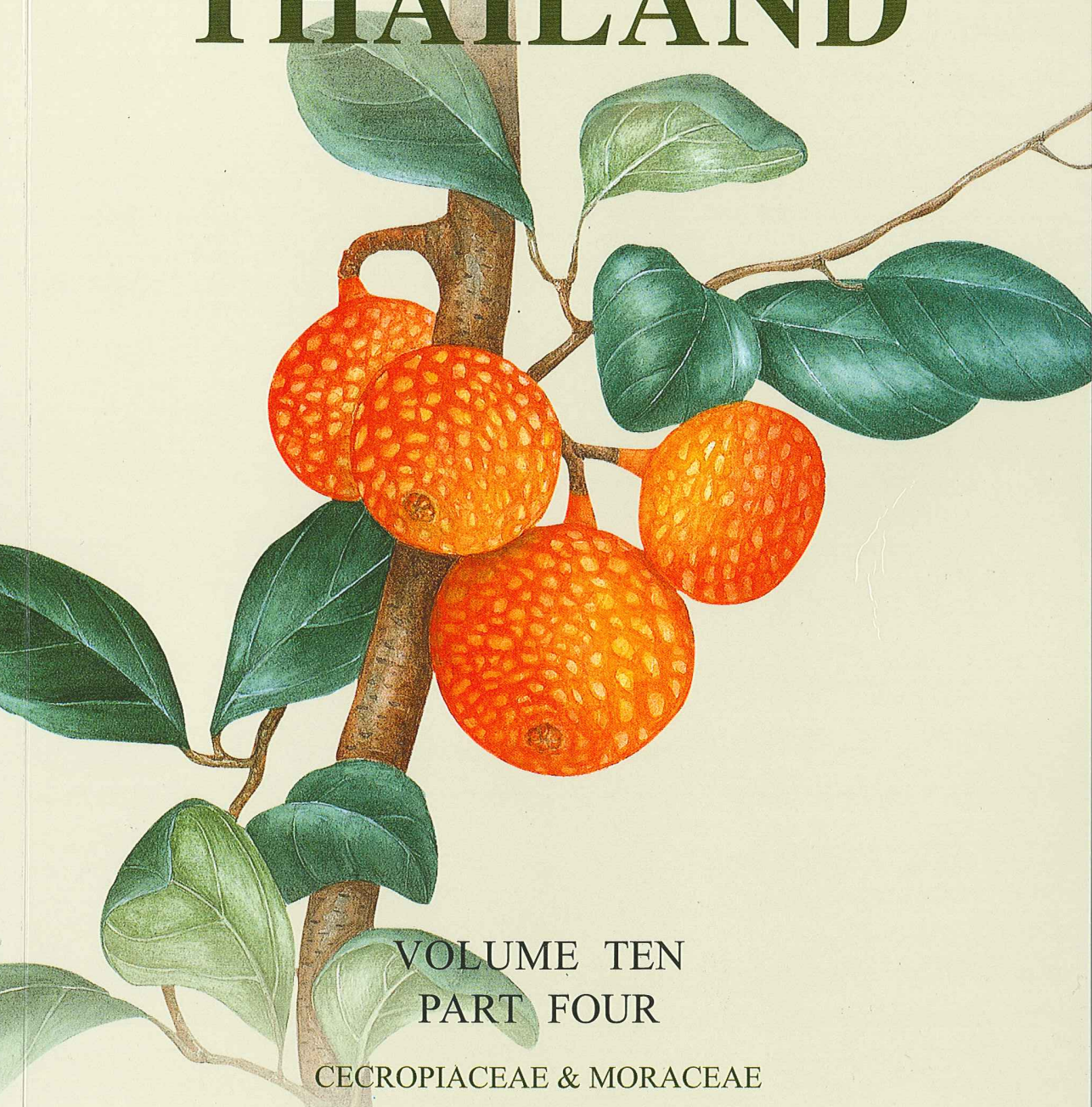


FLORA OF THAILAND



VOLUME TEN
PART FOUR

CECROPIACEAE & MORACEAE

THE FOREST HERBARIUM
DEPARTMENT OF NATIONAL PARKS, WILDLIFE AND PLANT CONSERVATION
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FLORA OF THAILAND VOLUME TEN PART FOUR

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Front cover: เตื่อเถาใบใหญ่ (Duea thao bai yai) *Ficus punctata* Thunb.

CECROPIACEAE

CORNELIS C. BERG*¹ & NANNAPAT PATTHARAHIRANTRICIN**

Trees, shrubs or woody climbers, with adventitious roots, strictly dioecious; sap not milky; cystoliths punctiform or, in *Poikilospermum*, elongate. *Leaves* in spirals; lamina basally attached and entire or palmately incised or peltate and radially incised; stipules connate, fully amplexicaul or, in *Poikilospermum*, semi-amplexicaul, often large. *Inflorescences* cymosely and (partly) dichotomously branched, bracteate, the flowers variously arranged, often in heads or spikes. *Staminate flowers* with 2–4 tepals, free or connate; stamens 1–4, straight or sometimes inflexed in the bud, pistillode present or absent. *Pistillate flowers* with 2–4 tepals, connate; ovary free, ovule basally attached, stigma 1, ligulate to capitate-penicillate to peltate. *Fruits* achenes (or drupelets), free, entirely (or partly) enclosed by a ± fleshy perianth; seeds small, with endosperm (*Poikilospermum*) or large, without endosperm.

The family Cecropiaceae was established (Berg, Taxon 27: 39. 1978) following discussions by Chew (Gard. Bull. Singapore 20: 1. 1963) and Corner (Gard. Bull. Singapore 19: 187. 1962) about the systematic position of *Poikilospermum* and the genera included in Urticaceae *sensu stricto* subfamily Conocephaloideae (Engler in Engler & Prantl, Nat. Pflanzenfam. 3(1): 66. 1888). Recent molecular studies (Sytsma et al., Amer. J. Bot. 89: 1531–1546. 2002), and the Angiosperm Phylogeny Website (Stevens, P. F. (2001 onwards). Angiosperm Phylogeny Website. Version 9, June 2008 [and more or less continuously updated since]) include these genera in the Urticaceae.

This family of six genera and ca. 140 species, is clearly different from the Moraceae in the basal position of the ovule, the single stigma and the absence of milky sap. It differs from the Urticaceae in the absence of urticaceous stamens and, as a consequence, the loss of the ballistic mode of pollen release as the basis of anemophily. All members of the family are woody with spirally arranged leaves, connate (often large) stipules, and adventitious roots which become stilt-roots in some genera or become modified to allow hemi-epiphytism. *Poikilospermum* differs from the African and American genera in the presence of elongate cystoliths and the basic construction of the inflorescence. *Poikilospermum* shares hemi-epiphytism with the neotropical genus *Coussapoa*, in the latter genus largely like that of *Ficus* subg. *Urostigma* with young plants establishing in the canopy while, in the former genus, more like that in *Ficus* subg. *Sycidium* sect. *Palaeomorpha* with young plants establishing on tree trunks and, moreover, with a climbing habit.

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POIKILOSPERMUM

Zipp. ex Miq., Ann. Mus. Lugd.-Bat. 1: 203. 1864; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3(1): 114. 1888; Chew, Gard. Bull. Singapore 20: 1. 1962.— *Conocephalus* Blume, Bijdr. Fl. Ned. Ind. 483. 1825; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 87. 1847; Kurz, Forest Fl. Burma 2: 429. 1877; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3(1): 93. 1888; Barg.-Petr., Nuovo Giorn. Bot. Ital., n.s., 9: 213. 1902; Ridley, Fl. Malay Penin. 3: 356. 1924; Gagnep., Fl. Indo-Chine 5: 830. 1929.— *Balansaephytum* Drake, Bull. Soc. Bot. France 43: 83. 1896.

Hemi-epiphytic woody climbers, with elongate to punctiform cystoliths. *Leaves* in spirals; lamina entire, pinnately veined with scalariform tertiary venation; petiole varying in length; stipules semi-amplexicaul, intrapetiolar, connate, bicarinate, (sub)persistent or caducous, often curved. *Inflorescences* axillary or below the leaves, often solitary, dichotomous cymes with terminal heads of flowers and a pair of bracts on the peduncle, 2–4 bracts at the first furcation or also at the second furcation, these bracts conspicuous, persistent or caducous, often large, ± boat-shaped, and (sub)persistent, much smaller bracts may occur elsewhere in the inflorescence. *Flower heads* globose with sessile or pedicellate flowers; staminate flowers with 2–4 (almost) free tepals, 2–4 straight or (in subg. *Poikilospermum*) inflexed stamens, and a pistillode; pistillate flowers with 4, connate tepals and a ligulate to capitate stigma. *Fruits* achenes, entirely or partly enclosed by a slightly fleshy enlarged perianth, forming a mucilaginous substance expelling the achenes.

The genus is subdivided into two subgenera: *Poikilospermum* subg. *Poikilospermum* with five species in eastern Malesia and *P.* subg. *Ligulistigma* with 15 species extending from NE India to eastern Malesia. The latter subgenus is characterised by exfoliating periderm, the presence of elongate cystoliths, curved stipules, flowers arranged in globose heads, short and straight stamens, and fruits for the greater part remaining enclosed by the perianth until expulsion. The inner surface of the perianth becomes mucilaginous and pushes the fruit out of the perianth.

The bracts are born on the peduncle in pairs with 2 or 4 at the base of the first dichotomy or also further up in the inflorescence.

In species of *Poikilospermum* subg. *Ligulistigma*, the cystoliths are sometimes also subpunctiform and ± regularly distributed or radiate with hydrotodes at the centre on the upper surface of the lamina; they are arranged on and along veins on the lower surface.

Poikilospermum subg. *Ligulistigma* is represented in Thailand by five species.

KEY TO THE SPECIES

- | | |
|---|----------------------------|
| 1. Epidermis of petiole flaking off | |
| 2. Stipules (2.5–)4–6(–7) cm long | 1. <i>P. cordifolium</i> |
| 2. Stipules 1–2.5(–4) cm long | |
| 3. Basal lateral veins of lamina usually branched; bracts 0.5–2 cm long | 5. <i>P. suaveolens</i> |
| 3. Basal lateral veins of lamina unbranched; bracts 0.2–0.7 cm long | 4. <i>P. naucleiformum</i> |
| 1. Epidermis of petiole persistent | |
| 4. Stipules (2.5–)4–6(–7) cm long; base of lamina deeply cordate to rounded; bracts 1–1.5 cm long | 1. <i>P. cordifolium</i> |
| 4. Stipules (0.5–)1–2.5 cm long; base of lamina cuneate to rounded; bracts 0.1–0.5 cm long | |
| 5. Lamina glabrous beneath | 3. <i>P. microstachys</i> |
| 5. Lamina puberulous on the veins beneath | 2. <i>P. lanceolatum</i> |

1. *Poikilospermum cordifolium* (Barg.-Petr.) Merr., Contr. Arnold. Arbor. 8: 49. 1934; Chew, Gard. Bull. Singapore 20: 66. 1963.— *Conocephalus cordifolius* Barg.-Petr., Nuovo Giorn. Bot. Ital., n.s., 9: 220, t. 7. 1902; Merr., J. Straits Branch Roy. Asiat. Soc. Special: 229. 1921.

Leafy twigs 10–20 mm thick, glabrous or sparsely white appressed-puberulous, lenticellate; periderm flaking off, flakes in brown flakes. *Lamina* coriaceous, broadly ovate, ovate or elliptic, (20–)30–50(–60) by (15–) 20–35(–40), apex obtuse to acute, base deeply cordate to rounded, margin entire to repand; upper surface glabrous, lower surface glabrous or puberulous on the midrib; lateral veins (8–)10–12 pairs, the basal, second and third pairs branched, tertiary venation scalariform, slightly prominent, reticulum partly stellate radiating; petiole (7–)10–40(–50) cm long, (2–)4–7 mm thick, glabrous, lenticellate, the epidermis persistent (or flaking off in minute pieces); stipules (2.5–)4–6(–7) cm long, white appressed-puberulous or glabrous, subsistent (or caducous). *Staminate inflorescences* below the leaves, solitary, 4–6 by 5–6 cm, ca. 3 times dichotomously branched; peduncle 2–3.5 cm long; bracts ca. 1 cm long, persistent; peduncle and branches white puberulous to subtomentose; heads ± clustered at the (short) branches, 0.3–0.5 cm diam.; flowers sessile 1.5–2 mm long, tepals 4, puberulous, stamens 4, ca. 1.5–2.5 mm long, filaments straight, pistillode ca. 1 mm long, the apex peltate. *Pistillate inflorescences* in the leaf axils, solitary, 4–10(–12) by 4–10(–15) cm, 1–3 times dichotomously branched; bracts 1–1.5 cm long, persistent (or caducous?); heads 2–8, (1.5–)3–5 cm diam.; flowers to 6 mm long pedicellate; perianth 2–3 mm long, 4-lobed, the apex mostly punctate by cystoliths, sometimes puberulous below the apex; ovary ca. 1.5 mm long, stigma ca. 1 mm long. *Fruits* 3–5 mm long, enclosed by the fruiting perianths.

T h a i l a n d.—PENINSULAR: Yala, Narathiwat.

D i s t r i b u t i o n.—Peninsular and Bornean Malaysia (Sarawak-type), Singapore, Indonesia (Sumatra).

E c o l o g y.—Evergreen and peat swamp forests, along streams, at low altitudes.

2. *Poikilospermum lanceolatum* (Trécul) Merr., *J. Arnold Arbor.*, 8: 50. 1934; Chew, *Gard. Bull. Singapore* 20: 71. 1963.—*Conocephalus lanceolatus* Trécul, *Ann. Sci. Nat., Bot. Ser.* 3, 8: 88. 1847.

Leafy twigs 4–5 mm thick, white puberulous; periderm flaking off, flakes brown. *Lamina* subcoriaceous to chartaceous, elliptic to (sub)ovate or to (sub)obovate or to oblong, 11–27 x 5–15 cm, apex acuminate, base obtuse to rounded, margin entire; upper surface glabrous, lower surface white puberulous on the veins, cystoliths spindle-shaped, regularly distributed above, on the veins beneath; lateral veins 10–14 pairs, the basal pair branched the second pair sometimes branched, tertiary venation scalariform, slightly prominent; petiole 2.5–12 cm long, variable in length on the same twig, 2–3 mm thick, white puberulous, the epidermis persistent; stipules 1.5–2.5 cm long, white appressed puberulous, caducous. *Staminate inflorescences* solitary (?), 1.5–2 x 1.5–2.5, 2 x dichotomously branched; peduncle 0.5–1 cm long, minutely puberulous; bracts c. 0.1 mm long; heads ca. 0.5 cm diam.; flowers (sub)sessile; perianth ca. 2 mm long, tepals 4, glabrous, stamens 4, 1.5–2 mm long, filaments straight, pistillode cushion-shaped, ca. 0.3 mm long. *Pistillate inflorescences* in the leaf axils and below the leaves, solitary 1–2.5 x 2–3 cm, 1–6 (?) x dichotomously branched; bracts ca. 0.2 cm long, persistent (?); heads 3–ca. 30, ± crowded, ca. 0.5 cm diam.; flowers (sub)sessile; perianth ca. 2 mm long, 4-lobed, the apex punctate by cystoliths; ovary ca. 1 mm long, stigma subpenicillate. *Fruits* 3.5–4.5 mm long, not fully enclosed by fruiting perianths.

T h a i l a n d.—NORTHERN: Nan.

D i s t r i b u t i o n.—NE India (type), Burma, China (Xizang, SW Yunnan).

E c o l o g y.—Dry evergreen forest, at altitudes of (600–)1,200(–2,000) m.

3. *Poikilospermum microstachys* (Barg.-Petr.) Merr., Contr. Arnold Arbor. 8: 50. 1934; Chew, Gard. Bull. Singapore 20: 72. 1963.—*Conocephalus microstachys* Barg.-Petr., Nuovo Giorn. Bot. Ital., n.s., 9: 226. 1902; Merr., J. Straits Branch Roy. Asiat. Soc. Special: 229. 1921.

Leafy twigs 2–6 mm thick, glabrous or sparsely minutely white puberulous, densely lenticellate; periderm persistent; short-shoots present in the leaf axils and below the leaves. *Lamina* chartaceous to subcoriaceous, oblong to subobovate, 6–25 by 2–7 cm, apex (sub) acuminate, base rounded to cuneate, margin entire; both surfaces glabrous; lateral veins 7–9 pairs, the basal pair branched (or unbranched when the base cuneate), tertiary venation loosely scalariform, flat; petiole 1–11 cm long, often quite variable in length on the same twig, 1–2 mm thick, glabrous, the epidermis persistent; stipules (0.5–)1–2 cm long, glabrous, caducous or subpersistent. *Staminate inflorescences* in the leaf axils or below the leaves, solitary, 1–2 by 1–2 cm, once dichotomously branched; peduncle ca. 0.5 cm long; bracts 0.1–0.5 cm long, boat-shaped, persistent (or caducous?); the peduncle and branches white puberulous; heads (1 or) 2, terminating the branches, 0.3–0.5 cm diam.; flowers (sub) sessile; perianth 1–1.5 mm long, sparsely puberulous; stamens 4, slightly longer than the perianth, filaments short and straight; pistillode thin; interfloral bracts minute. *Pistillate inflorescences* in the leaf axils or below the leaves, solitary, 1–1.5 by 2–3 cm, once dichotomously branched; bracts ca. 0.5 cm long, persistent (or caducous?); peduncle and branches white puberulous; heads (1 or) 2, 0.5–1 cm diam., pinkish; flowers up to 2 mm long pedicellate; perianth 2–3.5 mm long, 4-lobed, the apex punctate with cystoliths or smooth; ovary ca. 1 mm long, stigma ca. 0.5 mm long. *Fruits* 2.5–3.5 mm long, the upper parts not enclosed by the fruiting perianths.

T h a i l a n d.—PENINSULAR: Yala, Narathiwat.

D i s t r i b u t i o n.—Peninsular and Bornean Malaysia (Sarawak-type), Singapore, Indonesia (Kalimantan), Brunei.

E c o l o g y.—Evergreen and peat swamp forests, at low altitudes.

4. *Poikilospermum naucleiflorum* (Roxb.) Chew, Gard. Bull. Singapore 20: 76. 1963.—*Conocephalus naucleiflorus* Roxb. apud. Lindl., Bot. Reg. 14: 1203A & B. 1828; Trécul, Ann. Sci. Nat. Bot., Sér 3, 8: 92. 1847; Koord., Exkursfl. Java t. 27. 1912.—*Conocephalus roxburghii* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 92. 1847. Plate LVII: 1.

Leafy twigs 2–6 mm thick, white puberulous (on young parts); periderm flaking off, flakes brown. *Lamina* subcoriaceous, oblong to subovate, 10–25 by 6–8 cm, apex acuminate, acute or rounded, base rounded to subcordate, margin entire; both surfaces glabrous; lateral veins 7–10(–11) pairs, the basal pair unbranched, tertiary venation scalariform, slightly prominent; petiole (4–)6–15 cm long, ca. 2 mm thick, puberulous (when young), the epidermis flaking off, the flakes brown; stipules 1–2 cm long, initially whitish puberulous, caducous (or subpersistent). *Staminate inflorescences* axillary or below the leaves, solitary, 3–7 by 3–8.5 cm, 3–7 times dichotomously branched; peduncle 0.5–1 cm long; bracts 0.2–0.5 cm long, caducous or subpersistent; minutely brown floccose on the peduncle and proximal branches, minute bracts and numerous white to brown pluricellular trichomes on the ultimate branches; heads numerous, terminating the ultimate dichotomies, 0.3–0.5 cm diam.; flowers sessile, 1–2 mm long, tepals 4, purple, white puberulous, stamens 3–4, ca. 1 mm long, filaments straight, pistillode ca. 0.5 mm long, cylindrical. *Pistillate inflorescences* below the leaves, solitary, 4–9 by 4–9 cm, 1–2(–3) times dichotomously branched; bracts ca. 0.5 cm long, caducous; heads (1–)2–8, (0.7–)1–2(–3) cm diam.; flowers up to 3 mm long pedicellate; perianth 2–3 mm long, 4-lobed, purple, white puberulous; ovary 1.5–2 mm long, stigma ca. 0.5 mm long. *Fruits* ca. 2 mm long, enclosed by fruiting perianths.

T h a i l a n d.— NORTHERN: Lampang, Tak; NORTH-EASTERN: Phetchabun; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Phetchaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Phangnga, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— NE India, China (SE Xizang), Burma.

E c o l o g y.— Evergreen and mixed deciduous forests, near streams, up to 800 m.

5. Poikilospermum suaveolens (Blume) Merr., Contr. Arnold Arbor. 8: 47. 1934.— *Conocephalus suaveolens* Blume, Bijdr. Fl. Ned. Ind.: 484. 1825; Miq., Ann. Bot. Lugd.-Bat. 3: 210. 1867; Kurz, Forest Fl. Burma 2: 430. 1877; Merr., J. Straits Branch Roy. Asiat. Soc. Special: 229. 1921. Gagnep., Fl. Indo-Chine 5: 831. 1929; Chew, Gard. Bull. Singapore 20: 88. 1963.— *Conocephalus ellipticus* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 91. 1847.— *Balansaephytum tonkinense* Drake, Bull. Soc. Bot. France 43: 83, t. 1. 1899.— *Conocephalus tonkinensis* (Drake) Renner, Bot. Jahrb. Syst. 39: 409. 1907.— *Poikilospermum tonkinense* (Drake) Merr., Contr. Arnold Arbor. 8: 52. 1934.— *Conocephalus sinensis* Wright in Forbes & Hemsl., J. Linn. Soc. Bot. 26: 471. 1899.— *Poikilospermum sinense* (Wright) Merr., Contr. Arnold Arbor. 8: 51. 1934.— *Conocephalus oblanceolatus* Ridl., Bull. Misc. Inform.: 81. 1926.— *Poikilospermum oblanceolatum* (Ridl.) Merr., Contr. Arnold Arbor. 8: 51. 1934.— *Conocephalus mollis* Gagnep., Fl. Indo-Chine 5: 834. 1929.— *Poikilospermum gagnepainii* Merr., Contr. Arnold Arbor. 8: 50. 1934. Fig. 1.

Leafy twigs 3–12 mm thick, glabrous or minutely white puberulous; periderm flaking off, flakes red-brown. *Lamina* subcoriaceous, elliptic, (sub)ovate, (sub)obovate or oblong, 10–20(–40) by 6–12(–15) cm, apex obtuse to acute, base rounded, cordate or obtuse, margin entire to repand; both surfaces glabrous; lateral veins (8–)10–14(–18) pairs, the basal pair branched (or unbranched if the base of the lamina is narrow, the second pair sometimes branched), tertiary venation scalariform, slightly prominent to flat; petiole (4–)6–10(–15) cm long, 2–4(–6) mm thick, glabrous or minutely whitish puberulous, the epidermis flaking off, flakes red-brown; stipules 1–2.5(–4) cm long, glabrous or minutely whitish puberulous, caducous or subpersistent. *Staminate inflorescences* in the leaf axils and/or below the leaves, solitary (2–)4–6 by 2–5 cm, 2–3 times dichotomously branched; peduncle 0.5–1 cm long; bracts 0.5–1 cm long, persistent; heads arranged in umbels, 0.3–0.5 cm diam., yellow; flowers sessile 1.5–2 mm long, tepals 4, puberulous, stamens 4, ca. 1.5 mm long, filaments straight, pistillode ca. 1 mm long, apex peltate. *Pistillate inflorescences* in the leaf axils and/or below the leaves, solitary, 4–6 by 6–9 cm, 1–2 times dichotomously branched; bracts 1–2 cm long, persistent (or caducous); heads 3–5, 1.5–3 cm diam., pink (in fruit); flowers up to 10 mm long pedicellate; perianth 2–3.5 mm long, 4-lobed, the apex punctate with cystoliths; ovary 1–2 mm long, stigma ca. 1 mm long. *Fruits* 3–5 mm long, enclosed by fruiting perianths.

T h a i l a n d.— EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Phetchaburi, Prachuap Khiri Khan; CENTRAL: Saraburi, Nakhon Nayok; SOUTH-EASTERN: Prachin Buri, Chachoengsao, Chon Buri, Chanthaburi; PENINSULAR: Surat Thani, Phangnga, Krabi, Nakhon Si Thammarat, Phatthalung, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— India (Nicobar Islands), Bangladesh, China (SE Yunnan), Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi, Moluccas), Philippines.

E c o l o g y.— Evergreen and dry evergreen forests, often on rocks along streams, up to 700 m.

V e r n a c u l a r.— Kurapia (ក្រះប៊ើម) (Songkhla); khaman (ขมัน)(Chanthaburi); khruca

tao hai (เครือเต้าไห้) (Lampang); cha rai (ชะไร), ya wi (ยาวิ) (Satun); thao ka man (เถากะมัน), yan mu ru (ย่านมูรู) (Phatthalung); ma ru (มะรุ) (Pattani); mue-ko (มือกอ) (Malay-Narathiwat); ro (โร) (Phangnga); ai rai (อ้ายไร) (Bangkok).

Unnamed collection

Phengkklai 1483 (BKF) a sterile collection from Narathiwat.

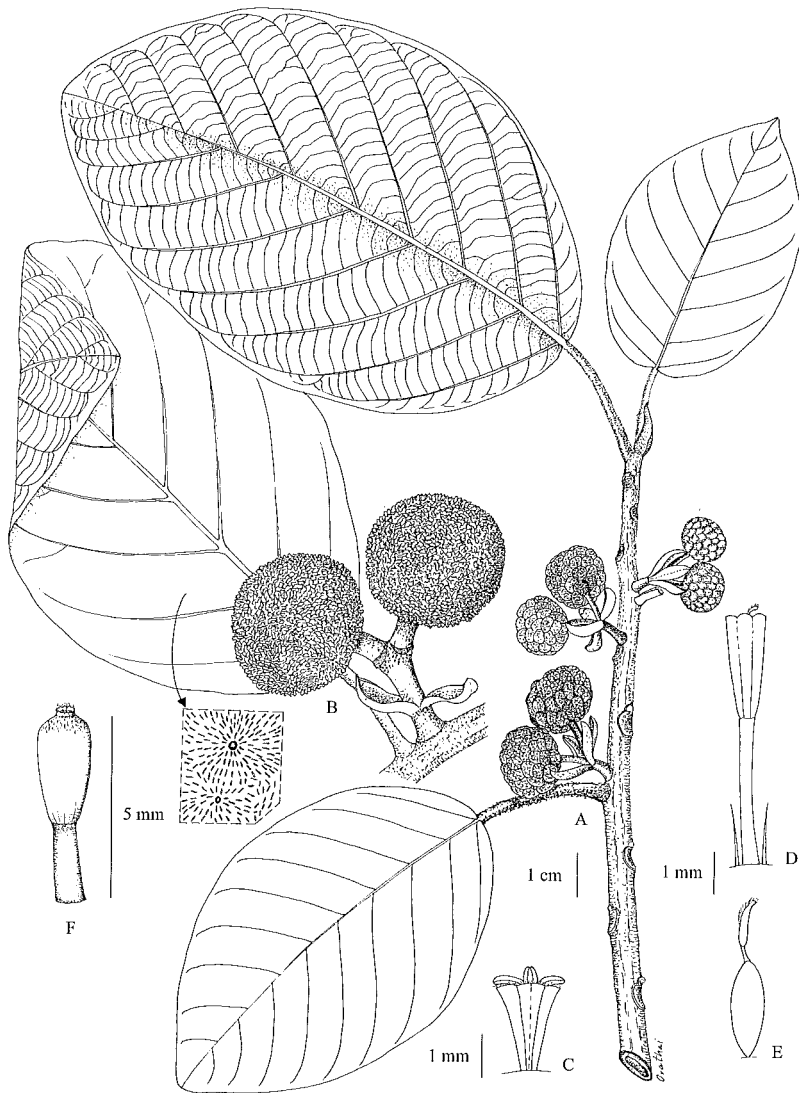


Fig. 1. *Poikilospermum suaveolens* (Blume) Merr.: A. leafy twig with staminate inflorescences; B. leafy twig with pistillate inflorescences and part of lower surface with hydathode and cystoliths; C. staminate flower; D. pistillate flower and bracts; E. pistil; F. fruiting perianth. (A: Wongprasert *et al.* s.n. BKF123205, BKF; B: Larsen *et al.* 32616, BKF; C: van Beusekom *et al.* 27, L; D-E: Stone *et al.* 12584, L). Drawn by Orathai Kerdkaew (A-B) and Cornelis Berg (C-F).

MORACEAE

CORNELIS C. BERG*¹, NANNAPAT PATTHARAHIRANTRICIN** & BHANUMAS CHANTARASUWAN***

Trees, shrubs, woody climbers or herbs, terrestrial, hemi-epiphytic (or holo-epiphytic), dioecious or monoecious, with milky sap. *Leaves* alternate and spirally arranged or distichous, (sub)opposite or subverticillate; stipules fully amplexicaul or semi-amplexicaul and lateral or intrapetiolar, free or connate; lamina basally attached (or peltate), with the margin entire or incised (to seemingly compound), venation pinnate or subpalmate, brochidodromous. *Inflorescences* typically in pairs, unisexual or bisexual, racemose, spicate, globose-capitate, capitate with a discoid to cup-shaped receptacle (and then with or without involucre), or with an urceolate receptacle, multi- to uniflorous, bracteate. *Flowers* unisexual, free or connate (or also adnate to the receptacle). *Staminate flowers*: tepals 2–4(–7) and free or connate, or perianth lacking; stamens 1–4(–6), straight or inflexed before anthesis; pistillode present or absent. *Pistillate flowers*: tepals (3–)4(–8), free or connate; pistil 1, ovary unilocular, free or adnate to the perianth; stigmas 2 or 1, various in shape; ovule 1, (sub)apically attached, anatropous to campylotropous. *Fruit* an achene or drupaceous (dehiscent or indehiscent), free or adnate to the perianth, often forming a drupaceous whole with the fruiting perianth or also with the (fleshy) receptacle; seed large and without endosperm or small and with endosperm; embryo various.

The family comprises 37 genera and 1,070–1,100 species represented by 11 native genera with in total 139 indigenous species recognised; 12 species are introduced in Thailand. Most species are elements of lowland evergreen forest.

INTRODUCTION

Subdivision

The family can be subdivided into seven tribes (C.C. Berg, *Blumea* 50: 535. 2005), of which four are represented in the flora of Thailand: Moreae (centred in the Sino-Himalayan region) with *Broussonetia*, *Maclura*, *Morus*, *Streblus* and *Trophis*; Artocarpeae (centred in western Malesia and the adjacent part of continental Asia) with *Artocarpus*, *Hullettia*, *Prainea*,

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and *Parartocarpus*; Castilleae (mainly neotropical, but with one genus in Asia) *Antiaris*; and the monotypic Ficeae, with the speciose genus *Ficus*.

Habit

The family comprises a wide range of life and growth forms. In Thailand, only the woody ones are represented, varying from tall trees in *Artocarpus* and *Ficus* to small shrubs in *Hullettia* and *Ficus*, in the latter even suffrutescent, for example *F. griffithii*. Some frutescent *Ficus* species are rheophytes: *F. ischnopoda* and *F. squamosa*. The four *Maclura* species are (essentially) climbers with spines and *Broussonetia kurzii* and *Trophis scandens* are climbers without spines. Some *Ficus* species are also often or sometimes scandent, e.g., *F. globosa* and *F. subulata*. In addition to the *Maclura* species, some *Streblus* species are armed with thorns. Many *Ficus* species are hemi-epiphytic (see below under *Ficus*) and one of them, *F. deltoidea*, can be holo-epiphytic. The genera *Broussonetia* and *Morus* show features linking them to northern temperate conditions: abscission of the terminal meristems of the branches with elongation of the branches coming from the upper axillary resting buds.

Inflorescences

The inflorescences are quite diverse in the family. They may be rather simple in construction such as the spicate or racemose ones of *Morus* or less so by condensation of axes into capitate inflorescences, such as the pistillate ones of *Broussonetia*, *Maclura*, and *Prainea*. Fusion of the flowers with each other or also with surrounding structures, such as bracts and receptacle, make the inflorescences more complex, for example, the pistillate ones of *Antiaris* (uniflorous), *Hullettia* (pluriflorous), or *Artocarpus* (multiflorous). In the latter genus they can become huge, as in *A. heterophyllus*. The syconium, the peculiar urceolate inflorescence of *Ficus* is described in some detail under *Ficus* below in connection with the pollinating system.

Bracts are found in the majority of species. They occur as interfloral bracts and are then often peltate, or they subtend inflorescences and are then often basally attached; the latter may constitute involucre, such as in the staminate inflorescences of *Antiaris*.

Flowers

The flowers are simple in structure, consisting of a perianth with basically 4 or 5 tepals, 4 or 5 stamens and sometimes a pistillode, or with a single pistil with 2 or 1 stigmas and a single apically attached ovule. The perianth can be reduced, or even absent. The number of stamens can be reduced to one (as in *Artocarpus*). Ovaries can be free or adnate to the perianth. The stamens are of the urticaceous type, inflexed in the bud and at anthesis suddenly and elastically straightening and throwing the pollen out. This type of androecium is characteristic of the tribe Moreae (although some *Maclura* species lack them). For the ballistic release of pollen the staminate flowers need to be complete as far as perianth and pistillode are concerned in order to keep the stamens under tension.

Infructescences, fruits, and seeds

It is not often that a single fruit is the entity of dispersal in Moraceae. Such fruits are found in *Streblus*. They are drupaceous and may be dehiscent. The "dehiscent drupe" is quite common in Moraceae with free fruits. They are mostly stipitate and unevenly pincer-like thickened around the endocarp. The exocarp squeezes the endocarp out or ejects it, as in *Streblus macrophyllus* (D.J. Middleton, pers. comm.). The fruits are mostly enclosed by the fleshy perianth forming together a pseudodrupe. Such a drupe can be more complex if the receptacle also forms the outer part, as in *Antiaris*. Many-seeded, \pm drupaceous structures are formed by inflorescences with fused flowers, as in *Artocarpus*.

The fruits of *Ficus* are mostly achenes and mostly free of surrounding structures. They are enclosed by the fleshy urceolate receptacle which is generally the functional entity of dispersal.

The seeds are small, usually with simple embryos, with endosperm and dormancy, as in *Ficus*, or large, often with more complex embryos, without endosperm and without dormancy, as in *Artocarpus*.

Pollination

The species with urticaceous stamens are wind-pollinated and so are some others, like *Artocarpus elasticus* and *A. rigidus*. The others are in one way or another insect-pollinated, often without precise information about details; by contrast, the unique mode of pollination in *Ficus* is in general well-known.

Dispersal

With the exception of those species in which endocarp bodies are released from the fruit and drop to the forest floor or into a stream, dispersal is, in the majority of species, carried out by animals, varying from small and large birds to mammals as bats, squirrels, monkeys and elephants.

KEY TO THE GENERA

- | | |
|---|---------------------------------------|
| 1. Receptacle of inflorescence urceolate, stigmas and anthers not exposed at anthesis | 4. Ficus |
| 1. Receptacle of inflorescence not urceolate, stigmas and anthers exposed at anthesis | |
| 2. Climbers | |
| 3. Armed with thorns | 6. Maclura |
| 3. Unarmed | |
| 4. Plants deciduous; lamina chartaceous, its margin crenate to serrate-dentate | 3.1 Broussonetia kurzii |
| 4. Plants evergreen; lamina subcoriaceous, its margin entire or denticulate towards the apex | 11. Trophis scandens |
| 2. Trees or shrubs | |
| 5. Stipules fully amplexicaul, leaving annular scars | 2. Artocarpus subg. Artocarpus |
| 5. Stipules not fully amplexicaul | |
| 6. Stipules lateral, subulate, subpersistent | 5. Hullettia |
| 6. Stipules semi-amplexicaul or lateral, broader, mostly caducous. | |
| 7. Shoot-apices shed, just above the upper lateral, scaled resting-bud | |
| 8. Leaves distichous | 7. Morus |
| 8. Leaves spirally arranged or subopposite | 3.2 Broussonetia papyrifera |
| 7. Shoot-apices persistent | |
| 9. Tertiary venation reticulate to subscalariform; petiole 0.1–0.5(–0.6) cm long; margin and/or apex of lamina often spinulate | 10. Streblus |
| 9. Tertiary venation scalariform to subscalariform; petiole mostly longer than 0.5 cm; margin of lamina entire or dent(icul)ate | |
| 10. Pistillate inflorescence uniflorous; staminate inflorescence discoid and involucrate | 1. Antiaris |
| 10. Pistillate inflorescence with more than 1 flower; staminate inflorescence globose or obovoid | |
| 11. Leaves spirally arranged; stipules connate, intra-petiolar | 8. Parartocarpus |
| 11. Leaves distichous; stipules free, lateral | |
| 12. Pistillate flowers free; trees dioecious | 9. Prainea |
| 12. Pistillate flowers fully connate; trees monoecious | 2. Artocarpus subg. Pseudojaca |

1. ANTIARIS

Lesch., Ann. Mus. Hist. Nat. Paris 16: 478. 1810, nom. cons.; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 142. 1847; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1: 85. 1888; Corner, Gard. Bull. Singapore 19: 244. 1962; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 140. 2006.

Trees, monoecious or dioecious. *Leaves* chartaceous to subcoriaceous, more or less hairy, margin subtire to denticulate; stipules semi-amplexicaul, free. *Inflorescences* on short-shoots in the axils of the leaves or below the leaves, with 1–2 pistillate inflorescences (on the lower nodes of the short-shoot) and/or to ca. 8 staminate ones. *Staminate inflorescences* discoid, pedunculate, with many basally attached bracts, those on the margin of the receptacle in 1–3 rows, imbricate, forming an involucre; flowers many, with 2–7 free tepals; stamens 2–4, straight before anthesis, anthers latrorse to extrorse; pistillode absent. *Pistillate inflorescences* sessile or pedunculate, with an involucre of several basally attached, imbricate bracts, flower 1, occasionally 2; perianth 4-lobate, the lower part adnate to the receptacle; ovary adnate to the embedded part of the perianth, stigmas 2. *Infructescences* with an orange to scarlet, fleshy receptacle, forming a whole with the fruit, the involucre bracts scattered on its outer surface; endocarp crustaceous.

The genus comprises a single very variable species, occurring in continental tropical Africa, Yemen, Madagascar and Asia from Sri Lanka to Tonga.

Antiaris toxicaria Lesch., Ann. Mus. Hist. Nat. Paris 16: 478, t. 22. 1810; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 143. 1847, f. 158–162.; Hook.f., Fl. Brit. India 5: 537. 1888; Ridl., Fl. Malay Penins. 3: 351. 1924; Gagnep., Fl. Indo-Chine 5: 721, f. 98: 1–8. 1928; C.C. Berg, Bull. Jard. Bot. Natl. Belg. 47: 310, t. 9–12. 1977; 48: 466. 1978; Kochummen, Tree Fl. Malaya 3: 120. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 141. 2006.

subsp. ***toxicaria*** Fig 1.

Trees to 50 m tall, (always?) deciduous. *Leafy twigs* 2–5 mm thick, brownish hirtellous to puberulous. *Leaves* distichous on the lateral branches; lamina elliptic to oblong to (sub)obovate, 5–20(–30) by 2.5–10(–12) cm, ± asymmetric, chartaceous to subcoriaceous, apex short-acuminate to subacute or obtuse (to rounded), base cordate to rounded, margin entire or denticulate (towards the apex); upper surface puberulous to hispidulous, scabrous to (sub)glabrous and smooth, lower surface densely to sparsely puberulous to hirtellous or to subtomentose on the veins, smooth; midrib slightly prominent to flush above, lateral veins 7–12 pairs, tertiary venation scalariform; petiole 0.3–1.2 cm long, puberulous to hirtellous; stipules 0.4–1 cm long, puberulous, caducous. *Staminate inflorescences* to 4 together, in leaf axils, on short-shoots or the base of lateral branches; peduncle 0.5–1.5 cm long, puberulous; head discoid, 0.5–1.2(–2) cm diam.; involucre bracts in ca. 4 rows, ovate, 1–2 mm long, minutely puberulous; tepals (2–)3–5(–7), spatulate-cucullate, 1–2 mm; stamens 3–4, 1–2 mm long, anthers 0.8–1.8 mm long. *Pistillate inflorescences* solitary or in pairs on short-shoots; peduncle 0.3–0.5 cm, in fruit to 1 cm long, puberulous; receptacle with 6–12 bracts, most of them crowded at the apex, 0.5–1 mm long, minutely puberulous; stigmas 5–15 mm long. *Infructescences* ellipsoid, 1.2–2.5 cm long, red to crimson at maturity; seed 0.5–2 cm long.

T h a i l a n d.— NORTHERN: Lampang, Phitsanulok; NORTH-EASTERN: Sakon Nakhon; EASTERN: Nakhon Ratchasima (Khao Yai); SOUTH-EASTERN: Chachoengsao; PENINSULAR: Phatthalung, Trang.

D i s t r i b u t i o n.— Tropical Africa, Madagascar, Yemen, and from Sri Lanka and S India, Burma, to S China and Vietnam, Peninsular and Bornean Malaysia, Brunei, Indonesia (incl. Java-type) Philippines, Papua New Guinea, N Australia, Solomon Islands, New Hebrides, Fiji, Tonga.

E c o l o g y.— Evergreen and mixed deciduous forests, 200–800 m.

V e r n a c u l a r.— Mai i to (ไม้ไอ้ต๋) (Trang), Yang nong (ยางนอง) (Nakhon Ratchasima).

N o t e.— The very widespread species is very variable and several species and varieties have been recognised (see Berg, Bull. Jard. Bot. Natl. Belg. 47: 309. 1977. Subsp. *toxicaria* is the subspecies occurring in the Asian mainland and the greater part of Malasia.

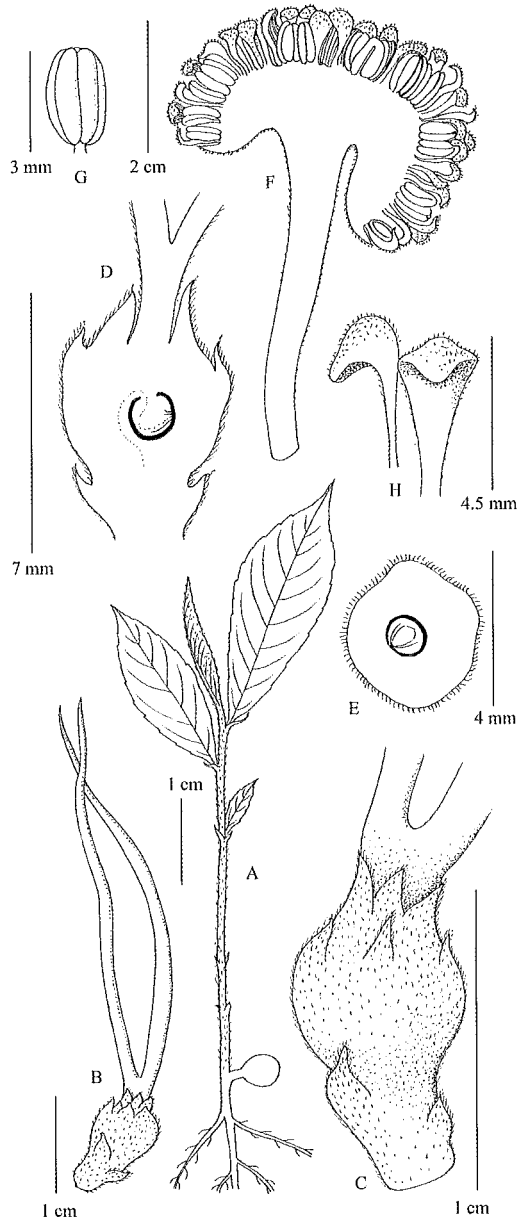


Fig. 1. *Antiaris toxicaria* Lesch. subsp. *toxicaria*: A. seedling; B. one-flowered pistillate inflorescence (Bot. Gard. Singapore); C. base of pistillate inflorescence at anthesis; D. pistillate inflorescence in length section and E. in cross section; F. staminate inflorescence at anthesis, in length section; G. anther; H. tepals of staminate flower; (A: *Tri bb 1379*); B–H: material from Singapore Botanical Gardens, Courtesy of Flora Malesiana ser I, 17(1): 142, fig. 25.

2. ARTOCARPUS

J.R. Forst. & G. Forst., Char. Gen. Pl.: 101, t. 51, 51a. 1776, nom. cons.; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 1. 1889; Ridl., Fl. Malay Penins. 3: 351. 1924; Gagnep., Fl. Indo-Chine 5: 731. 1928; Jarrett, J. Arnold Arbor. 40: 113. 1959; Kochummen, Tree Fl. Malaya 3: 120. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 71. 2006.— *Sitodium* Banks & Solander ex Parkinson, J. Voy. Endeavour: 45. 1773; Thunb., Philos. Trans. 69: 465. 1779; Fosberg, Amer. J. Bot. 26: 230. 1939; Taxon 3: 114. 1954.— *Rade(r)machia* Thunb., Kongl. Svenska Vetensk. Acad. Handl. 37: 251. 1776.— *Polyphema* Lour., Fl. Cochinch.: 546. 1790.

Trees, monoecious. *Leaves* spirally arranged (subg. *Artocarpus*) or distichous (subg. *Pseudojaca*); lamina pinnately veined or sometimes subtriplinerved, entire or pinnately divided, sometimes down to the midrib; stipules free, amplexicaul (subg. *Artocarpus*) or lateral (subg. *Pseudojaca*). *Inflorescences* unisexual, solitary or in pairs in the leaf axils or on short-shoots on the older wood, pedunculate (or subsessile), bracteate or ebracteate. *Staminate inflorescences* spicate, ellipsoid to cylindrical to clavate to subglobose-capitate; flowers numerous, free; perianth tubular, subentire or 2–4-lobate to -partite; stamen 1. *Pistillate inflorescences* (sub)globose to ellipsoid-capitate, flowers numerous, with the upper parts of the perianth (or all of it) fused with adjacent perianths and/or interfloral bracts; perianth tubular with a narrow aperture; ovary free, stigma 1 or 2 of equal or unequal length. *Infructescences* consisting of a solid outer layer with a smooth areolate surface or with various protuberances, a soft, more or less fleshy middle layer containing the fruits, and a solid central part; fruit free, with a chartaceous to coriaceous or to crustaceous pericarp or endocarp; seed without endosperm, embryo straight, longitudinally to obliquely aligned, cotyledons equal or unequal, radicle minute.

The genus comprises about 45 species and ranges from Sri Lanka to southern China and eastwards to Australia and the Solomon Islands; 14 species occur in Thailand, two of them are introduced. The genus is centred in western Malesia and the adjacent part of continental Asia.

Subdivision.— The genus comprises two quite distinct subgenera:

A. Subg. *Artocarpus* with the leaves spirally arranged, the stipules fully amplexicaul and mostly longer than 1 cm, the pistillate inflorescences/infructescences covered with cushion-shaped to pyramidate to cylindrical, \pm hardened, free apices of the pistillate flowers, including the following species *A. altilis*, *A. chama*, *A. elasticus*, *A. heterophyllus*, *A. integer*, *A. kemando*, *A. lanceifolius*, *A. rigidus*, and *A. teijsmannii*.

B. Subg. *Pseudojaca* with the leaves distichous, the stipules lateral and mostly 0.2–0.5 cm long, the pistillate inflorescences/infructescences with smooth surfaces, including the following species: *A. altissimus*, *A. gomezianus*, *A. lacucha*, *A. nitidus*, and *A. thailandicus*.

Note.— In subg. *Artocarpus*, in pistillate inflorescences lacking (sub)peltate bracts, the flowers are often intermixed with rigid “processes” varying in shape and length from conical to filiform, and from straight to \pm curved. They are apparently modified bracts. These “processes” often resemble the hardened free apices of the perianths which may be cushion-shaped, pyramidate, conical, spine-like, subulate or filiform (and straight to curved). The perianth apices can be distinguished from “processes” by the perforate apices and presence of stigmata.

KEY TO THE SPECIES

1. Leaves distichous; stipules lateral, to 0.5 cm long
 2. Margin of lamina with glands
 2. Margin of lamina without glands

2. A. altissimus

3. Lower surface of lamina minutely hairy in the areoles **14. A. thailandicus**
 3. Lower surface of lamina not hairy in the areoles
 4. Lower surface of lamina also hairy on the smaller veins; margin of lamina mostly denticulate towards the apex
 5. Indumentum predominantly white; peduncle of staminate inflorescence to 0.3 cm long; peduncle of pistillate inflorescence 0.3–0.7 cm long **14. A. thailandicus**
 5. Indumentum brown; peduncle of staminate inflorescence 0.6–1.5 cm long; peduncle of pistillate inflorescence usually 1–4 cm long **9. A. lacucha**
 4. Lower surface of lamina hairy only on the main veins; margin of lamina entire
 6. Peduncle of staminate inflorescence 0.5–1.5 cm long; peduncle of pistillate inflorescence (1–)1.5–4.5 cm long **5. A. gomezianus**
 6. Peduncle of staminate inflorescence 0.1–0.4 cm long; peduncle of pistillate inflorescence 0.1–0.5 cm long **11. A. nitidus**
1. Leaves spirally arranged; stipules fully amplexicaul, at least 1 cm long.
 7. Trees with inflorescences on the older wood (cauliflorous)
 8. Indumentum whitish; peduncle broadened into a rim; in cultivation **6. A. heterophyllus**
 8. Indumentum brownish or absent; peduncle not broadened into a rim; wild or in cultivation **7. A. integer**
7. Trees with inflorescences in the leaf axils
 9. Adult trees with pinnately incised lamina; in cultivation **1. A. altilis**
 9. Adult trees with entire lamina; indigenous **4. A. elasticus**
 10. Stipules 4–20 cm long; lamina ± scabrous
 10. Stipules 0.5–3 cm long, if to 4.5 cm long, then the lamina smooth
 11. Lamina glabrous or sparsely puberulous on the midrib beneath; petiole 2–5 cm thick; stipules with hairs of equal length **10. A. lanceifolius**
 11. Lamina ± distinctly hairy or, if sparsely hairy, then the petiole 1–2 mm thick and/or the hairs towards the apex of the stipules longer **13. A. teijsmannii**
 12. Hairs on the stipules distinctly longer towards the apex than near the base
 12. Hairs on the stipules of about equal length
 13. Base of lamina subcordate to rounded; most of the lateral veins branched or forked away from the margin **3. A. chama**
 13. Base of the lamina obtuse to rounded; usually none of the lateral veins branched or forked away from the margin
 14. Inflorescences with peltate bracts **12. A. rigidus**
 14. Inflorescences without peltate bracts **8. A. kemando**

1. Artocarpus altilis (Parkinson) Fosberg, J. Wash. Acad. Sci. 31: 95. 1941; Fosberg, Brittonia 12: 104. 1960; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 82. 2006.— *Sitodium altile* Banks & Sol. ex Parkinson, J. Voy. Endeavour: 45. 1773.— *Artocarpus communis* J.R. & G. Forst., Char. Gen. Pl.: 101, t. 51, 51a. 1776; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 16 1889; Jarrett, J. Arnold Arbor. 40: 307. 1959; Kochummen, Tree Fl. Malaya 3: 124. 1978.— *Rade(r) machia incisa* Thunb., Kongl. Svenska Vetensk. Acad. Handl. 37: 253. 1776.— *Sitodium incisum* (Thunb.) Thunb., Philos. Trans. 69: 465. 1779.— *Artocarpus incisus* (Thunb.) L.f., Suppl. Pl.: 411. 1782. Plate LVII: 2.

Tree to 25(–40) m tall, evergreen. *Leafy twigs* 10–20 mm thick, minutely white appressed-puberulous to hispidulous, scabridulous, drying brown. *Leaves* spirally arranged; lamina (sub) coriaceous, elliptic to subrhombic to obovate in outline, 20–80(–100) by 15–50(–60) cm, mostly pinnatifid with 1–5(–9) pairs of lateral lobes, base cuneate to subcordate, apex acuminate to acute, margin subentire, ± revolute to flat; upper surface minutely white (appressed-)puberulous to hispidulous, also sparsely brown subhirtellous on the main veins (or subglabrous), scabridulous to smooth, lower surface minutely white appressed-puberulous, scabridulous to smooth; lateral veins 9–13 pairs, tertiary venation scalariform, ± prominent; petiole 3–9 cm long, 3–7 mm thick, minutely white appressed-puberulous to hispidulous, scabridulous; stipules (3–)10–25 cm long, white appressed-puberulous, also brown subhirsute to pubescent, mainly on the midrib, the margins and towards the apex, caducous. *Staminate inflorescences* axillary, solitary; peduncle 1–6

cm long, white appressed-puberulous to hispidulous, scabridulous; head cylindrical to clavate to spicate, 5–30(–40) cm by (0.5–)1–3(–5.5) cm; perianth tubular, 1–2 mm long, the apex 2-lobate, subhispidulous or subglabrous; stamen ca. 1.5–3 mm long, anther 0.6–0.8 mm long; interfloral bracts absent. *Pistillate inflorescences* axillary, solitary; peduncle (2–)5–10(–14) cm long, white appressed puberulous to hispidulous, scabridulous; head ellipsoid to subglobose; perianth (in the seedless form) cushion-shaped, ca. 1 mm long, whitish to brownish hispidulous to puberulous, the apex apiculate, 2-lobate; stigma simple; interfloral bracts absent. *Infructescences* ellipsoid to subglobose, ca. 15–30 by 10–30 cm diam., (in the seedless form) covered with 1 mm high, cushion-shaped apices of perianths; fruits ellipsoid, ca. 2–2.5 cm long.

T h a i l a n d.— Cultivated in gardens, throughout the country.

D i s t r i b u t i o n.— Indigenous in eastern Malesia (Philippines, Moluccas, and New Guinea) and in cultivation, initially in the Pacific (type) and subsequently throughout the tropics, with various cultivars, seeded and seedless ones; it is not known whether both the seeded and seedless forms are represented in Thailand.

V e r n a c u l a r.—Sake (สาเก), khanun sampalo (ขุ่นส้มปลอ) (Central); Breadfruit, Breadnut for seeded form.

U s e s.— Fruit eaten locally (preserved in syrup).

2. *Artocarpus altissimus* (Miq.) J.J. Sm., Icon. Bogor. 3: 79. 1907, t. 233; Jarrett, J. Arnold Arbor. 41: 135. 1960; Berg et al. Fl. Males., Ser. 1, Spermat. 17(1): 111. 2006.— *Morus ? altissima* Miq., Fl. Ind. Bat. Suppl.: 415. 1861.

Tree to 30 m tall, with or without buttresses, deciduous. *Leafy twigs* 1.5–3 mm thick, brownish to whitish puberulous, sometimes partly with retrorse uncinat hairs, smooth, drying dark brown to blackish. *Leaves* distichous; lamina subcoriaceous to chartaceous, entire or 3–5-lobate when juvenile, ovate to subovate to elliptic to oblong, 6–20 by 5–13 cm, apex acuminate, base cordate to subcordate to rounded, (almost) equilateral, margin glandular-crenate, ± revolute, at least towards the base; upper surface whitish to brownish puberulous on the main veins (to subglabrous), smooth (to scabridulous), lower surface sparsely to densely whitish to brownish puberulous to subtomentose on the (main) veins, smooth (to scabridulous); lateral veins 5–9 pairs, the basal pair branched, tertiary venation scalariform, ± prominent; petiole 1–3.5 cm long, 1.5–2.5 mm thick, ± densely brownish to whitish puberulous, the epidermis flaking off; stipules lateral, 0.3–0.5 cm long, brownish to whitish appressed-puberulous, caducous. *Staminate inflorescences* axillary or on short-shoots on the older wood; peduncle 0.5–0.7 cm long, brownish velutinous; head ellipsoid to cylindrical, 0.5–0.8 cm long, 0.2–0.3 cm diam.; perianth with 4 free tepals, ca. 0.7 mm long; stamen not exerted, anther ca. 0.4 mm long; interfloral bracts peltate, the apical part ca. 0.6 mm diam., puberulous. *Pistillate inflorescences* axillary or on short-shoots on the older wood; peduncle to 1.2 cm long, brownish velutinous; head globose, at anthesis ca. 0.5 cm diam.; stigma bifid; interfloral bracts peltate. *Infructescences* not seen.

T h a i l a n d.— PENINSULAR: Surat Thani.

D i s t r i b u t i o n.— Indonesia (Sumatra-type, Kalimantan).

E c o l o g y.— Evergreen forest, at low altitudes.

V e r n a c u l a r.—Sanai (แสน) (Surat Thani).

3. *Artocarpus chama* Buch.-Ham., Mem. Wern. Nat. Hist. Soc. 5: 331. 1826; Mabberly, Taxon 26: 529. 1977.— *A. chaplasha* Roxb., Fl. Ind. Ed. 1832 3: 525. 1832; Jarrett, J. Arnold Arbor. 40: 144. 1959.— *A. calophyllus* Kurz, Forest Fl. Burma 2: 431. 1877; King, Ann. Bot. Gard. Calcutta 2: 8, t. 2. 1889.— *A. asperulus* Gagnep., Bull. Soc. Bot. France 73: 86. 1926; Gagnep., Fl. Indo-Chine 5: 734, t. 90. 1928.— *A. rigidus* Blume subsp. *asperulus* (Gagnep.) Jarrett, J. Arnold Arbor. 40: 154. 1959.— *A. asperulus* Gagnep. var. *hirta* Gagnep., Bull. Soc. Bot. France 73: 87. 1926; Gagnep., Fl. Indo-Chine 5: 735. 90. 1928.

Tree to 40 m tall. *Leafy twigs* 2–8 mm thick, ± densely brown hirtellous to puberulous or strigillose, ± scabrous, drying (dark) brown. *Leaves* spirally arranged; lamina coriaceous, entire, elliptic to oblong to (sub)ovate or to ovate, (3–)10–29 by (1.5–)5–14(–20) cm, entire (or, when juvenile, 3-lobate and to ca. 40 by 30 cm to pinnatifid and to ca. 60 by 50 cm), apex short-acuminate, acute, apiculate, rounded or obtuse, base rounded to subcordate (or obtuse), margin entire to repand or denticulate towards the apex; upper surface densely (to sparsely) brown puberulous or strigillose on the midrib and/or also on the lateral veins to hispidulous (or glabrous) elsewhere, ± scabrous (or smooth), lower surface brownish strigose, hirtellous, puberulous, subtomentose or strigillose on the main veins and puberulous to hispidulous or subtomentose on the smaller veins, ± scabrous or smooth; lateral veins (6–)8–12(–14) pairs, most or some of them branched or forked away from the margin, tertiary venation loosely scalariform, ± prominent; petiole (0.5–)1–4 cm long, 2–3 mm thick, brown strig(ill)ose to puberulous, the epidermis persistent or ± flaking off; stipules (0.5–)1–3 cm, brown strigose, caducous. *Staminate inflorescences* axillary, solitary; peduncle 0.0–0.2 cm or 1.5–5(–8) cm long, brown hispidulous to strigillose, scabrous; head subglobose to ovoid or ellipsoid, 1–1.5 cm diam. or 2–2.5 x 1.5–2 cm; perianth tubular ca. 2 mm long, the apex 2-lobate, minutely puberulous; stamen ca. 2.5 mm long, anther ca. 0.3 mm long; interfloral bracts peltate, apical part ca. 0.4 mm diam., puberulous. *Pistillate inflorescences* axillary, solitary; peduncle 0.0–0.3 cm or (0.7–)1–5 cm long, brown puberulous, scabridulous; head subglobose; perianth tubular, brown hispidulous, the apex convex; stigma simple; interfloral bracts peltate, apical part 0.2–0.4 mm diam., puberulous. *Infructescences* subglobose, ca. 4–7(–10) cm diam., covered with (3–)5–10 mm long, cylindrical apices of the perianths; fruits ellipsoid, 1–1.5 cm long.

Thailand.— NORTH-EASTERN: Sakon Nakhon; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Chachoengsao, Chon Buri, Chanthaburi, Trat; PENINSULAR: Surat Thani, Phuket, Trang, Satun, Songkhla, Narathiwat.

Distribution.— India, Sikkim, Bangladesh (type), Burma, Cambodia, Vietnam.

Ecology.— Evergreen and mixed deciduous forests, to 750 m.

Vernacular.— Khanun pan (ขนนปาน) (Surat Thani); Khanun pa (ขนนป่า) (Chachoengsao).

Uses.— Fruits edible.

Notes.— The name *Artocarpus chama* is applied here but it is not yet clear whether it includes the material found in Thailand, where two forms, both with relatively short peduncles and stipules, and pistillate flowers with long apices, are found:

a. calophyllus-form with ± patent hairs on leafy twigs and petioles, the epidermis of the petiole often exfoliating, petioles to 4 cm long, stipules to 3 cm long, peduncles of pistillate inflorescences 1–5 cm long, and apices of perianths of pistillate flowers 6–10 mm long. This form is also found in Burma and northernmost Peninsular Malaysia; it may occur in NE India as well.

b. asperulus-form with hairs on leafy twigs and petioles appressed, the epidermis of the petiole persistent, petioles to 1.5(–2.5) cm long, stipules to 1.5 cm long, peduncles of pistillate inflorescences 0–0.3 mm or 0.7–2 cm long, and apices of the pistillate flowers 3–8 mm long. This form is also found in Cambodia and Vietnam. It probably has two subforms: one with very short peduncles of the pistillate inflorescence and the other much longer ones.

Material referred to *Artocarpus chaplasha* Roxb. and to *A. melinoxylus* Gagnep. subsp. *melinoxylus* by Jarrett (J. Arnold Arbor. 40: 144 and 143. 1959) may represent the third form.

c. chama-form with longer peduncles and/or stipules and short apices of the pistillate flowers) or the true *A. chama* (?), possibly represented by collection *T. Smitinand 10364* (Chanthaburi).

The scarcity of well-made and -prepared collections makes it difficult to describe the variation of the length of the peduncles and relate it to other features properly.

4. *Artocarpus elasticus* Blume, Bijdr. Fl. Ned. Ind.: 481. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 211. 1867; Jarrett, J. Arnold Arbor. 40: 346. 1959; Kochummen, Tree Fl. Malaya 3: 124, t. 3. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 88. 2006.— *A. kunstleri* King in Hook.f., Fl. Brit. India 5: 540. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 9, t. 4. 1889; Ridl., Fl. Malay Penins. 3: 353. 1924.— *A. scortechinii* King in Hook.f., Fl. Brit. India 5: 542. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 12, t. 9. 1889; Ridl., Fl. Malay Penins. 3: 355. 1924; Jarrett, J. Arnold Arbor. 40: 344. 1959; Kochummen, Tree Fl. Malaya 3: 134, t. 6. 1978. Fig 2.

Tree to 25(–45?) m tall, evergreen. *Leafy twigs* 10–15(–20)mm thick, brown puberulous to subhispidulous or to hirtellous, ± scabrous, drying dark brown to blackish. *Leaves* spirally arranged; lamina coriaceous to chartaceous, entire, elliptic to oblong, 13–40(–60) by 6–20(–35) cm or, when juvenile, pinnately incised with 3–4(–5) pairs of lobes, apex short-acuminate, base rounded to cuneate (to subattenuate), margin entire to repand to lobed; upper surface minutely puberulous to (sub)hispidulous, on the main veins to hirtellous, ± scabrous, lower surface brownish appressed-puberulous or partly strigillose to (sub)hirtellous on the veins, ± scabrous; lateral veins 10–16 pairs, most of them branched or forked away from the margin, tertiary venation scalariform, prominent; areoles usually bullate; petiole 2.5–10 cm long, 2–6 mm thick, brown appressed-puberulous, the epidermis persistent; stipules fully amplexicaul, 4–20 cm long, brown, (sub)hirsute to subvillous or to subsericeous, caducous. *Staminate inflorescences* axillary, solitary; peduncle 3.5–7.5 or 9.5–18 cm long, brown appressed-puberulous; head cylindrical, 6–15 by 1–2.5 cm, sulcate, the grooves often interrupted and almost straight; perianth tubular, ca. 0.6 mm long, the apex 2-lobate, minutely puberulous; stamen ca. 0.9 mm long, anther 0.2–0.4 mm long; interfloral bracts absent. *Pistillate inflorescences* axillary, solitary; peduncle 4.5–12 cm long, brown appressed-puberulous; head ellipsoid to cylindrical; perianth tubular, brownish (to whitish) puberulous to hispidulous, the apex convex to flat; stigma bifid (with equal or unequal arms); the flowers intermixed with subulate to filiform (± recurved), 6–12 mm long “processes”, these brown hispidulous or absent. *Infructescences* ellipsoid to cylindrical (or to subglobose), (6–)8–12(–17) by 5.5(–10) cm, covered with 1–4 mm long, cushion-shaped to pyramidate to cylindrical apices of the perianths intermixed with elongate “processes” or not; fruits ellipsoid, 0.8–1 cm long.

T h a i l a n d.— NORTHERN: Tak; SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Surat Thani, Phangnga, Phuket, Krabi, Nakhon Si Thammarat, Trang, Satun, Songkhla, Pattani, Narathiwat.

Distribution.— Burma, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java-type, Kalimantan, Lesser Sunda Islands), Philippines (Palawan).

Ecology.— Dry evergreen and evergreen forests, at low altitudes.

Vernacular.— Ka ok (กะอวก), ka-o (กะเอว) (Peninsular); o (เอว) (Trang); tue-ka (ตื้อกะ) (Malay-Yala).

Uses.— Seeds are edible (Narathiwat).

Note.— In Thailand, the species is represented by the typical form with subulate interfloral processes and the scabrous upper surface of the lamina.

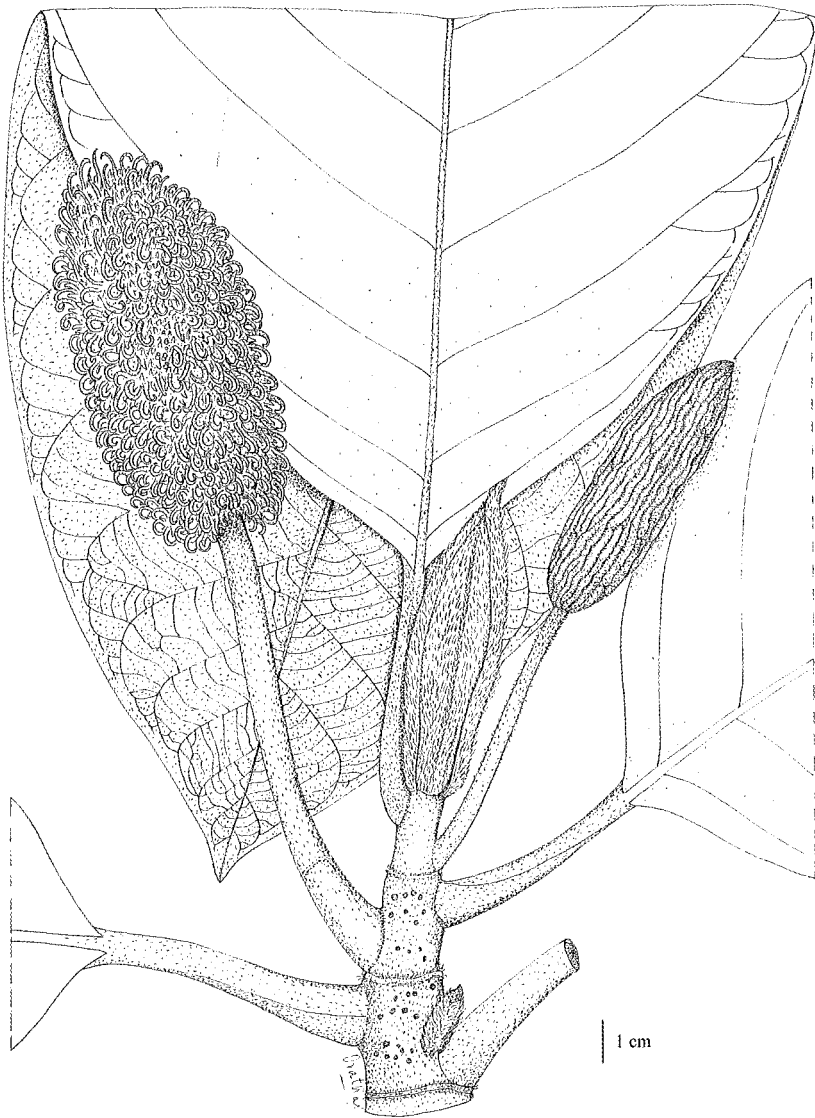


Fig. 2. *Artocarpus elasticus* Blume: leafy twig with pistillate inflorescence and staminate inflorescence form, composite drawing (A: Niyomdham 706, BKF; B: Smitinand 7125, BKF). Drawn by Orathai Kerdkaw.

5. *Artocarpus gomezianus* Wall. ex Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 118. 1847; King in Hook.f., Fl. Brit. India 5: 544. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 15, t. 14A. 1889; Jarrett, J. Arnold Arbor. 41: 88. 1960; Kochummen, Tree Fl. Malaya 3: 126, t. 4. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 113. 2006.

Tree to 20(–40?) m tall, evergreen. *Leafy twigs* 2–4 mm thick, sparsely white appressed-puberulous (to densely brown minutely puberulous), smooth, drying pale to dark brown. *Leaves* distichous; lamina coriaceous, entire, elliptic to oblong (to subovate), 9–25(–30) by 5–16 cm, apex acuminate (mostly shortly and abruptly so) to rounded, base rounded to subcordate (or cuneate to attenuate), slightly inequilateral to equilateral, margin entire, ± revolute; upper surface sparsely minutely white appressed-puberulous on the midrib or subglabrous, smooth, lower surface sparsely, minutely whitish appressed-puberulous on the midrib or main veins, smooth (to scabridulous); lateral veins (7–)10–15 pairs, usually some of them (in the upper part of the lamina) forked away from the margin, tertiary venation scalariform, slightly prominent; petiole 1–3(–4.5) cm long, 1.5–2.5 mm thick, sparsely minutely white appressed-puberulous to subglabrous, the epidermis persistent; stipules lateral, 0.3–0.5 cm long, whitish appressed-puberulous, caducous. *Staminate inflorescences* axillary, solitary; peduncle 0.5–1.5 cm long, minutely white puberulous; head obovoid to subglobose, 1–1.5 cm diam.; perianth 2–3-partite, ca. 0.5 mm long; stamen ca. 0.6 mm long, anther ca. 0.2 mm long; interfloral bracts (sub)peltate, the apical part ca. 0.3 mm diam., puberulous. *Pistillate inflorescences* axillary, solitary; peduncle (1–)1.5–4.5(–6) cm long, sometimes the apex cupula-like, broadened, densely minutely whitish to brownish puberulous; head obovoid to subglobose; stigma simple; interfloral bracts peltate, caducous, the apical part ca. 0.3 mm diam., puberulous. *Infructescences* subglobose to obovoid, to 8 cm diam., densely whitish to brownish puberulous (to velutinous); fruits ellipsoid, ca. 1.2 cm long.

T h a i l a n d.—NORTHERN: Chiang Mai, Lampang, Tak, Phitsanulok; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; CENTRAL: Saraburi, Bangkok; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Krabi, Nakhon Si Thammarat, Trang, Songkhla, Pattani, Yala.

D i s t r i b u t i o n.—Sri Lanka, India (incl. Andaman Islands), Burma (type), Peninsular Malaysia, Singapore, Indonesia (Sumatra, Java), Philippines.

E c o l o g y.—Mixed deciduous, dry evergreen and evergreen forests, at low altitudes.

V e r n a c u l a r.—Hat nun (หาดหนูน) (Northern); i po (อีโป้) (Trang); ta pang (ตะปัง), tam-pang (ตำปึง) (Malay-Peninsular).

N o t e s.—*Van Beusekom et al. 436* (AAU, E, L) deviates in the large lamina (to 30 by 13 cm) with a cuneate to attenuate base and a relatively long petiole (to 4.5 cm long) and the leafy twig is densely minutely brown puberulous. The only usable differentiating characters between this species and large-leaved specimens of *A. nitidus* are the longer peduncles of staminate and pistillate inflorescences and (in Thailand) also the hairy pistillate head of the former.

6. *Artocarpus heterophyllus* Lam., Encycl. 3: 210. 1789; Tabl. Encycl. (1797) t. 745; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 117. 1847; Corner, Gard. Bull. Singapore 10: 56. 1939; Jarrett, J. Arnold Arbor. 40: 334. 1959; Kochummen, Tree Fl. Malaya 3: 127, t. 4. 1978; Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 91. 2006.

Tree to 10(–30) m tall, with or without short buttresses, evergreen. *Leafy twigs* 2–6 mm thick, minutely whitish appressed-puberulous (to subpunctate), drying brown to greyish, smooth. *Leaves* spirally arranged; lamina (sub)coriaceous, entire (or, when juvenile, 3-lobed),

oblong to elliptic to (sub)obovate, 4–15 by 2–8(–12) cm, apex short-acuminate to obtuse, base cuneate to rounded, mostly \pm decurrent, margin entire, \pm revolute; upper surface often initially with sparse (retorse) uncinata hairs, soon glabrous, smooth, lower surface sparsely, minutely whitish appressed-puberulous on the main veins or only the midrib, often also with sparse (retorse), uncinata hairs initially, smooth; lateral veins 6–10 pairs, tertiary venation scalariform, slightly prominent; petiole 0.8–3 cm long, 1–2 mm thick, sparsely, minutely, whitish appressed-puberulous, the epidermis persistent; stipules fully amplexicaul, 1–5(–8) cm long, minutely, whitish appressed-puberulous, caducous. *Staminate inflorescences* axillary or cauliflorous on slender leafy branchlets, solitary; peduncle 1–5.5 cm long, minutely, whitish appressed-puberulous, at the apex broadened into a rim; head cylindrical to spicate or subellipsoid, 2.5–7 by 0.8–2.8 cm; perianth tubular 0.7–1 mm long, the apex 2-lobate, minutely puberulous; stamen 1.5–2 mm long, anther ca. 0.3 mm long; flower intermixed with numerous (to few?) cylindrical “processes”, these as long as the flowers, or such “processes” absent. *Pistillate inflorescences* axillary, ramiflorous or cauliflorous on leafy branchlets, solitary; peduncle 3–10 cm long, minutely, whitish (appressed-)puberulous, the apex broadened into a broad rim; head ellipsoid to cylindrical; perianth tubular, white puberulous to subhispidulous, the apex convex; stigma simple; interfloral bracts (sometimes?) present, these peltate with the apical part 0.2–0.4 mm diam. *Infructescences* subglobose, 30–100 by 25–50 cm, covered with ca. 3 mm long, conical to pyramidal apices of the perianths; fruits ellipsoid, ca. 3 cm long.

T h a i l a n d.— Cultivated throughout the country.

