

TREE FLORA of SABAH AND SARAWAK

Volume One

edited by
E. Soepadmo and K.M. Wong



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International Tropical
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TREE FLORA
of
SABAH AND SARAWAK

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INTERNATIONAL TROPICAL TIMBER ORGANIZATION



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ALANGIACEAE

A. Berhaman

Forest Research Centre,
Sabah Forestry Department,
Sandakan, Malaysia

Merrill, PEB (1929) 232; Masamune, EPB (1942) 517; Backer & Bakhuizen *f.*, FJ 2 (1965) 159; Eyde, J. Arn. Arb. 49 (1968) 167; Kochummen, TFM 1 (1972) 56; Anderson, CLTS (1980) 133; Cockburn, TS 2 (1980) 15; Ashton, MNDTS 2 (1988) 4; Whitmore, Tantra & Sutisna, CLK 1 (1989) 11.

The family consists of only one genus, *Alangium*, distributed in tropical Africa, and E Asia, Malesia, eastern Australia and some South Pacific Islands.

Taxonomy. *Alangium* has in the past been included in the Cornaceae. Eyde *l.c.* investigating the anatomy of the flower and discussing the relationships of *Alangium*, concluded that this genus was not closely related to the Cornaceae. Instead, he suggested that the alkaloid characteristics and floral morphology indicate that *Alangium* has its closest relatives in the Rubiaceae. The evidences have not been further examined and the most recent treatments accept the Alangiaceae as a monogeneric family, usually placed in the Cornales.

ALANGIUM Lam.

(after the Malabar plant name, *alangi*)

kondolon (Dusun, Sabah), *midong* (Iban, Sarawak)

Encycl. Meth. Bot. 1 (1783) 174; Merrill, EB (1921) 459 (as part of Cornaceae), *l.c.* (1929) 232; Bloembergen, Blumea 1, 2 (1935) 241, Bull. Jard. Bot. Btzg. 3, 16 (1939) 139; Masamune *l.c.* 517; Kochummen *l.c.* 56; Anderson *l.c.* 133; Cockburn *l.c.* 15; Ashton *l.c.* 4; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman, Sandakania 4 (1994) 31.

Trees, more rarely shrubs or woody climbers, *often with thin buttresses or stilt-roots*. **Bark** smooth, thin, grey-brown, often with pale lichen patches; inner bark thick, yellowish brown. **Leaves** simple, alternate, entire, pinnately veined, or sometimes 3–5-veined at the base; stalk terete or slightly grooved or flattened on upper side; stipules none. **Inflorescence** an axillary cyme, few- to many-flowered. **Flowers** bisexual, sessile or stalked (the stalks, if present, articulate); calyx-tube connate with the ovary wall, truncate or with 4–10 teeth or lobes; petals 4–10, valvate, linear, becoming recurved, alternate with the calyx-teeth, usually white; stamens as many as or 2–6-times the number of petals; anthers linear, dehiscing laterally or introrsely; disc intrastaminal, well-developed; *ovary inferior, 1–2-celled, style single*, usually as long as the corolla, ovule 1 in each locule, anatropous. **Fruit** a drupe, globose to ellipsoid and somewhat bilaterally compressed, often longitudinally

ribbed, crowned by the persistent calyx-teeth and disc. **Seed** 1–2 per fruit with a copious endosperm; cotyledons foliaceous, flat, palmately veined at base; radicle straight.

Distribution. 21 species, distributed as noted for the family. 10 species in Sabah and Sarawak, including *A. kurzii* Craib, a new record for Borneo.

Ecology. Primary and secondary forests, lowlands to 1500 m.

Taxonomy. Bloembergen *l.c.* (1939) recognised four sections, *Angolam* Baill. (which Eyde *l.c.* points out should be called section *Alangium* as it contains the type species), *Marlea* Baill., *Rhytidandra* Baill., and *Conostigma* Bloemb.; all except *Rhytidandra* are represented in Sabah and Sarawak. Eyde *l.c.* has found that differences in style and stigma structure, stamen number, the pattern of floral vasculature, pollen morphology, and fruit endocarp characteristics support Bloembergen's designation of the four sections.

