

## ***Baccaurea scortechinii* distinct from *B. parviflora* (Euphorbiaceae)**

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### **Abstract**

*Baccaurea scortechinii* Hook. f. is a species distinct from *B. parviflora* (Müll. Arg.) Müll. Arg. recognised by a combination of the following characters: greater number of pairs of veins, proportionately wider leaf, shorter male and female inflorescences, position of the female inflorescence on the upper part of the trunk or on the branches, short pedicel of male flowers, longer sepals of the female flower, which are hoary outside, the rosy pink, obovoid ridged fruit (often with a wrinkled surface), which has a thick pericarp and up to six seeds.

### **Introduction**

Over reliance on herbarium material as opposed to field observations can sometimes lead to erroneous results. A case in point is the synonymising of *Baccaurea scortechinii* with *B. parviflora* (Airy Shaw, 1972).

In the field, these two species are totally distinct based on the position of the infructescences, the colour and shape of the fruits and whether the fruits are ridged or not. Corner (1952) described *B. scortechinii* as the 'Chinese Lantern Tree' because 'the fruiting trees look as if they were hung with little Chinese lanterns'. He described the fruits as being rose-pink and six-ridged and hanging from the branches on strings. The infructescences are also produced on the trunk but never from the base. In contrast, the fruits of *B. parviflora* are smooth, purple-brown and are produced on strings at the base of the trunk and trail in profusion on the ground. In the field, these two species are certainly distinct!

The inability to distinguish between the two *Baccaurea* species with elongate fruits and terminalia branching may in part be due to the poor choice of characters in keys for identifying them. Thus, Pax and Hoffman (1922) used the degree of pubescence of the young twigs, a character that cannot be used for specimens with older twigs, which are uniformly glabrous in both species. Ridley (1924) used leaf shape, which, while it can be used for the extremes of variation, also shows considerable overlap. He

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contributed to the confusion by adding a note to his description of *B. scortechinii* stating that 'Hooker says racemes from the branches, though in the specimens I have seen at Kew they all appear to have been from the stem as in *B. parviflora*, but *B. parviflora* does sometimes have racemes from the branches' (though this fact is not mentioned in Ridley's description of *B. parviflora*). Whitmore (1973) was of the opinion that those species with terminalia branching 'are extremely difficult to distinguish without fruits because the leaves are similar, and variable, within each species'.

Based on a study of herbarium specimens, Airy Shaw (1972) reduced *B. scortechinii* to synonymy with *B. parviflora* without giving a reason for his decision. Whitmore (1973) followed Shaw in regarding it as a synonym of *B. parviflora* but as Corner (1988) commented 'there seems to be some mistake'.

*Baccaurea scortechinii* was first described by Hooker f. based on a single specimen (*Scortechini s.n.*, Perak) and it has remained poorly known. The fruit and the position of the inflorescence were not known to Hooker but the character of number of vein pairs that he gave is useful in distinguishing these two species (Table 1). Now that more specimens are available, it is possible to reassess the characters that are used to separate the two species.

Fruiting specimens of *B. parviflora* and *B. scortechinii* are readily identified based on whether the fruits are ridged or not, their colour and shape, and the position and length of the infructescence (Table 1). Specimens with female flowers can be identified by flower size, indumentum of the sepals and whether the ovary is ridged or not (but in fact have rarely been collected) and those with male flowers by the length of the pedicel.

Sterile material can be identified by the number of pairs of veins and also by the *gestalt* of the terminalia branching. In *B. parviflora* the distal two or three tiers of caulomeres frequently have slender twigs of equal thickness suggesting that they were produced by the same growth flush. In contrast, it appears that usually only a single tier of caulomeres is produced at a time in *B. scortechinii* as the distal twig is much more slender than the adjacent proximal one. In the field, *B. scortechinii* has a conspicuously narrow crown, perhaps the result of this less profuse mode of growth. The phenology of these growth flushes is not known.