D i s t r i b u t i o n.— Indigenous in western India and throughout the tropics, including Mauritius (type), in cultivation with some varieties.

V e r n a c u l a r.— Khanun (ขุ่น) (General); mak mi (หมักหมี่) (Northeastern); Jak, Jack.

U s e s.— Fruit edible, yields yellow dye for dyeing silk.

7. *Artocarpus integer* (Thunb.) Merr., Int. Rumph.: 190. 1917; Corner, Gard. Bull. Singapore 10: 56, t. 1, 2. 1939; Jarrett, J. Arnold Arbor. 40: 329. 1959; Kochummen, Tree Fl. Malaya 3: 127. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 94. 2006.— *Rade(r)machia integra* Thunb., Kongl. Svenska Vetensk. Acad. Handl. 37: 254. 1776.— *Artocarpus integrifolia* L.f., Suppl. Pl.: 411. 1782.

Tree to 20 m tall, evergreen. *Leafy twigs* 2–4 mm thick, whitish puberulous (or punctate) and also brown hirtellous to (sub)hirsute, sometimes only (and sparsely) on and near the nodes, the hairs with swollen bases and sometimes uncinata, sometimes glabrous, drying brown to blackish. *Leaves* spirally arranged; lamina subcoriaceous, entire (or when juvenile to 3-lobed), oblong to elliptic to (sub)obovate, (4–)8–20(–27) by (1.5–)4–8(–12) cm, apex acuminate, base cuneate to obtuse to rounded, often slightly inequilateral, margin entire, \pm revolute; upper surface whitish puberulous and brownish strigillose, over the whole surface or only on the main veins or midrib, or glabrous, lower surface whitish puberulous and brown hirtellous over the whole surface or only on the main veins, the hairs all or partly uncinata, or (becoming) glabrous, smooth; lateral veins 6–12 pairs, tertiary venation towards the margin (obliquely) scalariform or largely reticulate, slightly prominent to almost flush; petiole 0.8–3 cm long, 1–2 mm thick, brown (sub)hirsute or also whitish puberulous, the epidermis persistent; stipules fully amplexicaul, 1.5–5(–9) cm long, (sparsely) brown (sub)hirsute to hirtellous to strigillose, the hairs with \pm swollen bases and some uncinata, or also whitish puberulous, caducous. *Staminate inflorescences* axillary or cauliflorous on slender leafy branchlets, solitary; peduncle 2.5–6 cm long, brown hirtellous, also

white puberulous; head ellipsoid to cylindrical to spicate, 1.5–5.5 by 0.9–1.2 cm; perianth tubular 0.7–1 mm long, the apex 2-lobate, minutely puberulous; stamen 1–1.3 mm long, anther 0.2–0.3 mm long; interfloral bracts absent. *Pistillate inflorescences* axillary, ramiflorous or cauliflorous on slender leafy branchlets, solitary; peduncle 1.5–6.5(–10) cm long, brown hirtellous to (retrorely) strigillose and most hairs uncinatae or also whitish puberulous; head cylindrical to subobovoid; perianth tubular, brown puberulous to subhispidulous, the apex truncate to convex; stigma simple; interfloral bracts absent. *Infructescences* cylindrical to subglobose, ca. 20–35 by 10–15 cm, covered with 1.5–3 mm long, cylindrical to conical to pyramidate apices of the perianths; fruits ellipsoid, ca. 3 cm long.

T h a i l a n d.— PENINSULAR: Surat Thani, Phuket, Nakhon Si Thammarat, Trang, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Kalimantan, Sulawesi, Moluccas, Papua), Brunei; also in cultivation, outside its range also in Java (type) and Burma.

E c o l o g y.— Evergreen forest, also cultivated, at low altitudes.

V e r n a c u l a r.— Champada (จําปาตะ) (General); champado (จําปาเตาะ) (Peninsular); Champedak.

8. *Artocarpus kemando* Miq., Fl. Ned. Ind., Eerste Bijv.: 418. 1861; Ridl., Fl. Malay Penins. 5: 335. 1925; Corner, Gard. Bull. Singapore 10: 282. 1939; Jarrett, J. Arnold Arbor. 40: 354. 1959; Kochummen, Tree Fl. Malaya 3: 129, t. 5. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 96. 2006.— *A. maingayi* King in Hook.f., Fl. Brit. India 5: 542. 1888; Ann. Roy. Bot. Gard. (Calcutta) 2: 11, t. 8A. 1889; Ridl., Fl. Malay Penins. 3: 354. 1924; Corner, Gard. Bull. Singapore 10: 282. 1939; Jarrett, J. Arnold Arbor. 40: 357. 1959; Kochummen, Tree Fl. Malaya 3: 131, t. 5. 1978.— *A. sumatranus* Jarrett, J. Arnold Arbor. 40: 353. 1959. Plate LVII: 3.

Tree to 20(–35?) m tall, evergreen, with (short) buttresses. *Leafy twigs* 2–3 mm thick, brown (to whitish) appressed-puberulous to -hispidulous or hirtellous (with part of the hairs uncinatae and ± retrore), scabridulous, drying (dark) brown. *Leaves* spirally arranged; lamina coriaceous, entire, elliptic to oblong to subobovate, (3–)7–15(–18) by (1.5–)3–10 cm, apex short-acuminate to obtuse or rounded, base cuneate to rounded, margin entire, ± revolute; upper surface (sparsely) minutely, whitish puberulous, on the midrib the hairs often longer (and brownish), or subglabrous, smooth, lower surface (sparsely), minutely, whitish puberulous, on the main veins the hairs longer and brownish, smooth; lateral veins 8–15 pairs, usually unbranched, tertiary venation scalariform, slightly prominent; petiole 1–3 cm long, 1–2 mm thick, brownish appressed-puberulous, the epidermis persistent; stipules fully amplexicaul, 0.7–2 cm long, brown appressed-puberulous to strigillose, caducous. *Staminate inflorescences* axillary, solitary (or in pairs) peduncle (0.3–)0.7–1.5(–2) cm long, brown subvelutinous; head cylindrical to spicate, 2–4 by 0.3–0.5 cm, (irregularly) sulcate, occasionally subtended by some 0.5–1 mm long, scale-like bracts; perianth tubular, ca. 0.4 mm long, the apex 2-lobate, minutely puberulous; stamen ca. 0.4–0.5 mm long, anther ca. 0.2 mm long; interfloral bracts absent. *Pistillate inflorescences* axillary, solitary (or in pairs); peduncle (0.3–0.8 cm ? or) 1–4 cm long, brown subvelutinous; head ellipsoid to ovoid, occasionally subtended by some 0.5–1 mm long, scale-like bracts; perianth tubular, densely brown puberulous, the apex flat to concave; stigma simple; interfloral bracts absent. *Infructescences* ellipsoid to subglobose, to 4 by 2.5 cm, covered with ca. 2 mm long, (concave) cushion-shaped (or pyramidate, to 3 mm long) apices of the perianths; fruits ellipsoid, ca. 0.8 cm long.

T h a i l a n d.— EASTERN: Chaiyaphum; PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra-type, Kalimantan).

E c o l o g y.— Evergreen forest, occasionally in peat swamp forest, at low altitudes.

V e r n a c u l a r.— Khanun pa (ขนนป่า) (Narathiwat); yatu (ยาตุ) (Malay-Narathiwat).

N o t e.— It is not known whether the form with pistillate inflorescences with peduncle shorter than 1 cm, known from Peninsular Malaysia, also occurs in Thailand.

9. Artocarpus lacucha Buch.-Ham., Mem. Wern. Nat. Hist. Soc. 5: 333. 1826; Mabblerley, Taxon 26: 529. 1977; Grierson & Long, Fl. Bhutan 1, 1: 100. 1983; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 114. 2006.— *A. lakoocha* Roxb., Fl. Ind. Ed. 1832 3: 524. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 681. 1843; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 117. 1847; Kurz, Forest Fl. Burma 2: 433. 1877; King in Hook.f., Fl. Brit. India 5: 543. 1888; King, Ann. Bot. Gard. Calcutta 2: 14, t. 13. 1889.— *A. ovatus* Blanco, Fl. Filip.: 666. 1837.— *A. cumingiana* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 119, t. 117, 118. 1847.— *A. dadah* Miq., Fl. Ned. Ind., Eerste Bijv.: 420. 1861; Corner, Gard. Bull. Singapore 10: 282. 1939; Jarrett, J. Arnold Arbor. 41: 91. 1960; Kochummen, Tree Fl. Malaya 3: 126, t. 4. 1978.— *A. fretessii* Teijsm. & Binn. in Hassk., Abh. Naturf. Ges. Halle 9: 189. 1866.— *A. lakoocha* Roxb. var. *malayana* King in Hook.f., Fl. Brit. India 5: 543. 1888.— *A. refracta* Becc., For. Borneo: 630. 1902.— *A. vrieseanus* Miq. var. *refractus* (Becc.) Jarrett, J. Arnold Arbor. 41 (1960) 98.— *A. peltatus* Merr., J. Straits Branch Roy. Asiat. Soc. 85: 166. 1922; Jarrett, J. Arnold Arbor. 41: 92. 1960.— *A. cumingiana* Trécul var. *stenophylla* Diels, Bot. Jahrb. Syst. 67: 177. 1935.— *A. yunnanensis* H.H. Hu, Bull. Fan Mem. Inst. Biol. 8: 32. 1937.— *A. ficifolia* W. T. Wang, Acta Phytotax. 6: 274, t. 15, fig. 23. 1957.— *A. vrieseanus* Miq. var. *papillosus* Jarrett, J. Arnold Arbor. 41: 99. 1960. Fig. 3.

Tree to 40 m tall, deciduous. *Leafy twigs* 3–5 mm thick, densely brown (to whitish) puberulous with straight or also some uncinat hairs, smooth, drying brown (to blackish). *Leaves* distichous; lamina subcoriaceous to chartaceous, elliptic to oblong or ovate, 8–30 by 4–17 cm, apex short-acuminate to acute (or rounded), base subcordate to rounded to broadly cuneate, often slightly inequilateral, margin denticulate towards the apex to entire (or, when juvenile, 3-lobed to pinnately incised), ± revolute to flat; upper surface brownish puberulous with straight and some uncinat hairs (mainly) on the main veins, smooth, lower surface brownish puberulous to subtomentose on the veins, smooth; lateral veins 10–20 pairs, none (or some of them in the upper part of the lamina) forked away from the margin, tertiary venation scalariform, prominent; petiole 0.5–2(–4.5) cm long, 1.5–2.5 mm thick, densely brown puberulous, the epidermis persistent; stipules lateral, 0.3–0.5(–1.2) cm long, brown (to whitish) appressed-puberulous, caducous (or subsistent) or persistent at the shoot-apices forming terminal buds (or also in the leaf axils forming lateral buds). *Staminate inflorescences* axillary (or just below the leaves), solitary; peduncle 0.6–1.5(–2) cm long, densely brown puberulous with straight and uncinat hairs; head globose to semi-globose or discoid and 0.8–1.5 cm diam. or ellipsoid to clavate-spicate and to 4.5 cm long; perianth 2–3-partite, ca. 0.3 mm long; stamen ca. 0.5 mm long, anther ca. 0.2 mm long; interfloral bracts (sub)peltate, persistent, the apical part ca. 0.4 mm diam., puberulous. *Pistillate inflorescences* axillary, solitary; peduncle (0.5–)1–4 cm long, densely brown puberulous with straight and uncinat hairs; head subglobose to obovoid; stigma simple; interfloral bracts peltate, caducous or persistent, the apical part 0.3–0.4 mm diam., puberulous. *Infructescences* subglobose, to ca. 7 cm diam., often lobed, densely, minutely, brown puberulous (to velutinous); fruits ellipsoid, 1–1.2 cm long.

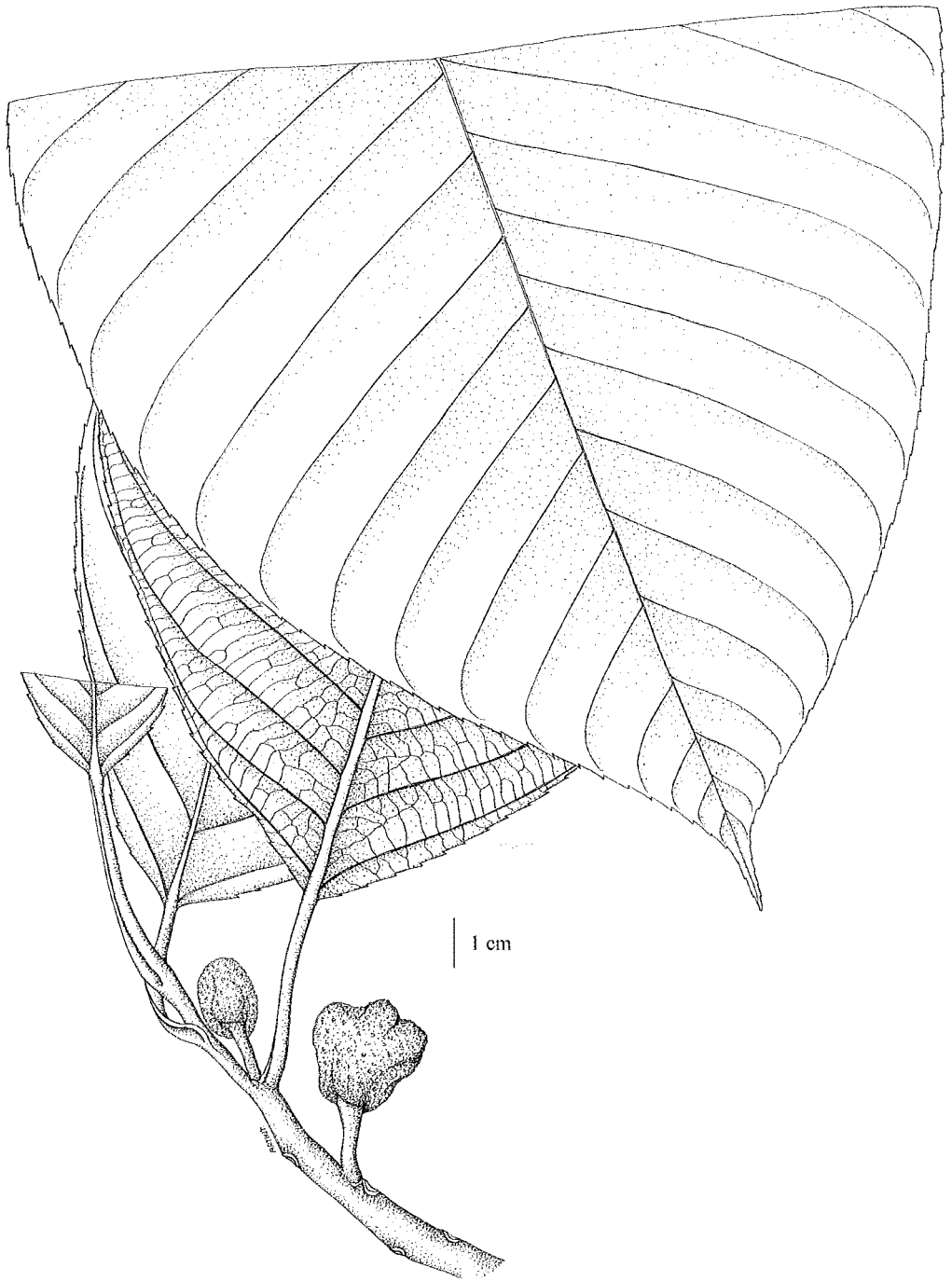


Fig. 3. *Artocarpus lacucha* Buch.-Ham.: leafy twig with pistillate inflorescences (Maxwell 97-282, BKF). Drawn by Arthit Khamkamnoed.

T h a i l a n d.—NORTHERN: Chiang Mai, Nan, Lamphun, Lampang; NORTH-EASTERN: Phetchabun, Loei, Udon Thani; EASTERN: Nakhon Ratchasima, Roi Et; SOUTH-WESTERN: Kanchanaburi, Ratchaburi, Phetchaburi; SOUTH-EASTERN: Chachoengsao, Chanthaburi, Trat; PENINSULAR: Chumphon, Surat Thani, Phangnga, Phuket, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.—Bhutan, India (type), Bangladesh, China (Yunnan), Indochina, Burma, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Kalimantan, Sulawesi, Moluccas, Papua), Philippines, Papua New Guinea, Solomon Islands.

E c o l o g y.—Deciduous dipterocarp, mixed deciduous, dry evergreen and evergreen forests; to ca. 1,300 m.

V e r n a c u l a r.—Mahat (มะหาด) (Peninsular); mahat bai yai (มะหาดใบใหญ่) (Trang); hat (หาด) (General); ka-yae (กาเย), ta-pae (ตาแป), ta-paeng (ตาปอง) (Malay-Narathiwat).

N o t e.—Clavate to spicate staminate heads are uncommon and found in the collections *S. Phusomsang 196* from Trang and *S. Gardner et al. ST1738* from Surat Thani.

10. Artocarpus lanceifolius Roxb. Fl. Ind. Ed. 1832 3: 527. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 679. 1843; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 122. 1847; King in Hook.f., Fl. Brit. India 5: 543. 1888; King, Ann. Bot. Gard. Calcutta 2: 13, t. 11. 1889; Ridl., Fl. Malay Penin. 3: 354. 1924; Jarrett, J. Arnold Arbor. 40: 140. 1959; Kochummen, Tree Fl. Malaya 3: 129, t. 5. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 97. 2006.

Tree to 20(–35?) m tall, evergreen. *Leafy twigs* 6–8 mm thick, ± densely brown (to whitish) appressed-puberulous; drying brown. *Leaves* spirally arranged; lamina coriaceous, entire and oblong to elliptic, sometimes 3-fid or pinnatifid, 10–40 by 3.5–17(–30) cm, apex short-acuminate (to rounded), base cuneate to obtuse, margin entire to repand (or sublobate); upper surface glabrous, smooth, lower surface glabrous or sparsely appressed puberulous on the midrib, smooth; lateral veins 9–14 pairs, usually some of them forked away from the margin or branched, tertiary venation scalariform, slightly prominent; petiole 1–3(–5.5) cm long, 2–5 mm thick, minutely appressed-puberulous, the epidermis persistent; stipules fully amplexicaul, 1–4.5 cm long, brown appressed-puberulous, caducous. *Staminate inflorescences* axillary, solitary; peduncle 2–7 cm long, brown (to whitish) appressed-puberulous; head ellipsoid to subobovoid, oblongoid or cylindrical, 3–6 by 1–1.5(–2) cm; perianth tubular, ca. 2 mm long, the apex 2-lobate, minutely puberulous to subglabrous; stamen 3–3.5 mm long, anther ca. 0.3 mm long; interfloral bracts peltate, the apical part 0.3–0.4 mm diam., radially appressed-puberulous. *Pistillate inflorescences* axillary, solitary; peduncle 2.5–7 cm long, densely brown (to whitish) appressed-puberulous; head subglobose; perianth tubular, brown puberulous, the apex ± convex; stigma bifid; interfloral bracts peltate, caducous or persistent, the apical part 0.3–0.4 mm diam., radially appressed-puberulous. *Infructescences* subglobose, ca. 6–7 cm diam., sometimes ± lobed, covered with 3–4 mm long, cylindrical apices of the perianths; fruits ellipsoid, 1–1.5 cm long.

T h a i l a n d.—NORTHERN: Tak; PENINSULAR: Pattani, Narathiwat.

D i s t r i b u t i o n.—Peninsular (type?) and Bornean Malaysia, Singapore, Indonesia (Sumatra, Kalimantan).

E c o l o g y.—Evergreen forest, at altitudes to ca. 1,400 m.

V e r n a c u l a r.—Khanun pa (ขนนปา) (Peninsular); nang-ka-pi-to (นังกาปีโต), nang-ka-pi-pit (นังกาปีปัด) (Malay-Peninsular); nang-ka-pi-pae (นังกาปีเป๊ะ) (Malay-Narathiwat).

11. *Artocarpus nitidus* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8 : 119. 1847; Jarrett, J. Arnold Arbor. 41: 121 1960; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 121. 2006.— *A. gomezianus* Wall. ex Trécul var. *griffithii* King in Hook.f., Fl. Brit. India 5: 544. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 15, t. 14B. 1889.— *A. griffithii* (King) Merr., Pap. Mich. Acad. Sci. Part. I, 24: 64. 1939.— *A. nitidus* Trécul subsp. *griffithii* (King) Jarrett, J. Arnold Arbor. 41: 128 1960; Kochummen, Tree Fl. Malaya 3: 131, t. 6. 1978.— *A. antiarifolia* Becc., For. Borneo: 630. 1902.— *A. xanthocarpus* Merr., Philipp. J. Sci. 17: 10. 1904; Jarrett, J. Arnold Arbor. 41: 102. 1960.— *A. borneensis* Merr., J. Straits Branch Roy. Asiat. Soc 85: 165. 1922.— *A. nitidus* Trécul subsp. *borneensis* (Merr.) Jarrett, J. Arnold Arbor. 41: 127. 1960.— *A. sampor* Gagnep., Bull. Soc. Bot. France 73: 90. 1926; Gagnep., Fl. Indo-Chine 5: 738. 1928.— *A. eberhardtii* Gagnep., Bull. Soc. Bot. France 73: 87. 1926.— *A. parva* Gagnep., Bull. Soc. Bot. France 73: 89. 1926; Gagnep. Fl. Indo-Chine 5: 735, t. 90. 1928.— *A. eberhardtii* Gagnep. var. *poilanei* Gagnep., Fl. Indo-Chine 5: 737. 1928.— *A. lingnanensis* Merr., Lingnan. Sci. J. 7: 302. 1931.— *A. nitidus* Trécul subsp. *lingnanensis* (Merr.) Jarrett, J. Arnold Arbor. 41: 12.4 1960. 124.— *A. vrieseanus* Miq. var. *subsessilis* Jarrett, J. Arnold Arbor. 41: 101. 1960.

Tree to 35 m tall, with or without buttresses, evergreen. *Leafy twigs* (1–)2–3(–4) mm thick, sparsely whitish to ± densely brownish appressed-puberulous, smooth, drying brown to blackish. *Leaves* distichous; lamina (sub)coriaceous, oblong to elliptic, (sub)obovate or lanceolate, 3–25(–30) by 1.5–9(–12) cm, apex acuminate (to rounded), base cuneate to rounded, margin (sub)entire, ± revolute; upper surface glabrous, smooth, ± shining; lower surface (very) sparsely, whitish appressed-puberulous (or also with some patent uncinat hairs) to subglabrous, smooth; lateral veins (5–)8–15 pairs, none of them forked away from the margin, tertiary venation (sub)scalariform, almost flush; petiole 0.5–1.5(–5) cm long, 1–2 mm thick, whitish or brownish appressed-puberulous, the epidermis persistent; stipules lateral, 0.2–0.4 cm long, brownish appressed-puberulous, caducous. *Staminate inflorescences* axillary, solitary; peduncle 0.1–0.4 cm long, densely brown puberulous; head subglobose to obovoid, ellipsoid or clavate, 1–2.5 by 0.5–0.6 cm; perianth 2–3-lobate to -partite, ca. 0.6 mm long; stamen ca. 0.8 mm long, anther ca. 0.2 mm long; interfloral bracts (sub)peltate, the apical part ca. 0.4 mm diam., puberulous. *Pistillate inflorescences* axillary, solitary; peduncle 0.1–0.5 cm long, densely brown puberulous; head subglobose; stigma simple; interfloral bracts (persistent!) peltate, the apical part ca. 0.3 mm diam., puberulous. *Infructescences* subglobose, to ca. 4 cm diam., subglabrous; fruits ellipsoid, ca. 1 cm long.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Nan, Lamphun, Tak; NORTH-EASTERN: Phetchabun, Loei; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Prachin Buri, Chon Buri, Rayong, Chanthaburi, Trat; PENINSULAR: Surat Thani, Phuket, Krabi, Trang, Satun, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— India, Burma, China, Cambodia, Vietnam Taiwan, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Kalimantan, Papua), Philippines (type), Papua New Guinea, Solomon Islands.

E c o l o g y.— Evergreen and deciduous dipterocarp forests, to ca. 1,200 m.

V e r n a c u l a r.— Mahat khoi (มะหาดข่อย) (Surat Thani).

U s e s.— Fruits edible (Pattani).

N o t e s.— Two forms of lamina can be distinguished: **a.** lamina with 8–10 pairs of lateral veins, often small to 10 cm, sometimes to 20 cm long, elliptic (to oblong); and **b.** lamina with

(10–)12–15 pairs of lateral veins, lamina to 25 cm long, oblong to subobovate or lanceolate. The two forms can be found on the same tree or branch, see collection *Niyomdham 6377*.

12. *Artocarpus rigidus* Blume, Bijdr. Fl. Ned. Ind.: 482. 1825; Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 114. 1847; Miq. Ann. Mus. Bot. Lugd.-Bat. 3: 211. 1867; King in Hook.f., Fl. Brit. India 5: 540. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 8, t. 3. 1889; Ridl., Fl. Malay Penins. 3: 352. 1924; Jarrett, J. Arnold Arbor. 40: 150. 1959; Kochummen, Tree Fl. Malaya 3: 131, t. 6. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 100. 2006. Plate LVII: 4.

Tree to 35 m tall, with buttresses, evergreen. *Leafy twigs* 2–6 mm thick, ± densely brown strigillose, scabridulous; drying brown. *Leaves* spirally arranged; lamina (sub)coriaceous, entire, oblong to elliptic or (sub)obovate, (3–)10–20(–30) by (1.5–)5–10(–15) cm (or pinnately lobate to partite and to 55 by 35 cm), short-acuminate to rounded (and often retuse, sometimes apiculate), base cuneate to subattenuate or subcordate, margin entire to repand (or crenate towards the apex), ± revolute; upper surface brownish puberulous to densely strigillose on the midrib to (sparsely) strigillose only on the midrib, smooth or scabridulous; lower surface strigillose on the main veins to puberulous or hispidulous on the smaller veins, smooth or ± scabrous; lateral veins (6–)10–20 pairs, usually none branched or forked away from the margin, tertiary venation scalariform, ± prominent; petiole (0.5–)1–3(–4) cm long, 2–3 mm thick, brown strigillose, the epidermis persistent; stipules (0.5–)1–3 cm, brown strigillose to strigose, caducous. *Staminate inflorescences* axillary, solitary; peduncle 0.2–1 cm long, brownish strigillose, ± scabrous; head obovoid to subglobose, 1.2–2 diam.; perianth tubular, ca. 1.2 mm long, the apex 2-lobate, minutely puberulous; stamen ca. 1.3 mm long, anther 0.1 mm long; interfloral bracts peltate, the apical part 0.2–0.3 mm diam., yellowish puberulous. *Pistillate inflorescences* axillary, solitary; peduncle 0.8–3(–4) cm long, brown strigillose, ± scabrous; head ellipsoid to subglobose (or depressed-globose); perianth tubular, hispidulous to muriculate, the apex ± convex; stigma simple; interfloral bracts peltate, the apical part 0.2–0.3 mm diam., yellowish puberulous. *Infructescences* subglobose, ca. 4–9 cm diam., covered with 3–8 mm long, cylindrical apices of the perianths; fruits ellipsoid, 1.2–1.5 cm long.

T h a i l a n d.— SOUTH-EASTERN: Chachoengsao, Chon Buri, Rayong, Trat; PENINSULAR: Nakhon Si Thammarat, Trang, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular Malaysia, Borneo, Singapore, Indonesia (Sumatra, Java-type, Kalimantan, Lesser Sunda Islands: Bali).

E c o l o g y.— Evergreen forest, at low altitudes.

V e r n a c u l a r.— Khanun pa (ขานุนป่า) (Peninsular).

13. *Artocarpus teijsmannii* Miq., Fl. Ned. Ind., Eerste Bijv.: 418. 1861; Jarrett, J. Arnold Arbor. 40: 341. 1959; Kochummen, Tree Fl. Malaya 3: 134, t. 6. 1978; C.C. Berg, Blumea 50: 543. 2005; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 104. 2006.

subsp. **teijsmannii** — *A. peduncularis* Kurz, J. Bot. 13: 331. 1875; King in Hook.f., Fl. Brit. India 5: 541. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 10, t. 6. 1889.

Tree to 20(–40?) m tall, evergreen. *Leafy twigs* 3–8 mm thick, minutely whitish to brownish appressed-puberulous, smooth, drying blackish to brown or to greyish; scars of the stipules prominent. *Leaves* spirally arranged; lamina (sub)coriaceous, entire, oblong to elliptic to

(sub)ovate, (5–)10–25(–40) by (3–)6–13(–17) cm, apex short-acuminate to acute or obtuse, base cuneate to rounded (or subcordate), often slightly inequilateral, margin entire, often \pm revolute; upper surface minutely whitish puberulous, the hairs slightly longer and appressed on the main veins, smooth, lower surface minutely whitish puberulous, the hairs slightly longer and appressed on the main veins, smooth; lateral veins 6–16(–18) pairs, often branched or forked away from the margin, tertiary venation scalariform, almost flush; petiole (1–)2–5 cm long, (1–)2–3 mm thick, minutely whitish appressed-puberulous, the epidermis persistent; stipules fully amplexicaul, 1–5(–8) cm long, whitish to brownish appressed-puberulous, brownish subsericeous towards the apex, caducous. *Staminate inflorescences* axillary, solitary; peduncle 2–8 cm long, minutely whitish appressed-puberulous; head spicate, 3.5–7.5 by 0.5–0.7(–0.9) cm; perianth tubular, ca. 1.5 mm long, the apex 2-lobate, minutely puberulous; stamen 1–2 mm long, anther ca. 0.5 mm long; flowers intermixed with 1–2 mm long subulate “processes”. *Pistillate inflorescences* axillary, solitary; peduncle 3–10 cm long, minutely whitish (appressed-)puberulous; head cylindrical; perianth tubular, minutely brownish to whitish puberulous, the apex convex; stigma simple (or bifid); flowers often intermixed with 0.3–0.6 mm long, subulate “processes”. *Infructescences* cylindrical to clavate, to 8.5 by 4.5 cm, covered with 1–2 mm long, pyramidate or sometimes to 6 mm long and subulate apices of the perianths, (in some infructescences none, in others some or many) to 6 mm long, subulate “processes”; fruits ellipsoid, ca. 0.7 (?) cm long.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— India (Nicobar Islands), Peninsular Malaysia, Borneo, Indonesia (Sumatra-type, Kalimantan, Sulawesi, Moluccas, Papua).

E c o l o g y.— Peat swamp and evergreen forests, at low altitudes.

N o t e.— The species is represented in Papua New Guinea and the Solomon Islands by subsp. *subglabrus* C.C. Berg

14. *Artocarpus thailandicus* C.C. Berg, *Blumea* 50: 531. 2005, fig. 1. Fig 4. Plate LVII: 5–6.

Tree to 10 m tall, deciduous. *Leafy twigs* 1.5–4 mm thick, densely brown to yellowish puberulous, smooth, drying brown to blackish. *Leaves* distichous; lamina (sub)coriaceous, entire elliptic to obovate 2–13(–17) by 1–8.5(–10.5) cm, apex short-acuminate to apiculate or acute, base rounded to cuneate, \pm inequilateral, margin denticulate towards the apex to entire; upper surface sparsely brownish to whitish puberulous, more densely on the main veins (or also sparsely hispidulous between the main veins), \pm glabrescent, smooth or scabridulous, lower surface usually \pm densely minutely brownish to whitish puberulous to tomentose (or very sparsely puberulous to glabrous) in the areoles or also on the reticulum and (more sparsely) puberulous to tomentose or subhirtellous on the main veins, smooth to scabrous; lateral veins 7–9 pairs, some forked away from the margin, tertiary venation scalariform, slightly prominent to flush; petiole (0.5–)1–2(–3.5) cm long, 1–2 mm thick, densely brown(ish) to whitish puberulous, the epidermis persistent; stipules lateral, 0.3–0.6 cm long, brown(ish) puberulous, caducous. *Staminate inflorescences* axillary and below the leaves (down to previous season’s growth), solitary or in pairs; peduncle (0.0–)0.1–0.3 cm long, minutely brownish puberulous; head cylindrical to clavate, obovoid or pulvinate, 0.5–1.5(–1.8) cm long, 0.2–0.8 cm diam., pinkish to pale orange; perianth 2–3-partite, ca. 0.5 mm long; stamen ca. 0.8 mm long, anther ca. 0.2 mm long; interfloral bracts (sub)peltate, the apical part ca. 0.3 mm diam., densely puberulous. *Pistillate inflorescences* axillary, solitary; peduncle 0.2–0.7 cm long, densely brownish to whitish puberulous, broadening into a disc with or without basally attached bracts on its margin; head obovoid (to subglobose?), stigma simple;

interfloral bracts peltate, caducous, the apical part 0.2–0.3 mm diam., puberulous. *Infructescences* to 4 cm diam., brown velutinous; mature seeds not seen.

T h a i l a n d . — NORTHERN: Chiang Mai (Doi Chiang Dao, J.F. MAXWELL 90-232, holotype L; isotype CMU, E), Lamphun, Phitsanulok; CENTRAL: Bangkok; NORTH-EASTERN: Loei, Udon Thani, Khon Kaen; SOUTH-WESTERN: Uthai Thani, Prachuap Khiri Khan.

D i s t r i b u t i o n .— Probably endemic in Thailand.

E c o l o g y .— Deciduous dipterocarp forest, to 1,000 m.

V e r n a c u l a r .—Mahat (มะหาด).

U s e s .— Locally chewed with betel.

N o t e s .— This species belongs to a group of species with minute indumentum in the areoles of the lamina beneath and comprising *Artocarpus glaucus* Blume, *A. hypargyreus* Hance, and *A. styracifolius* Pierre. The short peduncles are shared with *A. glaucus* (ranging from the Malay Peninsula to Australia) from which this species differs in the short-acuminate to acute apex of the lamina, the dense indumentum on leafy twigs and petioles, and deciduousness of the tree.

In collection *R. Pooma et al.* 5749 from Tak, hairs are lacking in the areoles beneath and in collection *Th. Wongprasert s.n.* from Uthai Thani, the hairs on the main veins are mainly \pm appressed in some leaves with sparse, minute hairs in the areoles beneath, but in other leaves, which mainly have patent hairs on the veins, minute hairs in the areoles beneath are absent. It is not clear whether the variation in the denseness of hairs in the areoles is due to variation in the species or the result of hybridisation with *Artocarpus lacucha*; the more dense indumentum on the leafy twigs of these collections and the tendency of dentition towards the apex may be indications of the latter assumption.

3. BROUSSONETIA

L'Hér. ex Vent., *Tabl. Règn. Vég.* 3: 547. 1799, nom. cons.; Blume, *Ann. Mus. Bot. Lugd.-Bat.* 2: 85. 1856; Bureau in DC. *Prod.* 17: 223. 1873; Engl. in Engl. & Prantl, *Nat. Pflanzenfam.* 3, 1: 76. 1888; Corner, *Gard. Bull. Singapore* 19: 233. 1962; C.C. Berg, *Bull. Jard. Bot. Natl. Belg.* 47: 355; C.C. Berg et al., *Fl. Males.*, Ser. 1, *Spermat.* 17(1): 29. 2006.— *Papyrius* Lam., *Tabl. Encycl.*: t. 762. 1798.— *Allaeanthus* Thwaites, *Hooker's J. Bot. Kew Gard. Misc.* 6: 302. 1854.— *Smithiodendron* Hu, *Sunyatsenia* 3: 106. 1936.

Trees (or climbers), dioecious, unarmed, deciduous, shoot apices shed, with (small) axillary scaled resting buds. *Leaves* distichous, spirally arranged or (sub)opposite; lamina pinnately veined; stipules free, semi-amplexicaul. *Inflorescences* unisexual, usually solitary in the leaf axils or on leafless nodes at the base of fertile twigs. *Staminate inflorescences* spicate, sometimes subcapitate, with a rather distinct abaxial, sterile strip; perianth 4-partite, segments valvate in the bud; stamens 4, inflexed in the bud. *Pistillate inflorescences* globose-capitate, sometimes elongate; perianth unequally 2–4-lobate to 2–4-dentate; ovary free, stigmas 2, one of them strongly reduced; the interfloral bracts longer than the perianth, their upper parts cohering by entangling hairs. *Fruiting perianth* enlarged, membranous; fruit usually short-stipitate and slightly compressed, exocarp fleshy, for the greater part rather thinly so, thicker at the base and on the seed-bearing side; endocarp crustaceous, with a thickened crest-like part at the apex and small woody plug towards the hilum; seed with endosperm, embryo curved, cotyledons unequal

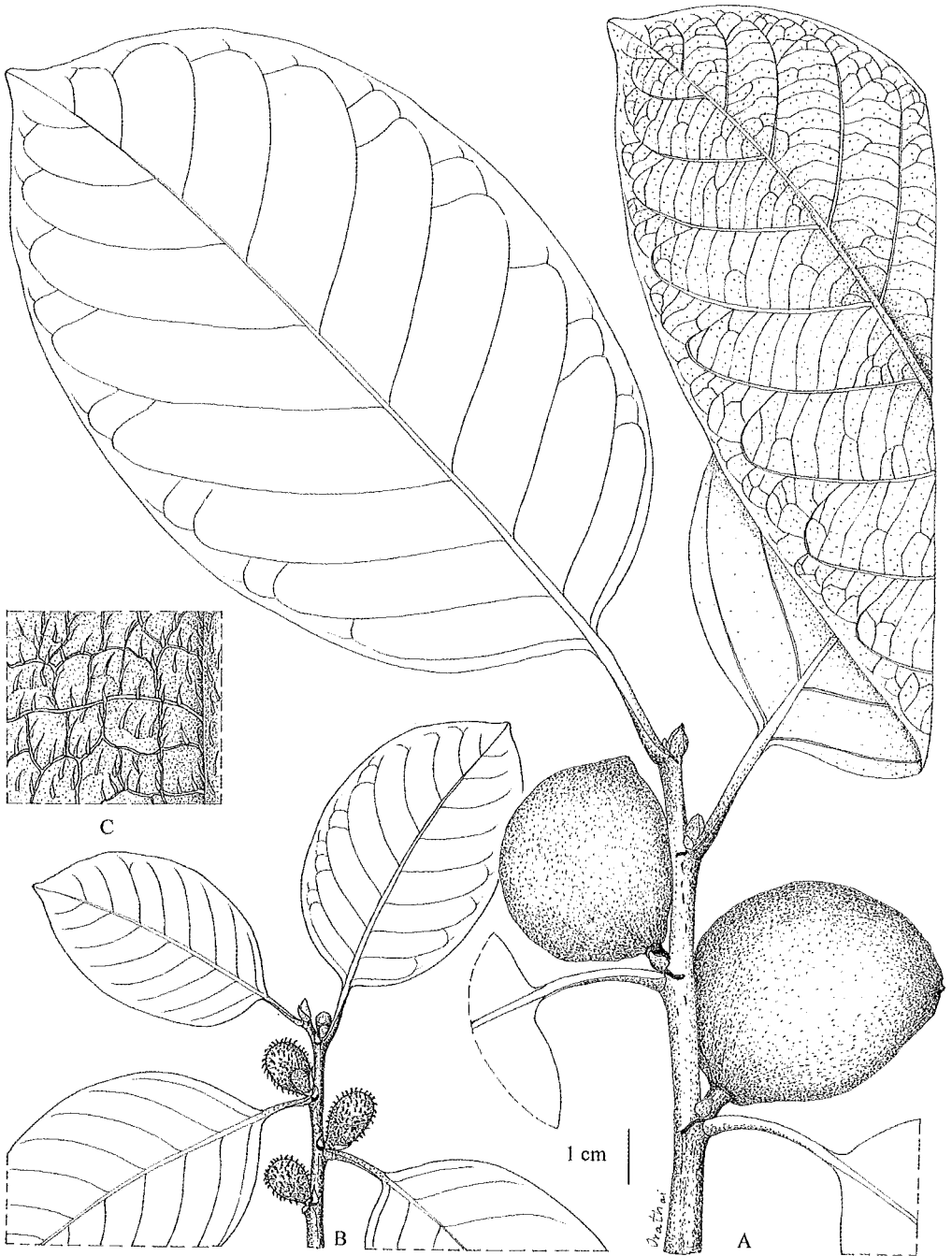


Fig. 4. *Artocarpus thailandicus* C.C. Berg: A. leafy twig with infructescences (*Bunchuai & Nimanong 1465*, BKF); B. leafy twig with staminate inflorescences; C. indumentum on lower surface of lamina (B-C: *Wongprasert 48*, BKF). Drawn by Orathai Kerdkaeav.

or almost equal, subconduplicate to almost flat, straight or the apex reflexed, not enclosing the long radicle or, if the cotyledons unequal, then the larger cotyledon more or less clasping the smaller one; the bracts more or less fused at the base and hardened at the apex.

The genus comprises eight species, seven of them in tropical to subtropical Asia, and one species in Madagascar.

Subdivision. Two sections, *Broussonetia* and *Allaeanthus*, were recognised by Corner (Gard. Bull. Singapore 19: 234. 1962). The differences between these sections are very small. *B. kurzii* was included in the former section and *B. papyrifera* in the other.

KEY TO THE SPECIES

1. Tree; leaves spirally arranged or subopposite; lamina scabrous above
1. Climber; leaves distichous; lamina smooth above

2. *B. papyrifera*
1. *B. kurzii*

1. *Broussonetia kurzii* (Hook.f.) Corner, Gard. Bull. Singapore 19: 234. 1962; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 30. 2006.—*Allaeanthus kurzii* Hook.f., Fl. Brit. India 5: 490. 1888; Gagnep., Fl. Indo-Chine 5: 721. 1928. Fig 5. Plate LVIII: 1.

Climber, deciduous. *Leafy twigs* 1–3 mm thick, whitish appressed-puberulous. *Leaves* distichous; lamina oblong to elliptic or subovate to ovate, 4–12 by 2.5–6 cm, ± asymmetric, chartaceous, apex acuminate to subacute, base rounded to subcordate, margin crenate- to serrate-dentate; upper surface sparsely appressed-puberulous on the main veins, smooth, lower surface sparsely appressed-puberulous on the veins; midrib impressed above, lateral veins 5–8 pairs, tertiary venation scalariform; petiole 0.6–1.5 cm long, sparsely appressed-puberulous; stipules 0.3–0.9 cm long, ovate, sparsely minutely puberulous, caducous or subpersistent. *Staminate inflorescences* clustered on short-shoots or at the base of leafy twigs, spicate; peduncle 0.3–2 cm long, minutely puberulous; spike (0.5–)1–5 cm long; perianth 1.5–2 mm long, minutely puberulous; stamens 2.5–3 mm long, anthers 0.6–0.8 mm long; bracts ovate to linear, puberulous. *Pistillate inflorescences* solitary on leafless branchlets to 4 cm long, or at the base of leafy twigs, capitate; peduncle 0.3–1 cm long, minutely puberulous to tomentellous; head globose, 0.2–0.4 cm diam.; perianth ca. 0.5 mm long, 4-dentate; ovary ca. 0.3 mm long, stigma 7–10 mm long; interfloral bracts clavate to subpeltate, ca. 0.7 mm long, densely puberulous to tomentellous, bracts subtending the head ovate, 0.5–1 mm long, sparsely minutely puberulous. *Infructescences* globose, 0.5–0.8 cm diam.

T h a i l a n d.—NORTHERN: Chiang Mai, Lamphun, Lampang; NORTH-EASTERN: Loei; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Saraburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Surat Thani, Nakhon Si Thammarat, Trang.

D i s t r i b u t i o n.—India (Assam), Burma (type), Sumatra (Aceh).

E c o l o g y.—Mixed deciduous, dry evergreen and evergreen forests; at low altitudes.

V e r n a c u l a r.—Sa lae (सानล) (Loei), yan nam lai khwai (ย่านน้ำลายควาย) (Trang).

2. *Broussonetia papyrifera* (L.) Vent., Tabl. 3: 547. 1799; 547; Bureau in DC. Prod. 17: 224. 1873; Hook.f., Fl. Brit. India 5: 490. 1888; Gagnep., Fl. Indo-Chine 5: 717, f. 88. 1928; Barker, Curtis's Bot. Mag. 19: 8, cum t. 2002; C.C. Berg, Prosea 17: 91, cum t. 2003; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 32. 2006.—*Morus papyrifera* L., Sp. Pl. : 986. 1753.—*Smithiodendron artocarpoideum* Hu, Sunyatsenia 3: 106. 1936. Fig. 5.

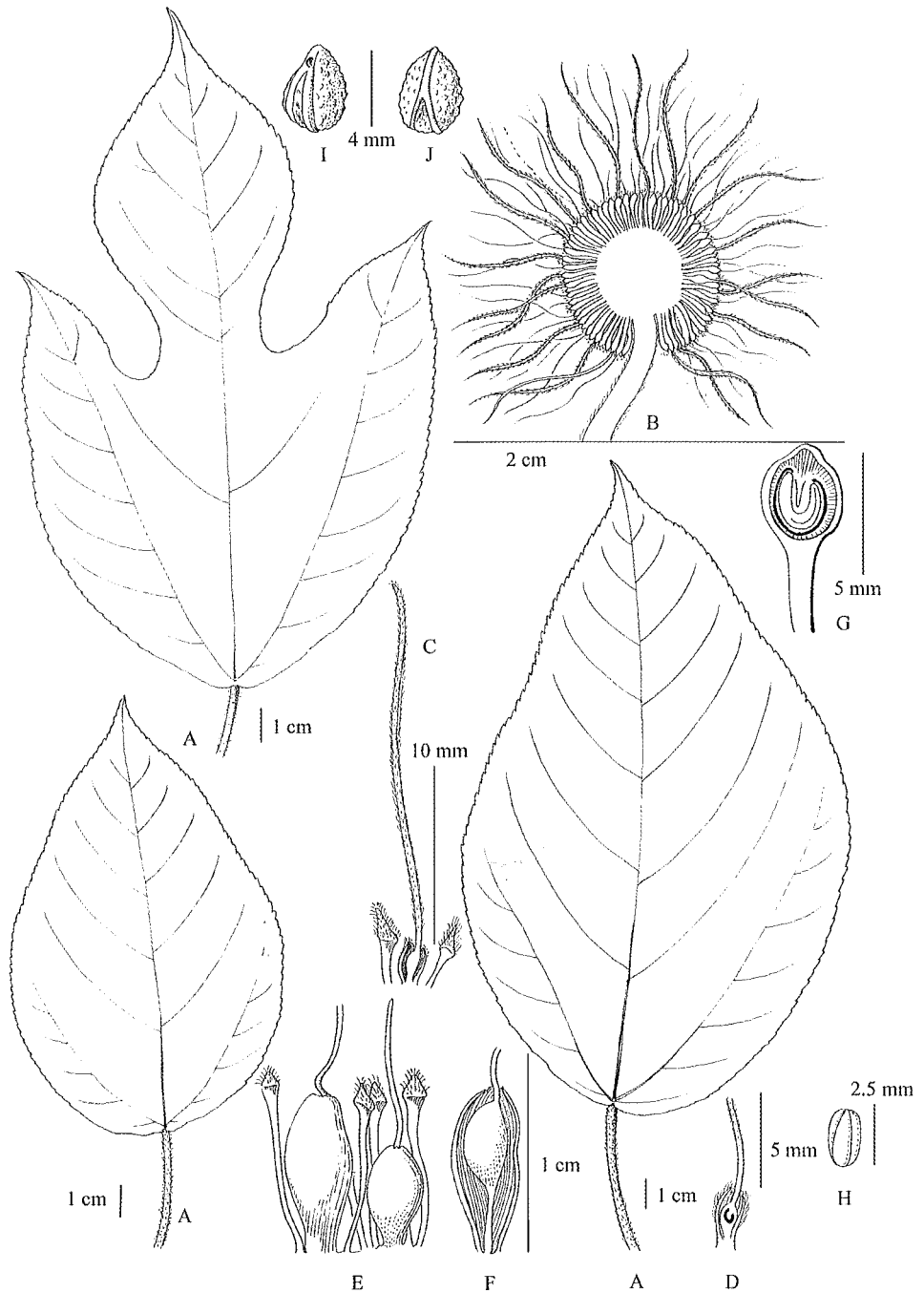


Fig. 5. *Broussonetia papyrifera* (L.) Vent. A, leaves; B, pistillate inflorescence; C, pistillate flower; D, base of pistillate flower; E, fruit-containing perianths with elongate bracts; F, fruit with enlarged utricular perianth cut open; G, stalked drupe in section; H, I, endocarp bodies; J, embryo (all floral parts from material from Cambridge Botanical Garden, Courtesy of Flora Malesiana ser I, 17(1): 33, fig. 4. – leaves added).

Tree to 35 m tall, deciduous. *Leafy twigs* 1.5–3 mm thick, subtomentose, hirtellous or puberulous. *Leaves* spirally arranged or (sub)opposite; lamina ovate to cordiform or elliptic, 5–20 by 4–12 cm, entire or lobate, ± asymmetric, chartaceous, apex acuminate to subacute, base cordate, rounded or subcuneate, margin crenate- to serrate-dentate; upper surface hispidulous, scabrous, lower surface ± densely puberulous to subtomentose on the veins; midrib impressed above, lateral veins 5–9 pairs, tertiary venation scalariform; petiole (1–)2–9(–15) cm long, subtomentose; stipules 0.5–1.5 cm long, ovate, puberulous, ± ribbed, caducous. *Staminate inflorescences* axillary or below the leaves, solitary or clustered on short-shoots, spicate; peduncle 1–2.5 cm long, puberulous to tomentellous; spike 3–10 cm long; perianth 1.5–2 mm long, puberulous; stamens 3–3.5 mm long, anthers ca. 0.8 mm long; bracts subulate, 1.5–2.5 mm long, puberulous. *Pistillate inflorescences* axillary or below the leaves, solitary, capitate; peduncle 0.3–1.5 cm long, puberulous to tomentellous; head globose, 1–1.2 cm diam.; perianth ca. 1 mm long, 4-dentate; ovary 0.5 mm long, stigma 7–10 mm long; interfloral bracts clavate to subpeltate, 1–1.5 mm long, densely puberulous to tomentellous. *Infructescences* (sub)globose, 2–2.5 cm diam.; endocarp body ovoid, 2–2.5 mm long.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Phayao, Lampang, Phrae, Sukhothai; SOUTH-WESTERN: Uthai Thani, Kanchanaburi; CENTRAL: Lop Buri, Saraburi; PENINSULAR: Nakhon Si Thammarat.

D i s t r i b u t i o n.—India (Assam); Burma, China, Indo-China, Japan (type); introduced in the Ryukyu Islands, Taiwan, Malesia, and Polynesia.

E c o l o g y.—Mixed deciduous, dry evergreen and evergreen forests, usually found near streams, to 750 m.

V e r n a c u l a r.—Po sa (ปอสา), po krasa (ปอกระสา) (Northern); Paper mulberry.

N o t e.—The bark is used to make cloth and paper.

4. FICUS

L., Gen. Pl. ed. 5: 482. 1754; L. Sp. Pl.: 1059. 1753; Miq., Ann. Bot. Mus. Lugd.-Bat. 3: 214, 260. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1: 1. 1887/1888; Corner, Gard. Bull. Singapore 21: 1. 1965; S. Masuthon, Taxonomic studies of the genus *Ficus* in Sakaerat. 1979; C.C. Berg, Blumea 48: 168. 2003; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 2. 2005.—*Urostigma* Gasp., Giorn. Bot. Ital. 2: 214. 1844.—*Pharmacosycea* Miq., London J. Bot. 6: 525. 1847.—*Pogonotrophe* Miq., London J. Bot. 6: 525.—*Synoecia* Miq., London J. Bot. 7: 469. 1848. For other synonyms see C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 2. 2005.

Trees, shrubs or climbers, often with adventitious roots (aerial in hemi-epiphytes and root climbers), monoecious or (gyno)dioecious (functionally “male” and “female”); with latex, milky and white, sometimes coloured or watery, waxy glandular spots (usually) present on leaves (at the base of the midrib or in the axils of the basal or other lateral veins or in main furcations of the venation beneath) or at the nodes of leafy twigs. *Leaves* alternate, in spirals or distichous, (sub)opposite or sometimes subverticillate; stipules fully amplexicaul to lateral, mostly free. *Inflorescences* with an urceolate receptacle (syconium or fig) with a narrow circular or slit-shaped orifice (ostiole), bracts on the peduncle (peduncular bracts), subtending the receptacle, mostly 2 or 3 (basal bracts), on the outer surface of the receptacle (lateral bracts), in the orifice of the receptacle (ostiolar bracts), among the flowers (interfloral bracts) and/or subtending

(staminate) flowers (bracteoles), bisexual (with staminate flowers and pistillate flowers with styles of different length) or (functionally) unisexual either with staminate flowers and (non-seed-producing) pistillate flowers with short styles or with long-styled pistillate flowers (and neuter flowers), pronouncedly protogynous; staminate flowers sessile or pedicellate, with 2–5 (or more) free to almost fully connate tepals, stamens 1–5, pistillode absent or present; pistillate flowers sessile or pedicellate, with 3–5 (or more) free to fully connate tepals, ovary free, styles different in length, stigmas 2 and filiform to subulate or 1 and filiform to subulate or clavate to infundibuliform, cohering or free. *Fruit* a drupelet or achene, small. *Seed* with endosperm, embryo (almost) straight with flat and equal or \pm curved with conduplicate cotyledons.

The genus comprises 725–750 species worldwide of which 108 occur naturally in Thailand; 7 have been introduced: *F. benghalensis*, *F. carica*, *F. cyathistipula*, *F. elastica*, *F. lyrata*, *F. natalensis* subsp. *leprieurii*, *F. pumila*, and probably also *F. religiosa*. The majority of the indigenous species are lowland ones, only *F. cyrtophylla*, *F. neriifolia*, and *F. oreophila* can be regarded as (sub)montane. The *Ficus* flora consists of three elements: the Malesian and the Sino-Himalayan as main ones, and the Indo-Chinese as the minor one. The most interesting (and problematical) part of the Thai *Ficus* flora occurs on limestone.

INTRODUCTION

MORPHOLOGY

Habit.— In addition to “normal” terrestrial trees, shrubs and climbers, which comprise about 50% of the species, some other life forms are present in the genus.

Hemi-epiphytes. They start their life as epiphytes on (host) trees, established in some suitable site such as the fork of a branch or rotting branch stump. The primary root system is replaced by a system of adventitious aerial roots, of which the leading one descends along the trunk of the host tree to the soil. When that is reached and the plant gets access to sufficient water and nutrients, it can expand its stem, branches and secondary root system. The crown of the host tree will sooner or later be overgrown. By taking away light and nutrients from the soil, the host tree is starved and will sooner or later die and its trunk rot. If the fig tree happens to be in the right position or so strong that it has built a broad supporting base, for example, by also sending aerial roots down along adjacent trees, it may replace the host tree rather than falling with its host's decayed trunk.

Members of *Ficus* subg. *Urostigma* usually establish themselves at a height of 20–25(–30) m above the forest floor in high forest, lower in \pm open areas. In *Ficus* subg. *Sycidium* (sect. *Palaeomorphe*), they establish themselves close to (some metres from) the forest floor in high forest. Some members of *Ficus* subg. *Urostigma* can be hemi-epilithic, starting on a rocky surface and sending their roots down.

Root-climbers. These are typically root-climbers with climbing stems attached to tree trunks or rock surfaces by small adventitious roots. The leaves are of two kinds, called **bathyphylls** and **acrophylls**, which differ from each other in shape, size, texture and sometimes also indumentum. Bathyphylls are found on climbing stems and branches, and only bear figs in a few cauliflorous species, such as *Ficus punctata*. Acrophylls are found on fig-bearing branches and these are the only leaves described in the species accounts below.

Rheophytes. Some species are adapted to living and establishment in (rapidly) flowing water. Some of them are not always rheophytic, but *F. squamosa* apparently always is. This species has unusually long persistent styles with retrorse hairs which can be regarded as adaptations to anchor the fruits to the substrate.

In some (sub)sections shrubs or trees show rhythmic growth, usually elongation of a twig or a new one starting with formation of long internodes which gradually become shorter, the terminal ones often very short and only with stipules which are often (sub)persistent and may form a terminal bud (in subsect. *Urostigma*). The difference of colour between the twig of current growth and that of previous growth (often marked by sections with very short internodes) helps to recognise the phenomenon. Moreover, new branches tend to develop from parts with short internodes: “*Terminalia*-branching”.

Syconium.— The inflorescence of *Ficus* is technically known as a syconium but, for simplicity, it is called a fig in the descriptions and key below. It consists of an urceolate receptacle, mostly globose, bearing on its inner surface unisexual flowers; the entrance to the cavity containing the flowers, the *ostiole*, is closed by bracts, such that, in principle, only the highly specialized pollinators can enter. The syconium bears various types of bracts:

basal bracts: usually in a whorl of 3 (or 2) subtending the receptacle (Fig. 6. 1–7).

peduncular bracts: mostly 3, \pm scattered on the peduncle, common in *Ficus* subg. *Sycidium* (Fig. 6)

ostiolar bracts: closing (\pm) off the entrance to the interior of the syconium (Fig. 6. 1–7).

apical bracts: surrounding the ostiole (Fig. 6. 7).

lateral bracts: between basal and apical bracts, as in *F. beccarii* (Fig. 6.6 and 6.7).

interfloral bracts: among the flowers, only in *Ficus* subg. *Pharmacosyceae* and *Ficus* subg. *Urostigma* (Fig. 6. 4).

bracteoles: subtending (and enclosing) staminate flowers, only in *Ficus* subg. *Sycomorus* (Fig. 6.8).

internal hairs can often be found, most commonly in dioecious species (Fig. 6.7).

Position of syconia on the plant.— Syconia are mostly **axillary** (Fig. 7.1), usually in pairs, less commonly solitary, or more than two together on minute short-shoots. In some species (with seasonal growth), figs are usually borne below the leaves on the previous season’s growth (e.g., *F. lamponga*; Fig. 7.2). Axillary short-shoots may persist and continue to develop on older wood (**ramiflory**; Fig. 7.3; e.g., in *Ficus* subsect. *Urostigma*). Syconia may only or mainly be borne on (main) branches and trunk (**cauliflory**; e.g., in *Ficus* subg. *Sycomorus*; Fig. 7.4 and 7.5), sometimes only at the base of the trunk. Syconia may be borne only or predominantly on stolon-like branches (with long internodes and roots) departing from the base of the trunk (**stoloniflory**; in spp. of *Ficus* subg. *Sycomorus*; Fig. 7.6); the branches may become 10 m long, leaf-bearing, orthotropic and, thus, establish new individuals.

Leaf.— Leaf dimorphism in relation to age is often found and mostly clearly seen in the lobing of the lamina and the length of the petiole. The lamina is (nearly) symmetrical in most groups, in *Ficus* subg. *Synoecia*, at least in the adult state. The lamina is often asymmetrical in *Ficus* subg. *Sycidium* and *Ficus* subg. *Sycomorus*.

Venation.— The venation of the lamina varies from scalariform, with veins in the intercostal region **scalariform** (perpendicular to lateral veins and parallel) to reticulate to (largely) parallel

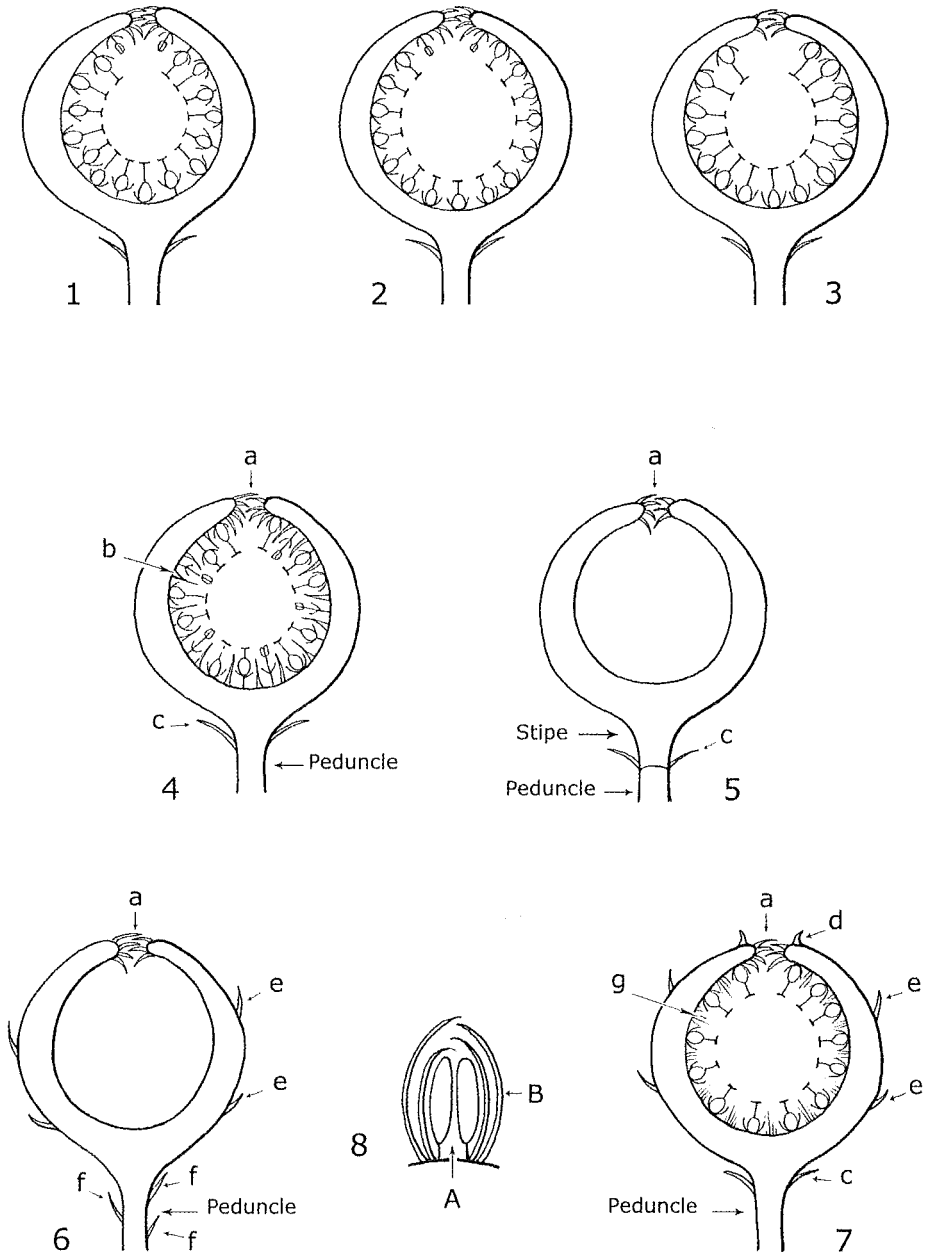


Fig. 6. Schematic drawings of syconia and their bracts. 1. Syconium of a monoecious species, with staminate flowers and both short- and long-styled pistillate flowers. 2. Syconium of a dioecious species with staminate flowers and short-styled pistillate flowers, not producing seeds. 3. Syconium of a dioecious species with long-styled pistillate flowers, producing seeds. 4. Pedunculate syconium of a monoecious species with (a) ostiolar bracts, (b) interfloral bracts, and (c) basal bracts. 5. Pedunculate syconium with stipe, (a) ostiolar bracts and (c) basal bracts. 6. Pedunculate syconium with (a) ostiolar bracts, (e) lateral bracts, and (f) peduncular bracts. 7. Pedunculate syconium with (a) ostiolar bracts, (c) basal bracts, (d) apical bracts, (e) lateral bracts, and (g) internal hairs. 8. Staminate flower (A) enclosed by two bracteoles (B). Drawn by Hendrieke Berg.

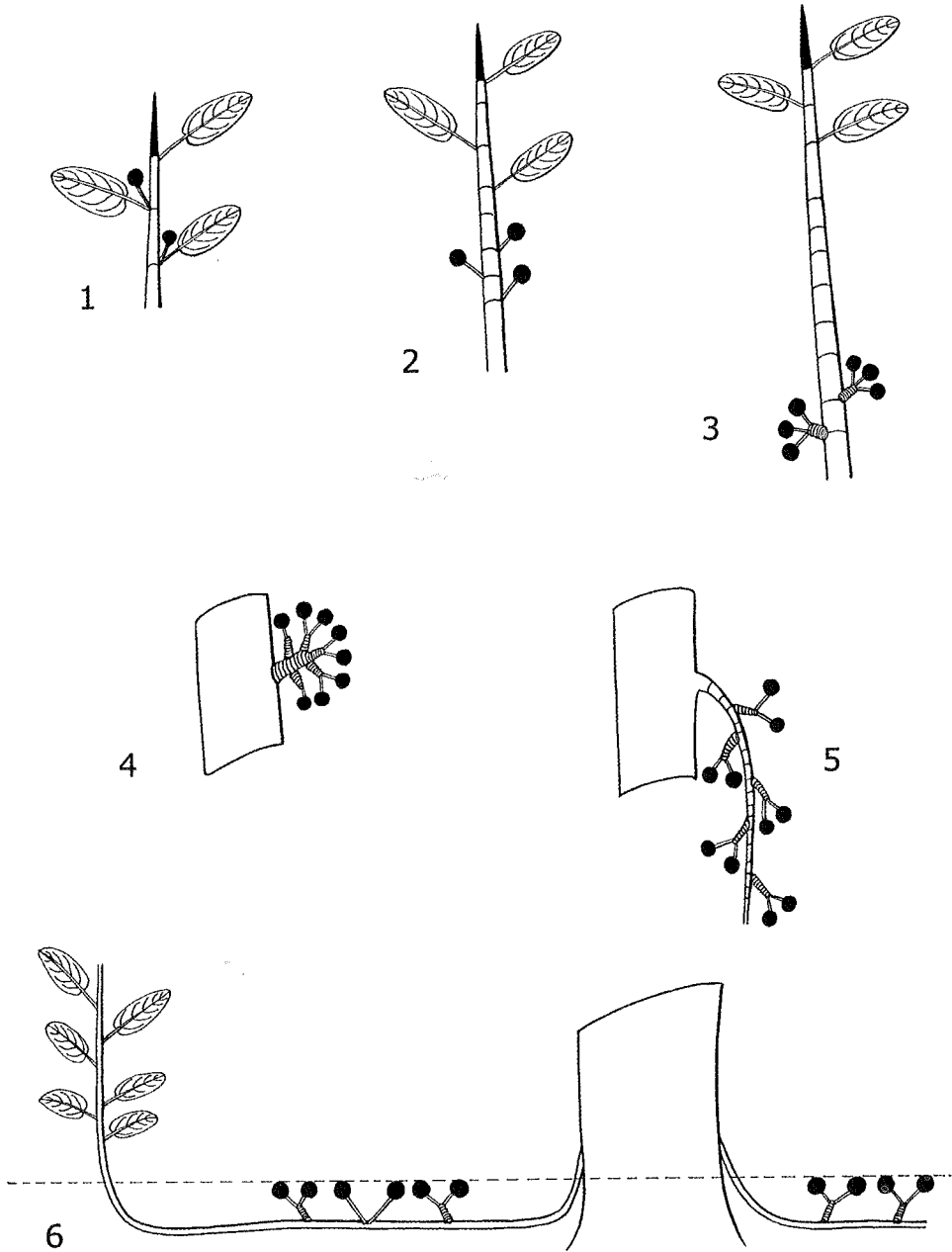


Fig. 7. Position of figs on the tree. 1. Axillary. 2. Just below the leaves on previous season's growth. 3. On spurs on the older wood (ramiflory). 4. On short leafless branchlets with short internodes (or woody tubercles) on the main branches and/or trunk (cauliflory). 5. On leafless branchlets with long internodes on the main branches and/or the trunk (cauliflory). 6. On leafless rooting branchlets with long internodes departing from the base of the trunk (stoloniflory). Drawn by Hendricke Berg.

to the lateral veins. The basal lateral veins are often distinct in their length and/or the angle at which they depart from the midrib; basal lateral veins are unbranched or branched. Other lateral veins may be furcate far from the margin.

Waxy glandular spots.— Nearly all species have glandular spots, in fresh material often covered by a waxy layer, and in dry material visible as dark-coloured spots. These spots occur on various places on the lamina, on the base of the petiole, and on the nodes of leafy twigs. In most (in Asia all) species of *Ficus* subg. *Urostigma* a single glandular spot is found at the base of the midrib beneath (Fig. 8.1). In other subgenera the glands occur mostly in pairs, namely in the axils of the lamina (Fig. 8.7), or the axil of another lateral vein (Fig. 8.8) of the basal lateral veins (Fig. 8.2); in strongly asymmetrical laminae there is only one in the axil at the broad side of the lamina (Fig. 8.7). Additional, usually smaller glandular spots can be found in the axils of other lateral veins or in the axils of branches or furcations of lateral veins (Fig. 8.3). In *Ficus* sect. *Sycocarpus* the spots are mostly absent from the axils of the basal lateral veins and are thus present in those of other lateral veins, but moreover, often (also) on the nodes of leafy twigs (Fig. 8.4). In *F. deltoidea* the spots are found in the furcation of the midrib (or also in the furcations of its branches (Fig. 8.6)). In some species of *Ficus* subg. *Ficus*, glandular spots are found at the base of the petiole (Fig. 8.5).

Monoecy – dioecy.— All species of *Ficus* subg. *Pharmacosyceae* and *Ficus* subg. *Urostigma* and of a subsection of *Ficus* subg. *Sycomoraceae*, which is represented in continental Asia only by *F. racemosa*, are monoecious. The syconia contain staminate flowers and pistillate flowers with differences in style-length (heterostyly). One can recognise short-styled flowers (which are mostly pedicellate) and long-styled flowers (which are usually sessile). Transitions between the categories occur (imperfect heterostyly). The other subgenera and most species of *Ficus* subg. *Sycomoraceae* are dioecious. Syconia of one plant contain staminate flowers and short-styled flowers, those of another plant only long-styled flowers (or also neuter flowers, substituting staminate flowers). The two categories of style-length do not show overlap (perfect heterostyly). Whereas in monoecious species, short-styled flowers can also produce seeds, this is not the case in dioecious species.

Staminate flowers.— These are either ostiolar or dispersed, arranged near the ostiole or among the pistillate flowers respectively. The number of stamens varies from one to four.

REPRODUCTION

Pollination.— *Ficus* has a unique pollination system: it is based on breeding on ovaries and carried out by a group of small wasps, Agaoninae, not involved in other Angiosperms. In most cases there is a species-specific relationship between insect and plant species. The pollination wasps die inside the syconium and the next generation of female wasps carry pollen out of it. The Agaoninae show strong sexual dimorphism: the females have wings, well-developed eyes and antennae, which are absent from the males. These, by contrast, have strong biting mouth parts. Females carrying pollen enter the fig cavity through the barrier of ostiolar bracts, usually losing their wings, and (parts) of their antennae. They lay eggs in ovules which are accessible, that is, in principle, those of the short-styled flowers. While ovipositing or trying to do so, the wasp deposits pollen on the stigmas and fertilization can take place, resulting in the development of tissues into seeds, or in their being consumed by the larvae of the pollinator. After some weeks or months the larvae have finished their development, the seeds are ripe, and the stamens ready

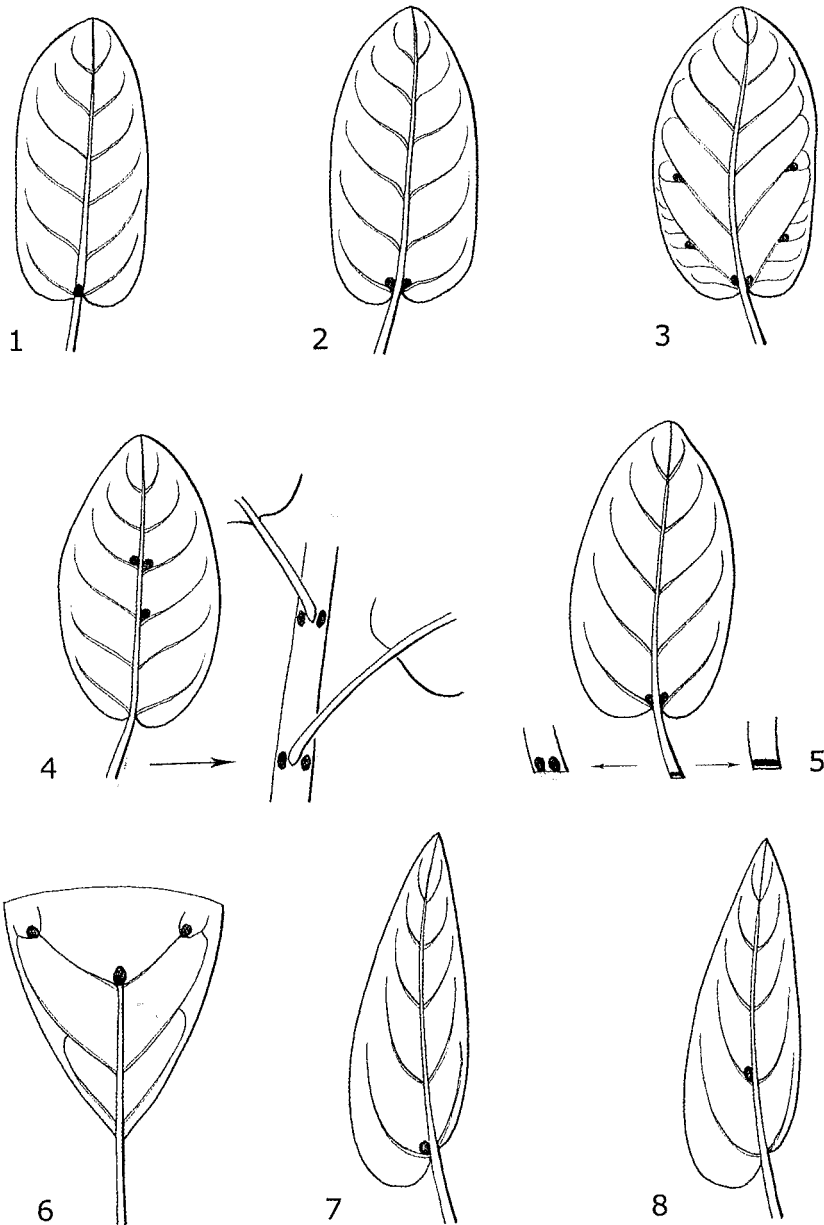


Fig. 8. Position of waxy glands below the lamina of symmetrical and asymmetrical leaves, the petiole, and leafy twigs. 1. A single one at the base of the midrib (subg. *Urostigma*). 2. In the axils of the basal lateral veins. 3. In the axils of basal lateral veins and in furcations of lateral veins. 4. In the axils of lateral veins in the middle of the lamina, often in combination with glands on the nodes (sect. *Sycocarpus*). 5. In the axils of basal lateral veins and on the base of the petiole, two (*F. glandulifera*) or one (*F. lamponga*). 6. In furcations of the midrib and lateral veins (*F. deltoidea*). 7. A single waxy gland in the axil of the basal lateral veins at the broad side of an asymmetric lamina. 8. A single waxy gland in the middle of the lamina at the broad side of an asymmetric lamina. Drawn by Hendrieke Berg.

to expose pollen. The male insects leave the “gall-ovaries” first by biting a hole through the wall of the fruit. They open “gall-fruits” containing females and copulate. The female insects freed from their cages start to collect pollen in, for example, their pollen pockets. Those species which do not have organs to store pollen are dusted with pollen which becomes stored, for example, in slits between the abdomen segments. After copulation, the males start to make tunnels through the wall of the syconium, often through the ostiolar bracts. Through these tunnels the females can leave the syconium undamaged. After having left the syconium, the females disperse partly by being blown on the wind, partly by flying. When the females detect chemical compounds emitted by the *Ficus* species with which they are associated, they look for the ostiole to enter the syconium. Some pollinator species pollinate actively, collecting pollen in pockets and depositing it on stigmas. In the case of passive pollination, the pollinator receives and deposits pollen passively. *Ficus* species with passive pollination can often be recognised by having more numerous (and larger) stamens. In syconia of monoecious species, pollinators lay eggs solely or mainly in short-styled flowers, which implies that, in principle, 50 % of the female flowers are used for reproduction of the pollinator and the others for reproduction of the plant species, and thus reproduction of both organisms is coupled in space and time. In dioecious species, the insects reproduce in the syconia with short-styled pistillate flowers and staminate flowers and the plants reproduce by means of the syconia with long-styled flowers (the ovules of which cannot be reached in attempts to oviposit). In dioecious species the frequency of production of figs with short-styles has to comply with the needs of the pollinator and the period of production of those with long-styled flowers can be adapted to the needs of the plant species in relation to dispersal of seeds and of establishment. As the life-span of the female insects is short, at most some days, they have to find figs with receptive stigmas during that short period. This implies that syconia in receptive state are available throughout the year in a population of a *Ficus* species.

