alt. 1300–1400 m, 8 Oct 1978, *R. Wingfield & H. van der Werff 6751* fr (U). Yaracuy: Sierra de Aroa, Cerro Tigre, Río Carabobo and adjacent slopes, alt. 800–1200 m, 31 Mar 1980, *R.L. Liesner & A. Gonzalez 9763* fr (MO, U); Distrito San Felipe, Vuelta de Pavo, 5 km S of Candelaria, alt. 1200 m, 7 Dec 1980, *J.A. Steyermark & V. Carreño Espinoza 123804* fr (U, VEN).

This is the second species now known from Venezuela, as Aristeguieta (1973) recorded *Crematosperma brevipes* (A. DC. ex Dunal) R.E. Fries for cloud forests of the Cordillera de la Costa. The new species can be distinguished from *C. brevipes* and any other *Crematosperma* species by its extremely large monocarps up to 25 mm long.

3. *Crematosperma pacificum* R.E. Fries, Ark. Bot., n.s., 1(6): 330. 1950. Fig. 4.

This species, only known so far from the Pacific coast of Colombia (El Valle: Río Cajambre, and near Buenaventura), is now recorded for Panama:

Panama. San Blas: Comarca de San Blas: evergreen seasonal lowland rainforest on the Aila Tiwar (Río Acla), alt. 25–100 m, 23 Mar 1979, *A. Sugden 613* fr (MO).

According to the label, the panamanian specimen was collected from a tree of 8 m high, with red fruits, and with leaves containing 'cardiac glycosides'.

4. *Crematosperma panamense* P. Maas, *spec. nov.*

Type: *I.M. Johnston 1812*. Panama. Canal Zone: northwestern part of Canal Zone (area west of Limon Bay, Gatun Locks and Gatun Lake), Maru Towers, 7 Apr 1956, fr (MO). Figs. 5, 6.

Species foliis parvis acuminatis venis secundariis saepe venam marginalem formantibus facile recognita.

Shrub or tree, 2–6.5 m tall, stems 6(– more?) cm in diam. Young twigs finely striate to verruculose, glabrous except sometimes for some whitish hairs 0.1–0.2 mm long at apex, brown to blackish-brown, sometimes somewhat shiny; older twigs almost smooth to finely, irregularly, longitudinally striate or ribbed, greyish-brown to brown. Petiole 3–5 mm long, 1–1.5 mm in diam., canaliculate above, glabrous. Lamina narrowly elliptic, 7–14 cm long, 2.5–4.5 cm wide, glabrous, often with numerous minute waxy protuberances, base decurrent, apex acuminate, obtuse at the tip itself; primary vein raised on upper side, weak to moderate; secondary veins straight to curved, rarely slightly recurved, 8–9 on either side of primary vein, raised on upper side, angles with primary vein 50°–80°, loop-forming at obtuse angles, loops distinct, forming a marginal vein, smallest distance between loops and margin 3–4 mm.

Inflorescences axillary, in foliate zone, single, rarely several fasciculate clustered, single-flowered. Peduncle 2–3 mm long, 0.6–0.7 mm in diam., sparsely appressed puberulous, 1–2 mm in diam. in fruit. Pedicel 10–15(– 25)

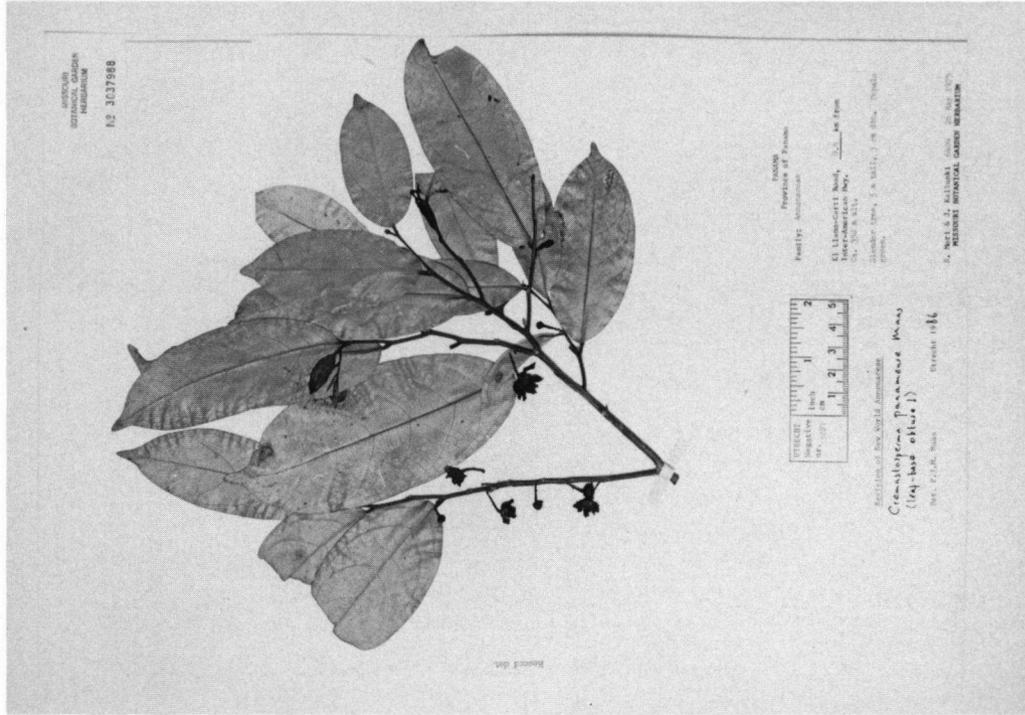


Fig. 6. *Crematosperma panamense* (S.A. Mori & J. Kallunki 6404, MO).

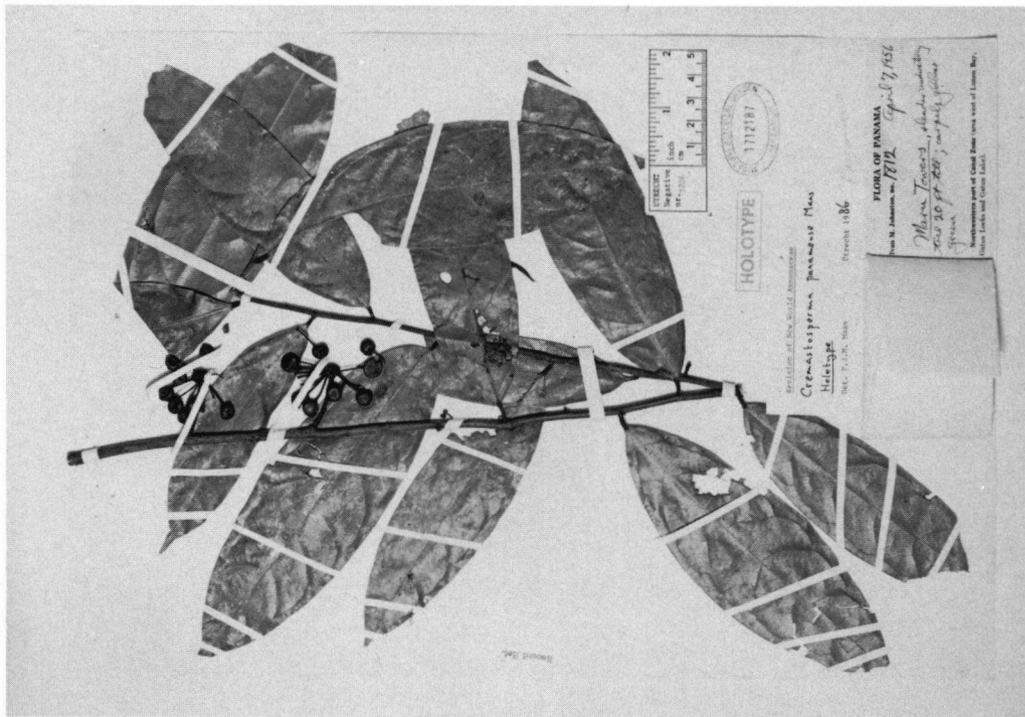


Fig. 5. *Crematosperma panamense*, holotype specimen (L.M. Johnston 1812, MO).

mm long, ca. 0.7 mm in diam. at the base, ca. 1 mm in diam. below the flower, sparsely appressed puberulous, respective diameters in fruit to 1.2 mm and 2 mm, with basal articulation. Bracts 2 to the pedicel, one below the articulation, and one at some distance above the articulation in the lower or the upper half of the pedicel, 0-few bracts on the peduncle, upper pedicel bract triangular-ovate to broadly elliptic, 0.7–1.5 mm long, 1–1.5 mm wide, persistent, lower pedicel bract, and peduncle bracts, of same shape, to 1 mm long or less, persistent or deciduous; bracts short puberulous, ciliate.

Flowers greenish (*in vivo*). Perianth 3-merous. Sepals free, ovate, 2–2.5 mm long, 2.5–3 mm wide, rounded, glabrous on both sides, margins ciliate. Outer petals ovate to broadly elliptic-ovate, 7–9 mm long, 4–6 mm wide, rounded, glabrous on both sides, margins ciliate. Inner petals ovate, 6.5–10 mm long, 4–5 mm wide, rounded to obtuse, glabrous on both sides, margins ciliate. Torus slightly elevated, with concave top. Stamens numerous, ca. 1 mm long, ca. 0.7 mm wide, thecae about as broad as the connective, the outer locules almost reaching to the base, apical prolongation of connective truncate, depressed, 5-angled. Carpels ca. 25.