Key to *Alangium* species

1. Woody climbers.....2
 Trees.....3
2. Leaf coriaceous with domatia in the axils of main veins. Inflorescence almost sessile, with less than 15 flowers.....
 Alangium sp. 1.
 Woody climber. Leaves obovate-elliptic, 12–15 x 4.5–6 cm, coriaceous; base 3-veined, cuneate; apex acuminate; lateral veins 4–5 pairs; stalk 1.2–1.5 cm long, glabrous.
 Only one specimen, *SAN 79310*, from Telupid in Sabah known, with young flower buds.
 Leaf thinly chartaceous, without domatia. Inflorescence with stalk up to 4 cm long, and 17–30 flowers.....
 A. scandens Bloemb.
 l.c. (1935) 264, *l.c.* (1939) 193; Masamune *l.c.* 518; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman *l.c.* 32. Type: *Ender 4076*, Sarawak, 4th Division, Long Petah (lectotype BO).
 Woody climber. Leaves ovate to ovate-elliptic, 8–15.5 x 3.5–6 cm, chartaceous to thinly coriaceous; base subcordate to rounded, apex acuminate; lateral veins 6–7 pairs; stalk hairy, 1–1.5 cm long.
 Sumatra and Borneo. Hill to lower montane forest, common in Sabah and Sarawak.
3. Leaf base 3–5-veined.....4
 Leaf base pinnately veined.....9
4. Leaves markedly obovate with narrowed base, or if elliptic and base rounded then lateral veins 6–7 pairs.....**6. A. longiflorum**
 Leaves rounded to broadly ovate with rounded to cordate base, or if (rarely) elliptic and base narrowed then lateral veins 4–5 pairs.....5
5. Leaf length at least twice the width.....**2. A. griffithii**
 Leaf length not reaching twice the width.....6

6. Leaf-stalk densely hairy; lateral veins 9–12 pairs. Inflorescence-stalk less than 8 mm long. Flowers almost sessile.....**7. A. nobile**
Leaf-stalk glabrous to sparsely hairy; lateral veins less than 8 pairs. Inflorescence-stalk more than 10 mm long. Flowers distinctly stalked7
7. Leaf-apex blunt to emarginate; lateral veins 4–5 pairs. Petals *c.* 28 mm long and 5 mm wide at base, covered by tiny stellate scales.....**1. A. circulare**
Leaf-apex acute to acuminate; lateral veins 5–7 pairs. Petals less than 15 mm long and 1–2 mm wide at base, covered by straight hairs.....8
8. Leaf lower surface velvety (seldom sparsely) hairy; midrib and lateral veins on upper surface densely hairy. Calyx-tube densely hairy, teeth to only about 0.5 mm long**5. A. kurzii**
Leaf lower surface glabrous to sparsely hairy, never velvety; midrib and lateral veins on upper surface glabrous. Calyx-tube sparsely hairy, teeth more than 1 mm long**8. A. rotundifolium**
9. Plants of mixed swamp forest. Leaf-base typically asymmetric. Calyx-limb with distinct triangular teeth. Style thickly yellow hairy. Stamen filaments broadened and thickly woolly hairy at base.....**3. A. havilandii**
Plants of lowland mixed dipterocarp forest. Leaf-base typically symmetric (rarely asymmetric). Calyx-limb subtruncate. Style sparsely white-hairy. Stamen filaments uniformly thick throughout, subglabrous to sparsely short-hairy at base.....**4. A. javanicum**

1. *Alangium circulare* Stone & Kochummen

(Latin, *circularis* = circular; the round-shaped leaves)

Blumea 22 (1975) 219; Ashton *l.c.* 4. **Type:** *Salleh ak Nantah S. 24325*, Sarawak, 1st Division, Bukit Siol, Kuching (holotype SAR; isotypes A, BO, K, KEP, L, SAN, SING).

Small to medium-sized tree to 15 m tall. **Bark** smooth, grey-brown; inner bark pale brown. **Sapwood** pale yellow. Twigs grey to brown. **Leaves** broadly ovate-elliptic-obovate to subcircular, 8.5–10.5 x 8–10 cm, coriaceous; *base rounded to cordate, 3-veined, apex blunt to emarginate*; midrib raised on both surfaces; *lateral veins 4–5 pairs*, slightly raised on both surfaces, glabrous; stalk glabrous, 7–10 mm long, 2–3 mm diameter, grooved on upper surface. **Inflorescence** a short cyme, 1–2-times branched, stalk 11–14 mm long, finely greyish pubescent, 1–3-flowered. **Flowers** 5-merous, *sessile to shortly stalked, stalks 2–3 mm long*; calyx funnel-shaped, 3–4 mm long, 3 mm across, finely stellate-pubescent, teeth 5, triangular, to 1 mm high; *petals linear-lanceolate, c. 28 mm long, c. 5 mm wide at base, abaxial side covered with minute stellate hairs*; stamens as many as petals, linear, 10–11 mm long; ovary 1-celled, style hairy, 22–26 mm long. Fruit and seed unknown.

Distribution. Endemic to Sarawak, recorded from Bukit Siol, Sempadi Forest Reserve and Gunung Pueh in the 1st Division. Apparently a species of *kerangas* forest.