Phenology and dispersal.— In the monoecious *Ficus* subgenera *Pharmacosycea* and *Urostigma*, individuals flower simultaneously with all syconia at the same stage of development but, in populations, they flower asynchronously. In deciduous monoecious species, syconia are generally borne below the leafy parts, such as on the previous season’s growth or on spurs on older wood, making production of syconia independent from leafless periods and formation of new leaves. Cauliflorous and stoloniflorous species may flower continuously. Presence of syconia the year round provides a continuous (largely season-independent) food-source for a large assortment of arboreal animals. These frugivorous animals play a dominant role in the dispersal of the diaspores.

SUBDIVISION

The genus can be subdivided into six subgenera (Berg, Blumea 48: 168–179, 2003). *Ficus* subg. *Ficus*, *Ficus* subg. *Pharmacosycea*, *Ficus* subg. *Sycidium*, *Ficus* subg. *Sycomorus*, *Ficus* subg. *Synoecia*, and *Ficus* subg. *Urostigma*. The species are arranged alphabetically under these subgenera in the present treatment.

KEY TO THE SUBGENERA

1. Plants monoecious; staminate and pistillate flowers together in the figs, the latter with styles of different length
2. Trees or shrubs with more or less extensive secondary aerial root systems – hemi-epiphytes (so-called stranglers), mostly establishing in the forest canopy, or hemi-epilithic, rarely terrestrial climbers; lamina with a single waxy gland at the base of the midrib beneath

VI. *Ficus* subg. *Urostigma*

2. Trees without secondary root systems – terrestrial, never climbing; lamina with waxy glands at least in the axils of the basal lateral veins or absent
3. Trees cauliflorous
3. Trees with figs axillary or just below the leaves
1. Plants dioecious; plants bearing figs with staminate flowers and short-styled flowers with styles of the same length, or figs with pistillate long-styled flowers with styles of the same length (or also mostly inconspicuous neuter flowers)
4. Root-climbers with short roots to attach stems to tree trunks or rocky surfaces; leaves distichous, those on the climbing parts different in shape and often also in size from those on non-rooting, fig-bearing branches
4. Non-climbing trees or shrubs (sometimes epiphytic or hemi-epiphytic), or if climbers, then without clear leaf dimorphy and figs not produced on more or less distinct leafy branches
5. Shrubs or tree(let)s with the leaves spirally arranged; lamina symmetrical; waxy glands often only in the axils of both basal lateral veins, or also at the base of the petiole; figs in the leaf axils or just below the leaves on previous season's growth
5. Shrubs, trees, climbers or, if hemi-epiphytes, then establishing to some metres from the forest floor; leaves often distichous or subopposite; lamina mostly more or less asymmetrical; waxy glands often absent from the axils of (both) lateral veins, but bilaterally or unilaterally in the axils of other lateral veins; figs often on spurs, woody tubercles, leafless branchlets on branches and/or the trunk
6. Stipules semi-amplexicaul or fully amplexicaul; figs axillary or several together on short-spurs (on small branches); lamina often drying greyish-green; figs with basal bracts often scattered on the peduncle; figs usually small, at most ca. 1 cm diam.
6. Stipules always fully amplexicaul; figs mostly on leafless branchlets on main branches and on the trunk or stolon-like branches at the base of the trunk; lamina usually drying brown; figs with the basal bracts in whorls; figs often large, mostly at least 1 cm diam.

IV. *Ficus* subg. *Sycomor*: 10. *Ficus racemosa*II. *Ficus* subg. *Pharmacosycea*V. *Ficus* subg. *Synoecia*I. *Ficus* subg. *Ficus*III. *Ficus* subg. *Sycidium*IV. *Ficus* subg. *Sycomor*I. *FICUS* SUBGENUS *FICUS*

Terrestrial trees or shrubs, mostly hairy on various parts. *Leaves* spirally arranged; lamina chartaceous to subcoriaceous, symmetrical, entire or palmately incised, the margin often dent(icul)ate, the tertiary venation often scalariform or subscalariform, the waxy glands mostly in the axils of the basal lateral veins alone, in some species also present at the base of the petiole. *Plants* dioecious. *Figs* in the leaf axils or just below the leaves (on previous season's growth).

The subgenus comprises ca. 60 species, of which 18 indigenous and *F. carica* in cultivation as a fruit tree.

Subdivision.— The subgenus is subdivided into two sections:

A. *Ficus* sect. *Ficus* which is subdivided into subsect. *Ficus* with three species, including *Ficus carica*, cultivated in Thailand, and subsect. *Frutescentiae*, represented in Thailand by (small) shrubs and trees, showing intermittent growth and “*Terminalia*-branching” (see above). In this subsection, the proximal nodes do not bear normal leaves, only stipules which are usually not fully amplexicaul (and never become so in *Ficus ischnopoda* and *F. thailandica*). The indumentum is mostly ± inconspicuous, short, sparse or absent. The lamina is entire with waxy glands in the axils of the basal lateral veins (or furcations of the midrib in *Ficus deltoidea*). The tepals of the pistillate flowers are dark red, ciliolate or with 1–2 hairs at the apex. This subsection comprises ca. 25 species, most of them elements of the Sino-Himalayan region; eight species are indigenous: *Ficus abelii*, *F. bistipulata*, *F. deltoidea*, *F. ischnopoda*, *F. neriifolia*, *F. oleifolia*, *F. pyriformis*, and *F. thailandica*.

B. *Ficus* sect. *Eriosycea* which is also subdivided into two subsections of which only subsect. *Eriosycea* is represented in Thailand. It comprises trees or shrubs often with conspicuous indumentum, often brown. The leaves often palmately lobed to divided in juvenile and/or adult state. Tepals of pistillate flowers dark red and glabrous. The subsection comprises 33 species, of which 10 are indigenous: *Ficus cambodica*, *F. chartacea*, *F. fulva*, *F. glandulifera*, *F. grossularioides*, *F. hirta*, *F. lamponga*, *F. mollissima*, *F. oreophila*, and *F. triloba*.

KEY TO THE SPECIES OF FICUS SUBG. FICUS

1. Lamina with felted-tomentose indumentum covering areoles and vein reticulation beneath 9. *F. grossularioides*
 1. Lamina without such indumentum beneath, if areoles and vein reticulation invisible, then not covered by felted indumentum
2. Lamina (in adult plants) palmately incised
3. Indumentum on leafy twigs and lamina white
4. Fig 0.2–0.5 cm pedunculate 4. *F. carica*
 4. Figs sessile 10. *F. hirta*
3. Indumentum on leafy twigs and lamina brown
5. Lateral veins 4–5(–6) pairs; stipules (1–)1.5–5 cm long; petiole (2–)5–15 cm long 19. *F. triloba*
 5. Lateral veins (5–)6–9 pairs; stipules 0.5–1.5(–2) cm long; petiole 1.5–4(–7) cm long 10. *F. hirta*
2. Lamina entire or pinnately incised
6. Stipules lateral to semi-amplexicaul; plants mostly rheophytic 11. *F. ischnopoda*
 6. Stipules fully amplexicaul, sometimes lateral on the first (leafless) nodes of a branch; plants not or sometimes rheophytic
7. Leafy twigs (sub)glabrous
8. Tertiary venation (sub)scalariform
9. Lateral veins usually 10–18 pairs; stipules 1–2 cm long 14. *F. neriifolia*
 9. Lateral veins usually 4–7 pairs; stipules 0.3–1(–1.2) cm long 5. *F. chartacea*
8. Tertiary venation (sub)reticulate
10. Epidermis of petiole flaking off; lamina obtriangular to oblanceolate; often with waxy glands in the furcation(s) of the midrib beneath 6. *F. deltoidea* subsp. *deltoidea*
 10. Epidermis of petiole persistent; lamina elliptic to oblong; waxy glands, if present, in the axils of the basal lateral veins 15. *F. oleifolia* subsp. *intermedia*
7. Leafy twigs hairy
11. Stipules lateral 18. *F. thailandica*
 11. Stipules fully amplexicaul, sometimes lateral on the first (leafless) nodes of a branch
12. Base of the petiole with 1 or 2 waxy glands
13. Waxy gland at the base of the petiole, one and band-shaped; lateral veins usually 10–13 pairs 12. *F. lamponga*
 13. Waxy glands at the base of the petiole 2 and almost circular; lateral veins usually 4–8 pairs
14. Figs pedunculate
15. Stipules 0.5–0.8 cm long; basal lateral veins to 1/6–1/4 the length of the lamina 8. *F. glandulifera*
 15. Stipules 0.8–3.2 cm long; basal lateral veins to 1/3–2/3 the length of the lamina 7. *F. fulva*
14. Figs sessile
16. Lateral veins 4–5(–6) pairs; stipules (1–)1.5–5 cm long; petiole (2–)5–15 cm long 19. *F. triloba*
 16. Lateral veins (5–)6–9 pairs; stipules 0.5–1.5(–2) cm long; petiole 1.5–4(–7) cm long 10. *F. hirta*
12. Waxy glands absent from the base of the petiole
17. Stipules glabrous or ciliolate and/or sparsely hairy on the keel and/or the base
18. Lateral veins usually 6–9 pairs, the basal pair to 1/10–1/6 the length of the lamina
19. Hairs on the petiole only or mainly adaxially; fig receptacle 1–1.5 cm diam. 17. *F. pyriformis*
 19. Hairs on petiole all round; fig receptacle usually 0.6–1 cm diam. 1. *F. abelii*
18. Lateral veins usually 4–6 pairs, the basal pair to 1/5–1/3 the length of the lamina 2. *F. bistipulata*
17. Stipules densely hairy
20. Basal lateral veins to 1/5–2/3 the length of the lamina 16. *F. oreophila*
 20. Basal lateral veins to 1/2–2/3 the length of the lamina
21. Stipules 0.5–0.6 cm long; petiole 0.5–1.5(–2.5) cm long 3. *F. cambodica*
 21. Stipules 0.8–2.8 cm long; petiole usually 3–14 cm long
22. Figs mostly pedunculate; ostiole 2–4 mm diam. 7. *F. fulva*
 22. Figs (sub)sessile; ostiole c. 8 mm diam. 13. *F. mollissima*

FIC1. *Ficus abelii* Miq., Ann. Bot. Mus. Lugd.-Bat. 3: 281. 1867; Miq., London J. Bot. 7: 437, t. 6A. 1848, sub. *F. pyriformis*; Corner, Gard. Bull. Singapore 21: 43. 1965.— *F. pyriformis* Hook. & Arn. var. *abelii* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 158, t. 200A. 1888; Gagnep., Fl. Indo-Chine 5: 798. 1928.— *F. subpyriformis* Miq., Ann. Bot. Mus. Lugd.-Bat. 3: 229. 1867.— *F. pyriformis* Hook. & Arn. var. *subpyriformis* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 158, t. 201B. 1888.— *F. schinzii* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 550. 1910.

Shrub to 3 m tall, with internodes distinctly or hardly different in length and leaves \pm tufted at the ends of branches. *Leafy twigs* 1.5–2.5 mm thick, \pm densely whitish puberulous; periderm persistent. *Leaves* in spirals; lamina subobovate or oblanceolate to linear, (1–)4–11 by (0.4–)0.6–2.5 cm, (sub)coriaceous, apex subacuminate to subacute, base obtuse, margin entire, \pm revolute, at least towards the base; upper surface white puberulous on the midrib, smooth, lower surface white puberulous also on the smaller veins, smooth to scabridulous; cystoliths only below; lateral veins (6–)8–10(–12 pairs, the basal pair to 1/8–1/6 the length of the lamina, unbranched, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.3–0.7 cm long, white puberulous, equally dense all round, the epidermis flaking off; stipules 0.2–0.4 cm long, lateral to semi-amplexicaul on parts with long internodes, fully amplexicaul on parts with short internodes, ciliolate and white puberulous mainly on the keel or only at the apex, caducous (or subsistent). *Figs* axillary (or just below the leaves), solitary; peduncle 0.3–0.8 cm long; basal bracts 3, 1–2 mm long, glabrous; receptacle ellipsoid or obovoid to subpyriform, 0.6–1(–1.3) cm diam. when dry, sometimes to 0.4 cm long stipitate, white puberulous, orange to red or purple at maturity, apex often slightly protracted, ostiole 2–3 mm in diam.; internal hairs short, few. *Tepals* dark red. *Ovary* dark red.

T h a i l a n d.—NORTHERN: Chiang Mai (Mae Wang, Mae Ya falls, Doi Inthanon, Tat Noi).

D i s t r i b u t i o n.—NE India, NE Bangladesh, Burma, S China (type), Laos, Vietnam.

E c o l o g y.—Dry evergreen forest, along stream, to 1,000 m alt.

N o t e s.—This species resembles *Ficus ischnopoda* from which it can be distinguished by the fully amplexicaul stipules in parts of leafy twigs with short internodes, the exfoliating epidermis of the petiole, and the smaller figs. It also resembles *Ficus pyriformis* from which it can be distinguished by the hairs being equally dense all round the petiole and the smaller figs.

It is remarkable that both *F. abelii* and *F. pyriformis* are represented in Thailand by a single collection, whereas the related *F. ischnopoda* with ecological similarities is abundantly represented.

FIG2. *Ficus bistipulata* Griff., Not. Pl. Asiat. 4: 398. 1854; Griff., Icon. Pl. Asiat. 4: t. 559. 1854; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 180. 1888; C.C. Berg, Thai Forest Bull. (Bot.) 35: 14. 2007.—*F. silhetensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 223, 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 154, t. 194. 1888.—*F. leekensis* Drake, J. Bot. 10: 212. 1896; Gagnep., Fl. Indo-Chine 5: 797. 1928.—*F. cyanus* H. Lév. & Vaniot, Mem. Acad. Barcelona 6: 149. 1907.—*F. cyanus* H. Lév. & Vaniot var. *viridescens* H. Lév. & Vaniot, Mem. Acad. Barcelona 6: 149. 1907.—*F. gasparriniana* Miq. var. *viridescens* (H. Lév. & Vaniot) Corner, Gard. Bull. Singapore 17: 428. 1960.—*F. congesta* H. Lév., Fl. Kouy-Tchéou 429. 1914/1915.—*F. vaniotii* H. Lév., Fl. Kouy-Tchéou: 434. 1914/1915, fide Corner, Gard. Bull. Singapore 21: 42. 1965.—*F. comata* Hand.-Mazz., Anz. Akad. Wien, Math.-Nat. 58: 227. 1921, fide Corner, Gard. Bull. Singapore 21: 42. 1965.

Shrub to 5 m (or treelet to 6 m) tall, with internodes more or less clearly different in length and then the leaves \pm tufted at the ends of branches. *Leafy twigs* 1–2.5(–3) mm thick, \pm densely whitish puberulous to hispidulous, smooth to \pm scabrous; periderm persistent. *Leaves* spirally arranged; lamina subobovate to obovate or oblong to elliptic, 2–16 by 0.5–5.5 cm, chartaceous, apex acuminate, base obtuse to rounded, margin entire; upper surface white hispidulous to puberulous, \pm scabrous, lower surface densely to sparsely white puberulous to subhispidulous

on the veins, those on the midrib, at least, usually with a thickened and persistent base, scabrous to scabridulous; cystoliths only below; lateral veins 4–7(–8) pairs, the basal pair to 1/5–1/3 the length of the lamina, unbranched, other lateral veins rarely branched or forked away from the margin, tertiary venation loosely scalariform to reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.3–1.2 cm long, 1–1.5 mm thick, whitish puberulous to subhispidulous, ± scabrous to smooth, the epidermis persistent; stipules 0.3–1 cm long, amplexicaul or semi-amplexicaul (in twig parts with relatively long internodes), glabrous (or sparsely puberulous at the base and/or the midrib), caducous (or subsistent in tufts at the apices of leafy twigs). *Figs* axillary or just below the leaves, in pairs (or solitary), (sub)sessile (or to 0.5 cm long pedunculate); basal bracts 3, 1–1.5 mm long, glabrous; receptacle subglobose, 0.4–0.9 cm diam. when dry, non-stipitate or to 0.2 cm long stipitate, sparsely to densely puberulous, at maturity red to dark purple, apex convex to slightly protracted, ostiole ca. 2 mm diam., slightly prominent, the outer ostiolar bracts patent; internal hairs sparse, short. *Tepals* dark red, glabrous.

T h a i l a n d.—NORTHERN: Chiang Mai (Tat Noi).

D i s t r i b u t i o n.—Sikkim, NE India (type), S China, Burma, Laos, Vietnam.

E c o l o g y.—Evergreen forest, near streams, ca. 1,000 m (elsewhere 500–2,800 m).

N o t e s.—This species shows similarities to *F. abelii* Miq., from which it differs in the persistent epidermis of the petiole and the smaller number of lateral veins.

The peduncle is to 0.5 cm long in the collection from Thailand, whereas elsewhere at most to 0.3 cm long, if pedunculate.

The type of *Ficus gasparriniana* Miq. belongs to one of the forms of the variable *F. neriifolia* Sm. The types of *Ficus bistipulata* Griff. and *F. silhetensis* Miq. belong to the same species of which numerous collections have been identified as *F. gasparriniana* Miq. var. *viridescens* (H. Lév. & Vaniot) Corner, Gard. Bull. Singapore 17: 428. 1960, including types of several species listed by Corner (1965) under this variety, in some cases incorrectly so. The materials Corner (1960) included in the varieties *Ficus gasparriniana* var. *esquirolii* (H. Lév. & Vaniot) Corner (1960) and var. *laceratifolia* (H. Lév. & Vaniot) Corner (1960), represent distinct species.

Ficus esquirolii H. Lév. & Vaniot (1907) is distinct in the acute (to subacuminate) apex, the more numerous lateral veins (than in the narrow-leaved form of *F. gasparriniana*), the tendency towards repand margins of the lamina, the usually hairy stipules, the usually distinctly pedunculate figs, the hairy apices of the tepals. It is found in southern China. *Ficus laceratifolia* H. Lév. & Vaniot (1907) is distinct in the lyrate and mostly dentate lamina, the relatively long petiole, less conspicuous (shorter and often sparser) indumentum on the lamina beneath, the stipules being hairy on the keel, and probably also the pale tepals; the figs are mostly solitary, often distinctly pedunculate, the receptacle often larger. This species is known from southern China and from Vietnam.

Ficus silhetensis Miq. var. *annamica* Gagnep. (1928) is based on a collection of *Ficus tuphapensis* Drake (1896).

It is not clear why Corner cited *F. bistipulata* both under *F. gasparriniana* var. *viridescens* and *F. glaberrima* (Corner, 1965: 17, 42) as the type, *Griffith 4616* (K) from NE India, does not consist of different elements.

FIG3. *Ficus cambodica* Gagnep., Notul. Syst. (Paris) 4: 87. 1927; Fl. Indo-Chine 5: 825. 1929; C.C. Berg, Thai Forest Bull. (Bot.) 35: 15. 2007.—*F. annamensis* Gagnep., Notul. Syst. (Paris) 4: 85. 1927, Fl. Indo-Chine 5: 757. 1928.—*F. tuphapensis* Drake var. *annamensis* (Gagnep.)

Corner, Gard. Bull. Singapore 17: 434. 1960.— *F. hirta* Vahl var. *brevipila* Corner, Gard. Bull. Singapore 17: 439. 1960. Plate LVIII: 3.

Tree to 15 m tall, with intermittent growth. *Leafy twigs* 2–3 mm thick, densely brown puberulous; periderm persistent. *Leaves* in spirals; lamina subobovate to oblong, (3–)5–17 by (1.5–)2.5–7.5 cm, chartaceous, apex acuminate, base cuneate to obtuse (to rounded), margin entire (to faintly denticulate towards the apex); upper surface puberulous to hispidulous on the main veins, ± scabrous, lower surface rather densely brown puberulous, the veins smooth; cystoliths absent (or sparse and only above); lateral veins 4–5 pairs, the basal pair to 1/2–2/3 the length of the lamina, close to the margin and unbranched (or more distant and branched), tertiary venation subscalariform to reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.5–1.5(–3.5) cm long, 1–2 mm thick, densely brown puberulous, the epidermis persistent; stipules fully amplexicaul, 0.5–0.6 cm long, brown (to pale yellowish) subsericeous, caducous. *Figs* below the leaves on previous season's growth, in pairs or solitary, subsessile; basal bracts 3, 1–1.5 mm long, puberulous; receptacle subglobose to ovoid, when dry 0.5–0.7(–1) cm diam., to ca. 1 cm diam. when fresh, rather densely puberulous, without lateral bracts, colour at maturity unknown, apex convex, ostiole 2–3 mm diam., almost flat to umbonate, the upper ostiolar bracts appressed-puberulous; internal hairs sparse, long, whitish. *Tepals* dark red, glabrous. *Stamens* 2. *Style* of long-styled flowers hairy.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Nan; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Trat; PENINSULAR: Krabi.

D i s t r i b u t i o n.—S China, Vietnam, Cambodia (type).

E c o l o g y.—Dry evergreen and evergreen forests, to 1750 m.

V e r n a c u l a r.—Ma dua khon (มะเดื่อขน) (Chiang Mai).

N o t e s.—This species was reduced to a variety of *F. tuphagensis* Drake, a species from Vietnam and SE China (Hainan), which differs in the semi-amplexicaul to lateral stipules and the mostly rounded to subcordate base of the lamina.

This species is closely related to the submontane *Ficus oreophila* which can be distinguished from *F. cambodica* specimens with pedunculate figs by the smooth upper surface of the lamina and the shorter lateral veins.

This species shows similarities to (and has been mixed up with) *F. fulva*, which is distinct, e.g., in the rounded to cordate base of the lamina, by the distinctly branched basal lateral veins and other lateral veins branched or forked away from the margin, the clearly denticulate margin of the lamina, and the longer basal bracts.

Collection *Maxwell 97-50* from Mae Hong Son is somewhat distinct by the petiole to 2.5 cm long, the branched lateral veins, and the larger fig receptacle, being ca. 1 cm diam.

FIG4. *Ficus carica* L., Sp. Pl.: 1059. 1753; Condit, The Fig, Chronica Bot. Co.: 1–222. 1948.2; Condit, Hilgardia 23: 323–538. 1955; Condit & Enderud, A Bibliography of the Fig, Hilgardia 25: 1–663. 1956; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 88. 2005.

Tree to 10 m tall. *Leafy twigs* 4–7 mm thick, puberulous to subtomentose; periderm persistent. *Leaves* spirally arranged; lamina cordiform to ovate and 3–5–7(–11) palmately lobed to palmatifid, (4–)10–20(–35) by (4–)10–20(–35) cm, subcoriaceous, apex rounded to obtuse, base cordate to truncate, margin dentate, crenate or subentire; upper surface hispidulous (to subglabrous), ± scabrous (to smooth), lower surface hirtellous to subtomentose on the veins;

cystoliths only below; lateral veins 6–12 pairs, the basal pair to $1/2$ – $2/3$ the length of the lamina, branched, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins; petiole 4–12 cm long, puberulous, the epidermis persistent; stipules 0.5–1.5 cm long, ciliolate, also puberulous on the keel, or glabrous, caducous. *Figs* axillary or also below the leaves on previous season's growth, solitary; peduncle 0.2–2.5 cm long; basal bracts 3, 2–3.5 mm long, ciliolate or also sparsely puberulous outside; receptacle (sub)pyriform to subglobose, 1.5–4 cm diam. when dry, 2.5–7 cm diam. when fresh, puberulous, purple at maturity, apex convex or flat, ostiole ca. 3 mm diam., \pm prominent; internal hairs abundant, short.

T h a i l a n d.— First introduced by a royal project for cultivated plants in Chachoengsao, then distributed throughout the country.

D i s t r i b u t i o n.— Mediterranean to Afghanistan, widely cultivated in subtropical conditions.

E c o l o g y.— Relatively cool climate conditions.

U s e s.— Cultivated as a fruit tree or as an ornamental tree.

V e r n a c u l a r.— *Ma duea farang* (มะเดื่อฝรั่ง) (Bangkok); Fig tree.

FIG5. *Ficus chartacea* (Wall. ex Kurz) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 159, t. 203. 1888; Ridl., Fl. Malay Penins. 3: 350. 1924; Gagnep., Fl. Indo-Chine 5: 789. 1928; Dict. Econ. Prod. Malay Penins.: 1006. 1935; Corner, Philos. Trans., Ser. B, 259: 357, 373, f. 17. 1970; Kochummen, Tree Fl. Malaya 3: 142. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 268. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 105. 2005.— *F. lamponga* Miq. var. *chartacea* Wall. ex Kurz, Forest Fl. Burma 2: 451. 1877.— *F. chartacea* (Wall. ex Kurz) King var. *torulosa* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 159. 1888.— *F. chartacea* (Wall. ex Kurz) King var. *lanceolata* Corner, Gard. Bull. Singapore 17: 433. 1960. Plate LIX: 1–2.

Shrub (sometimes scandent) or tree to 12 m tall; milky sap sometimes watery. *Leafy twigs* 1–2.5 mm thick, (sub)glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong, elliptic or (sub)obovate (to lanceolate or linear-lanceolate), 4–16(–24) by (0.5–)1–9 cm, chartaceous (to subcoriaceous), apex acuminate to caudate, base cuneate (to rounded), margin entire (or sparsely denticulate); upper surface glabrous or sparsely appressed-puberulous, smooth, lower surface rather sparsely appressed on the veins or glabrous, on the midrib occasionally subhirtellous; cystoliths absent; lateral veins 4–7 pairs, in lanceolate laminas to 18 pairs, the basal pair to $(1/10)$ – $1/4$ – $1/3$ (– $1/2$) the length of the lamina, unbranched, tertiary venation loosely scalariform; waxy glands in the axils of the basal lateral veins, sometimes also in the axils of other lateral veins; petiole 0.5–3.5(–6) cm long, (sub)glabrous or appressed-puberulous, the epidermis persistent; stipules 0.3–1.2 cm long, only ciliolate, caducous. *Figs* axillary and/or below the leaves on previous season's growth, in pairs or solitary, with a peduncle 0.1–0.4(–1) cm long (or sessile); basal bracts 3, ca. 1 mm long, only ciliolate; receptacle subglobose, 0.4–0.8 cm diam. when dry, 0.6–1.2 cm diam. when fresh, sometimes to 0.1 cm long stipitate, sparsely minutely puberulous or glabrous, yellow to orange (or scarlet) at maturity, apex convex, ostiole 1.5–2 mm diam., slightly prominent; internal hairs abundant to sparse, whitish.

T h a i l a n d.— NORTHERN: Nan, Tak; NORTH-EASTERN: Nong Khai; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; SOUTH-EASTERN: Chon Buri, Chanthaburi, Trat; PENINSULAR: Chumphon, Ranong, Surat Thani, Phangnga, Phuket, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Yala, Narathiwat.

Distribution.— Burma (type), S China, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore.

Ecology.— Dry evergreen and evergreen forests, to 1,200 m.

Vernacular.— Duea nok (เดื่อนอก), ma duea thet (มะเดื่อเทศ) (Trat); ma duea khi nok (มะเดื่อขี้nok), ma duea hom (มะเดื่อหอม) (Chanthaburi); duea din (เดื่อดิน) (Nakhon Si Thammarat, Trang); sai nok (ไซnok) (Songkhla); ma duea (มะเดื่อ), ma duea din (มะเดื่อดิน) (Surat Thani); yue-ka-bu-rong (ฮือกาบุรุง) (Malay-Songkhla).

Notes.— Collection *Pooma 1381* from Nan is distinct by the 0.7–1 cm long peduncles. Lateral veins are shorter than normal in lanceolate laminas, but sometimes also relatively in short broader laminas, as in *Niyomdham 5417* from Yala.

FIG6. *Ficus deltoidea* Jack, Mal. Misc. 2: 71. 1822; Merr., J. Arnold Arbor. 33: 225. 1952; Corner, Gard. Bull. Singapore 17: 420. 1960; Kochummen, Tree Fl. Malaya 3: 145. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 90. 2005.— *F. diversifolia* Blume var. *deltoidea* (Jack) Ridl., Fl. Malay Penins. 3: 346 1924.

The species is subdivided into two subspecies of which one is found in Thailand.

subsp. **deltoidea** — *Ficus ovoidea* Jack, Mal. Misc. 2: 71. 1822.— *Urostigma ovoideum* (Jack) Miq., London J. Bot. 6: 581. 1847.— *Ficus retusa* L. var. *ovoidea* (Jack) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 288. 1867.— *F. diversifolia* Blume var. *ovoidea* (Jack) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 140, t. 174D. 1888; Ridl., Fl. Malay Penins. 3: 346. 1924.— *F. diversifolia* Blume, Bijdr. Fl. Ned. Ind.: 456. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 268, 289. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 139, t. 174, 175. 1888.— *Synoecea diversifolia* (Blume) Miq., London J. Bot. 7: 470 1848.— *Ficus lutescens* Desf., Cat. Hort. Paris ed. 3: 413. 1829; Miq., London J. Bot. 7: 453. 1848.— *Erythroyne lutescens* (Desf.) Vis. ex Gasp., Giorn. Bot. Ital. 2: 219. 1844.— *Ficus diversifolia* Blume var. *lutescens* (Desf.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 140. 1888.— *F. ovoidea* Jack var. *lutescens* (Desf.) Kuntze, Rev. Gen. Pl. 1: 627. 1891.— *F. deltoidea* Jack var. *lutescens* (Desf.) Corner, Gard. Bull. Singapore 17: 423. 1960.— *F. deltoidea* Jack var. *borneensis* Corner, Gard. Bull. Singapore 17: 422. 1960; Kochummen, Tree Fl. Sabah & Sarawak 3: 269. 2000. Fig. 9. Plate LX: 1.

Shrub to 3 m tall, epiphytic, epilithic or terrestrial (and then sometimes lianescent?). *Leafy twigs* 1–4 mm thick, glabrous; periderm persistent or flaking off. *Leaves* spirally arranged; lamina obovate to obtriangular or subobovate to oblanceolate (or subobovate), 1–7(–10) by 0.5–6 cm, (sub)coriaceous, rounded to truncate, base (sub)cuneate, margin entire, often ± revolute; both surfaces glabrous; cystoliths only below; venation basically pinnate with (2–)3–8(–9) pairs of lateral veins or with the midrib forked at various distances from the basal pair of lateral veins, tertiary venation reticulate; waxy glands in the axils of the basal lateral veins, in the axils of lateral veins in the middle of the lamina, in the furcation of the midrib, and the furcations or axils of the two branches of the midrib, in total to 5 glands, (or to 6 glands in the axils of the lateral veins in pinnately veined laminas) or absent; petiole 0.2–2(–3) cm long, 1–3 mm thick, glabrous or minutely puberulous, the epidermis flaking off; stipules 0.3–0.6 cm long, ciliolate, caducous. *Figs* axillary, in pairs or solitary; peduncle 0.3–1 cm long; basal bracts 3, 0.5–2 mm long, ciliolate; receptacle globose to ellipsoid, 0.4–1.2 cm diam. when dry, sometimes substipitate, glabrous, yellow to orange or red to dark purple (to black) at maturity, apex convex to ± protracted, ostiole ca. 1.5 mm diam., prominent; internal hairs few. *Tepals* of the pistillate flowers fleshy.

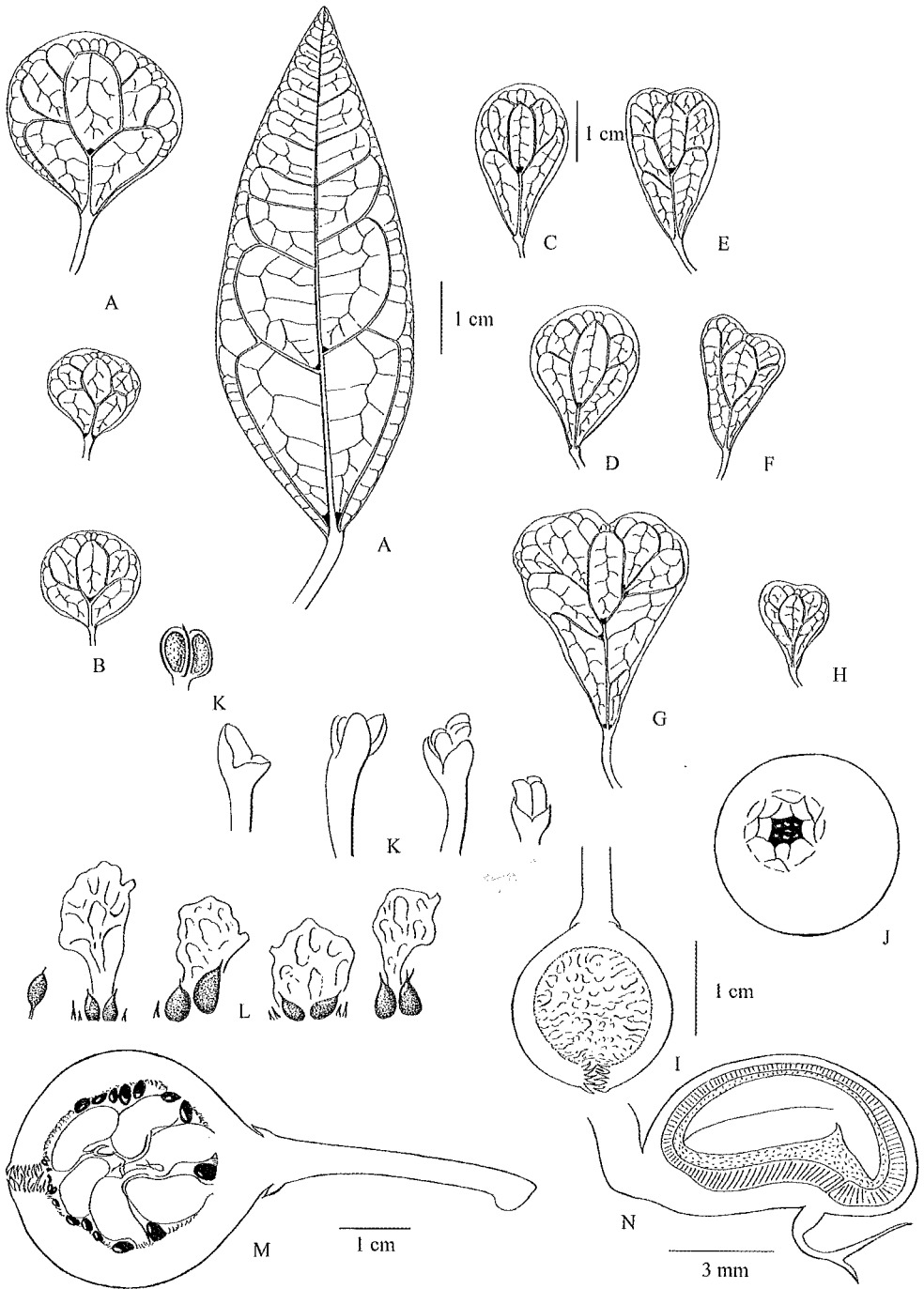


Fig. 9. *Ficus deltoidea* Jack subsp. *deltoidea*. A–H: leaves; I, fig; J, ostiole; K, staminate flowers and separate stamen; L, short-styled flowers with 'gall-fruits' and separate tepal; M, 'seed-fig'; N, fruit, longitudinal section (A: *Nieuwenhuis s.n.*, B: *Amdjah 243*; C: *Mondi 76*; D: *Achmad 1210*; E, F: *Corner s.n.*, Pahang; G: *SF 21235*; H: *SF 2368*; I–L: *SF 33240*; M, N: *Corner s.n.*, Trengganu. Courtesy of *Flora Malesiana* ser I, 17(2): 93, fig. 24.

T h a i l a n d.— PENINSULAR: Songkhla, Satun.

D i s t r i b u t i o n.— Peninsular (subsp. and var. b) and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra-type var. a), Java: western, Kalimantan, Moluccas).

E c o l o g y.— Evergreen forest, to 900 m.

N o t e.—This species is variable in the shape of the lamina and the position of the waxy glands. The venation can be clearly pinnate with glands in the axils of lateral veins, or furcate with glands in the furcations. The former type may represent a (sub)juvenile state, represented by collection *S. Gardner et al. ST2568*, from Satun) and the other adult ones. In the latter category two varieties can be recognised in Thailand:

a. var. angustifolia (Miq.) Corner, Gard. Bull. Singapore 17: 421. 1960.— *Synoecia diversifolia* (Blume) Miq. forma *angustifolia* Miq., Pl. Jungh.: 67. 1851.— *Synoecia diversifolia* (Blume) Miq. var. *angustifolia* (Miq.) Miq., Fl. Ind. Suppl.: 435. 1861.— *Ficus spathulata* Miq., London J. Bot. 7: 441. 1848.— *F. sideroxyliifolia* Griff., Not. Pl. Asiat. 4: 389. 1854; Griff., Icon. Pl. Asiat. 4: t. 551, f. 2. 1854.

Lamina subobovate to oblanceolate, to 6 by 2 cm, the midrib forked at or above the middle of the lamina, waxy glands 2–3, in the axils of the lateral veins in the middle of the lamina, 1 in the furcation of the midrib, or absent. *Fig* receptacle ca. 0.5 cm diam.

T h a i l a n d.— PENINSULAR: Trang, Satun, Songkhla, Narathiwat.

E c o l o g y.— Evergreen forest, to 300 m.

V e r n a c u l a r.— Ma chor (มะจ้อ), ma chor te (มะจ้อเต๊ะ) (Malay-Narathiwat).

b. var. kunstleri (King) Corner, Gard. Bull. Singapore 17: 423. 1960.— *Ficus diversifolia* Blume var. *kunstleri* King in Hook.f., Fl. Brit. India 5: 140, t. 175 A, B. 1888; Ridl., Fl. Malay Penins. 3: 346. 1924.

Lamina broadly obovate to obtriangular, to 7 by 6 cm, the midrib forked below the middle of the lamina; waxy glands 5, 2 in the axils of the basal lateral veins and the others in the furcation of the midrib and the furcations of its two branches. *Fig* receptacle ca. 1 cm diam.

T h a i l a n d.— PENINSULAR: Yala, Narathiwat.

E c o l o g y.— Evergreen forest, to 900 m.

FIC7. Ficus fulva Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 478. 1825; Ann. Mus. Bot. Lugd.-Bat. 3: 269, 280. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 148, t. 187. 1888; Ridl., Fl. Malay Penins. 3: 437. 1924; Corner, Philos. Trans., Ser. B, 259: 357, 373, f. 3 and 16. 1970; Kochummen, Tree Fl. Malaya 3: 147. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 276. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 106. 2005.— *F. chrysocarpa* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 475. 1825; Ann. Mus. Bot. Lugd.-Bat. 3: 270, 291. 1867.— *F. fulva* Reinw. ex Blume var. *chrysocarpa* (Reinw. ex Blume) Koord., Exk. Fl. Java 2: 117. 1912.— *Pogonotrophe flavidula* Miq., Fl. Ned. Ind., Eerste Bijv.: 435. 1861.— *Ficus flavidula* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 270. 1867.— *F. chrysocarpa* Reinw. ex Blume var. *flavidula* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 291. 1867.— *F. fulva* Reinw. ex Blume var. *orbicularis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 269. 1867.— *F. fulva* Reinw. ex Blume var. *minor* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 148, t. 187. 1888.— *F. patens* Ridl., J. Straits Branch Roy. Asiat. Soc. 86: 306. 1922; Ridl., Fl. Malay Penins. 3: 348. 1934; Corner, Gard. Bull. Singapore 10: 286. 1939. Fig. 10. Plate LVIII: 5.

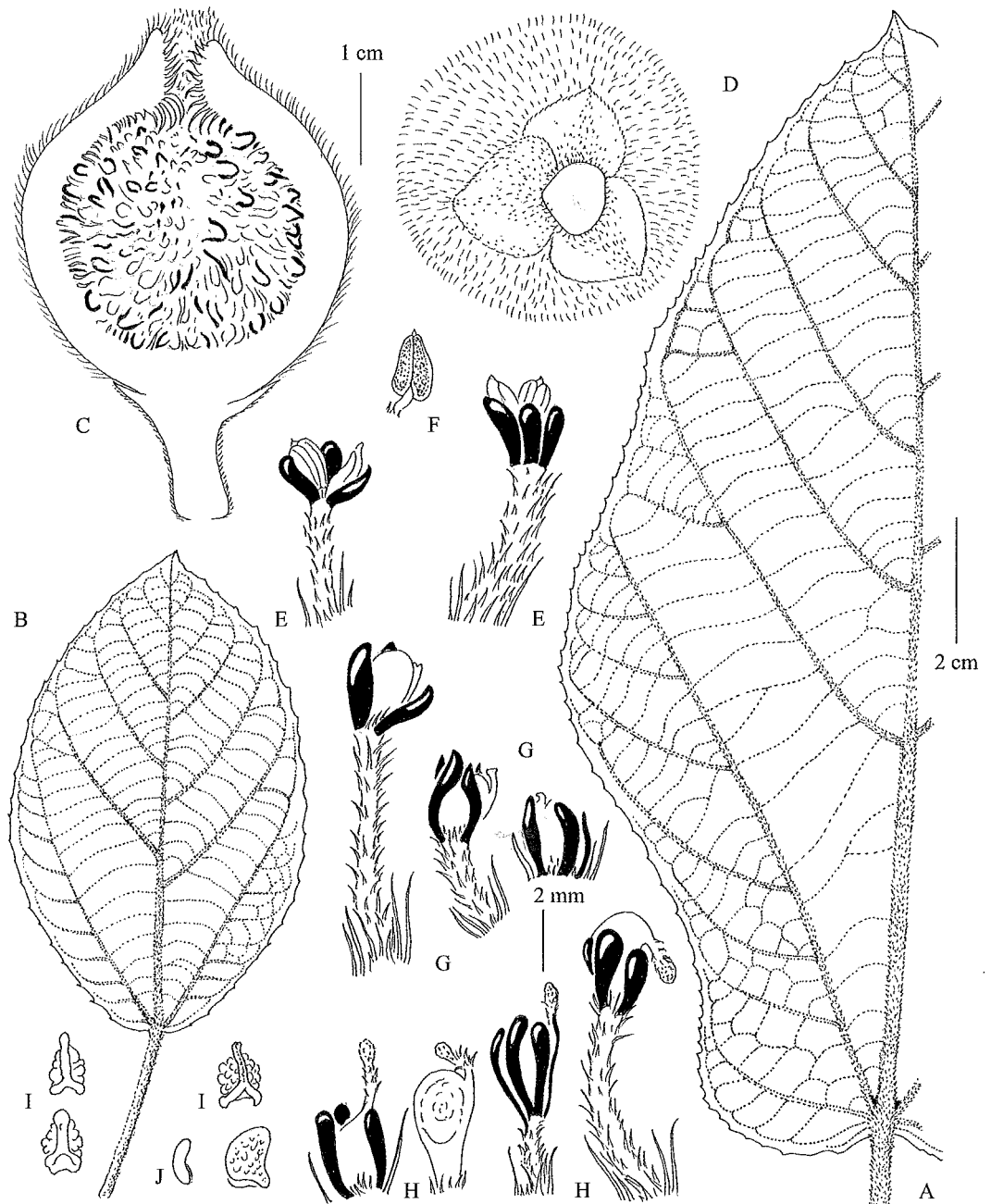


Fig. 10. *Ficus fulva* Blume A and B. leaves; C. fig; D. basal bracts; E. staminate flowers; F. stamen; G. short-styled flowers; H. long-styled flowers; I. fruits; J. embryo (all from different *Corner s.n.* collections). Courtesy of Flora Malesiana ser I, 17(2): 108, fig. 27.

Tree to 20 m tall. *Leafy twigs* 3–13 mm thick, yellowish to brownish hirtellous to puberulous or hirsute, often with pairs of small waxy glands at the bases of the petioles; periderm persistent; branches dark brown. *Leaves* spirally arranged; lamina elliptic, obovate, oblong or suborbicular (and often somewhat contracted in the lower part, subpandurate) or (when juvenile) subpalmately 3–5–7-lobate to -fid with the mid-segment sometimes pinnately lobate, 6–35 by 2.5–20 cm (when juvenile to 50 by 35 cm), chartaceous to subcoriaceous, apex shortly acuminate, base cordate to rounded, margin dentate, often down to near the base; upper surface strigillose, hirtellous on the main veins, ± scabrous to smooth, lower surface whitish hirtellous to densely subtomentose on the veins; cystoliths absent; lateral veins 4–7 pairs, the basal pair to 1/3–2/3 the length of the lamina, branched, other lateral veins often branched or forked away from the margin, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins; petiole 1–14 (when juvenile –30) cm, puberulous to hirtellous, the epidermis persistent; stipules 0.8–3.2 cm long, finely whitish to yellowish (to pale brown) sericeous or yellowish subsericeous, subhirtellous or appressed-puberulous, caducous. *Figs* axillary and below the leaves on previous season's growth, in pairs, with a peduncle 0.2–0.5 cm long (or sessile); basal bracts 3, 2–3.5 mm long, shortly white sericeous; receptacle subglobose, ovoid or ellipsoid, 1–1.5(–2) cm diam. when dry, 1.2–2(–2.5) cm diam. when fresh, yellowish appressed-puberulous, hirtellous or brownish subvelutinous, occasionally one or a few lateral bracts, yellow to orange at maturity, apex convex or slightly protracted, ostiole 2.5–4 diam., the outer ostiolar bracts erect; internal hairs abundant (or few), yellowish.

T h a i l a n d.—NORTHERN: Nan, Phrae; SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Trang, Narathiwat.

D i s t r i b u t i o n.—India (Nicobar Islands), Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra-type), Java, Kalimantan, Sulawesi, Lesser Sunda Islands).

E c o l o g y.—Evergreen forest, to 1,800 m.

V e r n a c u l a r.—Sai bai khon (ไทรใบขน) Narathiwat.

FIG8. *Ficus glandulifera* (Wall. ex Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 143, t. 180. 1888; Ridl., Fl. Malay Penins. 3: 347. 1924; Gagnep., Fl. Indo-Chine 5: 784. 1928; Kochummen, Tree Fl. Malaya 3: 147. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 278, t. 110; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 109. 2005; C.C. Berg, Blumea 53: 319. 2008.—*Pogonotrophe glandulifera* Wall. ex Miq., London J. Bot. 7: 77. 1848.—*P. aurantiaca* Miq. in Zoll., Syst. Verz. 2: 93, 99. 1854.—*Ficus aurantiaca* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 293. 1867, non Kunth & C.D. Bouché, 1847.—*Pogonotrophe sumatrana* Miq., Fl. Ned. Ind., Eerste Bijv.: 436. 1861.—*Ficus hasskarlii* Merr. Philipp. J. Sci. 11: 264. 1916.—*F. henschelii* Merr., Philipp. J. Sci. 11: 264. 1916.—*F. glandulifera* (Wall. ex Miq.) King var. *villosa* Corner, Gard. Bull. Singapore 17: 433. 1960. Plate LVIII: 2.

Tree to 10(–)30 m tall, deciduous. *Leafy twigs* 2–4 mm thick, (dark) brown subtomentose or densely (to sparsely) brown(ish) patent- to appressed-puberulous; periderm persistent; branches usually dark purplish to blackish with prominent petiole scars. *Leaves* spirally arranged; lamina elliptic, oblong, (sub)obovate or (sub)ovate (or lanceolate), (4–)6–13(–20) by (2–)3.5–8(–9) cm, chartaceous to subcoriaceous, apex acuminate, base subcordate, cordulate or rounded (to cuneate), margin entire or dent(icul)ate or faintly repand; upper surface appressed-puberulous to brown subtomentose on the main veins, smooth, lower surface brown subtomentose to puberulous or partly strigillose on the veins; cystoliths absent; lateral veins

5–8(–10) pairs, the basal pair $1/6$ – $1/4$ the length of the lamina, branched or unbranched, tertiary venation scalariform; waxy glands in the axils of the basal lateral veins or absent; petiole (1–)2–4(–6) cm long, brown subtomentose to \pm densely appressed-puberulous, the epidermis flaking off (or persistent), with a pair of waxy glands laterally at the base; stipules 0.5–0.8 cm long, brown (or yellowish) subtomentose to subsericeous (near the margins often glabrous), caducous. *Figs* mostly below the leaves on previous season's growth, in pairs; peduncle 0.3–1.3 cm long; basal bracts 3, 1.5–2.5 mm long, brown appressed-puberulous to strigillose; receptacle ellipsoid to subglobose, 0.7–1 cm diam. when dry, 1.2–1.5 cm diam. when fresh, sparsely but around the ostiole densely appressed-puberulous to strigillose (or the whole surface densely appressed-puberulous), often finely ribbed, sometimes to 0.5 cm long stipitate, seed-figs yellow to red at maturity, gall-figs yellowish to orange at maturity and irregularly longitudinally dehiscent, apex convex, ostiole ca. 2 mm diam., \pm prominent; internal hairs abundant, yellowish.

T h a i l a n d.— SOUTH-EASTERN: Trat; PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular (type) and Bornean Malaysia, Singapore, Brunei (?), Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Moluccas, Papua?), Philippines, Papua New Guinea.

E c o l o g y.— Evergreen forest, at low altitudes.

V e r n a c u l a r.— Duea thao (เดื่อเตา) (Narathiwat).

N o t e.— This species is closely related to *F. lamponga*, from which it differs in the smaller number of lateral veins (usually to 8 pairs) and the presence of a pair of waxy glands at the base of the petiole (clearly visible in fresh material, sometimes not in dried material). This species is less common than *F. lamponga*.

FIG9. *Ficus grossularioides* Burm.f., Fl. Ind.: 227. 1768; Miq., London J. Bot. 7: 234. 1848; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 292. 1867; Corner, Philos. Trans., Ser. B, 259: 354, f. 1. 1970; Kochummen, Tree Fl. Malaya 3: 148. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 278. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 110. 2005. Plate LVIII: 4.

N o t e.— Three varieties can be distinguished, one of them is found in Thailand.

var. **grossularioides** — *Ficus alba* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 467. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 270, 290. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 147, t. 186. 1888.— *F. nivea* Blume, Bijdr. Fl. Ned. Ind.: 476. 1825.— *F. palmata* Roxb., Fl. Ind. Ed. 1832 3: 529. 1832, non Forssk., 1775.— *F. hunteri* Miq., London J. Bot. 7: 225. 1848.— *F. gossypina* Wall. ex Miq., London J. Bot. 7: 455. 1848.— *F. chloroleuca* Miq., Fl. Ned. Ind. 1(2): 294. 1859.— *F. mappan* Miq., Fl. Ned. Ind., Eerste Bijv.: 425. 1861.— *F. alba* Reinw. ex Blume var. *mappan* (Miq.) Miq. Ann. Mus. Bot. Lugd.-Bat. 3: 290. 1867.— *F. lobata* W. Hunter ex Ridl., J. Straits Branch Roy. Asiat. Soc. 53: 123. 1909.

Shrub or tree to 10(–15) m tall. *Leafy twigs* 2–5 mm thick, whitish puberulous to hispidulous; periderm usually persistent. *Leaves* spirally arranged; lamina elliptic, oblong, ovate or, when juvenile, (sub)palmately 3–5(–7)-lobate to -fid, 3–15 by 1.5–7.5 cm (when juvenile to 35 by 30 cm), chartaceous to subcoriaceous (or coriaceous), apex shortly acuminate, base cuneate, rounded or subcordate (when juvenile cordate to cuneate), margin dent(cul)ate to crenate (at least towards the apex); upper surface hispidulous and \pm scabrous (or sparsely strigillose and smooth); lower surface densely felted-tomentose, this indumentum usually (largely) covering the

vein reticulations, main veins glabrous or sparsely appressed-puberulous (sometimes hirtellous); cystoliths absent; lateral veins 3–6 pairs, when juvenile to 8 pairs, the basal pair to 1/3–1/2 the length of the lamina, mostly branched, other lateral veins often branched or forked away from the margin, tertiary venation loosely scalariform; waxy glands in the axils of the basal lateral veins; or also in axils of other lateral veins; petiole 1–10 (when juvenile –20) cm long, glabrous or sparsely appressed-puberulous, the epidermis usually persistent; stipules 0.5–1.8 cm long, sericeous, caducous. *Figs* usually below the leaves on previous season's growth, in pairs, sessile or with a peduncle to 0.2 cm long; basal bracts 3, 1–2.5 mm long, white appressed-puberulous; receptacle (sub)globose, ellipsoid, ovoid or depressed-globose, 0.4–1 cm diam. when dry, 0.6–1.3 cm diam. when fresh, sparsely puberulous to glabrous, yellow, orange, brownish or red at maturity, apex convex, ostiole 2–2.5 mm diam., ± prominent; internal hairs few, whitish.

T h a i l a n d.— PENINSULAR: Phangnga, Phatthalung, Trang, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore, Brunei (?), Indonesia (Sumatra, Java-type, Kalimantan).

E c o l o g y.— Evergreen forest and secondary growth, to 600 m.

N o t e.— Re-examination of a collection from Narathiwat which has been referred to *Ficus tricolor* Miq. var. *robusta* (Corner) Corner ex C.C. Berg (see Flora Malesiana 17(2): 124) proved that it belongs to *F. grossularioides*. The former taxon, found in Peninsular Malaysia, mostly at altitudes between 1,200 and 1,700 m, is not yet known from Thailand and differs in the brownish hirtellous to strigose indumentum on the main veins of the cordiform to ovate lamina beneath, the larger figs, 1–1.8 cm diam., and the longer peduncle 0.2–0.5 cm long, and often also by the visible reticulation of the lamina beneath.

FIG10. *Ficus hirta* Vahl, Enum. Pl. 2: 201. 1805; Blume, Bijdr. Fl. Ned. Ind.: 476. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 290. 1867; Kurz, Forest Fl. Burma 2: 449. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 149, t. 188. 1888; Gagnep., Fl. Indo-Chine 5: 804. 1928; Chun, Sunyatsenia 1: 225. 1934; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 113. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 21. 2007.— *F. heterophylla* Lam., Encycl. 2, 2: 499. 1788, non L.f., 1782.— *F. setosa* Blume, Bijdr. Fl. Ned. Ind.: 477. 1825.— *F. hirta* Vahl var. *setosa* (Blume) Miq., Fl. Ned. Ind. 1(2): 297. 1859.— *F. setosa* Hook. & Arn., Bot. Beech. Voy.: 216. 1836, t. 49.— *F. setifera* Steud., Nomencl. Bot. ed. 2, 1: 638. 1840.— *F. hibiscifolia* Champ. ex Benth., Hook. J. Bot. Kew Misc. 6: 77. 1854.— *F. hirta* Vahl var. *hibiscifolia* (Champ. ex Benth.) Chun, Sunyatsenia 1 (1934) 225.— *F. hirta* Vahl var. *integrifolia* Miq., Fl. Ned. Ind. 1(2): 297. 1859.— *F. porteri* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 550. 1910.— *F. laus-esquirolii* H. Lév., Fl. Kouy-Tchéou: 425. 1914/1915.— ? *F. neoesquirolii* H. Lév., Fl. Kouy-Tchéou: 431 1914/1915.— *F. hirta* Vahl var. *appressa* Corner, Gard. Bull. Singapore 17 (1960) 430. Fig. 11. Plate LIX: 4–5.

Shrub or treelet to 5 m tall. *Leafy twigs* 2–4 mm thick, whitish to dark brown puberulous to hirtellous and pale brown to yellowish hirtellous, subhirsute or dark brown hirsute (or strigillose), the long hairs often with a swollen base; waxy glands sometimes present at the base of the petiole; internodes sometimes hollow; periderm persistent. *Leaves* in spirals (to subdistichous); lamina oblong, elliptic, (sub)obovate, (sub)ovate or lanceolate, often with a constriction in the lower part of the lamina, or (when juvenile) (sub)palmately 3–5–7-lobate to -fid or pinnately lobate or the mid-segment sometimes pinnately lobate, 6–25 by 3.5–16

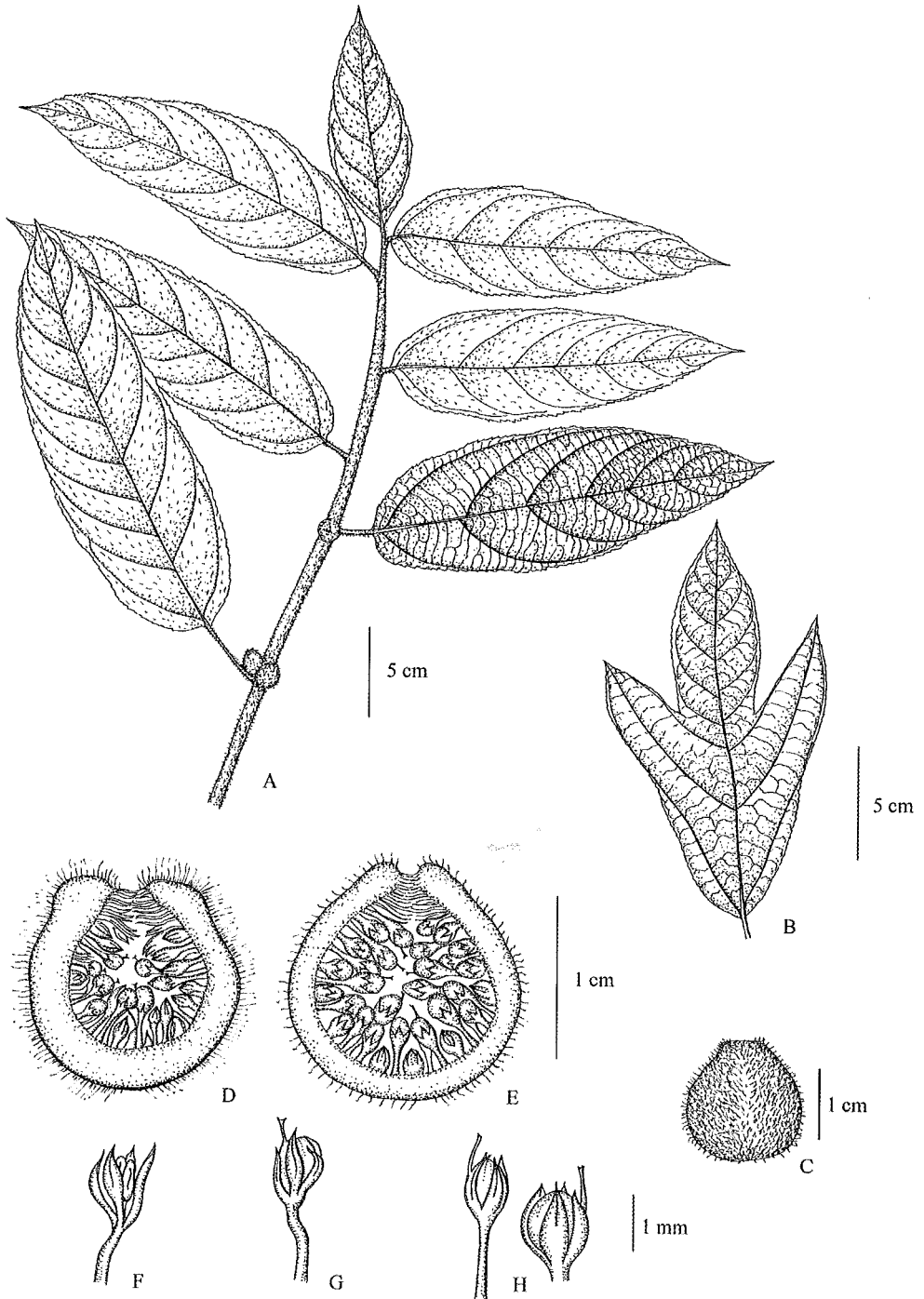


Fig. 11. *Ficus hirta* Vahl: A. leafy twig with figs; B. leaf; C. fig; D. opened fig with short-styled flowers; E. opened fig with long-styled flowers; F. staminate flower; G. short-styled flower; H. long-styled flower. Drawn by Wattana Tanming.

cm, chartaceous to subcoriaceous, apex (shortly) acuminate, base cordate to rounded, margin dent(icul)ate; upper surface strigillose, hirtellous or hirsute, \pm scabrous to smooth, lower surface densely to rather sparsely whitish puberulous and pale to dark brown hirtellous, substrigose or hirsute on the veins, often scabridulous; cystoliths absent; lateral veins (5–)6–8 pairs, the basal pair to 1/6–1/3 the length of the entire lamina, in lobate ones to 1/2, usually branched, other lateral veins often branched or forked away from the margin, tertiary venation scalariform, \pm prominent beneath; waxy glands in the axils of the basal lateral veins and often small ones in the axils of other lateral veins; petiole 1.5–4(–12.5) cm long, 1–2 mm thick, whitish puberulous or pale to dark brown hirtellous or hirsute, the epidermis persistent; stipules 0.5–2 cm long, ciliate and with stiff appressed to \pm patent pale to dark brown hairs on or also along the keel or also finely white appressed-puberulous to sericeous towards the margins, or sometimes the whole surface yellow to brown sericeous to subhirsute, caducous (or subsistent). *Figs* axillary or just below the leaves, in pairs or solitary, (sub)sessile; basal bracts 3, 2–3 mm long, brownish to whitish appressed-puberulous to strigillose, persistently on the keel or on the whole surface; receptacle subglobose, ovoid or ellipsoid (to (sub)cylindrical), 0.4–1.2 cm diam. when dry, 1–2 cm diam. when fresh, densely to sparsely pale to dark brown hirtellous, puberulous, hispidulous or subhirsute (or subglabrous), sometimes with lateral bracts, yellow to orange or (dark) red at maturity, apex \pm convex, ostiole 2–3(–3.5) diam., surrounded by to 2 mm long bracts or with a tuft of hairs pointing upwards or the ostiole slightly impressed; internal hairs abundant to sparse, whitish.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Nan, Lamphun, Lampang, Tak, Phitsanulok; NORTH-EASTERN: Phetchabun, Loei, Nong Khai, Sakon Nakhon; EASTERN: Chaiyaphum, Nakhon Ratchasima, Si Sa Ket; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Prachin Buri, Chachoengsao, Chon Buri, Chanthaburi, Trat; PENINSULAR: Phuket, Satun, Yala.

D i s t r i b u t i o n.— NE India, Nepal, Sikkim, S China (type), Burma, Laos, Vietnam, Indonesia (Java, Sumatra, introduced).

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests, often in secondary growth or disturbed areas, to 1,300 m.

V e r n a c u l a r.— Manot nam (มะนอดน้ำ) (Chiang Rai); salot nam (สลอดน้ำ) (Central); duea khon (เดื่อขน) (Northern); duea hom lek (เดื่อหอมเล็ก), duea hom yai (เดื่อหอมใหญ่) (Trat); nom ma (นมหมา) (Nakhon Phanom); not nam (นอดน้ำ) (Lampang); not hom (นอดหอม), ma duea tia (มะเดื่อเตี้ย) (Chanthaburi); ma duea khon (มะเดื่อขน) (Nakhon Ratchasima); ma duea hom (มะเดื่อหอม) (Chon Buri, Trang); yuea-thong (เยื่อทอง) (Yao-Chiang Rai); hat (หาด) (Chiang Mai).

N o t e s.— This species is extremely variable in the shape and dimensions of the lamina, the length of the peduncle, the shape and the dimensions of the receptacle, and the indumentum (colour, length, and rigidity of the hairs and denseness of the two types of hairs). The hairs vary from brown to white, from long (hirsute) to short (hispidulous), from straight to curved (or even uncinata), and from dense to very sparse. Rather distinct among specimens with dense brown indumentum on leafy twigs, petioles and venation of the lamina beneath are some collections from Laos and the adjacent part of Thailand with appressed hairs, and because of that (almost) smooth upper surfaces of the lamina. They were included in *Ficus hirta* var. *appressa* Corner, known from Thailand by three collections: *K. Larsen et al.* 43518 (BKF, P) from Nan, *Parinya et al.* 227 (BK) from Uttaradit, and *P. Srisanga* 301 (QBG) from Nan. More complex is the situation with regard to specimens with (very) short, (very) sparse, predominantly whitish indumentum. They occur more scattered in the range of distribution of the species and intermediates with the

more distinctly hairy forms are frequent. They include type material of *F. dumosa*, *F. hirta* var. *imberbis*, *F. palmatiloba*, *F. tridactyles*, and probably even of *F. simplicissima*, characterized by the presence of uncinata hairs. Deeply incised, 3–5(–7) partite laminas may occur more frequently in this group of specimens than in those with more common types of indumentum. This form is not as common in Thailand as in Vietnam. It could be identified as *F. hirta* Vahl var. *imberbis* Gagnep. to distinguish it from var. *appressa* and the variable remainder. The last set of species names is not included in the synonymy as further investigations are needed.

FIC11. *Ficus ischnopoda* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 229, 294. 1867; Kurz, Forest Fl. Burma 2: 456. 1877; Kochummen, Tree Fl. Malaya 3: 149. 1978.—*F. pyriformis* Hook. & Arn. var. *ischnopoda* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 158, t. 201C. 1888.—*F. pyriformis* Hook. & Arn. var. *angustifolia* Ridl., Fl. Malay Penins. 3: 349. 1924.—*F. petelotii* Merr., Un. Cal. Publ. Bot. 13: 129. 1926.—*F. delavayi* Gagnep., Notul. Syst. 4: 89. 1927.—*F. pedunculosa* Miq. var. *velutina* Corner, Gard. Bull. Singapore 17: 427. 1960.—*F. ischnopoda* Miq. var. *subcylindrica* Corner, Gard. Bull. Singapore 17: 429. 1960. Fig. 12. Plate LVIII: 6.

Shrub or treelet to 3(–6) m tall, with internodes distinctly different in length and leaves ± tufted at the ends of branches. *Leafy twigs* 1–3 mm thick, sparsely to densely brown to whitish puberulous or glabrous; periderm persistent. *Leaves* spirally arranged, sometimes subopposite or subverticillate; lamina linear-oblongate to subobovate (to obovate), 3–21 by 0.5–4(–5.5) cm, chartaceous to coriaceous, apex acuminate to subacute, base cuneate to rounded, margin (sub)entire, ± revolute, at least at the base; upper surface glabrous or sparsely to densely brown to whitish puberulous, lower surface sparsely to densely brown to whitish puberulous on the veins; cystoliths only below; lateral veins 7–20 pairs, the basal pair to 1/20–1/6 the length of the lamina, unbranched, tertiary venation (sub)reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.2–1.5(–2.5) cm long, brown to whitish puberulous all around to mainly or only adaxially or glabrous; stipules 0.5–1 cm long, lateral to semi-amplexicaul, glabrous or sparsely brown to whitish puberulous, caducous or subpersistent. *Figs* axillary, solitary; peduncle 0.2–2(–3) cm long; basal bracts 3, 1–2 mm long, sparsely puberulous; receptacle ellipsoid, subpyriform, subglobose or (sub)ovoid (to almost cylindrical), 1.5–2.3 cm diam. when dry, 2–3 cm diam. when fresh, sometimes to 1 cm long stipitate, glabrous or brown to whitish puberulous, at maturity pink, dark red and purple or black, apex ± protracted, ostiole 2–3 mm diam., often slightly sunken; internal hairs few, short.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Lamphun, Tak, Phitsanulok; NORTH-EASTERN: Phetchabun, Loei, Nong Khai, Sakon Nakhon, Nakhon Phanom, Kalasin, Khon Kaen; EASTERN: Chaiyaphum, Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Prachin Buri, Chon Buri, Rayong, Chanthaburi, Trat; PENINSULAR: Ranong, Surat Thani, Phangnga, Nakhon Si Thammarat, Phatthalung, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.—NE India, Bhutan, Bangladesh (type), Burma, S China, Laos, Vietnam, Cambodia, Peninsular Malaysia.

E c o l o g y.—Mixed deciduous, dry evergreen, evergreen and montane forests, mostly on rocks in and along rivers as rheophytes, to 1,600 m.

V e r n a c u l a r.—Su-nor (ซุนนอร์) (Malay-Narathiwat).

N o t e.—This species is closely related to both *Ficus abelii* and *F. pyriformis*, under which species differences are discussed.

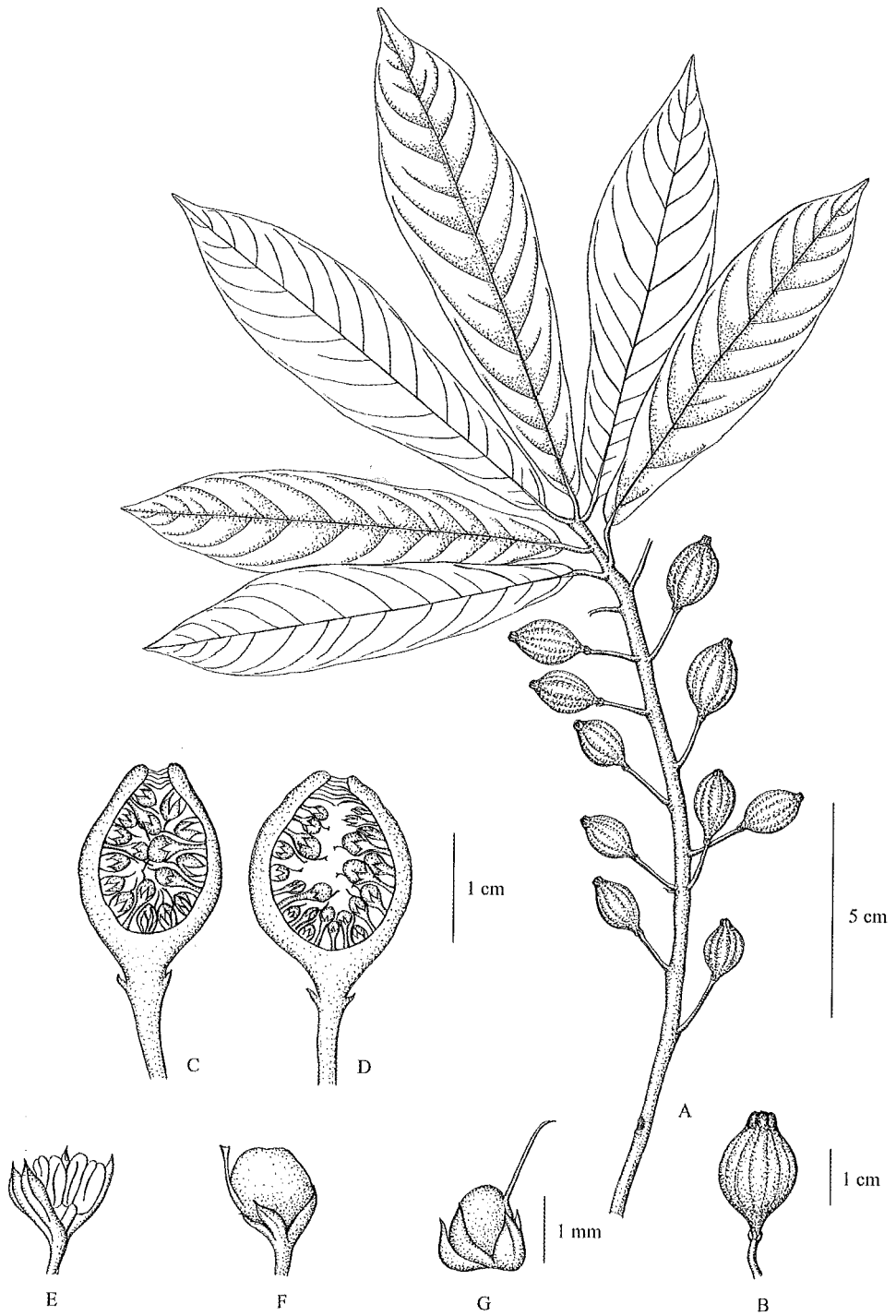


Fig. 12. *Ficus ischnopoda* Miq.: A. leafy twig with figs; B. fig; C. opened fig with short-styled flowers; D. opened fig with long-styled flowers; E. staminate flower; F. short-styled flower; G. long-styled flower. Drawn by Wattana Tanming.

FIG12. *Ficus lamponga* Miq., Fl. Ned. Ind., Eerste Bijv.: 431. 1861; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 294. 1867; Kurz, Forest Fl. Burma 2: 451. 1877; Corner, Philos. Trans., Ser. B, 259: 370, f. 15. 1970; Kochummen. Tree Fl. Malaya 3: 150. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 116. 2005; C.C. Berg, Blumea 53: 320. 2008.— *F. lepidosa* Wall. ex Kurz, J. Asiat. Soc. Bengal 42(2): 107. 1873; Kurz, Forest Fl. Burma 2: 450. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 163. 1888; Ridl., Fl. Malay Penins. 3: 350. 1924; Gagnep., Fl. Indo-Chine 5: 788. 1928.— *F. lepidosa* Wall. ex Kurz var. *martabanica* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 163. 1888.— *F. lamponga* Miq. var. *martabanica* (King) Basu, J. Econ. Taxon. Bot. 18: 447. 1994.— *F. balansae* Gagnep., Notul. Syst. 4: 86. 1927; Gagnep., Fl. Indo-Chine 5: 822. 1929. Fig. 13. Plate LIX: 3.