Fruiting receptacle depressed ovoid to transversely ellipsoid, 3–8 mm in diam. Monocarps 3–10(–25), yellow, maturing black (*in vivo*), globose, 7–11 mm in diam., sometimes with apicule up to 1 mm long, glabrous, smooth, wall papyraceous to crustaceous, mostly brittle, becoming slightly tougher when mature, 0.1–0.7 mm thick; stipe 7–15 mm long, 1–1.5(–3) mm in diam., glabrous. Seed medium brown, 1 per monocarp, horizontal to slightly oblique, free from wall, lateral to almost apical, broadly transversely ellipsoid to globose, 5–9 mm long, 6–9 mm in diam., foveolate.

Distribution: Restricted to Panama; in forests at elevations from sea level up to 1000 m.

Specimens examined: PANAMA. Canal Zone: along road S-1 between Gatun and Pina, alt. 0–170 m, 2 Apr 1973, *R.L. Liesner 1362* fr (F). Coclé: area between Caño Blanco del Norte, Caño Sucio and Chorro del Río Tife, alt. 200–400 m, 3 Feb 1983, *G. Davidse & C.W. Hamilton 23634* fr (MO). Colón: Santa Rita Ridge Road, 4 mls. from Transisthmian Hwy. to Agua Clara weather station, alt. ca. 500 m, 11 Dec 1973, *R.L. Dressler et al. 8828* fr (MO, U); along Santa Rita Ridge Road, to 10 km from Transisthmian Hwy., alt. 300–400 m, 1 Aug 1983, *J.S. & L. Miller 947* (MO, U). Panamá: El Llano-Carti Road, 7.8 km from junction with Inter-American Hwy., 31 Oct. 1977, *J.P. Folsom et al. 6155* fr (MO, U), same, 10–12 km from Inter-American Hwy., alt. 410 m, 31 Oct 1974, *S.A. Mori & J. Kallunki 2906* fr (MO), *2918* fr (MO, U), same, 24.5–25 km from Inter-American Hwy., 12 Apr 1975, *S.A. Mori & J. Kallunki 5527*, fl, fr (MO), same, 9.6 km from Inter-American Hwy., alt. 350 m, *S.A. Mori & J. Kallunki 6404* fl (MO); Comarca de San Blas, El Llano-Carti Road, 19.1 km from junction with Inter-American Hwy., 19 Sep 1984, alt. 200 m, *G. de Nevers et al. 3906* fl, fr (MO); Cerro Jefe, alt. 900–1000 m, 27 Jan 1966, *E.L. Tyson et al. 3314* fr (SCZ), same, alt. 800 m, Feb 1968, *A.*

Gomez-Pompa et al. 3067 fr (MO); Cerro Jefe, 1.5 mile down right turnoff 6.7 mile past Goofy Lake, alt. 700 m, 27 Dec 1980, *K. Sytsma et al.* 2884 fr (MO, U). San Blas: Nusagandi, alt. 300 m, 31 Jul 1984, *G. de Nevers & C. de León* 3601 fr (MO).

This species is readily distinguished by its small, acuminate leaves often with a distinct marginal vein. It is possibly related to *C. pendulum* from Peru.

The specimen *Mori & Kallunki* 6404 (Fig. 6), the only profusely flowering one of this species we saw, is slightly deviating in having very shortly acuminate leaves with a base tending to be obtuse rather than acute. In all other characters, including floral characters, it matches well with the bulk of the material seen.

5. *Hornschurchia polyantha* P. Maas, *spec. nov.*

Type: *T.S. dos Santos* 3099. Brazil. Bahia: km 9 of new road from São José to Una, 21 Apr 1976, fl (holotype, CEPEC; isotype, U). Fig. 7.

Hornschurchiae bryotrophi inflorescentia paniculiformi similis, sed ab ea facile distinguibilis foliis vena marginali carentibus.

Tree, 3–4 m tall. Young twigs finely striate, glabrous to sparsely appressed puberulous, soon glabrescent, grey-green to blackish-brown; older twigs with fine, irregularly longitudinal ribs or sometimes with many small pustulate lenticels, pale greyish-brown. Petiole 2–3 mm long, 1–2 mm in diam., glabrous. Lamina narrowly elliptic, 12–16.5 cm long, (2.2–)3–4.5 cm wide, glabrous, base decurrent, apex long-acuminate to long-acute, the tip itself obtuse; primary vein raised above, moderate; secondary veins slightly recurved, abruptly curved near the margin, 12–14 on either side of primary vein, raised above, angles with primary vein 30°–40°, loop-forming at obtuse angles, loops thin, smallest distance between loops and margin 2–2.5 mm.

Inflorescences panicle-like, both in foliate zone – axillary or terminal – and on lateral branchlets from the stem, sparsely appressed puberulous to glabrous, with up to numerous flowers appearing in succession. Flowers opposite the bracts, supra-axillary, or (pseudo-)axillary, more or less spaced to crowded. Pedicel slender, 8–13 mm long, 0.3–0.5 mm in diam., to 0.8–1 mm in diam. below the flower, with basal articulation, ebracteate, sparsely appressed puberulous to glabrous. Bracts (narrowly) elliptic to broadly elliptic, 0.7–2 mm long, 0.5–1 mm wide, sparsely puberulous, deciduous or more or less persistent.

Flowers white (*in vivo*). Perianth 3-merous. Sepals completely connate into a cup- to saucer-shaped calyx, 1 mm long, 2–3 mm in diam., sparsely strigose outside, margins ciliate. Outer petals very narrowly elliptic to linear, 6–9 mm long, 1 mm wide, rounded, sparsely brown-strigose outside, inner side very sparsely hairy. Inner petals very narrowly elliptic, 6–8 mm long, 1 mm wide, rounded, brown-strigose outside, brown-tomentose inside. Stamens few, ca. 2.5 × 0.5 mm, apical prolongation of connective acuminate or acute, with few hairs on top. Carpels few, 2.5–3 mm long, glabrous except for long hairs along the four edges, stigma globose.

Fruiting receptacle variable, 1–2 mm in diam. Monocarps 1–3, green (*in vivo*), ellipsoid to narrowly ellipsoid, 12–20 mm long, 5(–6) mm in diam., gradually narrowing into the stipe, glabrous, finely verrucose, base and apex acute, sometimes (?) slightly constricted (2-seeded specimens), wall papyraceous to crustaceous, brittle, 0.2 mm thick; stipe 1–5 mm long, 1–1.5 mm in diam. at the base, broader toward the apex, glabrous. Seeds medium brown, 1–2 per monocarp, vertically oriented, free from wall, the lowermost basal, the second (if present) lateral, ellipsoid, ca. 10 mm long, 4–5 mm in diam., finely transversely ribbed, with 2 longitudinal ribs and a conspicuous, more or less swollen, hilum.

Distribution: The Brazilian state of Bahia; in forest.

Specimen examined: BRAZIL. Bahia: Municipio de Una, km 9 of new road (BR 101) from São José to Una, 20 Jan 1982, *T.S. dos Santos & L.A. Mattos Silva 3712* fl (U).

Hornschurchia polyantha has the same panicle-like inflorescence (due to reduction of foliage leaves) as *H. bryotrophe*, but it is immediately different from that species by leaves which completely lack a marginal vein.

6. *Malmea anomala* (R.E. Fries) P. Maas, *comb. nov.*

≡ *Crematosperma anomalum* R.E. Fries, Kongl. Svenska Vetenskapskad. Handl. 24(10): 4. pl. 1c–d. 1948; R.E. Fries, Ann. Missouri Bot. Gard. 49: 182. f. 154. 1962. – Type: *E.P. Killip & H. García 33600*. Colombia. Chocó: Bahía Solano, near Ciudad Mutis, alt. 0–75 m, 21–23 Feb 1939, fl, fr (holotype, S). Figs. 8, 10a.

Distribution: Panama (Darién) and Colombia (Antioquia and Chocó).

Specimens examined: PANAMA. Darién: vicinity of El Real, alt. 15 m, 7 Oct 1938, *P.H. Allen 969* fr (GH); between Quebrada Venado and Peje Swamp, on the headwaters of Río Tuqueza, 28 Jun 1967, *N. Bristan 1011* fl (OS); Río Aruza, 24 Oct 1967, *N. Bristan 1341* fl, fr (OS); Río Uruceca, Nov 1967, *N. Bristan 1449* fl (OS); forest, 1–4 mls. N of Pucro, 22 Jun 1967, *J.A. Duke 13032* fl (OS); between Paya and Palo de los Letras, 30 Aug 1967, *J.A. Duke & J.H. Kirkbride 14049* fl (MO); lowland area between Cerro Pirre and Piji Vasal, alt. 0–300 m, 15 Nov 1977, *J.P. Folsom 6365* fr (MO); ridges of Filo del Talo, SW of Canglón, in upper reaches of Río Canglón, in dry stream beds, alt. 250–300 m, 8 Mar 1982, *S. Knapp & J. Mallet 3987* fl (MO, U); 4.5 km S of El Real, foothills of N slope of Cerro Pirre, tropical moist forest dominated by *Cavanillesia platanifolia*, 5 Apr 1975, *S.A. Mori & J. Kallunki 5421* fr (MO, U); vicinity of El Real, Río Tuira, 1 mile downstream from Pinogana near Quebrada Chuito, 6 Jun 1959, *W.L. Stern et al. 124* fr (GH).