Flowering is, however, seasonal occurring in the two main flowering seasons for trees (Kiew, 1986). Corner (1952) noted that *B. parviflora* flowers gregariously after a dry spell. Most male flowering specimens have been collected between January and April with a peak in February to March with a few in June-July and October (specimens with female flowers are scarce but have been collected in February to April and in September) and fruiting specimens from May to September. *B. scortechinii* fruits



between March and April and again in June-July and September, but there is insufficient flowering material to assess its flowering seasons.

*Baccaurea parviflora* is widespread from Burma to Borneo (where it has rarely been collected). In Peninsular Malaysia, it has been collected from all states and is common in the lowlands up to 1300 m altitude. It is most frequently collected from hill slopes and ridge tops. In contrast, *B. scortechinii* has been more frequently collected from forest beside streams and rivers. *B. scortechinii* is endemic to Peninsular Malaysia and is more common in Kelantan, Trengganu and Pahang.

**Table 1.** *Baccaurea parviflora* and *B. scortechinii* compared

Character	<i>B. parviflora</i>	<i>B. scortechinii</i>
bark <sup>1</sup>	finely ridged	not ridged
bark colour <sup>1</sup>	brownish grey	pale fawn
lamina length (cm)	8.5–15.5	13–18
lamina width (cm)	3–5	5–9.5
lamina l:w ratio	2.8–3.1	1.9–2.6
no. vein pairs	(4–) 5 (–6)	(6–) 7 (–9)
male raceme length (cm)	10–15	3.5–8
male pedicel length (mm)	3–4	1–1.5
female raceme length (cm)	15–30	5.5–12
female raceme position	base of trunk	trunk and branches
male & female sepal shape	ovate	oblong
female sepal length (mm)	2.5–3.5	8–9
female sepal indumentum (outer surface)	glabrous	hoary
ovary shape	cylindrical	ovoid
ripe fruit colour	purple brown	rosy pink
fruit shape	fusiform	obovoid
	not ridged	6-ridged
fruit apex	narrowed	rounded
pericarp thickness (mm)	1.5–2.0	0.5–1.1
no. seeds per fruit	1–3	1–6

<sup>1</sup>from Corner (1988). No details are available on labels of herbarium specimens to verify this.



### **Baccaurea parviflora**

*Baccaurea parviflora* (Müll. Arg.) Müll. Arg. in DC Prodrumus **XV**(2) (1866) 462.

Figure 1.

Type: *Wallich 7759B* Tavoy, India. (K holo)

Hook. f. Fl. Brit. India. **5** (1887) 368; Pax & Hoff. Pflanzenreich. iv **147 XV** (1922) 59; Ridley Fl. Mal. Pen. **3** (1924) 243, Fig. 152; Corner Wayside Trees. (1952) 241, Fig. 71.

*Pierardia parviflora* Müll. Arg. in Linnaea **32** (1863) 82.

Small tree to 15 m tall and 7.5–10 cm dbh., flowering at 2 m, with terminalia branching with leaves clustered at the tips of the twigs, twigs slender with long internodes and pilose, becoming glabrous with age. Bark brownish-grey, rather closely and finely ridged. Stipules lanceolate, pubescent outside. Young leaves pinkish. Petiole 0.75–3 cm long, grooved above. Lamina oblanceolate, (8.5–) 12 (–15) cm long and (3–) 4 (–5) cm wide; apex caudate, base strongly acute, margin entire, apex caudate, glabrous above and beneath; in dried state thinly coriaceous, smooth (not puckering); veins (4–) 5 (–6) pairs prominent beneath, tertiary veins inconspicuous.

In male trees raceme cauliflorous in more or less upright tufts on burrs on trunk about 3 m above the ground, sometimes on branches, 10–15 cm long, hairy. Bracts minute, broadly ovate, 0.2–0.3 mm long, densely tomentose. Flower fragrant with a sharp lemon scent. Pedicel 3–4 mm long. Sepals 4–5, ovate, 1.0–1.5 mm long and 0.5–1 mm wide, yellowish green (rarely reddish brown). Stamens (3–) 6, filaments 0.1–0.2 mm, anthers subglobose, 0.2 mm long, yellow. Pistillode large.