Tree to 15 (–30) m tall, becoming slightly buttressed, deciduous; milky sap watery. *Leafy twigs* 2–4 mm thick, white to brown appressed-puberulous to strigillose or glabrous; periderm persistent; branches dark brown to purplish, scars of the stipules ± prominent. *Leaves* spirally arranged; lamina oblong, or elliptic (to subobovate), (4–)8–25 by (1.5–)3.5–13 cm, chartaceous, apex acuminate, base truncate to cuneate, margin entire; upper surface appressed-puberulous on the veins or only on the midrib, smooth, lower surface appressed-puberulous to strigillose on the veins; cystoliths absent; lateral veins (6–)10–13(–18) pairs, the basal pair to 1/6–1/3 the length of the lamina, branched or unbranched, tertiary venation scalariform; waxy glands absent; petiole (0.5–)2–8 cm long, 1–2 mm thick, appressed-puberulous to strigillose or glabrous, with a median band-shaped glandular spot at the base, the epidermis persistent or flaking off; stipules 0.5–1.2 cm long, brown to yellowish appressed-puberulous to strigillose, mostly only on the keel or glabrous outside and only ciliolate, caducous. *Figs* below the leaves on previous season's growth, in pairs; peduncle (0.2–)0.5–1 cm; basal bracts 3, 2–3 mm long, sparsely appressed-puberulous or only ciliolate; receptacle ellipsoid to subglobose, 0.8–1.3 cm diam. when dry, 1.3–1.6 cm diam. when fresh, sometimes to 0.2 cm long stipitate, sparsely to densely puberulous, seed-figs orange-ochre to red at maturity, gall figs greenish at maturity and irregularly longitudinally dehiscent, apex convex or somewhat protracted, ostiole 2–2.5 mm diam., somewhat prominent; internal hairs abundant, yellow.

T h a i l a n d.— NORTHERN: Chiang Mai, Lampang, Phrae, Phitsanulok; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri; PENINSULAR: Chumphon, Surat Thani, Phangnga, Nakhon Si Thammarat, Satun, Songkhla, Yala.

D i s t r i b u t i o n.— India (NE and Andaman Islands), Sikkim (?), Burma, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, type).

E c o l o g y.— Mixed deciduous and evergreen forests, to ca. 1,100 m.

FIG13. *Ficus mollissima* Ridl., Fl. Malay Penins. 3: 348. 1924; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 119. 2005; C.C. Berg & S. Gardner, Thai Forest Bull. (Bot.) 35: 33. 2007.

Tree to 20 m tall, sometimes with short buttresses. *Leafy twigs* 5–10(–15) mm thick, pale brown to yellowish velutinous; internodes hollow; periderm flaking off below the leaves. *Leaves* in spirals; lamina cordiform to ovate, 16–22 by 13–16 cm, chartaceous, apex acuminate, base cordate, sometimes deep and overlapping lobes, margin dent(icul)ate; upper surface densely pale brown to yellowish puberulous, hirtellous or velutinous on the main veins, smooth, lower surface pale brown to yellowish velutinous; cystoliths absent; lateral veins 4–6 pairs, basal pair to ca. 1/2 the length of the lamina, branched, other lateral veins often branched or furcate away from the

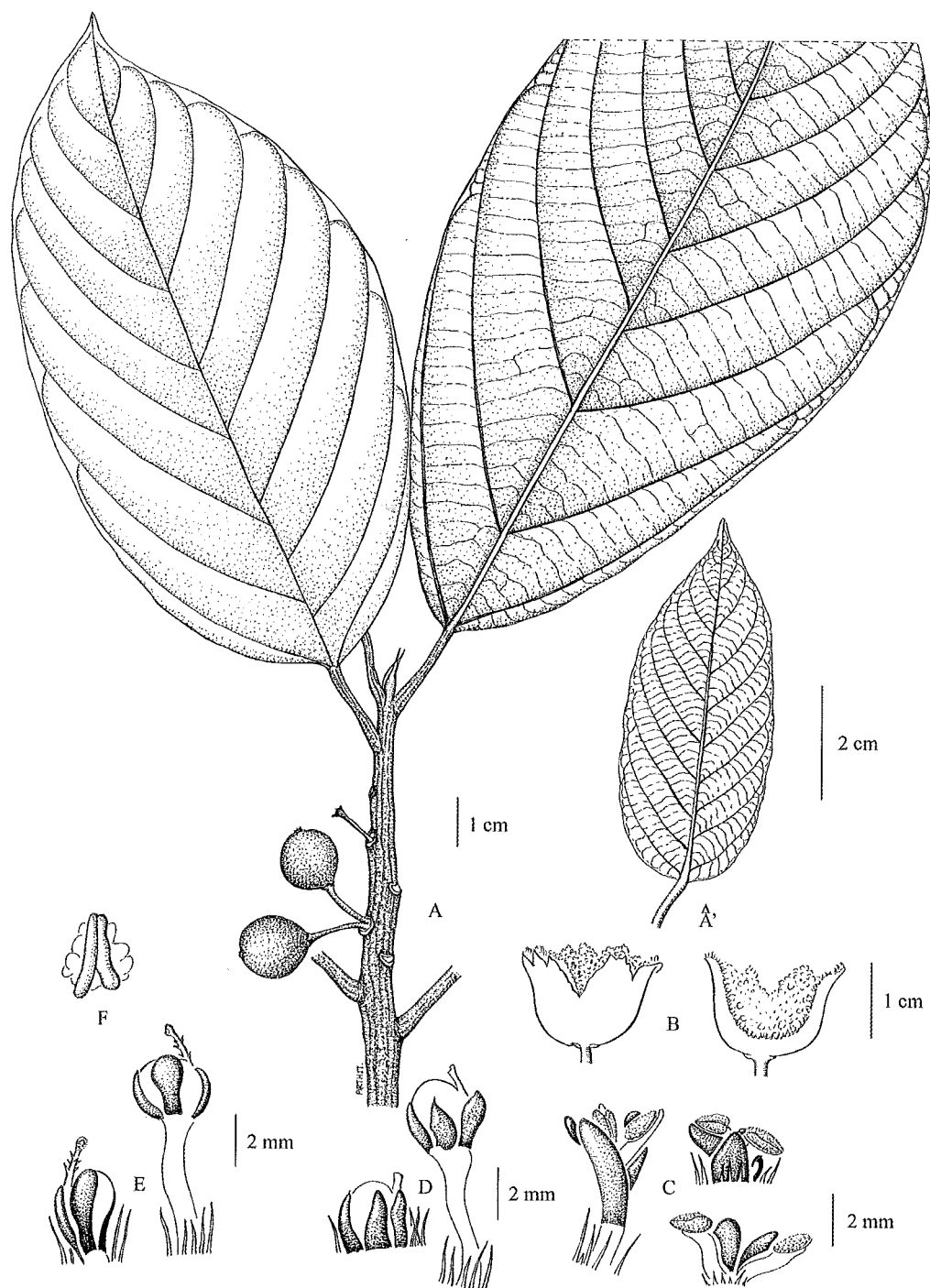


Fig. 13. *Ficus lamponga* Miq.: A. leafy twig with figs; A' leaf (SF 29227); B. 'gall' figs (SF 29227); C. staminate flowers (SF 29227); D. short-styled flowers (SF 29227); E. long-styled flowers (SF 34922); F. fruit (SF 34922). Courtesy of Flora Malesiana ser I, 17(2): 117, fig. 28. — modified, leafy twig with figs added.

margin, tertiary venation loosely scalariform; waxy glands in the axils of the main basal lateral veins or also in axils of the lesser basal veins and axils of the branches of the main lateral veins; petiole 3–9 cm long, pale brown to yellowish velutinous, the epidermis persistent; stipules 1–1.8 cm long, pale brown subvelutinous to subsericeous, caducous. *Figs* mostly below the leaves on previous season's growth, in pairs, (sub)sessile; basal bracts 3, ca. 3 mm long, yellowish subvelutinous; receptacle subglobose to ovoid, 1.5–2.5 cm in diameter when dry, pale brown to yellowish velutinous, with or without lateral bracts, orange-brown at maturity, apex convex, ostiole ca. 8 mm in diameter, the (outer) ostiolar bracts erect; internal hairs abundant.

T h a i l a n d.— PENINSULAR: Songkhla (Khao Nam Khang National Park), Yala (Betong).

D i s t r i b u t i o n.— Peninsular Malaysia (type).

E c o l o g y.— Evergreen forest, at low altitudes.

N o t e.— This species shows similarities to *Ficus triloba*, from which it differs by its shorter basal bracts and stipules and hairs of similar length and same colour on petioles and stipules.

FIG14. *Ficus neriifolia* Sm. in Rees, Cyclop. 14: n. 21. 1810; Corner, Gard. Bull. Singapore 17: 426. 1960; Grierson & D.G. Long, Fl. Bhutan 1(1): 95. 1983.— *F. fieldingii* Miq., London J. Bot. 7: 439. 1848.— *F. nemoralis* Miq. var. *fieldingii* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 163, t. 206E. 1888.— *F. neriifolia* Sm. var. *fieldingii* (Miq.) Corner, Gard. Bull. Singapore 17: 426. 1960.— *F. gasparriniana* Miq., London J. Bot. 7: 436; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 181. 1888; C.C. Berg, Thai Forest Bull. (Bot.) 35: 14. 2007.— *F. densa* Miq., London J. Bot. 7: 453. 1848.— *F. nemoralis* Wall. ex Miq., London J. Bot. 7: 453. 1848; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 161, t. 200A. 1888.— *F. neriifolia* Sm. var. *nemoralis* (Miq.) Corner, Gard. Bull. Singapore 17: 426. 1960.— *F. gemella* Wall. ex Miq., London J. Bot. 7: 454. 1848.— *F. nemoralis* Miq. var. *gemella* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 162, t. 206D. 1888.— *F. trilepis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 228, 294.— *F. nemoralis* Miq. var. *trilepis* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 162, 206B. 1888.— *F. neriifolia* Sm. var. *trilepis* (Miq.) Corner, Gard. Bull. Singapore 17: 426. 1960.— *F. wardii* C.E.C. Fischer, Bull. Misc. Inform. Kew 1936: 281. 1936, fide Corner, Gard. Bull. Singapore 21: 39. 1965.

Shrubs or trees to 15(–20) m tall, with internodes rather similar in length. *Leafy twigs* 2–4 mm thick, glabrous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic, 8–14 by 2.5–6 cm, symmetrical, subcoriaceous, apex acuminate to subcaudate, base cuneate to obtuse, margin entire, flat; upper and lower surface glabrous and smooth; cystoliths only below; lateral veins 9–12 pairs, the basal pair to 1/20–1/10 the length of the lamina, unbranched, tertiary venation subscalariform to reticulate; waxy glands in the axils of the basal lateral veins; petiole 1–2.5 cm long, 1–1.5(–2) mm thick, glabrous, the epidermis persistent; stipules 1–2 cm long, glabrous, caducous or subpersistent in tufts at the twig apices. *Figs* axillary or just below the leaves, in pairs (or solitary); sessile; basal bracts 3, 1–2 mm long, glabrous; receptacle subglobose, 0.6–0.7 cm diam. when dry, glabrous, greenish (?) at maturity, apex convex or protracted into a rim, ostiole 2–2.5 mm diam., ± prominent; internal hairs absent.

T h a i l a n d.— NORTHERN: Chiang Mai.

D i s t r i b u t i o n.— Pakistan, N India, Nepal (type), Bhutan, Sikkim, Burma, SW China (Yunnan, Xizang).

E c o l o g y.— Montane evergreen forest, 2,300 m (outside Thailand 1,200–3,200 m).

N o t e.— The species is known by a single collection, representing the variable species in a form with glabrous and smooth lamina and small, subglobose figs.

FIG15. *Ficus oleifolia* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 160, t. 204A. 1888; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 97. 2005.

The species is subdivided into two subspecies of which one is found in Thailand.

subsp. **intermedia** (Corner) C.C. Berg, Blumea 48: 541. 2003.— *Ficus oleifolia* King var. *intermedia* Corner, Gard. Bull. Singapore 17: 423. 1960.— *F. kinabaluensis* Stapf, Trans. Linn. Soc. Bot., Ser. 2, 4: 226. 1894.— *F. deltoidea* Jack. var. *kinabaluensis* (Stapf) Corner, Philos. Trans., Ser. B, 256. 305. 1969.

Shrub (or treelet) to 3(–6) tall, epiphytic or epilithic. *Leafy twigs* 1.5–2.5 mm thick, glabrous, often drying dark purplish-brown to blackish; periderm sooner or later flaking off. *Leaves* spirally arranged; lamina elliptic to oblong (or lanceolate), 2–5 by 2–3 cm, coriaceous, usually drying brown, apex rounded to subacuminate, base rounded to subattenuate, margin entire, ± revolute; both surfaces glabrous; cystoliths only below; lateral veins 4–6 pairs, often departing from the midrib at wide angles (to 90°), the midrib forked in the upper part of the lamina if the apex is rounded, the basal pair to 1/10–1/6 the length of the lamina, unbranched, tertiary venation largely parallel to the lateral veins to reticulate, midrib even in laminas with acuminate apex not reaching the tip of the acumen; waxy glands often absent or present in the axils of the basal lateral veins; petiole 0.2–0.5 cm long, ca. 1.2 mm thick, glabrous, the epidermis persistent; stipules 0.3–1.7 cm long, ciliolate, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.1–0.4 cm long; basal bracts 3, ca. 1 mm long, ciliolate; receptacle subglobose, ellipsoid or subfusiform, 0.4–0.7 cm diam. when dry, substipitate, glabrous, red to dark purple at maturity, apex convex or ± protracted, ostiole 1.5–2.5 mm diam. ± prominent to flat; internal hairs absent or present in seed-figs.

T h a i l a n d.— PENINSULAR: Yala.

D i s t r i b u t i o n.— Peninsular (type) and Bornean Malaysia, Indonesia (Kalimantan).

E c o l o g y.— Evergreen forest, 550–850 m.

FIG16. *Ficus oreophila* Ridl., J. Straits Branch Roy. Asiat. Soc. 82: 196. 1920; Ridl., Fl. Malay Penins. 3: 348. 1924; Kochummen, Tree Fl. Malaya 3: 152. 1978. Fig. 14.

Shrub or treelet to 4 m tall; milky sap sometimes pink. *Leafy twigs* 2–3 mm thick, brown(ish) puberulous, hirtellous or hispidulous; periderm persistent. *Leaves* spirally arranged; lamina oblong, subobovate or lanceolate, 4.5–17 by 2–8.5 cm, (sub)coriaceous, apex acuminate to subacute, base cuneate to obtuse, margin entire; upper surface sparsely, on the midrib more densely puberulous, subhispidulous or strigillose, scabrous to smooth, lower surface densely to sparsely brown(ish) hirtellous to subtomentose puberulous on the veins; cystoliths absent; lateral veins 4–6(–8) pairs, the basal pair running close to the margin, to 1/5–1/3 the length of the lamina, unbranched, tertiary venation scalariform to almost reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.8–2(–3) cm long, ± densely puberulous to hirtellous; stipules 0.4–0.8 cm long, brownish to yellowish subsericeous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle (0.1–)0.3–0.6 cm long; basal bracts 3, 1–2 mm

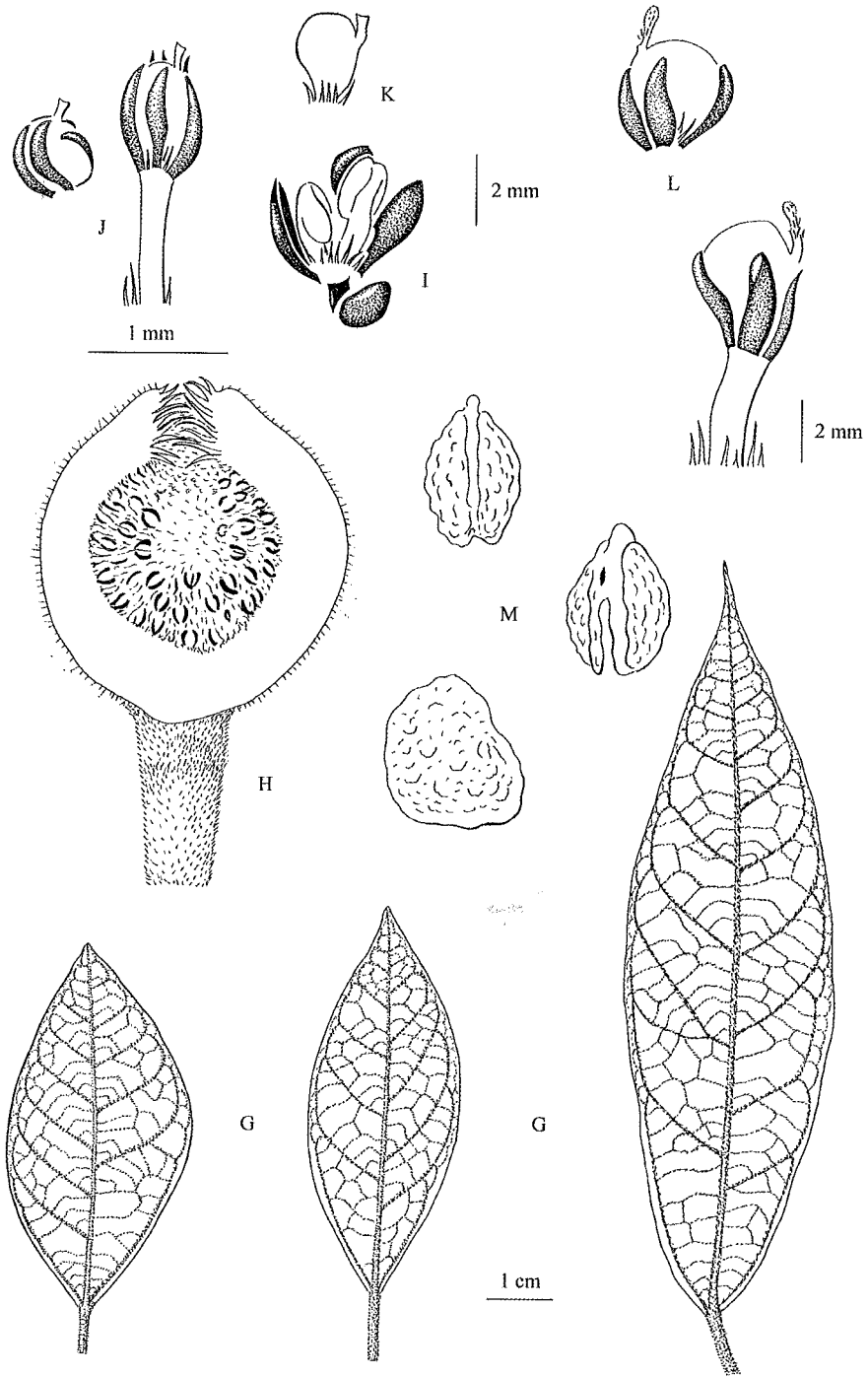


Fig. 14. *Ficus oreophila* Ridl. A. leaves (*Corner s.n.*), B. fig (*Corner s.n.*); C. short-styled flowers (*Corner s.n.*), D. 'gall' fruit (*Corner s.n.*); E. long-styled flowers (*SF 28864*); F. fruits (*SF 28864*). Courtesy of Flora Malesiana ser I, 17(2): 118, fig. 29, changed.

long, minutely puberulous; receptacle subglobose to pyriform, (0.6–)0.8–1.2 cm diam. when dry, 1.2–1.4 cm diam. when fresh, ± densely hirtellous to patent-puberulous, to 0.5 cm long stipitate (or non-stipitate), orange to red at maturity, apex convex, ostiole 2–2.5 mm diam., prominent to flat; internal hairs abundant.

T h a i l a n d.—PENINSULAR: Krabi, Yala (Betong).

D i s t r i b u t i o n.—Peninsular Malaysia (type).

E c o l o g y.—Montane forest, 1,000–1,500 m.

N o t e.— This species is closely related to *Ficus cambodica*, under which some differentiating characters are mentioned.

FIG17. *Ficus pyriformis* Hook. & Arn., Beech. Voy.: 216. 1836; Miquel, London J. Bot. 7:437. t. 6A. 1848. Benth., Fl. Hongk.: 328. 1861; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 157. t. 200A. 1888; Gagnep., Fl. Indo-Chine 5: 797. 1928; Corner, Gard. Bull. Singapore 21: 39. 1965.—*F. milletii* Miq., London J. Bot. 7: 436. 1848, as “*millisii*”; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 281. 1867.—*F. rectinervia* Merr.; Philipp. J. Sci., Bot. 13: 135. 1918.—*F. pyriformis* Hook. & Arn. var. *hirtinervis* S.S. Chang, Guihaia 4: 117, t. 10. 1984.

Shrub to 2(–3) m tall, with internodes mostly ± distinctly different in length and leaves often ± tufted at the ends of branches. *Leafy twigs* 1–2.5 mm thick, ± densely (to sparsely) white to brownish puberulous; periderm persistent. *Leaves* spirally arranged, sometimes subopposite; lamina linear-oblongate or subobovate (to obovate or subpandurate), 1–12(–17) by 0.5–4 cm, subcoriaceous, apex acuminate subcaudate to subacute, base cuneate to rounded, margin entire, ± revolute, at least towards the base; upper surface glabrous (or puberulous), lower surface ± sparsely puberulous on the (main) veins to glabrous; cystoliths only below; lateral veins (4–)6–9(–12) pairs, the basal pair to 1/10–1/6 the length of the lamina, unbranched, tertiary venation subscalariform to reticulate; waxy glands in the axils of the basal lateral veins; petiole 0.2–1 cm long, white puberulous, more densely so or only so above, the epidermis persistent or (sooner or later) flaking off; stipules 0.5–1.2 cm long, amplexicaul or semi-amplexicaul on parts of twigs with long internodes, keeled, glabrous or ciliolate (or sparsely appressed puberulous on the keel), caducous or subsistent (along the leafy twigs or in tufts at their apices). *Figs* axillary, solitary; peduncle 0.3–1.5 cm long; basal bracts 3, 1–2 mm long, glabrous; receptacle ellipsoid, obovoid or subpyriform (to subobovoid or subglobose), (1–)1.2–1.5 cm diam. when dry, sometimes to 1 cm long stipitate, glabrous or white puberulous, at maturity red or purple (to black), apex ± protracted, ostiole 2–3(–4) mm diam.; internal hairs few or absent (?). Tepals dark red.

T h a i l a n d.—NORTHERN: Chiang Mai, Phitsanulok.

D i s t r i b u t i o n.—S China (type), Vietnam.

E c o l o g y.—Dry evergreen forest, common on slopes and often along rivers, at low altitudes (in China to 1,900 m).

V e r n a c u l a r.—Duae tia (เดื่อเตี้ย) (Loei); ta-ku-ti (ตะกั่วตี) (Karen-Chiang Mai).

N o t e s.—The species is rather variable, in particular in the shape of the fig receptacle and the length of the peduncle.

It is closely related to *F. ischnopoda*, sharing several characters often including the distribution of hairs on the petiole. It differs in the amplexicaul stipules in parts of the twigs with short internodes, in the somewhat smaller number of lateral veins, the more well-developed

basal lateral veins, and the tendency of exfoliation of the epidermis of the petiole. The two species could be considered as distinct only at the subspecies level, as suggested by King (1888) when he reduced *F. ischnopoda* to a variety of *F. pyriformis*, as well as *F. abelii* Miq., another species showing close affinities to both *F. ischnopoda* and *F. pyriformis* (see above).

FIG18. *Ficus thailandica* C.C. Berg & S. Gardner, Thai Forest Bull. (Bot.) 35: 31. 2007, t. 1. Plate LXI: 1.

Shrub to 4 m tall with intermittent growth; sap milky. *Leafy twigs* 1–3 mm thick, yellowish appressed-puberulous; periderm persistent. *Leaves* spirally arranged, distichous or subopposite; lamina subobovate to oblong, 6–20 by 2–5.5 cm, chartaceous (to subcoriaceous), apex acuminate, base obtuse, margin entire; upper surface sparsely yellowish appressed-puberulous chiefly on the main veins, smooth, lower surface rather sparsely yellowish appressed-puberulous, chiefly on the main veins; cystoliths on both sides; lateral veins 4–6 pairs, the basal pair to 1/2 the length of the lamina, shortly branched, tertiary venation loosely scalariform; waxy glands absent (or hidden in domatia in the axils of the basal lateral veins?); petiole 2.5–7 cm long, yellowish appressed-puberulous, the epidermis persistent; stipules lateral, 0.5–0.7 long, yellowish appressed-puberulous, caducous. *Figs* on previous season's growth, solitary, with a peduncle 1–2 cm long; basal bracts 3, ca. 1 mm long, yellowish appressed-puberulous; receptacle reflexed?, subglobose to ovoid ca. 0.5 cm diam. when dry, 0.1–0.3 cm long stipitate, densely yellowish appressed puberulous, colour at maturity unknown, apex convex, ostiole ca. 1.5 mm diam.; internal hairs absent.

T h a i l a n d.—PENINSULAR: Surat Thani (Khlung Yan Wildlife Sanctuary).

D i s t r i b u t i o n.— Only known from the type locality, probably endemic.

E c o l o g y.— Secondary growth between agricultural fields, ca. 150 m.

N o t e.— This species shows similarities in the features of the leaves to *F. chartacea* from which it differs by the lateral stipules, the hairy leafy twigs, stipules, petioles and fig receptacles, the much longer peduncles, and the absence of internal hairs.

FIG19. *Ficus triloba* Buch.-Ham. ex Voigt, Hort. Suburb. Calcutt.: 284. 1845, substitute name; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 270, 290. 1867; Kurz, Forest Fl. Burma 2: 449. 1877; C.C. Berg, Thai Forest Bull. (Bot.) 35: 26. 2007.—*F. hirsuta* Roxb., Fl. Ind. Ed. 1832 3: 528. 1832, non Schott, 1827; Wight, Icon. Pl. Ind. Orient.: 2 t. 670. 1843.—*F. hirta* Vahl var. *triloba* (Buch.-Ham.) Kuntze, Rev. Gen. Pl. 1: 627. 1891.

N o t e.— Two subspecies can be distinguished, the widespread typical subspecies and subsp. *quangtrienensis* (Gagnep.) C.C. Berg, probably confined to Vietnam (see Thai Forest Bull. (Bot.) 35: 27. 2007).

subsp. **triloba** — *Ficus hirta* Roxb., Fl. Ind. Ed. 1832 3: 531. 1832, non Vahl, 1805; Wight, Icon. Pl. Ind. Orient. 2: t. 672. 1843.—*F. roxburghii* Miq., London J. Bot. 7 (1848) 456, non Wall., 1840.—*F. hirta* Roxb. var. *roxburghii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 150, t. 189. 1888; Gagnep. in Fl. Indo-Chine 5: 804. 1928.—*F. hirta* Roxb. subsp. *roxburghii* (King) C.C. Berg, Blumea 48: 537. 2003; Blumea 49: 154. 2004; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 115. 2005.—*F. cordata* Ridl., J. Straits Branch Roy. Asiat. Soc. 57: 93. 1911, non Kunth. & C.D. Bouché, 1847, nec Thunb., 1786; Ridl., Fl. Malay Penins. 3: 347. 1924; Corner, Gard. Bull. Singapore 10: 285. 1939.—*F. esquiroliana* H. Lév., Bull. Geogr.

Bot. 24: 252. 1914; Corner, Gard. Bull. Singapore 21: 45. 1965.— *F. hirta* Vahl var. *malayana* Corner, Gard. Bull. Singapore 17: 430. 1960.— *F. hirta* Vahl var. *squamosa* Corner, Gard. Bull. Singapore 17: 431. 1960. Plate LX: 2–3.

Tree to 15 m tall or shrub. *Leafy twigs* 5–20 mm thick, rusty brown hirsute to setose, the hairs with thickened bases, or hirtellous, the longer hairs intermixed with sparse to dense, much shorter brownish hairs, conspicuous to inconspicuous pairs of waxy glands at the bases of the petioles; internodes often hollow; periderm persistent. *Leaves* in spirals; lamina cordiform, ovate or suborbicular and often subpalmately 3–5(–7)-lobate to -fid, or elliptic to oblong and not constricted in the lower part, (5–)10–32(–42) by (3.5–)10–25(–40) cm, chartaceous, apex shortly (sub)acuminate, base cordate, margin denticulate; upper surface brown hirtellous, mainly on the veins, smooth to scabridulous, lower surface densely white-tomentose to subvillous covering the areoles, white tomentose to puberulous on the reticulum and/or smaller veins, and brown to whitish hirtellous to subhirsute on the main veins, smooth; cystoliths absent; lateral veins 4–5(–6) pairs, the basal pair branched, to 1/2–2/3 the length of the lamina, branched, other lateral veins often branched or forked away from the margin, tertiary venation scalariform, ± prominent beneath; waxy glands in the axils of the (main) basal lateral veins, smaller ones in axils of other lateral veins and in furcations of lateral veins; petiole (2–)5–15 cm long, 2–3(–4) mm thick, hirsute and minutely whitish puberulous, the epidermis persistent; stipules (1–)1.5–5 cm long, whitish appressed-puberulous to sericeous and on and brown strigose along the keel and the base, caducous or subpersistent. *Figs* axillary, in pairs or solitary, (sub)sessile; basal bracts 3, 1–1.5 cm or 0.5–2.5 cm long, persistent or (if long then) caducous, white appressed-puberulous to subsericeous and brown (to whitish) strigose on the keel; receptacle ellipsoid, ovoid or subglobose (to subcylindrical), when dry (0.7–)1.2–2.5(–3.5) cm diam., rusty brown hirsute, strigose or hirtellous, sometimes with lateral bracts to 1.5 cm long, yellow to red at maturity, apex convex, ostiole 5–7 mm diam., surrounded by a rosette of ostiolar bracts to 0.6 mm long pointing upwards or surrounded by stiff brown (to whitish) hairs; internal hairs abundant, white. *Style* (of long-styled flowers) hairy.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Lamphun, Lampang, Tak, Phitsanulok; SOUTH-WESTERN: Phetchaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri; PENINSULAR: Ranong, Phuket, Nakhon Si Thammarat, Yala.

D i s t r i b u t i o n.— Nepal, Sikkim, Bhutan, NE India, Bangladesh (type), Burma, S China, Vietnam, Laos, Peninsular Malaysia, Indonesia (Sumatra).

E c o l o g y.— Evergreen and deciduous dipterocarp forests, to ca. 1,500 m.

N o t e.— This species varies considerably in the shape and the size of the leaves, and the length of the stipules. The figs vary in size and shape (from ellipsoid to ovoid to subcylindrical). The basal bracts vary in length, if they are short they are mostly persistent, but if they are long, they are caducous. In some collections from northern Sumatra the fig receptacle has several lateral bracts.

II. FICUS SUBGENUS PHARMACOSYCEA

Terrestrial trees (often large) or shrubs, without secondary roots. *Leaves* spirally arranged; lamina coriaceous, with entire margin (when adult), the tertiary venation scalariform to reticulate, waxy glands in the axils of the basal lateral veins or absent. *Figs* axillary, mostly pedunculate and/or stipitate. *Plants* monoecious with staminate and pistillate flowers in the same fig, the latter with styles of different length but, in contrast to *Ficus* subg. *Urostigma*, with bifid stigmas.

This subgenus has a worldwide distribution and comprises ca. 70 species, of which 5 are found in Thailand. Two sections can be recognised, one of them is confined to the New World. The Old World species are included in *Ficus* sect. *Oreosyceae*, which can be subdivided into two subsections: *Glandulosae* and *Pedunculatae*. The former subsection has waxy glands in the axils of the basal lateral veins beneath and is represented in Thailand by *F. nervosa*. The other species belong to the latter subsection which is characterized by the absence of waxy glandular spots.

KEY TO THE SPECIES OF *FICUS* SUBG. PHARMACOSYCEA

- | | |
|--|-------------------------|
| 1. Waxy glands present in the axils of basal lateral veins; lamina drying brown (Subsect. <i>Glandulosae</i>) | 4. <i>F. nervosa</i> |
| 1. Waxy glands absent; lamina drying greyish-green (Subsect. <i>Pedunculatae</i>) | |
| 2. Lateral veins 4–6 pairs; lamina chartaceous | 3. <i>F. capillipes</i> |
| 2. Lateral veins usually 6–12(–16) pairs; lamina mostly coriaceous | |
| 3. Tertiary venation reticulate | 5. <i>F. vasculosa</i> |
| 3. Tertiary venation scalariform | |
| 4. Fig receptacle 1.5–2.5 cm diam. when dry; petiole glabrous | 2. <i>F. callosa</i> |
| 4. Fig receptacle 1–1.5 cm diam. when dry; petiole sparsely to densely hairy | 1. <i>F. albipila</i> |

PHA1. *Ficus albipila* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 179. 1888; Corner, Gard. Bull. Singapore 17: 408. 1960; Corner, Philos. Trans., Ser. B, 259: 392, f. 5. 1970; Kochummen, Tree Fl. Malaya 3: 139. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 257. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 163. 2005.— *Covellia albipila* Miq., Fl. Ned. Ind., Eerste Bijv.: 175, 434. 1. 1861.— *Ficus mollis* Miq. var. *albipila* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867.— *Morus leucophylla* Miq., Fl. Ned. Ind., Eerste Bijv.: 415. 1861.— *Ficus colosseae* F. Muell. ex Benth., Fl. Austral. 6: 163. 1873. Fig. 15. Plate LX: 4.

Tree to 30(–40) m tall, with buttresses to 5 m tall, deciduous. *Branchlets* drying brown. *Leafy twigs* 2–4 mm thick, solid, densely to sparsely white puberulous to subtomentose. *Leaves* spirally arranged; lamina oblong, elliptic, subovate or ovate, (4–)10–20(–24) by (2–)4–10(–14) cm, symmetrical, coriaceous to chartaceous, apex acuminate to acute, base deeply cordate to rounded, margin entire, slightly revolute; upper surface (rather) sparsely white puberulous to tomentose, mainly on the veins, or (sub)glabrous, lower surface ± densely to sparsely puberulous, subtomentose or hirtellous on the veins; cystoliths on both sides; midrib almost flush above, lateral veins (6–)10–14 pairs, the basal lateral veins to ca. 1/20–1/10 the length of the lamina, (faintly) branched, most other lateral veins branched or forked away from the margin, tertiary venation scalariform, the smaller veins (almost) flush beneath; waxy glands absent; petiole 1–6(–8.5) cm long, (often) varying in length on the same twig, sparsely to rather densely white puberulous to subtomentose, the epidermis persistent; stipules 0.5–1.3 cm long, white sericeous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary); peduncle 0.2–0.8 cm long; basal bracts 3, 1–2 mm long, caducous; receptacle subglobose, 1–1.5 cm diam. when dry, non-stipitate or to 0.1 cm long stipitate, sparsely to densely white puberulous to tomentose, yellow, pink or red at maturity, apex slightly umbonate, ostiole ca. 1–1.5 mm diam., prominent; internal hairs abundant, long. *Tepals* reddish, glabrous. *Stamens* 1 (or 2).

T h a i l a n d.— SOUTH-EASTERN: Chachoengsao, Chon Buri.

D i s t r i b u t i o n.— Peninsular Malaysia, Indonesia (Sumatra-type, Java, Kalimantan?), Lesser Sunda Islands, Papua, Papua New Guinea, Australia.

E c o l o g y.— Dry evergreen forest, at low altitudes.

V e r n a c u l a r.— Liang phueng (เลี้ยงผึ้ง) (Southeastern).

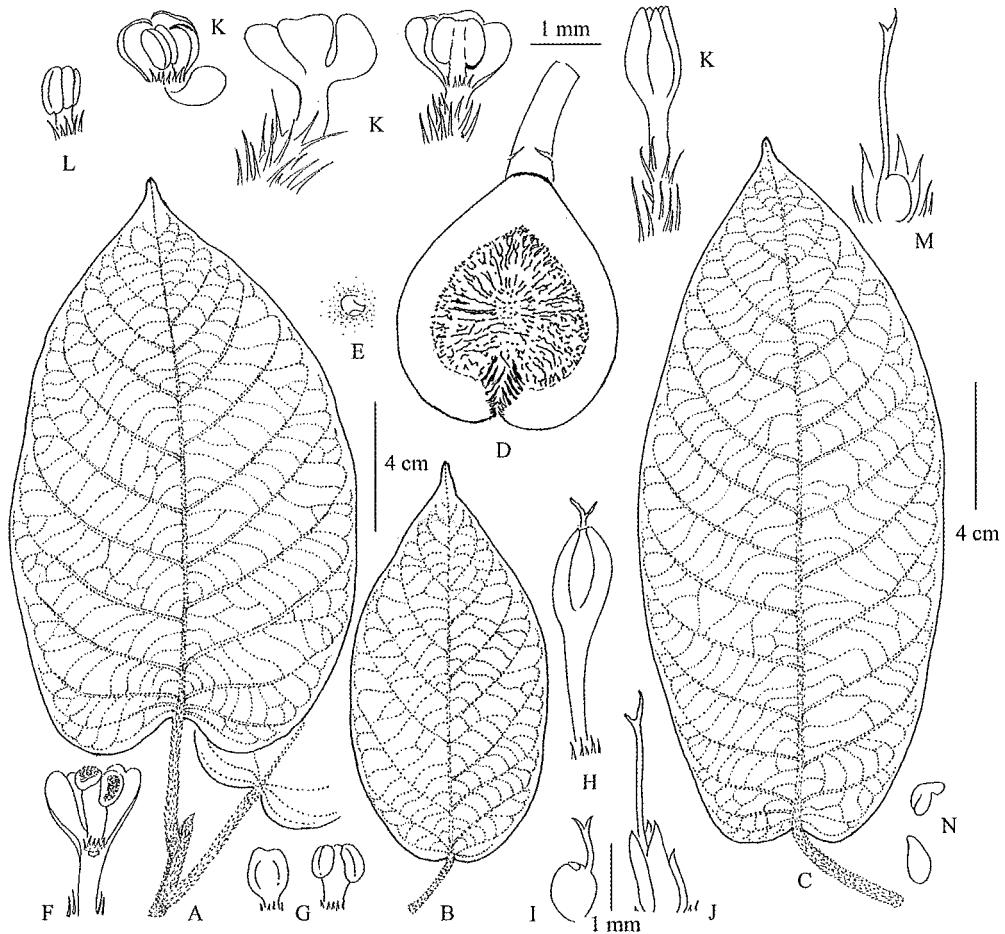


Fig. 15. *Ficus albipila* (Miq.) King: A. leafy twig (SF 31641); B, C. leaves (SF 31641); D. fig (SF 31641); E. ostiole (Horsfield s.n.); F. staminate flower (Corner s.n.); G. stamens (Corner s.n.); H. Short-styled flowers (Corner s.n.); I. 'gall' fruit (Corner s.n.); J. long-styled flower (Corner s.n.); K. Staminate flower (Carr 12255); L. stamen (Carr 12255); M. long-styled flower (Carr 12255); N. embryo (Corner s.n.). Courtesy of Flora Malesiana ser I, 17(2): 164, fig. 37.

PHA2. *Ficus callosa* Willd., Act. Acad. Berol.: 102, t. 4. 1798; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867; Kurz, Forest Fl. Burma 2: 454. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 64, t. 85. 1887; Gagnep., Fl. Indo-Chine 5: 773. 1928; Kochummen, Tree Fl. Malaya 3: 142, f.7. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 166. 2005.— *F. scleroptera* Miq., Pl. Jungh.: 63. 1851.— *F. basidentula* Miq., Fl. Ned. Ind. 1(2): 314. 1859; Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867.— *F. porteana* Regel, Gartenfl. 11: t. 372, 1862; Gagnep., Fl. Indo-Chine 5: 774. 1928. Plate LX: 5.

Tree to 20(–)45 m tall, with buttresses, deciduous. *Branchlets* drying dark brown; stipule scars prominent. *Leafy twigs* 3–8 mm thick, solid, sparsely minutely puberulous to glabrous. *Leaves* spirally arranged; lamina elliptic, oblong or subobovate, (8–)10–30(–45) by (4–)5–15(–

25) cm, (almost) symmetrical, coriaceous, apex shortly and bluntly acuminate to rounded, base equilateral to slightly inequilateral, broadly to narrowly subcordate, rounded or subattenuate, margin entire (lobate and/or (towards the base) dentate when juvenile), \pm revolute; upper surface glabrous, shining when dry, lower surface glabrous, scabridulous; cystoliths only below; midrib slightly prominent to flush above, lateral veins (6–)9–12 pairs, the basal lateral veins to ca. 1/10–1/6 the length of the lamina, faintly or not branched, most other lateral veins branched or forked away from the margin, tertiary venation (\pm loosely) scalariform, the smaller veins (almost) flush beneath; waxy glands absent; petiole 3–7(–9) cm long, (often) varying in length on the same twig, glabrous, lenticellate, the epidermis persistent; stipules 1–3(–5) cm long, white (sub)sericeous, caducous. *Figs* axillary, solitary (or in pairs); peduncle 0.2–2 cm long; basal bracts 3, 1.5–4 mm long, persistent; receptacle subglobose, ovoid or ellipsoid, 1.5–2.5 cm diam. when dry, 0.1–1 cm long stipitate, minutely white puberulous, green (or yellow?) at maturity, apex slightly umbonate, ostiole ca. 1–1.5 mm diam., prominent; internal hairs absent. *Tepals* reddish, glabrous. *Stamens* (1–)2.

T h a i l a n d.— NORTHERN: Chiang Mai; NORTH-EASTERN: Loei; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; CENTRAL: Saraburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Nakhon Si Thammarat, Trang, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, India (type, NE, Andaman and Nicobar Islands), Bangladesh, Burma, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines.

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, near streams, to 1,050 m.

V e r n a c u l a r.— Ka pung (กะปุง), lin khwai (ลิ้นควาย), ma dua kwang (มะเดื่อกลาง) (Central); khong (ข้อง) (Saraburi); tong nang (ตองหนั่ง) (Loei); lin krabue (ลิ้นกระบือ) (Uttaradit); ma dua ton (มะเดื่อตัน) (Chanthaburi).

N o t e s. — In the juvenile state the lamina can be oblong to lanceolate and \pm lobate (and to 60 by 23 cm, with to 22 pairs of lateral veins) or elliptic and entire. In both types of lamina the margin is spinulose-dentate towards the base. The two types of lamina can be found side by side on treelets, being apparently descendants of the same tree. In the juvenile state the lamina has waxy glands in the axils of the basal lateral veins and also (less clearly) at the base of the midrib above. Such glands are not present in the adult state.

PHA3. *Ficus capillipes* Gagnep., Notul. Syst. (Paris) 4: 87. 1927; Gagnep., Fl. Indo-Chine 5: 815. 1928; C.C. Berg, Blumea 53: 325. 2008, t. 1. Plate LX: 7.

Tree to 20 m tall, deciduous. *Branchlets* drying brown. *Leafy twigs* 2–3 mm thick, solid, \pm densely white puberulous. *Leaves* spirally arranged (or opposite); lamina oblong, elliptic or subobovate, 4–12(–17) by 1–5(–7) cm, symmetrical, chartaceous, apex acuminate, base rounded to cuneate, margin entire to subrepand, slightly revolute; upper surface (rather) sparsely white puberulous to tomentose, mainly on the veins, or (sub)glabrous, lower surface \pm densely to sparsely (minutely) puberulous on the veins; cystoliths on both sides; midrib slightly prominent above, lateral veins 4–6 pairs, the basal lateral veins to ca. 1/4–1/2 the length of the lamina, (faintly) branched, tertiary venation scalariform, the smaller veins (almost) flush beneath; waxy glands absent; petiole 1–4.5 cm long, hardly to distinctly varying in length on the same twig, \pm densely white puberulous to subtomentose, the epidermis persistent; stipules

0.3–0.5 cm long, white puberulous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary); peduncle ca. 0.5–1–5 cm long; basal bracts 3, sometimes subverticillate, 1–1.5 mm long, persistent; receptacle subglobose (to ovoid), when dry 0.8–1.3 cm diam., non-stipitate or to 0.5 cm long stipitate, ± densely white puberulous, colour at maturity unknown, apex slightly umbonate, ostiole ca. 3–3.5 mm diam., prominent or flat; internal hairs absent. *Tepals* dark red, glabrous. *Stamens* 1 (or 2).

T h a i l a n d.— NORTHERN: Chiang Mai, Lampang; SOUTH-EASTERN: Chon Buri; PENINSULAR: Phuket, Trang.

D i s t r i b u t i o n.— India (Andaman and Nicobar Islands), Vietnam (type), Cambodia, Indonesia (Sumatra).

E c o l o g y.— Dry evergreen and mixed deciduous forests, to 550 m.

V e r n a c u l a r.— Sai (ไทร) (Saraburi); khang khao (ขางขาว) (Lampang); ra-wia (ระเวีย) (Khmer-Chanthaburi).

N o t e.— The outer/upper ostiolar bracts are short, several, to ca. 10, mostly pointing upwards, sometimes flat, leaving a pore in the centre or the ostiole.

PHA4. *Ficus nervosa* Heyne ex Roth in Roem. & Schult., Syst. Veg. 1: 513. 1817; Roth, Nov. Pl. Sp.: 388. 1821; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 53, t. 65. 1887; Gagnep., Fl. Indo-Chine 5: 777. 1928; C.C. Berg, Blumea 48: 298. 2003; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 154. 2005.— *Urostigma nervosum* (Roth) Miq., London J. Bot. 6: 585. 1847.

subsp. **nervosa** — *Ficus undulata* Buch.-Ham, Trans. Linn. Soc. 15: 133. 1826, non S.S. Chang, 1984.— *F. angustifolia* Roxb., Fl. Ind. Ed. 1832 3: 554. 1832, non Blume, 1825, nec (Miq.) Miq., 1867.— *Urostigma modestum* Miq., London J. Bot. 6: 586. 1847; Miq., Ann. Bot. Mus. Lugd.-Bat. 3: 293.— *Ficus blinii* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 550. 1910. Plate LX: 6.

Tree to 25(–40) m tall, with buttresses. *Branchlets* drying brown to greyish. *Leafy twigs* 2–6 mm thick, solid, slightly angular to ± compressed to subterete, minutely brownish to whitish puberulous. *Leaves* in lax spirals to subdistichous; lamina oblong (to lanceolate), 6–23 by 2.5–7.5 cm, symmetrical, coriaceous, apex subacuminate, acute or obtuse, base cuneate, margin entire, flat; upper surface glabrous, lower surface glabrous or brownish to whitish appressed puberulous on the midrib, smooth; cystoliths only below; midrib almost flush above, lateral veins 8–15 pairs, basal pair not or slightly distinct, tertiary venation reticulate to subscalariform, the smaller veins slightly prominent beneath; waxy glands in the axils of the (main) basal lateral veins; petiole (0.5–)1–1.5(–3) cm long, the epidermis flaking off; stipules 0.5–1.5(–2) cm long, brownish to whitish subsericeous or puberulous, caducous. *Figs* axillary, solitary or in pairs, (sub)sessile; basal bracts 3, 1–2 mm long, persistent; receptacle subglobose, when dry 0.6–1.5 cm diam., 0.3–1.5 cm long stipitate, glabrous, yellow to red at maturity, apex convex, ostiole 2–4 mm diam., slightly prominent; wall thick; internal hairs absent. *Tepals* red, glabrous. *Stamens* 1 (or 2).

T h a i l a n d.— NORTHERN: Chiang Mai, Lampang; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Trang, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, India (type), Sikkim, Bhutan, Burma, S China, Vietnam.

E c o l o g y.— Evergreen and montane forests, 750–1,500 m (in China to 1,600 m).

V e r n a c u l a r.— Ya khang (ยาค่าง) (Northern); pho khanun (โพขนุน) (Central, Southeastern); hang (หาง, ฮ้าง) (Northern).

N o t e s.— This species is divided into three subspecies, the typical subspecies of continental Asia, the Malesian subspecies *pubinervis* (Blume) C.C. Berg, and a small-leaved one known from Sri Lanka and southern India, subsp. *minor* (King) C.C. Berg.

In several collections, mainly from the southern part of the country the midrib of the lamina bears appressed hairs and, in this feature, resembles the Malesian subspecies.

PHA5. *Ficus vasculosa* Wall. ex Miq., London J. Bot. 7: 454 1848; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867; Kurz, Forest Fl. Burma 2: 453. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 65, t. 86. 1887; Ridl., Fl. Malay Penins. 3: 337. 1924; Gagnep., Fl. Indo-Chine 5: 815. 1928; Kochummen, Tree Fl. Malaya 3: 160. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 167. 2005.— *F. championi* Benth., in Hook. J. Bot. Kew Misc. 6: 76. 1854; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867; Gagnep., Fl. Indo-Chine 5: 770. 1928.— *F. vasculosa* Wall. ex Miq. var. *acuminata* Miq., Pl. Jungh.: 61. 1851.— *F. renitens* Miq., Fl. Ned. Ind. 1(2): 317. 1859.— *F. variabilis* Miq., Fl. Ned. Ind. 1(2): 310 1859; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 274, 292. 1867.— *F. variabilis* Miq. var. *integrifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 274. 1867. Fig. 16. Plate LXI: 2.

Tree to 20 m tall, with or without low buttresses. *Branchlets* drying brown to blackish. *Leafy twigs* 1–3 mm thick, solid, glabrous. *Leaves* spirally arranged; lamina oblong to subobovate, (3–)5–15(–20) by (1.5–)2–5.5(–7.5) cm, symmetrical, coriaceous, apex acuminate (to obtuse), base rounded to cuneate, margin entire, flat to slightly revolute towards the base; upper surface glabrous, shining when dry, lower surface glabrous, smooth; cystoliths only below; midrib slightly prominent to flush above, lateral veins 9–12(–16) pairs, the basal lateral veins not distinct, tertiary venation reticulate to partly parallel to the lateral veins, the smaller veins (almost) flush beneath; waxy glands absent; petiole (0.7–)1–2.5 cm long, 0.5–1 mm thick, similar in length on the same twig, glabrous, the epidermis persistent (or ± flaking off); stipules 0.4–1.2 cm long, glabrous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary); peduncle (0.1–)0.3–1.2 cm long; basal bracts 3, 0.5–1 mm long, persistent (or caducous); receptacle subglobose, 0.5–1 cm diam. when dry, non-stipitate or to 0.7 cm long stipitate, glabrous, orange to red at maturity, apex convex, ostiole ca. 1–1.5 mm diam., flat; internal hairs absent. *Tepals* red, glabrous. *Stamens* (1–)2(–3).

T h a i l a n d.— NORTHERN: Chiang Mai; CENTRAL: Nakhon Nayok; SOUTH-WESTERN: Phetchaburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Ranong, Surat Thani, Phangnga, Nakhon Si Thammarat, Trang, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Burma, S China, Laos, Vietnam, Peninsular (type) and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java, Kalimantan).

E c o l o g y.— Evergreen and dry evergreen forests, to ca. 800 m.

V e r n a c u l a r.— Ma dua thong (มะเดื่อทอง) (Trang); ha-gor-bue-te (ฮากอบือเต๊ะ) (Malay-Narathiwat).

III. FICUS SUBGENUS SYCIDIUM

Trees, shrubs, climbers or hemi-epiphytes. *Leaves* spirally arranged, distichous (or subopposite), lamina often chartaceous to subcoriaceous, asymmetrical, and scabrous; stipules

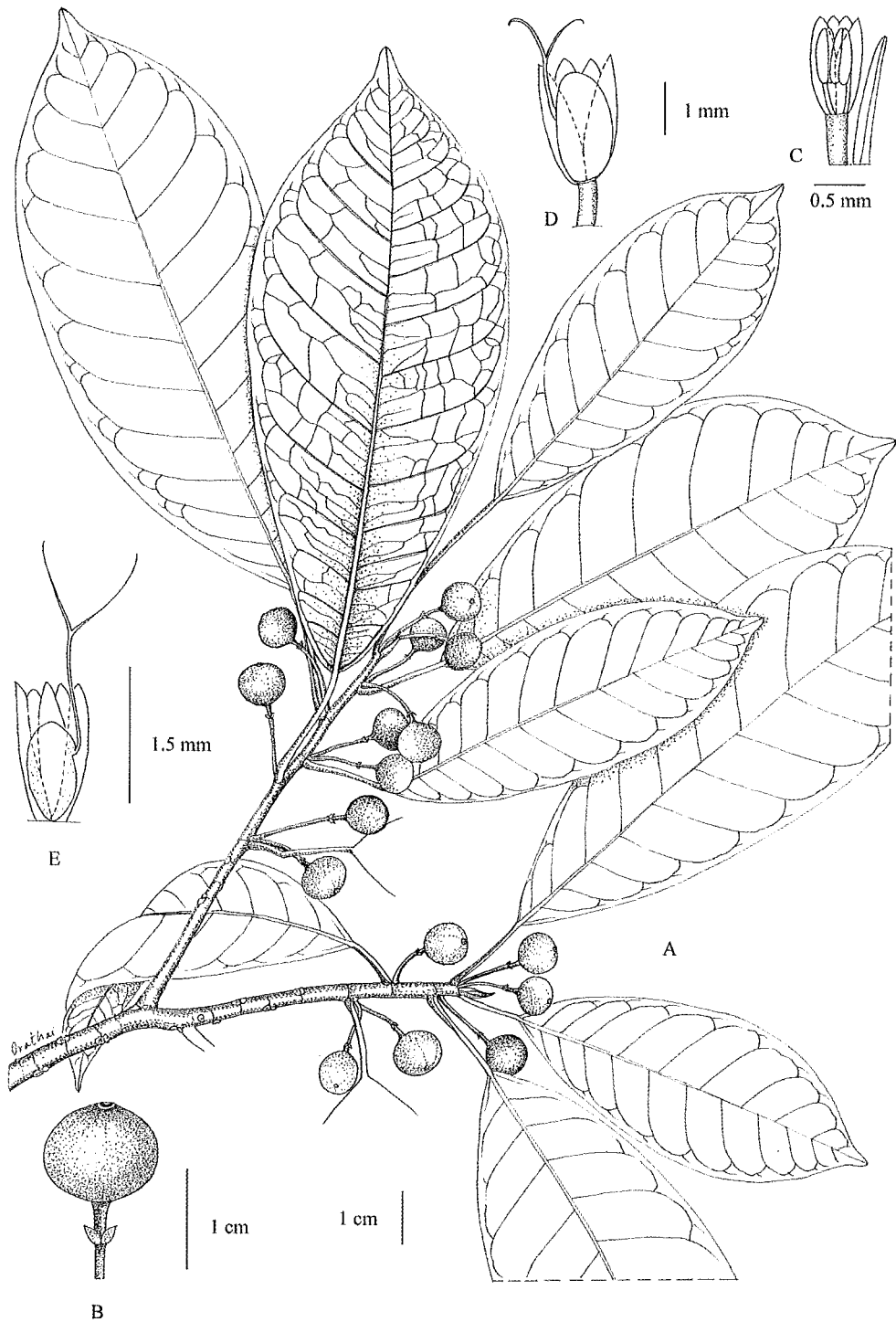


Fig. 16. *Ficus vasculosa* Wall. ex Miq.: A. leafy twig with figs; B. fig; C. staminate flower and interfloral bract; D. short-styled flower; E. long-styled flower (All from Maxwell 85-859, BKF). Drawn by Orathai Kerdkaew (A-B) and Cornelis Berg (C-E).

often not fully amplexicaul. *Plants* dioecious. *Figs* in the leaf axils or on branches (ramiflorous); basal bracts mostly not in a whorl at the base of the receptacle but \pm scattered on the peduncle. Staminate flowers (nearly) always with (minute to large) pistillode.

In Thailand, this subgenus, with ca. 115 species, is represented by 15 indigenous species. The subgenus is subdivided into two sections *Sycidium* and *Palaeomorpha*. The former comprises terrestrial procumbent or erect shrubs or treelets and is represented in Thailand by 6 species: *F. assamica*, *F. cyrtophylla*, *F. heterophylla*, *F. montana*, *F. praetermissa* and *F. subincisa*. The other 9 species belong to sect. *Palaeomorpha*, which comprises shrubs, treelets, climbers (with adventitious roots on stems) or hemi-epiphytes which usually establish some metres from the soil (even in shade). The waxy glands are often unilateral and the figs are often borne below the leaves on short spurs. The pistillode is often large, often as large as the pistil of the short-styled flower.

KEY TO THE SPECIES OF FICUS SUBG. SYCIDIUM

1. Lamina more or less scabrous above
 2. Basal lateral veins to 1/3–2/3 the length of the lamina; petiole 1–10 cm long, mostly longer than 1.5 cm; fig receptacle 0.8–1.5 cm diam. when dry **2. *F. assamica***
 2. Basal lateral veins to 1/20–1/3 the length of the lamina; petiole 0.1–1.5 cm long or, if longer than 1.5 cm, then fig receptacle 0.5–0.8 cm diam. when dry
 3. Fig receptacle 0.3–0.4 cm diam. and peduncle 0.1–0.2 cm long; lamina mostly to 10 cm long **1. *F. anastomosans***
 3. Fig receptacle 0.4–1.5 cm diam. and peduncle mostly longer than 0.2 cm; lamina mostly longer than 10 cm
 4. Tertiary venation reticulate; shrubs, often prostrate and rooting on stems and branches; shape of lamina variable **5. *F. heterophylla***
 4. Tertiary venation scalariform (in small or narrow laminas to subreticulate); rarely prostrate shrubs; lamina constant in shape
 5. Lamina (almost) symmetrical **7. *F. montana***
 5. Lamina distinctly asymmetrical
 6. Base of the lamina cuneate to rounded on the broad side **9. *F. praetermissa***
 6. Base of lamina rounded to cordate on the broad side
 7. Fig receptacle usually 0.2–0.5 cm diam. when dry; petiole 0.1–0.6 cm long **10. *F. scaberrima***
 7. Fig receptacle 0.8–1.5 cm diam. when dry; petiole 0.8–1.2 cm long **4. *F. cyrtophylla***
 1. Lamina smooth above
 8. Basal lateral veins to 1/2–2/3 the length of the lamina **8. *F. parietalis***
 8. Basal lateral veins to 1/20–1/2 the length of the lamina
 9. Stipules usually 1–2 cm long; apical (= stipular) bud divaricate and often curved **13. *F. subulata***
 9. Stipules 0.3–1 cm long; apical (= stipular) bud straight
 10. Epidermis of the petiole (usually) persistent
 11. Petiole 1–6(–13) cm long; prostrate to erect shrub to 2 m tall **7. *F. montana***
 11. Petiole 0.3–1 cm long; erect shrub or treelet to 4 or 6 m tall
 12. Peduncle 0.1–0.4 cm long; fig receptacle 0.3–0.5 cm diam. when dry **11. *F. sinuata***
 12. Peduncle 0.4–0.8 cm long; fig receptacle 0.5–1(–1.3) cm diam. when dry **12. *F. subincisa***
 10. Epidermis of the petiole flaking off
 13. Midrib of lamina impressed above **6. *F. heteropleura***
 13. Midrib of lamina prominent to flush above
 14. Apex of lamina subacuminate to subacute (to rounded) **14. *F. tinctoria* subsp. *gibbosa***
 14. Apex of lamina caudate or abruptly acuminate to subcaudate
 15. Acumen of lamina ca. 1/4–1/2 the length of the lower part of the lamina; fig receptacle 0.2–0.3 cm diam. when dry **3. *F. cuspidata***
 15. Acumen of lamina ca. 1/10–1/4 the length of the lower part of the lamina; fig receptacle 0.3–0.6 cm diam. when dry
 16. Lateral veins furcate away from the margin; twigs changing from dark red-brown to yellowish due to exfoliation of periderm **15. *F. uniglandulosa***
 16. Lateral veins not furcate away from the margin; twigs (pale) brown, not changing in colour due to exfoliation of periderm **11. *F. sinuata***

SYC1. *Ficus anastomosans* Wall. ex Kurz, J. Asiat. Soc. Bengal 42(2): 107. 1873, as *anastomozans*; Kurz, Forest Fl. Burma 2: 455. 1877; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 264. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 4, t. 1. 2007.—*F. tinctoria* G. Forst. subsp. *parasitica* (Miq.) Corner var. *anastomosans* (Wall. ex Kurz) Corner, Gard. Bull. Singapore 17: 477. 1960.—*F. ampelas* Burm.f. var. *hispidula* Corner, Gard. Bull. Singapore 18: 89. 1961. Fig. 17. Plate LXII: 1.

Shrub or treelet, terrestrial, sometimes scandent. *Branchlets* drying (dark) brown. *Leafy twigs* 1–2 mm thick, rather densely puberulous, smooth; internodes solid. *Leaves* distichous; lamina oblong, elliptic or (sub)ovate, 1–10(–13) by 0.5–4.5 cm, ± asymmetrical to (almost) symmetrical, chartaceous to subcoriaceous, apex acute to obtuse (or subacuminate), base (almost) equilateral, rounded to obtuse, margin crenate-dentate to sublobate, flat to slightly revolute towards the base; upper surface hispidulous to puberulous on the main veins, ± scabrous, dull, lower surface sparsely (sub)hispidulous to puberulous on the main veins, scabrous to almost smooth; cystoliths on both sides; midrib flush above; lateral veins 2–9 pairs, the basal pair running (rather) close to the margin, to (1/10–)1/5–1/3 the length of the lamina, unbranched or faintly branched, other lateral veins often forked away from the margin, tertiary venation reticulate to subscalariform; waxy glands in the axils of both lateral veins or also in the axils of some other lateral veins; petiole 0.2–1 cm long, puberulous, the epidermis flaking off; stipules amplexicaul, 0.2–0.3 cm long, puberulous, caducous. *Figs* axillary or just below the leaves, solitary; peduncle 0.1–0.2 cm long; peduncular bracts 3, scattered, 0.5–1 mm long; receptacle (sub)globose, 0.3–0.4 cm diam. when dry, puberulous to subhispidulous, scabridulous to almost smooth, sometimes (?) with a lateral bract, yellow to red at maturity, apex ± umbonate, ostiole ca. 1 mm diam., surrounded by a rim; internal hairs minute and sparse. *Tepals* pinkish, glabrous. *Styles* glabrous.

T h a i l a n d.—NORTHERN: Chiang Mai, Chiang Rai, Lamphun, Tak; NORTH-EASTERN: Loei; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; PENINSULAR: Chumphon.

D i s t r i b u t i o n.—Burma (type), Indonesia (Sulawesi: near Pankajene).

E c o l o g y.—Evergreen and dry evergreen forests, on limestone, to 900 m.

N o t e s.—In some collections the petiole is 0.2–0.5 cm long, whereas in others often to 1 cm long, as in *Maxwell 04-565* from Lamphun.

Two collections (*Kerr 2510* from Chiang Rai, *5239* from Chiang Mai) being climbers, or possibly so, are not included in the description: the (larger) leaves are more pronouncedly asymmetrical and the lamina can be irregularly lobate; in other features they are similar.

SYC2. *Ficus assamica* Miq., London J. Bot. 7: 226. 1848; Thai Forest Bull. (Bot.) 35: 9, t. 3. 2007.—*F. repens* Roxb. ex Willd. var. *assamica* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat 3: 290. 1867.—*F. heterophylla* L.f. var. *assamica* (Miq.) Corner, Gard. Bull. Singapore 21: 73. 1965.—*F. grossularioides* Burm.f. forma *assamica* (Miq.) Kuntze, Rev. Gen. Pl. 1: 626. 1891.—*F. repens* Roxb. ex Willd., Sp. Pl. 4: 1149. 1806, non Rottl., 1803.—*F. heterophylla* L.f. var. *repens* (Roxb. ex Willd.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 77, t. 94, fig. 3 and 4. 1888; Gagnep., Fl. Indo-Chine 5: 776. 1928.—*F. rubifolia* Griff., Not. Pl. Asiat. 4: 399. 1854; Griffith, Icon. Pl. Asiat. 4: t. 557, III. 1854. Fig. 18.

Shrub to 3(–6) m tall, often prostrate (creeping or scandent) and rooting on the branches; branchlets drying brown. *Leafy twigs* 1–2.5 mm thick, sparsely whitish puberulous

to subhispidulous, smooth; internodes hollow. *Leaves* distichous; lamina cordiform to ovate, 3–15 by 1–10 cm, symmetrical or \pm strongly asymmetrical, chartaceous, apex acute to rounded, base equilateral or inequilateral, (sub)cordate, margin (coarsely) dentate (to crenate), often \pm revolute; juvenile leaves often palmately 3–5-lobate; upper surface (minutely) hispidulous to strigillose, (\pm) scabrous, lower surface sparsely minutely to rather densely hispidulous to subhirtellous, scabrous or scabridulous; cystoliths on both sides; lateral veins 3–4(–5) pairs,

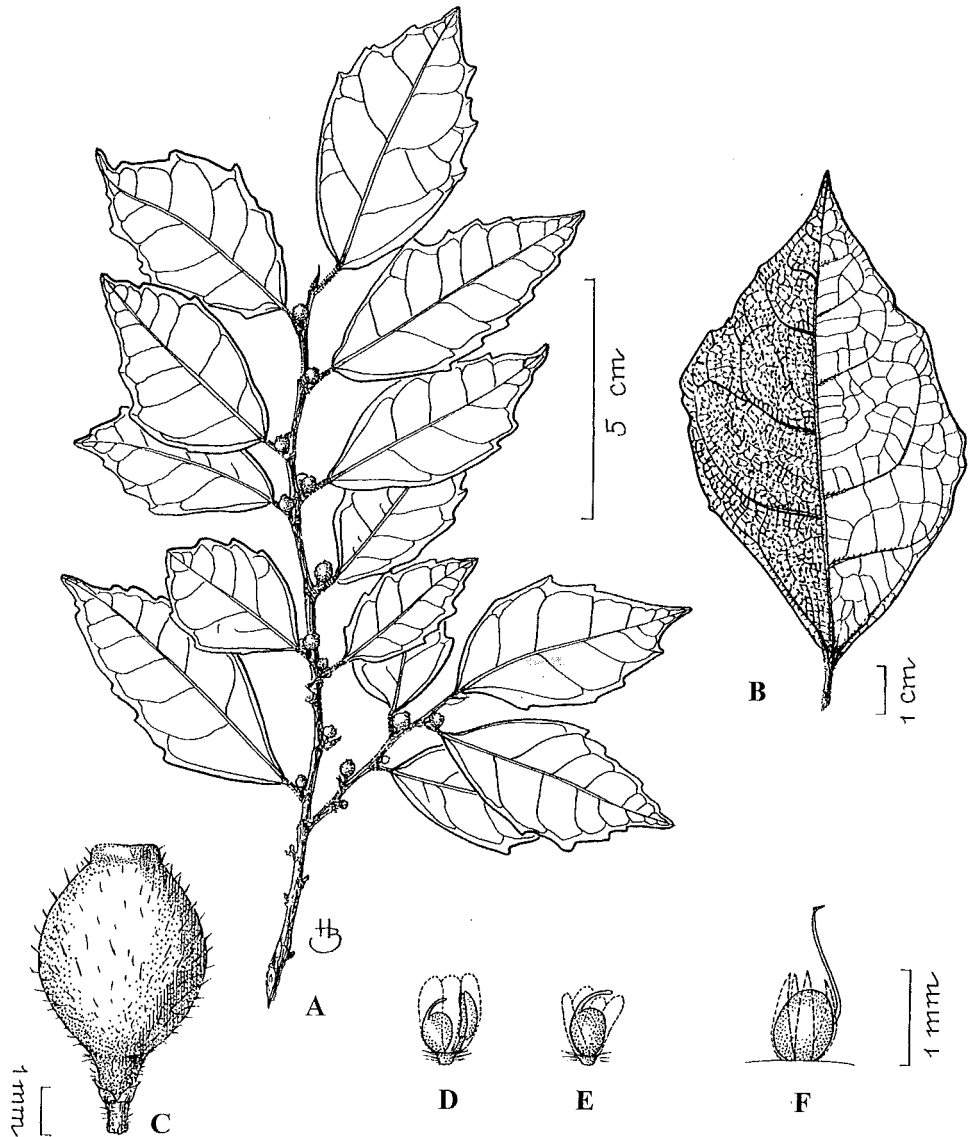


Fig. 17. *Ficus anastomosans* Kurz: A. leafy twig with figs; B. leaf; C. fig; D. staminate flower; E. short-styled flower; F. long-styled flower. (A, C–F: Maxwell 91-603, L; B: Kerr 5329, L). Drawn by Hendricke Berg.

the basal lateral veins to ca. 1/3–1/2 the length of the lamina, branched, tertiary venation (sub)reticulate; waxy glands in the axils one of the basal lateral veins or absent; petiole 1–10 cm long, 1–2 mm thick, white puberulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.5 cm long, subglabrous, caducous (or subpersistent). *Figs* axillary, solitary; peduncle 0.2–2 cm long; peduncular bracts 3, in a whorl, 0.5–1 mm long; receptacle (sub)globose to ellipsoid, when dry 0.8–1.5 cm in diameter, to 2.5 cm long stipitate, rather densely hispidulous to puberulous, ± scabrous, without lateral bracts, red at maturity, apex convex to slightly umbonate, ostiole ca. 3 mm in diameter, surrounded by 4–6 ± swollen apical bracts; internal hairs absent. *Tepals* whitish, glabrous or minutely hairy at the apices. *Styles* glabrous or hairy. *Fruits* not seen.

T h a i l a n d.— NORTHERN: Mae Hong Son, Nan, Sukhothai, Phitsanulok; NORTH-EASTERN: Nong Khai; EASTERN: Amnat Charoen; SOUTH-WESTERN: Kanchanaburi.

D i s t r i b u t i o n.— India (type), Bangladesh, Sikkim, Bhutan, Burma, China (Yunnan), Cambodia.

E c o l o g y.— Dry evergreen forest, mostly along rivers, at low altitudes.

N o t e.— The stipules are probably only subpersistent in juvenile material.

SYC3. *Ficus cuspidata* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 464. 1825. Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 292. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 88, t. 112. 1888; Ridl. Fl. Malay Penins. 3: 340. 1924; Ridl., Fl. Malay Penins. 5: 333. 1925; C.C. Berg & Corner. Fl. Males., Ser. 1, Spermat. 17(2): 269. 2005.— *F. sinuata* Thunb. subsp. *cuspidata* (Reinw. ex Blume) Corner, Gard. Bull. Singapore 17: 479. 1960; Kochummen, Tree Fl. Malaya 3: 156. 1978.— *F. angustifolia* Blume, Bijdr. Fl. Ned. Ind.: 463. 1825.— *F. cuspidata* Reinw. ex Blume var. *angustifolia* (Blume) Miq., Fl. Ned. Ind. 1(2): 308. 1859. Fig. 19.

Shrub or tree to 7 m tall, sometimes (?) lianescent or hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 1–2 mm thick, sparsely minutely puberulous, smooth; internodes solid. *Leaves* distichous; lamina oblong, 3–8(–12) by 1–2.5(–3) cm, (almost) symmetrical to slightly asymmetrical, coriaceous to subcoriaceous, apex (gradually) caudate, the acumen 2–2.5 cm long and 1/4–1/2 the length of the lower part of the lamina, base almost equilateral, cuneate (to obtuse), (in the upper part) often (sparsely and) coarsely crenate-dentate (to sublobate) or entire, revolute or flat; upper surface glabrous, smooth, lower surface very sparsely appressed-puberulous on the veins to subglabrous, smooth; cystoliths only below; midrib prominent above; lateral veins 5–9 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, to ca. 1/5 the length of the lamina, unbranched, the other lateral veins departing from the midrib wide, mostly at angles of (nearly) 90° and mostly (almost) straight, tertiary venation (sub)reticulate; waxy glands in the axils of one of the basal lateral veins (or of both); petiole 0.2–0.5(–0.8) cm long, sparsely minutely puberulous, the epidermis flaking off; stipules amplexicaul, 0.3–0.7 cm long, glabrous or ciliate, caducous. *Figs* axillary, solitary or paired, or clustered on minute spurs, more commonly so on spurs (or tubercles) to 0.3 cm long below the leaves (ramiflorous); peduncle 0.05–0.2 cm long; peduncular bracts 2–3, at the base of the peduncle, ca. 0.5 mm long; receptacle ovoid, ellipsoid or (sub)globose, 0.2–0.3 cm diam. when dry, 0.5–0.6 cm diam. when fresh, (very) sparsely minutely puberulous, smooth, without or with few lateral bracts, yellow (to whitish ?) at maturity, apex convex, ostiole ca. 1 mm diam., surrounded by short and ± thickened apical bracts; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

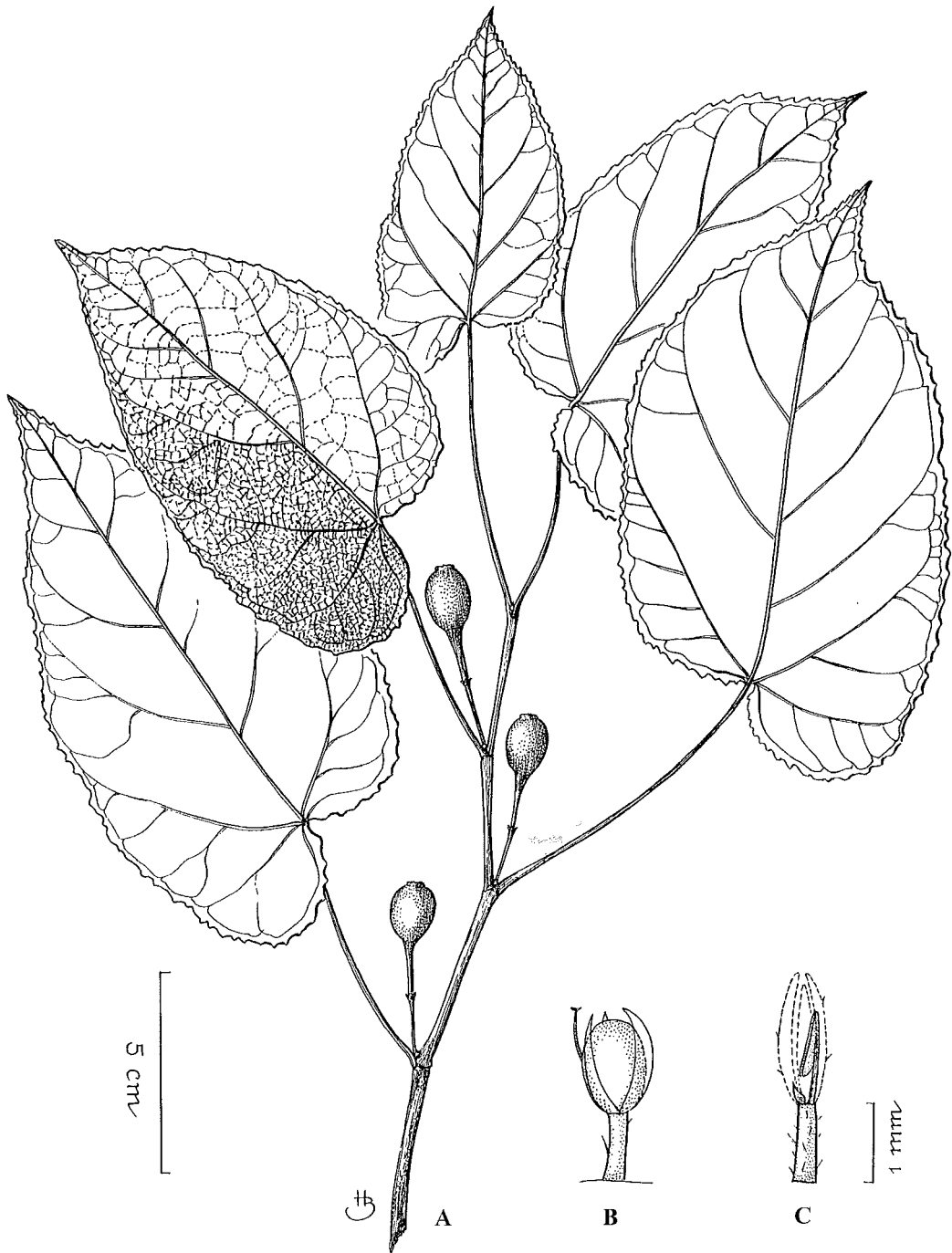


Fig. 18. *Ficus assamica* Miq.: A. leafy twig with figs; B. short-styled flower; C. staminate flower (van Beusekom *et al.* 99, L). Drawn by Hendrieke Berg.

