

## THE GENUS *DYSOXYLUM* (MELIACEAE) IN CEYLON

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### SUMMARY

Three endemic species of *Dysoxylum* (Meliaceae) occur in Sri Lanka. The first one, *D. zeylanicum*, sp. nov. was considered formerly to represent *D. nectariferum*, a species not occurring in Ceylon, the second one, *D. pyriforme*, stat. nov. was originally described as a variety of *D. nectariferum*, the third one, *D. peerisii*, sp. nov. is a giant tree of the wet, evergreen Sinharaja forest in S.W. Ceylon.

### 1. INTRODUCTION

The three Ceylonese *Dysoxylum* species are all trees, the smallest one (up to 15 m tall, but already flowering and fruiting when 2 m tall) is *D. pyriforme*, the largest one (up to 35 m tall) is *D. peerisii*.

Their leaflets are very similar in shape, but there are differences in texture, size and venation. A distinguishing factor is the indumentum of the terminal bud (actually the undeveloped leaf). The inflorescence is quite different in *D. peerisii*: a broad, very large panicle, compared with that of the other two, which are raceme like, very narrow panicles. The flowers are trimerous in *D. pyriforme*, but 4-merous in the other two. This brings *Dysoxylum* closer to *Amoora* which has trimerous flowers. The differences between *Amoora* and *Dysoxylum* are not very strong: dioecy in *Amoora* (if this is true), the short staminal tube, the trimerous flowers (now also in *Dysoxylum*) and the imbricate sepals and petals, the only characteristic of importance. PENNINGTON & STYLES (1975) included *Amoora* in *Aglaiia*, but the dehiscent fruit militates against this and *Amoora* is perhaps nearer to *Dysoxylum* than to *Aglaiia*.

The presence or absence of teeth on the calyx cup is an unreliable character, as distinctly dentate calyces and those with an entire rim, may occur in the same inflorescence. The texture of the calyx, thin in *D. pyriforme*, thick in the other two, is useful. The size of the petals, the length of the staminal tube and of the disc, are difficult to apply, as they lengthen considerably during maturation of the flower and material with fully mature flowers with reflexed petals, was not available (except of *D. peerisii*, where I collected them from the forest floor). Hairyness of the ovary might be a good character, also the length of the teeth of the staminal tube and disc. The disc-like large stigma, protruding slightly from the staminal tube, has three or four excrescences on its flat top.

The fruits are orange in all species (unknown in *D. peerisii*) with a leathery thick epicarp, dehiscing into 3 or 4 parts along the grooves. As a rule in each cell is a glossy brown seed, which is surrounded by a red, slightly juicy aril.

*D. pyriforme* is not uncommon, but very scattered in the Dry Zone. *D. zeylanicum* is a mid- and low-mountain species, formerly perhaps common. *D. peerisii* was found so far only in a very restricted area in the Sinharaja forest in lowland, wet, evergreen forest, along small streamlets and is now, because of logging, very rare.

## 2. THE SPECIES OF DYSOXYLUM

### Key to the species

1. Inflorescence a large, wide, many-flowered panicle. Calyx tube 5–10 mm diameter. Petals 15 mm long . . . . . 1. *D. peerisii*
1. Inflorescence a short, thick, narrow, pseudo-raceme like panicle. Calyx tube up to 4 mm diameter. Petals up to 7 mm long.
  2. Leaflets very conspicuously reticulate on both surfaces, chartaceous, drying a pale colour, like the twigs and rachis. Flowers 3-merous with 6 anthers. Calyx cup thin. Tree of the Dry Zone . . . . . 2. *D. pyriforme*
  2. Leaflets sub-coriaceous with obscure reticulation, drying a dark colour. Flowers 4-merous with 8 anthers. Calyx cup fleshy. Tree of the Wet Zone . . . . . 3. *D. zeylanicum*

### 1. *Dysoxylum peerisii* Kosterm., sp. nov.

Arbor magna, foliis paripinnatis magnis glabrescentis, foliolis 3–5 – paribus alternantibus ovato-oblongis sensim acutis, basi obliquis, petiolulis 2 cm longis, inflorescentiis late paniculatis, multifloris, pedicellis 3–4 mm longis, tubus calycinus cupuliformibus coriaceis 5–6 mm diametris, petalis 4, 15 mm longis coriaceis, tubus staminiis quadrangularis 15 mm longis, antheris 8 inclusis, discus tubuliformis, 5 mm longis, 4-dentatis, margine fimbriatis, stigma magnis.