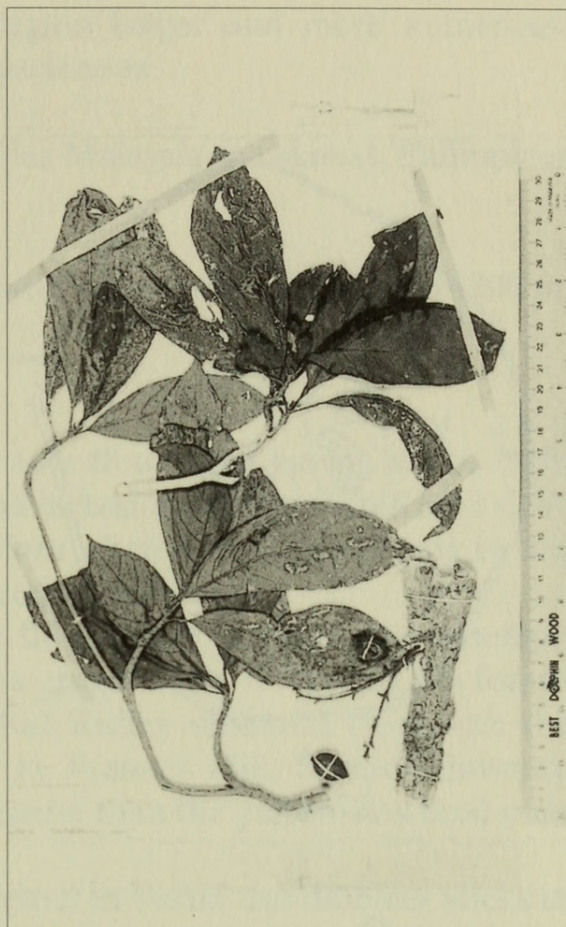
In female trees, raceme cauliflorous, numerous and always at the base of the trunk, (15–) 23 (–30) cm long. Peduncle reddish. Bracts cordate, 0.1–0.2 mm long, tomentose. Pedicel 3–4 mm long. Sepals 5, spatulate, 2.5–3.5 mm long and 0.5–1 mm wide, deep red and almost glabrous outside, white and finely pilose inside. Ovary cylindric, 3-loculate, 1.5–2 mm long and 1–1.5 mm wide, dark red, finely pilose. Style 0.5–1 mm long. Stigma 3, each bifurcating and recurved, dark red.

Berry fusiform, stigma persistent, 1.25–2.75 cm long and 11.5 cm wide, dark red turning purple brown, sour. Pericarp fleshy, smooth, indehiscent, 13–20 mm thick. Seeds 1–3, oval, thin, 9–12 mm long, 5–6 mm wide, aril fleshy, magenta, testa brown.





**Figure 1.** *Baccaurea parviflora*



**Figure 2.** *Baccaurea scortechinii*

## Anatomy of Ovary and Fruit

*T.S. Ovary:* (Fig. 3A, C)

Round with 3 locules, ovary wall (0.40–) 0.48 (0.55) mm thick, ovules 1 or 2 per locule. Vascular bundles 3, positioned midway in the ovary wall opposite the locules with 2–4 minor bundles in between.

