

**STUDIES ON THE TRIBE SAC COPETALEAE (ANNONACEAE) - III  
REVISION OF THE GENUS MEZZETTIA BECCARI**

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SUMMARY

In the present revision of *Mezzettia* Beccari four species are recognized, including one new, *M. macrocarpa* Heijden & Keßler.

INTRODUCTION

The small genus *Mezzettia* Becc. comprises four species which are all tall trees. As most of the members of the family they are confined to the perhumid rain and peat-swamp forests of Malaysia, Borneo, Sumatra, and the Moluccas.

The genus is clearly separated from other Annonaceous genera and can be very easily recognized by its single carpel containing two ovules one placed on top of the other, its introrse or latero-introrse anthers, reduced in number, and its large, single, two-seeded fruitlet.

The relationship between *Mezzettia* and other Annonaceous taxa is still uncertain. Sinclair (1955) suggested that the genus is a satellite genus of *Polyalthia* Blume which he stated is the most central and primitive genus of his Unoneae tribe. *Polyalthia* is characterized by a reduction of the number of ovules, but not of carpels, whereas the petals are unspecialized, valvate, and spreading. According to the same author there are also some affinities with *Cananga* Hook. f. & Thomson because of spreading petals of both genera.

Fries (1959) classified *Mezzettia*, together with *Cananga*, *Polyalthia*, *Meiogyne* Miq., *Dendrokingstonia* (Hook. f. & Thomson) Rauschert, *Fenerivia* Diels, *Papualthia* Diels, *Woodiellantha* (Merr.) Rauschert, and *Miliusa* Lesch. ex A. DC. in his *Polyalthia* group, which is characterized by axillary inflorescences, valvate petals (except for *Dendrokingstonia*), and anthers with concealed connectives. Within this group, *Mezzettia* shares with *Dendrokingstonia* the single carpel and the reduced number of stamens, but is probably not closely related to it as shown by the imbricate aestivation of sepals and petals and the clearly uvarioïd stamens in *Dendrokingstonia*.

Walker (1971), classifying the Annonaceae in informal groups on ground of pollen morphology, placed *Mezzettia* in his *Malmea* subfamily, *Uvaria* tribe. The genera of this tribe, with advanced inaperturate and echinate pollen, mainly occur in Asia. He further pointed out that more studies are needed to divide this tribe of 50 genera into subtribes.

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Keßler (in press), arranging the genera in informal groups, attaches *Mezzettia* as a doubtful element to his *Miliusa* group (= Saccopetaleae Hook. f. & Thomson), mainly on ground of the reduction of the number of stamens and carpels. However, *Mezzettia* lacks the characteristic specialized petals and the miliusoid stamens.

Okada & Ueda (1984) considered the genus as specialized because its satellite chromosomes have only a small satellite. This in contrast to other genera which showed large satellites. However, Walker (1971) stated that genera determined as primitive tend to have a chromosome number  $n = 7$ , which is, according to Okada & Ueda (1984), the number of chromosomes found in *Mezzettia*.

It is clear that *Mezzettia* is one of the more advanced genera, indicated by its single two-ovuled carpel, its reduced number of stamens arranged in whorls, its introrse or latero-introrse thecae, its large fruitlet, and the two large tritegmic seeds. Therefore a link with the advanced *Miliusa* group would be justified because also the genera *Platymitra* Boerl. and *Mezzettiopsis* Ridley have tritegmic seeds which otherwise occur very rarely in the family (Christmann, 1987).

Further primitive characters, like the non-specialized spreading petals and the stamens with a connective dilated over the locules, do not exclude a possible relationship with *Polyalthia*.

#### DISTRIBUTION

The four species of *Mezzettia* are confined geographically to the Malay Peninsula, Sumatra, Borneo, and the Moluccas. Probably due to dryer climatic conditions, the species do not occur in Java and the Lesser Sunda Islands and do not cross the Isthmus of Kra on the Malay Peninsula. *Mezzettia parviflora*, the most widespread species, is not recorded from Celebes, in spite of the fact that it does occur in Borneo and the Moluccas. This disjunct distribution may not have climatic cause because suitable conditions may be met in Celebes. *Mezzettia macrocarpa* is endemic to a part of Sarawak, Brunei, and Sabah (Borneo).