*Typus*: Ceylon, Sinharaja forest, Kostermans 27957 (L holo, G. PDA)

Tree, up to 35 m tall, bole 10 m, dbh. 80 cm, heavily buttressed up to 2 m, out 1 m. Bark dark brown, scaly. Leaves scattered, paripinnate, rachis cylindrical, thick, swollen at the base, sparsely, microscopically appressed pilose, glabrescent, up to 40 cm long; leaflets sub-coriaceous, dark green above, paler below and here with numerous grey dots. Folioles 3–5 pairs, the basal ones subopposite, the apical pair opposite, ovate-oblong, the upper ones 15 × 35 – 11 × 30 cm the lower 7 × 15 cm, gradually acute, base oblique, rounded (upper half larger), lateral nerves 12–16 pairs, erect-patent, at the margin abruptly erect-arcuate. Petiolules thick, 2 cm, sparsely microscopically appressed pilose (hairs short, very thin), above flattened and along the median slightly narrowly channelled.

Inflorescences paniculate, axillary, semi-erect, 15–45 cm long, many-flowered. Flush brown with grey over-tinge, densely microscopically appressed pilose. Lower branches patent or somewhat reflexed, the lower ones up to 15 cm

long, opposite and alternate, remote, pseudo-racemiformous, the secondary branches 0–1 cm long, apically with 2 opposite, minute, ovate, acute, 1–2 mm long bracteoles, each bearing one flower. Pedicel thick, 3–4 mm long, pale brown, appressed pilose. Calyx cup-shaped, pale brown pilose, 5–6 mm diameter, fleshy, 3 mm deep; teeth 1–1½ mm high, 3½–4 mm wide, acuminate. Petals 4, light pink, rather sparsely microscopically appressed pilose outside, fleshy, linear, 15 mm long, 5 mm wide, at anthesis strongly recoiled, inside glabrous, creamy white; the apical 2 mm thicker than the rest, at base for 2 mm connate. Staminal tube quadrangular, white, fleshy, for 1 mm at base connate to the corolla, 15 mm long, 5 mm diameter, margin entire, bearing at the inside 8 black, oblong, 1½ mm long anthers. Disc tube-like, dirty pale brownish pink, 5 mm high, 2½ mm diameter, margin fimbriate (hairs 1–1½ mm long) and obscurely 4-lobed.

*Distribution:* Only known from the type locality, Sinharaja forest, S.W. Ceylon, wet, evergreen.

*Note:* The tree must have been fairly common and grows always in depressions along small clear sandy streamlets in the Sinharaja forest, but only in one place. In other places it is probably cut down.

Although the type tree flowered twice in two years, no fruit were set.

*Specimens examined:* S.W. Ceylon, Sinharaja forest, Weddegalle entrance, near work shed on main logging road (workshed now replaced by field station), about 3 miles from Weddegalle village, along clear shallow sandy stream, alt. 200–300 m, Febr. 1979, fl., Kostermans 27259 (G, L. PDA); Nov. 1979, fl. Kostermans 27957, typus (G, L. PDA).

The species is named in honour of Dr. (Mrs.) Savitri Peeris-Gunatilleke, who initiated the ecological work in the Sinharaja forest and who discovered this new tree. Dr. Savitri Gunatilleke is a lecturer at the University of Peradeniya, Department of Botany, Sri Lanka.

## 2. *Dysoxylum pyriforme* (Trimen) Kosterm., comb. et stat. nov.

*Dysoxylum binectariferum*, var. *b. pyriforme* TRIMEN, *Handb. Fl. Ceylon* 1: 247. 1893. — Lectotypus propositum: Gardner s.n., anno 1858, Batticaloa, fr., C. P. 3596 (PDA); syn-typus: Gardner, id., C.P. 3596, fl. (PDA).

*Dysoxylum macrocarpum* (non Bl.), var. *b.* THWAITES, *Enum. Pl. Zeyl.* 60. 1858 and 404. 1864. — Gardner, Batticaloa, C.P. 3596 (PDA).

*Dysoxylum binectariferum* Hiern in HOOKER f. *Fl. Brit. Ind.* 1: 546. 1875, p.p., quoad cit. Ceylon et *D. macrocarpum*, var. *b.* THWAITES.