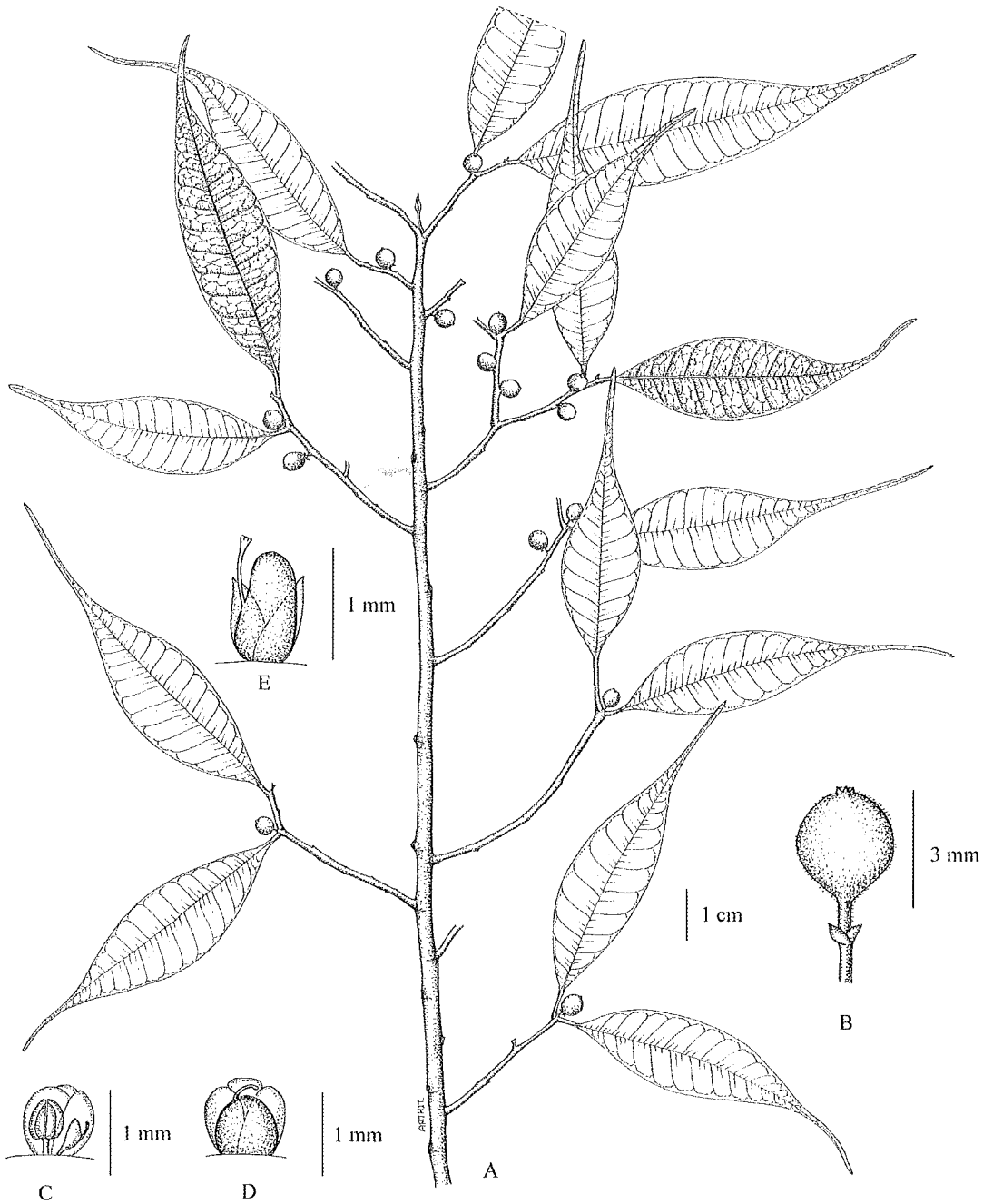


Fig. 19. *Ficus cuspidata* Reinw. ex Blume: A leafy twig with figs; B, fig; C, staminate flower; D, short-styled flower; E, long-styled flower (A–B, E: van Beusekom & Phengklai 949, BKF; C–D: Soepadmo *et al.* s86, L). Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–E).

T h a i l a n d.— PENINSULAR: Phangnga, Nakhon Si Thammarat.

D i s t r i b u t i o n.— Peninsular Malaysia, Indonesia (type, Sumatra, Java).

E c o l o g y.— Evergreen forest, 700–1,200 m.

SYC4. *Ficus cyrtophylla* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 282, 296. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 82. 1888.— *Covellia cyrtophylla* Wall. ex Miq., London J. Bot. 7: 460. 1948.— *Ficus asymmetrica* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 4: 82. 1907.

Shrub or treelet to ca. 7 m tall. *Leafy twigs* 1.5–3 mm thick, ± densely brownish to whitish puberulous to hirtellous, smooth to scabridulous; internodes hollow or solid. *Leaves* (sub)distichous; lamina subobovate, (7–)10–28 by (2.5–)4–12 cm, ± strongly asymmetrical, chartaceous, apex acuminate to subcaudate, base inequilateral, the broad side rounded to subcordate, the narrow side obtuse to cuneate, margin (coarsely) dentate, slightly revolute; upper surface whitish hispidulous to strigillose, scabrous, lower surface ± densely whitish puberulous to subhirtellous on the veins, smooth to scabridulous; cystoliths on both sides; lateral veins 6–9 pairs, the basal lateral veins distinct, to ca. (1/6–)1/4–1/3 the length of the lamina, at the broad side branched, tertiary venation scalariform; waxy glands in the axils of one or both the basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 0.8–1.2 cm long, whitish puberulous to subhirtellous, the epidermis persistent; stipules semi-amplexicaul, 0.5–1 cm long, puberulous, caducous. *Figs* axillary or below the leaves (on previous season's growth), solitary, or on spurs on the older wood; peduncle 0.3–0.8 cm long; peduncular bracts 2 or 3, scattered or 2 subopposite, ca. 0.5–1 mm long; receptacle (sub)globose, when dry 0.8–1.5 cm diam., rather densely puberulous, smooth, without lateral bracts, colour at maturity unknown, apex convex, ostiole 2–3 mm diam., flat. Internal hairs abundant, also on the pedicels. *Tepals* yellowish, glabrous. *Styles* hairy (only of long-styled flowers?). *Fruits* lens-shaped, ca. 1.2 mm long, with a rim.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Phayao, Nan.

D i s t r i b u t i o n.— Nepal, Sikkim, Bhutan, NE India, Bangladesh (type), Burma, S China (Yunnan), Laos, Vietnam.

E c o l o g y.— Montane forest, 1,300–1,800 m.

N o t e.— The lamina shows similarities to that of *F. scaberrima*, but in the former the figs are axillary and the receptacle is larger.

SYC5. *Ficus heterophylla* L.f., Suppl. Pl.: 442. 1782, non Lam., 1788.; Roxb., Fl. Ind. Ed. 1832 3: 531. 1832; Wight, Icon. Pl. Ind. Orient. 2 t. 659. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 271, 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 75, t. 94. 1888; Ridl., Fl. Malay Penins. 3: 339. 1924; Gagnep., Fl. Indo-Chine 5: 775. 1928; Kochummen, Tree Fl. Malaya 3: 148. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 231. 2005.— *F. cannabina* Lour., Fl. Cochinch. 2: 668. 1790; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 290. 1867.— *F. repens* Rottl., Neue Schrift. Gesellsch. Naturf. Freunde Berlin 4: 208. 1803, non Roxb. ex Willd., 1806; P. Daniel, Taxon 40: 608. 1991.— *F. morifolia* Vahl, Enum. Pl. 2: 203. 1805.— *F. scabrella* Roxb., Fl. Ind. Ed. 1832 3: 532. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 661. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 291. 1867; Kurz, Forest Fl. Burma 2: 455. 1877.— *F. heterophylla* L.f. var. *scabrella* (Roxb.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 76. 1888. Plate LXI: 3–4.

Shrub to 3(–6) m tall, often prostrate and rooting on the branches, sometimes ± climbing (straggling). *Branchlets* drying brown. *Leafy twigs* 1–2.5 mm thick, sparsely to densely whitish puberulous to subhispidulous, smooth to scabridulous; internodes solid. *Leaves* distichous (or opposite); lamina oblong to subovate, 5–14 by 1.5–7 cm, ± asymmetrical to almost symmetrical, chartaceous, apex acuminate to subcaudate, base inequilateral, cordate to rounded (to cuneate) at the broad side, cuneate to obtuse (to subcordate) at the narrow side, margin (coarsely) dentate (to subentire), often ± revolute; juvenile leaves often pinnately lobate or palmately 3-lobate; upper surface (minutely) hispidulous, scabrous, lower surface sparsely minutely to rather densely hispidulous to (sub)puberulous, scabrous or scabridulous; cystoliths on both sides; lateral veins 4–9 pairs, the basal pair to ca. 1/6–1/3 the length of the lamina, if running close to the margin of the lamina then unbranched or, if at some distance, then branched, tertiary venation (sub)reticulate; waxy glands in the axils of both or one of the basal lateral veins; petiole 0.5–1.5(–5.5) cm long, puberulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–0.5 cm long, puberulous, caducous. *Figs* axillary and also just below the leaves, solitary (or in pairs); peduncle 0.3–1.5 cm long; peduncular bracts 3, verticillate, subtending the receptacle or far below (and then the receptacle apparently stipitate), ca. 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 0.6–1.5 cm diam. when dry, minutely hispidulous, ± scabrous, without lateral bracts, orange to dark red at maturity, apex convex to slightly umbonate, ostiole ca. 2 mm diam., surrounded by 4–6 ± swollen apical bracts; internal hairs absent. *Tepals* whitish, glabrous or minutely hairy at the apices. *Styles* glabrous or hairy. *Fruits* lens-shaped to subreniform or almost tetrahedral, ca. 1.5 mm long.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Nan, Phrae, Phitsanulok; NORTH-EASTERN: Udon Thani, Sakon Nakhon; EASTERN: Chaiyaphum, Ubon Ratchathani; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Ang Thong; SOUTH-EASTERN: Chachoengsao, Chon Buri; PENINSULAR: Surat Thani, Nakhon Si Thammarat, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.—Sri Lanka, India (type, Andaman Islands), Bangladesh, Burma, S China, Laos, Vietnam, Cambodia, Peninsular Malaysia, Indonesia (Java, Kalimantan).

E c o l o g y.—Common in open places, mostly along streams, at low altitudes.

N o t e.—The material included in var. *assamica* (Miq.) Corner (1965), is currently treated as a distinct species (see p. 539).

SYC6. *Ficus heteropleura* Blume, Bijdr. Fl. Ned. Ind.: 466. 1825; Corner, Gard. Bull. Singapore 17: 480. 1960; Kochummen, Tree Fl. Malaya 3: 148. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 243. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 274. 2005.—*F. radicans* Roxb., Fl. Ind. Ed. 1832 3: 536. 1832, non Desf., 1829; Wight, Icon. Pl. Ind. Orient. 2: t. 671. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278, 293. 1867; Kurz, Forest Fl. Burma 2: 452. 1877.—*F. urophylla* Wall. ex Miq., London J. Bot. 7: 429. 1848; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 11, t. 9. 1887; Gagnep., Fl. Indo-Chine 5: 799. 1928.—*F. intermedia* Griff., Icon. Pl. Asiat. 4: t. 556, II. 1854.

Shrub or tree to 13 m tall, often lianescent, sometimes hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 1–4 mm thick, sparsely brownish (sub)hispidulous or densely puberulous, ± scabrous or smooth; internodes solid. *Leaves* distichous; lamina elliptic, oblong, lanceolate, subovate or subobovate, 4–20 by 2–7 cm, (almost) symmetrical to slightly asymmetrical, (sub)coriaceous, often drying reddish, apex caudate to acuminate, base (almost) equilateral, cuneate to

rounded (to cordulate), margin entire, often slightly revolute, involute at the base; upper surface glabrous, smooth, often shiny, lower surface (very) sparsely minutely brownish hispidulous to subglabrous or brownish puberulous to subhispidulous on the veins, scabridulous to smooth; cystoliths only below; midrib impressed above; lateral veins (2–)3–6 pairs, the basal pair to ca. 1/8–1/2 the length of the lamina, mostly running close to the margin of the lamina and then unbranched, sometimes running more distantly from the margin and then branched, other lateral veins often forked away from the margin, tertiary venation reticulate to subscalariform; waxy glands in the axils of one of the basal lateral veins (or in large leaves in the axils of both); petiole 0.3–1.5 cm long, sparsely brownish hispidulous or densely brownish puberulous, the epidermis flaking off; stipules amplexicaul or semi-amplexicaul, 0.2–1 cm long, glabrous or puberulous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.4–1.5 cm long; peduncular bracts 2–3, mostly near the base, ca. 0.5–1 mm long; receptacle (sub)globose, 0.4–0.8 cm diam. when dry, ca. 0.5–1 cm diam. when fresh, hispidulous, scabrous, mostly without lateral bracts, (seed-figs?) pinkish to dark red or (gall-figs?) orange or yellow at maturity, apex convex, ostiole ca. 1–3 mm diam., sometimes surrounded by a lobed rim; internal hairs absent or short and sparse (to abundant). *Tepals* whitish, glabrous. *Styles* glabrous.

T h a i l a n d.— NORTH-EASTERN: Sakon Nakhon, Mukdahan; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Ranong, Surat Thani, Phangnga, Nakhon Si Thammarat, Phatthalung, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— NE India, Bhutan, Burma, S China (Hainan), Vietnam, Laos, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (type, Sumatra, Java, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines.

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, at low altitudes.

V e r n a c u l a r.— Sai (ไทร) (Nakhon Si Thammarat); salot hin (สลอดหิน) (Trat); yue-ka (ยือกา) (Malay-Narathiwat).

SYC7. *Ficus montana* Burm.f., Fl. Ind.: 226. 1768; Blume, Bijdr. Fl. Ned. Ind.: 471. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 271, 291. 1867; Corner, Gard. Bull. Singapore 17: 453. 1960; Kochummen, Tree Fl. Malaya 3: 151. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 229. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 238. 2005.— *F. purpurascens* Blume, Bijdr. Fl. Ned. Ind.: 471. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 271, 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 75, t. 93. 1888.— *F. montana* Burm.f. var. *purpurascens* (Blume) Corner, Gard. Bull. Singapore 17: 453. 1960.— *F. quercifolia* Roxb., Fl. Ind. Ed. 1832 3: 534. 1832, non Blume, 1825; Wight, Icon. Pl. Ind. Orient. 2: t. 646. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 77, t. 95. 1888; Ridl., Fl. Malay Penins. 3: 339. 1924.— *F. humilis* Roxb., Fl. Ind. Ed. 1832 3: 535. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 635. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 271. 1867.— *F. quercifolia* Roxb. var. *humilis* (Roxb.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 77. 1888.— *F. sclerocoma* Miq., Pl. Jungh.: 58. 1851; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 184. 1888.— *F. madurensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 222, 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 83, t. 104. 1888; Corner, Gard. Bull. Singapore 17: 453. 1960; Kochummen, Tree Fl. Malaya 3: 151. 1978.— *F. sangumae* Weiblen & Whitfeld, Harvard Pap. Bot. 15: 1. 2010. Plate LXII: 2.

Shrub, often prostrate (and partly creeping or scandent), the stems rooting, if erect, then to 1 m tall. *Leafy twigs* 1–3(–4) mm thick, (minutely) whitish puberulous or also hirtellous;

internodes hollow (or solid). *Leaves* spirally arranged; lamina oblong to elliptic (or (ob) lanceolate or linear-lanceolate), (3–)8–24(–32) by (0.5–)2–10(–18) cm, symmetrical to slightly asymmetrical, chartaceous (to subcoriaceous), apex acuminate to subacute, base cuneate, rounded or subcordate, margin (coarsely) crenate-dentate to subentire or on young plants often irregularly pinnately lobate; upper surface (sub)glabrous or punctate (by cystoliths), smooth (or scabridulous), lower surface sparsely whitish hispidulous to strigillose on the veins, scabridulous; cystoliths on both sides; lateral veins 6–9(–16) pairs, the basal pair to ca. (1/20–)1/6–1/3 the length of the lamina, mostly unbranched, tertiary venation laxly scalariform (or subreticulate in narrow leaves); waxy glands in the axils of both basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 0.5–5 (in young plants –13) cm long, slightly different to almost equal in length on the same twig, sparsely whitish hispidulous to rather densely puberulous (sometimes also hirtellous) or glabrous, the epidermis persistent; stipules semi-amplexicaul, 0.2–1 cm long, sparsely minutely appressed-puberulous, often slightly striate, caducous (or subpersistent at apices of leafy twigs). *Figs* in the leaf axils, paired or solitary, or clustered on spurs in the leaf axils and also below the leaves; peduncle (0.1–)0.2–0.5 cm long; peduncular bracts 2–3, ca. 0.5 mm long; receptacle (sub)globose, 0.5–0.8 cm diam. when dry, sparsely minutely puberulous to glabrous, (usually) with few ca. 0.5 mm long lateral bracts, orange to (dark) red at maturity, apex ± convex, ostiole ca. 1 mm diam., surrounded by a low (sublobate) rim; internal hairs absent. *Tepals* whitish, glabrous. Styles glabrous (or hairy). *Fruits* (endocarp body) 1–1.5 mm long, subtetrahedral to lens-shaped, tuberculate, weakly keeled.

T h a i l a n d.— NORTHERN: Chiang Mai, Tak, Kamphaeng Phet; SOUTH-WESTERN: Kanchanaburi, Phetchaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Phangnga, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Songkhla, Pattani.

D i s t r i b u t i o n.— India (NE?), Burma, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java-type, Lesser Sunda Islands (Bali), Papua?), Philippines (Palawan), Papua New Guinea.

E c o l o g y.— Evergreen and dry evergreen forests, edges and stream sides, to 1,300 m; sometimes rheophytic.

V e r n a c u l a r.— *Duea din* (เตื่อติน) (Chumphon); *ma duea hin* (มะเตื่อหิน) (Nakhon Si Thammarat).

SYC8. *Ficus parietalis* Blume, Bijdr. Fl. Ned. Ind.: 462. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 277, 293. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 10, t. 8. 1887; Ridl., Fl. Malay Penins. 3: 330. 1924; Kochummen, Tree Fl. Malaya 3: 153. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 248. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 282. 2005.— *F. parietalis* Blume. var. *ovalis* Blume, Bijdr. Fl. Ned. Ind. 462. 1825.— *F. rufipila* Miq., Pl. Jungh.: 57. 1851.— *F. parietalis* Blume var. *rufipila* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278. 1867.— *F. tabing* Miq., Fl. Ind. Bat., Suppl.; 430. 1861.— *F. parietalis* Blume var. *tabing* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278. 1867.— *F. parietalis* Blume var. *angustifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278. 1867. Plate LXII: 3–4.

Shrub or tree to 13(–20?) m tall, mostly lianescent, often hemi-epiphytic. *Branchlets* drying brown. *Leafy twigs* 2–3(–4) mm thick, ± densely brown puberulous to subtomentose or subhispidulous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong, elliptic, lanceolate, subobovate or subovate, 8–25(–36) by 4–12(–14) cm, (almost) symmetrical to ± asymmetrical, (sub)coriaceous, often drying reddish, apex acuminate to subcaudate, base (almost) equilateral, rounded to obtuse (to cuneate), margin entire, often ± revolute; upper surface

glabrous or hairy at the base(s) of the midrib (and the basal lateral veins), smooth, mostly shiny, lower surface \pm densely puberulous, subtomentose or sparsely (sub)hispidulous on the veins, smooth to scabridulous; cystoliths only below; midrib impressed above; lateral veins 3–6 pairs, the basal pair to ca. $1/2$ – $3/4$ the length of the lamina, if not running close to the margin of the lamina then \pm branched, the other lateral veins often branched or forked away from the margin, tertiary venation scalariform, the greater part of the tertiary venation \pm perpendicular to the midrib; waxy glands in the axils of one of the basal lateral veins or of both; petiole 0.5–1.5 cm long, densely brown puberulous to subtomentose, the epidermis persistent; stipules amplexicaul, 0.4–0.8 cm long, brown puberulous to subtomentose, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.5–1.5(–2.5) cm long; peduncular bracts 2–3, scattered, mostly near the base, ca. 0.5–1 mm long; receptacle (sub)globose (or ovoid to subpyriform), 0.8–1.5 cm diam. when dry, ca. 1.5–2.5 cm diam. when fresh, \pm densely brownish puberulous to subhispidulous, often scabridulous, without lateral bracts, yellow, orange, red or reddish-brown at maturity, apex convex to slightly umbonate, ostiole ca. 2 mm diam., surrounded by a (low) rim; internal hairs sparse to abundant, short to minute. *Tepals* pinkish, glabrous or minutely hairy at the apices. *Styles* glabrous.

T h a i l a n d.— NORTHERN: Chiang Rai, Phitsanulok; NORTH-EASTERN: Phetchabun, Loei; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; PENINSULAR: Surat Thani, Phangnga, Krabi, Nakhon Si Thammarat, Trang, Yala, Narathiwat.

D i s t r i b u t i o n.— Vietnam, Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Moluccas), Philippines.

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, to ca. 900 m.

V e r n a c u l a r.— Ma dua khon (มะเดื่อขอน) (Nakhon Si Thammarat); ma hai (มะฮៃ) (Chiang Mai).

SYC9. *Ficus praetermissa* Corner, Gard. Bull. Singapore 17: 474. 1960.

Shrub (sometimes prostrate or climbing) or tree to 6 m tall. *Branchlets* drying (red-) brown. *Leafy twigs* 1–3 mm thick, whitish minutely hispidulous, scabrous; internodes solid. *Leaves* distichous; lamina oblong, subobovate or elliptic, (3–)5–26 by (1.5–)3–10 cm, \pm asymmetrical, (to almost symmetrical), chartaceous to subcoriaceous, apex \pm abruptly acuminate to subcaudate, base inequilateral to almost equilateral, cuneate or obtuse to rounded at the broad side, often shortly decurrent at the broad side, margin \pm coarsely crenate-dentate (towards the apex), \pm revolute; upper and lower surfaces minutely hispidulous, scabrous; cystoliths on both sides; midrib prominent above; lateral veins 4–8 pairs, the basal lateral veins to ca. $1/6$ – $1/3$ the length of the lamina, mostly close to the margin of the lamina and unbranched, the other lateral vein unbranched and not forked away from the margin, tertiary venation scalariform (to subscalariform); waxy glands in the axils one of the basal lateral veins (or both); petiole 0.4–1.2 cm long, minutely hispidulous, the epidermis persistent; stipules semi-amplexicaul to amplexicaul, 0.3–0.5 cm long, keeled, hispidulous on the keel, caducous. *Figs* axillary or below the leaves, solitary or to 4 clustered on short spurs; peduncle 0.2–0.4 cm long; peduncular bracts 1–3, scattered, 2 opposite, or 3 in a whorl, mostly near the base, ca. 0.5–1 mm long; receptacle (sub)globose, when dry 0.4–0.8 cm diam., minutely white hispidulous, \pm scabrous, without lateral bracts (or with 1 or 2), yellow to red at maturity, apex convex to \pm umbonate, ostiole 2–3 mm diam., surrounded by a rim; internal hairs absent (or few?). *Tepals* whitish, glabrous. *Styles* hairy. *Fruits* lens-shaped, smooth, slightly keeled.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Nan; CENTRAL: Saraburi, Nakhon Nayok.

D i s t r i b u t i o n.—Burma, China (Yunnan), Vietnam (type), Laos.

E c o l o g y.—Dry evergreen forest, to ca. 600 m.

V e r n a c u l a r.—Duea nam (เดื่อหน้า) (Nan).

SYC10. *Ficus scaberrima* Blume, Bijdr. 474. 1825.—*F. pisifera* Wall. ex Voigt var. *scaberrima* (Blume) Valeton in Koord. & Valeton, Bijdr. Booms. Java 11: 115. 1906.—*F. obscura* Blume var. *scaberrima* (Blume) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 273. 1867; Corner, Gard. Bull. Singapore 17: 482. 1960.—*F. pisifera* Wall. ex Voigt, Hort. Suburb. Calc.: 285. 1845; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 291. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 3, t. 1. 1887; Ridl., Fl. Malay Penins. 3: 329. 1924; C.C. Berg & Corner, Fl. Mal. I, 17(2): 284. 2005.—*F. scaberrima* Blume var. *pisifera* (Wall. ex Voigt) Hochr., Candollea 2: 327. 1925.—*F. leucoxyton* Miq., Pl. Jungh.: 6. 1851.—*F. obscura* Blume var. *leucoxyton* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 273. 1867.—*F. tondana* Miq., Fl. Ind. Bat. 1(2): 305. 1859.—*F. microtus* Miq. var. *tondana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 273. 1867.—*F. microtus* Miq., Fl. Ind. Bat., Suppl.: 428. 1861.—*F. pisifera* Wall. ex Voigt. var. *microtus* (Miq.) Kuntze, Rev. Gen. Pl. 1: 627. 1891.—*F. celebica* Blume var. *kunstleri* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 12, t. 10A. 1887; Ridl., Fl. Malay Penins. 3: 330. 1924.—*F. obscura* Blume var. *kunstleri* (King) Corner, Gard. Bull. Singapore 17: 481. 1960.—*F. microsyce* Ridl., Kew Bull. 1926: 82, non Ridl., 1924. Plate LXIII: 1.

Shrub or tree to 7(–10) m tall, often lianescent and/or hemi-epiphytic. *Branchlets* drying (pale) brown. *Leafy twigs* 2–5 mm thick, brown puberulous, hispidulous, subhirtellous or subtomentose, smooth to scabrous; internodes hollow or solid. *Leaves* distichous; lamina oblong, subobovate, elliptic, obovate or lanceolate, (3–)10–30(–40) by (1.5–)3–10(–13) cm, asymmetrical, chartaceous, apex acuminate to subcaudate, base ± equilateral, the narrow side cuneate to subcordate, the broad side rounded to cordate, decurrent, margin entire or denticulate to coarsely crenate-dentate (to sublobate), often ± revolute; upper surface hispidulous and scabrous or very sparsely and minutely puberulous to subhispidulous and smooth, lower surface brownish to whitish puberulous to subtomentose or to sparsely hispidulous on the veins, ± scabrous to smooth; cystoliths on both sides; midrib prominent above; lateral veins 4–8(–9) pairs, the basal pair to ca. (1/5–)1/4–1/3(–1/2) the length of the lamina, usually branched at the broad side of the lamina, mostly running close to the margin of the lamina and unbranched at the narrow side, the other lateral veins mostly branched or forked away from the margin, tertiary venation laxly (sub)scalariform to reticulate; waxy glands in the axils of one of the basal lateral veins and mostly with 1–5 additional ones in the axils of other lateral veins at the same side of the lamina; petiole 0.1–0.6 cm long, brown(ish) puberulous to hispidulous, the epidermis persistent; stipules semi-amplexicaul, 0.3–1.2 cm long, brownish appressed-puberulous or only ciliolate, subsistent or caducous. *Figs* axillary or just below the leaves, solitary, in pairs or mostly clustered, or ramiflorous to cauliflorous, clustered on (clusters of) short-shoots to 0.5 cm long; with a peduncle 0.1–0.5(–1) cm long or subsessile; peduncular bracts 2–3, scattered, often near the base, ca. 0.5 mm long; receptacle (sub)globose (to ovoid), 0.2–0.5(–0.6) cm diam. when dry, (very sparsely) hispidulous to puberulous, ± scabrous, without or with 1–2 lateral bracts, yellow to orange or scarlet to purplish at maturity, apex convex to slightly umbonate, ostiole ca. 1 mm diam., ± sunken or hardly so, but surrounded by low rim; internal hairs absent. *Tepals* whitish or sometimes pinkish, minutely hairy at the apices. *Styles* glabrous.

T h a i l a n d.— NORTHERN: Chiang Mai; CENTRAL: Saraburi; PENINSULAR: Ranong, Surat Thani, Phuket, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Peninsular (type) and Bornean Malaysia, Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Moluccas), Philippines.

E c o l o g y.— Near streams in evergreen forest, peat swamp forest, to 700 m.

V e r n a c u l a r.— *Duca din* (เดื่อดิน) (Surat Thani); *sai tok* (ไทรตอก) (Nakhon Si Thammarat, Trang).

N o t e.— In the treatment of this species in *Flora Malesiana*, the priority rule was not applied.

SYC11. *Ficus sinuata* Thunb., *Ficus*: 6, 12. 1786; Corner, *Gard. Bull. Singapore* 17: 474. 1960; Kochummen, *Tree Fl. Malaya* 3: 156. 1978; Kochummen, *Tree Fl. Sabah & Sarawak* 3: 305. 2000; C.C. Berg & Corner, *Fl. Males.*, Ser. 1, *Spermat.* 17(2): 288. 2005.— *F. rostrata* Lam., *Encycl.* 2, 2: 498. 1788; Vahl, *Enum. Pl.* 2: 200. 1805; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 274, 293. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 86, t. 110. 1888; Ridl., *Fl. Malay Penins.* 3: 340. 1924.— *F. cuspidata* Reinw. ex Blume var. *sinuata* King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 89, t. 112C. 1888.— *F. sinuata* Thunb. var. *oblonga* Corner, *Gard. Bull. Singapore* 17: 479. 1960; Kochummen, *Tree Fl. Malaya* 3: 156. 1978. Plate LXIII: 2.

Shrub or treelet to 6 m tall with drooping branches, often hemi-epiphytic with short stem and clasping aerial roots. *Branchlets* drying brown to yellowish. *Leafy twigs* 1–3 mm thick, glabrous or sparsely minutely hispidulous (glabrescent), ± angular, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong, elliptic, subobovate or lanceolate, 6–15(–28) by 2–8(–10) cm, somewhat asymmetrical to almost symmetrical, coriaceous to subcoriaceous, apex ± abruptly acuminate to subcaudate, the acumen 2–2.5 cm long, 1/8–1/4 the length of the lamina, base ± inequilateral to almost equilateral, cuneate to obtuse (to rounded), one side ± decurrent, margin (in the upper part) often (sparsely and ± irregularly) coarsely crenate-dentate (to lobate), broadly lobate in the lower part, or entire, flat; upper surface glabrous, smooth, lower surface very sparsely hispidulous on the veins to subglabrous, scabridulous to smooth; cystoliths only below; midrib prominent above; lateral veins 6–10 pairs or, if the lamina narrow then to 17 pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, to ca. 1/8–1/4 the length of the lamina, unbranched, the other lateral veins departing at angles of ca. 45° to 90°, tertiary venation loosely scalariform or, in small leaves, to (sub)reticulate; waxy glands in the axils of one of the basal lateral veins (or of both); petiole 0.3–1(–1.2) cm long, sparsely minutely hispidulous, the epidermis flaking off or persistent (?); stipules amplexicaul, 0.3–0.8(–1) cm long, glabrous, caducous. *Figs* axillary, solitary or paired, or clustered on spurs, more commonly so on spurs to 1 cm long below the leaves (ramiflorous); peduncle 0.1–0.2(–0.3) cm long; peduncular bracts 2–3, scattered, 2 (sub)opposite, or 3 in a whorl, ca. 0.5–1 mm long; receptacle (sub)globose to ellipsoid, 0.3–0.5 cm diam. when dry, sparsely hispidulous, ± scabrous, often with a few lateral bracts, orange to red at maturity, apex convex to slightly umbonate, ostiole ca. 1 mm diam., often surrounded by a low (lobed) rim; internal hairs absent. *Tepals* whitish, glabrous. *Styles* glabrous.

T h a i l a n d.— PENINSULAR: Ranong, Nakhon Si Thammarat, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— NE India (type), Burma (?), Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java, Kalimantan).

E c o l o g y.— Near streams in evergreen forest, to 1,000(–1,250?) m.

V e r n a c u l a r.— Salot hin (สลอดหิน) (Narathiwat).

N o t e.— This species is often confused with *F. heteropleura* from which it is clearly distinct in the prominent midrib of the lamina.

SYC12. *Ficus subincisa* Sm. in Rees, Cyclop. 14: n. 91. 1810; Corner, Gard. Bull. Singapore 17: 420. 1960; Corner, Gard. Bull. Singapore 21: 36. 1965.— *F. chincha* Roxb., Fl. Ind. Ed. 1832 3: 534. 1832.— *F. trachycarpa* Miq., London J. Bot. 7: 430. 1848.— *F. subincisa* Sm. var. *trachycarpa* (Miq.) Corner, Gard. Bull. Singapore 21: 36. 1965.— *F. trachycarpa* Miq. var. *paucidentata* Miq., London J. Bot. 7: 430. 1848.— *F. subincisa* Sm. var. *paucidentata* (Miq.) Corner, Gard. Bull. Singapore 21: 36. 1965.— *F. clavata* Wall. ex Miq., London J. Bot. 7: 431. 1848.— *F. caudata* Wall. ex Miq., London J. Bot. 7: 431. 1848, non Stokes, 1812.— *F. caudata* Griff., Not. Pl. Asiat. 4: 396. 1854; Griffith, Icon. Pl. Asiat.: t. 557. 1854, non Stokes, 1812, nec Miq., 1848. Fig 20. Plate LXIII: 3.

Shrub or treelet to 4 m tall. *Leafy twigs* 1.5–2.5 mm thick, angular and finely ribbed, sparsely hispidulous to subglabrous, scabridulous (to smooth), red-brown; internodes solid. *Leaves* distichous; lamina oblong to subobovate or (linear-)lanceolate, 6–24 by 1.5–7 cm, symmetrical or slightly asymmetrical, chartaceous to subcoriaceous, apex (\pm abruptly) acuminate, base cuneate to rounded, margin entire or (towards the apex) irregularly crenate, slightly revolute (towards the base); upper surface glabrous, smooth, lower surface (sub)glabrous, scabridulous; cystoliths on both sides; lateral veins 6–10 pairs, in linear-lanceolate laminae to 15 pairs, the basal lateral veins to ca. 1/10–1/6(–1/4) the length of the lamina, unbranched, tertiary venation (laxly) scalariform to subreticulate; waxy glands in the axils of both basal lateral veins; petiole 0.4–0.8 cm long, glabrous, the epidermis persistent; stipules lateral, 0.3–0.5 cm long, sparsely minutely puberulous to hispidulous, caducous. *Figs* axillary, solitary; peduncle 0.4–0.8 cm long; peduncular bracts 3, in a whorl subtending the receptacle or just below the receptacle, sometimes slightly scattered, ca. 0.5–1 mm long; receptacle (sub)globose or ellipsoid (to subobovoid or oblongoid), when dry 0.5–1(–1.3) cm diam., hispidulous, \pm scabrous, without lateral bracts, orange-red at maturity, apex \pm convex, ostiole 2–3 mm diam., prominent (the outer ostiolar bracts pointing upwards); internal hairs minute and sparse or absent. *Tepals* reddish, glabrous. *Styles* glabrous. *Fruit* lens-shaped, smooth.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Phayao, Nan, Lamphun, Lampang, Tak, Phitsanulok, Kamphaeng Phet; NORTH-EASTERN: Loei; SOUTH-WESTERN: Kanchanaburi, Phetchaburi.

D i s t r i b u t i o n.— Pakistan, N India, Nepal (type), Sikkim, Bhutan, Burma, S China, Vietnam, Laos.

E c o l o g y.— Dry evergreen, montane and mixed deciduous forests, 500–2,000 m.

V e r n a c u l a r.— Kok khrai (กอกไคร้) (Loei); ma dua noi (มะเดื่อร้อย) (Lampang); manot nam (มะน้อยน้ำ) (Northern).

N o t e.— Two, not very distinct forms occur: **a.** with the lamina normally 10–20 cm long, and **b.** with the lamina mostly to 10 cm long.

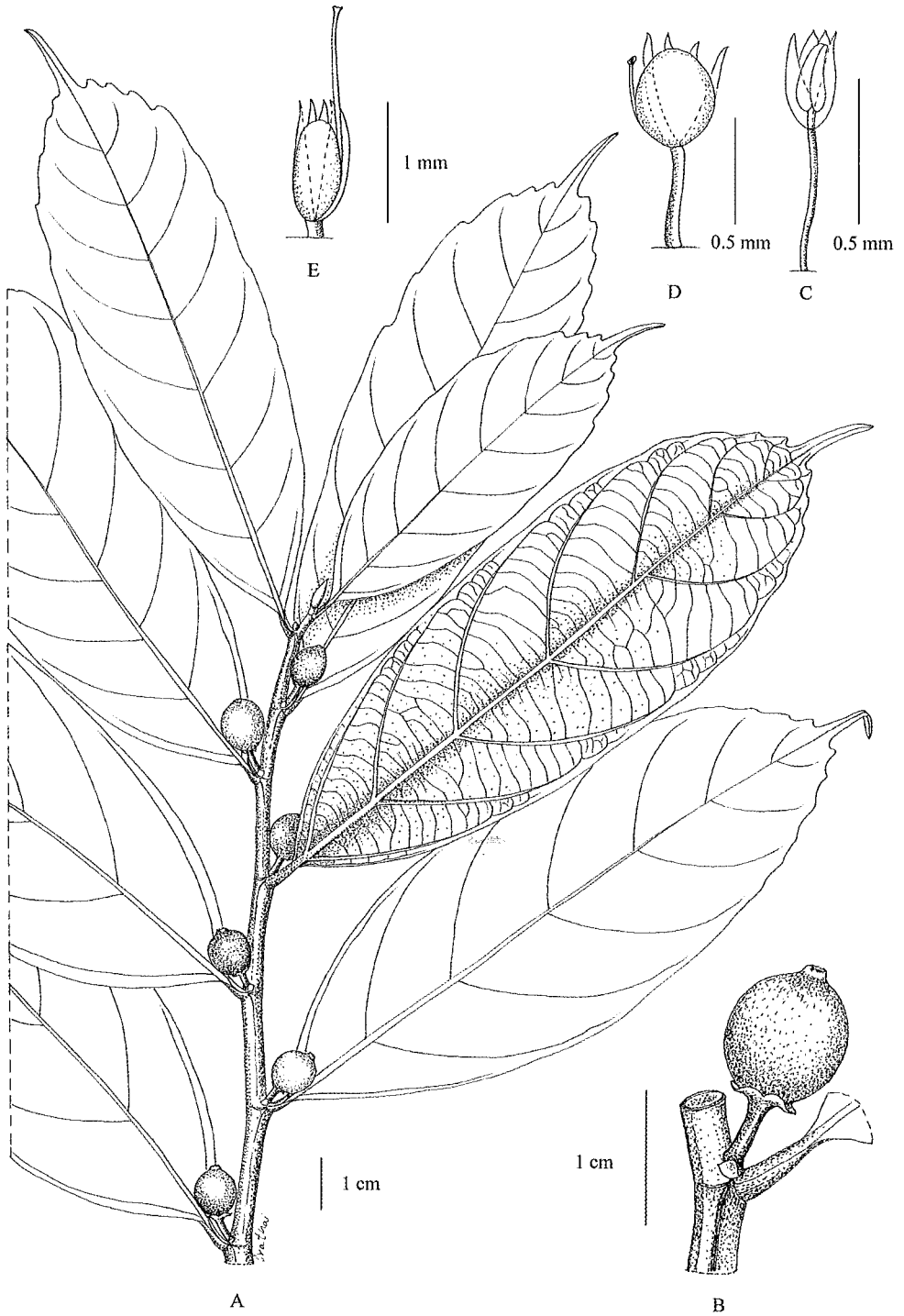


Fig. 20. *Ficus subincisa* Sm.: A. leafy twig with figs; B. fig; C. staminate flower; D. short-style flower = "gall flower"; E. long-styled flower (A–B, D–E: Hansen & Smitinand 12918, BKF; C: Phengklai et al. 6913, AAU). Drawn by Orathai Kerkaew (A–B) and Cornelis Berg (C–E).

SYC13. *Ficus subulata* Blume, Bijdr. Fl. Ned. Ind.: 461. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 275, 292. 1867; Kurz, Forest Fl. Burma 2: 452. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 8, t. 6. 1887; Ridl., Fl. Malay Penins. 3: 329. 1924; Kochummen, Tree Fl. Malaya 3: 158. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 245. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 290. 2005.—*F. acuminata* Roxb., Fl. Ind. Ed. 1832 3: 538. 1832; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 292. 1867.—*F. sikkimensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 225, 292. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 89, t. 113. 1888; Gagnep., Fl. Indo-Chine 5: 826. 1929.—*F. sanhday* Gagnep., Notul. Syst. 4: 95. 1927; Gagnep., Fl. Indo-Chine 5: 776. 1928. Fig. 21.

Shrub or tree to 15 m tall (with drooping branches), lianescent and/or hemi-epiphytic. *Branchlets* drying brown to greyish. *Leafy twigs* 1.5–3 mm thick, sparsely whitish-appressed-puberulous, hispidulous or (sub)glabrous, smooth or scabridulous; internodes solid. *Leaves* distichous; lamina oblong to subobovate (or elliptic, subovate or lanceolate), (4–)10–20(–35) by (1.5–)4–9(–12) cm, somewhat asymmetrical to (almost) symmetrical, subcoriaceous to coriaceous, apex acuminate to subcaudate, base inequilateral, cuneate to obtuse (to rounded), one side \pm clearly decurrent and often slightly (or clearly) auricled, margin entire (occasionally lobed), flat (or in coriaceous laminas sometimes \pm revolute); both surfaces glabrous, smooth; cystoliths only below (or also a few above); midrib slightly prominent to flush above; lateral veins (4–)6–13(–16) pairs, the basal pair hardly different from the other lateral veins, to ca. 1/10–1/8 the length of the lamina, unbranched, tertiary venation scalariform (or, in smaller leaves, to subscalariform); waxy glands in the axils of one of the basal lateral veins (or of both), in one of the axils of the 2nd, 3rd or 4th pair, or in that position a 2nd (or 3rd) gland; petiole 0.3–1.5(–3) cm long, glabrous or white puberulous, the epidermis flaking off; stipules amplexicaul, (0.5–)1–2(–3) cm long, glabrous (or whitish puberulous), caducous (or subpersistent), dark brown when dry; terminal buds \pm clearly divaricate, often curved. *Figs* axillary, solitary or paired, or clustered on spurs, more commonly so on spurs to 1 cm long below the leaves (ramiflorous), sessile or with a peduncle to 0.6(–0.8) cm long; peduncular bracts 3, scattered, 2 (sub)opposite, or 3 verticillate, ca. 0.5–1 mm long; receptacle (sub)globose (to subpyriform), (0.3–)0.5–1 cm diam. when dry, ca. 1–1.5 cm diam. when fresh, glabrous, smooth, with or without lateral bracts, yellow, orange, red or red-brown at maturity, apex convex, ostiole ca. 2 mm diam., sometimes surrounded by a low rim; internal hairs absent. *Tepals* whitish, glabrous or minutely hairy at the apices, not indurate. *Styles* glabrous.

T h a i l a n d.—NORTHERN: Chiang Mai, Chiang Rai, Nan, Tak; SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Chumphon, Ranong, Phangnga, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Yala, Narathiwat.

D i s t r i b u t i o n.—Sikkim, Bhutan, India (NE and Andaman Islands), Bangladesh, Burma, S China, Vietnam, Peninsular and Bornean Malaysia, Brunei, Indonesia (type, throughout), Philippines, Papua New Guinea, Solomon Islands.

E c o l o g y.—Evergreen and mixed deciduous forests, often climbing on rocks, to 1,100 m.

V e r n a c u l a r.—Cha-roei-kroem (จระเขยเครือ) (Khmer–Chanthaburi); duea (เดื่อ) (Chiang Mai).

N o t e.—In a population in Doi Phu Kha National Park, at altitudes of 670 to 1,500 m (represented by *P. Srisanga* 337, 750, 1582, 1704, and 1786 in QGB), the stipules are always shorter than 1 cm, and, moreover, the fig receptacle is small (0.3–0.4 mm diam.) and the lamina mostly shorter than 10 cm with 4–6 pairs of lateral veins.

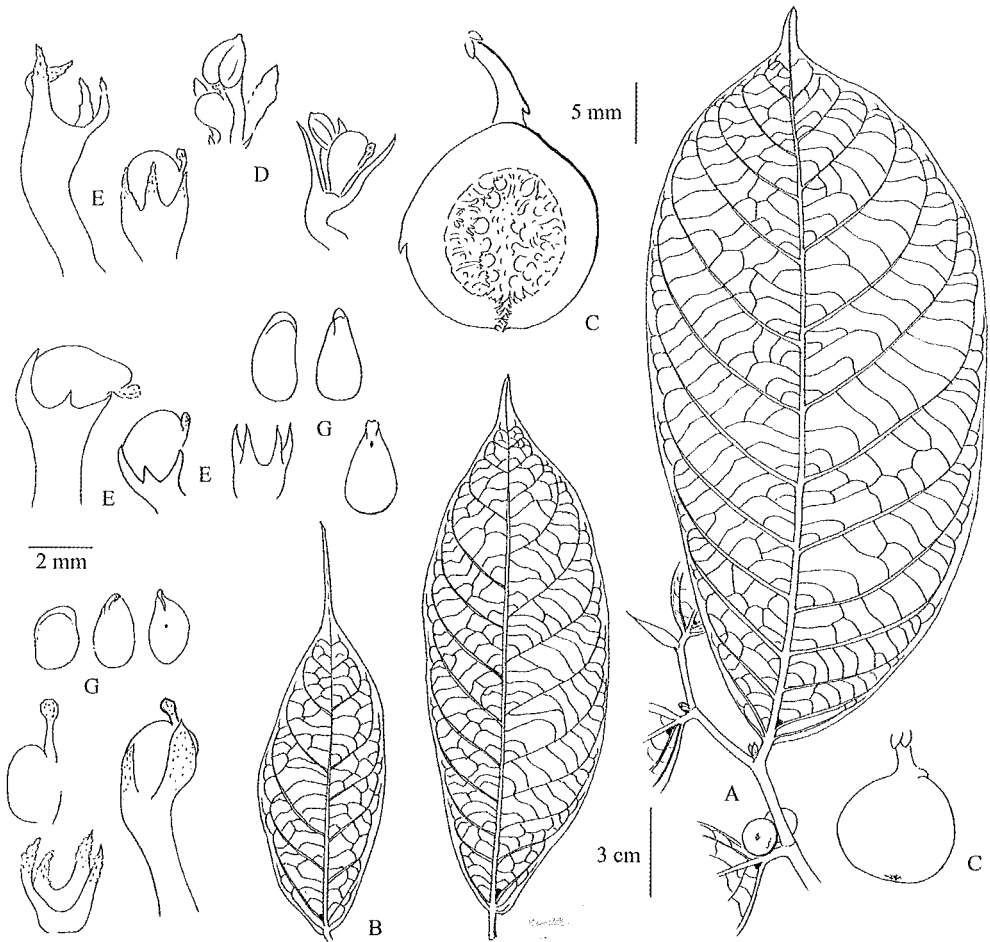


Fig. 21. *Ficus subulata* Blume: A. leafy twig with figs; B. leaves C. figs; D. staminate flowers; E. short-styled flowers; F. long-styled flowers and perianth; G. fruits. (all from *Corner s.n.*). Courtesy of Flora Malesiana ser I, 17(1): 291, fig. 55.

SYC14. *Ficus tinctoria* G. Forst., *Prod. Fl. Austr.*: 76. 1786; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 293. 1867; Corner, *Gard. Bull. Singapore* 17: 475. 1960; C.C. Berg & Corner, *Fl. Males., Ser. 1, Spermat.* 17(2): 292. 2005.

Note.—This very widespread and variable species can be subdivided into two subspecies, one in the western part of the range and the other in the eastern part.

subsp. ***gibbosa*** (Blume) Corner, *Gard. Bull. Singapore* 17: 476. 1960.—*Ficus gibbosa* Blume, *Bijdr. Fl. Ned. Ind.*: 466. 1825; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 276, 292. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(1): 4, t. 2. 1887; Ridl., *Fl. Malay Penins.* 3: 329. 1924; Gagnep., *Fl. Indo-Chine* 5: 799. 1928; Kochummen, *Tree Fl. Malaya* 3: 159. 1978; Kochummen, *Tree Fl. Sabah & Sarawak* 3: 309. 2000; C.C. Berg & Corner, *Fl. Males., Ser. 1, Spermat.* 17(2): 294. 2005.—*F. parasitica* J. Koenig ex Willd., *Mém. Acad. Roy. Sci. Hist. (Berlin)* 2: 102, t.

3. 1801: Vahl, Enum. Pl. 2 188. 1805; Miq. Ann. Mus. Bot. Lugd. Bart. 3: 276, 292. 1867.— *F. gibbosa* Blume var. *parasitica* (Willd.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 6, 2b, f. A. 1887.— *F. tinctoria* G. Forst. subsp. *parasitica* (Willd.) Corner, Gard. Bull. Singapore 17: 476. 1960.— *F. paradoxa* Blume, Bijdr. Fl. Ned. Ind.: 467. 1825.— *F. tuberculata* Roxb., Fl. Ind. Ed. 1832 3: 554. 1832.— *F. gibbosa* Blume var. *tuberculata* (Roxb.) King, Sp. Pl. 1: 6, t. 2b, f. B. 1887.— *F. cuspidifera* Miq., London J. Bot. 7: 434. 1848.— *F. gibbosa* Blume var. *cuspidifera* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 6, t. 2a. 1887.— *Urostigma excelsum* Miq., Fl. Bat. 1, 2: 350. 1859.— *U. volubile* Dalzell in Dalzell & A. Gibson, Bombay Fl. 242. 1861.— *Ficus volubilis* (Dalzell) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 185. 1888. Fig. 22. Plate LXIII: 4.

Shrub or tree to 15(–25) m tall, hemi-epiphytic or terrestrial, sometimes lianescent; branchlets drying brown to yellowish. *Leafy twigs* 1.5–4 mm thick, ± sparsely minutely hispidulous and/or white appressed-puberulous, ± scabrous or smooth; internodes solid. *Leaves* distichous; lamina oblong elliptic (to suborbicular or lanceolate), often obliquely (sub)rhombic, (2–)5–20(–30) by (1–)3–8(–13) cm, ± asymmetrical to (almost) symmetrical, coriaceous, apex (sub)acuminate to subacute (to rounded), apex acuminate to subacute, base ± inequilateral, cuneate, rounded or subattenuate, one side sometimes slightly decurrent, margin entire or unilaterally (angular-)sublobate, ± revolute; upper surface glabrous, smooth, often shiny, lower surface glabrous or sparsely hispidulous on the veins, smooth or scabridulous, often brown-tessellate when dry; cystoliths on both sides; midrib slightly prominent to flush above; lateral veins 4–9(–11) pairs, the basal lateral veins running close to the margin, to 1/8–1/3 the length of the lamina, unbranched, most other lateral veins furcate away from the margin, tertiary venation reticulate to subscalariform; waxy glands in the axils of one of the basal lateral veins (or of both, but then unequal in size); petiole 0.3–1.5 long, sparsely minutely subhispidulous, the epidermis flaking off; stipules amplexicaul, 0.5–1(–1.2) cm long, sparsely minutely puberulous, only ciliolate or glabrous, caducous. *Figs* axillary or just below the leaves, in pairs, solitary (or 3 or more on short spurs), sometimes ramiflorous; with a peduncle 0.1–0.6(–1) cm long or (sub) sessile; peduncular bracts 3, mostly in a whorl at the base of the peduncle, ca. 1–1.5 mm long; receptacle (sub)globose or ovoid to ellipsoid, when dry (0.3–)0.4–1 cm, when fresh, ca. 0.8–1.5 cm diam., sparsely minutely hispidulous, scabridulous to almost smooth, without lateral bracts, yellow, orange or (dark) red at maturity, apex ± umbonate, ostiole ca. 1 mm diam., surrounded by a rim; internal hairs minute, abundant. *Tepals* whitish, glabrous or ciliolate. *Styles* glabrous.

T h a i l a n d.—NORTHERN: Chiang Mai, Lamphun, Lampang, Phrae, Tak, Phitsanulok; NORTH-EASTERN: Phetchabun, Sakon Nakhon, Khon Kaen; Nakhon Nayok; SOUTH-EASTERN: Chon Buri, Chanthaburi; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Ratchaburi, Phetchaburi; CENTRAL: Saraburi; PENINSULAR: Chumphon, Surat Thani, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Pattani, Narathiwat.

D i s t r i b u t i o n.—Sri Lanka, India (incl. Andaman and Nicobar Islands), Nepal, Sikkim, Bhutan, Bangladesh, Burma, S China, Vietnam, Laos, Cambodia, Peninsular and Bornean Malaysia, Brunei (?), Indonesia, Sumatra, Java-type), Kalimantan Lesser Sunda Islands: Bali), Philippines (Palawan).

E c o l o g y.—Dry evergreen, evergreen and mixed deciduous forests, near streams or often on rocks, to 1,000 m.

V e r n a c u l a r.—Krang (กร่าง), sai krang (ไทรกร่าง) (Central); hai (ไฮ), hai nok (ไฮนอ) (Khon Kaen); sai dam (ไทรดำ) (Lampang); paeng (แปง).

N o t e s.—Some collections (*Kerr 995* (Chiang Mai), *11375* (Chumphon), and *15149*

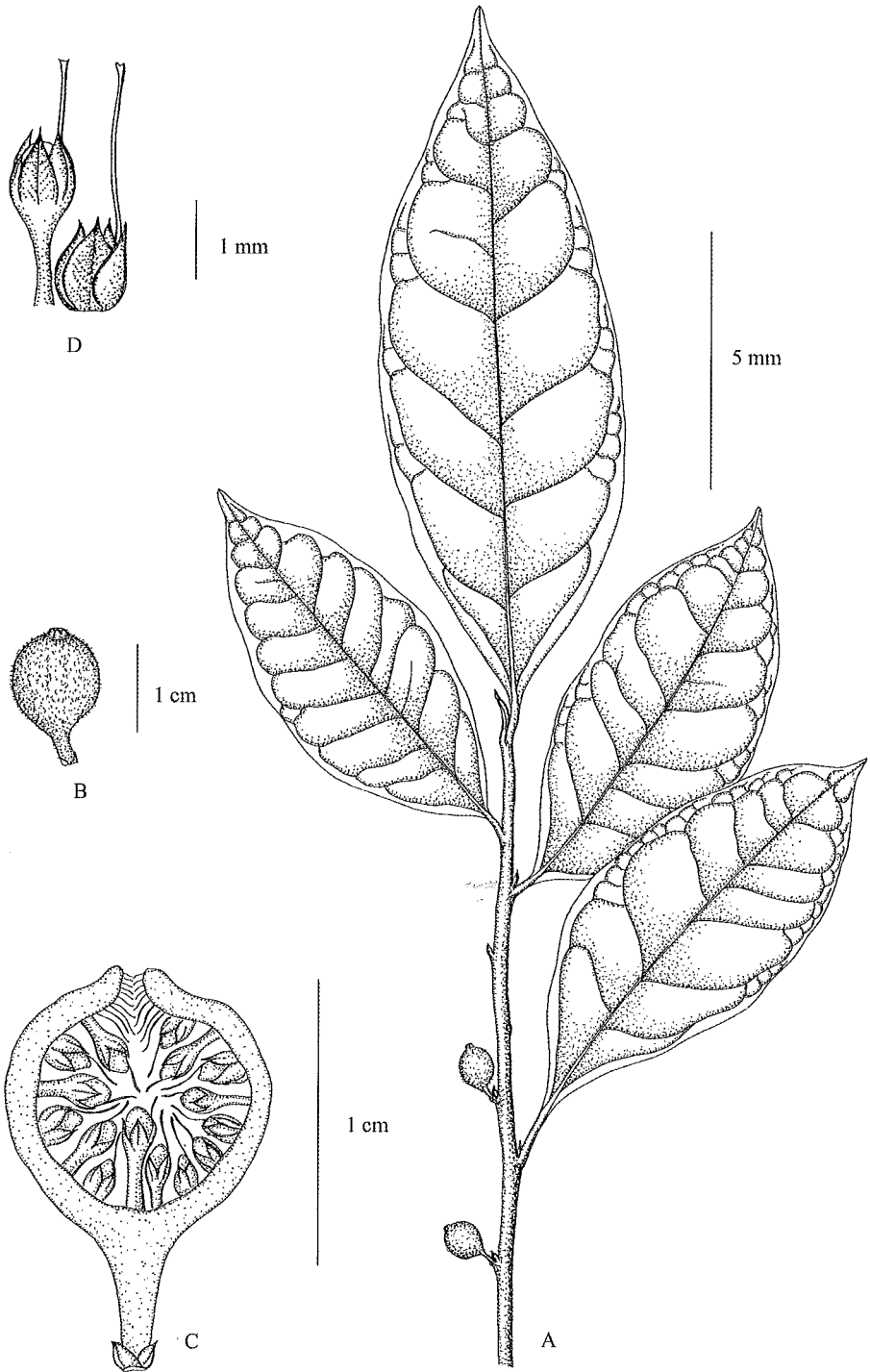


Fig. 22. *Ficus tinctoria* G. Forst. subsp. *gibbosa* (Blume) Corner: A. leafy twig with figs; B. fig; C. opened fig with long-styled flowers; D. long-styled flowers. Drawn by Wattana Tanning.

(Phatthalung), and *Phonsena et al.* 3006), are distinct by the small figs, ca. 0.3 cm diam. and with the figs subsessile or to 0.1 cm long pedunculate. The leaves are relatively small as well, 4–10 cm long; the petiole is 0.3–0.5 cm long. They resemble *F. anastomosans* in the size of the figs, but are similar to *F. tinctoria* subsp. *gibbosa* in other features.

Some collections (e.g., *K. Larsen 8684*) have scabrous more pronounced oblique laminae, representing a form rather common in Peninsular India, possibly ecologically distinct and tending to be a climber. Whether this form merits recognition is not yet clear.

SYC15. *Ficus uniglandulosa* Wall. ex Miq., London J. Bot. 7: 431. 1848; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 277, 293. 1867; Kurz, Forest Fl. Burma 2: 453. 1877; Kochummen, Tree Fl. Malaya 3: 160. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 224. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 296. 2005.—*F. subsubulata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 225, 292. 1867.—*F. uniglandulosa* Wall. ex Miq. var. *parvifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 277. 1867.—*F. uniglandulosa* Wall. ex Miq. var. *latior* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 277.

Shrub or tree to 10(–20?) m tall; often hemi-epiphytic or lianescent. *Branchlets* drying (dark red-)brown, becoming yellowish to greyish after exfoliation of the periderm. *Leafy twigs* 1.5–3 mm thick, puberulous to (sub)glabrous, scabridulous to smooth; internodes solid. *Leaves* distichous; lamina oblong, elliptic or subobovate (to oblanceolate), (4–)8–20(–28) by (1.5–)3–7(–14) cm, (almost) symmetrical, coriaceous to subcoriaceous, apex often ± abruptly acuminate to subcaudate, the acumen 1.5–2(–2.5) cm long, 1/10–1/6 the length of the lower part of the lamina, base almost equilateral, cuneate to obtuse (to rounded), one side ± decurrent, margin (in the upper part) often (sparsely and ± irregularly) coarsely crenate-dentate to (sub)entire, ± revolute to flat; upper surface glabrous, smooth, lower surface glabrous (or sparsely puberulous on the main veins), smooth; cystoliths only below; midrib prominent above; lateral veins 3–6 (–7) or (6–)7–10(–12) pairs, the basal pair mostly somewhat different from the other lateral veins, running close to the margin, to ca. 1/10–1/6(–1/4) the length of the lamina, unbranched, the other lateral veins (long) conspicuously ascending and curved and often branched or forked away from the margin to (short and) slightly curved to almost straight (and the loop-connections often forming an arcuate submarginal vein), tertiary venation loosely reticulate to subscalariform, irregular to rather regular; waxy glands in the axils of one of the basal lateral veins; petiole 0.3–0.8(–2) cm long, glabrous (or puberulous), the epidermis flaking off; stipules semi-amplexicaul, 0.3–0.7(–1) cm long, glabrous (or puberulous), caducous. *Figs* axillary, solitary, paired, or clustered on spurs, or ramiflorous on clusters on short spurs or on tubercles; peduncle 0.1–0.3 cm long; peduncular bracts 2–3, scattered, sometimes 1 on the base of the receptacle, ca. 0.2 mm long; receptacle (sub)globose, when dry 0.3–0.6 cm, when fresh ca. 0.6–0.8 cm diam., glabrous, smooth, (usually) without lateral bracts, yellow, orange or red (to purplish) at maturity, apex convex to slightly umbonate, ostiole ca. 1 mm diam., often ± sunken and/or often surrounded by a low (entire or faintly lobed) rim; internal hairs sparse and minute (or absent?). *Tepals* dark red, glabrous or minutely hairy at the apices. *Styles* glabrous.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi, Phetchaburi; PENINSULAR: Phangnga, Songkhla, Pattani.

D i s t r i b u t i o n.— Burma, Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra-type, Kalimantan), Philippines.

E c o l o g y.— Dry evergreen and evergreen forests, on limestone, to 1,000 m.

IV. FICUS SUBGENUS SYCOMORUS

Terrestrial trees and shrubs, often cauliflorous or flagelliflorous; often with waxy glands on the nodes of leafy twigs. *Leaves* spirally arranged, distichous, or opposite; lamina chartaceous to (sub)coriaceous, the margin often dent(icul)ate; stipules always fully amplexicaul. *Plants* dioecious or (*F. racemosa*) monoecious. *Figs* axillary, on leafless branchlets on the main branches and trunk, or on stolons; staminate flowers subtended and enclosed by 2(–3) bracteoles.

The subgenus comprises ca. 155 species, of which 16 occur in Thailand. It is subdivided into seven sections of which three are represented in Thailand:

1. Sect. *Sycomorus* with symmetrical leaves and glandular spots in the axils of both basal lateral veins; one of the species, *F. racemosa*, is monoecious (in subsect. *Sycomorus*) and the others, *F. auriculata* and *F. variegata* are dioecious (in subsect. *Neomorphe*).

2. Sect. *Hemicardia* with (at least on the branches) ± asymmetrical leaves and waxy glands only in the axil of one of the basal lateral veins, the figs are borne on stolons: *F. semicordata*

3. Sect. *Sycocarpus* with the leaves mostly ± asymmetrical and waxy glands usually not in the axils of basal lateral veins but in those of lateral veins in the middle of the lamina. All species in Thailand belong to subsect. *Sycocarpus* except for the rheophytic *F. squamosa* with very long style with retrorse hairs of the long-styled flowers which is included in subsect. *Macrostyla*.

KEY TO THE SPECIES OF FICUS SUBG. SYCOMORUS

- | | |
|---|----------------------------------|
| 1. Rheophytic shrub dark brown to blackish strigose on various parts | 15. <i>F. squamosa</i> |
| 1. Non-rheophytic (sub)shrub or tree with the hairs mostly white to brown | |
| 2. Figs only axillary | |
| 3. Prostrate subshrub, stem creeping and erect leafy twigs to 40 cm long | 4. <i>F. griffithii</i> |
| 3. Erect shrub or tree | 7. <i>F. lepicarpa</i> |
| 2. Figs on leafless branches, spurs or woody tubercles on the older wood | |
| 4. Figs on rooting branches to 10 m long, emerging from the base of the trunk (stoloniflory) | |
| 5. Margin of the lamina entire | 2. <i>F. beccarii</i> |
| 5. Margin of the lamina dent(icul)ate, at least towards the apex | |
| 6. Most leaves (sub)opposite | 5. <i>F. heterostyla</i> |
| 6. Most or all leaves distichous | |
| 7. Waxy gland in the axil of the basal lateral veins on the broad side of the lamina; lateral veins normally 9–15 pairs; epidermis of petiole flaking off | 14. <i>F. semicordata</i> |
| 7. Waxy glands in the axils of some lateral veins in the middle part of the lamina; lateral veins normally 6–9 pairs; epidermis of petiole persistent | |
| 8. Lateral veins not furcate; hairs on vegetative parts (predominantly) of similar length (and colour); fig receptacle with lateral bracts | 8. <i>F. malayana</i> |
| 8. Lateral veins furcate; hairs of vegetative parts of different length (and colour); fig receptacle without lateral bracts | 12. <i>F. ridleyana</i> |
| 4. Figs on short non-rooting branches, spurs or woody tubercles on the (main) branches or the trunk (cauliflory) | |
| 9. Most leaves subopposite | 6. <i>F. hispida</i> |
| 9. None or some of the leaves subopposite | |
| 10. Waxy gland in the axils of lateral veins in the middle part of the lamina (sometimes inconspicuous or absent) | |
| 11. Fig receptacle 3.5–4.5 cm diam. when dry | 9. <i>F. obpyramidata</i> |
| 11. Fig receptacle 0.4–2(–2.5) cm diam. when dry | |
| 12. Epidermis of fig receptacle flaking off | 13. <i>F. rosulata</i> |
| 12. Epidermis of fig receptacle persistent | |
| 13. Leafy twigs glabrous or sparsely puberulous, or if distinctly hairy, then most of the hairs curved | 3. <i>F. fistulosa</i> |
| 14. Peduncle 0.5–4.5(–6) cm long | 7. <i>F. lepicarpa</i> |
| 14. Peduncle 0–0.2 cm long | 11. <i>F. ribes</i> |
| 13. Leafy twigs distinctly hairy, most of the hairs straight | |
| 10. Waxy glands in the axils of the (main) basal lateral veins (sometimes inconspicuous) | |
| 15. Stipules 1.5–3 cm long | 1. <i>F. auriculata</i> |
| 15. Stipules 0.5–1.2 cm long | |

16. Basal lateral veins running close to the margin of the lamina, unbranched (or faintly branched); plants monoecious (in syconia the styles different in length) **10. F. racemosa**
 16. Basal lateral veins running more or less distantly from the margin of the lamina and distinctly branched; plants dioecious (in syconia the styles similar in length) **16. F. variegata**

SY01. *Ficus auriculata* Lour., Fl. Cochinch. 2: 660. 1790; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867; Merr. & Chun, Sunyatsenia 2: 216. 1935; Corner, Gard. Bull. Singapore 19: 395. 1962; Corner, Philos. Trans., Ser. B, 281: 383, t. 7. 1978; C.C. Berg, Fl. Males., Ser. 1, Spermat. 17(2): 341. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 11. 2007.— *F. macrophylla* Roxb. & Buch.-Ham. ex Sm. in Rees, Cycl. 14: Ficus 32. 1810, non Desf. ex Pers., 1807; Roxb., Fl. Ind. Ed. 1832 3: 556. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 673. 1843.— *Tremotis cordata* Raf., Sylv. Tellur.: 59. 1838.— *Covellia macrophylla* (Roxb. ex Sm.) Miq., London J. Bot. 7: 465. 1848.— *Ficus roxburghii* Wall., Calc. Gard. Rep.: 33. 1840; Steud., Nomencl. Bot. ed. 2, 1: 637. 1840, non Miq., 1848; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867; Kurz, Forest Fl. Burma 2: 460. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 168, t. 211. 1888; D.D. Cunn. Ann. Roy. Bot. Gard. (Calcutta) 1: Appendix. 1888; Gagnep., Fl. Indo-Chine 5: 806. 1928; Mabb. in Manilal, Bot. Hist. Hort. Malab.: 90. 1980.— *F. rotundifolia* Roxb., Fl. Ind. Ed. 1832 3: 555. 1832; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 290. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 183. 1888.— *F. sclerocarpa* Griff., Not. Pl. Asiat. 4: 397. 1854; Griff., Icon. Pl. Asiat. 4: t. 558. 1854, as *scleroptera*.— *F. regia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 230, 296. 1867; Kurz, Forest Fl. Burma 2: 459. 1877.— *F. oligodon* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 234, 297. 1867; Corner, Gard. Bull. Singapore 18: 43. 1960; Corner, Philos. Trans., Ser. B, 281: 383, t. 7. 1978; Kochummen, Tree Fl. Malaya 3: 152. 1978.— *F. pomifera* Wall. ex King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 171, t. 215. 1888, non Kurz, 1873; Ridl., Fl. Malay Penins. 3: 350. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 46, f. 24. 1933.— *F. hainanensis* Merr. & Chun, Sunyatsenia 2: 215. 1935; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 343. 2005. Fig. 23. Plate LXIII: 5–6.

Shrub or tree to 15(–20) m tall, tall ones becoming shortly buttressed. *Leafy twigs* 2–10 mm thick, whitish to brownish (appressed-)puberulous to subtomentose or glabrous, without nodal waxy glands; internodes hollow (or solid); periderm flaking off or persistent. *Leaves* spirally arranged to subdistichous; lamina cordiform, ovate, elliptic, oblong, subobovate or suborbicular, (6–)10–30(–40) by (3–)7–25(–32) cm, symmetrical, chartaceous to subcoriaceous, apex short-acuminate to acute, base cordate to rounded (to broadly cuneate), margin coarsely dentate, denticulate or subentire; upper surface glabrous or sparsely puberulous on the main veins, smooth, lower surface densely to sparsely puberulous on the veins or only on the main veins or glabrous; cystoliths on both sides; lateral veins 3–7 pairs, basal pair to ca. 1/3–2/3 the length of the lamina, (usually) branched, tertiary venation (sub)scalariform; waxy glands in the axils of the (main) basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 2–15(–30) cm long, whitish to brownish puberulous or glabrous, the epidermis flaking off; stipules 1.5–3 cm long, densely to sparsely whitish to brownish appressed-puberulous, subsericeous or glabrous, caducous or subsistent. *Figs* (cauliflorous) on (clusters of) spur-like, leafless branchlets, or on more elongate, unbranched or branched, leafless branchlets to 10(–40) cm long on the trunk and main branches, or (also) stoloniflorous on unbranched or branched, rooted branchlets (becoming orthotropic and leafy terminally) to 2 m long; with a peduncle 0.5–8 cm long (or subsessile); basal bracts 3, verticillate (or ± scattered on the upper part of the peduncle), 1–7 mm long, persistent; receptacle subpyriform, subglobose or depressed-globose, 2–6 cm diam. when dry, to 10 cm diam. when fresh, 0–1.5 cm long stipitate, densely to sparsely brown, yellowish or whitish puberulous, subtomentose, subvelutinous or subglabrous, with numerous strong to weak longitudinal ridges, occasionally with 1 or a few lateral bracts,

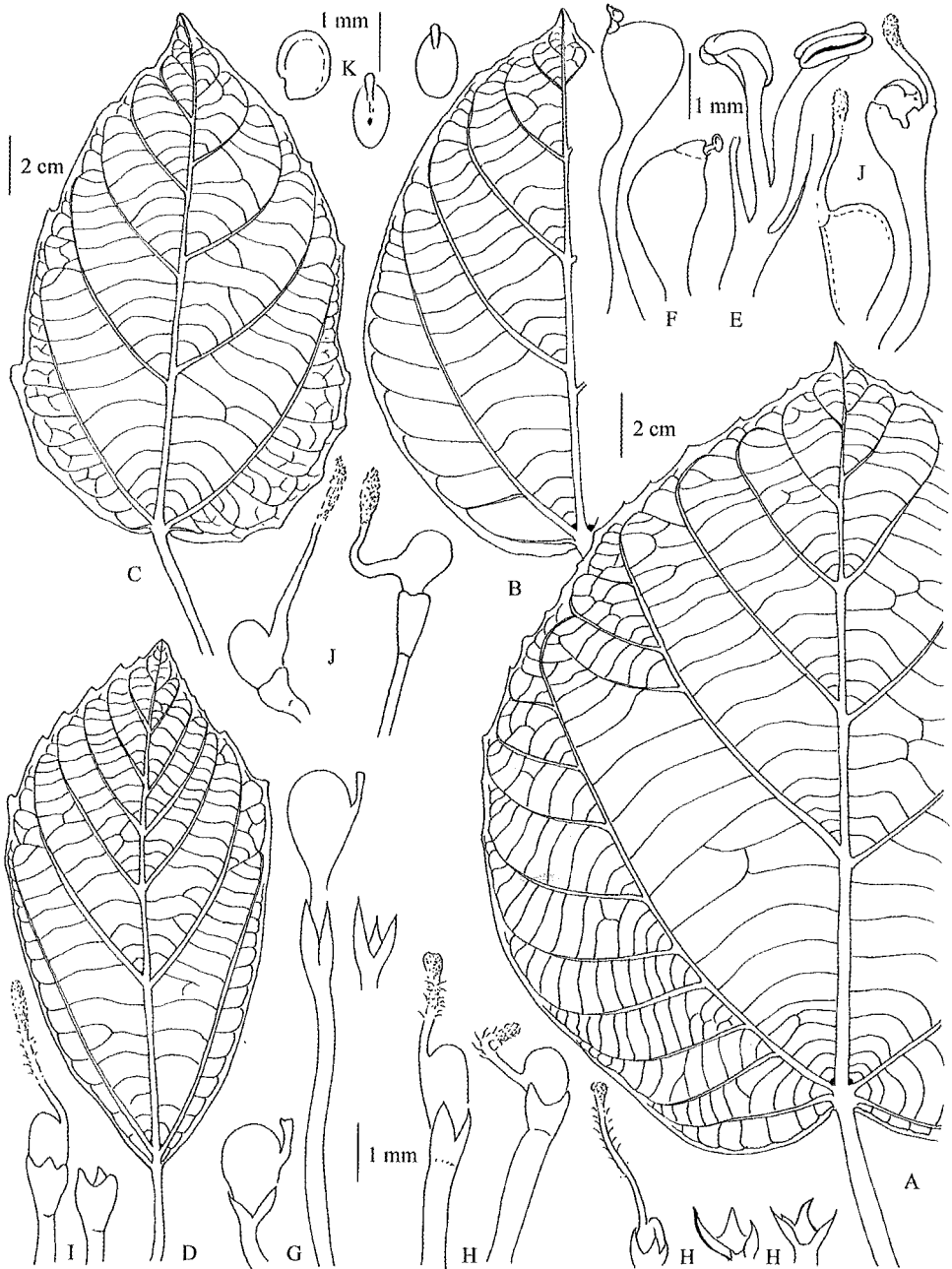


Fig. 23. *Ficus auriculata* Lour.: A–D, leaves (A. unknown, B. *Kerr 4946*, C. *Kerr 3410*, D. *d'Alleizette sn*); E, staminate flower (collection unknown); F, G, short-styled flowers (collection unknown); H, I, long-styled flowers and perianths (H, collection unknown, I, *Tsang 29392*); J, long-styled flowers (*Hooker & Thomson Covallia 8*); K, fruits (collection unknown). Courtesy of *Flora Malesiana* ser I, 17(2): 342, fig. 56.

red(dish), red-brown, orange, dark red or purple at maturity, apex \pm concave to flat, ostiole 2–12 mm diam. with a prominent rosette of ostiolar bracts; wall 1–7 mm thick when dry; internal hairs minute and white or absent. *Perianth* of the pistillate flower tubular to 3-partite. *Styles* of the long-styled flowers glabrous or hairy.