Walker (1971, 1972) concluded, on ground of pollen types, that the Annonaceae as a family originated in the ancient West Gondwanaland. Keßler (1988), on the other hand, suggested that at least the genus *Orophea* Blume, which mainly occurs west of Wallace's line, originated in Laurasia rather than in Gondwanaland. In the genus *Disepalum* Hook. f. (Johnson, 1989) and also in *Mezzettia* a distribution pattern more or less similar to *Orophea* is found. This confirms the idea that many Southeast Asian Annonaceous taxa may have originated in the Northern Hemisphere.

#### ACKNOWLEDGEMENTS

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## MEZZETTIA

*Mezzettia* Becc., Nuovo. Giorn. Bot. Ital. 3 (1871) 187; Scheffer, Ann. Jard. Bot. Buitenzorg 2 (1885) 8; Prantl in Engl. & Prantl, Nat. Pflanzenfam. 3 (1888) 29; Boerlage, Handl. Fl. Ned. Ind. 1 (1890) 32; King, J. Asiat. Soc. Bengal 61 (1892) 128; Ann. Roy. Bot. Gard. (Calcutta) 4 (1893) 167; Ridley, Fl. Malay Penins. 1 (1922) 100; Browne, Forest Trees of Sarawak and Brunei (1955) 56; Sinclair, Gard. Bull. Str. Settl. 14 (1955) 327; Fries in Engl. & Prantl, Nat. Pflanzenfam. ed.2, 17a II (1959) 96; Kochummen in Whitmore, Tree Fl. Malaya 1 (1972) 77; Keßler in Kubitzki, Families and Genera of Vascular Plants, in press. — Type species: *Mezzettia umbellata* Becc.

*Lonchomera* Hook. f. & Thomson in Hook. f., Fl. Brit. India 1 (1872) 93. — Type species: *Lonchomera leptopoda* Hook. f. & Thomson.

Trees up to 40 m high. Buttresses small or absent. Young twigs glabrous or pubescent, older twigs glabrous, more or less striate, lenticels often numerous. *Leaves* coriaceous to subcoriaceous, dull or glaucous beneath, shining above, glabrous on both sides, sometimes pubescent beneath when young, lamina usually oblong, 2–16 by 2–7 cm, base shortly attenuate, edges reflexed, apex mostly acuminate, midrib sunken to slightly prominent above, prominent beneath and slightly hairy or glabrous, lateral veins prominent on both sides, interarching at (2–)3–5(–6) mm from the margin. Petiole sometimes hairy when young, glabrescent. *Inflorescence* a rhipidium, ramiflorous, axillary or on short shoots. *Prophylls* boat-shaped, minute, fimbriate. Peduncle present or not, pubescent to almost glabrous, glabrescent, thickened in fruiting stage. Bracts boat-shaped, minute, caducous. Pedicels pubescent to almost glabrous, glabrescent, enlarged and thickened in fruiting stage. *Sepals* 3, valvate, broadly ovate, pubescent outside, glabrous or pubescent inside, free or connate up to the middle, apex acute or blunt, reflexed or straight. *Petals* 6, in two whorls of 3, valvate, spreading, inner smaller than outer ones, densely pubescent on both sides. *Stamens* 9–21, arranged in 2 or 3 whorls, connective dilated over the locules, thecae 1- or 2-locular, opening introrse or latero-introrse with one or two valves, staminodes seldom present. *Receptacle* slightly concave, hairy. *Carpel* 1, bottle-shaped, 1–1.5 mm long, with a groove running from stigma to base, glabrous or hairy; stigma flat to capitate, horseshoe-shaped; ovules 2, biseriate. *Fruitlet* solitary, globose, ellipsoid, or obovoid, glaucous or not, pericarp woody. *Seed(s)* (1) 2, ellipsoid, large, smooth, flattened on one side, testa thick, woody.

*Distribution.* Thailand, W Malaysia, Sumatra, Borneo, and the Moluccas.

*Ecology.* Lowland Dipterocarp and swamp forests, up to 500(–1100) m alt.

*Uses.* The durable wood is used in S Sumatra for interior timberwork (Heyne, 1950).

*Notes.* 1. According to Okada & Ueda (1984), the chromosome number of *M. parviflora* is  $2n = 14$ .

2. Corner (1948) reported that the seed-coat is built up by the middle integument, which was confirmed by Christmann (1987). The pollen grains are solitary, apolar, radiosymmetric, inaperturate, globular, and medium-sized (Walker, 1971). The seedlings of *M. parviflora* are epigeal, cryptocotylar and belong to the *Blumeodendron* type (De Vogel, 1980).