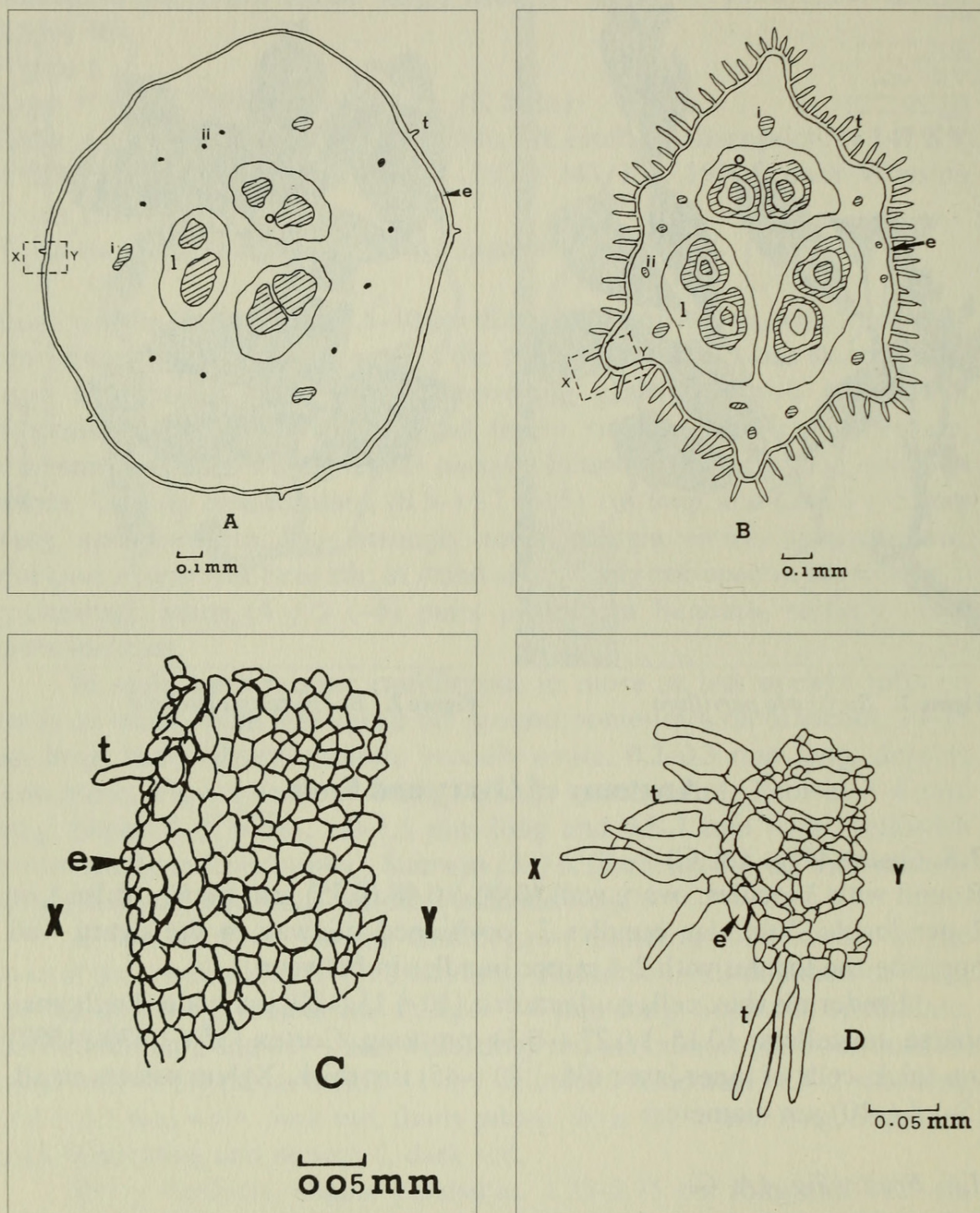
Epidermis thin, cells isodiametric (10–) 15 (–20)  $\mu\text{m}$  wide. Trichomes sparse, unicellular (0.15–) 0.27 (–0.3) mm long. Cortex (350–) 430 (–500)  $\mu\text{m}$  thick, cells of inner layer (35–) 40 (–45)  $\mu\text{m}$  thick. Xylem vessels small, (5–) 8 (–10)  $\mu\text{m}$  diameter.

*T.S. Fruit:* (Fig. 4A, C).

Round with 3 locules, 1–3 seeds per fruit. Pericarp fleshy (1.5–) 1.8 (–2.0) mm thick. Arrangement of vascular bundle as for ovary.

Exocarp thin, single layered, cells (50–) 53 (–55)  $\mu\text{m}$  long and (20–) 23 (–25)  $\mu\text{m}$  wide, becoming almost glabrous. Mesocarp (1.0–) 1.3 (–1.5) mm thick; outer and central region with scattered large cells with thickened





**Figure 3.** T.S. ovary: A *Baccaurea parviflora*, B *B. scortechinii*.

Outer layers of ovary: C *B. parviflora*, D *B. scortechinii*.

i major vascular bundle, ii minor vascular bundle, o ovule, t trichomes, e epidermis, l locule.



cellulose walls, cells in the central region larger and more numerous. Endocarp with several layers of brachysclereids.