2. *Alangium griffithii* (Clarke) Harms

(W. Griffith, 1810–1845, doctor and botanist in India and Malacca)

in Engl. & Prantl., Pfl. Fam. 3, 8 (1898) 262; Bloembergen *l.c.* (1935) 266, *l.c.* (1939) 194; Masamune *l.c.* 517; Kochummen *l.c.* 58; Cockburn *l.c.* 16; Anderson *l.c.* 134; Ashton *l.c.* 5; Whitmore, Tantra & Sutisna *l.c.* 11; Berhaman *l.c.* 32. **Basionym:** *Marlea griffithii* Clarke in Hooker *f.*, Fl. Brit. Ind. 2 (1879) 742. **Type:** Griffith 3387, Malacca (lectotype K; isolectotypes B, BM). **Synonym:** *Marlea densiflora* Koord. & Valetton, Bijdr. Booms. Java 5 (1899) 84.

Medium-sized tree to 20 m tall, 30 cm diameter, sometimes with spreading buttresses to 50 cm wide. **Bark** smooth, grey to dark brown; inner bark pale yellow. **Sapwood** white to pale yellow. Twigs dark brown, smooth to hairy. **Leaves** chartaceous, *elliptic to narrowly ovate*, 5.5–18.5 x 2–8 cm, *length at least twice the width*, hairy on the lower surface, mainly on the main veins, grey to dark brown when dry; base cuneate, asymmetric, 3–5-veined, apex acuminate; midrib flat on upper side, hairy on the lower surface; lateral veins 4–5(–6) pairs, usually glabrous between the veins on upper surface; stalk 5–15 mm long, sparse to densely hairy. **Inflorescence** hairy, 3–4-times branched, 3–6.5 cm long, many-flowered, stalk 1–2.2 cm long. **Flowers** 5-merous, white to cream, fragrant; calyx-tube densely hairy, with teeth 0.25–0.5 mm long, limb spreading; petals linear, swollen at base, glabrous to sparsely hairy outside, cream, 8.5–15 mm long; stamens as many as petals, 8–14 mm long; ovary 1-celled, style glabrous, cream, 8–11 mm long. **Fruit** ovoid, 14–21 x 8–10 mm, dark brown when dry, faintly grooved, crowned by the persistent calyx-limb, dark blue when ripe.

Vernacular names. Sabah—*gadong hutan* (Brunei Malay). Brunei—*mayam kampong* (Malay).

Distribution. Peninsular Thailand, Sumatra, Peninsular Malaysia, Java, and Borneo. In Sabah, quite common but in Sarawak only found in the Tinjar Forest Reserve. Also in Brunei and Kalimantan.

Ecology. Primary and secondary forest, 60–400 m.

3. *Alangium havilandii* Bloemb.

(J.D. Haviland, 1857–1901, first Sarawak Medical Officer and plant and insect collector)

l.c. (1935) 277, *l.c.* (1939) 213; Masamune *l.c.* 518; Anderson *l.c.* 134; Ashton *l.c.* 8; Whitmore, Tantra & Sutisna *l.c.* 11. **Type:** Omar 54, Sarawak, 1st Division, Gunung Sedilu Forest Reserve (holotype SING).

Small to medium-sized tree to 25 m tall, 30 cm diameter, with tall prominent thin flying buttresses. **Bark** smooth, greyish; inner bark yellow. **Sapwood** pale whitish to yellowish. **Leaves** ovate to elliptic, 5–15 x 3.5–6 cm, chartaceous or thinly coriaceous; *base typically asymmetric, rarely symmetric, pinnately veined*, apex long acuminate to acute; midrib flat on the upper surface; lateral veins, 6–9 pairs, raised on the lower surface; stalk 5–12 mm long, slender. **Inflorescence** a short cyme, 1–2-times branched, 1–6-flowered, stalk 1–1.5 cm long. **Flowers** 4–5-merous; *calyx-tube tomentose, c. 2 mm long, limb with distinct triangular teeth*; petals 15–20 mm long, prominently dilated at base; stamens as many as petals, 14–17 mm long, *filaments broadened and thickly woolly hairy at base*; ovary 1-celled, *style thickly yellow hairy*, 11–13 mm long. **Fruit** ellipsoid-ovoid, finely hairy, 10.5–18 x 6–9 mm, flattened when dried, crowned by the persistent calyx-limb, ripening pink.

Vernacular names. Sarawak—*dadam* or *jadam paya* (Melanau), *jenangan* (Melanau, Bintulu), *sisit* (Malay).

Distribution. Sarawak, Brunei and Kalimantan, not yet recorded in Sabah.

Ecology. Frequent and locally common in mixed peat swamp forest at low altitude.