Thailand.—NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Phayao, Nan, Phrae, Tak; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri, Trat; PENINSULAR: Phatthalung, Nakhon, Si Thammarat, Satun, Pattani, Yala, Narathiwat.

Distribution.—Pakistan, N India, Nepal, Sikkim, Bhutan, Burma, S China, Laos, Vietnam (type), Cambodia, Peninsular Malaysia.

Ecology.—Evergreen, mixed deciduous and montane forests, often near streams, on various substrates, to ca. 1,600 m.

Vernacular.—*Duea wa* (เตื่อหว่า) (Chiang Mai); *ta-kue-do* (ตะกือเต้าะ) (Karen–Mae Hong Son); *sai pho* (ไซโพ) (Central); *ma duea wa* (มะเตื่อหว่า) (Kanchanaburi); *duea luang* (เตื่อหลวง) (Northern); *ma duea chumphon* (มะเตื่อชุมพร) (Yala); *ha-gor-ba-do* (ฮากอบาเต้าะ) (Malay–Narathiwat).

Uses.—Figs eaten as a vegetable.

Note.—This species as currently defined is quite variable, in particular with regard to the shape of the lamina and the (predominant) position of the figs on the tree.

Two main informal entities can be distinguished. They are linked by intermediates. One of the forms shows a strong preference for running water and limestone.

A. Cauliflorous (auriculata s. str.) form.—Trees to 15(–20) m tall. *Leaves* spaced (as internodes are rather similar in length); lamina cordiform to broadly ovate or elliptic, (6–)10–30(–40) by (3–)7–25(–32) cm, base cordate to rounded; stipules caducous. *Figs* in to 5(–10) cm long leafless (spur-like) branchlets or woody tubercles on the trunk and main branches; peduncle (1–)2–8 cm long; basal bracts 2–7 mm long; receptacle subpyriform, subglobose or depressed-globose, 2–6 cm diam. when dry, to 10 cm diam. when fresh, non-stipitate or to 1.5 cm long stipitate, mostly distinctly ribbed; ostiole 4–12 mm diam. when dry.

B. Stoloniflorous (and calciphilous) form.— **Shrubs or trees to 6 m tall.** *Leaves* often \pm tufted (due to different lengths of internodes); lamina (ob)lanceolate to oblong, (5–)10–30(–37) by (1.5–)3–10(–18) cm, base cuneate to rounded; stipules often subsistent (on twig parts with short-internodes). *Figs* on rooting (branched or unbranched) **branches to 2 m long departing from the base of the trunk (or also on a few, to 40 cm long fig-bearing branchlets on the trunk and/or main branches);** with a peduncle 0.5–1 cm long (or sessile); bracts 1–3 mm long; receptacle discoid to subpyriform, 1.5–2.5 cm diam. when dry, 2.5–4.5 cm diam. when fresh, non-stipitate or to 0.5 cm long stipitate, not or faintly ribbed, ostiole 3–5 mm diam. when dry, to 10 mm when fresh.

Ecology.—In and along flowing water on and among limestone rocks, at low altitudes.

C. Intermediate forms on limestone and in running water. In most features as form A but cauliflorous figs on branched or unbranched leafless branchlets to 40 cm long, often with longer peduncles and receptacle subpyriform to subglobose and/or the leaves spaced on the twigs, the lamina subobovate to oblong.

Note.—Whether similar intermediates also occur in other types of habitat is uncertain.

SYO2. *Ficus beccarii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 102, t. 130. 1888; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 20. 1933; Kochummen, Tree Fl. Sabah & Sarawak 3: 261. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 398. 2005; C.C. Berg & Chantarasuwan, Blumea 52(2): 314. 2007.

Shrub or treelet to 5 m tall. *Leafy twigs* 1.5–3 mm thick, yellowish strigose, with nodal waxy glands; internodes hollow; periderm persistent. *Leaves* distichous; lamina lanceolate to oblong, (7–)15–30 by (1.5–)3–5 cm, \pm asymmetrical (to almost symmetrical), chartaceous, apex caudate (the apex of the acumen often filiform), base cuneate to rounded, margin entire; upper surface glabrous (including the midrib), smooth, lower surface yellowish strigose to strigillose on the veins, smooth, cystoliths only below; lateral veins 5–9 pairs (in the lower part closer together than distally), none of them branched or forked away from the margin, tertiary venation scalariform, in the upper part of the lamina running perpendicular to the midrib; waxy glands in the axils of the upper lateral veins; petiole 0.4–0.8 cm long, yellowish strig(ill)ose, the epidermis persistent; stipules 1.5–3 cm long, caudate and margin often inflexed, yellowish strigose to subsericeous, (sub)persistent. *Figs* on slender stolons to 3 m long with internodes to 10 cm long; *figs* subsessile or with a peduncle to 0.5 cm long; basal bracts 3 and verticillate or to 6 and subverticillate, 3–4 mm long; receptacle subglobose, ca. 1–2 cm in diameter when dry, brown hirtellous, with \pm inflexed lateral bracts, reddish at maturity, apex convex to flat, ostiole 3–4 mm in diameter, surrounded by a rosette of apical bracts; internal hairs absent.

T h a i l a n d.—PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia (type), Brunei, Indonesia (Kalimantan).

E c o l o g y.— Evergreen forest, at low altitudes.

SYO3. *Ficus fistulosa* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 470. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 284, 296. 1867; Kurz, Forest Fl. Burma 2: 459. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 114, t. 150, 151. 1888; Ridl., Fl. Malay Penins. 3: 343. 1924; Gagnep., Fl. Indo-Chine 5: 817. 1928; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 26, f. 12, 13. 1933; Kochummen, Tree Fl. Malaya 3: 146. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 274. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 418. 2005. Plate LXIV: 1–2.

Tree to 10(–18) m tall. *Leafy twigs* 3–8 mm thick, (sub)glabrous or sparsely brownish to whitish appressed-puberulous, with nodal waxy glands; internodes hollow or solid; periderm flaking off. *Leaves* spirally arranged or (partly) subopposite, distichous on ultimate branches; lamina oblong, subobovate or (ob)lanceolate (to elliptic), (4–)8–22(–35) by (1.5–)4–9(–17) cm, symmetrical or \pm asymmetrical, subcoriaceous, apex acuminate to caudate, base cuneate to rounded (to subcordate), margin entire or (in particular towards the apex) \pm irregularly dentate, occasionally lobate, usually slightly revolute (towards the base); upper surface (sub)glabrous, smooth, lower surface glabrous or sparsely appressed-puberulous on the veins, smooth, cystoliths only below; lateral veins (4–)6–10(–14) pairs, some of them branched or furcate far from the margin, the basal pair relatively weakly developed, tertiary venation scalariform to subreticulate; waxy glands absent or inconspicuous in furcations of lateral veins; petiole (1–)1.5–3(–10) cm long, glabrous or hirtellous to puberulous, the epidermis flaking off; stipules 0.5–1.5(–2.5) cm long, glabrous or sparsely appressed-puberulous, caducous. *Figs* axillary, solitary (or in pairs) or sometimes more together on short spurs in the leaf axils and/or below the leaves on short spurs developing into woody tubercles or on branchlets to 4(–10) cm long on the older wood down

to the trunk; peduncle (0.5–)1–4.5(–6) cm long; basal bracts 3, (usually) verticillate, 0.5–1 mm long; receptacle subglobose, obovoid or subpyriform, 0.5–1.5 cm diam. when dry, ca. 1–2 cm diam. when fresh, mostly 0.1–1 cm long stipitate, (sub)glabrous, lateral bracts absent, sometimes obscurely to distinctly ribbed, yellowish (or red) at maturity, apex \pm convex to concave, ostiole ca. 1.5–3 mm diam.; internal hairs absent.

Note.— Two varieties can be distinguished in relation to size and apex of the lamina and the position of the figs on the plant.

Ficus tengerensis was reduced to a variety of *F. fistulosa*. This rather distinct form, mainly occurring in Peninsular Malaysia, is represented by a few collections in Thailand: *Niyomdham & Puudjaa 3081* (from Songkhla) and *5522* (from Yala) and *Pooma 4421* (from Yala) and *4534* (from Narathiwat).

a. var. fistulosa — *Ficus harlandii* Benth., Fl. Hongk.: 330. 1861; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 113, t. 148. 1888; Gagnep., Fl. Indo-Chine 5: 772. 1928.— *F. fistulosa* Reinw. ex Blume var. *angustifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 284. 1867; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 28. 1933; Kochummen, Tree Fl. Malaya 3: 147. 1978.— *F. polysyce* Ridl., J. Straits Branch Roy. Asiat. Soc. 82: 195. 1920; Ridl., Fl. Malay Penins. 3: 342. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 42. 1933.

Leafy twigs 2–4 mm thick. *Lamina* oblong to subobovate (to elliptic), 8–22(–35) by 3–9(–17) cm; apex acuminate, base cuneate to rounded (to subcordate); lateral veins 6–10(–13) pairs; petiole (1–)2–4(–10) cm long. Figs on spurs or to 2.5 cm long leafless branchlets on main branches and trunk; peduncle 1–4.5(–6) cm long; receptacle 0.8–1.5 cm diam. when dry.

T h a i l a n d.— **NORTHERN:** Chiang Mai, Chiang Rai, Lamphun, Tak, Phitsanulok, Kamphaeng Phet; **NORTH-EASTERN:** Phetchabun, Loei, Sakon Nakhon; **EASTERN:** Nakhon Ratchasima; **SOUTH-WESTERN:** Phetchaburi, Prachuap Khiri Khan; **CENTRAL:** Nakhon Nayok; **SOUTH-EASTERN:** Chon Buri, Chanthaburi, Trat; **PENINSULAR:** Chumphon, Ranong, Surat Thani, Phangnga, Phuket, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— India (NE and Nicobar Islands), Sikkim, Bangladesh, Burma, S China, Taiwan, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Brunei, Indonesia (type, Sumatra, Java, Kalimantan, Sulawesi, Lesser Sunda Islands, Papua), Philippines.

E c o l o g y.— Evergreen forest and secondary growth, to 1,500 m.

V e r n a c u l a r.— Ching khao (จิ้งขาว, จั้งขาว), ching ban (จั้งบ้าน) (Nakhon Si Thammarat); ching (จั้ง), dueai (เดือย) (Trang); ma duea plong (มะเดือปล่อง) (Trat); ha-kor-ni-ya (ฮากอนียา) (Malay-Narathiwat).

b. var. tengerensis (Miq.) Kuntze, Rev. Gen. Pl. 1: 626. 1891; Kochummen, Tree Fl. Malaya 3: 147. 1978.— *Ficus tengerensis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 283, 296. 1867.

Leafy twigs 1–2 mm thick. *Lamina* subobovate (to oblanceolate), 4–17 by 2–5 cm, apex (sub)caudate, base cuneate or obtuse; lateral veins 4–6 pairs; petiole 1–1.5 cm long. Figs axillary or on short spurs below the leaves; peduncle 0.5–1 cm long; receptacle 0.5–1 cm diam. when dry.

T h a i l a n d.— **PENINSULAR:** Surat Thani, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Indonesia (Java, Sumatra-type).

E c o l o g y.— Evergreen forest, to 800 m.

N o t e.— This variety being ramiflorous rather than cauliflorous may be linked to the typical variety in southern Thailand by intermediates as represented by the sterile collection *Smitinand 6143* (from Trang).

SYO4. *Ficus griffithii* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 297. 1867; Corner, Gard. Bull. Singapore 18: 39. 1960; C.C. Berg, Thai Forest Bull. (Bot.) 35: 18, t.4. 2007.— *Covellia griffithii* Miq., London J. Bot. 7: 467. 1848. Fig. 24.

Shrub or subshrub with trailing stems and erect leafy twigs. *Leafy twigs* 1.5–2.5 mm thick, minutely white puberulous and strigillose, with nodal waxy glands present (? faint); internodes hollow; periderm persistent. *Leaves* in lax spirals to subdistichous; lamina elliptic to ovate, 4–15 by 2.5–8 cm, symmetrical, chartaceous to membranaceous, apex acute to subacuminate, base cordate to rounded, margin (coarsely) crenate to dentate; upper surface sparsely puberulous to strigillose on the main veins, scabridulous, lower surface sparsely strigillose on the main veins, smooth, cystoliths only below (or also sparsely above?); lateral veins 4–6, branched or forked away from the margin, basal pair to 1/3–1/2 the length of the lamina, tertiary venation loosely scalariform to subreticulate; waxy glands in the axils of some of the lateral veins in the middle of the lamina; petioles unequal in length on the same twig, 1–5 cm long, ca. 1 mm thick, white (sub)strigillose, the epidermis persistent; stipules 0.5–1 cm long, (sub)glabrous, subpersistent. *Figs* axillary; peduncle 0.5–0.8 cm long; bracts 3, verticillate, ca. 1.5 mm long; receptacle subglobose, when dry 1–1.5 cm diam., to 0.4 cm long stipitate, puberulous, with lateral bracts, colour at maturity unknown, apex convex, ostiole ca. 3 mm diam., surrounded by apical bracts; internal hairs absent. *Stamen* 1. *Styles* of the long-styled flower hairy.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi (Thong Phaphum); CENTRAL: Saraburi.

D i s t r i b u t i o n.— Burma (type).

E c o l o g y.— Dry evergreen forest, at low altitudes.

N o t e.— This peculiar suffrutescent species with procumbent, trailing stems, shows similarities in its habit to *Ficus assamica*, *F. heterophylla*, and *F. montana*.

SYO5. *Ficus heterostyla* Merr., J. Arnold Arbor. 23: 158. 1942; C.C. Berg, Thai Forest Bull. (Bot.) 35: 19. 2007; C.C. Berg & Chantarasuwan, Blumea 52(2): 314. 2007.— *F. hispida* L.f. var. *badiostrigosa* Corner, Gard. Bull. Singapore 18: 53. 1960; Chantarasuwan & Kuntong, J. Thail. Nat. Hist. Mus. 1: 81, t. 2, 5, 6. 2005.

Shrub or tree to 5 m tall. *Leafy twigs* 2.5–10 mm thick, whitish puberulous, intermixed with longer patent dark brown to purplish hairs, usually with pairs of nodal waxy glands on the nodes; internodes hollow; periderm sometimes flaking off. *Leaves* (sub)opposite or distichous; lamina oblong to subovate, 5.5–27 by 2–11 cm, symmetrical or slightly asymmetrical, chartaceous, apex acuminate, base rounded, obtuse or truncate, margin dent(icul)ate at least towards the apex; upper surface whitish hirtellous to hispidulous, scabrous, lower surface whitish puberulous to subtomentose on the veins, on the main veins intermixed with longer patent to ± appressed dark brown to purplish hairs, scabridulous, cystoliths only below; lateral veins (4–)6–8 pairs, the basal pair usually branched, 1/10–1/6 the length of the lamina, other lateral veins often branched or furcate away from the margin, tertiary venation scalariform, ± prominent beneath;

waxy glands of lateral vein in the middle of the lamina minute (or absent); petiole 1–6 cm long, whitish puberulous, intermixed with longer patent dark brown to purplish hairs, the epidermis flaking off; stipules 0.5–2 cm long, brown (sub)sericeous, caducous. *Figs* on slender, rooting, leafless, branched or unbranched branches, 3–4 m long with internodes to 10 cm long; peduncle 0.1–0.3 cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose, 0.8–1.7 cm diam. when dry, to 1.6–2.2 cm diam. when fresh, non-stipitate or to 0.1 cm long stipitate, faintly ribbed, dark brown hirtellous, without lateral bracts, orange, red or brownish at maturity, apex convex, ostiole ca. 2 mm diam., surrounded by 5 apical bracts; internal hairs absent.

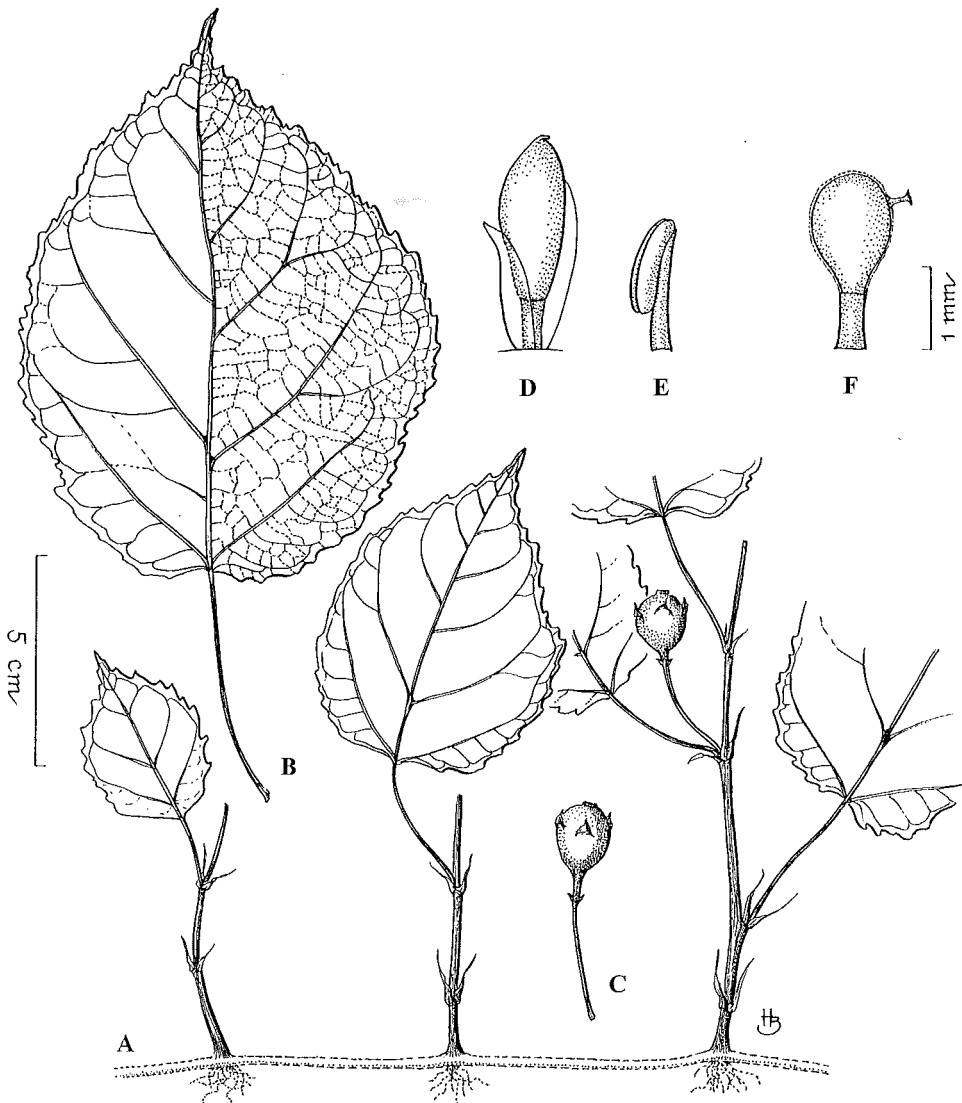


Fig. 24. *Ficus griffithii* (Miq.) Miq.: A. creeping branch with fig-bearing leafy twigs; B. leaf; C. fig; D. staminate flower; E. stamen; F. short-styled flower. (all from *Kostermans et al.* 894, L). Drawn by Hendrieke Berg.

T h a i l a n d.— SOUTH-WESTERN: Phetchaburi, Prachuap Khiri Khan; CENTRAL: Saraburi, Nakhon Nayok; SOUTH-EASTERN: Chachoengsao, Chon Buri, Rayong, Chanthaburi, Trat; PENINSULAR: Chumphon, Surat Thani, Phangnga.

D i s t r i b u t i o n.— Vietnam (type), Laos, Cambodia.

E c o l o g y.— Evergreen forest, often secondary growth, to 300 m.

N o t e s.—This species is related to *F. hispida* L.f. from which it differs in the stoloniflory, the dark brown indumentum on leafy twigs and other parts, the smaller fig receptacles without lateral bracts, with persistent indumentum, and mostly turning brownish at maturity. At least in the region where the two species co-occur, *F. hispida* is predominantly cauliflorous, sometimes with short (to 40 cm long) fig-bearing branchlets at the base of the trunk, the figs have longer peduncles, the receptacles bear lateral bracts and turn yellow at maturity. The indumentum of *F. hispida* is whitish almost throughout its range; in Sri Lanka, India, Burma, and China, however, plants with dark brown hairs and fertile (or sterile?) stolons occur.

It is not quite certain whether the type of *Ficus hispida* L.f. var. *rubra* (from Vietnam), of which the indumentum is whitish (the predominant colour in *F. hispida*), belongs to this species. In most other features it matches the brown-hairy material.

Collection *Middleton et al. 1601* from Phetchaburi resembles *Ficus heterostyla* in the brown indumentum on various parts, but is distinct in to 2 m long pendulous fig-bearing branchlets, ca. 0.5 cm long peduncles, and fig receptacles with lateral bracts. This collection differs from *Ficus hispida* in the orange colour of the mature fig receptacle and the brown indumentum, and from both species in the cuneate base of the lamina and the weakly developed lower lateral veins, and is in this feature similar to *Ficus squamosa*.

SYO6. *Ficus hispida* L.f., Suppl. Pl.: 442. 1782; Kurz, Forest Fl. Burma 2: 460. 1877; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 282, 296. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 116, t. 154, 155. 1888; Ridl., Fl. Malay Penins. 3: 342. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 31, f. 16, 17. 1933; Kochummen, Tree Fl. Malaya 3: 149. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 426. 2005; Chantarasuwan & Kumtong, J. Thail. Nat. Hist. Mus. 1: 79, t. 1, 3. 2005.— *Gonusuke hispida* (L.f.) Raf., Sylv. Tellur.: 58. 1838.— *Covellia hispida* (L.f.) Miq., London J. Bot. 7: 462. 1848.— *Ficus oppositifolia* Roxb., Pl. Corom. 2: 14, t. 124. 1799; Griff., Icon. Pl. Asiat. 4: t. 560. 1854.— *F. daemonum* J. König ex Vahl, Enum. Pl. 2: 198. 1806.— *Gonusuke daemonum* (J. Koenig ex Vahl) Raf., Sylv. Tellur.: 58. 1838.— *Covellia daemonum* (J. Koenig ex Vahl) Miq., London J. Bot. 7: 462. 1848.— *Sycomorpha roxburghii* Miq., Ann. Sci. Nat. Bot., Sér. 3, 1: 35. 1844.— *Covellia courtallensis* Miq., London J. Bot. 7 (1848) 463.— *Ficus poilanei* Gagnep., Notul. Syst. 4: 93. 1927; Gagnep., Fl. Indo-Chine 5: 820, f. 93, 94. 1928. Plate LXIV: 3–4.

Shrub or tree to 10(–15) m tall. *Leafy twigs* 3–10 mm thick, whitish strigose, hirtellous, strigillose or appressed-puberulous, usually with pairs of nodal waxy glands at the bases of the petioles (or on the nodes); internodes hollow; periderm flaking off (often starting below the leaves). *Leaves* (sub)opposite or spirally arranged (or distichous); lamina oblong, elliptic, subobovate or subovate, 5–25(–35) by 2.5–10(–16) cm, symmetrical or slightly asymmetrical, chartaceous, (lower surface often drying much paler than the upper), apex acuminate, base cuneate to subcordate, margin (often) crenate-dentate, denticulate (or to subserrate) or subentire; upper surface sparsely to rather densely whitish strigillose, hispidulous or appressed-puberulous, ± scabrous or smooth, lower surface (rather) densely whitish strigose, hirtellous or to appressed-

puberulous on the smaller veins, smooth, cystoliths only below; lateral veins (4–)6–10 pairs, the basal pair usually branched, short or to 1/2 the length of the lamina, other lateral veins often branched or forked away from the margin, tertiary venation scalariform, \pm prominent beneath; waxy glands small, in the axils of lateral veins in the middle part of the lamina or also smaller ones in furcations of lateral veins; petiole 1–6.5(–10) cm long, whitish strigose to dark brown hirtellous to appressed-puberulous, the epidermis flaking off; stipules (0.5–)1–2.5 cm long, whitish appressed-puberulous, strigose or hirtellous, caducous. *Figs* axillary, solitary (or in pairs), or cauliflorous on branchlets to 1.5 m long arising in clusters from the main branches or trunk, sometimes also on the base of the trunk; peduncle 0.5–2(–3.5) cm long; basal bracts 3, usually verticillate, 0.5–2.5 mm long; receptacle subglobose to depressed-globose, 1.5–2.5 cm diam. when dry, to 3.5 cm diam. when fresh, to 0.6 cm long stipitate or non-stipitate, often ribbed, whitish puberulous, with a few lateral bracts, pale yellow at maturity, apex convex to flat or concave, ostiole 2–4 mm diam., surrounded by 5–6 apical bracts; internal hairs absent.

T h a i l a n d.— Throughout the country.

D i s t r i b u t i o n.— Sri Lanka, Pakistan, India (incl. Andaman Islands and Nicobar Islands?), Nepal, Sikkim, Bhutan, Bangladesh, Burma, S China, Vietnam, Laos, Cambodia, Peninsular Malaysia, Singapore, Indonesia (Sumatra, Java, type, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines, Papua New Guinea, Australia.

E c o l o g y.— Evergreen and mixed deciduous forests, often in secondary growth, to 1,600 m.

V e r n a c u l a r.— Duea plong (เตี้อปล้อง) (Nakhon Si Thammarat, Saraburi, Northern); duea pong (เตี้อปอง) (Bangkok); duea sai (เตี้อสาย) (Chiang Mai); ta-oe-na (ตะเอน่า), ao-nae (เอาหน) (Karen-Mae Hong Son); ma duea plong (มะเตี้อปล้อง) (Central); ha-ko-sa-ni-ya (ฮะกอสะนียา) (Malay-Narathiwat).

SYO7. *Ficus lepicarpa* Blume, Bijdr. Fl. Ned. Ind.: 459. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 283, 297. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 118, t. 156. 1888; Ridl., Fl. Malay Penins. 3: 343. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 28, f. 14, 15. 1933; Kochummen, Tree Fl. Malaya 3: 150. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 282. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 430. 2005.— *Covellia lepicarpa* (Blume) Miq., Fl. Ned. Ind. 1(2): 328. 1859.— *Ficus lepicarpa* Blume var. *pedunculata* Corner, Gard. Bull. Singapore 18: 54. 1960. Plate LXV: 1.

Shrub or tree to 8(–12) m tall. *Leafy twigs* 3–4 mm thick, sparsely to rather densely whitish to brownish appressed-puberulous (with curved hairs of about equal length) to glabrous, sometimes with nodal waxy glands; internodes hollow; periderm (often) flaking off; leaf scars prominent and conspicuous; often small conical “buds” in the leaf axils and on the nodes below the leaves. *Leaves* spirally arranged or subopposite, lamina subobovate, oblong, obovate or elliptic, (5–)8–24(–32) by (1.5–)3–11(–14) cm, symmetrical or slightly asymmetrical, subcoriaceous, apex acuminate, base obtuse, cuneate, truncate or subcordate, margin (sub)entire; upper surface white appressed-puberulous on the midrib or glabrous, smooth, lower surface sparsely white appressed-puberulous (or glabrous) on the main veins, smooth, cystoliths only below; lateral veins 8–12 pairs, none or some (or most) of them branched or forked away from the margin, tertiary venation subscalariform; waxy glands absent or inconspicuous in slit-shaped extensions of the axils of the lateral veins in the middle part of the lamina (or in furcations of lateral veins); petiole 1–6 cm long, sparsely appressed-puberulous or glabrous, the epidermis

± flaking off; stipules 1.2–2.6 cm long, (sparsely) appressed-puberulous or glabrous, caducous or subsistent. *Figs* mostly in pairs in the leaf axils, occasionally also on short spurs on the trunk, (sub)sessile (or with a peduncle to 0.2 cm long); basal bracts 3, 1–7 mm long; receptacle subglobose, ellipsoid or obovoid (or to depressed-globose), ca. 1–1.5 cm diam. when dry, 2–2.5 cm diam. when fresh, sparsely white or brownish puberulous or glabrous, usually with a few small lateral bracts on the upper part of the receptacle, often ± ribbed, brownish-yellow or greenish-yellow at maturity, apex convex, ostiole ca. 4–6 mm diam., surrounded by 2–3 rows of ± erect apical bracts, the outer ones often at some distance from the ostiole; internal hairs absent.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi; PENINSULAR: Ranong, Surat Thani, Phangnga, Krabi, Nakhon Si Thammarat, Trang, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular and Bornean Malaysia, Indonesia (type, Sumatra, Java, Kalimantan: Anambas and Natuna Islands, Sulawesi, Moluccas), Philippines.

E c o l o g y.— Evergreen forest, often along streams, to 1,100 m.

V e r n a c u l a r.— Cha luk pho (ชาลูกโพ) (Nakhon Si Thammarat); dua muan (เดื่อม่วน) (Ranong); ma dua (มะเดื่อ) (Narathiwat).

N o t e.— In the majority of trees, the figs are confined to the leaf axils, but trees are occasionally cauliflorous, bearing figs on spur-like branchlets on the trunk.

SYO8. *Ficus malayana* C.C. Berg & Chantarasuwan, *Blumea* 52(2): 315. 2007; C.C. Berg, *Thai Forest Bull. (Bot.)* 35: 21. 2007.— *F. uncinata* (King) Becc. var. *strigosa* Corner, *Gard. Bull. Singapore* 18: 59. 1960; Corner, *J. Malayan Branch Roy. Asiat. Soc.* 11: 17, f. 5–7. 1933 (as *F. geocarpa*).— *F. uncinata* (King) Becc. var. *truncata* Corner, *Gard. Bull. Singapore* 18: 59. 1960.— *F. uncinata* (King) Becc. var. *subbeccarii* Corner, *Gard. Bull. Singapore* 19: 401. 1962. Plate LXV: 3–4.

Tree to 10 m tall. *Leafy twigs* 2–4 mm thick, brownish hirtellous to subhirsute with hairs of similar length, with a swollen base, mostly (re)curved, sometimes intermixed with sparse shorter hairs, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous; lamina oblong to subobovate, (10–)15–40 by (3–)6–14 cm, asymmetrical, chartaceous, apex acuminate, base cuneate to cordate at the broad side, cuneate to obtuse at the narrow side, margin denticulate to dentate; upper surface brownish hirtellous to hispidulous, ± scabridulous, lower surface brownish hirtellous on the veins, the hairs of similar length, scabridulous; cystoliths only below; lateral veins 6–9 pairs, none forked away from the margin, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina, small; petiole 0.8–1.5 cm long, brownish hirtellous to subhirsute, the hairs of similar length, the epidermis persistent; stipules (1–)1.5–2.5 cm long, brownish hirtellous to substrigose, subsistent. *Figs* on branched, to 10 m long rooting stolons arising from the base of the trunk (or 1.5–2 m from the base) and with internodes to 8 cm long, peduncle 0.1–0.4 cm long; basal bracts 3–5, (sub)verticillate, 2–3 mm long, appressed; receptacle subglobose, 1.5–3 cm diam. when dry, densely brownish puberulous to hirtellous, the indumentum persistent, with several lateral bracts, these ± appressed, colour at maturity unknown, apex convex; ostiole 2–3 mm diam., more or less hidden in the indumentum; internal hairs absent. *Long-styled flower* with glabrous style and perianth absent.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular Malaysia (type), Borneo: Brunei, Kalimantan, Sabah, Sarawak.

E c o l o g y.— Evergreen forest, at low altitudes.

V e r n a c u l a r.— Yue-ha-ha-ro (ชื่อฮาดารอ) (Malay-Narathiwat).

SYO9. *Ficus obpyramidata* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 116, t. 153. 1888; Ridl., Fl. Malay Penins. 3: 343. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 40, f. 22, 23. 1933; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 438. 2005. Plate LXV: 5–6.

Tree to 10 m tall; latex white. *Leafy twigs* 3–6 mm thick, brown appressed-puberulous, with nodal waxy glands; internodes hollow; periderm (of the older parts) flaking off. *Leaves* spirally arranged or subopposite; lamina oblong to subobovate, 7–25(–32) by 3–10(–17) cm, slightly asymmetrical, chartaceous, apex acuminate, base cuneate to cordate, margin denticulate to subentire; upper surface puberulous to subhispidulous, scabridulous, lower surface brown hirtellous, strigose or whitish puberulous on the veins, smooth, cystoliths only below; lateral veins (6–)8–13 pairs, some of them branched or forked away from the margin, tertiary venation scalariform; waxy glands in the axils of lateral veins in the middle part of the lamina; petiole (1–)2–8 cm long, brown puberulous to hirtellous, the epidermis flaking off; stipules 0.5–1.5(–2.2) cm long, brown to whitish appressed-puberulous to subsericeous, caducous. *Figs* on branched branchlets to ca. 15 cm long with (very) short internodes, on the trunk; peduncle ca. 1–3.5 cm long; basal bracts 3, verticillate, 2–3 mm long; receptacle obovoid, pyriform or depressed-globose, 2.5–3 cm diam. when dry, ca. 3.5–4.5 cm diam. when fresh, (sub)glabrous, ribbed, without lateral bracts, yellow to brownish at maturity, apex concave, ostiole 6–8 mm diam., depressed; internal hairs rather sparse, whitish.

T h a i l a n d.— PENINSULAR: Chumphon, Surat Thani, Nakhon Si Thammarat, Trang, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular Malaysia (type).

E c o l o g y.— Evergreen forest and secondary growth, at low altitudes.

V e r n a c u l a r.— Pho (โผะ, โผะ) (Nakhon Si Thammarat, Trang); ha-gor (ฮากอ) (Malay-Narathiwat).

U s e s.— The figs are eaten in curry, sold at markets.

SYO10. *Ficus racemosa* L., Sp. Pl.: 1060. 1753; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867; Kochummen, Tree Fl. Malaya 3: 154. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 297. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 339. 2005; G. Zhang et al., Biotropica 33: 334. 2006; Upadhyay & Srivastava, Taxon 59: 1879. 2010.— *F. glomerata* Roxb., Pl. Corom. 2: 13, f. 123. 1798; Roxb., Fl. Ind. Ed. 1832 3: 558. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 667. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 297. 1867; Kurz, Forest Fl. Burma 2: 458. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 173, t. 218, 219. 1888; Gagnep., Fl. Indo-Chine 5: 807. 1928; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 58, f. 31. 1933.— *Covellia glomerata* (Roxb.) Miq., London J. Bot. 7: 465. 1848.— *Ficus lucescens* Blume, Bijdr. Fl. Ned. Ind.: 444. 1825.— *Urostigma lucescens* (Blume) Miq., Fl. Ned. Ind. 1(2): 341. 1859.— *Ficus lanceolata* Buch.-Ham. ex Roxb., Fl. Ind. Ed. 1832 3: 557. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 645. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 297. 1867; Kurz, Forest Fl. Burma 2: 457. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 177, t. 224. 1888.— *Covellia lanceolata* (Buch.-Ham. ex Roxb.) Miq., Hook. London J. Bot. 7: 465. 1848.— *Ficus trichocarpa* Decne., Nouv. Ann. Mus. Hist. Nat. Paris 3: 497. 1834, non Blume, 1825.— *Covellia mollis* Miq., London J.

Bot. 7: 466. 1848.— *Ficus mollis* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 283, 296. 1867, non Vahl, 1790, nec Willd., 1798.— *F. glomerata* Roxb. var. *mollis* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 174. 1888.— *F. racemosa* L. var. *mollis* (Miq.) M.F. Barrett, Bull. Torrey Bot. Club 73: 323. 1946.— *F. chittagonga* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 228, 294. 1867.— *F. glomerata* Roxb. var. *chittagonga* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 174. 1888.— *F. glomerata* Roxb. var. *elongata* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 173. 1888.— *F. racemosa* L. var. *elongata* (King) M.F. Barrett, Bull. Torrey Bot. Club 73: 323. 1946.— *F. glomerata* Roxb. var. *miquelii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 174. 1888.— *F. racemosa* L. var. *miquelii* (King) Corner, Gard. Bull. Singapore 21: 35. 1965.— *F. acidula* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 176, t. 223. 1888.— *F. henrici* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 176. 1888. Fig 25. Plate LXVI: 1–2.

Tree to 20(–)30 m tall, becoming buttressed, deciduous; latex white, cream, or pinkish. *Leafy twigs* 1.5–3 mm thick, sparsely to densely appressed-puberulous; internodes solid; periderm flaking off. *Leaves* spirally arranged (to subdistichous); lamina oblong, lanceolate, or subovate (or to subobovate), (2–)6–20 by (1–)3–9 cm, symmetrical, (sub)coriaceous, apex (sub)acuminate to subacute, base cuneate to rounded (to subcordate), margin entire, sometimes (faintly) irregularly dentate or sublobate; upper surface sparsely pilose and glabrescent or appressed-puberulous on the midrib, smooth, lower surface sparsely pilose and glabrescent or appressed-puberulous on the main veins; cystoliths only below; lateral veins 4–9(–12) pairs, the basal pair \pm distinct, unbranched or faintly and sparsely branched, tertiary venation scalariform; waxy glands in the axils of the basal pair of lateral veins, often inconspicuous; petiole 1.5–7 cm long, (sub)glabrous or appressed-puberulous, the epidermis flaking off; stipules 0.5–1.2 cm long, sparsely to densely appressed-puberulous to subtomentose or only ciliolate, subpersistent or caducous. *Figs* on clusters of to ca. 25 cm long, often branched, leafless branches on the older wood, down to the trunk; peduncle 0.3–1.2 cm long; basal bracts 3, 1–2 mm long, persistent; receptacle subglobose to subpyriform, 1.5–3 cm diam. when dry, 3–5 cm diam. when fresh, puberulous, without lateral bracts, pinkish to purple-red or orange at maturity, apex flat to slightly concave, ostiole ca. 3 mm diam., prominent; internal hairs absent.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Lamphun, Lampang, Phrae, Tak, Phitsanulok; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Lop Buri, Saraburi, Nakhon Nayok; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Songkhla, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, Pakistan, India (type), Nepal, Sikkim, Bangladesh, Burma, S China, Vietnam, Laos, Cambodia, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Lesser Sunda Islands, Papua), Australia.

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests; to 1,000 m.

V e r n a c u l a r.— Ku-sae (กุ่มซาย) (Karen-Mae Hong Son); duea kliang (เดื่อเกลี้ยง) (Central, Northern); duea nam (เดื่อหน้) (Peninsular); ma duea (มะเดื่อ) (Lampang); ma duea chumphon (มะเดื่อชุมพร), ma duea utum phon (มะเดื่ออุทุมพร) (Central).

SYO11. *Ficus ribes* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 463. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 284, 297. 1867; Kurz, Forest Fl. Burma 2: 458. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 110, t. 144. 1888; Kochummen, Tree Fl. Malaya 3: 155. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 446. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 22. 2007; C.C. Berg & Chantarasuwan, Blumea 52(2): 317. 2007.— *Covellia ribes* (Reinw. ex Blume) Miq., Fl. Ned. Ind. 1(2): 325. 1859.— *C. paniculata* Miq., London J. Bot. 7: 467.

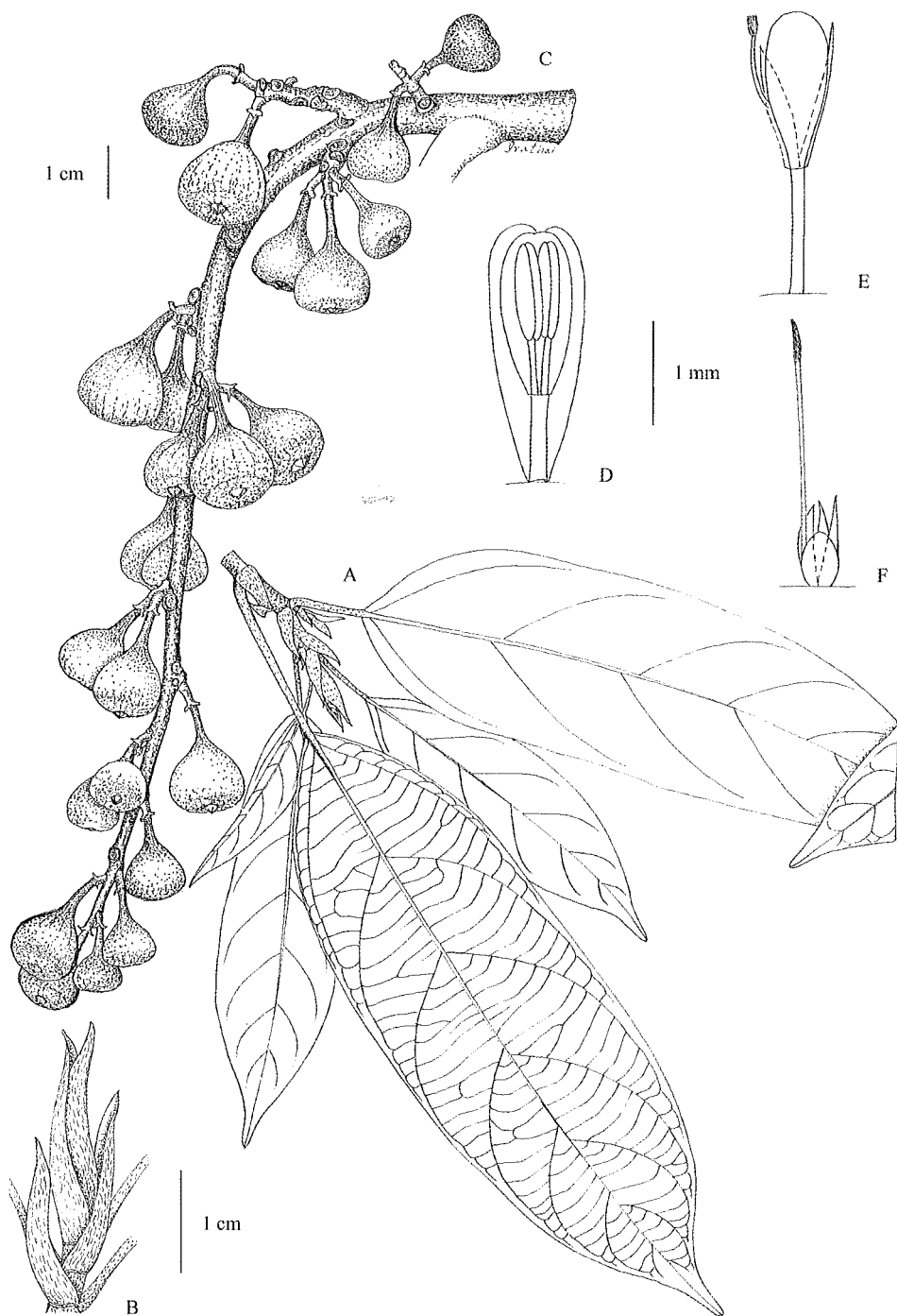


Fig. 25. *Ficus racemosa* L.: A. leafy twig; B. stipules; C. fig-bearing branchlet; D. staminate flower; E. short-styled flower; F. long-styled flower (A–C: Maxwell 94-1168, BKF; D–F: Yahara et al. 21676, BKF). Drawn by Orathai Kerdkaew (A–C) and Cornelis Berg (D–F).

1846.— *Ficus staphylosyce* Ridl., Fl. Malay Penins. 3: 301. 1924; Ridl., Fl. Malay Penins. 5: 334. 1925; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 43. 1933.— *F. scortechinii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 112, t. 147. 1888; Ridl., Fl. Malay Penins. 3: 343. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 36, f. 20–21. 1933; Corner, Gard. Bull. Singapore 10: 286. 1939; Kochummen, Tree Fl. Malaya 3: 155. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 451. 2005.— *F. fasciculata* King in Hook.f., Fl. Brit. India 5: 524. 1888, non F. Muell. ex Benth., 1873; Ridl., Fl. Malay Penins. 3: 343. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 42. 1933.— *F. arfakensis* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 104, t. 133. 1888; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 397. 2005. Plate LXVI: 3–4.

Tree to 10(–20) m tall. *Leafy twigs* 1.5–3 mm thick, brown to whitish appressed-puberulous to strigillose, without (or with small) nodal waxy glands; internodes hollow or solid; periderm persistent. *Leaves* (sub)distichous, sometimes subopposite; lamina (ob)lanceolate, subobovate or oblong, (2–)6–18(–29) by (1–)1.5–5.5(–10) cm, symmetrical or slightly (to distinctly) asymmetrical, chartaceous, apex acuminate, caudate or acute, base cuneate to obtuse, margin denticulate (at least) towards the apex or subtire; upper surface sparsely brownish to whitish strigillose to glabrous, smooth, lower surface sparsely (to rather densely) brown(ish) strigillose to appressed-puberulous (or hirtellous) on the veins, smooth, cystoliths above (numerous to few) and below or only below; lateral veins (4–)6–10 pairs, the lower ones not distinctly loop-connected, none (or some of them) branched or forked away from the margin, tertiary venation scalariform (to subreticulate); waxy glands absent or, if present, then in slit-shaped extensions of the axils of 1 or 2 lateral veins in the middle part of the lamina; petiole 0.2–1(–1.5) cm long, 1–1.5 mm thick, brownish to whitish strigillose, the epidermis ± flaking off; stipules 0.5–1.2(–1.8) cm long, brown(ish) strigillose, hirtellous to subsericeous (or glabrous), subsistent or caducous. *Figs* sometimes axillary, mostly on woody tubercles or (clusters of) rather slender to stout leafless branchlets to 40 cm long, mostly at the base of the trunk; peduncle 0.1–1(–1.6) cm long; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose, obovoid or ellipsoid, 0.4–0.8 cm diam. when dry, 1–2 cm diam. when fresh, (sub)glabrous, non-stipitate or to 0.2 cm long stipitate, (faintly) ribbed, with or without one or a few lateral bracts, yellow-brown, pinkish, orange, reddish or dark red at maturity, apex ± convex to flat, ostiole 2–3 mm diam., surrounded by 5(–6) apical bracts; internal hairs sparse to abundant, white to brownish.

T h a i l a n d.— NORTHERN: Tak, Phitsanulok; SOUTH-WESTERN: Kanchanaburi; PENINSULAR: Chumphon, Surat Thani, Phangnga, Phuket, Nakhon Si Thammarat, Phatthalung, Trang, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular Malaysia, Singapore, Indonesia (type, Sumatra, Java, Moluccas), Papua New Guinea.

E c o l o g y.— Evergreen and dry evergreen forests, to ca. 900 m.

V e r n a c u l a r.— Manot (มะน้อย) (Northern); dua din (เดื่อดิน) (Trang); ha-go-ta-mong (ฮากอตาโมง) (Malay-Narathiwat).

N o t e s.— In the current concept of the species, *Ficus ribes* and *F. scortechinii*, as well as the disjunct *F. arfakensis* are united. The only character that kept them separate was the distribution of cystoliths: only below or also above (the number varying from abundant to few).

In Thailand, the fig-bearing branches remain short, not becoming stolons to 10 m long, as they do in Sumatra and Java.

SYO12. *Ficus ridleyana* C.C. Berg & Chantarasuwan, *Blumea* 52(2): 317. 2007; C.C. Berg, Thai Forest Bull. (Bot.) 35: 22. 2007.— *F. vrieseana* Miq. forma *obliqua* Corner, Gard. Bull. Singapore 18: 50. 1960. Plate LXVI: 5–6.

Tree to 5 m tall. *Leafy twigs* 2–4 mm thick, (dark) brown strigose to hirsute, the long hair intermixed with much shorter whitish hair, without nodal waxy glands; internodes hollow; periderm persistent. *Leaves* (sub)distichous; lamina oblong to subobovate, (2–)9–37 by (1–)4–15 cm, asymmetrical, chartaceous, apex acuminate to caudate, base cuneate to cordate at the broad side, cuneate to obtuse at the narrow side, margin denticulate to dentate; upper surface brown puberulous to hispidulous, ± scabridulous, lower surface (dark) brown (sub)strigose to hirsute on the main veins to whitish puberulous or subhispidulous on the smaller veins, the long hair intermixed with much shorter whitish hair, ± scabrous, cystoliths only below; lateral veins 7–9 pairs, most of them forked away from the margin or branched, tertiary venation scalariform; waxy glands in the axils of some lateral veins in the middle part of the lamina, and in furcations of lateral veins, small; petiole 0.8–2 cm long, (dark) brown strigose to hirsute, the long hair intermixed with much shorter whitish hair, the epidermis persistent; stipules 0.5–1.5 cm long, (dark) brown hirsute to strigose to partly brown appressed puberulous, caducous. *Figs* on branched, to 2 (or more) m long, rooting stolons arising from the base of the trunk and with internodes to 16 cm long, peduncle 0.2–0.5 cm long; basal bracts 3, verticillate, ca. 2 mm long, appressed; receptacle subglobose, 0.8–1.3 cm diam. when dry, densely brown puberulous to hirtellous, the indumentum persistent, without lateral bracts, colour at maturity unknown, apex convex, ribbed towards the ostiole; ostiole ca. 3 mm in diameter, surrounded by apical bracts; internal hairs absent. *Long-styled flower* with hairy style and the perianth (very) short collar-shaped (to absent?).

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular Malaysia (type).

E c o l o g y.— Evergreen forest, to ca. 1,300 m.

SYO13. *Ficus rosulata* C.C. Berg, *Blumea* 55(2): 117. 2010.— Under *F. miquelii* King (= *F. botryocarpa* Miq.): Ridl., Fl. Malay Penins. 3: 341. 1924; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 34, f. 18, 19. 1933; Corner, Gard. Bull. Singapore 10: 286. 1939.

Tree to 20 m tall. *Leafy twigs* 1–3 mm thick, brown strigillose, with nodal waxy glands; internodes hollow; periderm flaking off; often with minute abortive axillary buds (also below the leaves). *Leaves* distichous, occasionally subopposite; lamina oblong to subobovate (or obovate), 6–15(–27) by 2–6(–9.5) cm, often ± asymmetrical, chartaceous to subcoriaceous, apex ± abruptly acuminate to subcaudate, base cuneate to obtuse, margin entire, sometimes faintly denticulate towards the apex; upper surface sparsely brown strigillose on the midrib, smooth, lower surface ± sparsely strigillose on the veins, smooth, cystoliths only below; lateral veins 6–12 pairs, rarely branched or forked away from the margin, tertiary venation scalariform (to almost reticulate); waxy glands, if present, small, in the axils of some of the lateral veins in the middle of the lamina; petiole 0.5–2.5 cm long, brownish strigillose, the epidermis flaking off; stipules 0.5–1.5 cm long, brown strigillose or glabrous, caducous. *Figs* on branched (or unbranched) branchlets to 60 cm long on the trunk; peduncle 1–3.5 cm long, the epidermis flaking off; basal bracts 3, verticillate, 1–2 mm long; receptacle subglobose, subpyriform or depressed-globose, 1.2–2(–2.5) cm diam. when dry, 2–3.5 cm diam. when fresh, 0.2–0.8 cm long stipitate or non-stipitate, glabrous, the epidermis flaking off, without lateral bracts, yellow or brownish at maturity, apex

flat to slightly concave, ostiole 4–8 mm diam., surrounded by a rosette of erect bracts; internal hairs absent or sparse.

T h a i l a n d.— NORTHERN: Chiang Rai, Lampang; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; PENINSULAR: Ranong, Phangnga, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular and Bornean Malaysia, Indonesia (Sumatra-type, Kalimantan).

E c o l o g y.— Evergreen and dry evergreen forests, to 1,000 m.

V e r n a c u l a r.— Ching khao (จิ้งเขา, ชั่งเขา) (Nakhon Si Thammarat); deua ching (เดือฉิ่ง) (Yala); ha-kor-ka-yu (ฮากอคาญ) (Malay-Narathiwat).

U s e s.— The figs are eaten in curry.

SYO14. *Ficus semicordata* Buch.-Ham. ex Sm. in Rees, Cycl. 14: Ficus no. 71. 1810; Corner, Gard. Bull. Singapore 17: 449. 1960; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 382. 2005; C.C. Berg & Chantarasuwan, Blumea 52(2): 318. 2007.— *F. cunia* Buch.-Ham. ex Roxb., Fl. Ind. Ed. 1832 3: 561. 1832; Wight, Icon. Pl. Ind. Orient. 2. t. 648. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 282, 296. 1867; Kurz, Forest Fl. Burma 2: 461. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 101, t. 126. 1888; Ridl., Fl. Malay Penins. 3: 341. 1924; Gagnep., Fl. Indo-Chine 5: 814. 1928; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 21, f. 8, 9. 1933; Burkill, Dict. Econ. Prod. Malay Penins.: 1006. 1935; Kochummen, Tree Fl. Malaya 3: 156. 1978.— *Covellia cunia* (Buch.-Ham. ex Roxb.) Miq., London J. Bot. 7: 459. 1848.— *Covellia inaequiloba* Miq., London J. Bot. 7: 456. 1848.— *Ficus hapalophylla* Kurz, Forest Fl. Burma 2: 461. 1877. Fig. 26. Plate LXVII: 1–2.

Tree to 15 m tall, with wide-spreading branches. *Leafy twigs* 2–4 mm thick, white puberulous and (dark) brown to whitish (sub)hirtellous to subvillous, without nodal glands; internodes hollow; periderm flaking off. *Leaves* distichous; lamina oblong, subobovate or lanceolate (or elliptic or linear), (4–)10–25(–45) by (3–)4–12(–17) cm, asymmetrical, chartaceous to subcoriaceous, apex acuminate, base cuneate to rounded on the narrow side, cordate on the broad side, lobe often covering the petiole, margin (towards the apex) denticulate; upper surface hispidulous, scabrous, lower surface ± densely brownish (to whitish) puberulous, subhispidulous or strigillose (to strigose), often scabridulous; cystoliths (only) below; lateral veins (4–)9–15(in lanceolate leaves –26) pairs, some or most of them branched or forked away from the margin, the basal pair at the broad side to 1/6–1/13(–1/2) the length of the lamina; tertiary venation scalariform, ± prominent beneath; waxy glands (conspicuous) in the axils of the basal lateral veins on the broad side; petiole 0.5–2 cm long, white puberulous and brown hirtellous, the epidermis flaking off; stipules 1–2(–3.5) cm long, white appressed-puberulous, to brown strigose or subhirtellous on the keel, caducous. *Figs* sometimes axillary, mostly on leafless branched branchlets hanging from the main branches and/or on stolons to 2 m long departing from the base of the trunk and with internodes to 4 cm long; with a peduncle 0.2–1 cm long or sessile; basal bracts 3, verticillate, 1–2.5 mm long; receptacle subglobose, 1–2 cm diam. when dry, 2–2.5 cm diam. when fresh, to 0.5 cm long stipitate or non-stipitate, white to yellowish (sub)tomentose or (sub)glabrous, mostly with a few lateral bracts, red to red-brown at maturity, apex convex, ostiole ca. 3 mm diam., surrounded by 5 apical bracts; internal hairs abundant to very sparse, white or brownish. *Tepals* of pistillate flowers free, linear to spatulate (to subobovate). *Fruits* whitish.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Phayao, Nan, Lamphun; NORTH-

EASTERN: Loei; SOUTH-WESTERN: Kanchanaburi, Phetchaburi; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Nakhon Si Thammarat, Trang, Yala, Narathiwat.

Distribution.—Pakistan, N India, Nepal (type), Sikkim, Bhutan, Burma, S China, Laos, Vietnam, Peninsular Malaysia.

Ecology.—Evergreen, dry evergreen and montane forests, at altitudes to 1,600 m.

Vernacular.—Duea plong hin (เตื่อปล้องหิน) (Peninsular); not (นอด) (Nan); ma kha khon (มะค่าขน); manot kwai (มะน็อคคว้าย) (Chiang Mai); ma duea khon (มะเดื่อขน) (Chiang Rai); mae non (แม่นอน) (Yala); ha-kor-bu-lu (ฮากอบูลู) (Malay-Narathiwat).

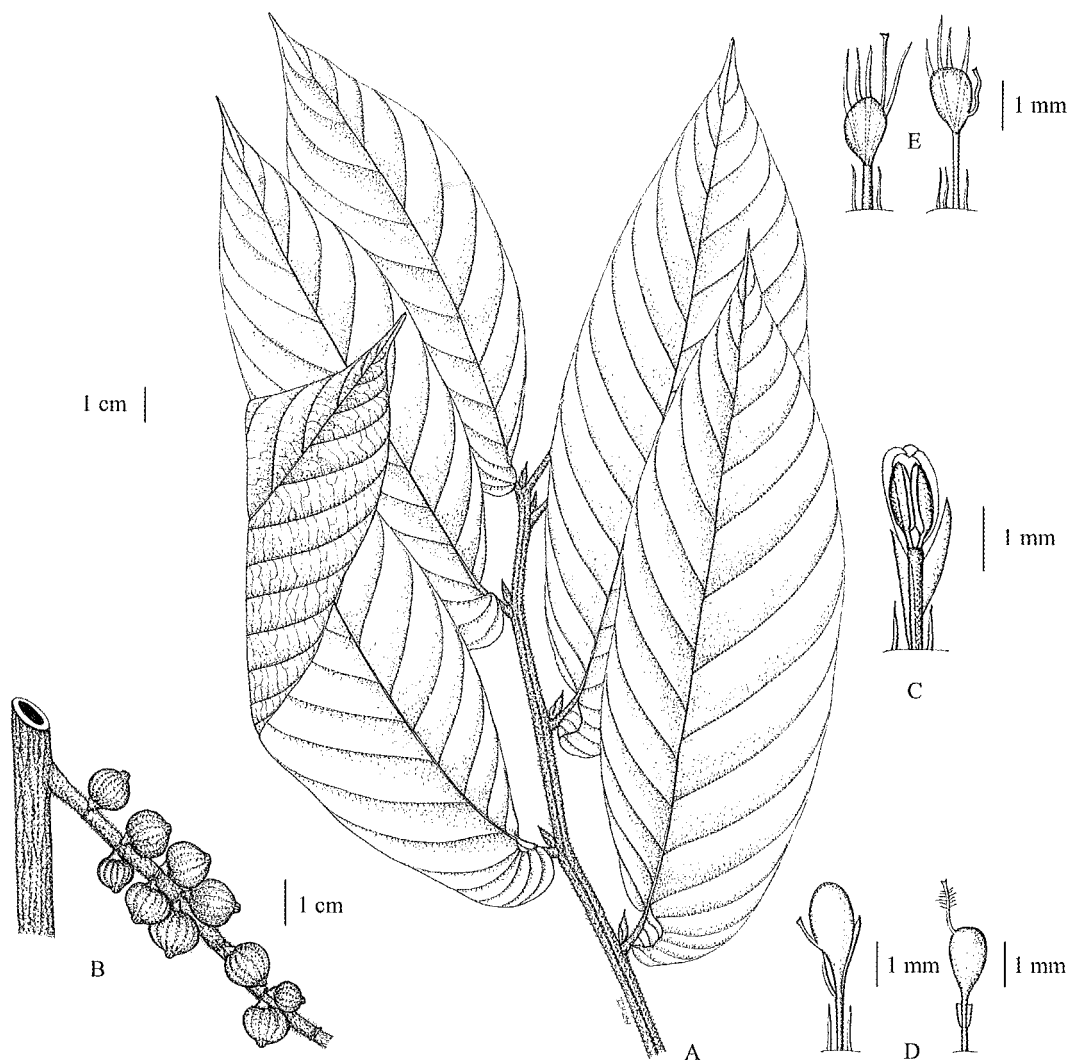


Fig. 26. *Ficus semicordata* Buch.-Ham. ex Sm.: A. leafy twig; B. fig-bearing branch; C. staminate flowers; D. pistillate flowers; E. pistillate flowers and internal hairs (A: *Niyomdham* 8, BKF; B: *Maxwell* 89-595, BKF; C: *van Beusekom* 3554, BKF; D: *Smitinand* s.n. BKF 14690, BKF; E: *Maxwell* 75-876) Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–E).

SYO15. *Ficus squamosa* Roxb., Fl. Ind. Ed. 1832 3: 531. 1832; Corner, Gard. Bull. Singapore 21: 85. 1965; Grierson & D.G. Long, Fl. Bhutan 1(1): 90. 1983.— *F. saemocarpa* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 232, 296. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 115, t. 152. 1888.— *F. pyrrocarpa* Kurz, J. Asiat. Soc. Bengal 42(2): 106. 1873; Kurz, Forest Fl. Burma 2: 457. 1877. Fig. 27. Plate LXVII: 3–4.

Shrub to 2(–3) m tall, rheophytic, with rooting stolon-like stems and ascending or erect leafy branches, lower internodes long, upper ones short. *Leafy twigs* 2–5 mm thick, dark brown to blackish strigose; periderm persistent. *Leaves* spirally arranged or subopposite, ± tufted; lamina oblanceolate, (1–)5–21 by (0.5–)1–5 cm, symmetrical, (sub)coriaceous, apex acuminate to subacute, base cuneate to obtuse, margin entire (or crenate towards the apex), ± revolute at least towards the base; upper surface dark brown or whitish strigillose, mainly on the midrib, smooth, lower surface dark brown to whitish strigose or hirtellous on the midrib and the margin, often sparsely so on the lateral veins; cystoliths only below; lateral veins (4–)8–14 pairs, not distinctly loop-connected, the basal pair not distinct, short, tertiary venation scalariform; waxy glands small, in the axils of some of the lateral veins, lacking in the basal ones; petiole 0.5–3.5 cm long, brown strigose to hirtellous, the epidermis flaking off; stipules (0.5–)1–1.5(–2) cm long, brown to whitish strigillose on and along the midrib or glabrous, subpersistent. *Figs* rami- to cauliflorous on leafless (to 1 cm long) short-shoots on the ascending or creeping stems, subsessile or with a peduncle to 1.5 cm long; basal bracts 3, in a whorl or ± scattered on the peduncle, 1.5–3 mm long; receptacle subglobose, subpyriform or ellipsoid, when dry ca. 1.2–2 cm diam., often shortly (to 0.4 cm long) stipitate, often clearly ribbed, brown hirtellous (or to whitish puberulous), lateral bracts present, these (broadly) ovate, 0.2–0.3 cm long, puberulous or glabrous, purple to black at maturity, apex convex to concave, ostiole ca. 2 mm diam., surrounded upper lateral bracts; internal hairs few and short.

T h a i l a n d.— NORTHERN: Chiang Mai, Lamphun, Lampang; SOUTH-WESTERN: Kanchanaburi; PENINSULAR: Chumphon.

D i s t r i b u t i o n.— Nepal, Bhutan, Sikkim, NE India, Bangladesh (?), Burma, Laos, China (Yunnan).

E c o l o g y.— Dry evergreen and mixed deciduous forests, rocky beds and banks of streams, to ca. 1,000 m.

V e r n a c u l a r.— Duea nam (เดื่อหน้า), duea pha (เดื่อผา), duea hohe (เดื่อโฮเฮ) (Northern).

SYO16. *Ficus variegata* Blume, Bijdr. Fl. Ned. Ind.: 459. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 169, t. 212. 1888; Ridl., Fl. Malay Penins. 5: 335. 1925; Gagnep., Fl. Indo-Chine 5: 808. 1928; Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 48, f. 25, 26. 1933; Kochummen, Tree Fl. Malaya 3: 160. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 314, t. 12. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 347.— *F. subracemosa* Blume, Bijdr. Fl. Ned. Ind.: 469. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 282, 294. 1867.— *F. cordifolia* Blume, Bijdr. Fl. Ned. Ind.: 438. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 260, 285. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 180, t. 225. 1888.— *F. chlorocarpa* Benth., Fl. Hongk.: 330. 1861; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 296. 1867.— *F. variegata* Blume var. *chlorocarpa* (Benth.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 197, t. 213. 1888.— *F. sycomoroides* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 230, 295. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 172, t. 217. 1888.— *F. variegata* Blume var. *sycomoroides* (Miq.) Corner, Gard. Bull. Singapore 18: 33. 1960.— *F. sum* Gagnep., Notul. Syst. 4: 96. 1927;

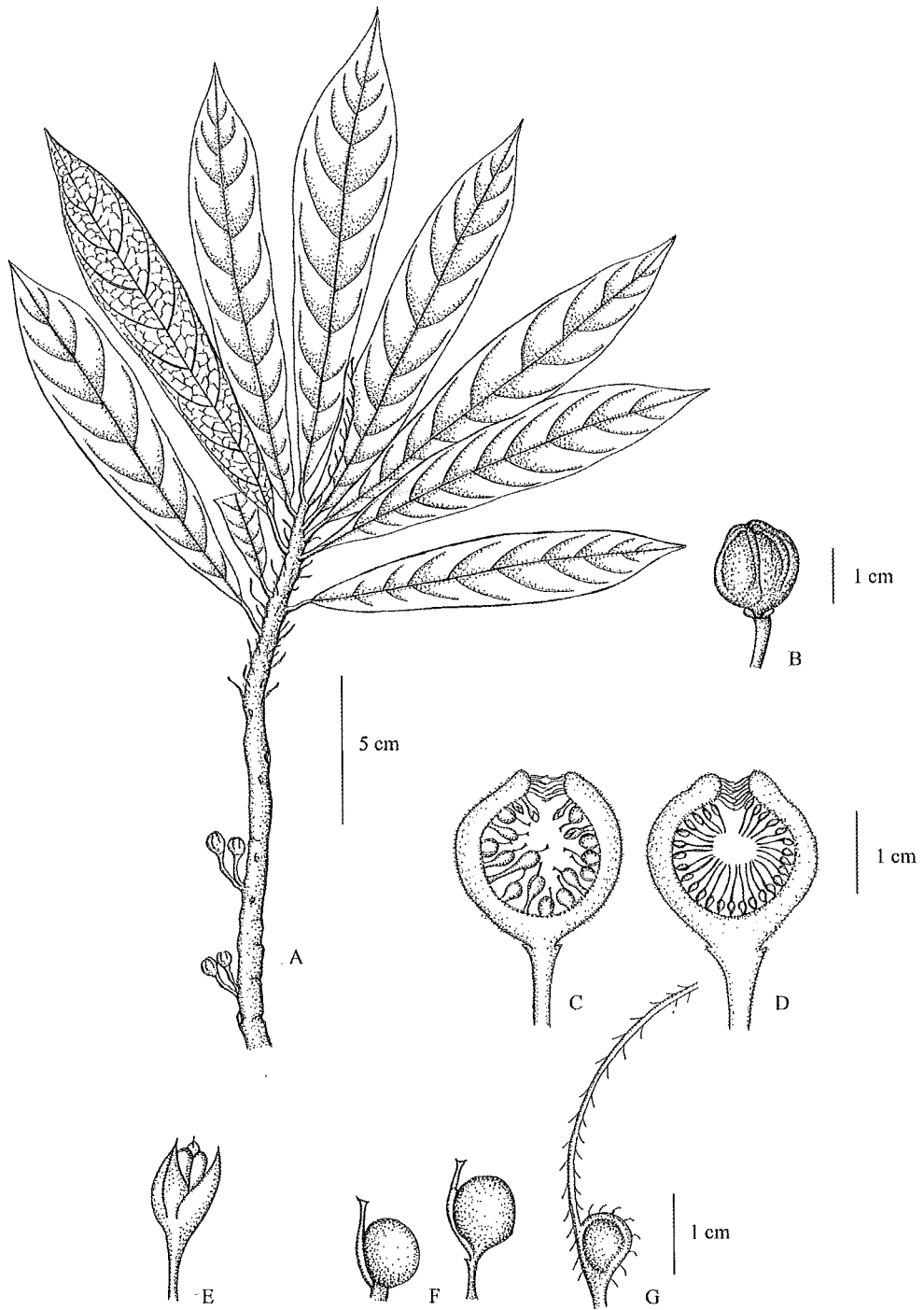


Fig. 27. *Ficus squamosa* Roxb.: A. leafy twig with figs; B. fig; C. opened fig with short-styled flowers; D. opened fig with long-styled flowers; E. staminate flower; F. short-styled flowers; G. long-styled flower. Drawn by Wattana Tanning.

Fl. Indo-Chine 5: 828, t. 95. 1929.— *F. viridicarpa* Corner, J. Malayan Branch Roy. Asiat. Soc. 11: 52, f. 27–29. 1933; Kochummen, Tree Fl. Malaya 3: 161. 1978. Plate LXV: 2.

Tree to 25(–40) m tall, becoming buttressed, deciduous. *Leafy twigs* 2–5 mm thick, glabrous or appressed-puberulous; internodes hollow or solid; periderm flaking off. *Leaves* spirally arranged; lamina ovate, subovate, elliptic or oblong, 6–20(–35) by 2–10(–15) cm, symmetrical; subcoriaceous to chartaceous (or coriaceous), apex acuminate, subacute or obtuse, base cordate, subcordate or obtuse (or cuneate or subattenuate), margin (sub)entire (or coarsely dentate); upper surface glabrous or puberulous on the main veins, smooth, lower surface minutely appressed-puberulous (or patent-puberulous) on the veins; cystoliths only below, lateral veins (3–)4–9(–14) pairs, the basal pair to 1/4–2/3 the length of the lamina, often unequal in length, branched, some or none of the other lateral veins forked away from the margin; tertiary venation scalariform, sometimes loosely so and almost reticulate; waxy glands in (± clear) slit-shaped extensions of the axils of the (main) basal lateral veins; petiole 2–14 cm long, glabrous or appressed-puberulous, the epidermis flaking off; stipules 0.5–1.2 cm long, glabrous (and then often partly “corky” and flaking off) or yellowish appressed-puberulous, at least at the base and/or the apex, caducous. *Figs* on tuberculate spurs on minor branches and/or on clustered, sparingly branched, to 7 cm long, leafless branchlets on the older wood, down to the trunk; peduncle (0.5–)1–6(–9) cm long; basal bracts 3, 0.5–2.5 mm long, (obliquely) verticillate, sometimes ± scattered, persistent (or caducous); receptacle subglobose, pyriform or ellipsoid, (1–)1.5–2.5 cm diam. when dry, (1.5–)2–3.5(–5) cm diam. when fresh, to 0.8 cm long stipitate or non-stipitate, (sub)glabrous or minutely puberulous, pink to red (or sometimes green) at maturity, sometimes faintly ribbed when dry, the inner surface often with low flower-bearing projections, apex ± concave to flat or slightly convex, ostiole 3–4 mm diam., ± prominent; wall to 8 mm thick when dry; internal hairs usually absent. *Tepals* of pistillate flowers free or basally connate, lanceolate or spatulate, entire. *Styles* glabrous. *Fruits* smooth.

T h a i l a n d.— NORTHERN: Chiang Mai, Phayao, Sukhothai; EASTERN: Nakhon Ratchasima; CENTRAL: Saraburi, Nakhon Nayok; SOUTH-EASTERN: Chon Buri; PENINSULAR: Ranong, Phangnga, Krabi, Yala, Narathiwat.

D i s t r i b u t i o n.— India (NE and Andaman Islands), Burma, S China, Ryukyu Islands, Taiwan, Vietnam, Laos, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (type, throughout), Philippines, Papua New Guinea, Solomon Islands, Australia.

E c o l o g y.— Evergreen and dry evergreen forests, to 1,100 m.

V e r n a c u l a r.— Phuk (ฝู) (Krabi); duea phlong (เดื่อพลอง) (Yala).

V. FICUS SUBGENUS SYNOECIA

Root-climbers with the leaves distichous or in lax spirals and mostly dimorphic: bathyphylls (often asymmetrical) on rooting climbing sterile stems and acrophylls (usually symmetrical) on non-rooting fertile branches. *Plants* dioecious. *Figs* axillary, clustered on short spurs below the leaves (ramiflorous), or in *F. punctata* (cauliflorous), bearing figs on leafless branchlets on the (rooting) stems or main branches.

The subgenus comprises ca. 72 species of which 13 indigenous in Thailand; *F. pumila* is introduced as an ornamental climber.

The following subdivisions and species are represented:

Sect. *Kissosycea* with tessellate (= with brownish areoles) lower leaf surfaces when dry: **in Thailand**, *F. apiocarpa*, *F. disticha*, *F. hederacea* and *F. punctata*.

Sect. *Rhizocladus* with non-tessellate lamina, is subdivided into four subsections:

Subsect. *Punctulifoliae* with the figs often in clusters of more than 2, often also below the leaves: **in Thailand**, *F. araneosa*, *F. recurva*, *F. sagittata*, *F. urnigera* and *F. villosa*.

Subsect. *Trichocarpeae*, with figs in pairs in the leaf axils: **in Thailand**, *F. trichocarpa* only.

Subsect. *Plagiostigma* with (rather) large figs, solitary in the leaf axils or on spurs on the older wood: **in Thailand**, *F. anserina*, *F. pubigera*, and the introduced *F. pumila*.

Subsect. *Pogonotrophe* with only *F. laevis* is distinct by lacking leaf dimorphy and by the presence of glands on the leafy twigs.