Shrub or small tree, 2–4 m tall, rarely up to 15 m. Twigs thick, pale, grooved, glabrous, no lenticels; terminal bud densely, minutely sericeous. Leaves imparipinnate, glabrous; rachis 15–23 cm long, pale, petiolar part 5–11 cm; leaflets 3–5 pairs, drying pale, chartaceous, oblong to subovate-oblong (lower ones), 2 × 5 (lower ones) – 3 × 10 – 6 × 15 cm, shortly, broadly acuminate, base oblique, rounded or acutish, both sides densely reticulate; above midrib prominent, lateral nerves thin (also the reticulation), prominent; below duller, midrib slender, prominent; lateral nerves c. 8 pairs, thin, prominent, erect-patent,

arcuate, towards the margin forked into the reticulation. Petiolules slender, 2–5 mm long, concave above.

Panicles supra-axillary, greenish, 2–6 cm long, very narrow, raceme-like, glabrous, apically with a sparse indumentum of minute, appressed hairs; branches twice branched, 2–4 mm long, thickish, pilose. Pedicel thickish, densely pilose, 1–1½ mm long. Calyx tube cup-shaped, thin, sparsely minutely appressed pilose, 1–2 mm high, 4 mm diameter, margin almost entire or with 3 short, very broad teeth. Petals 3, oblong, valvate, thickish, densely, microscopically appressed pilose, c. 5 mm long (immature). Staminal tube almost as long, barrel-shaped, with shortly dentate margin and 6 large anthers inside near the rim. Disc cup-shaped, dentate, 2 mm high. Style thickish, 4 mm long with large disc-shaped stigma with 3 minute knobs on the flat top.

Fruit pear shaped, orange red, 3 cm long, 3 cm diam., 3-loculed; epicarp leathery, dehiscent. Pedicel short, thick. Aril orange-yellow, seed glossy black.

*Distribution:* Ceylon, Dry Zone.

*Note:* The species differs notably from *D. binectariferum* in its leaf reticulation, the smaller leaves and the different flowers. The available flowering material was scanty (Bernardi's specimen was in a bad state and had no flowers left), the only specimen with immature flowers was Silva 252.

The 3 petals and 6 anthers brings this species close to *Amoora*, but the petals are valvate and the flowers bi-sexual.

*Specimens examined:* S. E. Ceylon, Ruhuna National Park (Yala) near Ragamtota, Apr., y. fr., Fosberg 50195 (PDA); Amparai Distr., Watinagalle, alt. 500 m, Nov., fl., Bernardi 15636 (PDA); Kurunagala Distr., N.W. Prov., border of cultivated garden, Oct., y. fr., Waas 224 (PDA); Uma Oya, Balangandawala, Dec., fl., Silva 252 (PDA); Batticaloa, anno 1858, Gardner C. P. 3596 (PDA, one sheet fl. one sheet fr.); Kirindioya, Tanamanawila, Hambantota Distr., low, April., fr., Balakrishnan 254 (PDA); *ibid.*, June, y. fr., Meyer 186 (PDA); Mile 17 Modagama-Monaragala, May, buds, Jayasuriya 1998 (PDA); Kumbukkan Oya, 2 miles above mouth at Megahakande, Jan., buds, Fosberg et al 51087 (PDA); Thunmodera, Polonaruwa Distr., June, buds, Waas 580 (PDA).

### 3. *Dysoxylum zeylanicum* Kosterm., sp. nov.

*Dysoxylum macrocarpum* (non Bl.) THWAITES, *Enum. Pl. Zeyl.* 60. 1858 (exclud. synonym. and var. *b.*); TRIMEN, *Handb. Fl. Ceylon* 1: 247. 1893 (exclud. var. *b. pyriforme* Trim.). — Lecto typus propositum: Gardner s.n., fl., Hantane, anno 1858, C.P. 2637 (PDA), syn-typus: Gardner, Kadugannawa, July 1858 (on the same sheet, no specimen) and Centr. Prov. 1856, fr. (PDA).

*Dysoxylum binectariferum* (non Hooker f.) Hiern in HOOKER f., *Fl. Brit. Ind.* 1: 546. 1875, p.p. quoad cit. *D. macrocarpum* Thw. et Ceylon; Trimen, l.c., p.p., exclud. var. *pyriforme*; C. DE CANDOLLE, *Monogr. Phan. Prodr.* 1: 493. 1878, quoad cit. Ceylon.