*Distribution:* Burma, Thailand, Peninsular Malaysia (all states), Philippines and Borneo.

*Habitat:* Lowland forest, frequently on hill slopes and ridges up to 1300 m.

*Local Name:* Setambun (Malay).

*Notes:* Earlier descriptions cited the male flowers as having up to eight stamens but this is an error based on the inclusion of specimen *King's Coll.* 3321 (K) with 6-8 stamens in *B. parviflora* when it does not belong to this species as its inflorescences are produced on the twigs.

Ridley (1924) recorded that the flowers are 'scented like cowslips' and Corner (1952) that when it flowers gregariously it scented the forest. The male flowers are usually yellow but Ridley observed trees with red flowers at Semangkok and, close by at Fraser's Hill, crimson-flowered trees are seen though they are less common than the yellow-flowered ones (Kiew, 1998).

Burkill (1966) reports that the Semai in Perak use dibbling sticks of *B. parviflora* because 'they suppose, its habit of fruiting close to the ground may ensure the hill-rice having a short straw, inhibiting it from being lanky in growth'.

There is another (as yet unnamed) taxon with terminalia branching and elongate fruits collected from Trengganu, which shares characters with both *B. parviflora* and *B. scortechinii*, i.e. its fruits are ridged like *B. scortechinii* but are produced on long inflorescences at the base of the tree as in *B. parviflora*. It is, however, distinct from these two species in its extremely long petioles (c. 5 cm long). The petioles of both *B. parviflora* and *B. scortechinii* are variable in length depending on the leaf's position within the tuft, the shortest being about 0.75 cm and the longest 3 cm long.

### ***Baccaurea scortechinii***

***Baccaurea scortechinii*** Hook. f. Fl. Brit. India. **5** (1887) 368.

Figure 2.

Type: *Scortechini* s.n. Perak (K, Kew no. H/0980/88 71 - lectotype, here chosen; L, SING iso)

Pax & Hoff. Pflanzenreich. iv **147 XV** (1922) 56; Ridley Fl. Mal. Pen. 3 (1924) 244; Corner Wayside Trees. (1952) 242.



Small tree to 10 m with 5–10 cm dbh, flowering at 3 m; with terminalia branching with clusters of leaves at the tips of the twigs, twigs minutely hirsute becoming glabrous with age. Bark pale fawn, slightly flakey, not ridged. Stipules subulate. Petiole 0.75–3 cm long, grooved above. Lamina oblanceolate to subrhomboid, (13–) 14 (–18) cm long and (5–) 6 (–9.5) cm wide; apex caudate, base strongly acute, margin entire, glabrous above and beneath; in the dried state chartaceous and puckering along the tertiary veins; midrib usually minutely pilose beneath, veins (6–) 7 (–9) pairs, prominent beneath, tertiary veins conspicuous above and beneath.

In male trees raceme cauliflorous about 3 m from the ground, 3.5–8 cm long. Bracts minute, broadly ovate, c. 0.1 mm long, tomentose. Flowers white. Pedicel 1–1.5 mm long. Sepals 4–6, oblong, 1–1.5 mm long and 0.5–1 mm wide. Stamens 4–5, filament c. 0.1 mm long, anthers subglobose, 0.1 mm long. Pistillode large.

In female trees, raceme slender, pendant, cauliflorous or less usually ramiflorous but never from the base of trunk, 6.5–12 cm long. Bracts minute, cordate, 0.1–0.2 mm long and 0.1–0.2 mm wide, tomentose. Pedicel 2–2.5 mm long. Sepals 5, pale yellow, oblong, 8–9 mm long and 1–2 mm wide, margin inrolled, densely tomentose inside and out. Ovary ovoid, 6-ridged and 3-loculate, 2– mm long and 1–2 mm wide, red, densely pilose. Style 0.5–1 mm long. Stigma 3, each bifurcating and recurved.

Berry obovoid, stigma persistent, 6-ridged often finely wrinkled between the ridges, (1.5–) 2.2 (–2.5) cm long and 1.2–1.5 cm wide, rosy pink, sour. Pericarp fleshy, indehiscent, (5–) 8 (–11) mm thick. Seeds 1–6, oblong, thin, 3–4 mm long and 1–2 mm wide, aril fleshy, purple, testa brown.