## KEY TO THE SPECIES

- 1a. Leaves glaucous beneath; young leaves hairy beneath; midrib upperside sunken; inflorescences pedunculate [2–19(–25) mm long]; carpel hairy; fruitlet stalked, ellipsoid . . . . . **1. *M. umbellata***  
 b. Leaves not glaucous beneath; young leaves glabrous beneath; midrib above flat or slightly prominent; inflorescences not pedunculate (less than 2 mm long); carpel glabrous; fruitlet not stalked, globose, sometimes subglobose or obovoid **2**  
 2a. Sepals glabrous inside (magn.  $\times 30$ ), connate up to the middle, tips straight; thecae 1-locular, opening introrse with one valve . . . . . **2. *M. havilandii***  
 b. Sepals hairy inside, free, tips often reflexed . . . . . **3**  
 3a. Thecae 2-locular, opening latero-introrse with two valves; staminodes sometimes present; fruit globose or subglobose, (3–)4–7(–8) cm, glaucous; seeds 3–4 by c. 2.5 by c. 2 cm; fruit-stalk 3–7(–8) mm broad . . **3. *M. parviflora***  
 b. Thecae 1-locular, opening introrse with one valve; staminodes not present; fruit obovoid, c. 10 by 8 cm, not glaucous; seeds 6.5–7.5 by 4.5–6 by c. 3.5 cm; fruit-stalk 11–14 mm broad . . . . . **4. *M. macrocarpa***

## KEY TO FRUITING SPECIMENS

- 1a. Fruitlet stalked, distinctly ellipsoid . . . . . **1. *M. umbellata***  
 b. Fruitlet not stalked, globose, subglobose, or obovoid. . . . . **2**  
 2a. Fruitlet covered with a waxy bloom . . . . . **3. *M. parviflora***  
 b. Fruitlet not covered with a waxy bloom . . . . . **3**  
 3a. Fruitlet globose, (4–)5.5–6 cm, with a faint protrusion running from top to base; seeds c. 3.5 by 3 by 2 cm . . . . . **2. *M. havilandii***  
 b. Fruitlet obovoid, c. 10 by 8 cm, protrusion not present; seeds 6.5–7.5 by 4.5–6 by c. 3.5 cm . . . . . **4. *M. macrocarpa***

**1. *Mezzettia umbellata* Becc.**

*Mezzettia umbellata* Becc., Nuovo Giorn. Bot. Ital. 3 (1871) 187; Scheffer, Ann. Jard. Bot. Buitenzorg 2 (1885) 9; Boerlage, Icon. Bogor. I (2) (1899) 112; Ridley, Sarawak Mus. J. 7 (1913) 96; Kochummen in Whitmore, Tree Fl. Malaya 1 (1972) 79. — Type: *Beccari 1421*, Borneo, Sarawak (holo FI n.v., iso G, K, P).

*Mezzettia umbellata* Becc. var. *abbreviata* Boerl., Icon. Bogor. I (2) (1899) 112. — Type: *Jaheri s.n.*, Borneo, 1893 (holo BO; iso BO); syn. nov.

*Mezzettia umbellata* Becc. var. *schefferi* Boerl., Icon. Bogor. I (2) (1899) 112. — Type: *Teijsmann s.n.*, Borneo (holo BO 8643; iso A, L); syn. nov.

*Mezzettia pauciflora* Ridley, Kew Bull. (1912) 389; Sarawak Mus. J. 7 (1913) 97. — Type: *Haviland 1952*, Borneo, Kuching, 1-12-1892 (holo K; iso SAR, SING); syn. nov.

Tree up to 21 m high, 15–50 cm in diameter, sometimes with small buttresses. Young twigs pubescent, glabrescent. *Leaves* coriaceous, pubescent beneath when young, glabrescent, glaucous beneath, lamina oblong, sometimes elliptic, obovate to obovate-oblong or lanceolate, 3–14(–16) by 2–5.5(–7) cm, apex acuminate, sometimes blunt, blunt with a point, or retuse, midrib sunken above, slightly pubescent beneath, lateral veins 7–9 pairs. Petiole pubescent when young, glabrescent, (3–)6–