KEY TO THE SPECIES OF FICUS SUBG. SYNOECIA

1. Lower surface of lamina foveolate or (when dry) brown tessellate
 2. Areoles deeply foveolate; introduced species **8. *F. pumila***
 2. Areoles superficially foveolate or tessellate; indigenous species
 3. Petiole (1.5–)2.5–7.5 cm long **2. *F. apiocarpa***
 3. Petiole 0.2–2 cm long
 4. Tertiary venation (partly) scalariform **5. *F. hederacea***
 4. Tertiary venation reticulate
 5. Figs 0.3–0.6 cm diam. when dry **4. *F. disticha* subsp. *disticha***
 5. Figs 1.5–10 cm diam. when dry **9. *F. punctata***
1. Lower surface of lamina not foveolate nor tessellate
 6. Fig receptacle 2.5–5 cm diam. when dry; peduncle 1.5–4 cm long **1. *F. anserina***
 6. Fig receptacle 0.3–1.5(–2) cm diam., sessile or to 1.2 cm long pedunculate
 7. Lamina more or less scabrous above **12. *F. trichocarpa***
 7. Lamina smooth above
 8. Figs usually solitary, axillary (or just below the leaves)
 9. Lateral veins 4–6 pairs, the basal pair to 1/2 the length of the lamina; figs with peduncle of 1–3 cm long **6. *F. laevis***
 9. Lateral veins 8–12 pairs, the basal pair to 1/3 the length of the lamina; figs (sub)sessile **7. *F. pubigera***
 8. Figs in the lower leaf axils and on (minute) spurs below the leaves, down to the older wood in clusters of more than 2
 10. Indumentum of leafy twigs partly consisting of uncinata (= hooked) hairs **10. *F. recurva* var. *ribesioides***
 10. Indumentum of leafy twigs without uncinata hairs
 11. Lateral veins 3–4 pairs
 12. Leafy twigs for the greater part sparsely and minutely hairy **13. *F. urnigera***
 12. Leafy twigs conspicuously and densely hairy **3. *F. araneosa***
 11. Lateral veins 5–10 pairs
 13. Lateral veins and smaller veins prominent beneath; hairs on the lamina often (partly) patent **14. *F. villosa***
 13. Lateral veins slightly prominent beneath the smaller veins (almost) flush; hairs on the lamina appressed **11. *F. sagittata***

SOE1. *Ficus anserina* (Corner) C.C. Berg, Thai Forest Bull. (Bot.) 35: 5, t. 2. 2007.—*F. pubigera* (Miq.) Wall. ex Brandis var. *anserina* Corner, Gard. Bull. Singapore 18: 5. 1960. Fig. 28.

Root-climber (or treelet to 5 m tall). Branchlets drying brown. *Leafy twigs* 3–5 mm thick, densely brown subvillous. *Leaves* in lax spirals to subdistichous; lamina oblong to subovate, 24–40 by 10–20 cm, (almost) symmetrical, subcoriaceous to coriaceous, apex acuminate, base (almost) equilateral, cordate to rounded, margin entire; upper surface brownish puberulous to strigillose mainly on the main veins, lower surface densely brown appressed-pubescent to -puberulous, on all veins or mainly on the main ones; cystoliths only below; lateral veins 6–8 pairs, the basal lateral veins to ca. (1/4–)1/3–1/2 the length of the lamina, branched, tertiary

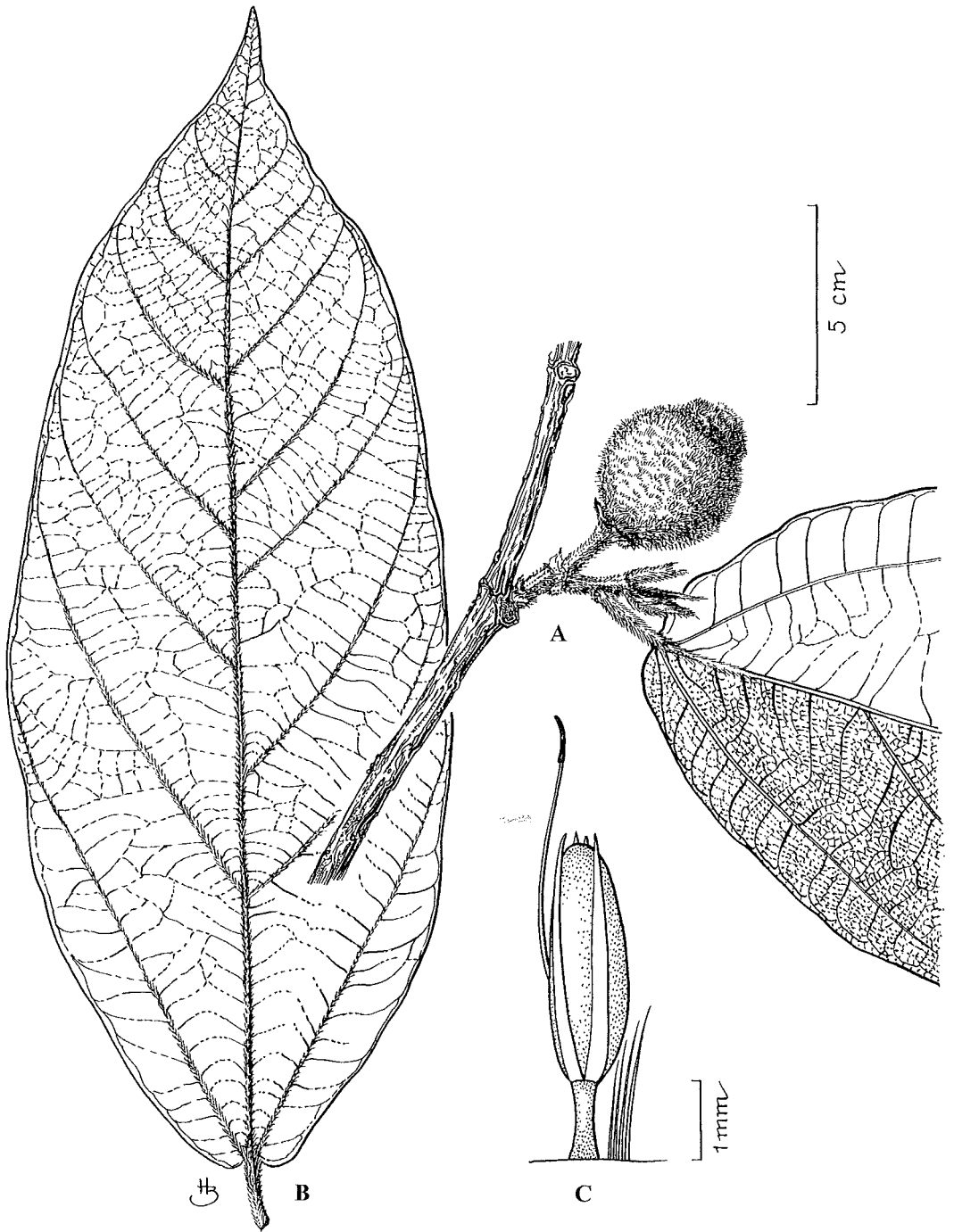


Fig. 28. *Ficus anserina* (Corner) C.C. Berg: A. branch with fig-bearing leafy twig; B. leaf; C. long-styled pistillate flower and internal hairs. (all from Maxwell 89-577, L). Drawn by Hendrieke Berg.

venation subscalariform, the smaller veins prominent beneath; waxy glands in the axils of the basal lateral veins (or also in the axils of some other lateral veins); petiole 0.5–2 cm long, 3–4 mm thick, brownish appressed-puberulous to -pubescent, the epidermis persistent; stipules (0.5–)1–1.5 cm long, brown to yellowish subsericeous, subpersistent or caducous. *Figs* (ramiflorous to cauliflorous?), below the leaves (on previous season's growth or older wood and then on short, to ca. 2 cm long short-shoots, solitary; peduncle 1.5–4 cm long; basal bracts 3–5 mm long, often ± scattered on the peduncle as far as the base of the receptacle, persistent; receptacle (sub) globose, ovoid or ellipsoid, when dry 2.5–5 cm, non-stipitate or to 1.5 cm long stipitate, densely brown subvillous, at maturity green or yellow to red (?), apex ± umbonate, ostiole ca. 3–4 mm diam.; internal hairs abundant, long, stiff, and brownish. *Tepals* red, glabrous.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Nan, Lampang.

D i s t r i b u t i o n.— China (Yunnan), Laos (type).

E c o l o g y.— Dry evergreen and montane forests, to 1,300 m.

N o t e.— This species differs from *F. pubigera* in the smaller number of lateral veins, of which the basal pair is distinctly branched and to 1/3–1/2 the length of the lamina, the persistent epidermis of the petiole, and the distinctly pedunculate figs.

SOE2. *Ficus apiocarpa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 269, 289. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 70, t. 92. 1888; Ridl., Fl. Malay Penins. 3: 338. 1924; Burkill, Dict. Econ. Prod. Malay Penins.: 1004 1935; Corner, Gard. Bull. Singapore 10: 99, f. 1–4, 8, 37. 1939; Kochummen, Tree Fl. Malaya 3: 140. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 238. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 493. 2005.— *Urostigma apiocarpum* Miq., Fl. Ned. Ind., Eerste Bijv.: 440. 1861.— *Ficus tetangis* Miq., Fl. Ned. Ind., Eerste Bijv.: 432. 1861. Plate LXVII: 5.

Root-climber. *Branchlets* drying brown; leaf scars prominent. *Leafy twigs* 3–7(–10) mm thick, hollow, sparsely and minutely whitish puberulous (or ± densely brownish subtomentose to puberulous). *Leaves* in lax spirals to distichous; lamina oblong to subovate (or elliptic to ovate), 10–20(–30) by 4–13 cm, (almost) symmetrical, coriaceous, apex acuminate, base equilateral, cuneate to subcordate (to cordate), margin entire, ± revolute; upper surface glabrous, lower surface glabrous (or ± subtomentose to puberulous on the veins), tessellate when dry; cystoliths only below; midrib slightly prominent above, lateral veins (3–)4–6 pairs, the basal pair to ca. 1/3–1/2(–3/4) the length of the lamina, branched, the other lateral veins often branched or forked away from the margin, tertiary venation subscalariform to reticulate, the smaller veins slightly prominent to flush beneath, the areoles ± clearly brownish when dry; waxy glands in the axils of the basal lateral veins and also in axils of some other lateral veins and in the axils of branches and in furcations of lateral veins; petiole 1.5–7.5 cm long, sparsely and minutely puberulous to glabrous (or ± densely subtomentose to puberulous), the epidermis flaking off; stipules (0.5–)1–2(–2.5) cm long, sparsely to densely minutely puberulous, only ciliate, or glabrous, caducous. *Figs* axillary, solitary or in pairs; peduncle 0.1–1.3 cm long; basal bracts 1–2 mm long, persistent; receptacle ellipsoid to subglobose, ca. 1.5–2.5 cm diam. when dry, 3–4 cm diam. when fresh, 0.5–3 cm long stipitate, sparsely to rather densely white puberulous (to subglabrous), orange to reddish(-brown) to scarlet, finally purple to black at maturity, apex slightly umbonate, ostiole ca. 1–2 mm diam., slightly sunken to flat; internal hairs sparse and short or absent. *Tepals* pinkish to whitish. *Staminate flowers* with long pedicels. *Stamens* 1 (or 2). *Neuter flowers* absent.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, type, Kalimantan).

E c o l o g y.— Peat swamp forest, at low altitudes.

SOE3. *Ficus araneosa* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 136, t. 170. 1888; Ridley, Fl. Malay Penins. 3: 345. 1924; Corner, Gard. Bull. Singapore 19: 391, f. 4. 1962; Kochummen, Tree Fl. Malaya 3: 140. 1978. Plate LXVII: 6.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–2.5 mm thick, solid, densely pale brown to greyish floccose-villous. *Leaves* distichous; lamina subovate to oblong, 3–11 by 1.2–4.5 cm, symmetrical, coriaceous, apex (sub)acuminate, base (almost) equilateral, rounded to cuneate, margin entire, ± revolute; upper surface glabrous or tomentellous on the midrib, glabrescent, lower surface densely floccose-villous; cystoliths only above; midrib ± impressed above, lateral veins 3–5(–6) pairs, the basal pair to ca. 1/3–1/2 the length of the lamina, mostly close to the margin, unbranched or faintly branched, tertiary venation reticulate, the smaller veins ± prominent beneath, the areoles small, minutely bullate to subfoveolate beneath; waxy glands in the axils of the basal lateral veins and also of some other lateral veins (hidden by the indumentum); petiole 0.3–1(–1.2) cm long, pale brown to greyish floccose-villous, the epidermis persistent; stipules 0.5–0.8 cm long, whitish pubescent on the keels and the base, caducous. *Figs* axillary, in pairs or (to 7) clustered, also on spurs on the older wood to 0.3 cm long, sessile; basal bracts 1–1.5 mm long, (sub)persistent; receptacle subglobose to ellipsoid, 0.4–0.6 cm diam. when dry, 0.1–0.3 cm long stipitate, often ± pustulate, densely whitish floccose-tomentose, glabrescent, orange at maturity, apex slightly umbonate to convex, ostiole 0.5–1 mm diam., flat to slightly prominent; internal hairs sparse. *Tepals* red.

T h a i l a n d.— PENINSULAR: Narathiwat (Waeng).

D i s t r i b u t i o n.— Peninsular Malaysia (type), Indonesia (Sumatra).

E c o l o g y.— Evergreen forest, at low altitudes.

N o t e.— The dense, pale-coloured, floccose indumentum on the various plant parts, including the fig receptacle, distinguishes this species.

SOE4. *Ficus disticha* Blume, Bijdr. Fl. Ned. Ind.: 458. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 294. 1867; Kochummen, Tree Fl. Malaya 3: 145. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 244. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 409. 2005.

subsp. ***disticha*** — *Ficus callicarpides* Corner, Gard. Bull. Singapore 18: 17. 1960; Corner, Gard. Bull. Singapore 19: 391, f. 4. 1962.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–2 mm thick, solid, minutely whitish puberulous to glabrous. *Leaves* distichous; lamina subobovate, obovate, oblong, elliptic, subovate, suborbicular or lanceolate, 1–5(–7.5) by 0.5–5.5 cm, symmetrical, coriaceous, apex rounded, obtuse or shortly and bluntly acuminate (or subacute), minutely retuse, initially with some hairs in the notch, base (almost) equilateral, cuneate, obtuse or rounded (to subcordate), margin entire, ± revolute, often only towards the base; both surfaces (sub)glabrous, only with minute brown trichomes, the lower surface tessellate when dry; cystoliths only below; midrib ± impressed to flush above, lateral veins (2–)3–7(–8) pairs, the basal pair to ca. 1/8–1/2 the length of the lamina, well-developed to ± poorly developed, unbranched, the other lateral veins often forked away from the margin, tertiary venation reticulate, the smaller veins flush

beneath, the areoles brownish beneath when dry; waxy glands in the axils of the basal lateral veins, usually also in the axils of other lateral veins, or absent; petiole 0.3–1(–2) cm long, minutely puberulous to glabrous, the epidermis flaking off; stipules 0.3–0.8 cm long, glabrous or minutely puberulous, caducous (or subpersistent on twigs with asymmetrical laminas). *Figs* axillary, in pairs or solitary (or also just below the leaves), or sometimes clustered on minute spurs on the older wood; peduncle 0.05–0.4 cm long; basal bracts 0.5–1.5 mm long, caducous (or subpersistent); receptacle subglobose to pyriform, 0.3–0.6(–0.8) cm diam. when dry, non-stipitate or to 0.4 cm long stipitate, (sub)glabrous, yellow, red-brown or purplish at maturity, apex convex to slightly umbonate, ostiole 0.5–1 mm diam., prominent to slightly sunken; internal hairs sparse or absent. *Tepals* red. *Stamens* 2.

T h a i l a n d.—PENINSULAR: Nakhon Si Thammarat, Narathiwat.

D i s t r i b u t i o n.—Burma, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java-type, Sulawesi, Moluccas, Papua), Philippines, Papua New Guinea, Solomon Islands.

E c o l o g y.—Evergreen and peat swamp forests, at low altitudes.

N o t e.—Two subspecies can be recognised, one widespread and the other confined to eastern Malesia and the Solomon Islands.

SOE5. *Ficus hederacea* Roxb., Fl. Ind. Ed. 1832 3: 538. 1832; Corner, Gard. Bull. Singapore 18: 18. 1960.—*F. scandens* Roxb., Fl. Ind. Ed. 1832. 3: 547. 1832; Miq., London J. Bot. 7: 452–1948; Miquel, Ann. Mus. Bot. Lugd.-Bat. 3: 281, 294. 1867; Kurz, Forest Fl. Burma 2: 455. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 129. t. 162; Gagnep., Fl. Indo-Chine 5: 794. 1928.—*F. fructicosa* Roxb., Fl. Ind. Ed. 1832 3: 533. 1832. Fig. 29. Plate LXVIII: 1.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 1–3 mm thick, solid, minutely whitish puberulous. *Leaves* distichous; lamina elliptic to ovate, (1–)5–10(–13) by (0.5–) 3.5–6(–7.5) cm, symmetrical, coriaceous, apex obtuse to subacute (to rounded), base mostly equilateral, rounded to subcordate or obtuse to cuneate, margin entire, ± revolute (towards the base); upper surface glabrous or sparsely puberulous on the main veins, lower surface glabrous or sparsely puberulous on the main veins, ± clearly tessellate when dry; cystoliths only below; midrib ± impressed above, lateral veins (3–)4–5(–7) pairs, the basal lateral veins to ca. 1/4–1/2 the length of the lamina, well-developed, (faintly) branched, the other lateral veins branched or often forked away from the margin, tertiary venation (partly) scalariform, the smaller veins flush beneath, the areoles often brownish beneath when dry; waxy glands in the axils of the basal lateral veins, usually also in the axils of other lateral veins; petiole (0.8–)1–2 cm long, minutely puberulous to glabrous, the epidermis flaking off; stipules 0.3–0.8 cm long, glabrous or sparsely minutely white puberulous, caducous. *Figs* axillary, in pairs or solitary (or also just below the leaves); peduncle 0.3–1.2 cm long; basal bracts 1–2 mm long, persistent, sometimes reflexed; receptacle subglobose, 0.5–1 cm diam. when dry, non-stipitate or to 0.3 cm long stipitate, (sub)glabrous, orange at maturity, apex convex to slightly umbonate, ostiole 1.5–2 mm diam., prominent; internal hairs absent. *Tepals* red. *Stamens* 2.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Phayao, Lamphun, Lampang, Tak; NORTH-EASTERN: Phetchabun, Loei; EASTERN: Chaiphaphum, Nakhon Ratchasima; SOUTH-EASTERN: Chon Buri, Chanthaburi.

D i s t r i b u t i o n.—India (N and Andaman Islands), Nepal, Sikkim, Bhutan, Bangladesh (type), Burma, S China, Vietnam, Laos.

E c o l o g y.—Dry evergreen and mixed deciduous forests, on limestone, 500–1,250 m.

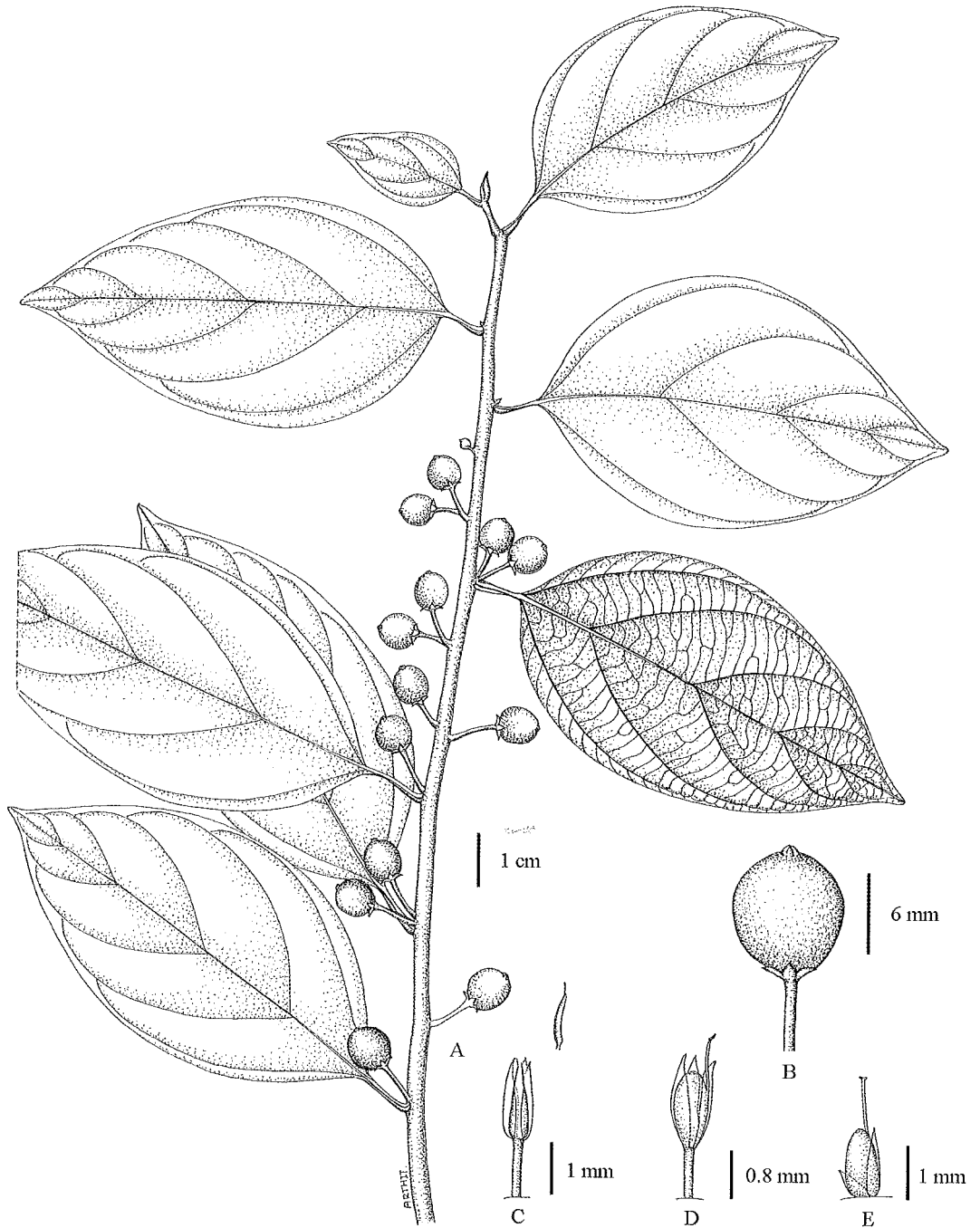


Fig. 29. *Ficus hederacea* Roxb.: A. leafy twig with figs; B. fig; C. staminate flower and anther; D. short-styled flower; E. long-styled flower (A. *Smitinand* 11549, BKF; B., E. *Maxwell* 96-431, BKF; C.-D. *Kostermans* 747, L). Drawn by Arthit Khamkamnoed (A) and Cornelis Berg (B-E).

SOE6. *Ficus laevis* Blume, Bijdr. Fl. Ned. Ind.: 437. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278, 293. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 128, t. 161. 1888; Ridl., Fl. Malay Penins. 3: 344. 1924; Gagnep., Fl. Indo-Chine 5: 796. 1928; Kochummen, Tree Fl. Malaya 3: 149. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 247. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 519. 2005.— *Pogonotrophe laevis* (Blume) Miq. in Zoll., Syst. Verz. 2: 93, 99. 1854.— *Ficus vagans* Roxb., Fl. Ind. Ed. 1832 3: 537. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 655. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278, 293. 1867.— *Pogonotrophe vagans* (Roxb.) Miq., London J. Bot. 7: 73. 1848.— *P. emodi* Wall. ex Miq., London J. Bot. 7: 73. 1848.— *Ficus emodi* (Wall. ex Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278, 293. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 181. 1888.— *Pogonotrophe assamica* Miq., London J. Bot. 7: 73. 1848.— *Ficus laevis* Blume var. *assamica* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 293. 1867.— *Pogonotrophe wightiana* Miq., London J. Bot. 7: 74. 1848.— *P. dasyphylla* Miq., London J. Bot. 7: 74. 1848.— *Ficus laevis* Blume var. *dasyphylla* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 128. 1888.— *F. laevis* Blume var. *tomentosa* King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 128. 1888; Ridl., Fl. Malay Penins. 3: 344. 1924.— *F. jamini* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 550. 1910. Fig. 30. Plate LXVIII: 2.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, densely brownish (sub)tomentose to subglabrous; pairs of subnodal waxy glands below (the scars of) the petioles. *Leaves* in lax spirals to subdistichous; lamina elliptic to ovate (to suborbicular), (5–)10–20(–25) by (3–)5–15(–20) cm, symmetrical, chartaceous, apex (mostly abruptly) acuminate, base equilateral, cordate to cuneate, margin entire; upper surface sparsely puberulous on the main veins, lower surface sparsely to densely subvillous on the main veins to subtomentose on the smaller ones; cystoliths only below; lateral veins 4–6 pairs, the basal pair to ca. 1/2 the length of the lamina, branched, tertiary venation scalariform, the smaller veins (almost) flush beneath, areoles punctate; waxy glands in the axils of the basal lateral veins or also smaller ones in the axils of other lateral veins; petiole 1.5–7(–10) cm long, sparsely appressed-pubescent, the epidermis flaking off; stipules 0.5–1.5 cm long, brownish (sub)sericeous, caducous. *Figs* axillary, solitary (or in pairs); peduncle 1–3 cm long; basal bracts 1–2 mm long, persistent; receptacle subglobose, 1.2–2 cm diam. when dry, 2–3.5 cm diam. when fresh, non-stipitate or to 0.3 cm long stipitate, sparsely (but near the ostiole densely) brownish puberulous, green (?) at maturity, apex ± convex, ostiole ca. 2–2.5 mm diam.; internal hairs abundant, long and stiff. *Tepals* red. *Stamens* 2(or 3). *Fruits* slightly compressed.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Nan, Tak; EASTERN: Nakhon Ratchasima; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Trang, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, India, Sikkim, Burma, S China, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java-type, Kalimantan).

E c o l o g y.— Evergreen and dry evergreen forests, to 1,200 m.

V e r n a c u l a r.— Ma dua thaο (มะตือเทา) (Chanthaburi).

SOE7. *Ficus pubigera* (Miq.) Wall. ex Brandis, Fl. N.W. India 424. 1874; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 294. 1867; Kurz, Forest Fl. Burma 2: 450. 1877; Kochummen, Tree Fl. Malaya 3: 153. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 517. 2005.— *Pogonotrophe pubigera* Wall. ex Miq., London J. Bot. 7: 76. 1848.— *P. verrucosa* Miq., London J. Bot. 7: 77, t. IIA. 1848; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2) (1888) t. 166D.— *Ficus verrucosa*

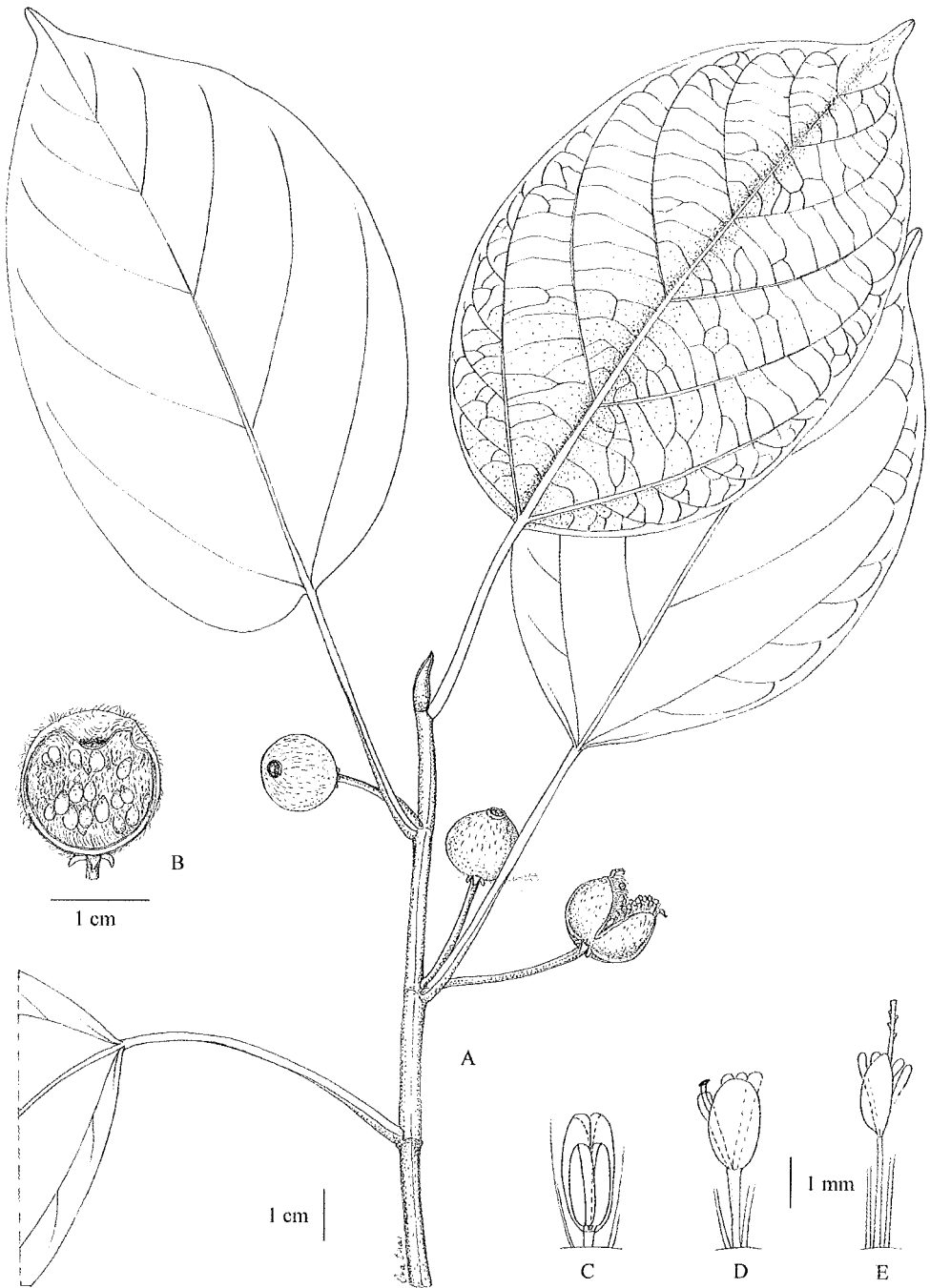


Fig. 30. *Ficus laevis* Blume: A. leafy twig with figs; B. opened fig with fruitlets; C. staminate flower and internal hairs; D. short-styled flower and internal hairs; E. long-styled flower and internal hairs (A–B, E: Maxwell 88-856, BKF; C–D: Maxwell 76-406, L). Drawn by Orathai Kerdkaew (A–B) and Cornelis Berg (C–E).

(Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867, non Vahl, 1805.— *F. erecta* Thunb. forma *khasiana* Miq., Ann. Mus. Bot. Lugd.-Bat. 2: 200. 1866; Miq., Prolus. Fl. Jap.: 132. 1866.— *F. erecta* Thunb. var. *khasiana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 294. 1867.— *F. howii* Merr. & Chun, Sunyatsenia 5: 43. 1940.

Root-climber, shrub (or tree to 20 m?). *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, densely to sparsely brown appressed-puberulous, tomentose or villous, with some conspicuous lenticels below the nodes. *Leaves* distichous (or in lax spirals); lamina oblong to subovate (to lanceolate), (5–)10–25 by (2–)4–7 cm, (almost) symmetrical to \pm asymmetrical, subcoriaceous to coriaceous, apex acuminate, obtuse or rounded, base (almost) equilateral to \pm inequilateral, cuneate to rounded (to subcordate), margin entire; upper surface glabrous or puberulous on the main veins, smooth; lower surface densely to sparsely brown to whitish tomentose to (appressed-)puberulous on all veins or mainly on the main ones; cystoliths only below; lateral veins 8–12 pairs, the basal lateral veins to ca. 1/6–1/4(–1/3) the length of the lamina, faintly branched or unbranched, tertiary venation subscalariform to reticulate, the smaller veins slightly prominent to flush beneath, areoles not foveolate; waxy glands in the axils of the basal lateral veins, small (or, in small leaves, absent); petiole (0.5–)1–2(–3.5) cm long, brownish puberulous to tomentose, the epidermis \pm flaking off; stipules 0.5–1.5(–2) cm long, brownish hirtellous to subsericeous, caducous. *Figs* axillary (or also just below the leaves), solitary (or in pairs), (sub)sessile or to 0.2 cm long pedunculate; basal bracts 1.5–4 mm long, persistent; receptacle subglobose (to ovoid or ellipsoid), 0.5–1.5(–2 cm) when dry, ca. 1–2 cm diam. when fresh, sometimes to 0.2 cm long stipitate, sparsely to densely brown(ish) (sub) tomentose, often \pm pustulate by lenticels, at maturity greenish, apex \pm umbonate, ostiole 2–3 mm diam., outer ostiolar bracts mostly patent (pointing upwards); internal hairs abundant, long, stiff, and brownish. *Tepals* red, those of pistillate flowers sometimes hairy at the apex. *Stamens* 2.

T h a i l a n d.—NORTHERN: Chiang Mai, Nan, Lamphun, Lampang, Tak, Nakhon Sawan; NORTH-EASTERN: Loei.

D i s t r i b u t i o n.—N India, Nepal (type), Sikkim, Bhutan, Burma, S China, Laos, Vietnam, Cambodia, Peninsular Malaysia.

E c o l o g y.—Dry evergreen and montane forests, 500–1,400 m.

N o t e.—Two forms can be distinguished: **a.** with small figs, ca. 0.5–1 cm diam. and small laminas, to ca. 12 cm long, and **b.** with larger figs, ca. 1.5 cm diam. and also larger laminas, ca. 10–25 cm long.

SOE8. *Ficus pumila* L., Sp. Pl.: 1060. 1753; Miq., Ann. Mus. Bot. Lugd.-Bat. 2: 199, 294. 1865; Hook. f., Bot. Mag. 108: t. 6657. 1882; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 124, t. 158. 1888; Gagnep., Fl. Indo-Chine 5: 793. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 518. 2005.— *F. stipulata* Thunb., Ficus: 8. 1786.— *F. scandens* Lam., Encycl. 2, 2: 498. 1788, non Roxb., 1832.— *Varinga repens* Raf., Sylv. Tellur.: 58. 1838.— *Tenorea heterophylla* Gasp., Giorn. Bot. Ital. 2: 214. 1844. Plate LXVIII: 5–6.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, brownish tomentose to villous. *Leaves* distichous (or in lax spirals); lamina elliptic, oblong or (sub)ovate, 2–10 by 1–6 cm, (almost) symmetrical, coriaceous, apex obtuse to subacute, base (almost) equilateral, rounded to cordate, margin entire; upper surface sparsely puberulous on the main veins, lower surface subvillous on the main veins to puberulous or subtomentose on the smaller ones;

cystoliths only below; midrib often not reaching the apex, lateral veins 4–6 pairs, the basal pair to ca. 1/2–2/3 the length of the lamina, branched, tertiary venation (sub)reticulate, the smaller veins prominent beneath, the areoles (deeply) foveolate beneath; waxy glands axils of the basal lateral veins; petiole 0.5–2(–2.5) cm long, brownish subvillous, the epidermis persistent; stipules 0.5–1.5 cm long, brownish (sub)sericeous, subpersistent. *Figs* axillary or below the leaves, solitary; peduncle 0.4–1(–2) cm long; basal bracts 4–7 mm long, caducous; receptacle (of gall-figs) subglobose to pyriform or (of seed-figs) obovoid to turbinate, 2.5–7 cm long and 2–3 cm diam. when dry, 3.5–6.5 cm diam. when fresh, sparsely appressed-pubescent, purple to blackish at maturity, base often stipitate, apex \pm umbonate, ostiole ca. 3 mm diam.; internal hairs abundant. *Tepals* red. *Stamens* 2–3.

T h a i l a n d.— Cultivated throughout the country as ornamental climber on walls.

D i s t r i b u t i o n.— Korea, Japan (type), Ryukyu Islands, Taiwan, China, Vietnam; elsewhere cultivated.

V e r n a c u l a r.— Ma dua thao (มะเดื่อเถา), tin tukkae (ตีนตุ๊กแก) (Bangkok); lin suea (ลิ้นเสือ) (Central).

SOE9. *Ficus punctata* Thunb., *Ficus*: 9 1786; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 268, 289. 1867; King, *Ficus* 2: 68, t. 88, 89. 1888; Ridl., *Fl. Malay Penins.* 3: 338. 1924; Gagnep., *Fl. Indo-Chine* 5: 813. 1928; Corner, *Gard. Bull. Singapore* 10: 137, t. 8, 22–25, 33. 1939; Kochummen, *Tree Fl. Malaya* 3: 154. 1978; Kochummen, *Tree Fl. Sabah & Sarawak* 3: 244. 2000; C.C. Berg & Corner, *Fl. Males.*, Ser. 1, *Spermat.* 17(2): 506. 2005.— *F. falcata* Thunb., *Ficus*: 5. 1786.— *Synoecia falcata* (Thunb.) Miq., *London J. Bot.* 7: 470, t. 9. 1848.— *Ficus macrocarpa* Blume, *Cat. Gew. Buitenzorg*: 36. 1823; Blume, *Bijdr. Fl. Ned. Ind.*: 459. 1825.— *Ficus elliptica* Miq., *London J. Bot.* 7: 444. 1848, non Kunth, 1817.— *Synoecia serpens* Miq., *Pl. Jungh.*: 67. 1851.— *Ficus aurantiacea* Griff., *Not. Pl. Asiat.* 4: 394. 1854; Griff., *Icon. Pl. Asiat.* 4: t. 555. 1854; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 67, t. 87. 1888; Ridl., *Fl. Malay Penins.* 3: 338. 1924; Corner, *Gard. Bull. Singapore* 21: 61. 1965; Kochummen, *Tree Fl. Malaya* 3: 140. 1978.— *Synoecia sumatrana* Miq., *Fl. Ned. Ind.* 1(2): 329. 1859.— *Ficus callicarpa* Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 268, 289, t. 10B. 1867, as *kallicarpa*; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 69, t. 90, 101B. 1888; Ridl., *Fl. Malay Penins.* 3: 338. 1924; Burkill, *Dict. Econ. Prod. Malay Penins.*: 1005. 1935; Corner, *Gard. Bull. Singapore* 10: 109, f. 8–11, 30, 31. 1939.— *F. pomifera* Kurz, *J. Asiat. Soc. Bengal* 42(2): 106. 1873; Kurz, *Forest Fl. Burma* 2: 454. 1877, non Wall. ex King, 1888.— *F. pomifera* Kurz var. *oviformis* Kurz, *J. Asiat. Soc. Bengal* 42(2): 106. 1873.— *F. megacarpa* Merr., *Publ. Gov. Lab. Philipp.* 17: 14. 1904.— *F. callicarpa* Miq. var. *angustifolia* Corner, *Gard. Bull. Singapore* 10: 120, f. 12, 13, 33. 1939.— *F. aurantiacea* Griff. var. *angustifolia* (Corner) Corner, *Gard. Bull. Singapore* 18: 23. 1960.— *F. callicarpa* Miq. var. *parvifolia* Corner, *Gard. Bull. Singapore* 10: 116, f. 32. 1939.— *F. aurantiacea* Griff. var. *parvifolia* (Corner) Corner, *Gard. Bull. Singapore* 18: 23. 1960. Plate LXVIII: 3–4.

Root-climber. *Branchlets* drying brown (to blackish). *Leafy twigs* 1–3 mm thick, solid, sparsely to rather densely minutely whitish to brownish puberulous or subtomentose. *Leaves* distichous; oblong, elliptic, subobovate, obovate or falcate (to lanceolate or suborbicular), (0.5–) 1–9(–12) by (0.2–)0.5–5.5(–7.5) cm, \pm asymmetrical or symmetrical, coriaceous, apex rounded to obtuse or shortly and bluntly acuminate, minutely retuse, initially with hairs in the notch, base inequilateral to equilateral, if inequilateral, then the broad side rounded to subauriculate, the narrow side obtuse to cuneate, if equilateral, then both sides (sub)cuneate, margin entire, \pm

revolute (at least towards the base); upper surface glabrous, lower surface sparsely puberulous to substrigillose or glabrous on the main veins, sparsely minutely puberulous on the rims of the (small) areoles; cystoliths only below; midrib (almost) flush to slightly prominent (or slightly impressed), lateral veins 3–6 pairs, the basal pair to ca. 1/6–1/3 the length of the lamina, unbranched, other lateral veins often forked away from the margin, tertiary venation reticulate, the smaller veins (almost) flush beneath, the areoles foveolate; waxy gland 1, in the axil of the basal lateral vein at the broad side of inequilateral laminas, or 2, in the axils of both basal lateral veins of equilateral laminas, or absent; petiole (0.1–)0.5–1.5(–2) cm long, puberulous, the epidermis flaking off; stipules 0.2–1.5 cm long, minutely appressed-puberulous, subpersistent or caducous. *Figs* ramiflorous to cauliflorous on leafless branchlets to 10 cm long with short internodes, solitary, sessile or with a peduncle to 2 cm long; basal bracts 2–5 mm long, persistent; receptacle subglobose, pyriform or ellipsoid, ca. (1.5–)3–5(–10) cm diam. when dry, if pyriform to ellipsoid, then to 8 cm long, when fresh 4–8(–15) cm diam., 0.4–1.5(–2.5) cm long stipitate, brown puberulous (at least on the lower part of the receptacle and on the stipe) to velutinous or sparsely (whitish) puberulous to subglabrous, yellowish, orange, pinkish, scarlet or black at maturity, apex \pm umbonate, ostiole ca. 3–5 mm diam., prominent to flat, often surrounded by 3–5 stiff bracts pointing upwards; internal hairs abundant. *Tepals* red. *Stamen* 1.

T h a i l a n d.— SOUTH-WESTERN: Phetchaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri, Rayong, Trat; PENINSULAR: Surat Thani, Phangnga, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— India (Nicobar Islands), Burma, Vietnam, Cambodia, Taiwan, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines.

E c o l o g y.— Evergreen and dry evergreen forests, to 750 m.

V e r n a c u l a r.— Duea thao bai yai (เตี้ยเถาใบใหญ่) (Narathiwat).

SOE10. *Ficus recurva* Blume, Bijdr. Fl. Ned. Ind.: 457. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 279, 294. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 131, t. 165A. 1888; Ridl., Fl. Malay Penins. 3: 345–1924; Burkill, Dict. Econ. Prod. Malay Penins.: 1013. 1935.

The species comprises four varieties after excluding var. *urnigera*, which is reinstated as a species below.

var. **ribesioides** (Wall. ex Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 132, t. 165B, C. 1888, t. 165B, C; Kochummen, Tree Fl. Malaya 3: 154. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 540. 2005.— *Pogonotrophe ribesioides* Wall. ex Miq., London J. Bot. 7: 78. 1848.— *Ficus ribesioides* (Miq.) Wall. ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 293. 1867; King in Hook.f., Fl. Brit. India 5: 528. 1888.— *F. recurva* Blume var. *bridelioides* Corner, Gard. Bull. Singapore 18: 14. 1960; Kochummen, Tree Fl. Malaya 3: 154. 1978.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–3 mm thick, solid, brownish puberulous, partly with uncinata hairs, and strigillose mainly on the nodes. *Leaves* distichous; lamina subovate, ovate, oblong or elliptic, 2–12 by 1–5 cm, symmetrical, (sub)coriaceous, apex acuminate to acute or obtuse (to rounded), base (almost) equilateral, rounded to subcordate, margin entire, \pm revolute; upper surface brownish puberulous, partly with uncinata hairs and mainly on the veins, lower surface brownish strigillose on the main veins and also puberulous, partly with uncinata hairs; cystoliths on both sides; midrib flush to slightly

impressed above, lateral veins 3–4(–5) pairs, the basal pair to 1/3–1/2 the length of the lamina, (faintly) branched, tertiary venation scalariform to subreticulate, the smaller veins slightly to almost flush beneath; waxy glands in the axils of the basal lateral veins and usually also of some other lateral veins; petiole 0.3–1.5 cm long, brownish strigillose and also puberulous, partly with uncinata hairs, the epidermis flaking off; stipules 0.3–1.2 cm long, sparsely whitish minutely appressed-puberulous subglabrous and sparsely brown strigillose on the keel and/or the base, caducous. *Figs* axillary and on minute spurs on the older wood, in pairs or (to 6) clustered; (sub) sessile; basal bracts 1–1.5 mm long, subpersistent; receptacle subglobose, 0.3–0.5 cm diam. when dry, non-stipitate or to 0.5 cm stipitate, glabrous, orange to red at maturity, apex convex, ostiole ca. 0.5–1 mm diam., slightly sunken to flat, usually surrounded by a low rim; internal hairs few and small or absent. *Tepals* red.

T h a i l a n d.— PENINSULAR: Narathiwat (Sungai Padi).

D i s t r i b u t i o n.— Peninsular (type) and Bornean Malaysia, Brunei (?), Indonesia (Sumatra, Java, Kalimantan), Philippines.

E c o l o g y.— Peat swamp forest.

SOE11. *Ficus sagittata* J. Koenig ex Vahl, *Symb. Bot.* 1: 83. 1790; Vahl, *Enum. Pl.* 2: 185. 1805; *Ann. Mus. Bot. Lugd.-Bat.* 3: 295. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 184. 1888; Corner, *Gard. Bull. Singapore* 19: 390, f. 3. 1962; Kochummen, *Tree Fl. Malaya* 3: 155. 1978; Kochummen, *Tree Fl. Sabah & Sarawak* 3: 239. 2000; C.C. Berg & Corner, *Fl. Males.*, Ser. 1, *Spermat.* 17(2): 553. 2005.— *F. compressicaulis* Blume, *Bijdr. Fl. Ned. Ind.*: 439. 1825; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 296. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 180. 1888.— *F. ramentacea* Roxb., *Fl. Ind. Ed.* 1832 3: 547. 1832; Wight, *Icon. Pl. Ind. Orient.* 2: t. 657. 1843; Kurz, *Forest Fl. Burma* 2: 454. 1877; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 135 t. 169. 1888; Ridl., *Fl. Malay Penins.* 3: 345. 1924; Gagnep., *Fl. Indo-Chine* 5: 794. 1928; Burkill, *Dict. Econ. Prod. Malay Penins.*: 1013. 1935.— *Pogonotrophe rigida* Miq., *London J. Bot.* 7: 74. 1848.— *Ficus oligosperma* Miq., *Pl. Jungh.*: 55. 1851.— *F. leptocarpa* Steud. var. *oligosperma* (Miq.) Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 280. 1867.— *F. sagittata* Vahl var. *oligosperma* (Miq.) Corner, *Gard. Bull. Singapore* 18: 12. 1960.— *F. adhaerens* Miq., *Pl. Jungh.*: 55. 1851.— *F. leptocarpa* Steud. var. *adhaerens* (Miq.) Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 280. 1867.— *F. sagittata* Vahl var. *adhaerens* (Miq.) Corner, *Gard. Bull. Singapore* 18: 12. 1960.— *F. crininervia* Miq., *Fl. Ned. Ind.*, *Eerste Bijv.*: 432. 1861; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 293. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 138. 1888; Gagnep., *Fl. Indo-Chine* 5: 825. 1929.— *F. rigescens* Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 278, 293. 1867.— *F. sagittata* Vahl var. *minor* Corner, *Gard. Bull. Singapore* 18: 12. 1960. Plate LXIX: 2.

Root-climber. *Branchlets* drying brown. *Leafy twigs* 2–5 mm thick, hollow or solid, ribbed, strigillose, hirtellous, puberulous or glabrous. *Leaves* distichous; lamina elliptic, oblong or (sub)ovate, (4–)10–20(–30) by (1.5–)5–10(–14) cm, symmetrical, coriaceous, apex acuminate to acute, base (almost) equilateral, cordate to rounded (or cuneate), margin entire to undulate, flat to revolute; upper surface glabrous or sparsely strigillose or also puberulous on the midrib, glabrescent, lower surface sparsely (to rather densely) strigillose on the main veins or only the midrib or also puberulous, sometimes only appressed-puberulous; cystoliths on both sides; midrib prominent, the main veins sometimes slightly impressed and then the midrib raised as a narrow ridge in the impression above, lateral veins (5–)6–9(–10) pairs, slightly prominent beneath, the basal pair to ca. 1/6–1/3 the length of the lamina, branched (or unbranched), the

other lateral veins sometimes forked away from the margin, tertiary venation scalariform slightly prominent beneath, the smaller veins (almost) flush beneath; waxy glands in the axils of the basal lateral veins, usually also in the axils of some other lateral veins and in the axils of branches and in furcations of the lateral veins (or absent); petiole (0.5–)1–4 cm long, sparsely strigillose or partly puberulous (or hirtellous), the epidermis flaking off; stipules (0.5–)1–1.5 cm long, yellowish subsericeous or sparsely to densely minutely puberulous and/or brown strigillose only on the keel and at the base (or glabrous), caducous or subpersistent. *Figs* axillary and on spurs on the older wood to 0.5 cm long, in pairs, solitary, or clustered; with a peduncle to 0.5 cm long or sessile; basal bracts ca. 0.5–2 mm long, caducous (or subpersistent); receptacle subglobose, (0.3–)0.5–1(–1.2) cm diam. when dry, ca. 1.5–2 cm diam. when fresh, 0.1–0.7 cm long stipitate, glabrous or sparsely minutely puberulous, surface often \pm pustulate, yellow, red, crimson or purple at maturity, apex convex to slightly umbonate, ostiole 0.5–1 mm diam., slightly sunken, flat or slightly prominent, often surrounded by a rim; internal hairs few and small. *Tepals* red.

T h a i l a n d.—NORTHERN: Chiang Mai, Lampang; NORTH-EASTERN: Phetchabun; EASTERN: Nakhon Ratchasima; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Trang, Satun, Yala, Narathiwat.

D i s t r i b u t i o n.—India (type, NE and Andaman Islands), Sikkim, Bangladesh, S China, Burma, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines, Micronesia (Palau).

E c o l o g y.—Evergreen and dry evergreen forests, to ca. 1,000 m.

SOE12. *Ficus trichocarpa* Blume, Bijdr. Fl. Ned. Ind.: 458. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 185. 1888; Kochummen, Tree Fl. Malaya 3: 159. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 254. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 556. 2005.—*Urostigma trichocarpum* (Blume) Miq., Fl. Ned. Ind. 1(2): 338. 185.—*Ficus filiformis* Blume, Bijdr. Fl. Ned. Ind.: 442. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 181. 1888.—*F. obtusa* Hassk., Cat. Hort. Bot. Bog.: 75. 1844; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 278, 293. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 130, t. 163. 1888; Gagnep., Fl. Indo-Chine 5: 820. 1928.—*F. trichocarpa* Blume var. *obtusa* (Hassk.) Corner, Gard. Bull. Singapore 18: 19. 1960.—*Pogonotrophe phaeopoda* Miq., London J. Bot. 7: 76. 1848.—*Ficus phaeopoda* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 293. 1867.—*Pogonotrophe piperifolia* Miq. in Zoll., Syst. Verz. 2: 93, 99. 1854.—*Ficus piperifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 293. 1867.—*F. obtusa* Hassk. var. *piperifolia* (Miq.) Koord. & Valetton, Bijdr. Boomsoort. Java 11: 227. 1906.—*F. trichocarpa* Blume var. *piperifolia* (Miq.) Corner, Gard. Bull. Singapore 18: 10. 1960. Fig 31. Plate LXIX: 1.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 2–3 mm thick, solid, densely brown puberulous, hirtellous, velutinous or sparsely puberulous. *Leaves* in lax spirals; lamina elliptic, oblong, ovate, subovate, cordiform or suborbicular, 4–14 by 3–10 cm, symmetric, coriaceous (to chartaceous), apex acuminate (mostly shortly and bluntly), acute or obtuse (to rounded), base equilateral, cordate, rounded or obtuse, margin entire, \pm revolute to flat; upper surface hispidulous to puberulous, \pm scabrous, lower surface \pm densely to sparsely brown to whitish puberulous, substrigillose or subhirtellous on the main veins and densely to rather sparsely white tomentose to tomentellous or puberulous on the smaller veins or only sparsely

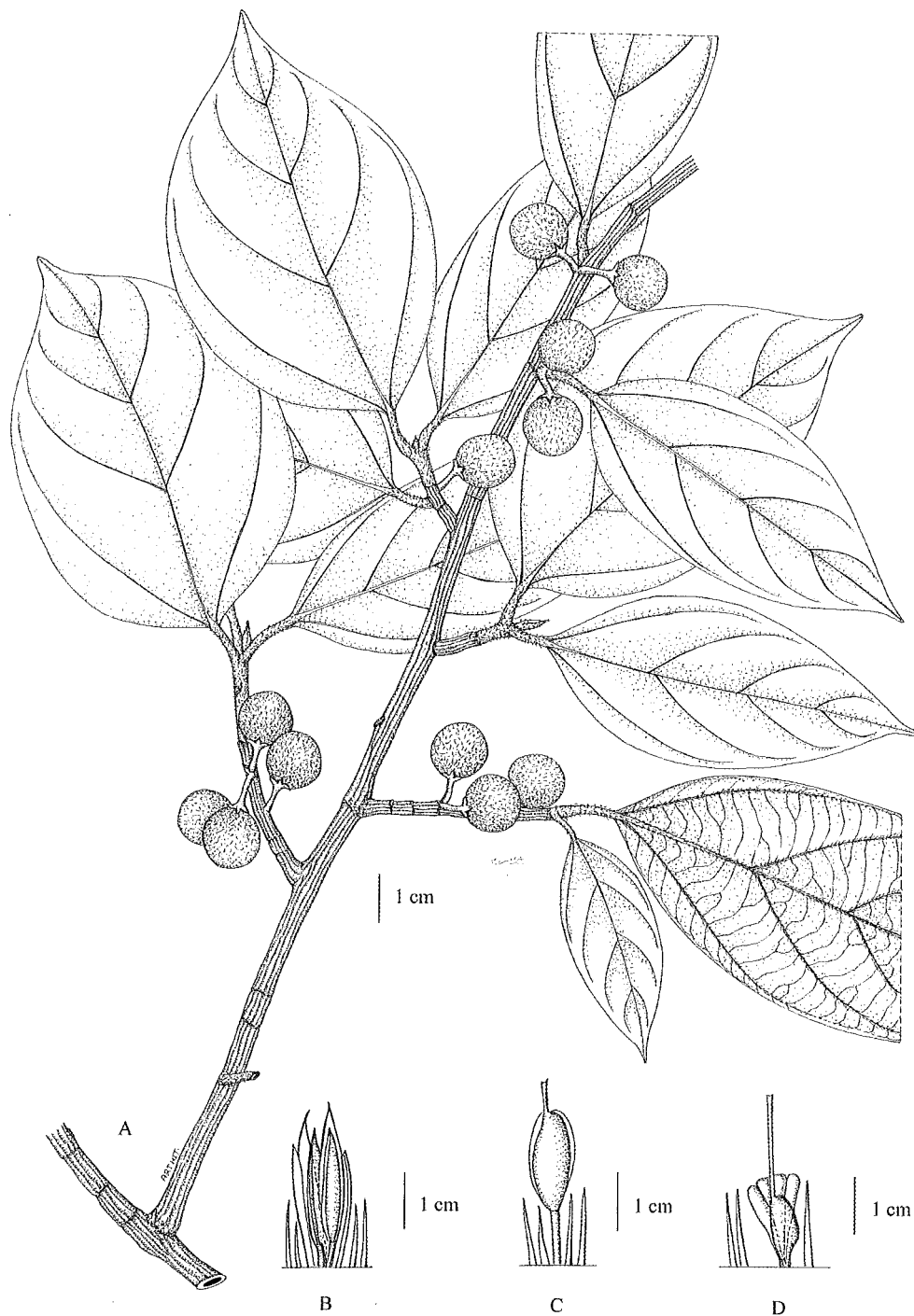


Fig. 31. *Ficus trichocarpa* Blume: A. leafy twig with figs; B. staminate flower, internal hairs; C. short-styled flower and internal hairs; D. long-styled flower and internal hairs (A–C: Niyomdham et al. 926, BKF; D: Collins 882, L). Drawn by Arthit Khamkamnoed (A) and Cornelis Berg (B–D).

appressed-puberulous on the main veins; cystoliths only below and sparse or absent; midrib \pm impressed (the lower part) to flush (the upper part) above, lateral veins 4–6 pairs, the basal pair to ca. $1/2$ – $2/3$ the length of the lamina, branched, most other lateral veins branched or forked away from the margin, tertiary venation scalariform, the smaller veins \pm prominent beneath; waxy glands in the axils of the basal lateral, often also in the axils of some other lateral veins and the axils of branches or in furcations of the lateral veins; petiole 0.5–2 cm long, \pm densely brown puberulous to velutinous, the epidermis persistent (or flaking off); stipules 0.3–0.9 cm long, brown (sub)sericeous, caducous. *Figs* axillary or just below the leaves, in pairs or solitary; peduncle 0.4–0.8; basal bracts 1.5–3 mm long, persistent; receptacle subglobose, 0.8–1.3(–1.8) cm diam. when dry, 1–1.5(–2) cm diam. when fresh, non-stipitate or substipitate, densely to sparsely brown to whitish (minutely) puberulous to tomentose, pinkish to orange, red-brown, scarlet or wine-red at maturity, apex \pm umbonate, ostiole ca. 1 mm diam., slightly prominent to flat; internal hairs abundant. *Tepals* red(dish). *Stamens* 2.

T h a i l a n d.— SOUTH-EASTERN: Chachoengsao, Chon Buri; PENINSULAR: Phatthalung, Yala, Narathiwat.

D i s t r i b u t i o n.— Vietnam, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java-type, Kalimantan, Lesser Sunda Islands), Philippines.

E c o l o g y.— Evergreen forest, mostly swamp forest, at low altitudes.

SOE13. *Ficus urnigera* Miq., in Zoll., Syst. Verz. 2: 92, 98. 1854; Miq., Fl. Ned. Ind. 1, 2 (1859) 318, t. 19A; King in Hook.f., Fl. Brit. India 5: 528. 1888; Kochummen, Tree Fl. Sabah & Sarawak 3: 253. 2000.— *F. recurva* Blume var. *urnigera* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 132, t. 165D. 1888; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 541. 2005.— *F. ramentacea* Roxb. var. *urnigera* (Miq.) Backer, Bekn. Fl. Java 6A: 23. 1948.

Root-climber. *Branchlets* drying dark brown to blackish. *Leafy twigs* 1.5–3 mm thick, solid, sparsely whitish appressed-puberulous to subhispidulous. *Leaves* distichous; lamina subovate, ovate, oblong or elliptic, 2–12 by 1–6 cm, symmetric, (sub)coriaceous, apex acuminate to acute or obtuse, base (almost) equilateral rounded to subcuneate, margin entire, \pm revolute to flat; upper surface (sub)glabrous, lower surface sparsely whitish appressed-puberulous to strigillose on the midrib to subglabrous; cystoliths on both sides; midrib prominent above, lateral veins 3–4(–5) pairs, the basal pair to $1/3$ – $1/2$ the length of the lamina, (faintly) branched, tertiary venation scalariform to subreticulate, the smaller veins slightly prominent to almost flush beneath; waxy glands in the axils of the basal lateral veins and usually also of some other lateral veins; petiole 0.3–1.5 cm long, sparsely whitish appressed-puberulous or strigillose to subglabrous, the epidermis flaking off; stipules 0.3–1 cm long, sparsely whitish minutely appressed-puberulous and sparsely brown strigillose on the keel and/or the base, caducous. *Figs* axillary and on minute spurs on the older wood, in pairs or (to 6) clustered; (sub)sessile or with a peduncle to 0.2 cm long; basal bracts 1–1.5 mm long, subsistent or caducous; receptacle subglobose, 0.2–0.4 cm diam. when dry, non-stipitate, glabrous, orange to red at maturity, apex convex, ostiole ca. 0.5–1 mm diam., slightly sunken to flat, usually surrounded by a low rim; internal hairs few and small or absent. *Tepals* red.

T h a i l a n d.— PENINSULAR: Nakhon Si Thammarat, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi), Philippines.

E c o l o g y.— Evergreen and peat swamp forests, at low altitudes.

N o t e.— This species was treated as a variety in Flora Malesiana (C.C. Berg & Corner, 2005), but further studies have made it clear that the rank of species is the proper one for this taxon.

SOE14. *Ficus villosa* Blume, Cat. Gew. Buitenzorg: 37. 1823; Blume, Bijdr. Fl. Ned. Ind.: 441. 1825; Miq. Ann. Mus. Bot. Lugd.-Bat. 3: 294. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 137. 1888; Ridl., Fl. Malay Penins. 3: 345. 1924; Gagnep., Fl. Indo-Chine 5: 801. 1928; Corner, Gard. Bull. Singapore 19: 390, f. 3. 1962; Kochummen, Tree Fl. Malaya 3: 161. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 250. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 547. 2005.— *F. barbata* Wall. ex Miq., London J. Bot. 7: 441. 1848; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 295. 1867.— *F. hirsuta* Wall. ex Miq., Fl. Ned. Ind. 1(2): 317 t. 21A, 1849. non Schott, 1827, nec Roxb., 1832.— *F. grossivenis* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 227, 294. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(2): 181. 1888; Corner, Gard. Bull. Singapore 21: 55. 1965.— *F. villosa* Blume var. *appressa* Corner, Gard. Bull. Singapore 18: 12. 1960.— *F. villosa* Blume var. *subglobosa* Corner, Gard. Bull. Singapore 18: 13. 1960.— *F. villosa* Blume var. *tonsa* Corner, Gard. Bull. Singapore 18: 13. 1960. Fig. 32. Plate LXIX: 3.

Root-climber. *Branchlets* drying brown to blackish. *Leafy twigs* 3–6 mm thick, hollow or solid, ribbed, densely brown hirtellous, subhirsute or subvillos (or subvelutinous), the longer and stiff hairs often with \pm swollen bases. *Leaves* distichous; lamina subovate (to ovate or to lanceolate) to oblong (to elliptic), 8–20 by 3–9 cm, symmetric, (sub)coriaceous, apex subacuminate to subacute, base (almost) equilateral, cordate to rounded (or obtuse), margin entire, \pm revolute; upper surface brown hirtellous to puberulous or strigillose, chiefly in the main veins, glabrescent, often \pm bullate, lower surface \pm densely hirtellous to subhirsute or subtomentose (or strigillose) on the veins, the longer and stiff hairs distributed evenly (and with their bases not strongly swollen) to \pm unevenly (clustered, and their bases strongly swollen); cystoliths on both sides; midrib impressed, at least the lower part, other main veins (and smaller) often slightly appressed above, lateral veins 6–10 pairs, prominent beneath, the basal pair to ca. 1/6–1/3 the length of the lamina, branched, the other lateral veins often branched or forked away from the margin, tertiary venation scalariform, prominent beneath, the smaller veins \pm prominent beneath, the areoles often minutely bullate; waxy glands in the axils of the basal lateral veins and also of some other lateral veins and in the axils of branches or in furcations of the lateral veins; petiole 1–3(–4) cm long, densely brown hirtellous to subhirsute (or strigillose), the epidermis persistent or, at least, not soon flaking off; stipules (0.5–)1–3 cm long, densely to sparsely minutely whitish appressed-puberulous and brown substrigillose to hirtellous on the keel and at the base, caducous or subpersistent. *Figs* axillary, in pairs or (to 8) clustered, also on spurs on the older wood to 1 cm long, often with subpersistent stipules to 0.6 cm long at the apex; peduncle 0.1–0.5(–0.7) cm long (or sessile); basal bracts 1.5–2 mm long, caducous; receptacle subglobose to ovoid (or ellipsoid), 0.3–0.9(–1.3) cm diam. when dry, ca. 0.8–1.8 cm diam. when fresh, 0.1–0.7(–1) cm long stipitate, brownish subtomentose to puberulous or glabrous (and then often pustulate), yellow, orange or crimson at maturity, apex \pm protracted or convex and the ostiole surrounded by a rim, ostiole ca. 1 mm diam., \pm sunken; internal hairs abundant, sparse and small, or absent. *Tepals* red.

T h a i l a n d.— NORTH-EASTERN: Loei; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Prachin Buri, Chon Buri; PENINSULAR: Songkhla, Narathiwat.

D i s t r i b u t i o n.— India (NE and Andaman Islands), Burma, S China, Vietnam, Laos, Cambodia, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (type, Sumatra, Java, Kalimantan, Sulawesi, Moluccas), Philippines.

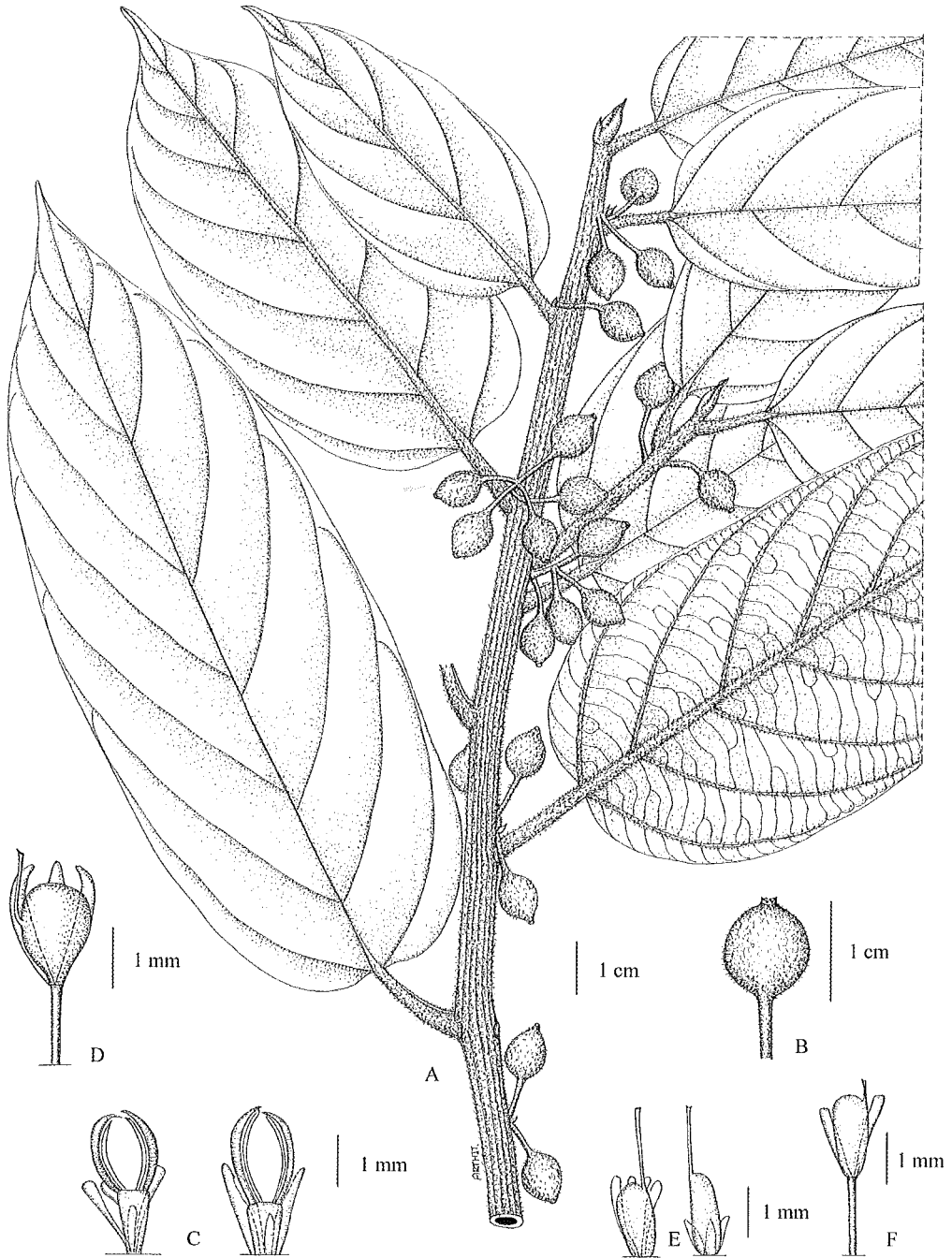


Fig. 32. *Ficus villosa* Blume: A. leafy twig with figs; B. fig; C. staminate flowers; D. short-styled flower; E. sessile long-styled flowers, with tepals of different lengths; F. pedicellate long-styled pistillate flower (A–B: *Larsen et al.* 32612, BKF; C–D: *Maxwell* 76-171, L; E–F: *Poilane* 28879, L). Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–F).

E c o l o g y.— Evergreen and dry evergreen forests, to 800 m.

V e r n a c u l a r.— Ma kra tuep rong (ไม้กระที่บโรง) (Loei).

N o t e s.— Two classes of fig receptacle size are found in Thailand:

a. 0.3–0.5 cm diam. when dry and **b.** 0.6–0.9 cm diam. when dry; the former is represented by *Chantarasuwan 2003-0218* from Narathiwat and the latter by *K. Larsen et al. 32612* from Narathiwat.

In the juvenile (= bathyphyll) state, the hairs on leafy twigs and lamina are distinctly longer than in the adult state and, moreover, the indumentum on the lamina is sparser and the lower surface of the lamina tessellate.

VI. FICUS SUBGENUS UROSTIGMA

Hemi-epiphytic (or hemi-epilithic) trees or shrubs (or terrestrial as climbers) with an extensive secondary system of aerial roots. *Leaves* spirally arranged; lamina entire, mostly coriaceous, with a single waxy gland at the base of the midrib of the lamina beneath. *Plants* monoecious with staminate and pistillate flowers in the same fig, the latter with styles of different lengths, and the stigmas usually undivided.

The subgenus, of which most species are often indicated as “strangler figs” or less commonly as “banyans”, has a worldwide distribution and comprises ca. 280 species. It can be subdivided into 4 sections, of which one is confined to the New World. In Thailand, 41 indigenous species are found; six species have been introduced, of which three from Asia.

A. Ficus sect. Urostigma. This essentially an Asian section (with extensions to Africa, Australia, and the Pacific), characterized by circular ostioles and 3, mostly persistent basal bracts. It can be subdivided into two subsections. Molecular studies contain indications that the two entities namely *Ficus* subsect. *Urostigma* and *Ficus* subsect. *Conosycea* are distinct at the level of sections, rather than subsections.

Aa. Ficus subsect. Urostigma comprises trees with clear features of intermittent (seasonal) growth: internodes different in length, at the end of the growing season the internodes very short, and the stipules on these short terminal internodes can be persistent and form terminal scaly buds. Branches show the intermittent and seasonal growth in differences in colour of successive twig elongations which are also marked by sections with very short internodes. Many species are deciduous. The figs are often borne on small spurs below the leaves (ramiflory) and in most species they have internal (short and whitish) hairs. Maturing figs often turn via whitish to purplish. The subsection comprises 25–30 species, of which 11 are indigenous in Thailand: *F. alongensis*, *F. arnottiana*, *F. caulocarpa*, *F. concinna*, *F. geniculata*, *F. orthoneura*, *F. rumphii*, *F. saxophila*, *F. subpisocarpa*, *F. superba*, and *F. virens*; *F. religiosa* may be introduced and naturalized.

Species delimitation in the group of species which bears figs on spurs below the leaves is often problematic because of the variation of characters such as length, the indumentum and exfoliation of the epidermis (of parts) of the petiole, the persistence of the basal bracts, the indumentum of stipules and fig receptacles. Material can usually only be identified with certainty if it is complete, with not too young leaves and figs, and shows sufficiently the presence of variation, such as in the length of the petiole. Not all Thai collections of this group could be readily included in one of the species presently recognised for the country (see p. 604, 625–626, 645, and 650).

Ab. Ficus subsect. Conosycea comprises hemi-epiphytic or hemi-epilithic trees or shrubs, sometimes (terrestrial) climbers (such as *F. globosa*) which do not show features indicating intermittent growth. Most species are evergreen and ramiflory is absent. The leaves are never articulate and have relatively short petioles; hairs inside syconia are rare.

The subsection comprises ca. 65 species, of which 30 are indigenous in Thailand.

Three groups of species can be distinguished:

1. F. benjamina-group with the tertiary venation largely parallel to the lateral veins, the leaves often drying greenish or greyish, the indumentum inconspicuous, sparse or absent, the figs sessile. *F. benjamina*, *F. binnendijkii*, *F. kurzii*, *F. maclellandii*, *F. stricta*, and *F. subcordata*.

2. F. annulata-group with tertiary venation often scalariform and/or the indumentum brown(ish) and conspicuous, the venation of the lamina beneath often \pm prominent, the figs often pedunculate: *F. annulata*, *F. bracteata*, *F. consociata*, *F. cucurbitina*, *F. drupacea*, *F. globosa*, *F. pubilimba*, *F. kochummeniana*, and *F. talbotii*; possibly also the subglabrous *F. glaberrima*.

3. F. sundaica-group with tertiary venation mostly reticulate, indumentum on the lamina inconspicuous and whitish, or absent, venation of lamina not or slightly prominent, the basal lateral veins usually departing from the midrib at some distance from the base of the lamina, the tertiary venation mostly reticulate, the figs sessile, and the basal bracts relatively large and persistent. This group comprises *F. callophylla*, *F. crassiramea*, *F. curtipes*, *F. pellucidopunctata*, *F. subgelderii*, *F. sumatrana*, *F. sundaica*, and *F. xylophylla*. Delimitation of species is somewhat problematic in this group, as it is not clear which characters are constant and in what combination they can be used. The less problematic *F. altissima*, *F. microcarpa*, and *F. pisocarpa* also seem to be members of this group.

KEY TO THE SPECIES OF THE SUNDAICA-GROUP:

1. Receptacle longer than wide (ellipsoid, oblongoid, or ovoid)
 2. Receptacle 1.5–3 cm diam. when dry
 3. Apex of lamina mostly rounded; tertiary venation obscure; terminal buds not swollen **F. xylophylla**
 3. Apex of lamina acuminate; tertiary and lesser venation distinct and the areoles small; terminal buds swollen **F. crassiramea** subsp. **crassiramea** p.p.
 2. Receptacle 0.8–1.5(–2) cm diam. when dry
 4. Ostiole wide open, pore-like **F. pellucidopunctata**
 4. Ostiole closed or slightly open
 5. Stipules hairy
 6. Basal bracts (4–)5–7 cm long; stipules 1–2 cm long **F. subgelderii**
 6. Basal bracts 1–3 mm long; stipules usually 2–4 cm long **F. altissima**
 5. Stipules glabrous **F. sundaica**
1. Receptacle about as long as wide or slightly wider than long
 7. Margin of lamina callose towards the base
 8. Petiole 1–1.5 cm long; lamina broadest above the middle, the apex rounded to retuse **F. curtipes**
 8. Petiole 1.5–4.5 cm long; lamina broadest in the middle, the apex usually shortly and bluntly acuminate **F. callophylla**
 7. Margin of lamina not callose
 9. Ostiole wide open **F. pisocarpa**
 9. Ostiole closed
 10. Stipules glabrous
 11. Petiole and stipules usually 0.5–1 cm long **F. microcarpa**
 11. Petiole and stipules usually longer than 1 cm **F. sumatrana** p.p.
 10. Stipules hairy
 12. Stipules 1–1.5(–2.2) cm long; basal bracts usually 3–5 mm long **F. sumatrana** p.p.
 12. Stipules usually 2–4 cm long; basal bracts 5–10 mm long **F. crassiramea** ssp. **crassiramea** p.p.