### **Anatomy of the Ovary and Fruit**

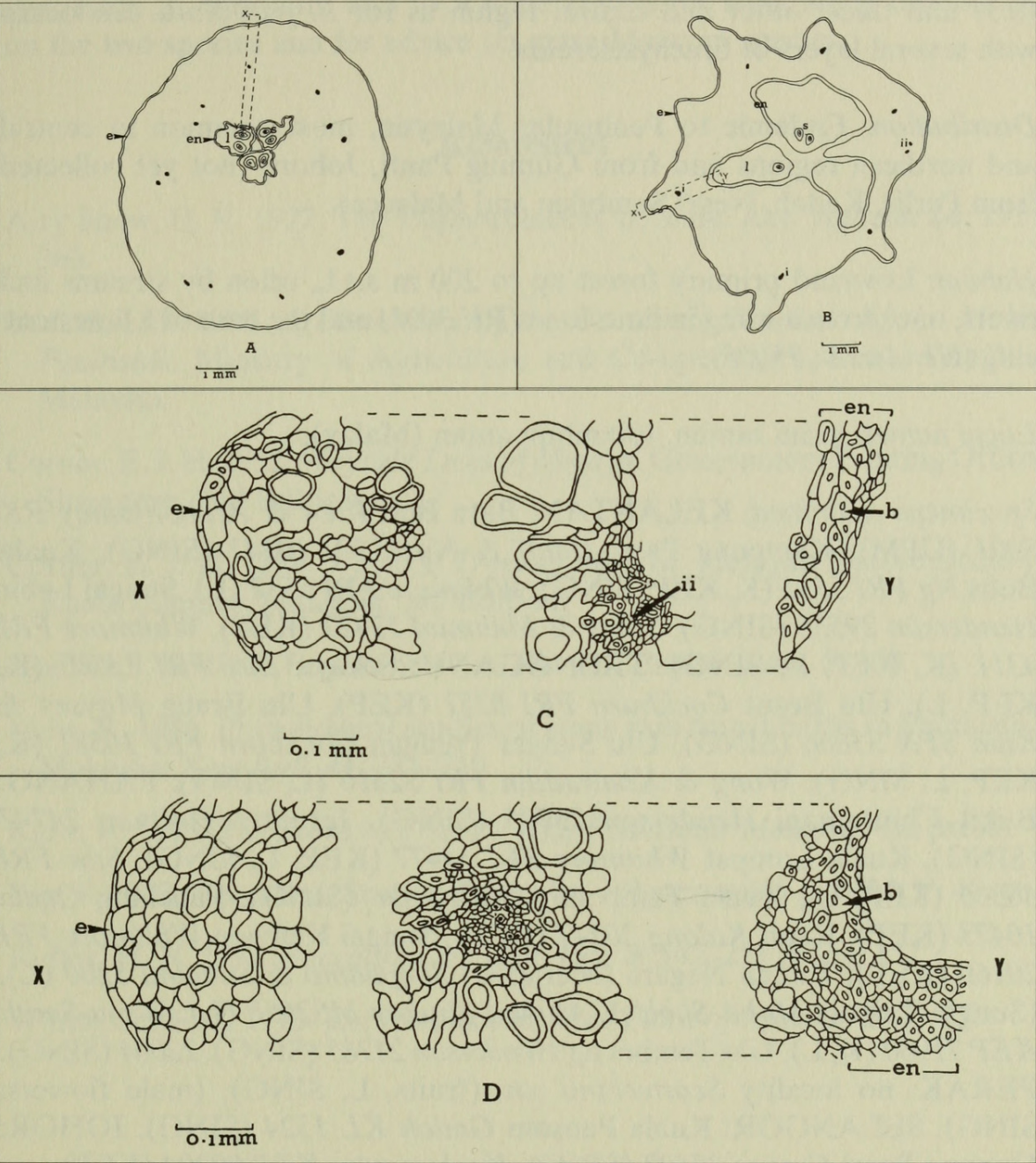
*T.S. Ovary* (Fig. 3B, D).