9(-12) mm long, 1-2 mm in diam. *Inflorescence* a 2-12(-20)-flowered rhipidium. *Prophylls* c. 1 mm long, 0.5 mm wide, pubescent outside, glabrous inside. Peduncle (1-)2-19(-25) mm long, 0.5-1 mm in diam., densely pubescent to almost glabrous. Bracts 1-3 mm long, 1-1.5 mm wide, pubescent outside, glabrous inside. Pedicel densely pubescent to almost glabrous, 6-40 mm long, c. 0.5 mm in diameter. Buds ovoid, 1.5-2(-3) by 1.5-2 mm. *Sepals* (1-)1.5-2.5 by (1-)1.5-2 mm, glabrous inside, free, apex acute. *Outer petals* linear-lanceolate to linear, (6-)10-25 by (0.8-)1-1.5(-2) mm. *Inner petals* ovate-lanceolate to ovate linear-lanceolate, (5-)6-12 (-13) by 1-2 mm. *Stamens* 9-15, thecae 2-locular, opening latero-introrse with two valves, staminodes sometimes present. *Carpel* densely pubescent, stigma capitate. *Fruitlet* ellipsoid, 3-5 cm long, 1.5-2 cm in diam., smooth, shrunk when dry, slightly glaucous, pericarp 1-1.5 mm thick, peduncle and pedicel 1-3 mm in diameter. *Seed(s)* 1 or 2, c. 2.5 by 1 cm.

**Distribution.** Borneo. Kochummen (1972) mentions two specimens (*KEP* 32321, 66204), found in Selangor, Malay Peninsula. These specimens could not be traced and hence the specific identity not ascertained.

**Ecology.** In lowland Dipterocarp and peat-swamp forests on flat land, on terraces, hills, and river sides, on white sand podsols, or peat-soils overlying white sand. Found up to 500(-1100) m altitude.

**Vernacular names.** Pepisoop (Malay), juvis (Dayak), kepayang babi (Brunei), sariwaka (SE Borneo, Sampit), karai manuk (Benuni), perdok, delasai, selukai (Iban).

**Uses.** Bark sometimes used for rope making (*Rahim A438*).

**Collector's notes.** Flowers greenish grey yellow, fruits greenish.

**Notes.** 1. One specimen (*Paie SF 42733*) combines the characters of *M. umbellata* and *M. parviflora*; the young leaves are pubescent beneath, the midrib is sunken above, the inflorescence is pedunculate, and the sepals are free and glabrous above. However, the carpel is glabrous and the leaves are not glaucous. This specimen might have arisen by hybridization between the two species. Because only one specimen was available the taxonomic significance is not clear.

2. According to Boerlage (1899), three varieties can be distinguished on ground of flower size and grade of indument on peduncle and pedicel; var. *abbreviata* is characterized by smaller flowers and var. *schefferi* by a very dense indument. The great differences in flower size can be explained by the fact that mature flowers are always larger than immature ones. The grade of indument is rather variable within this species, showing a wide range from almost glabrous to densely pubescent. Both characters are therefore of no taxonomic value.

3. Fruits are, in contrast to other species, only rarely collected.

## 2. *Mezzettia havilandii* (Boerl.) Ridley

*Mezzettia havilandii* (Boerl.) Ridley, Sarawak Mus. J. 7 (1913) 96. — *Mezzettia parviflora* Becc. var. *havilandii* Boerl., Icon. Bogor. I (2) (1899) 111. — **Type:** *Haviland 2335*, Borneo, Sarawak, Kuching, 17-5-1893 (holo BO; iso A, B, BM, GH, K, L).

Tree up to 35 m high, 30-80 cm in diameter, with buttresses up to 60 cm high. Young twigs glabrous. *Leaves* coriaceous, glabrous on both sides, dull beneath, la-

mina oblong, sometimes obovate-oblong, elliptic, or lanceolate, (4–)5–13(–15) by 2–5(–6.5) cm, apex shortly acuminate; midrib flat or slightly prominent above, lateral veins 8–10 pairs. Petiole glabrous, 6–9(–10) mm long, 1–2(–2.5) mm in diam. *Inflorescence* a 2–4-flowered rhipidium on short shoot. *Prophylls* 1–2 mm long, c. 1 mm wide, pubescent to glabrous outside, glabrous inside. Peduncle up to c. 1 mm long, pubescent. Bracts 1.5–2 mm long, c. 1 mm wide, pubescent outside, glabrous inside. Pedicel pubescent, 10–23(–30) mm long, c. 0.5 mm in diam. Buds globular, subovoid, or ovoid, (1–)1.5–2(–2.5) by (1–)1.5–2 mm. *Sepals* 1–2 by 1–2 mm, glabrous inside, connate up to the middle, apex acute or blunt, tip straight. *Outer petals* obovate-lanceolate, sometimes linear-lanceolate, (5–)6–8(–13) by (1–)2 mm. *Inner petals* oblong, sometimes lanceolate or ovate oblong, (3.5–)4–5.5 (–7.5) by 1.5–2 mm. *Stamens* 11–21; thecae 1-locular, opening introrse with one valve. *Carpel* glabrous, stigma flat or subcapitate. *Fruitlet* globose, 4–6 cm in diam., smooth, with a faint protrusion running from top to base, pericarp 4–6 mm thick; pedicel 13–29(–33) mm long, 3–10 mm in diam. *Seeds* 2, c. 3.5 by 3 by 2 cm.