COLOMBIA. Antioquia: Urabá, 5 km from Arboletes, near Necoclí, alt. 100 m, 20 Sep 1981, *J. Brand & A. Cogollo 119* fl (JAUM); Turbo, 41 km from Barranquilita, 21 Sep 1981, *J. Brand & A. Cogollo 125* fl (JAUM); 15 km W of Chigorodó, near Río León, alt. 100 m, 12 Mar 1962, *C. Feddema 1841* fr

(S). Chocó: between Río Sucio and La Nueva, alt. 100 m, 5 Feb 1967, *J.A. Duke 9766* fr (US); Hoya del Río Atrato, Tagachí, 8 Apr 1982, *E. Forero et al. 8980* fr (COL, U).

Vernacular name: Yaya (*Duke & Kirkbride 14049*).

Use: 'A favorite for the poles used in poling boats' (*Duke & Kirkbride 14049*).

This species was incorrectly included by Fries in *Crematosperma*. It is different from that genus, however, in various leaf characters (primary vein impressed on the upper side, tertiary veins not parallel), the flowers (ovules basal) and fruits (pedicels and receptacle becoming strongly woody with age). It fits very well, however, in *Malmea*, with which it also shares the shape of the monocarps.

7. *Oxandra reticulata* P. Maas, *spec. nov.*

Type: *G.E. Schatz et al. 842*. Brazil. Maranhão: between Cachoerinha and Igarapé Pau Grosso, 57 km SSW of Barra do Corda, 3 Mar 1983, fl (holotype, U; isotype, NY). Figs. 9, 10b, 11a-d.

Ab omnibus speciebus huius generis divergens foliis conspicue reticulatis parvis subtus in costa et secus margines dense rufopunctulatis.

Shrub or tree, 0.8–12 m tall, stems to 10 cm in diam. Young twigs finely striate to finely irregularly ribbed, brown to blackish-brown, lateral shoots often with articulation at the base, glabrous, older twigs irregularly ribbed, greyish-brown, often with small, whitish lenticels. Petiole 4–5 mm long, 0.5–1 mm in diam., canaliculate above, with obvious articulation at the base, glabrous. Lamina elliptic to narrowly ovate, 5–10 cm long, 2–4.5 cm wide, glabrous, minutely reddish-black-punctulate, base rounded to cordate, apex acute, the tip itself acute (to obtuse); primary vein raised on upper side, moderate to stout; secondary veins recurved to curved, 7–9 on either side of primary vein, raised on upper side, angles with primary vein 60°–70° (–90°), loop-forming at right to acute angles, loops faint, smallest distance between loops and margin 1–3 mm.

Inflorescences axillary, in foliate zone, single-flowered, sessile. Pedicel 3–6 mm long, 0.4–0.6 mm in diam., to 1 mm in diam. in fruit, with basal articulation, sparsely puberulous to glabrous. Bracts 1 below the articulation, 1 or none above the articulation: if present, mostly at about the middle or in the upper part of the pedicel, triangular-ovate to transversely elliptic, to ca. 1 mm long and wide, persistent (at least the lower bract) for some time; bracts sparsely puberulous to glabrous, upper bract ciliate.

Flowers white (*in vivo*). Perianth 3-merous. Sepals free to connate at the base, very broadly triangular-ovate to depressed elliptic-ovate, 1–1.5 mm long, 2 mm wide, acute, glabrous on both sides, margins sometimes thin and brown-punctulate, ciliate. Outer petals obovate, ca. 7 mm long, 3 mm wide, rounded, glabrous on both sides, outer side conspicuously brown-punctulate, margins

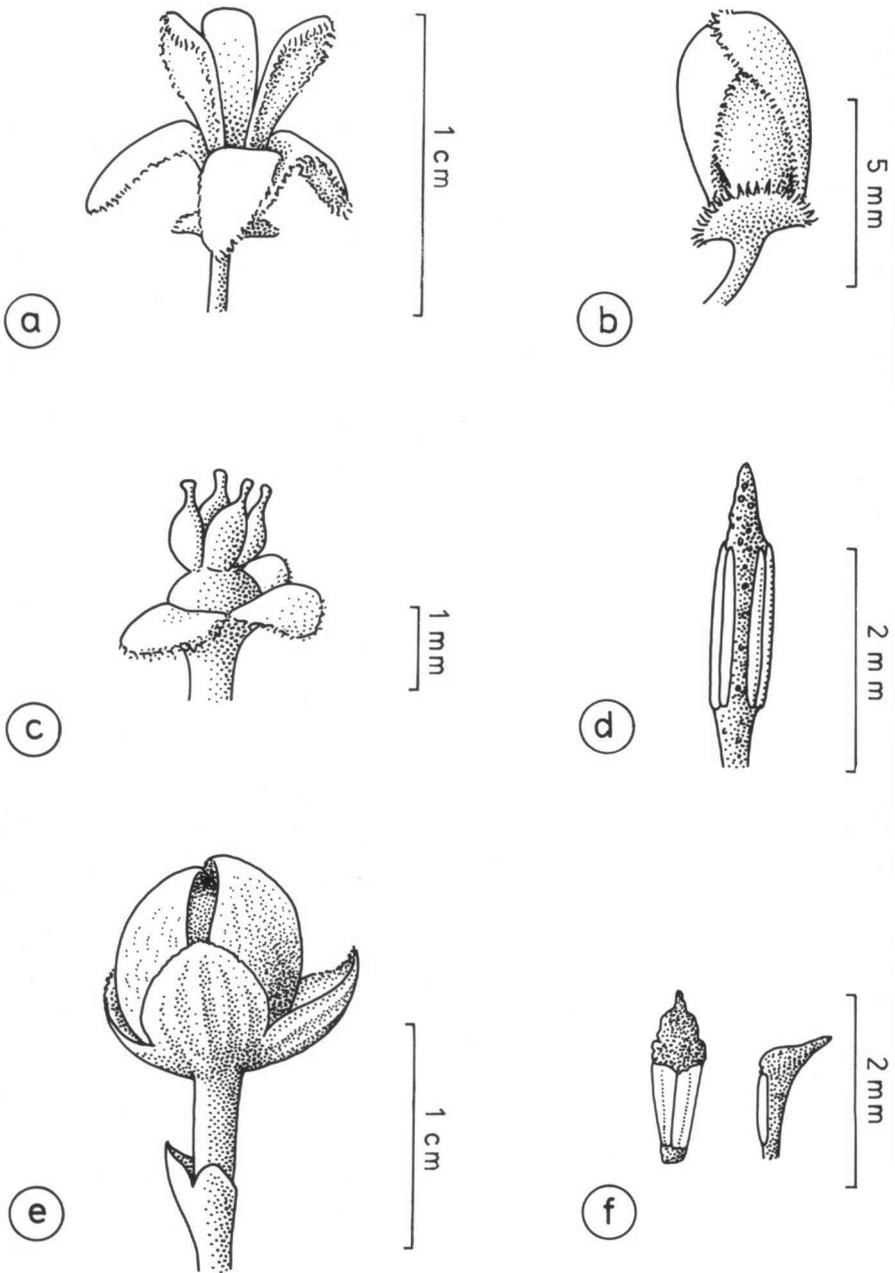


Fig. 11a–d. *Oxandra reticulata*, a: flower, b: flower in bud, c: carpels *in situ*, d: stamen (G.E. Schatz *et al.* 842).

Fig. 11e–f. *Unonopsis velutina*, e: flower in bud, f: stamen – abaxial and lateral view (F. Guanchez 85).

thin, ciliate. Inner petals narrowly obovate, 5–7 mm long, 1.5–2 mm wide, rounded, glabrous on both sides, outer side conspicuously brown-punctulate, margins ciliate (at least in upper part). Torus small, convex. Stamens several (ca. 15?), 2.3–2.4 mm long, ca. 0.4 mm wide, brown-punctulate, thecae ca. 1.3 mm long, apical prolongation of connective triangular-lingulate. Carpels several (1–4?), ca. 0.7 mm long, glabrous, tapering into a very short style, stigma lobulate.

Fruiting receptacle irregularly shaped, 1.3–2.5 mm in diam. Monocarps 1–4, broadly ellipsoid, 13–19 mm long, 11–14 mm in diam., glabrous, smooth, sometimes shiny (*in vivo*), wall crustaceous, coriaceous or cartilaginous, brittle to rather tough, 0.6–0.8 mm thick; stipe 1–4 mm long, 1.3–2 mm in diam. Seed pale yellowish, 1 per monocarp, vertically oriented, appressed to wall or just free from wall, basal, broadly ellipsoid, 13–16 mm long, 10–13 mm in diam., rather smooth or slightly transversely striate.

Distribution: The Brazilian states of Maranhão and Piauí; in savanna or secondary forest, on sandy or rocky soil; at sea level.

Material examined: BRAZIL Maranhão: Caxías, 10 Jul 1954, *G.A. Black et al.* 54-16717 fl (S, 3 sheets); Isla de São Luiz, Estrada do Sacavem, Feb-Mar 1939, *R.L. Fróes in Krukoff 11578* st (NY, U); Municipio Tuntum, Palmeirinhas, 46 km W of Presidente Dutra, 26 Feb 1983, *G.E. Schatz et al.* 775 fr (INPA, MG, NY, U); 12 km S of Barra do Corda, 6 Mar 1983, *G.E. Schatz et al.* 855 fl (INPA, MG, NY, U); along Hwy. 006, 52 km S of Arame and 78 km N of Grajaú, 13 Mar 1983, *G.E. Schatz et al.* 927 fr (INPA, MG, NY, U); Municipio de Grajaú, Estrada do Arame, 15 Apr 1983, *M.F.F. da Silva et al.* 1128 fr (MG, U). Piauí: Teresina, parque Piauí, 21 Dec 1980, *F. Chagas & Silva 349* fl (IBGE, U).