4. *Alangium javanicum* (Blume) Wangerin (of Java)

Fig. 1.

in Engl. & Prantl., Pfl. Fam. 4, 220b (1910) 14; Bloembergen *l.c.* (1935) 281, *l.c.* (1939) 218; Merrill *l.c.* (1921) 458, *l.c.* (1929) 232, *in syn.*; Masamune *l.c.* 518; Cockburn *l.c.* 16, *in syn.*; Kochummen *l.c.* 57, *in syn.*; Ashton *l.c.* 10; Anderson *l.c.* 133, *in syn.*; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman *l.c.* 33. **Basionym:** *Styrax javanicum* Blume, Bijdr. 13 (1825) 671. **Type:** Blume, *s.n.*, Java (holotype BO; isotype NY).

Medium-sized tree to 30 m tall and 35 cm diameter, often with flying buttresses. **Bark** smooth, yellowish to pale brown; inner bark yellowish to reddish. **Sapwood** yellowish. **Leaves** ovate-elliptic to obovate, (8–)15(–35) x (2.5–)5.5(–15.5) cm, chartaceous to coriaceous, lower surface glabrous to short-hairy on the midrib, or sometimes short velvety all over, drying pale olive-brown to purplish brown; base cuneate to rounded, *symmetric (rarely asymmetric), pinnately veined*, apex acute to acuminate; midrib flat to raised, rarely sunken on the upper surface; lateral veins 6–9(–19) pairs; stalk 0.5–3.8 cm long, slender, sometimes grooved on the upper surface and densely hairy. **Inflorescence** 1–3-times branched, with up to 35 flowers, stalk 2–8 mm long. **Flowers** (4–)6(–7)-merous, 2–2.5 cm long; *calyx-tube* campanulate, *limb subtruncate*, glabrous to densely covered by silky long hairs; corolla usually swollen at base, densely covered by long silky hairs or densely or sparsely stellate-hairy; petals 8.5–17 mm long, stamens as many as petals, *filaments uniformly thick throughout, subglabrous to sparsely short-hairy at base*; ovary 1-celled, *style 4–10 mm long, sparsely white-hairy*. **Fruit** ellipsoid-ovoid, variable in size, smooth to strongly ridged, crowned by the persistent calyx, 1–5 mm high and 2–10 mm wide.

Vernacular names. Sabah—*satu inchi* (colloquial Malay). Sarawak—*jadam* (Malay).

Key to varieties

1. Corolla densely covered by silky long hairs (velutinous). Lower side of leaf short-hairy on midrib only.....
 var. **javanicum**
 Synonyms: *A. bogoriense* Wangerin, Fedde. Repert. 4 (1907) 338; *A. borneense* Merr., J. Str. Br. R. As. Soc. 86 (1922) 10; *A. javanicum* "form B" of Ashton *l.c.* 11; *A. ebenaceum* "var. C" of Cockburn *l.c.* 18.
 Sumatra, Java and Borneo. Common in all districts in Sabah and Sarawak. Primary mixed dipterocarp and secondary forest.

Corolla sparsely to densely covered with stellate hairs, not long-hairy. Lower side of leaf glabrous, or sometimes short-velvety all over.....2

2. Leaves drying pale olive-brown, typically smaller, 8–12 cm long, but exceptionally reaching 27 cm long. Calyx-limb of mature fruit smaller, 1–2 mm high and 2–5 mm wide.....

var. **meyeri** (Merr.) Berhaman

l.c. 34. Basionym: *A. meyeri* Merr., Publ. Govern. Labor. 35 (1906) 54. Type: *Meyer F.B.* 2284, Phillipines, Luzon, Cagayan Province (lectotype BO; isolectotypes B, K, NY, S). Synonyms: *A. tutela* Ridl., J. Str. Br. R. As. Soc. 61 (1912) 10; *A. ebenaceum* var. *tutela* (Ridl.) Kochummen, Fed. Mus. J. 13 (1970) 133; *A. javanicum* "form C" (*pro parte*) & "form D" of Ashton *l.c.* 11; *A. ebenaceum* "var. B" (*pro parte*), "var. D", "var. E", and "var. G" of Cockburn *l.c.* 18 (*pro parte*).

Peninsular Malaysia, Java, Borneo, and the Philippines. Very common in all districts in Sabah and Sarawak, in primary and secondary mixed dipterocarp forest.

- Leaves drying purplish brown, (at least markedly so on the lower side), typically longer or larger (24–39 cm long). Calyx-limb of mature fruit larger, 2–5 mm high and 3–10 mm wide.....

var. **ebenaceum** (Clarke) Berhaman

l.c. 33. Basionym: *Marlea ebenacea* Clarke in Hooker *f.*, Fl. Brit. Ind. 2 (1879) 742. Type: *Griffith* 3383, Malacca (lectotype K). Synonyms: *A. ebenaceum* (Clarke) Harms in Engl. & Prantl *l.c.* (1898) 262; *A. ridleyi sensu* Ashton *l.c.* 14, non King (1902); *A. mezianum* Wangerin, *l.c.* 338; *A. sessiliflorum* Merr. *l.c.* (1929) 232; *A. javanicum* "form C" of Ashton, *l.c.* 11 (*pro parte*); *A. ebenaceum* "var. B" (*pro parte*) and "var. G" of Cockburn *l.c.* 18 (*pro parte*).