**Distribution.** Sumatra and Borneo.

**Ecology.** A lowland species, usually in swamp forests, on flat land, near streams or on the edges of terraces, on podsols, sandy alluvium, or grey soils.

**Vernacular names.** Borneo: kepayang babi (Sarawak), karai (Dusun), baru (Iban); Sumatra: tetapa hitam, hakai rawang.

**Collector's notes.** Flowers yellow, sepals green, fruits green, orange (Sadau SAN 49563).

**Note.** Three specimens, *Brünic* S 4436, *Jawa* S 36615, and *Bagong et al.* S 37637, are different by their very thick coriaceous leaves and non-connate sepals. The last one is especially characterized by its larger sepals (c. 3 by 2.5 mm), whereas the petioles are more stout [10(–14) by 2–3 mm] and the outer petals broader (2.5–3 mm). In our opinion, the first two specimens certainly belong to *M. havilandii*. The taxonomic position of the third one is not clear, but we tend to fuse it with *M. havilandii*, as the differences are not very large. All three specimens were collected near Kuching (Borneo, Sarawak).

### 3. *Mezzettia parviflora* Becc.

*Mezzettia parviflora* Becc., Nuovo Giorn. Bot. Ital. 3 (1871) 188; Scheffer, Ann. Jard. Bot. Buitenzorg 2 (1885) 8; Boerlage, Icon. Bogor. I (2) (1899) 110; Ridley, Sarawak Mus. J. 7 (1913) 96. — **T y p e s:** *Beccari* 2558, Borneo, Sarawak, Mt Mattan, Sept. 1866 (syn. A, B, FI n.v., G, K, NY, P), 308, Sept. 1865 (syn. BM, FI n.v., G, K, P), 2586 (syn. FI n.v.).

*Mezzettia parviflora* Becc. var. *floribunda* Boerl., Icon. Bogor. I (2) (1899) 110. — **T y p e:** *Ruloffs* 5792, cult. in Hort. Bot. Bog. sub IV-H-32, no. 108 (holo BO; iso B, L); syn. nov.

*Mezzettia parviflora* Becc. var. *subtetramera* Boerl., Icon. Bogor. I (2) (1899) 111. — **T y p e:** cult. in Hort. Bot. Bog. sub IV-G-64, no. 109, probably from Borneo (holo BO; iso K, L); syn. nov.

*Mezzettia leptopoda* (Hook. f. & Thomson) Oliv. in Hook., Icon. Pl. 6 (1887) t. 1560; King, J. Asiat. Soc. Bengal 61 (1892) 129; Ann. Roy. Bot. Gard. (Calcutta) 4 (1893) 168; Ridley, Fl. Malay Penins. 1 (1922) 100; Sinclair, Gard. Bull. Str. Settl. 14 (1955) 327; Kochummem & Whitmore, Fed. Mus. J. 13 (1968) 134; Kochummem in Whitmore, Tree Fl. Malaya 1 (1972) 78. — *Lonchomera leptopoda* Hook. f. & Thomson in Hook. f., Fl. Brit. India 1 (1872) 93. — **T y p e:** *Maingay s.n.* (Kew Distr. no. 102), Malacca (holo K).

*Mezzettia curtisii* King, J. Asiat. Soc. Bengal 61 (1892) 129; Ann. Roy. Bot. Gard. (Calcutta) 4 (1893) 168; Ridley, Fl. Malay. Penins. 1 (1922) 101; Sinclair, Gard. Bull. Str. Settl. 14 (1955) 330; Kochummen & Whitmore, Fed. Mus. J. 13 (1968) 134. — T y p e: *Curtis* 2266, Malaysia, Penang, Government hill, 360 m. alt., March 1890 (holo CAL, n.v.; iso BM, K).