Vernacular name: Atinha (*Fróes 11578*).

This species is completely aberrant from any other species of *Oxandra* by its strongly reticulate, small leaves. The primary vein and margins on the lower side, moreover, are densely covered with reddish-black dots.

From Bahia and Goiás we received several collections which share most characters of this species. They differ, however, in having conspicuous, hairy axillary buds, woody-thickened fruiting pedicels, and elongate monocarps with a more acute apex and with a more gradual transition between stipe and monocarp body. Provisionally we identified them as *Oxandra* aff. *reticulata*. This involves the following:

Bahia: 3 km NW of Lagoinha, 5.5 km SW of Delfino, alt. 640 m, 5 Mar 1974, *R.M. Harley et al.* 16751 fr (K, L); Serra Geral de Caitité, ca. 3 km from Caitité, alt. 1000 m, 10 Apr 1980, *R.M. Harley et al.* 21155 fr (K, U); Caitité, alt. 200 m, 13 Mar 1981, *S.B. da Silva 193* fr (MG). Goiás: ca. 10 km S of Araguáina, alt. 300 m, 16 Mar 1968, *H.S. Irwin et al.* 21255 fr (NY).

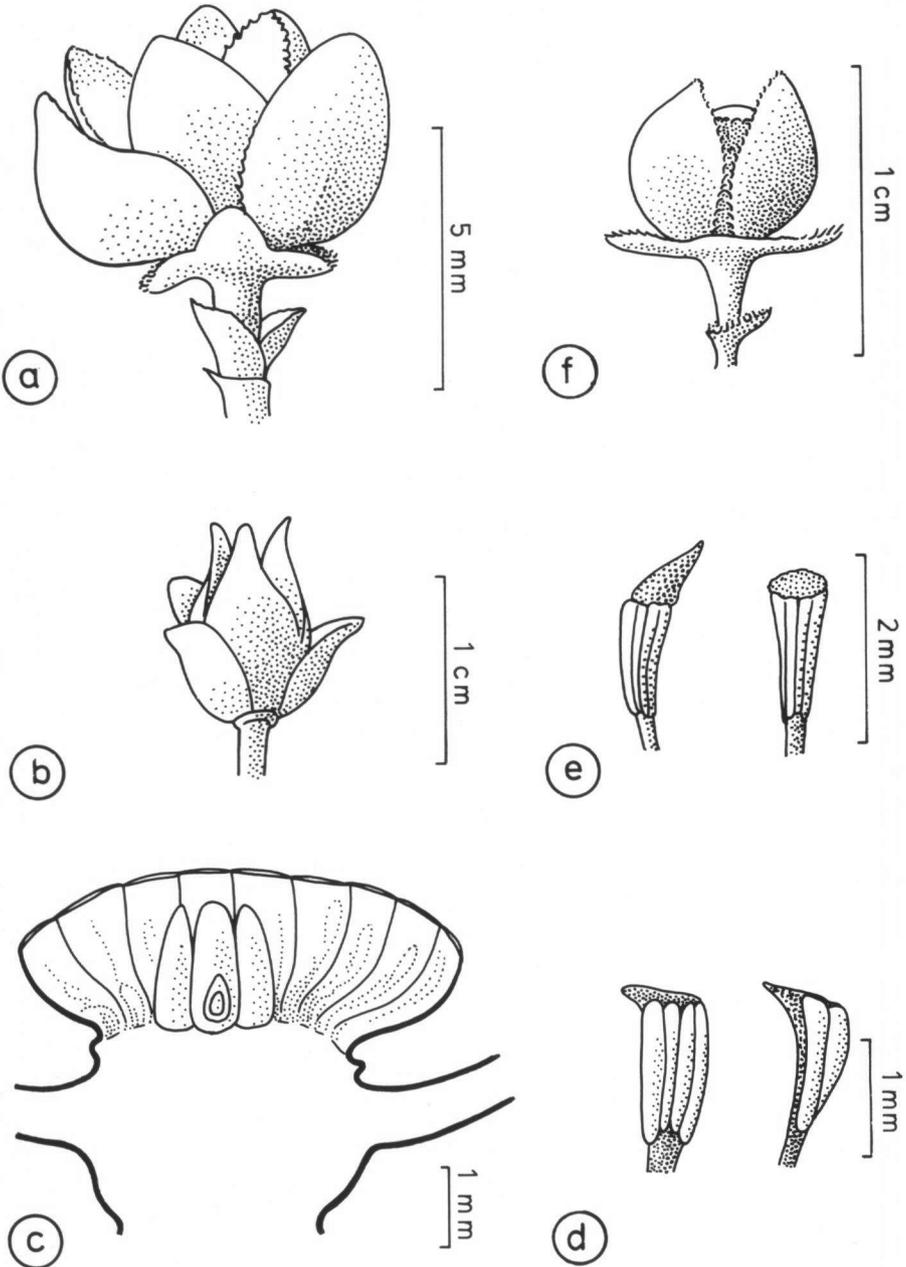


Fig. 12a-d. *Pseudoxandra cuspidata*, a: young flower, b: mature flower, c: carpels *in situ* - radial section, d: stamen - abaxial and lateral view (C.C. Berg et al. 757).

Fig. 12e-f. *Pseudoxandra bahiensis*, e: (left:) inner stamen and (right:) other stamen, f: flower in bud (S.A. Mori et al. 10240).

8. *Pseudoxandra bahiensis* P. Maas, *spec. nov.*

Type: S.A. Mori et al. 10240. Brazil. Bahia: Município de Uruçuca, new road from Uruçuca to Serra Grande, 28–30 km from Uruçuca, 15 Jul 1978, fl, fr (holotype, CEPEC; isotype, U). Figs. 12e–f, 13.

Pseudoxandrae sclerocarphae Novae Granatae incolae valde affinis, ab ea dif-
fert praecipue monocarpis pariete tenuiore.

Tree, 6–20 m tall, 8–25 cm in diam. Young twigs minutely striate to smooth, glabrous, pale greenish-brown to greenish-brown; older twigs scurfy, somewhat mealy, whitish. Petiole 4–6 mm long, 1–2 mm in diam., glabrous. Lamina narrowly elliptic, shiny above, (8–)11–17 cm long, (2–)2.5–3.5 cm wide, the young leaves with long simple white hairs mainly along the margins and at the apex, soon glabrescent, minutely verrucose on both sides, base obtuse to rounded, with an angular to tooth-like projection on either side, apex acuminate to long-acuminate; primary vein raised above, stout; secondary veins straight (rarely curved or recurved), 15–28 on either side of primary vein, raised above, angles with primary vein 70°–85°, abruptly loop-forming at obtuse angles, loops thin, but distinct, marginal vein manifest, smallest distance between loops and margin 2–3 mm.

Inflorescences axillary, ramiflorous, fasciculately placed in small clusters, single-flowered or perhaps partly few-flowered rhipidia. Peduncle to ca. 1 mm long, sparsely appressed puberulous, fruiting peduncle to 5 mm long, 3 mm in diam. Pedicel to ca. 2 mm long, ca. 1 mm in diam. at the base and 1.5 mm in diam. below the flower, with basal articulation, sparsely appressed puberulous, fruiting pedicel 6–10 mm long, 2–4 mm in diam. Bracts several, all below the articulation, transversely elliptical to semicircular, to ca. 1 mm long, 2 mm wide; bracts appressed puberulous.

Flowers green (*in vivo*). Perianth 3-merous. Calyx more or less irregularly splitting into 3 lobes down to 4/5 of the length, the lobes very broadly ovate, 3 mm long, ca. 4 mm wide, with irregular apex, glabrous, margins ciliate. Outer petals broadly elliptic, 7–8 mm long, 6–7 mm wide, rounded, glabrous, margins ciliate. Inner petals very broadly elliptic, rounded, glabrous, margins sometimes thin, ciliate. Torus convex. Stamens numerous, 2–2.3 × ca. 0.5 mm, thecae 1.3–1.5 mm long, apical prolongation of connective obliquely truncate, shallowly concave, that of inner stamens with long-tapering apex. Carpels numerous.

Fruiting receptacle very broadly ovoid, depressed ovoid or transversely ellipsoid, 3–12 mm in diam. Monocarps 1–15, green (*in vivo*), globose, (12–)15–18 mm in diam., glabrous, very finely verrucose, with mostly distinct, shallowly to very shallowly pyramidal apicule of (0.1–)1–3 × 1–3 mm, in the center to somewhat excentric, wall woody, tough, 1.2–1.8 mm thick; stipe 5–18 mm long, 2–3 mm in diam., sometimes widening toward the apex, glabrous. Seed 1 per monocarp, brown and shiny, lateral, horizontally to somewhat obliquely oriented, free from wall, 7–11 × 11–14 mm, foveolate.



Fig. 14. *Pseudoxandra cuspidata*, holotype specimen (H.S. Irwin et al. 47819, U).