Six-ridged with 3 locules, ovary wall (0.1–) 0.18 (–0.3) mm thick. Ovules 1–2 per locule. Vascular bundles 3, positioned midway in the ovary wall opposite the locules with 3 minor bundles in between.

Epidermal cells narrow, isodiametric (10–) 15 (–20)  $\mu$ m wide. Trichomes abundant, unicellular, (0.11–) 0.13 (–0.16) mm long originating from the epidermal layer. Cortex with cells (10–) 15 (–20)  $\mu$ m wide, decreasing in size towards the exterior. Xylem vessels small, (5–) 8 (–10)  $\mu$ m diameter.

*T.S. Fruit* (Fig. 4B, D).





**Figure 4.** T.S. fruit: A *Baccaurea parviflora*, B *B. scortechinii*.  
T.S. pericarp: C *B. parviflora*, D *B. scortechinii*.  
i major vascular bundle, ii minor vascular bundle, b brachysclereids, e epidermis, en endocarp, s seed.



Six-ridged with 3 locules, 1–6 seeds per fruit. Pericarp fleshy (0.5–) 0.8 (–1.1) mm thick. Arrangement of vascular bundles as for ovary.

Exocarp thin, single layered, cells narrow (10–) 11 (–12)  $\mu\text{m}$  long and (15–) 18 (–20)  $\mu\text{m}$  wide, becoming almost glabrous. Mesocarp (0.3–) 0.4 (0.5) mm thick; outer and central region as for *B. parviflora*. Endocarp with several layers of brachysclereids.

*Distribution:* Endemic to Peninsular Malaysia, most common in central and northern regions and from Gunung Pant, Johore (not yet collected from Perlis, Kedah, Negri Sembilan and Malacca).

*Habitat:* Lowland primary forest up to 200 m a.s.l., often by streams and rivers, once from a wang in limestone (RK 3001) and the base of a limestone cliff (Henderson 25005).

*Local names:* asam tamun, setambun antan (Malay).

*Specimens examined:* KELANTAN: Batu Boh Kiew & Anthonysamy RK 3001 (UPM), Kampung Parit Hanif & Nur SFN 10241 (SING), Kuala Betis Ng FRI 5532 (K, KEP, SING), Whitmore FRI 5532 (L), Sungai Lebir Henderson 29535 (SING), Stone & Mahmud 12427 (KEP), Whitmore FRI 4311 (K, KEP, L, SING). TRENGGANU: Sekayu Loy FRI 13515 (K, KEP, L), Ulu Besut Cockburn FRI 8251 (KEP), Ulu Brang Moysey & Kiah SFN 33866 (SING), Ulu Sungai Trengganu Cockburn FRI 10581 (K, KEP, L, SING), Wong & Khairuddin FRI 32616 (L, SING). PAHANG: Bukit Chintamani Henderson 25005 (SING), Jeruntut Holtum 24747 (SING), Kuala Lompat Whitmore FRI 34477 (KEP, L, SING), Saw FRI 36300 (KEP, L), Kuala Tembeling Ridley s.n. (SING), Panching Ogata 10473 (KEP), Raub Kalong 20247 (KEP), Sungai Kenyam Whitmore FRI 20160 (KEP), Taman Negara (Merapoh) Soepadmo & Suhaimi S260 (L), (Sungai Tahan) Mohd Shah & Ahmad Shukor MS2658 (L), Wyatt-Smith KEP 71960 (K, L), Ulu Tembeling Henderson 21785 (SING), 22004 (SING). PERAK: no locality Scortechinii s.n. (fruits, L, SING), (male flowers, SING). SELANGOR: Kuala Pansom Gadoh KL 1324 (SING). JOHOR: Gunung Pant Corner 29408 (SING), Kochummen KEP 99204 (KEP).

*Notes:* There are three sheets of Scortechini's collections at K. The one selected as the lectotype is his unnumbered collection, which has mature fruits and female flowers. Of the other two sheets, Scortechini 1992 has male flowers and Scortechinii 2002 has female flowers but no fruits. None of Scortechini's labels gives any information about exact locality, habitat or position of the inflorescences.



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