Peninsular Malaysia, Java, Borneo, and the Philippines. Common in all districts in Sabah and Sarawak. All these forms appear to be confined to clay-rich soils in mixed dipterocarp and associated secondary forest.

5. **Alangium kurzii** Craib

(W.S. Kurz, 1834–1878, German soldier and naturalist, Bogor and Calcutta)

Kew Bull. (1911) 60; Bloembergen *l.c.* (1935) 262, *l.c.* (1939) 183; Kochummen *l.c.* 58; Berhaman *l.c.* 31. **Type:** *Kerr* 1172, Thailand, Chiangmai, Doi Sutep (holotype K). **Synonyms:** *Alangium chinensis* var. *tomentosum* Merr., Philip. J. Sci., 21, 5 (1922) 505; *Alangium begoniaefolium* Ridl., FMP 1 (1922) 894.

Small tree to 15 m tall, 20 cm diameter, with short buttresses. **Bark** smooth, dark grey, lenticellate; inner bark orange and cream mottled. **Sapwood** soft, pale brown. **Leaves** thin coriaceous to chartaceous, lower surface velvety (*seldom sparsely*) hairy, ovate to broadly ovate, 8–20 x 5–10.5 cm; base markedly asymmetric, broadly rounded to cordate, 3–5-veined, apex acuminate-acute; midrib and major veins on upper surface densely hairy;