*Mezzettia herveyana* Oliv. in Hook., Ic. Pl. 6 (1887) t. 1560; King, J. Asiat. Soc. Bengal 61 (1892) 129; Ann. Roy. Bot. Gard. (Calcutta) 4 (1893) 168; Ridley, Fl. Malay. Penins. 1 (1922) 101; Sinclair, Gard. Bull. Str. Settl. 14 (1955) 328; Kochummen in Whitmore, Tree Fl. Malaya 1 (1972) 78. — T y p e: *Hervey s.n.*, Malaysia, August 1886 (holo K); syn. nov.

Tree up to 40 m high, 20–80 cm in diameter. Buttresses developed or not, up to 30 cm high. Twigs glabrous. *Leaves* coriaceous, sometimes subcoriaceous, glabrous on both sides, dull beneath, lamina oblong to elliptic or lanceolate, (3.5–)4–11(–16) by 2–4.5 (–5.5) cm, apex acuminate, sometimes acute, blunt, blunt with a point, or retuse, midrib flat or slightly prominent above, lateral veins 8–10 pairs. Petiole glabrous, (5–)6–8(–12) mm long, 1–1.5(–2) mm in diam. *Inflorescence* a 2–4-flowered rhpidium, on short shoots. *Prophylls* (0.5–)1–2(–3) mm long, 0.5–1(–1.5) mm wide, slightly pubescent to almost glabrous on both sides. Peduncle up to 2 mm long, pubescent. Bracts (1.5–)2–3.5 mm long, (0.5–)1–2.5 mm wide, pubescent to glabrous on both sides. Pedicel (4–)4.5–14(–18) mm long, c. 0.5 mm in diam. Buds ovoid, rarely subovoid or globular, 1.5–2 by (1–)1.5(–2) mm. *Sepals* (1.5–)2–3.5 by 1.5–2.5 mm, pubescent inside, glabrous towards the base, free, apex acute, tips often reflexed. *Outer petals* lanceolate to linear-lanceolate, sometimes linear (5.5–)7–13(–17) by 1–1.5(–2) mm. *Inner petals* ovate-oblong to ovate-lanceolate, (3.5–)5–8(–9) by 1.5–2.5(–3) mm. *Stamens* 9–17, thecae 2-locular, opening latero-introrse with two valves; staminodes sometimes present. *Carpel* glabrous, mostly white bloomed; stigma subcapitate or flat. *Fruitlet* globose to subglobose, (3–)4–7(–8) cm in diameter, smooth, shrunk when dry, glaucous, with a faint protrusion running from top to base, pericarp 2–5(–7) mm thick, pedicel 10–18(–24) mm long, 3–7(–8) mm in diam. *Seeds* 2, 3–4 by c. 2.5 by c. 2 cm.

**D i s t r i b u t i o n.** Peninsular Thailand, W Malaysia, Sumatra, Borneo, and the Moluccas.

**E c o l o g y.** A lowland species occurring up to 300(–800) m altitude. In lowland Dipterocarp forests, old secondary forests, Kerangas, peat-swamp forests or forests behind mangrove, on flat land, hill and river sides. Usually on sandy soils, also on sandy loam, porous red nickel soil, and clayey soil.

**V e r n a c u l a r n a m e s.** Borneo: barun (Sarawak), banitan (Dayak), ampunjit selapatan (Dayak), bongkoi (Sabah); Sumatra: bajoet batoe (Fatoek); Moluccas: foki foki (Ternate).

**C h r o m o s o m e s.**  $2n = 14$  (Okada & Ueda, 1984).

**C o l l e c t o r ' s n o t e s.** Flowers yellowish green, fruits green or yellow, mesocarp greenish, yellow-reddish and brown near the seed, seed black.

**N o t e s.** 1. One specimen from N Sumatra (*de Wilde & de Wilde-Duyfjes 15670*) is different in the following characters: the inner petals are extremely short in comparison with the outer petals which are more than twice as long. The sepal tips are not reflexed, whereas the fruits are not glaucous. More collections are needed from this region in order to say something about the taxonomic significance of these characters.