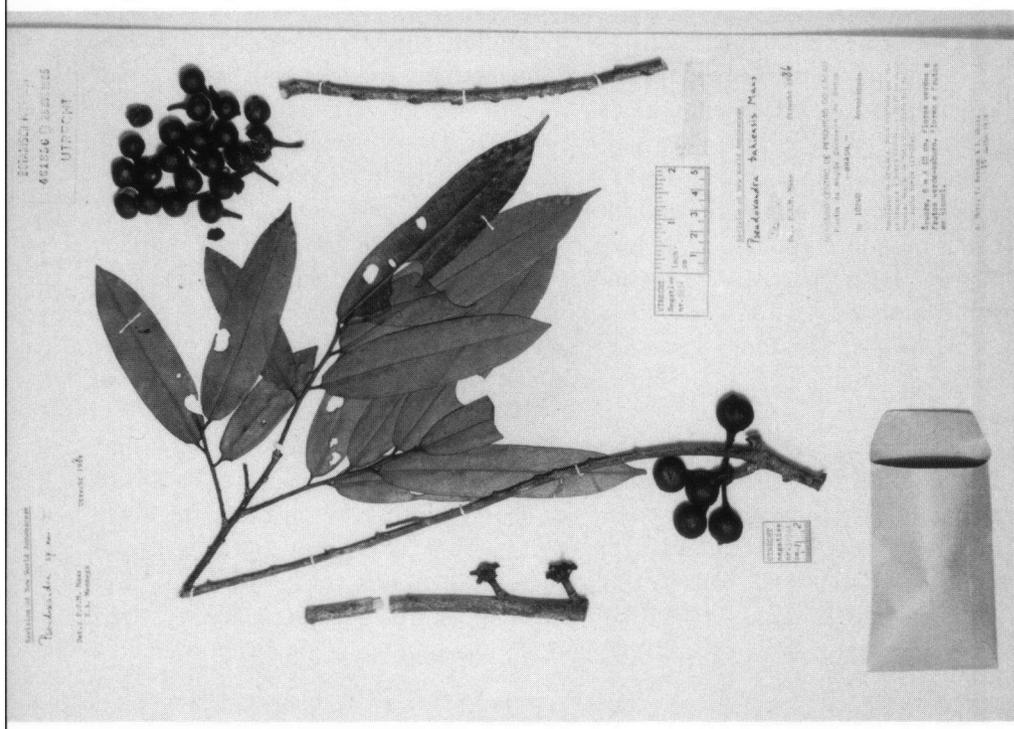


Fig. 13. *Pseudoxandra bahiensis*, isotype specimen (S.A. Mori et al. 10240, U).

Distribution: The Brazilian state of Bahia; in forest (mata hígrófila Sul Bahiana), and one collection from high secondary vegetation.

Specimens examined: BRAZIL. Bahia: Belmonte, 1 Feb 1967, *R.P. Belém & S. Pinheiro* 3252 fr (CEPEC, NY); Município de Belmonte, km 60–68 of Road from Itapebi to Belmonte, 9 Jul 1980, *L.A. Mattos Silva & H.S. Brito* 952 fr (CEPEC, U); Município de Sta. Cruz da Cabrália, near 'Estação Ecológica do Pau-Brasil', 16–17 km W of Porto Seguro, 21 Mar 1978, *S.A. Mori et al.* 9805 fr (CEPEC, U), same locality, 25 Jul 1978, *S.A. Mori et al.* 10304 fr (CEPEC, U), same locality, 25 Jul 1978, *S.A. Mori et al.* 10309 fl (CEPEC, U), same locality, 18 Aug 1978, *S.A. Mori et al.* 10827 fl (CEPEC, U); Município de Uruçuca, new road from Uruçuca to Serra Grande, 28–30 km from Uruçuca, 26 Jun 1979, *S.A. Mori et al.* 12051A fl (CEPEC, U); Camamu, Acarai, 11 Aug 1967, *S.G. da Vinha & R.S. Pinheiro* 79 fr (CEPEC, U).

Note: fruits are eaten by tucans (*Mori et al.* 10304).

P. bahiensis is very closely related to the Colombian *P. sclerocarpa*, from which it differs mainly by thinner-walled monocarps.

9. *Pseudoxandra cuspidata* P. Maas, *spec. nov.*

Type: *H.S. Irwin, J.M. Pires & L.Y. Th. Westra* 47819. French Guiana. Riv. Oyapock (Rio Oiapoque), 1 km N of mouth of Rio Iaué, 25 Aug 1960, fr (holotype, U; isotypes, NY, WU). Figs. 12a–d, 14.

Species foliis cuspidatis monocarpiis atratis apiculo laterali distincta, ramulis novellis cortice albida plerumque conspicuis.

Tree, 6–21 m tall, stems 5–20(–57) cm in diam. Young twigs minutely striate to smooth, glabrous, pale greenish-brown to greenish-brown, older twigs with cracking, scurfy and somewhat mealy cortex, whitish (to very pale brown). Petiole 4–6 mm long, 1–1.5 mm in diam., glabrous. Lamina narrowly elliptic to narrowly obovate, (7–)9–14 cm long, (1.5–)2–3.5 cm wide, sparsely whitish-pilose at the base of the primary vein below, otherwise glabrous, minutely verrucose on both sides, base cuneate, with an angular to tooth-like projection on either side, apex (acuminate to) cuspidate, the tip itself often obtuse; primary vein raised on the upper side, stout; secondary veins straight, 12–16 on either side of the primary vein, raised on the upper side, angles with primary vein 75°–80°, loop-forming at obtuse angles, loops distinct, marginal vein manifest, smallest distance between loops and margin 1 mm; tertiary veins nearly the size of and parallel to the secondary veins (giving leaves striped pattern).

Inflorescences axillary, in foliate zone and also ramiflorous, single or few together fasciculately clustered, single-flowered or few-flowered rhipidia. Peduncle sparsely appressed puberulous to glabrous, fruiting peduncle (including sympodial rhachis) to 3 mm long, to 2 mm in diam. Pedicel very short and stout, ca 2 mm long, 1–1.5 mm in diam. at the base, to 2 mm in diam. below the flower, with basal articulation, sparsely appressed puberulous to

glabrous, fruiting pedicel to ca. 5 mm long, to ca. 2.5 mm in diam. Bracts several, all at the base of the pedicel and on the peduncle, below the articulation or up to 2 above the articulation, transversely elliptic to semicircular, to ca. 1 mm long and 1.5 mm wide, appressed puberulous to sparsely appressed puberulous.

Flowers green (*in vivo*). Sepals connate over 1/3 of their length, depressed ovate, 1–1.5 mm long, 2–2.5 mm wide, rounded, glabrous, sometimes ciliate. Outer petals elliptic, 5–6 mm long, 4 mm wide, rounded, glabrous, margins thin, ciliate at the base. Inner petals ovate, 5–7 mm long, 3 mm wide, unguiculate, acute, glabrous, slightly ridged on the inner side, margins thin. Torus slightly elevated. Stamens numerous, 1.6–1.7 mm long, ca. 0.7 mm wide, outermost thecae 1.2 mm long, innermost 1 mm long, obliquely truncate. Carpels several (ca. 10 observed), ca. 1.2–1.5 mm long, glabrous, ovule 1.

Fruiting receptacle depressed ovoid, transversely ellipsoid, or broadly transversely ellipsoid, 3–6 mm in diam. Monocarps 2–7(–10), green, yellow, to orange (*in vivo*), broadly transversely ellipsoid to globose, (7–)9–13 mm long, (7–)10–15 mm in diam., glabrous, smooth, often with very small, shallowly pyramidal, 0.1–1.5 mm high, apical to more or less lateral apicule, wall crustaceous, brittle or more or less tough, 0.4–0.8 mm thick; stipe 5–18 mm long, 1–1.8 mm in diam., glabrous. Seed 1 per monocarp, brown, lateral, horizontally oriented, free from wall, 8–10 mm long, 9–12 mm in diam., foveolate.

Distribution: The Brazilian states of Pará and Amapá, and adjacent French Guiana; in forest on terra firme, from sea level to little over 100 m alt.

Specimens examined: FRENCH GUIANA. Riv. Oyapock, Trois Sauts, 30 Aug 1977, *P. Grenand 1423* fr (CAY, U).

BRAZIL. Amapá: second cachoeira on Rio Iaué, 3 km E of confluence with Rio Oiapoque, 26 Aug 1960, *H.S. Irwin et al. 47855* fr (NY, S, U); Camaipi, EMBRAPA reserve and vicinity, 6 Sep 1983, *S.A. Mori et al. 15894* fr (MG, NY, U), same locality, 17 Sep 1983, *S.A. Mori et al. 16197* st (NY, U); 109 km SSE of Oiapoque, on road between Oiapoque and Calçoene, 5 Dec 1984, *S.A. Mori et al. 17190* fr (MG, NY, U), same locality, 6 Dec 1984, *S.A. Mori et al. 17234* fr (MG, NY, U); Rio Araguari, 5 hours above Mururé, alt. 130 m, 23 Aug 1961, *J.M. Pires et al. 50444* fr (GH); Macapá, Rio Dois Irmãos, 12 km from Cupixi, 20 Apr 1977, *N.A. Rosa & M.R. Santos 1788* fr (NY). Pará: Altamira, Estação Experimental da EMBRAPA, 14 Aug 1978, *R.P. Bahia 23* fr (MG, U); 5 km N of Gurupi, 12 Aug 1964, *G.T. Prance & N.T. Silva 58673* fr (NY, S, U); km 100 of road Belém-Brasília, 14 Aug 1964, *G.T. Prance & N.T. Silva 58734* fr (NY, S, U); near EMBRAPA station, at km 23 on the road Altamira-Itaituba, 30 Oct 1977, *C.C. Berg et al. 757* fl (S, U).