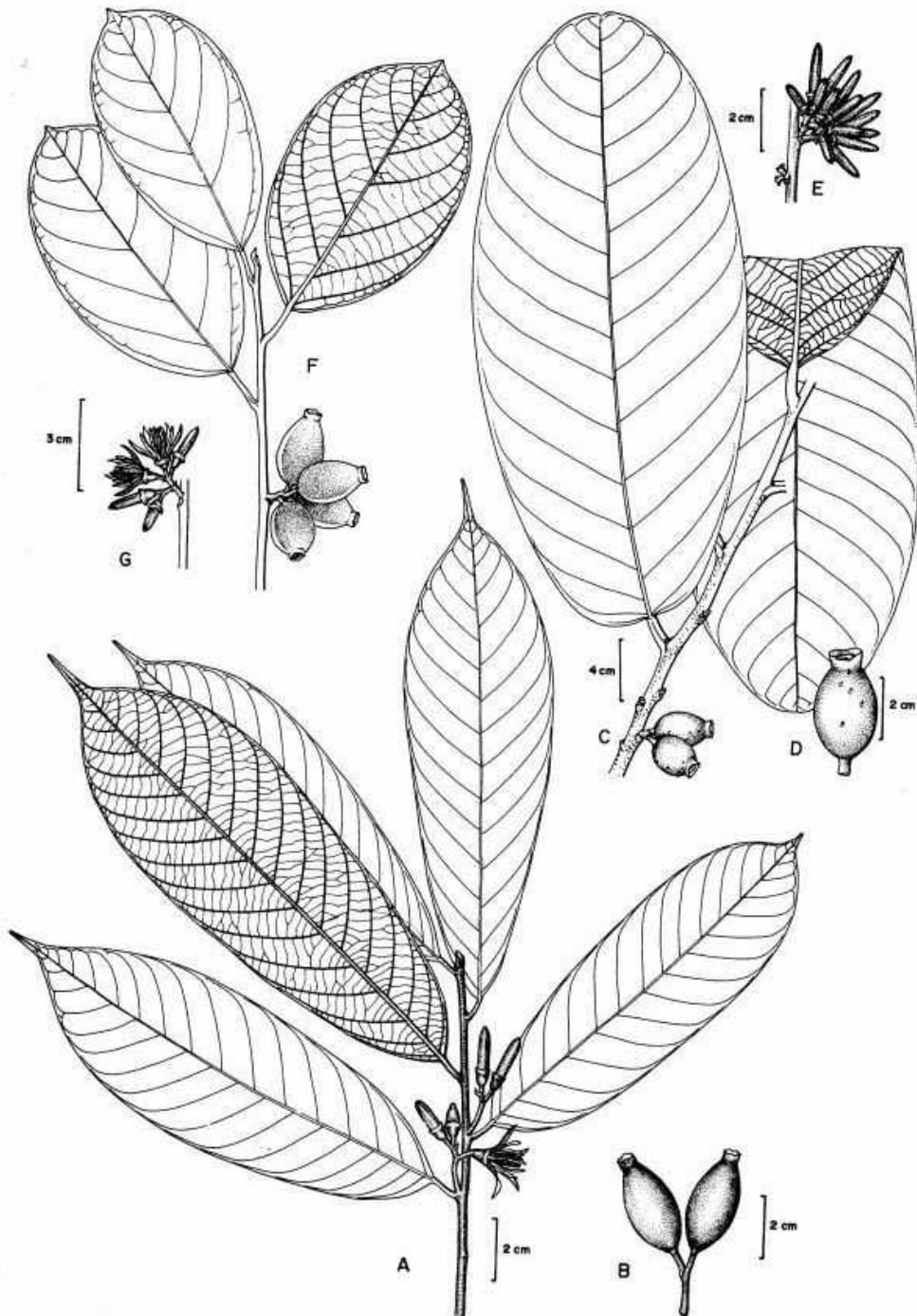


Fig. 1. *Alangium javanicum*. A–B, var. *javanicum*; C–E, var. *ebenaceum*; F–G, var. *meyeri*. A, flowering leafy twig; B & D, fruits; C & F, fruiting leafy twigs; E & G, inflorescences. (A from SAN 110170, B from SAN 39285, C & D from S. 34940, E from SAN 26087, F from SAN 82215, G from SAN 75771.)

lateral veins 5–7 pairs; stalk 2.5–3 cm long, glabrous to sparsely hairy. **Inflorescence** hairy, 2–4-times branched with 3–15 flowers per branch, *stalk* 11–15 mm long. **Flowers** pale greenish to yellow creamy; *calyx-tube* densely hairy, 1.25–2.5 mm long, *teeth* hairy, 0.25–0.5 mm long; *petals* (5–)9(–10), 5.5–10 mm long, swollen at base for 2–3 mm, covered by straight hairs; stamens as many as petals, 5–10 mm long, densely covered with long straight hairs; ovary (1–)2-celled, style glabrous, 5–8 mm long. Fruit ellipsoid 1–1.5 x 0.5–0.7 cm, crowned with the persistent calyx-limb.

Vernacular name. Sabah—*marapangi* (Dusun Tambunan).

Distribution. Myanmar (Burma), China, Indo-China, Thailand, Sumatra, Peninsular Malaysia, Java, and Borneo. In Sabah, recorded only from Kota Marudu (SAN 99531), Ranau (SAN 62010) and Tambunan (SAN 11355). Not recorded for Sarawak.

Ecology. Lowland to submontane forest to 1300 m. Flowering from January to July; fruiting from May to August.

6. *Alangium longiflorum* Merr.

(Latin, *longus* = long, *florum* = flowers)

Philip. J. Sci. Bot. 7 (1912) 319; Bloembergen *l.c.* (1935) 253, *l.c.* (1939) 159; Cockburn *l.c.* 16; Anderson *l.c.* 134; Ashton *l.c.* 11; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman *l.c.* 32. **Type:** *Darling* FB 14773, Philippines, Malueg, Cagayan Province (holotype L; isotype BO). **Synonyms:** *Alangium salvifolium* subsp. *hexapetalum* sensu Merr. *l.c.* (1912) 321; *A. lamarckii* Thwaites, Enum. Pl. Zeyl. (1850) 133; *A. hirsutum* Bloemb. *l.c.* (1939) 161.

Medium-sized tree to 20 m tall and 25 cm diameter. **Bark** smooth, dark brown; inner bark yellowish. **Sapwood** white. **Leaves** markedly obovate with narrowed base and 4–7 pairs of lateral veins or if elliptic and base rounded then with 6–7 pairs of lateral veins, velvety hairy on lower surface, 8–12 x 2.5–8 cm, chartaceous; *base* 3-veined, apex long-acuminate; midrib raised and sparsely hairy on the upper surface; stalk slender, hairy, 8–13 mm long. **Inflorescence** a short cyme with 1–5 flowers, densely hairy, *almost sessile or with stalk to 1.5 mm long*. **Flowers** white, 30–50 mm long; calyx-tube campanulate, densely hairy, teeth 0.25–0.5 mm long, limb 1–1.5 mm long; petals 5, white, 35–50 mm long, densely hairy outside, swollen at the base; stamens 30–50 mm long, 2–6-times as many as petals; ovary 1-celled, style glabrous, 30–45 mm long. **Fruit** ellipsoid to ovoid in dry state, rounded at both ends, 20–25 cm long, crowned by the persistent calyx-limb, ripening pinkish.

Distribution. Borneo and Philippines. Very uncommon in Sabah (e.g., SAN 30390, SAN 83891) and Sarawak (e.g., S. 21704, S. 43342), also known in Kalimantan.

Ecology. Primary mixed dipterocarp and associated secondary forests to 1200 m, on high nutrient clay soils. Flowering in March to July; fruiting in August to December.

One specimen, SAN 14167 (Sabah, Ranau) bears spines, but the leaf characters are very close to that for *A. longiflorum*.