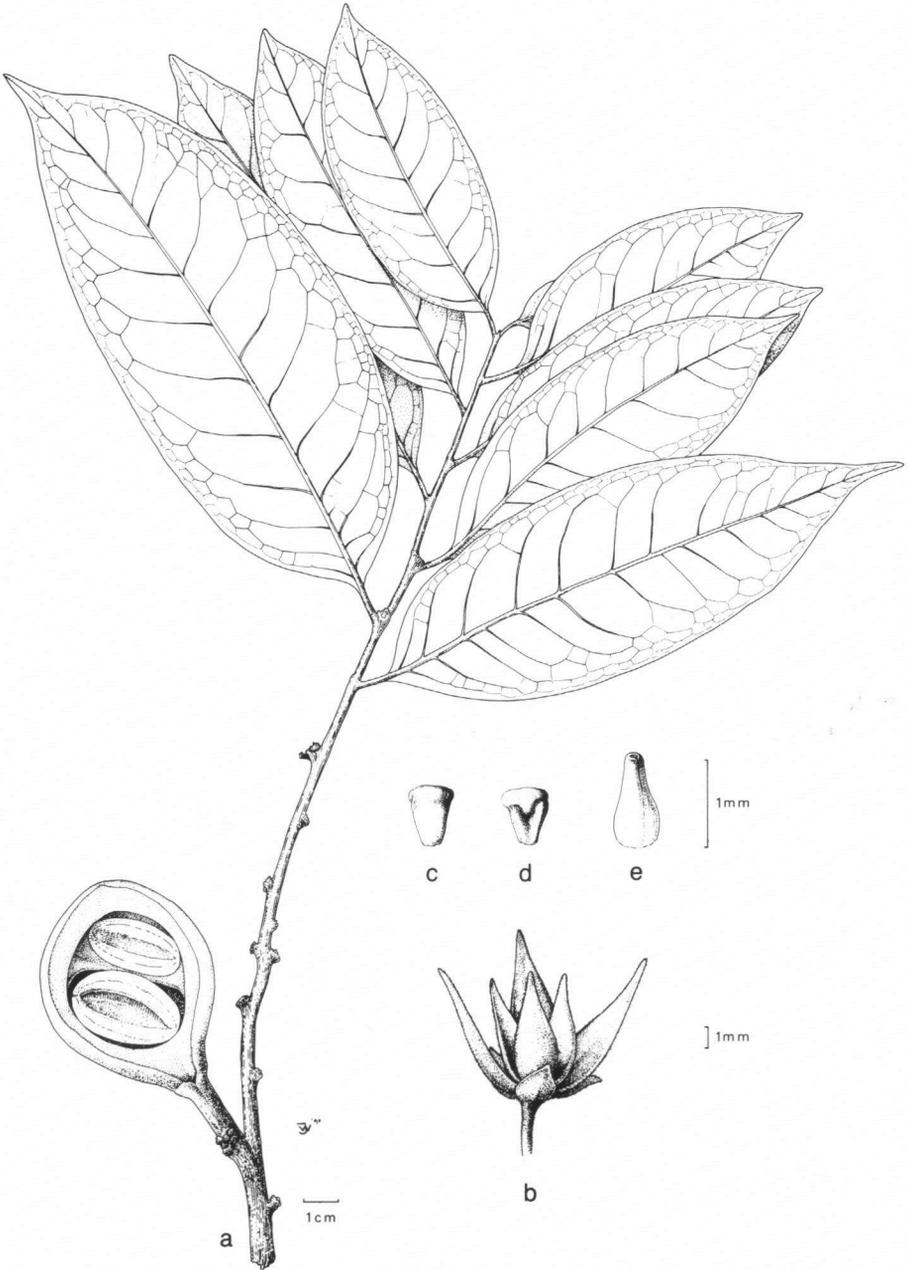


Fig. 1. *Mezzettia macrocarpa* Heijden & Keßler. a. Habit; b. flower; c. stamen, outside view; d. stamen, inside view; e. carpel (a Wright S 27189; b-e Wood SAN 17069).

2. We agree with King (1892), who concluded that the fruits associated with the type specimen of Maingay do not match with the twigs, but are evidently those of some species of *Polyalthia*. This supposition is confirmed by the fact that no fruit stalks can be found on the sheets.

3. Boerlage (1899) distinguished three varieties. *Var. floribunda* differs from Beccari's type in larger leaves, pedicels and flowers. The size of pedicels and flower parts depends on the stage of maturity of the sexual organs, whereas the leaves show a wide range of sizes and shapes. The second variety, *var. subtetramera*, is different by its tetramerous flowers. However, this character is rare in the herbarium material, so we treat this as a monstrosity without any taxonomic value.

5. We agree with Kochummen & Whitmore (1968), who reduced *M. curtisii* to synonymy on ground of petal length and leaf size. The main differences we found between *M. curtisii* and *M. parviflora* was in petal shape; the outer petals of *M. curtisii* are somewhat obovate-lanceolate, whereas the inner petals are oblong. This is in contrast to the outer petals of *M. parviflora* showing no obovate outer petals, whereas the inner petals are ovate oblong to ovate lanceolate. However, the differences are too small to keep the species separate.