Vernacular names: Malupete (French Guiana, Wayãpi: *Grenand 1423*); La Moussé (French Guiana, Creole: *Grenand 1423*); Lamuci (*Irwin et al. 47819, 47855, Pires et al. 50444*); Envira camuci (*Rosa & Santos 1788*).



Fig. 16. *Pseudoxandra sclerocarpa*, holotype specimen (S.E. Hoyos & J.J. Hernández 448, U).

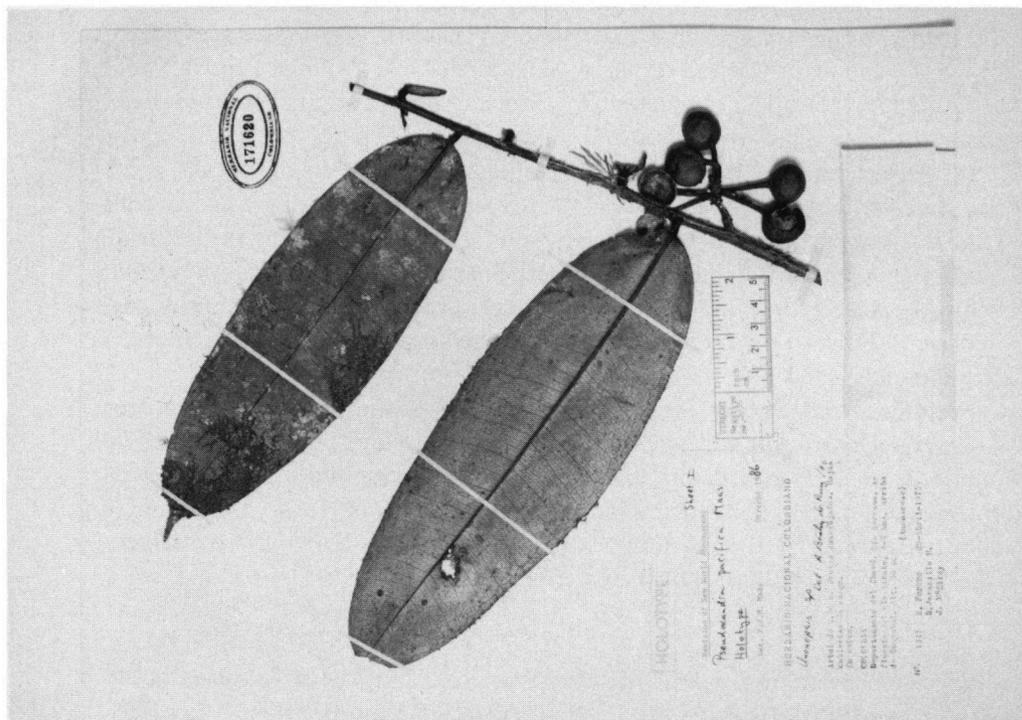


Fig. 15. *Pseudoxandra pacifica*, holotype specimen, sheet I (E. Forero et al. 1347, COL).

Use: Trees are used for canoe poles and fishing rods (*Pires et al.* 50444).

Pseudoxandra cuspidata is akin to a group of three very closely related species: *P. guianensis*, *P. lucida*, and *P. polyphleba* (these three probably have to be united). It is easily distinguished from those, however, by cuspidate leaves and blackish monocarps with a lateral apicule. A striking additional feature, though not seen in all specimens, are its whitish, almost scurfy twigs. The only other neotropical Annonacea with this appearance is *Oxandra leucodermis*, from the Upper Rio Negro Region in Amazonian Brazil and adjacent southern Venezuela.

10. *Pseudoxandra pacifica* P. Maas, *spec. nov.*

Type: *E. Forero et al.* 1347. Colombia. Chocó: Río Serrano, affluent of Río Atrato, 4–6 km above Guayabal, alt. 50 m, 29 Apr 1975, fr (holotype, 2 sheets, COL). Fig. 15.

Species foliis pro genere latissimis et coriaceis notata.

Tree, 2.5–10 m tall, stems to 10 cm in diam. Young twigs finely striate to very finely verrucose, glabrous (except for few whitish hairs to 0.2 mm long at apex), brown to blackish-brown, sometimes somewhat shiny; older twigs almost smooth to finely, irregularly longitudinally striate or ribbed, greyish-brown to brown. Petiole 5–8 mm long, 2–4 mm in diam., glabrous. Lamina narrowly elliptic, (15–)20–25 cm long, (4–)5–7.5 cm wide, minutely verrucose on both sides, base obtuse, with an angular to tooth-like projection on either side, apex long-acuminate; primary vein raised on upper side, moderate to stout; secondary veins straight (rarely slightly curved or recurved), 16–19 on either side of primary vein, slightly raised on upper side, angles with primary vein 75°–90°, abruptly loop-forming at obtuse angles, loops distinct, marginal vein manifest, smallest distance between loops and margin 2–5 mm.

Inflorescences axillary (only fruiting ones seen), in or below foliate zone, single or perhaps also several fasciculately clustered, with a single apocarpous fruit. Fruiting peduncle 3–6 mm long, 2–4 mm in diam., fruiting pedicel 6–10 mm long, 2–3 mm in diam, with basal articulation. Bracts (probably) several, below the articulation, more or less persistent, broadly elliptic to semicircular, uppermost bract to 1 mm long, 2 mm wide, others smaller, sparsely and minutely puberulous.

Fruiting receptacle depressed ovoid-oblong, 5–8 mm in diam. Monocarps 3–10, green to orange (*in vivo*), transversely broadly ellipsoid to globose, 16–20 mm long, 16–20 mm in diam., glabrous, smooth to very finely verrucose, wall crustaceous, brittle, 0.4–0.8 mm thick; stipe 11–24 mm long, 2–2.5 mm in diam., glabrous. Seed 1 per monocarp, lateral, brown, horizontally oriented, free from wall, 10–12 × 11–13 mm, foveolate.

Distribution: Pacific Coast of Colombia; in forest, alt. under 100 m.

Specimens examined: COLOMBIA. Chocó: ca. 3 km W of Tutunendo, alt. 80 m, 5 Jan 1981, *A. Gentry et al.* 30158 st (JAUM), same locality, 6 Jan 1981,

A. Gentry et al. 30200 fr (MO, U), same locality, 7 Jan 1981, *A. Gentry et al.* 30319 fr (MO, U). El Valle: Bajo Calima, Cartón de Colombia concession, 10–15 km N of Buenaventura, alt. 50 m, 10 Dec 1981, *A. Gentry et al.* 35509 st (MO, U), same locality, 15 Feb 1983, *A. Gentry et al.* 40279 st (MO, U).

P. pacifica is characterized by extremely wide (5–7.5 cm) and coriaceous leaves. As far as now known, it takes up an isolated position within the genus.

11. *Pseudoxandra sclerocarpa* P. Maas, *spec. nov.*

Type: *S.E. Hoyos & J.J. Hernández* 448. Colombia. Antioquia: Municipio de San Luis, La Josephina, km 132 of Autopista Medellín to Bogotá, alt. 800 m, 28 Nov 1983, fr (holotype, U). Fig. 16.

Species ex affinitate *Pseudoxandrae lucidae* R.E. Fries, foliis ut in ea specie basi plusminusve bidenticulatis costa venis secundariis tertiariisque supra manifeste prominentibus bene notata, sed ab ea specie distincta monocarpis multo maioribus pariete crasso et stipite longiore.

Tree, 8–20 m tall, wood yellow to creamy-yellow, cortex greyish, with bitter taste. Young twigs finely striate, glabrous, (brown to) blackish-brown, often somewhat shiny; older twigs with fine, irregularly longitudinal ribs, greyish-brown to blackish-brown. Petiole 5–7 mm long, 1–1.5 mm in diam., glabrous. Lamina narrowly elliptic, (6–)8.5–13 cm long, (1.5–)2.2–3.5 cm wide, glabrous, minutely verrucose on both sides, base obtuse to acute, with an angular to tooth-like projection on either side, apex acute to long-acuminate; primary vein raised above, moderate; secondary veins straight (rarely curved or recurved), 11–16 on either side of primary vein, raised above, angles with primary vein 60°–70°, loop-forming at obtuse angles, loops thin, but distinct, marginal vein manifest, smallest distance between loops and margin 1–2 mm.

Inflorescences axillary, (just) below the foliate zone, single, single-flowered. Peduncle 2–3 mm long, to ca. 1 mm in diam., appressed puberulous, fruiting peduncle to 3–5 mm in diam. Pedicel 4–5 mm long, ca. 1.2 mm in diam. at the base, ca. 1.5 mm in diam. below the flower, with basal articulation, glabrous, fruiting pedicel to 9 mm long, 2–4 mm in diam. Bracts 2 on the pedicel, basal, one below the articulation and one just above the articulation, or both below the articulation, and several on the peduncle, (broadly) triangular-ovate, pedicel bracts 1.5–2 mm long and wide, peduncle bracts semicircular, (mostly) less than 1 mm long, all bracts more or less persistent; bracts appressed puberulous.