7. *Alangium nobile* (Clarke) Harms

(Latin, *nobilis* = distinguished, noble, probably referring to the growth habit)

in Engl. & Prantl *l.c.* (1898) 262; Bloembergen *l.c.* (1935) 275, *l.c.* (1939) 211; Masamune *l.c.* 518; Kochummen *l.c.* 58; Anderson *l.c.* 134; Ashton *l.c.* 12; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman *l.c.* 32. **Basionym:** *Marlea nobilis* Clarke in Hooker *f. l.c.* 743; Ridley, Agr. Bull. Str. Settl. & Fed. Mal. St. 1 (1902) 181. **Type:** *Griffith* 3385, Malacca (lectotype K; isolectotypes B, BM).

Medium-sized tree to 20 m tall, 30 cm diameter. **Bark** smooth, brown; inner bark thin, yellow to pale brownish. **Sapwood** medium-hard, whitish. **Leaves** rounded to broadly obovate, 9–23 x 5–18 cm, chartaceous to coriaceous, upper surface hairy to glabrous, lower surface hairy to densely hairy; base rounded to cordate, 5-veined, apex rounded to acute, rarely acute to acuminate; midrib flattened to raised on the upper surface, densely hairy on the lower surface; lateral veins 9–12 pairs, raised and hairy below, flattened on the upper surface; stalk densely hairy, 2.5–4.5 cm long and 3–5 mm thick. **Inflorescence** a short cyme, stalk 5–7 mm long, 1–2-branched with 1–5 flowers. **Flowers** 4–5-merous, almost sessile; calyx-tube campanulate, hairy, lobes 5–7; petals swollen at base, 10–15 mm long, densely hairy outside; stamens as many as petals, 9–14 mm long, with filaments broadened at base; ovary 1-celled, style hairy, 7–12 mm long. **Fruit** ellipsoid-ovoid, 25–30 x 15–20 mm, grooved, velvety hairy, crowned by the persistent calyx-limb.

Distribution. Sumatra, Peninsular Malaysia and Borneo. In Sabah and Sarawak, uncommon in mixed dipterocarp forest (e.g., *SAN* 73205 and *S.* 38479).

Ecology. Lowland to submontane forest to 1500 m.

8. *Alangium rotundifolium* (Hassk.) Bloemb.

(Latin, *rotundus* = rounded in outline, *folium* = leaves)

l.c. (1935) 258, *l.c.* (1939) 179; Masamune *l.c.* 518; Kochummen *l.c.* 60; Cockburn *l.c.* 16; Whitmore, Tantra & Sutisna *l.c.* 12; Berhaman *l.c.* 38. **Basionym:** *Diaecaecarpium rotundifolium* Hassk., Bonplandia 7 (1859) 172. **Type:** *Sine coll.*, *s.n.*, Java, probably from Tjibodas, Cult. Bogor Botanic Garden (holotype BO; isotype L). **Synonyms:** *Marlea rotundifolia* (Hassk.) Teijsm. & Binn., Cat. Pl. Hort. Bot. Bogor. (1866) 238; *Alangium begoniifolium* Harms in Engl. & Prantl *l.c.* (1898) 261; *Marlea begonifolia* (Harms) Ridl., J. Fed. Malay. St. Mus., 8, 4 (1917) 44; *Alangium rotundatum* Ridl. ex Burkill & Henders., Gard. Bull. Str. Settl. 3 (1925) 380.

Tree to 28 m tall, 40 cm diameter. **Bark** smooth to slightly scaly, white to pale grey; inner bark yellowish. **Sapwood** white to pale yellow. Twig dark brown to pale brown. **Leaves** glabrous to sparsely hairy on the lower surface, never velvety, rounded to broadly ovate or triangular-ovate, 9.5–22 x 7.5–14 cm, chartaceous; base rounded to cordate, sometimes cuneate, 3–5-veined, apex acuminate to acute; midrib and lateral veins on upper surface glabrous; lateral veins 5–7 pairs; stalk 2.5–3.5 cm long, glabrous to sparsely hairy. **Inflorescence** a cyme, 3–4-times branched with 4–15 flowers, covered by short hairs, stalk 12–20 mm long. **Flowers** fragrant, white or cream to yellow; calyx-tube sparsely hairy, 1.5–3 mm long, limb flared with teeth 1–1.5 mm long; corolla swollen at the base; petals white or cream, 6–14(–18) mm long; stamens as many as petals, 6–18 mm long; ovary usually 1-celled, rarely 2-celled, style glabrous, 5–15 mm long. **Fruit** glabrous or thinly hairy, ovate-ellipsoid, cuneate or rounded at base, crowned by the flared persistent calyx-limb 1–1.5 mm long, reddish when ripe.