*Dysoxylum binectariferum*, var. *coriaceum* C. de Candolle, *Monogr.*, l.c. (exclud. cit. Nilgcherries). — Thwaites C. P. 2636 (= Gardner s.n.) Hantana (DC).

Arbor, ramulis crassis glabris, innovationibus dense minutissime pilosis, foliis imparipinnatis glabris, foliolis 3-4-paribus brevissime petiolulatis alternantibus obscure reticulatis, paniculis extra-axillaribus glabris robustis brevis paucifloris pseudo-racemiformibus, pedicellis brevibus, tubo calycinum crassis cupuliformibus, petalis 4 crassis extus dense minutissime pilosis, tubo staminibus petalibus sublongis ore dentatis, antheris 8 inclusis, discus tubulosus ovarium vix superantibus denticulatis glabris, stigma magnis.

*Typus:* Ceylon, Hantane, Gardner s.n., C.P. 2637 (PDA).

Small to medium sized tree, 4-20 m, up to 35 cm diameter; bark rough, peeling off in small, rectangular, 2 mm thick, dark brown pieces; live bark 5 mm thick, straw coloured; wood white. Twigs thick, angular; terminal bud densely covered with extremely small hairs. Leaves glabrous, imparipinnate, rachis 15-28 cm long, petiolar part 7-12 cm, angular. Folioles 3-4 pairs, terminal ones up to 6 × 15 cm, lower ones up to 4 × 7 cm, alternate, sub-coriaceous, oblong to ovate-oblong, broadly, shortly (up to 1 cm) acuminate, base acute or rounded, oblique (lower ones often symmetrical), both surfaces obscurely reticulate to almost smooth, above midrib thin, prominulous, below paler, midrib slender, prominent, the 7-10 pairs of erect-patent, slightly arcuate, thin lateral nerves prominulous, in between much shorter lateral nerves. Petiolules 5-10 mm long, concave above.

Panicles supra-axillary, stout, glabrous, 5-6 cm long, few-flowered, narrow with few, 2-4 cm long branches, main peduncle stout. Pedicels up to 2 mm long. Calyx tube cup-shaped, fleshy, margin entire or with 4 obscure broad, very short teeth. Petals (immature) thick, densely pilose, 7 mm long. Staminal tube  $\frac{3}{4}$  the petal length, tubular, glabrous, mouth minutely 8-toothed. Anthers 8, large, included below the mouth. Disc tubular, somewhat longer than the ovary, glabrous with very small teeth. Ovary glabrous; stigma large, capitellate-disc-shaped.

Fruit depressed-globose, orange, up to 3 cm high and  $4\frac{1}{2}$  cm diameter with 8 grooves and broad large ribs, dehiscent by 4 fleshy valves. Seeds with red aril. Petiole very short, 6 mm diameter.

*Distribution:* S. W. Province, Kandy Distr., Haputale Distr., from low to 1600 m.

*Note:* The material enumerated below is not entirely homogeneous, Kostermans 23377 has more smooth leaves, but as none of the specimens has mature flowers, I have grouped them together. The lectotype sheet in Peradeniya has one flowering branch with coriaceous leaves, it is marked in pencil as from Hantane, Gardner, but there is also a partly erased note in pencil: Kadugannawa, anno 1858. The other sheet of C.P. 2637 has immature fruits and a long young leaf (folioles 8 × 18 cm); it is marked Central Province. The Trimen sheet has a thinner calyx tube.

*Specimens examined:* Pasdun Korale, fl., Trimen s.n., anno 1883 (PDA); Karawita Kande, Ratnapura Distr., Oct., ripe fr., Waas 35 (PDA); Yagirala, Kalutara Distr., June, y. fr., Waas 1300 (PDA); Central Prov., anno 1856, y. fr., C. P. 2637 (PDA); Kandy Distr., Hantane, fl., Gardner s.n., C. P. 2637, typus

(PDA); Udawattekellie, above Kandy, 600 m alt., Sept., fr., Sohmer 8053 (PDA); c. 2 miles N. of Hunasgyriya, mile 23, alt. 1260 m, Nov., buds, Davidse 8442 (PDA); Doublecutting, road Laxapana to Maskeliya, alt. 900 m, May, buds, Kostermans 24076 (PDA); Haputale Distr., Tothulagala above Haputala, 1600 m alt., May, buds, Kostermans 23377 (PDA).

## REFERENCE

PENNINGTON, T. D. & B. T. STYLES (1975). *Blumea* **22**: 504–507.