Flowers green (*in vivo*). Perianth 3-merous. Sepals connate over 1/4 of their length, depressed ovate, 1.5–2 mm long, 2–2.5 mm wide, rounded, glabrous, margins ciliate. Outer petals (broadly) ovate-elliptic, 7–10 mm long, 5–6 mm wide, rounded, glabrous, margins ciliate at the base. Inner petals obovate, 10–13 mm long, 4.5–5.5 mm wide, rounded, glabrous, inner side sometimes slightly ridged at the base. Stamens numerous, apical prolongation of connective truncate. Carpels ca. 6–10, glabrous.

Fruiting receptacle depressed ovoid, 6–10 mm in diam. Monocarps 3–9,

green, turning blackish (*in vivo*), globose, 18–25 mm long, 18–25 mm in diam., glabrous, smooth to slightly rough, sometimes with a very shallowly pyramidal apicule of 1–2 mm high in the center, and sometimes with an indistinct longitudinal rib 2–3 × 1–1.5 mm, wall (soft) woody, tough, 2–3 mm thick (fleshy *in vivo*); stipe 12–21 mm long, 2.5–3 mm in diam., glabrous. Seed 1 per monocarp, lateral, horizontally oriented, wholly free, 11–13 × 12–15 mm, foveolate, dark brown to blackish-brown, often shiny (also *in vivo*).

Distribution: Only known from the Colombian state of Antioquia; in forests, locally common; alt. 700–900 m.

Specimens examined: COLOMBIA. Antioquia: Municipio de San Luís, near Vereda Alta Vista, alt. 700 m, 13 Aug 1983, *A. Cogollo & J. Brand 599* fr (JAUM, U), same locality, alt. 800–900 m, 18 Jan 1984, *A. Cogollo et al. 1206* fl, fr (JAUM, U); Autopista Medellín-Bogotá, Sector Río Samaná-Río Claro, San Luís, alt. 700 m, 21 Mar 1982, *J.J. Hernández et al. 318* fr (HUA, U); Municipio de San Luís, La Josephina, km 132 of Autopista Medellín-Bogotá, 28 Nov 1983, *S.E. Hoyos & J.J. Hernández 446* fl (JAUM, U).

P. sclerocarpa is closest to *P. bahiensis*: see remark under that species. *P. sclerocarpa* is well-distinct by its very thick-walled monocarps.

12. *Unonopsis aviceps* P. Maas, *spec. nov.*

Type: *E. Rentería et al. 2181*. Santander: Pte. de Sogamoso, carretera El Pedral, alt. 100–200 m, 30 Jan 1980, fl, fr (holotype, JAUM). Figs. 17, 18.

Inter omnes species huius generis monocarpiis conspicuis caput avis plusminusve simulantibus notata.

Tree, 8–15 m tall. Young twigs densely (pale) red-brown velutinous; older twigs smooth, with more or less distinct rib(s) running from petiole to petiole, at last glabrescent. Petiole dark brown, 6–12 mm long, 5–6 mm in diam., with short and long simple hairs. Lamina narrowly obovate to narrowly elliptic, 35–>50 cm long, 12–14 cm wide, sparsely puberulous along the primary vein both below and above, base rounded, apex acuminate; primary vein flat to slightly raised above, weak; secondary veins straight to slightly curved, 21–25 on either side of primary vein, not raised above, angles with primary vein 50°–70°, loop-forming at right angles, loops faint, smallest distance between loops and margin 3–4 mm, tertiary veins parallel at varying distances, perpendicular to the secondary veins, but anastomosing near the primary vein.

Inflorescences axillary, below the foliate zone, consisting of rhipidia with up to fairly numerous successive flowers branching from a common rhachis. Rhachis stout, 5–10 mm long (including very short peduncle), densely short pubescent. Pedicel 15–20 mm long, ca. 1.5 mm in diam., with basal articulation, densely short pubescent, fruiting pedicel 2–3 mm in diam. Bracts 2 to each pedicel, one basal, below the articulation, and one in the lower half of the pedicel, broadly triangular to semicircular, 1–1.5 mm long, 2–3 mm wide, persistent; bracts densely short pubescent.

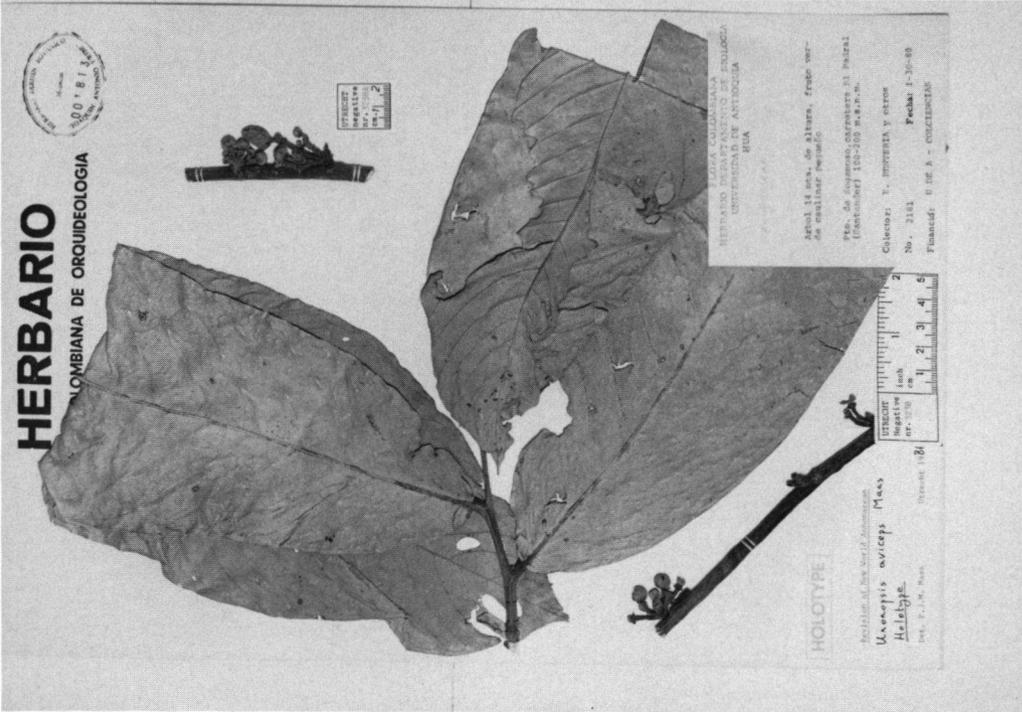


Fig. 17. *Unonopsis aviceps*, holotype specimen (E. Rentería et al. 2181, JAUM).



Fig. 18. *Unonopsis aviceps*, detail (J.J. Hernández et al. 693, HUA).

Perianth 3-merous. Sepals connate over 1/2 of their length, depressed triangular-ovate, 1.5–2.5 mm long, ca. 4 mm wide, acute to shortly acuminate, ferruginous-sericeous outside. Outer petals very broadly ovate, ca. 8 mm long, ca. 6 mm wide, acute, pale yellowish- or brownish-sericeous outside, with visible veins or only with prominent midrib. Inner petals ca. 6–7 mm long, glabrous or brownish-puberulous outside, with slightly keeled midrib. Torus cylindrical. Carpels several, pale brown-sericeous.

Fruiting receptacle depressed ovoid to transversely ellipsoid, 3.5–7.5 mm in diam. Monocarps 2–12, green, turning black (*in vivo*), ovoid to obpyriform, 15–20 mm long, 10–12 mm in diam., sparsely to moderately pale brown- to brown-puberulous or appressed puberulous, smooth, base rounded, apex acute, sometimes with apicule 1 × 1 mm, wall crustaceous, brittle to very brittle



Fig. 19. *Unonopsis velutina*, holotype specimen, actually mounted on 2 sheets (F. Guanchez 380, U).

(fleshy *in vivo*), 0.2–0.5 mm thick; stipe 15–30 mm long, 1.8–2.5 mm in diam., densely ferruginous- to brown-tomentose. Seed 1 per monocarp, apical, vertically oriented, free from wall, ellipsoid to broadly ellipsoid, 11–13 × 6–10 mm, foveolate, pale brown to brown.

Distribution: Colombia, the departments of Antioquia and Santander; in forest (rare); alt. to 500 m.

Specimens examined: COLOMBIA. Antioquia: Autopista Medellín-Bogotá, sector Río Samaná-Río Claro, San Luís, alt. 480 m, 12 Oct 1981, *J.J. Hernández & S.E. Hoyos* 65 fr (HUA), same locality, alt. 350 m, 15 Jan 1983, *J.J. Hernández et al.* 693 fr (HUA). Santander: Magdalena Valley, Campo Capote, 30 km E of Carare, alt. 300 m, 29 Sep 1977, *A. Gentry & E. Rentería* 20012 fr (MO, U); Municipio Vélez, Carare Opón, Campo Capote, alt. 240 m, 8 Jun 1979, *E. Rentería et al.* 1509 fr (HUA); Municipio Cimitara, Puerto Araujo, alt. 500 m, 18 Sep 1979, *E. Rentería et al.* 1782 fr (HUA, JAUM).

This species is very distinct by its monocarps which, owing to their peculiar shape, suggest the head of a small bird. Such monocarps had not yet been found in *Unonopsis* so far. In Fries's (1937) key to the species of *Unonopsis* this new species finds its place in group III, B2 (seed one, apical, vertically oriented), but it hardly has any resemblance to the two species in that group, viz. *U. floribunda* and *U. veneficiorum*.

13. *Unonopsis velutina* P. Maas, *spec. nov.*

Type: *F. Guanchez* 380. Venezuela. Amazonas: dep. Atures, 5 km N of San Pedro de Cataniapo, 60 km SE of Puerto Ayacucho, alt. 120–150 m, 9 Nov 1980, fr (holotype, 2 sheets, U). Figs. 11e–f, 19.