6. No differences were found between *M. herveyana* and *M. curtisii*, therefore *M. herveyana* is also reduced to synonymy.

7. The single alcohol collection of the fruits (*van Balgooy & van Setten 5653*) revealed a pericarp thickness of 6–9 mm.

#### 4. *Mezzettia macrocarpa* Heijden & Keßler, *spec. nov.* – Fig. 1.

Arbor c. 35 m alta, 30–70 cm diametro. Ramuli juniores glabrescentes. Folia oblonga usque lanceolata interdum elliptica vel obovato-elliptica, coriacea, (4,5–)8–18 cm longa, (2,5–)4–6(–7) cm lata, glabra, apice acuminata, costa supra subprominenti, complanata, nervis lateralibus 8–10 (–14) paribus, petioli 6–12(–15) mm longi, (1–)1,5–2 mm crassi. Inflorescentiae brachyblastis productae, in 2–4-floribus rhipidiis; pedunculi desunt, pedicelli 8–14 mm longi. Flores parvi, c. 1,5 cm diametro. Sepala late ovata, 3–4(–6) mm longa, 2,5–3 mm lata, apice acuta, saepe reflexa. Petala exteriora anguste lanceolata, 6,5–9 mm longa, 2–2,5 mm lata, interiora ovato-oblonga, 5,5–6,5 mm longa, 2–2,5 mm lata. Stamina 10–17, introrsa, thecae 1-loculares. Carpellum glabrum, stylule brevi, stigma subcapitate. Carpidium obovoideum, c. 10 cm longum, 8 cm diametro, subasperum, pedicello 15–20 mm longo, 11–14 mm crasso. Semina 2, elliptica, 6,5–7,5 cm longa, 4,5–6 cm lata, c. 3,5 cm crassa. — T y p u s: *Wood SAN 17069* (holo L; iso A, BO, BRI, K, KEP, SAN, SING), Borneo, Sabah, Temburong Dist., Sungei Belalong, 0.5 mile above Kuala Belalong, 26-3-1957.

Tree up to 35 m high, 30–70 cm in diameter, buttresses absent. Twigs glabrous. *Leaves* coriaceous, glabrous, dull beneath, lamina oblong to lanceolate, sometimes elliptic or obovate-elliptic, (4.5–)8–16 by (2.5–)4–6(–7) cm, apex acuminate, midrib flat or slightly prominent above, lateral veins 8–10(–14) pairs. Petiole glabrous, 6–12(–15) mm long, (1–)1.5–2 mm in diam. *Inflorescence* a 2–4-flowered rhipidium, on short shoots. *Prophylls* glabrous to sparsely pubescent on both sides, 1–2.5 by 1–1.5 mm. Peduncle absent. Bracts c. 2.5 mm long, c. 1 mm wide, pubescent on both sides. Pedicel pubescent, 8–14 mm long, c. 0.5 mm in diam. Buds ovoid 1–2 by 1–1.5 mm. *Sepals* 3–4(–6.5) by 2.5(–3) mm, pubescent inside, gla-

brous at the base, free, apex acute, tips often reflexed. *Outer petals* lanceolate, slightly ovate, 6.5–9 by 2–2.5 mm. *Inner petals* ovate-oblong, 5.5–6.5 by 2–2.5 mm. *Stamens* 10–17, thecae 1-locular, opening introrsely with one valve. *Carpel* glabrous, stigma subcapitate. *Fruitlet* obovoid, c. 10 by 8 cm, slightly rough, pericarp 5–10 mm thick, pedicel 15–20 mm long, 11–14 mm in diameter. *Seeds* 2, 6.5–7.5 by 4.5–6 by c. 3.5 cm.

**Distribution.** Borneo (Sarawak, Brunei, Sabah), rare.

**Ecology.** Lowland Dipterocarp forests on peaty alluvium over white sand, tertiary sandstone ridges or on yellow sandy clay. Recorded from altitudes up to c. 100 m.

**Vernacular names.** Merbatu (Iban), kepayang babi (Malay).

**Collector's note.** Flowers pale greenish yellow.

**Notes.** 1. Resembles *M. parviflora* at first sight, but differs in the type of stamen and size of fruit, seed, and fruitlet stalk.

2. One specimen (*Soepadmo & Chai 27617*) resembles this species but is different by its obovate-lanceolate outer petals and its oblong inner petals. Unfortunately no fruits are developed.

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