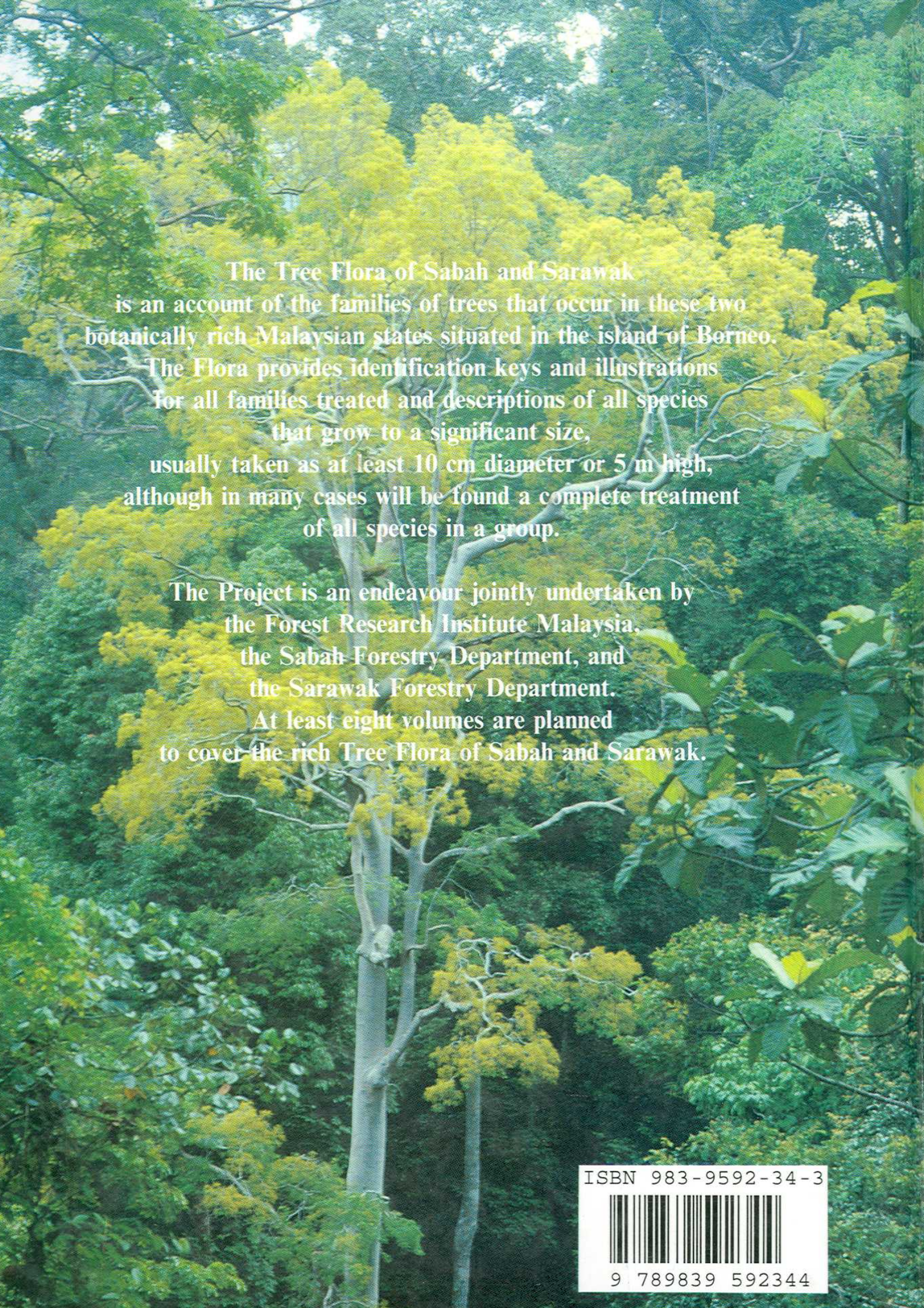
Vernacular name. Sabah—*marapangi* (Dusun Ranau).

Distribution. Sumatra, Peninsular Malaysia, Java, and Borneo. In Sabah only recorded from Mt. Kinabalu (e.g., *SAN 46772*, *SAN 48064*) and Crocker Ranges (*SAN 83987*). Not recorded for Sarawak.

Ecology. Primary and secondary forest on ultramafic soils, at 400–1600 m.

Excluded species

A. kinabaluense W.W. Sm., Not. Bot. Gard. Edinb. 8 (1915) 315; Merrill *l.c.* (1921) 459, is based on a specimen collected from Mt. Kinabalu, *Native Coll. 49* (E, K), which is *Polyosma hookeri* Stapf.



The Tree Flora of Sabah and Sarawak
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botanically rich Malaysian states situated in the island of Borneo.
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for all families treated and descriptions of all species
that grow to a significant size,
usually taken as at least 10 cm diameter or 5 m high,
although in many cases will be found a complete treatment
of all species in a group.

The Project is an endeavour jointly undertaken by
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the Sabah Forestry Department, and
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