Species probabiliter ex affinitate *Unonopsis spectabilis* Diels ut in ea foliis velutinis, sed ab ea differt calice magna venis prominentibus.

Tree, 6–10 m tall. Young twigs densely grey-green velutinous; older twigs somewhat rough, glabrescent, dark greyish-brown to brown. Petiole 7–12 mm long, 3–4 mm in diam., densely short pubescent. Lamina elliptic, 16–27 cm long, (5.5–)7.5–10 cm wide, pubescent, to densely pubescent along larger veins, below, glabrous above except along primary vein, base acute to obtuse, apex obtuse to shortly acuminate; primary vein raised above, weak; secondary veins curved, 8–14 on either side of primary vein, impressed above, angles with primary vein 60°–70°, eucamptodromous, tertiary veins oblique.

Inflorescences axillary, just below the foliate zone, consisting of several-flowered rhipidia branching from a common rhachis. Rhachis including very short peduncle 5–10 mm long, densely velutinous, fruiting peduncle 2–3(–4) mm long. Pedicel 20–25 mm long, ca. 2 mm in diam., with articulation at 1/4–1/3 of the length, densely velutinous, fruiting pedicel ca. 3 mm in diam. Bracts 2 to each pedicel, one basal, one above the articulation at about the middle or in the upper half of the pedicel (occasionally lower, and below the articulation), upper pedicel bract to ca. 5 mm long and wide, persistent, the lower

bract broadly elliptic to ovate, to 3–4 mm long, 4–5 mm wide, deciduous; densely velutinous.

Flowers cream (*in vivo*). Perianth 3-merous. Sepals connate over 1/5 of their length, sometimes persistent, very broadly ovate, 6–7 mm long, 7.5 mm wide, acute, beige-brown sericeous outside, glabrous inside, main veins prominent outside. Outer petals very broadly ovate, 9–10 mm long, 8 mm wide, acute, yellowish- to beige-brown sericeous outside, glabrous inside, midrib prominent outside. Inner petals trullate-ovate, ca. 7 mm long, 8 mm wide, unguiculate, acute, pale yellowish sericeous on (narrowly) triangular area along midrib, otherwise glabrous outside, glabrous inside. Torus cylindrical. Stamens numerous, 2 × 0.5 mm, thecae 1 mm long, apical prolongation of connective tongue-shaped. Carpels numerous, pale yellowish tomentose, stigma cylindrical-clavate, glabrous.

Fruiting receptacle depressed ovoid, 6–10 mm in diam. Monocarps 2–10, bluish-green or grey-green (*in vivo*), globose (to broadly obovoid when young), 16–27 mm long, 17–20 mm in diam., rather densely beset with pale yellow-brown hairs when young, becoming glabrous when mature, smooth, wall crustaceous to indurate, rather tough, 1–1.1 mm thick, with spongy mass filling the interior (particularly in one-seeded fruits) up to 6 mm thick; stipe absent or up to 2.5 mm long, 2.5–4 mm in diam., densely hairy when young, becoming sparsely hairy later on. Seeds 1(–2) per monocarp, lateral to nearly basal, horizontally to slightly obliquely oriented, imbedded in spongy mass, transversely broadly ellipsoid, plano-convex in two-seeded fruits, 9–10 × 11–13 mm, in two-seeded fruits 6–7 × 11–13 mm, foveolate, brown.

Distribution: Only known from the department of Atures, Amazonas, Venezuela; in forest, alt. to 150 m.

Specimens examined: VENEZUELA. Amazonas: dep. Atures, left bank of Río Cataniapo, opposite San Pedro de Cataniapo, 60 km SE of Puerto Ayacucho, alt. 90–110 m, 4 Aug 1980, *F. Guanchez* 85 fl (U); ibidem, along Río Coromoto, at Tobogán de la Selva, 35 km SE of Puerto Ayacucho, alt. 150 m, 14 May 1980, *J.A. Steyermark et al.* 122450 fr (U, VEN).

Vernacular name: Tanoajua (Venezuela, Piaroa language: *Guanchez* 85).

This species is probably closest to *U. spectabilis*, with which it shares the velutinous indument of the leaves. It is different, however, by its very large, prominently veined calyx.

14. Remarks on *Xylopia*

14.1 *Xylopia benthamii* R.E. Fries and *X. ulei* Diels

Fries (1930), in his revision of *Xylopia*, mentions two cauliflorous species, viz. *X. benthamii* and *X. ulei*. According to him, the two species are closely related, but can be distinguished by the indument: *X. benthamii* is not as densely hairy as the other species, and the hairs are longer, and more spreading; fur-

thermore, *X. benthamii* has slightly larger leaves, glabrous on the abaxial side, and also glabrous pedicels and flowers. Material of both species was studied by us, and it has now become clear that the two completely intergrade, so that there is no reason for keeping them separate. Therefore the two species are united:

Xylopia benthamii R.E. Fries, Kongl. Svenska Vetenskapsakad. Handl. 34(5): 35. t. 5, f. 2–4. 1900 (as '*Benthami*'); R.E. Fries, Acta Horti Berg. 10(1): 112. 1930 (as '*Benthami*'). – Type: *Spruce 3290*. Venezuela. Amazonas: Río Casiquiare, 1853–1854, fl.

= *Xylopia ulei* Diels, Abh. Bot. Vereins Prov. Brandenburg 47: 133. 1905; R.E. Fries, Acta Horti Berg. 10(1): 114. f. 9. 1930. – Type: *Ule 5629*. Brazil. Acre: Rio Juruá-Mirim ('Jurua-Miry'), Aug 1901 (holotype, B).

= *Xylopia benthamii* R.E. Fries var. *subnuda* R.E. Fries, Acta Horti Berg. 10(2): 333. 1931 (as '*Benthami*'). – Type: *Klug 557*. Peru. Loreto: Mishuyacu, near Iquitos, alt. 100 m, Oct–Nov 1928 (holotype, B; isotype, US).

X. benthamii is characterized by cauliflory, which is rarely met with in neotropical species of *Xylopia*, by a connate, cup-shaped calyx, and by large, woody, strongly striate monocarps.

14.2 *Xylopia neglecta* (O. Kuntze) R.E. Fries and *X. parviflora* Spruce.

We do not agree with O. Kuntze and R.E. Fries in considering *Xylopia parviflora* Spruce a nomen nudum! Spruce's (1861) text runs as follows: '*X. parviflora*, Pl. Am. 3678 (San Carlos), the most beautiful of the genus, grows to 60 feet high, and has a dense pyramidal head of four times pinnate branches'. This description, though short and very incomplete, nevertheless constitutes valid publication, and therefore *X. parviflora* Spruce is the correct name.

Xylopia parviflora Spruce, J. Proc. Linn. Soc. Bot. 5: 6. 1861. – Type: *Spruce 3678*. Venezuela. Amazonas: San Carlos de Río Negro (holotype, K; isotypes, B, BM, BR, P, W).

≡ *Xylopicrum neglectum* O. Kuntze, Rev. Gen. 8. 1891.

= *Xylopia neglecta* (O. Kuntze) R.E. Fries, Kongl. Svenska Vetenskapsakad. Handl. 34(5): 31. 1900; R.E. Fries, Acta Horti Berg. 10(1): 95. 1930.

This species is easily recognized by its very small leaves (1.5–3 cm long), which often have a mucro at the apex.

14.3 *Xylopia parviflora* (A. Rich.) Benth., non Spruce

As *Xylopia parviflora* Spruce is validly published, and antedates *Xylopia parviflora* (A. Rich.) Benth., the latter name, applying to an African species, will have to be replaced:

Xylopia longipetala De Wild. et T. Durand, Ann. Mus. Congo, sér. 2, Bot. 1: 4. 1899; De Wildeman & Durand, Ann. Mus. Congo, sér. 3, Bot. 1: 6. 1901. – Type: *A. Dewèvre s.n.* Zaire (formerly Belgian Congo). Rég. III: Bangala, May 1896 (holotype, BR).

= *Uvaria parviflora* A. Rich. in Guillemin, Perrottet & A. Richard, Fl. Seneg. tent. 9. t. 3, f. 1. 1831.

= *Xylopia parviflora* (A. Rich.) Benth., Trans Linn. Soc. London 23: 479. 1862.

For further synonymy and more particulars, see A. Le Thomas (1969).

14.4 *Xylopia sericea* A. St. Hil and *X. intermedia* R.E. Fries

Xylopia sericea and *X. intermedia* are distinguished by Fries (1930) based on fruit characters. In his key *X. sericea* has rough, blackish monocarps, whereas *X. intermedia* has smooth and shiny, reddish-yellow monocarps. We, however, found out that both species actually have smooth and shiny monocarps. Since there are no floral differences to be found, and no vegetative differences either, between *X. sericea* and *X. intermedia*, the two are now regarded as conspecific:

Xylopia sericea A. St. Hil., Pl. usuel. brasil. 1-7, pl. 33. 1825. – Type: *A.F.C.P. de Saint-Hilaire s.n.*. Brazil. Rio de Janeiro (holotype, P).

= *Xylopia intermedia* R.E. Fries, Kongl. Svenska Vetenskapsakad. Handl. 34(5): 32.1900. – Type: *A.F.M. Glaziou 10225*. Brazil. Rio de Janeiro: Restinga de Cabo Frio (lectotype, B; isotype, C).

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