B. Sect. *Stilpnophyllum*, of which the majority of the species is found in Australia, is characterized by the tertiary venation being predominantly parallel to the lateral veins of the lamina, stipules which are relatively long and connate, and caducous basal bracts. The ostiole is slit-shaped or triradiate, except in the Asian *F. elastica*, which occurs in Thailand in cultivation as an ornamental tree.

C. Sect. *Galoglygia*, an African section which can be recognised by slit-shaped ostioles and 2 basal bracts, is represented in Thailand by three species introduced as ornamental trees: *F. cyathistipula* Warb. (subsp. *cyathistipula*) with large persistent stipules and large pedunculate figs of which the wall is spongy, *F. lyrata* Warb. (Plate LXXIII: 3) with large persistent stipules, large sessile figs, and lyrate laminas, and *F. natalensis* Hochst. subsp. *leprieurii* (Miq.) C.C. Berg, with small caducous stipules, obtriangular laminas and small pedunculate figs

KEY TO THE SPECIES OF FICUS SUBG. UROSTIGMA

1. Ostiole slit-shaped; introduced ornamental trees (Sect. *Galoglychia*)
 2. Fig receptacle 0.5–1 cm diam. **F. natalensis** subsp. **leprieurii**
 2. Fig receptacle 2–3 cm diam.
 3. Figs sessile **F. lyrata**
 3. Figs pedunculate **F. cyathistipula**
1. Ostiole circular
 4. Stipules connate, long, often more than 10 cm **19. F. elastica**
 4. Stipules free
 5. Trees with intermittent growth, visible by 2 or more short internodes formed at the end of the seasonal growth and in some species resulting in scaly terminal buds, in others only marking the transition to long internodes and/or colour differences of twigs of different growth seasons; trees often deciduous and figs often on spurs below the leaves (ramiflory) (Subsect. *Urostigma*)
 6. Figs in pairs (or solitary) in the leaf axils or just below the leaves
 7. Apex of lamina caudate **32. F. religiosa**
 7. Apex of lamina acuminate to rounded
 8. Major basal lateral vein to 1/3–1/2 the length of the lamina **33. F. rumphii**
 8. Major basal lateral vein to 1/10–1/3 the length of the lamina
 9. Lateral veins (7–)10–13 pairs; fig receptacle usually 0.8–1.2 cm diam. when dry; peduncle 0.3–0.7 cm long **28. F. orthoneura**
 9. Lateral veins 3–10 pairs; fig receptacle 0.4–0.7 cm diam. when dry; fig (sub)sessile
 10. Basal lateral veins to 1/4–1/3 the length of the lamina, branched **34. F. saxophila**
 10. Basal lateral veins to 1/10–1/4 the length of the lamina, often unbranched
 11. Lamina cordiform to ovate, base cordate to rounded; stipules white puberulous; basal bracts (always?) caducous **4. F. arnottiana**
 11. Lamina oblong to elliptic, base obtuse to rounded; stipules glabrous; basal bracts persistent **1. F. alongensis**
 6. Figs predominantly on spurs below the leaves, also on older wood
 12. Basal bracts caducous
 13. Figs (sub)sessile **4. F. arnottiana**
 13. Figs 0.1–0.7 cm long pedunculate
 14. Petiole 1–2.5 cm long, glabrous and the epidermis persistent **11. F. concinna**
 14. Petiole (2.5–)4–7 cm long, minutely puberulous and/or the epidermis flaking off at the base **38. F. subpisocarpa**
 12. Basal bracts (usually) persistent
 15. Epidermis of petiole flaking off, at least at the uppermost and the basal part **10. F. caulocarpa**
 15. Epidermis of petiole (usually) persistent
 16. Peduncle 0.3–1.5 cm long; fig receptacle 0.8–1.5 cm diam. when dry and the ostiolar bracts glabrous
 17. Peduncle 0.3–0.7 cm long; lateral veins (7–)10–13 pairs; distinct terminal bud consisting of several persistent stipules absent **28. F. orthoneura**
 17. Peduncle 0.3–1.5 cm long; lateral veins 7–10 pairs; distinct terminal bud consisting of several persistent stipules present **41. F. superba**

16. Peduncle 0–0.3 cm long; fig receptacle 0.4–0.6 cm. diam. when dry or, if larger, then the ostiolar bracts hairy
18. Petiole 1–2.5(–3) cm long; leafy twigs 1–2 mm thick **11. *F. concinna***
18. Petiole usually longer than 2.5 cm; leafy twigs 2–5 mm thick
19. Petiole mostly longer than 5 cm; articulation between petiole and lamina clear and both parts often detached in dry material; apex of lamina usually short acuminate; upper ostiolar bracts glabrous **20. *F. geniculata***
19. Petiole mostly to 4.5 cm long; articulation between petiole and lamina less clear and both parts usually remaining attached in dry material; apex of lamina usually clearly acuminate; upper ostiolar bracts usually minutely hairy **43. *F. virens***
5. Trees without these signs of intermittent growth; trees mostly evergreen; figs axillary (Subsect. *Conosycea*)
20. Tertiary venation largely parallel to the lateral veins; lamina mostly drying greyish-green
21. Fig receptacle ellipsoid to ovoid or cylindrical, 1.2–2.5 cm diam. when dry **36. *F. subcordata***
21. Fig receptacle subglobose to obovoid, 0.5–1.8 cm diam. when dry
22. Midrib of lamina more or less prominent above **25. *F. kurzii***
22. Midrib of lamina flush or partly impressed above
23. Stipules with yellow hairs (sometimes few and then often only at the base) **26. *F. maclellandii***
23. Stipules glabrous or with white hairs
24. Stipules hairy **6. *F. benjamina***
24. Stipules glabrous
25. Stipules 2–3 cm long, basal bracts 3–8(–10) mm long **35. *F. stricta***
25. Stipules 0.5–1.5(–2) cm long; basal bracts 0.5–3 mm long **6. *F. benjamina***
20. Tertiary venation scalariform, reticulate or, if partly parallel to the lateral veins, then the lamina drying brown
26. Figs pedunculate
27. Midrib of the lamina laterally hairy, often with the hairs concentrated in the axils of the lateral veins **16. *F. depressa***
27. Midrib of the lamina glabrous or with hairs evenly distributed
28. Peduncle widened into a rim; basal bracts 3–10 mm long **3. *F. annulata***
28. Peduncle not widened into a rim; basal bracts 0.5–2 mm long
29. Basal bracts usually (early) caducous; peduncle 0.3–1.5 cm long; fig receptacle 0.5–0.7 cm diam. **21. *F. glaberrima***
29. Basal bracts persistent; peduncle to 0.3 cm long or, if longer, then fig receptacle 0.8–1.2 cm diam. when dry
30. Fig receptacle 0.5–0.8 cm diam. when dry; peduncle 0–0.3 cm long; stipules 0.5–1 cm long **42. *F. talbotii***
30. Fig receptacle 0.8–1.2 cm diam. when dry; peduncle 0.1–0.7 cm long; stipules usually longer than 1 cm **22. *F. globosa***
26. Figs sessile
31. Fig receptacle 0.3–1.3 cm long stipitate **18. *F. dubia***
31. Fig receptacle not stipitate
32. Indumentum on leafy twigs, stipules, petiole, etc. brown floccose-tomentose
33. Stipules 2–4(–6) cm long, subsistent; fig receptacle 1.2–2.2 cm, diam., its apex concave **8. *F. bracteata***
33. Stipules 0.5–2 cm long, caducous; fig receptacle 0.5–1.2(–1.5) cm diam., its apex ostiole convex or to concave
34. Stipules 1–2 cm long; fig receptacle 0.8–1.2(–1.5) cm diam. when dry; basal bracts 4–8 mm long **12. *F. consociata***
34. Stipules 0.5–1 cm long; fig receptacle 0.5–0.8 cm diam. when dry; basal bracts 1–2 mm long **42. *F. talbotii***
32. Indumentum of leafy twigs, stipules, petiole, etc. not floccose tomentose
35. Fig receptacle distinctly longer than wide, ellipsoid (to cylindrical or ovoid)
36. Indumentum of fig receptacle partly consisting of irritating setulose hairs **14. *F. cucurbitina***
36. Indumentum of fig receptacle without irritating setulose hairs
37. Indumentum (as on the stipules) brown; tertiary venation partly scalariform: fig receptacle ellipsoid and basal bracts 0.5–3 mm long **17. *F. drupacea***
37. Indumentum, if present (as on the stipules) then whitish; tertiary venation reticulate or largely parallel to the lateral veins or, if partly scalariform, then the basal bracts 5–10(–15) mm long
38. Fig receptacle 2–3.5 cm diam. when dry
39. Apex of lamina mostly rounded; tertiary venation obscure; terminal buds not swollen **44. *F. xylophylla***

39. Apex of lamina acuminate; tertiary and lesser venation distinct and the areoles small; terminal buds swollen **13. F. crassiramea** subsp. **crassiramea**
38. Fig receptacle 0.8–1.5(–2) cm diam. when dry
40. Basal bracts 1–3 mm long **2. F. altissima**
40. Basal bracts 3–8 mm long
41. Stipules glabrous **40. F. sundaica**
41. Stipules more or less densely hairy
42. Lateral veins (2–)4–6(–7) pairs, the basal pair to 1/5–1/2(–2/3) the length of the lamina; basal bracts (4–)5–7 cm long; ostiole ca. 4 mm diam., slightly open **37. F. subgelderi**
42. Lateral veins (6–)7–10 pairs, the basal pair to 1/10–1/4(–1/3) the length of the lamina; basal bracts 3–4 cm long; ostiole 2–3 mm diam., wide open **29. F. pellucidopunctata**
35. Fig receptacle about as long as wide, subglobose to depressed-globose
43. Lamina white puberulous above and beneath
44. Fig receptacle 0.5–1 cm diam. when dry, basal bracts 0.5–1.5 mm long **31. F. publimba**
44. Fig receptacle 1.2–1.8 cm diam. when dry, basal bracts 3–10 mm long **5. F. benghalensis**
43. Lamina glabrous or, if hairy, then brownish or, if whitish, then sparsely and only on the midrib beneath
45. Basal lateral veins weaker and shorter than the others, often not opposite, up to 1/20–1/10 the length of the lamina **23. F. kerkhovenii**
45. Basal lateral veins more strongly developed than the others, and mostly also longer, to 1/16–1/2 the length of the lamina, and mostly opposite
46. Fig receptacle 0.3–0.8 cm diam. when dry and/or stipules 0.5–1 cm long and caducous or, if longer, then subsistent
47. Stipules distinctly hairy, the hairs yellowish (and then sometimes only few at the bases of the stipules) brown or whitish
48. Stipules with yellowish hairs (mostly sericeous), at least some at their bases; ostiole open (the upper ostiolar bracts not fully imbricate) **26. F. maclellandii**
48. Stipules with brown hairs; ostiole closed (the upper ostiolar bracts fully imbricate)
49. Stipules 0.5–1 cm long **42. F. talbotii**
49. Stipules 1–2.5 cm long **24. F. kochummeniana**
47. Stipules glabrous or, if hairy, then whitish (and often minutely so)
50. Basal lateral veins to 1/3–1/2 the length of the lamina; apex of fig receptacle usually somewhat protracted and ostiole wide open **30. F. pisocarpa**
50. Basal lateral veins usually 1/6–1/3 the length of the lamina; apex of fig receptacle not protracted, ostiole closed, nearly closed or open
51. Stipules usually 0.5–1 cm long; figs (often) with internal hairs
52. Lamina distinctly acuminate; ostiole fully closed **42. F. talbotii**
52. Lamina shortly acuminate; ostiole slightly open **27. F. microcarpa**
51. Stipules usually 1–2 cm long; figs without internal hairs
53. Basal bracts 2–4 mm long; ostiole closed **39. F. sumatrana**
53. Basal bracts 1–2 mm long; ostiole open **7. F. binnendijkii**
46. Fig receptacle 0.8–1.5(–2) cm diam. when dry
54. Stipules distinctly hairy
55. Lateral veins (2–)4–6(–7) pairs; basal bracts 3–5 mm long; stipules usually 1–2 cm long **39. F. sumatrana**
55. Lateral veins 7–10(–12) pairs; basal bracts 1–3 mm long; stipules usually 2–4 cm long **2. F. altissima**
54. Stipules glabrous or sometimes minutely white puberulous and the other parts usually glabrous
56. Lateral veins usually 4–6(–7) pairs
57. Basal lateral veins to 1/3–1/2 the length of the lamina; ostiole wide open **30. F. pisocarpa**
57. Basal lateral veins to 1/4–1/3 the length of the lamina; ostiole closed **39. F. sumatrana**
56. Lateral veins usually (5–)6–10 pairs; ostiole closed (the upper ostiolar bracts fully imbricate) or, if more or less open, then the margin of the lamina callose and midrib of lamina slightly prominent to flush
58. Stipules usually 2–4 cm long; terminal bud swollen; margin of lamina towards the base not callose **13. F. crassiramea** subsp. **crassiramea**
58. Stipules usually 1–2 cm long; margin of lamina towards the base callose
59. Lamina usually broadest above the middle, apex rounded to retuse; petiole 1–1.5 cm long **15. F. curtipes**
59. Lamina usually broadest at the middle, apex of some of the leaves shortly and bluntly acuminate; petiole usually 1.5–4.5 cm long **9. F. callophylla**

URO1. *Ficus alongensis* Gagnep., Notul. Syst. 4: 84. 1927; Fl. Indo-Chine 5: 762. 1928; Berg, Blumea 52: 595. 2007.— *F. superba* (Miq.) Miq. var. *alongensis* (Gagnep.) Corner, Gard. Bull. Singapore 17: 376. 1960.— *F. concinna* (Miq.) Miq. var. *subsessilis* Corner, Gard. Bull. Singapore 17: 376. 1960.

Tree to 12(–30) m tall or shrub, with intermittent growth. *Branches* brown to blackish. *Leafy twigs* 1.5–4 mm thick, slightly angular to subterete, glabrous; periderm persistent. *Leaves* spirally arranged, coriaceous, oblong to elliptic, (2.5–)5–12 by (1–)1.5–5(–6) cm, apex (short-) acuminate (with the acumen obtuse) to obtuse, base obtuse to rounded, margin entire; upper and lower surface glabrous, smooth; cystoliths only below; midrib flush above, lateral veins (5–)6–10 pairs, the basal pair to 1/5–1/4(–1/3) the length of the lamina, unbranched (or in ovate laminas branched), the other lateral veins furcate away from the margin, tertiary venation largely parallel to the lateral veins to partly reticulate, the reticulum ± prominent and clearly visible above and beneath (or flush); waxy gland at the base of the midrib beneath; petiole 1–1.5(–3) cm long, ca. 1 mm thick, widely canaliculate, glabrous, the epidermis persistent; stipules 0.5–1(–3) cm long, glabrous, caducous. *Figs* axillary or also just below the leaves or on previous season's growth, in pairs or solitary; subsessile or with a peduncle to 1 mm long, basal bracts 1–2 mm long, persistent; receptacle subglobose to depressed-globose, 0.3–0.4(–0.6) cm diam. when dry, glabrous, usually ± maculate, colours at maturity unknown, apex of receptacle convex; ostiole ca. 1.5 mm diam., ± prominent, closed by glabrous bracts; internal hairs absent. *Staminate flowers* ostiolar. *Tepals* reddish. *Ovary* (dark) red-brown.

T h a i l a n d.— SOUTH-WESTERN: Prachuap Khiri Khan (Sam Roi Yot).

D i s t r i b u t i o n.— NE India(?), S China, Laos, Vietnam (type), Cambodia.

E c o l o g y.— Dry evergreen forest, on limestone, at low altitudes.

N o t e.— This species shows affinities to *F. concinna*, from which it differs in the absence of ramiflory and the basal bracts which are always persistent.

URO2. *Ficus altissima* Blume, Bijdr. Fl. Ned. Ind.: 444. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 262, 285. 1867; Kurz, Forest Fl. Burma 2: 442. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 30, t. 30. 1887; Gagnep., Fl. Indo-Chine 5: 780. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2). 625. 2005.— *Urostigma altissimum* (Blume) Miq. in Zoll., Syst. Verz. 2: 90. 1854.— *Ficus laccifera* Roxb., Fl. Ind. Ed. 1832 3: 545. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 656. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; Kurz, Forest Fl. Burma 2: 441. 1877.— *Urostigma lacciferum* (Roxb.) Miq., London J. Bot. 6: 575. 1847. Fig. 33. Plate LXX: 1.

Tree to 30(–40) m tall, hemi-epiphytic or (secondarily?) terrestrial (and then sometimes with buttresses). *Branches* drying brown, the scars of leaves and figs prominent. *Leafy twigs* 5–7 mm thick, ± angular, minutely whitish puberulous to glabrous; periderm persistent. *Leaves* spirally arranged; lamina elliptic to ovate (or oblong), (6–)10–22(–38) by (4–)6–14(–24) cm, coriaceous, apex short-acuminate, base (sub)attenuate to rounded; both surfaces glabrous; midrib slightly prominent to flush above, lateral veins (5–)7–10(–12) pairs, the basal pair ± distinct, to (1/6–)1/4–1/3(–1/2) the length of the lamina, straight or slightly curved, departing the midrib 3–5 mm above the base of the lamina, branched, 1–2 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, slightly prominent beneath; waxy gland at the base of the midrib; petiole 2–5(–10) cm long, 2–4(–6) mm thick, glabrous or sparsely minutely whitish puberulous, drying brown to blackish; stipules (1–)2–4 cm long, densely (to sparsely)

whitish puberulous, caducous. *Figs* axillary, paired (or solitary), sessile, initially in puberulous calyprate bud covers to 1.5 cm long; basal bracts 3 (or 2), 1–3 mm long, unequal in size, often connate, forming a lobate to subentire ring, minutely puberulous, persistent; receptacle ellipsoid to subglobose, 1–2(–2.5) cm diam. when dry, glabrous (or sparsely minutely white puberulous), red at maturity, apex convex to submammillate, ostiole ca. 2.5 mm diam., \pm prominent, open, the 3 upper ostiolar bracts subequal to unequal, slightly or not imbricate, rather thick; wall \pm shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

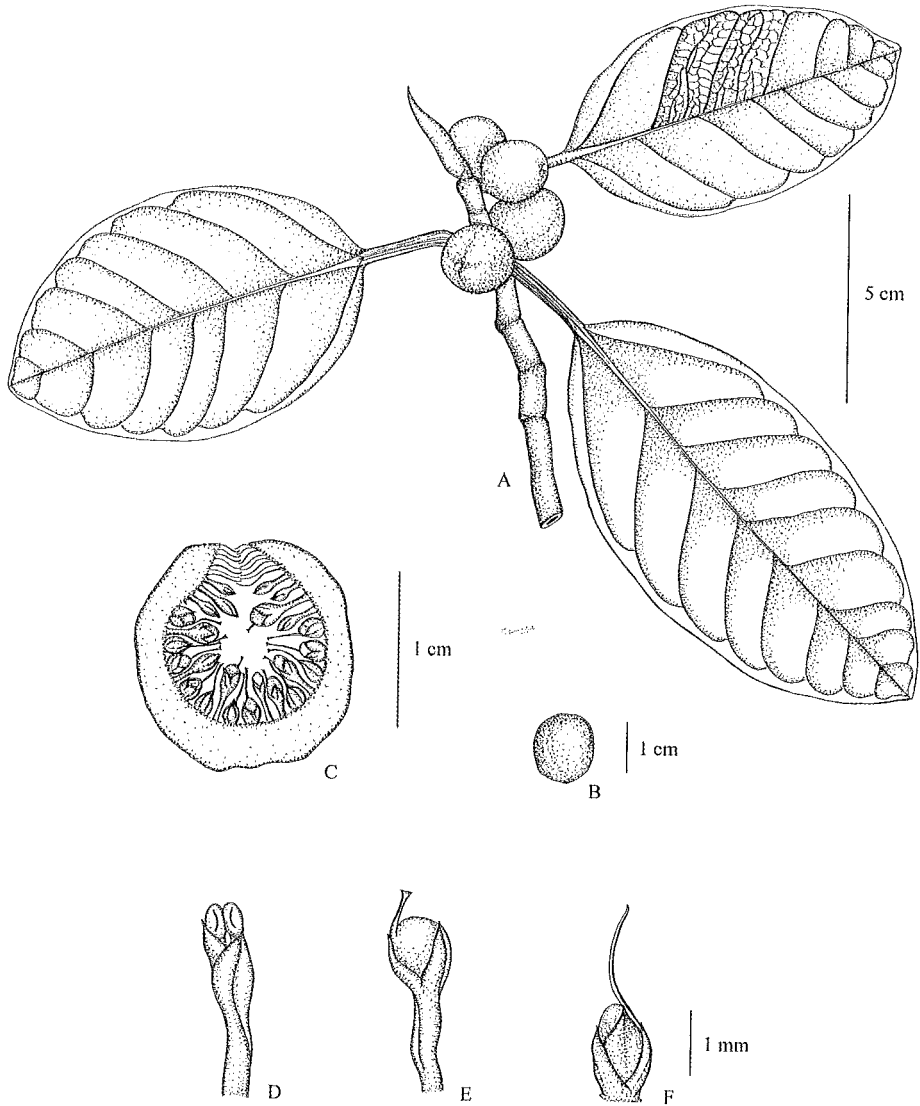


Fig. 33. *Ficus altissima* Blume: A. leafy twig with figs; B. fig; C. opened fig with flowers; D. staminate flower; E. short-styled flower; F. long-styled flower. Drawn by Wattana Tanning.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai; NORTH-EASTERN: Phetchabun, Loei; EASTERN: Chaiyaphum, Nakhon Ratchasima; SOUTH-WESTERN: Phetchaburi; CENTRAL: Saraburi; SOUTH-EASTERN: Chachoengsao, Chon Buri, Trat; PENINSULAR: Surat Thani, Krabi, Nakhon Si Thammarat, Narathiwat.

D i s t r i b u t i o n.— Bhutan, Sikkim, India (NE, Andaman Islands), Bangladesh, Burma, S China, Laos (?), Vietnam, Cambodia, Peninsular Malaysia, Singapore (?), Indonesia (Sumatra, Java-type, Sulawesi), Philippines.

E c o l o g y.— Evergreen and dry evergreen forests, to 1,100 m.

V e r n a c u l a r.— Krang (กร่าง) (Central); sai thong (ไทรทอง) (Nakhon Si Thammarat); lung (ลุง) (Chiang Mai, Lampang); hang khao (ห้างขาว), hang luang (ห้างหลวง), hang hueak (ห้างเหือก) (Chiang Rai); hai kham (ไฮค้ำ) (Phetchabun).

URO3. *Ficus annulata* Blume, Bijdr. Fl. Ned. Ind.: 448. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 261, 262, 285. 1867; Kurz, Forest Fl. Burma 2: 443. 1877; Ridl., Fl. Malay Penins. 3: 333. 1924; Gagnep., Fl. Indo-Chine 5: 783. 1928; Kochummen, Tree Fl. Malaya 3: 140. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 625. 2005.— *Urostigma annulatum* (Blume) Miq. in Zoll., Syst. Verz. 2: 90. 1854.— *Ficus flavescens* Blume Bijdr. Fl. Ned. Ind.: 449. 1825.— *Urostigma flavescens* (Blume) Miq., Pl. Jungh.: 48. 1851.— *Ficus annulata* Blume var. *flavescens* (Blume) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 26. 1887.— *F. valida* Blume, Bijdr. Fl. Ned. Ind.: 449. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 262, 285. 1867.— *Urostigma validum* (Blume) Miq., Fl. Ned. Ind. 1(2): 336. 1859.— *Ficus annulata* Blume var. *valida* (Blume) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 26. 1887.— *Urostigma biverrucellum* Miq., Fl. Ned. Ind., Eerste Bijv.: 436. 1861.— *Ficus annulata* (Blume) Miq. var. *biverrucella* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 261. 1867.— *F. annulata* (Blume) Miq. var. *elliptica* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 262. 1867. Plate LXX: 2.

Tree to 25(–35) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying yellowish to pale brown. *Leafy twigs* (3–)5–10 mm thick, ± angular, glabrous or brownish to whitish puberulous (mainly on the stipule scars). *Leaves* spirally arranged; lamina oblong, subobovate or elliptic (or lanceolate), (12–)18–30(–45) by (4–)6–12(–15) cm, (sub)coriaceous, apex acuminate, base cuneate to rounded (to subcordate); upper surface glabrous (or brownish puberulous on the (base of) the midrib, lower surface glabrous (or brownish puberulous on the (main) veins; cystoliths on both sides; midrib flush, lateral veins (8–)12–20 pairs, the basal pair hardly distinct, to 1/20–1/10 the length of the lamina, unbranched, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate (to subscalariform), ± prominent beneath; waxy gland at the base of the midrib; petiole (1–)1.5–3(–5) cm long, 2–4 mm thick, glabrous (or brownish puberulous), drying blackish; stipules (1.5–)2–3.5(–10.5) cm long, glabrous (or brownish subsericeous), caducous (or subsistent). *Figs* axillary, in pairs (or solitary), subsessile or with a peduncle 0.2–1.5(–2) cm long, the peduncle widened into an annular rim; basal bracts 3, inserted inside the rim of the peduncle, 3–10 mm long, subequal, brownish puberulous or glabrous, caducous at maturity; receptacle ellipsoid, ovoid or subglobose, 2–3 cm diam. when dry, glabrous, puberulous near the ostiole (or the whole surface brownish puberulous), yellowish (or pinkish) at maturity, apex convex (and submammillate), ostiole 2–3 mm diam., ± prominent, the 3 upper ostiolar bracts unequal, not (or slightly) imbricate, thick, the space left open by the upper ostiolar bracts usually filled with lower ostiolar bracts; wall (except for the apical part) strongly shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* partly red.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Phayao, Nan, Lampang, Tak; NORTH-EASTERN: Loei; SOUTH-WESTERN: Kanchanaburi, Phetchaburi, Prachuap Khiri Khan; CENTRAL: Lop Buri, Saraburi, Nakhon Nayok, Bangkok; SOUTH-EASTERN: Chon Buri, Chanthaburi, Trat; PENINSULAR: Surat Thani, Phangnga, Nakhon Si Thammarat, Trang, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Burma, S China (Yunnan), Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi), Philippines (Balabac Island).

E c o l o g y.— Mixed deciduous, deciduous dipterocarp and dry evergreen forests, common along seashore on limestone in evergreen forest, to 1,700 m.

V e r n a c u l a r.— Sai (ไผ่) (Chanthaburi, Trang); hai (ไผ่) (Loei); liap (ไผ่) (Phangnga).

N o t e.— Collection *Sangkachand* 236 from Narathiwat (Bacho), is distinct by the densely brownish puberulous fig receptacle and peduncle.

URO4. *Ficus arnottiana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 000. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 56, t. 68A. 1887; Corner, Gard. Bull. Singapore 21: 11. 1965; C.C. Berg, Thai Forest Bull. (Bot.) 35: 8. 2007.— *Urostigma arnottianum* Miq., London J. Bot. 6: 564. 1847.— *U. courtallense* Miq., London J. Bot. 6: 564. 1847.— *Ficus arnottiana* (Miq.) Miq. var. *courtallensis* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 56, t. 68B. 1887.

Shrub or tree to 10 m tall, hemi-epilithic, deciduous. *Branches* drying pale to dark brown, periderm ± flaking off. *Leafy twigs* 2–4 mm thick, slightly angular to subterete, glabrous or (minutely) white puberulous. *Leaves* spirally arranged; lamina cordiform to ovate (to elliptic), 4–9 by 2.5–5.5 cm, coriaceous, apex acuminate (with an obtuse acumen) to obtuse, base cordate to rounded; upper surface glabrous or minutely white puberulous on the midrib, lower surface glabrous; cystoliths only below; lateral veins 5–7(–8) pairs, the basal pair to 1/10–1/6 the length of the lamina, unbranched or branched, tertiary venation reticulate to subscalariform, this and smaller veins flush and rather obscure; waxy gland at the base of the midrib; petiole (1–)1.5–5 cm long, glabrous or (minutely) white puberulous, the epidermis persistent; stipules 0.4–0.7 cm long, whitish puberulous, caducous. *Figs* axillary and (on minute spurs) just below the leaves, in pairs or solitary, (sub)sessile (the peduncle to 0.1 cm long); basal bracts 3, 1.5–2 mm long, ciliolate (or minutely puberulous at the base), sooner or later caducous or persistent (?); receptacle subglobose, 0.4–0.7 cm diam. when dry, (sub)glabrous, orange at maturity, apex convex, ostiole 2–2.5 mm diam., slightly prominent to flat; internal hairs present. *Staminate flowers* ostiolar. *Tepals* reddish. *Ovary* red-brown.

T h a i l a n d.— NORTHERN: Lampang; SOUTH-WESTERN: Prachuap Khiri Khan; PENINSULAR: Satun.

D i s t r i b u t i o n.— Sri Lanka, India (peninsular, type).

E c o l o g y.— On limestone, at low altitudes.

N o t e s.— The identity of three collections currently included in *F. arnottiana* is not quite certain. They largely match the material of *F. arnottiana* from India, in particular that included in var. *courtallense* by Miquel (1867) and King (1887). Further studies are needed to arrive at a more definite decision (see also below).

It is not quite clear whether the basal bracts are always caducous or can be persistent.

Collection *Middleton et al. 1178* from Prachuap Khiri Khan (L) differs from the other Thai collections of the species, *Kerr 11383* from Chumphon (K) and *Maxwell 97-29*, and from all other collections included in the species by the presence of a puberulous indumentum on the midrib of the lamina above, the petiole, the leafy twig, the peduncle, the base of the basal bracts, and sparsely on the receptacle. Collection *Garrett 1184* (from Doi Chiang Dao, at 1,750 m) resembles the *Middleton* collection in the presence and distribution of indumentum, but differs in the clearly visible tertiary and quaternary venation of the lamina beneath; it is not included in the description above.

URO5. *Ficus benghalensis* L., Sp. Pl. 1059. 1753; Vahl, Enum. Pl. 2: 187. 1805; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 285. 1867; Kurz, Forest Fl. Burma 2: 440. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 18, t. 13. 1887; Ridl., Fl. Malay Penins. 3: 331. 1924; Corner, Revis. Handb. Fl. Ceylon, 1, 2: 136, t. 13. 1977; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 630. 2005.— *Perula benghalensis* (L.) Raf., Sylv. Tellur.: 59. 1838.— *Urostigma benghalense* (L.) Gasp., Giorn. Bot. Ital. 2: 215. 1844.— *Ficus indica* L., Sp. Pl.: 1060. 1753, emend. Lam., Encycl. 2(2): 494. 1788.— *F. cotoneifolia* Vahl, Enum. Pl. 2: 189. 1805.

Tree to 20 m or more tall, (in cultivation) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 5–10 mm thick, ± angular, whitish puberulous; periderm persistent or flaking off. *Leaves* in spirals; lamina ovate to elliptic, 7–30 by 4–20 cm, coriaceous, apex rounded, base cordate to rounded; upper surface sparsely white puberulous on the midrib, lower surface whitish puberulous on the midrib and lateral veins; midrib slightly prominent to flush above, lateral veins 5–6 pairs, the basal pair distinct, to 1/3–1/2 the length of the lamina, departing 3–5 mm above the base of the lamina, branched, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 2–7 cm long, 2–4 mm thick, whitish puberulous, drying brown to blackish; stipules 1.5–3.5 cm long, densely whitish puberulous, caducous. *Figs* axillary, paired, sessile, initially enclosed in calyprate bud covers to 1 cm long; basal bracts 3, 3–10 mm long, ± unequal in size and shape, minutely puberulous, persistent; receptacle depressed-globose, 1.2–1.8 cm diam. when dry, white puberulous (and often also with numerous minute brown hairs), red at maturity, apex convex, ostiole 2.5–3.5 mm diam., slightly prominent to flat, ± open, the 3 upper ostiolar bracts partly imbricate; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— Cultivated as an ornamental plant.

D i s t r i b u t i o n.— Pakistan, Sri Lanka, India (type); widely cultivated.

V e r n a c u l a r.— Krang (กร่าง) (Central); ni khrot (นิโครธ) (Bangkok); sai tok (ไซตอก) (Nakhon Si Thammarat).

N o t e.— This species, the “banyan tree”, is often confused with *F. altissima* from which it can be distinguished by the less numerous lateral veins, the rounded apex of the lamina, the shape of the fig receptacle and its indumentum.

URO6. *Ficus benjamina* L., Mant. 1: 129. 1767; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 267. 1867; Kurz, Forest Fl. Burma 2: 446. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 43, t. 52. 1887; Ridl., Fl. Malay Penins. 3: 336. 1924; Gagnep., Fl. Indo-Chine 5: 766. 1928; Kochummen, Tree Fl. Malaya 3: 141. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 262. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 631. 2005.— *Urostigma benjaminum* (L.) Miq.,

London J. Bot. 6: 583. 1847.— *Ficus nitida* Thunb., *Ficus*: 5, 11, 15. 1867.— *Urostigma nitidum* (Thunb.) Miq., London J. Bot. 6: 582. 1847.— *Ficus retusa* L. var. *nitida* (Thunb.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 267, 288. 1867.— *F. comosa* Roxb., Pl. Corom. 2: 14, t. 125. 1790.— *F. benjamina* L. var. *comosa* (Roxb.) Kurz, Forest Fl. Burma 2: 446. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 44, t. 52B. 1887.— *Urostigma nudum* Miq., London J. Bot. 6: 584. 1847.— *U. benjaminum* (L.) Miq. var. *nudum* Miq., Pl. Jungh.: 50. 1851.— *Ficus nuda* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 267, 288. 1867; Kurz, Forest Fl. Burma 2: 445. 1877.— *F. benjamina* L. var. *nuda* (Miq.) M.F. Barrett, Am. Midl. Nat. 45: 127, 128. 1951.— *F. papyrifera* Griff., Itin. Pl. Khasyah Mts.: 101. 1848; Griff., Icon. Pl. Asia 4: t. 554-II. 1854. Fig. 34. Plate LXX: 3.

Tree to 35 m tall, hemi-epiphytic or (secondarily?) terrestrial (or shrub). *Branches* drying brown, greyish or blackish. *Leafy twigs* 1–2(–3) mm thick, ± angular to subterete, glabrous (or white puberulous); periderm often flaking off. *Leaves* spirally arranged to subdistichous; lamina elliptic, oblong or (sub)ovate, 2–14 by 1.5–6(–8) cm, coriaceous, apex (sub)acuminate, base rounded to obtuse (to cuneate or subattenuate), margin flat, often callose towards the base; upper and lower surface glabrous; midrib (almost) flush, lateral veins 6–12(–16) pairs, the basal pair ± to hardly distinct, to 1/20–1/5(–1/4) the length of the lamina, unbranched, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.5–1.5(–2) cm long, 1–1.5(–2) mm thick, glabrous (or sparsely white puberulous towards the base), drying pale brown; stipules 0.5–1.5(–2.8) cm long, glabrous (or white puberulous to subtomentose), often drying pale brown to straw-coloured, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 0.5–3.5 mm long, unequal (or subequal), glabrous or white puberulous, persistent; receptacle subglobose to ellipsoid to obovoid (and substipitate) or subpyriform, 0.5–1(–1.8) cm diam. when dry, glabrous or whitish puberulous to subtomentose, yellow, orange or dark red (or pink to purple) at maturity, apex convex to slightly concave, ostiole 1.5–2 mm diam., flat or slightly prominent by a low rim, ± open or closed, the upper ostiolar bracts usually not fully (or sometimes fully) imbricate, sometimes minutely puberulous; wall ± shrivelled (to ribbed) to almost smooth (or pustulate) when dry; internal hairs present, sparse. *Tepals* (partly) red. *Ovary* partly red to whitish.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Lampang, Phitsanulok; NORTH-EASTERN: Loei, Sakon Nakhon, Mukdahan; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Ratchaburi, Phetchaburi, Prachuap Khiri Khan; CENTRAL: Saraburi, Nakhon Nayok, Bangkok; SOUTH-EASTERN: Chon Buri, Trat; PENINSULAR: Phuket, Nakhon Si Thammarat, Trang, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Pakistan, Nepal, Sikkim, Bhutan, India (type, NE and Andaman Islands), S China, Burma, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (throughout), Philippines, Solomon Islands, Australia.

E c o l o g y.— Dry evergreen and evergreen forests, also on limestone rocks (hemi-epilithic?), to 1,300 m; also cultivated.

V e r n a c u l a r.— Cha-roei (จําเรย) (Khmer); sai (ไทร) (Nakhon Si Thammarat); sai phan (ไทรพัน) (Lampang); sai kra buchang (ไทรกระเบื้อง) (Prachuap Khiri Khan); sai yoi (ไทรย้อย), sai yoi bai laem (ไทรย้อยใบแหลม) (Bangkok, Trat); Golden fig.

N o t e.— Two forms occur: **a.** entirely glabrous on all parts and **b.** whitish puberulous (to subtomentose) on leafy twigs, petioles, stipules, and fig receptacles. In the latter form the leafy twigs tend to be more pronouncedly angular, the stipules (to 2.8 cm) and basal bracts longer (2.5–3.5 mm). This hairy form is known from Kanchanaburi and Trat, occurring on limestone (as small trees or shrubs); it needs further attention.

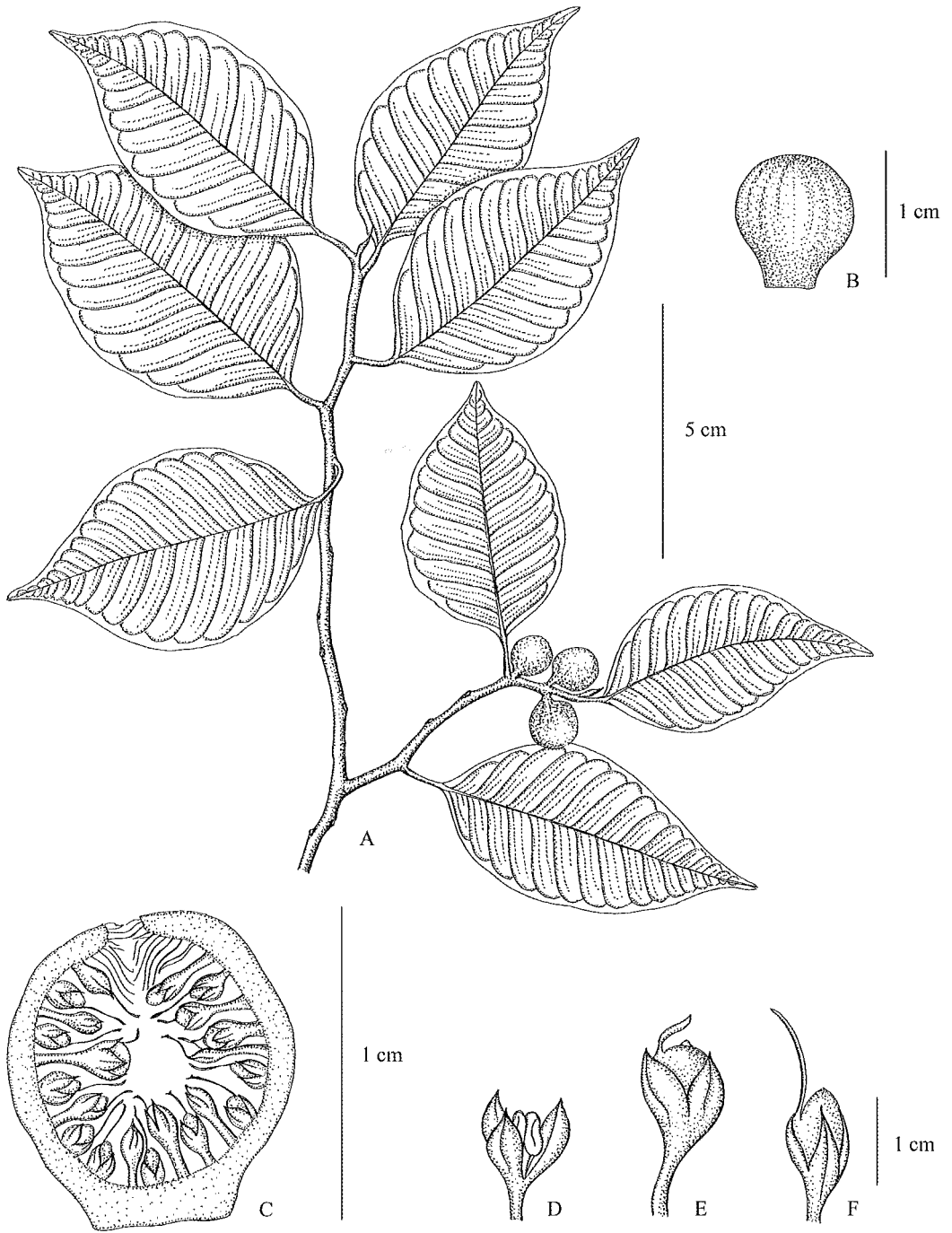


Fig. 34. *Ficus benjamina* L.: A. leafy twig with figs; B. fig; C. opened fig with flowers; D. staminate flower; E. short-styled flower; F. long-styled flower. Drawn by Wattana Tanning.

URO7. *Ficus binnendijkii* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 288. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 41, t. 47. 1887; Kochummen, Tree Fl. Malaya 3: 141. 1978; Tree Fl. Sabah & Sarawak 3: 227. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 633. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 29. 2007.— *Urostigma binnendijkii* Miq., Fl. Ned. Ind. 1(2): 341. 1859.— *Ficus ngii* Kochummen, Gard. Bull. Singapore 50: 209. 1998. Plate LXX: 4.

Tree to 10 m tall (or more?), hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* ca. 2 mm thick, \pm angular, glabrous; periderm persistent or \pm flaking off. *Leaves* in spirals; lamina oblong, elliptic or lanceolate (to linear), 3–15(–24) by 1–5 cm, coriaceous, apex acuminate, the acumen (sub)acute, base obtuse to rounded, margin flat or slightly revolute towards the base; both surfaces glabrous; midrib (at least the lower part) \pm impressed above, lateral veins 6–10(–14) pairs, the basal pair \pm distinct, to 1/10–1/4 the length of the lamina, unbranched, without smaller lateral veins below the (main) pair, tertiary venation largely parallel to the lateral veins, \pm prominent beneath, also slightly prominent above and clearly visible; waxy gland at the base of the midrib; petiole (0.5–)1–1.5(–2) cm long, 1–1.5 mm thick, glabrous, drying blackish to brown; stipules 1–2 cm long, glabrous, caducous. *Figs* axillary, paired (or solitary), sessile, initially enclosed in puberulous calyptrate bud covers to 0.8 cm long; basal bracts 3, ca. 1–2 mm long, (sub)equal to \pm unequal in size and shape, glabrous, persistent; receptacle subglobose, 0.3–0.6 cm diam. when dry, glabrous, whitish to pinkish (?) at maturity, apex convex to slightly concave, ostiole 1–2 mm diam., (almost) flat, \pm open, the 3 upper ostiolar bracts not or partly imbricate; wall smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Thailand.— PENINSULAR: Narathiwat.

Distribution.— Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan).

Ecology.— Evergreen forest, at low altitudes.

URO8. *Ficus bracteata* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 285. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 23, t.19. 1887; Ridl., Fl. Malay Penins. 3: 331. 1924; Burkill, Dict. Econ. Prod. Malay Penins.: 1005. 1935; Kochummen, Tree Fl. Malaya 3: 141. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 635. 2005.— *Urostigma bracteatum* Wall. ex Miq., London J. Bot. 6: 576. 1847. Plate LXX: 5.

Tree to 15(–40) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 5–10 mm thick, \pm angular, densely (dark) brown floccose-tomentose to -subvillous, glabrescent; periderm persistent. *Leaves* spirally arranged; lamina oblong, elliptic or subobovate, 12–25(–33) by 4–10(–17) cm, coriaceous, apex short-acuminate to rounded, base (sub)cordate to rounded; upper surface brown tomentose, on the lower part of the midrib, glabrescent (or glabrous?), lower surface brown floccose-tomentose, glabrescent; cystoliths on both sides; midrib (at least the lower part) \pm impressed above, lateral veins (4–) 5–8 pairs, the (main) basal pair distinct, to 1/4–1/3(–1/2) the length of the lamina, branched, 1–3 pairs of smaller basal veins below the main pair; tertiary venation reticulate, prominent beneath; waxy gland at the base of the midrib; petiole 2.5–4.5(–7) cm long, 3–4 mm thick, densely brown floccose-tomentose, glabrescent, drying brown to blackish; stipules 2–4(–6) cm long, \pm densely brown floccose-tomentose to -subvillous, subsistent. *Figs* axillary, paired (or solitary), sessile, calyptrate bud covers absent (?); basal bracts 3, 7–9 mm long, \pm unequal, 2 (or 1) with a distinct median part, puberulous on the median part or glabrous, persistent; receptacle (depressed-)subglobose, 1.2–2.2 cm diam. when dry, brown floccose-tomentose to -subvillous,

glabrescent, yellow, orange or red at maturity, apex (almost) flat to \pm concave, (sunken) ostiole 3–4 mm diam., flat, the 3 upper ostiolar bracts fully imbricate; wall \pm shrivelled when dry; internal hairs present, short, crinkled, and brown. *Tepals* reddish. *Ovary* red.

Thailand.—PENINSULAR: Ranong, Phangnga, Nakhon Si Thammarat, Songkhla.

Distribution.— Peninsular Malaysia, Singapore (type), Indonesia (Sumatra, W Kalimantan).

Ecology.— Evergreen forest, to 1,000 m.

Note.— This species shows close affinities to *F. consociata* from which it differs in the longer and subsistent stipules and the consistently concave apex of the fig receptacle.

URO9. *Ficus callophylla* Blume, Bijdr. Fl. Ned. Ind.; 445. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 265, 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 52, t. 51A. 1887; Kochummen, Tree Fl. Malaya 3: 142. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 225. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 637. 2005.— *Urostigma callophyllum* (Blume) Miq., Fl. Ned. Ind. 1(2): 349. 1859.— *U. clusoides* Miq., London J. Bot. 6: 579. 1847.— *Ficus clusoides* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 42, t. 50. 1887.— *F. callophylla* Blume var. *malayana* Corner, Gard. Bull. Singapore 17: 396. 1960; Kochummen, Tree Fl. Malaya 3: 142. 1978. Fig. 35A–I. Plate LXX: 6.

Tree to 20(–25) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to yellowish. *Leafy twigs* (1–)2–6 mm thick, \pm angular, glabrous (or white puberulous); periderm persistent. *Leaves* spirally arranged to subdistichous; lamina oblong, elliptic or (sub) obovate, (3–)6–13(–18) by (1–)3–6(–9) cm, coriaceous, apex short-acuminate to rounded, the acumen obtuse, base cuneate to obtuse, margin \pm revolute and callose (towards the base and extending to the base of the lamina); both surfaces glabrous; midrib \pm impressed (at least the lower part) above, lateral veins (5–)7–10(–13) pairs, the basal pair \pm distinct, to (1/5–)1/4–1/3(–1/2) the length of the lamina, unbranched (or faintly branched), departing the midrib 2–3 mm above the base of the lamina, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins, slightly prominent to flush and then often obscure (sometimes the lateral veins also obscure); waxy gland at the base of the midrib; petiole (1–)1.5–4.5 cm long, 2–3 mm thick, glabrous (or sparsely white puberulous), drying blackish to brown; stipules 1–2(–3) cm long, glabrous (or white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 4–8 mm long, (sub)equal, broadly ovate to semicircular with a rounded apex, glabrous (or white puberulous), persistent; receptacle (depressed-)subglobose, (0.6–)0.8–1.3(–1.8) cm diam. when dry, glabrous, pink to dark purple at maturity, apex slightly convex to almost flat, ostiole 2–3 diam., slightly prominent, open (to closed), the 3 upper ostiolar bracts unequal, not, hardly or just imbricate; wall \pm shrivelled (or smooth) when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

Thailand.—NORTH-EASTERN: Khon Kaen; EASTERN: Chaiyaphum, Nakhon Ratchasima, Buri Ram, Ubon Ratchathani; SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Chachoengsao, Chon Buri, Rayong, Chanthaburi, Trat; PENINSULAR: Phangnga, Satun, Narathiwat.

Distribution.— S China (incl. Hong Kong), Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Lesser Sunda Islands, Kalimantan, Sulawesi), Philippines.

Ecology.— Evergreen, dry evergreen and mixed deciduous forests, to 700 m.

Vernacular.— Taphan hin (ตะพานหิน) (Trat).

Note.—*Ficus phanrangensis* Gagnep. from Vietnam is closely related to *F. callophylla* from which it differs, for example, in the smaller number of lateral veins, the basal pair running to 1/2–2/3 the length of the lamina, the flat and hardly callose margin of the lamina, and the larger and closed ostiole; the two species may only be distinct at the level of subspecies.

Ficus callophylla is also morphologically close to *F. curtipes*, see below.

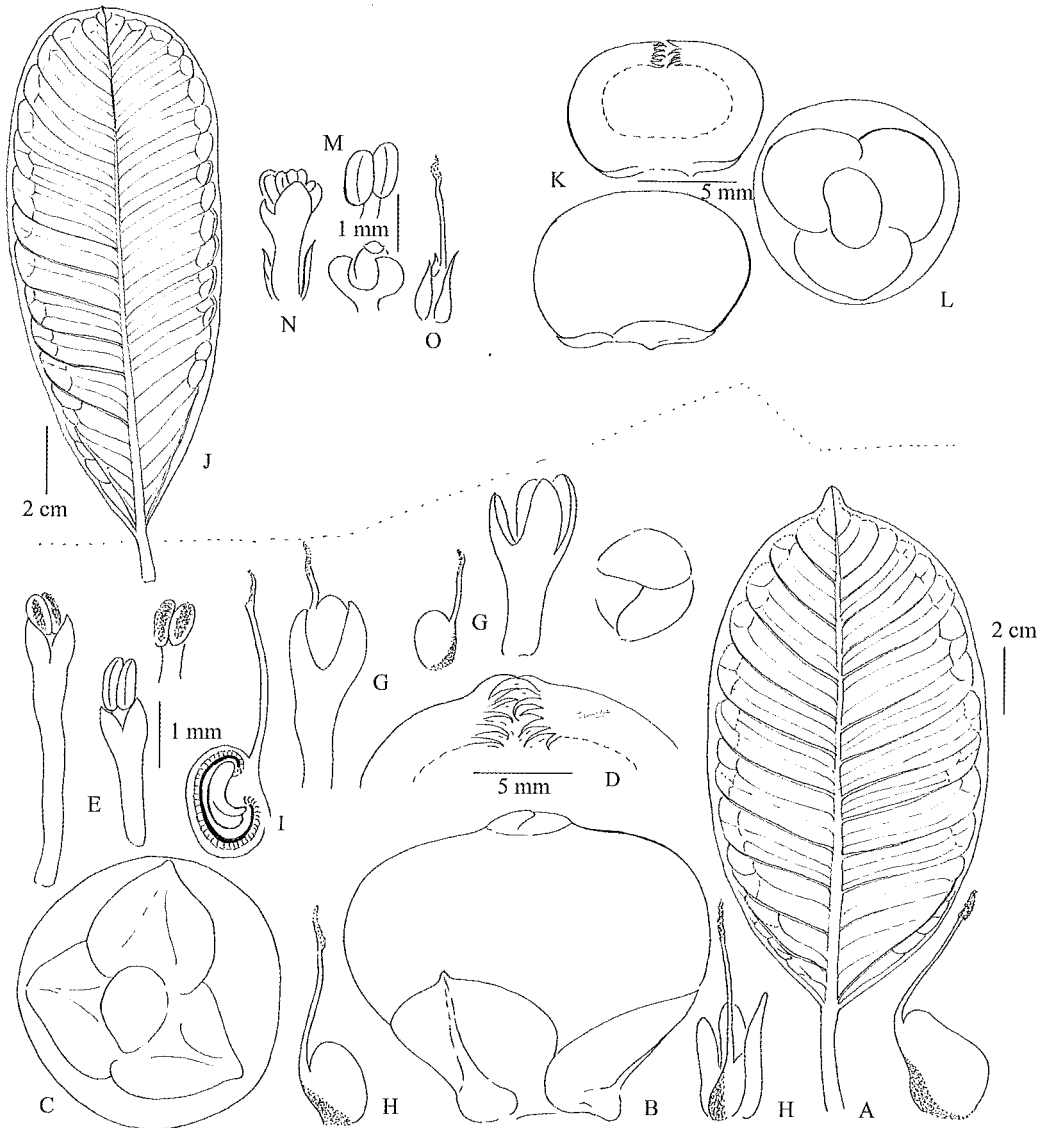


Fig. 35. *Ficus callophylla* Blume. A. leaf; B. fig; C. basal bracts; D. ostioles; E. staminate flowers; F. stamen; G. short-styled flowers and separate perianth and pistil; H. pistil of long-styled flowers; I. fruit and embryo (collections used unknown) and *F. curtipes* Corner: J. leaf; K. figs; L. basal bracts; M. staminate flowers; N. stamen; O. long-styled flower. (collections used unknown). Courtesy of Flora Malesiana ser I, 17(2): 639, fig. 113.

URO10. *Ficus caulocarpa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 268, 287. 1867; Corner, Gard. Bull. Singapore 10: 283. 1939; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 604. 2005.— *Urostigma caulocarpum* Miq., London J. Bot. 6: 568. 1847.— *Ficus infectoria* Roxb. var. *caulocarpa* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 63, t. 79. 1887.— *Urostigma stipulosum* Miq., London J. Bot. 6: 568. 1847.— *Ficus stipulosa* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867.

Tree to 20(–35) m tall, hemi-epiphytic, deciduous. *Branches* drying (red-)brown. *Leafy twigs* 2–5 mm thick, slightly angular to subterete, glabrous. *Leaves* spirally arranged; lamina oblong, elliptic, (sub)ovate or subobovate (or lanceolate), 6–19 by 2–7.5 cm, (sub)coriaceous, apex (short-)acuminate, the acumen obtuse to acute, base rounded to subcordate or obtuse (to cuneate); upper and lower surface glabrous; cystoliths only below; lateral veins 10–16 pairs, the basal pair to ca. 1/10 the length of the lamina, unbranched, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib, mostly in a groove when dry; petiole (1.5–)2–5(–8) cm long, 1.5–2 mm thick, glabrous (or minutely puberulous), the epidermis usually flaking off, and then mostly only at the uppermost part or also at the base; stipules 0.2–0.8(–1) (on opening-shoots to 4.5) cm long, glabrous or white puberulous (sometimes only on the margins), caducous or subpersistent at the apices of leafy twigs, forming ovoid terminal buds. *Figs* axillary and to 8 together on spurs on the older wood; peduncle (0.0–)0.1–0.5 cm long, puberulous to glabrous; basal bracts 3, 1.5–2(–3) mm long, puberulous or glabrous, often splitting into lobes, persistent; receptacle subglobose, 0.3–0.5 cm diam. when dry, glabrous, turning from white to pink and then purple to blackish at maturity, apex convex to flat, ostiole ca. 1.5 mm diam., ± prominent to flat, the upper ostiolar bracts glabrous; internal hairs abundant, chaffy. *Staminate flowers* near the ostiole. *Tepals* reddish. *Ovary* dark red.

T h a i l a n d.—NORTHERN: Chiang Mai, Tak; NORTH-EASTERN: Khon Kaen; PENINSULAR: Surat Thani, Nakhon Si Thammarat, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.—Sri Lanka, Burma, Ryukyu Islands, Taiwan, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java, Lesser Sunda Islands, Sulawesi, Moluccas, Papua), Philippines (type), Papua New Guinea.

E c o l o g y.—Evergreen, dry evergreen and montane forests, to 2,000 m.

N o t e.—The figs are normally pedunculate, those of *Geesink et al.* 8132 (L) are sessile.

URO11. *Ficus concinna* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; Kochummen, Tree Fl. Malaya 3: 144. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 234. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(1): 605. 2005.— *Urostigma concinnum* Miq., London J. Bot. 6: 570. 1847.— *Ficus glabella* Blume var. *concinna* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 50. 1887.— *Urostigma parvifolium* Miq., London J. Bot. 6: 570. 1847.— *Ficus parvifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867, non Oken, 1841.— *F. subpedunculata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 217, 286. 1867.— *F. concinna* Miq. var. *subsessilis* Corner, Gard. Bull. Singapore 17: 376. 1960.— *F. fecundissima* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9: 19. 1911.— *F. pseudoreligiosa* H. Lév., Fl. Kouy-Tchéou: 432. 1914/15. Fig. 36. Plate LXXI: 1–2.

Tree, to 20(–30) m tall, hemi-epiphytic. *Branches* drying pale to dark brown. *Leafy twigs* 1–2 mm thick, slightly angular to subterete, glabrous. *Leaves* spirally arranged; lamina oblong, elliptic or lanceolate (or subovate), 4–13 by 1–5 cm, (sub)coriaceous, apex (short-)acuminate, the acumen acute to obtuse, base cuneate to obtuse (or rounded); both surfaces glabrous;

cystoliths only below (or on both sides); lateral veins (6–)8–13 pairs, the basal pair to ca. 1/10–1/6 the length of the lamina, unbranched, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1–2.5(–3.5) cm long, 1–1.5 mm thick, glabrous, the epidermis persistent; stipules 0.2–0.5(–3.5) cm long, white puberulous or glabrous, caducous. *Figs* axillary or on minute spurs just below the leaves, in pairs or solitary; with a peduncle 0.1–0.3(–0.5) cm long (or subsessile); basal bracts 3, 0.5–1.5(–2.5) mm long, ciliolate, caducous (or subsistent to persistent?); receptacle subglobose, 0.4–0.6 cm diam. when dry, 0.6–0.8 cm diam. when fresh, (sub)glabrous, turning from white to pink and then purple to black at maturity, apex convex, ostiole ca. 1.5 mm diam., slightly prominent to flat, the upper ostiolar bracts ciliolate; internal hairs absent or very sparse. *Staminate flowers* near the ostiole. *Tepals* red(dish). *Ovary* red-brown.

T h a i l a n d.—NORTHERN: Mae Hong Son, Phayao, Tak; NORTH-EASTERN: Phetchabun, Loei; SOUTH-WESTERN: Kanchanaburi, Phetchaburi, Prachuap Khiri Khan; CENTRAL: Nakhon Nayok, Bangkok; SOUTH-EASTERN: Chon Buri; PENINSULAR: Ranong, Phuket, Nakhon Si Thammarat, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.—Sikkim, Bhutan, India (NE and Andaman Islands), Bangladesh (?), Burma, S China, Laos, Vietnam, Cambodia, Peninsular Malaysia and Bornean Malaysia (Sabah: Gaya Island), Indonesia (S Sumatra?), Philippines (type).

E c o l o g y.—Evergreen, dry evergreen and deciduous dipterocarp forests, often in rocky places along rivers, to 1,400 m; also cultivated.

V e r n a c u l a r.—Krang (กร่าง), krai (ไกร), sai krang (ไทรกร่าง) (Bangkok); hai hi (ไฮฮี) (Phetchabun).

N o t e s.—The basal bracts are usually caducous; they may sometimes drop later than normal or even be persistent, as in *Charoenchai 126* from Nakhon Nayok, *Gardner ST2606* from Phuket, and *Koyama et al. 34074* from Nakhon Si Thammarat, and then the species is only distinguishable from related species, such as *F. virens*, by the short petiole, and in Thailand also by the glabrous upper ostiolar bracts. The form with (sub?)persistent basal bracts may also be represented by the type of *Ficus affinis* Kurz, but this type could not be found.

URO12. Ficus consociata Blume, Bijdr. Fl. Ned. Ind.: 447. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 33, t. 36. 1887; Ridl., Fl. Malay Penins. 3: 331. 1924; Kochummen, Tree Fl. Malaya 3: 144. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 248. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 641. 2005.—*Urostigma consociatum* (Blume) Miq. in Zoll., Syst. Verz. 2: 91. 1854.—*Ficus consociata* Blume var. *murtonii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 34, t. 37. 1887; Corner, Gard. Bull. Singapore 21: 15. 1965; Kochummen, Tree Fl. Malaya 3: 144. 1978. Plate LXXI: 3.

Tree to 25(–40) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 5–8 mm thick, ± angular, densely (dark) brown floccose-tomentose to -subvillous, glabrescent; periderm persistent. *Leaves* spirally arranged; lamina oblong, elliptic or subobovate, 7–21 by 3.5–8.5 cm, coriaceous, apex short-acuminate to rounded, base (sub) cordate to rounded; upper surface brown tomentose on the (lower part of the) midrib or also on the (basal) lateral veins, glabrescent (or glabrous?), lower surface brown floccose-tomentose, glabrescent; cystoliths on both sides; midrib (at least the lower part) ± impressed above, lateral veins (4–)5–7(–8) pairs, the (main) basal pair distinct, to 1/4–1/3(–1/2) the length of the lamina, branched, 1–2 pairs of smaller basal veins below the main pair, tertiary venation reticulate, prominent beneath; waxy gland at the base of the midrib; petiole 1–4 cm long, 3–3.5 mm thick,

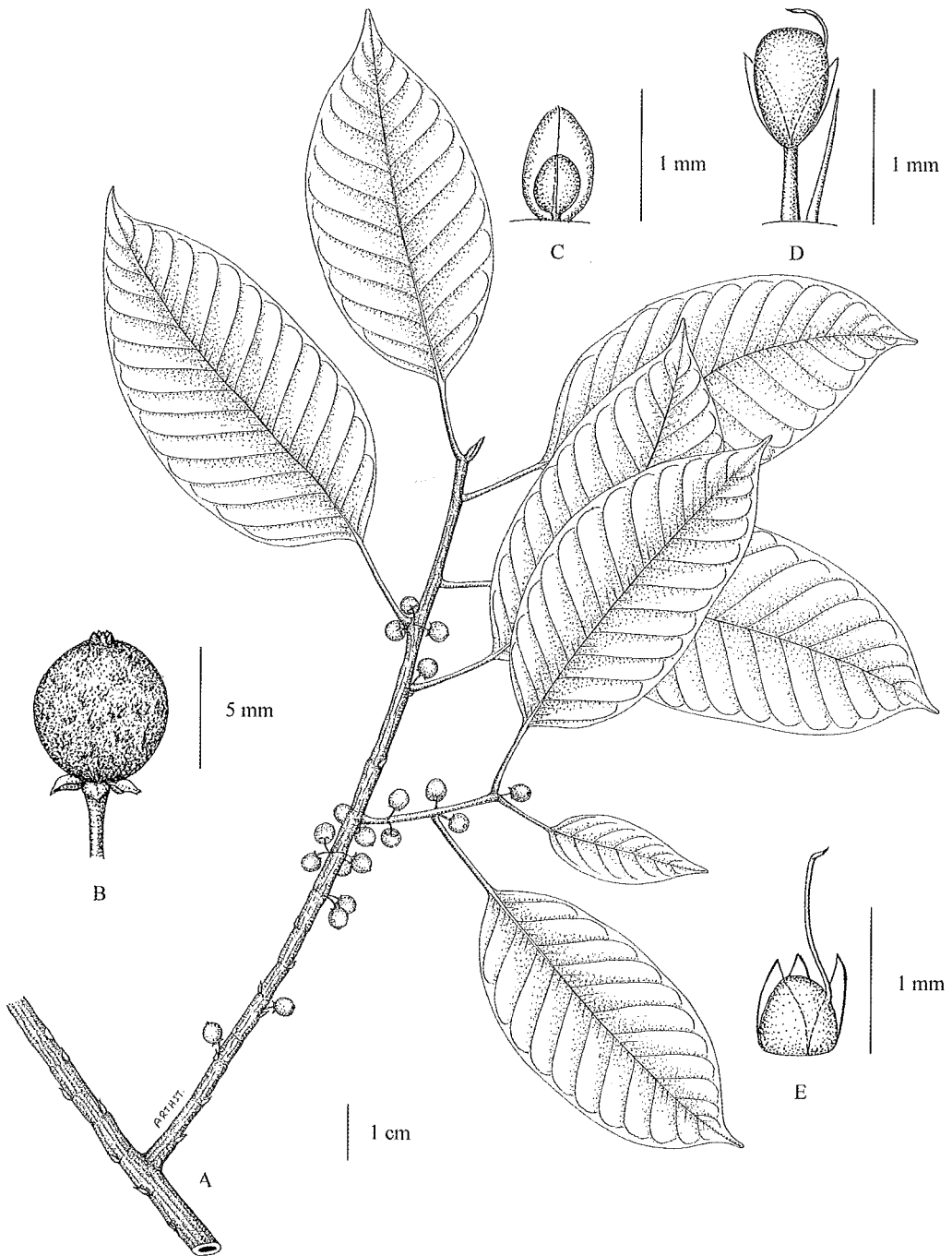


Fig. 36. *Ficus concinna* (Miq.) Miq.: A. leafy twig and figs on spurs on older wood; B. fig; C. staminate flower; D. short-styled flower and interfloral bract; E. long-styled flower (All from Middleton *et al.* 1057, BKF). Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–E).

densely brown floccose-tomentose, glabrescent, drying brown to blackish; stipules 1–2 cm long, \pm densely brown floccose-tomentose to -subvillous, caducous. *Figs* axillary, paired (or solitary), sessile, calyprate bud covers absent (?); basal bracts 3, 4–7 mm long, \pm unequal, 2 (or 1) with distinct median part, brown tomentose (on the median part) or glabrous, persistent; receptacle broadly ovoid to depressed-globose, 1–2 cm diam. when dry, brown floccose-tomentose to -subvillous, glabrescent, yellow to orange or red at maturity, apex concave with the sunken ostiole ca. 3 mm diam., or convex to flat and the prominent to flat ostiole 4–5 in diam., the 3 upper ostiolar bracts fully imbricate; wall \pm shrivelled when dry; internal hairs present, sparse, crinkled, and brown. *Tepals* reddish. *Ovary* red.

T h a i l a n d.— SOUTH-EASTERN: Chanthaburi, Trat; PENINSULAR: Phangnga, Krabi, Narathiwat.

D i s t r i b u t i o n.— Burma, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java (type, Kalimantan)), Brunei.

E c o l o g y.— Evergreen forest, to 1,000 m.

V e r n a c u l a r.— Sai yai (ไทรไทรย) (Trat).

N o t e.— In Thailand, this species shows remarkable differences in the ostiole: in some collections, such as *Chantarasuwan 2003-0157*, the apex of the fig receptacle is convex, and the ostiole is prominent and has a diameter of 4–5 mm, in other collections the apex of the receptacle is concave and the sunken ostiole is smaller, ca. 3 mm diam. The sunken ostiole is characteristic of *F. bracteata* (Miq.) Miq., a closely related species distinct by its longer (2–4(–6) cm) and subpersistent stipules. It is noteworthy that, in the collection cited, one of the figs has a flat to slightly concave apex, perhaps representing a transitional state. The form with a concave apex to the receptacle is also found in Burma, Cambodia and Vietnam.

URO13. *Ficus crassiramea* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; Corner, Gard. Bull. Singapore 17: 384. 1960; Kochummen, Tree Fl. Malaya 3: 144. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 232. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 643. 2005. Fig. 37. Plate LXXI: 4.

subsp. **crassiramea** — *Urostigma crassirameum* Miq., Pl. Jungh.: 48. 1851.— *Ficus procera* Reinw. ex Blume var. *crassiramea* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 36, t. 41. 1887.— *F. procera* Reinw. ex Blume, Bijdr. Fl. Ned. Ind.: 445. 1825, non Salisb., 1796; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 262, 286. 1867.— *Urostigma procerum* (Blume) Miq., Fl. Ned. Ind. 1(2): 336. 1859.— *Ficus subtectata* Corner, Gard. Bull. Singapore 17: 386. 1960; Kochummen, Tree Fl. Malaya 3: 158. 1978.— *F. stupenda* Miq. var. *minor* Corner, Gard. Bull. Singapore 17: 384. 1960.

Tree to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to blackish. *Leafy twigs* (3–)5–10 mm thick, \pm angular, glabrous, sparsely minutely white puberulous mainly on the stipule scars; periderm persistent. *Leaves* spirally arranged; lamina oblong, subobovate or elliptic (or oblanceolate), (8–)10–20(–30) by (3–)4–14(–16) cm, coriaceous, apex short-acuminate (to obtuse), the acumen mostly obtuse, base cuneate to rounded (to truncate); both surfaces glabrous; cystoliths on both sides; midrib \pm prominent to flush above, lateral veins (4–)6–8(–9) pairs, the basal pair distinct, to 1/8–1/3(–1/2) the length of the lamina, unbranched (or sparsely branched), departing the midrib 3–5 mm above the base of the lamina, 0–2 pairs of smaller lateral veins below the main pair, tertiary venation partly reticulate, towards the

margin (subs)scalariform with numerous perpendicular veinlets from the midrib, the areoles small; waxy gland at the base of the midrib; petiole 2–4(–7) cm long, 2–3 mm thick, glabrous or densely white puberulous, drying blackish or brown; stipules (1–)2–4(–7) cm long, sparsely to densely whitish appressed-puberulous or glabrous, caducous; terminal buds \pm swollen. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 5–8(–10) mm long, mostly (almost) equal, semicircular to suborbicular with a rounded apex and broadest at or above the middle, covering 1/6–1/4 of the receptacle, sometimes 1 or 2 with a distinct median part, glabrous or puberulous on the median part, persistent; receptacle ovoid, ellipsoid or subglobose, 1.5–3.5 cm long, 1.5–3 cm diam. when dry, (sub)glabrous or sparsely white puberulous, mainly near the ostiole, yellow to dark red at maturity, apex slightly convex and submammillate, ostiole 2–4 mm diam., slightly prominent, closed, the 3 upper ostiolar bracts fully imbricate, often only 2 visible or the third just; wall \pm smooth to \pm shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* red.

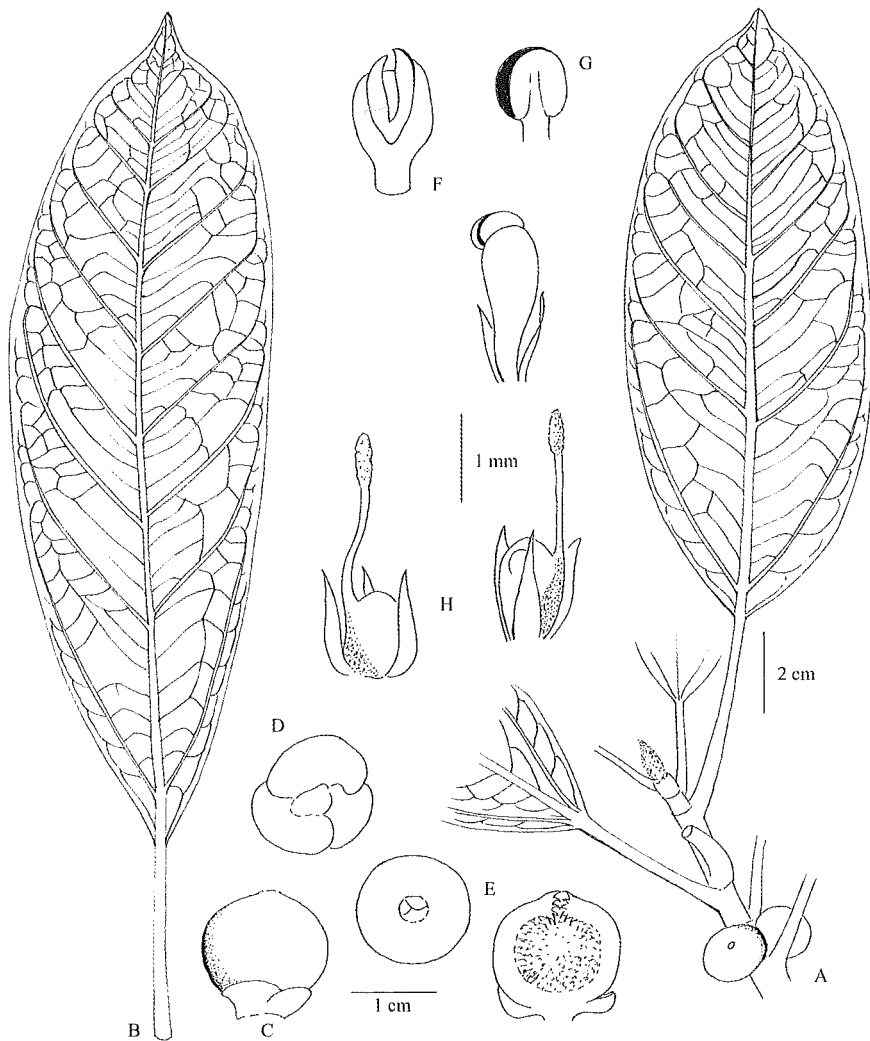


Fig. 37. *Ficus crassiramea* (Miq.) Miq. subsp. *crassiramea*. A. leafy twig with figs; B. leaf; C. figs; D. basal bracts; E. ostiole; F. staminate flowers; G. stamen; H. long-styled flowers. Courtesy of Flora Malesiana ser I, 17(2): 646, fig. 116, partly.

Thailand.— SOUTH-EASTERN: Trat; PENINSULAR: Ranong, Songkhla, Narathiwat.

Distribution.— Burma, Vietnam, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Lesser Sunda Islands: Flores, Kalimantan, Sulawesi, Moluccas, Papua), Philippines, Papua New Guinea, Solomon Islands.

Ecology.— Evergreen forest, at low altitudes.

Notes.— The other subspecies, *F. crassiramea* (Miq.) Miq. subsp. *stupenda* (Miq.) C.C. Berg, occurs in Java and Borneo.

The lamina tends to be relatively small and also narrow in Thailand. The species is characterized by its broad basal bracts which subtend subglobose receptacles in Thailand.

URO14. *Ficus cucurbitina* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 22, t. 17. 1887; Kochummen, Tree Fl. Malaya 3: 144. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 229. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 647. 2005.— *F. elliptifolia* Merr., Philipp. J. Sci. 18: 55. 1921. Plate LXXI: 5.

Tree to 15(–40) m tall, hemi-epiphytic or (secondarily?) terrestrial. Branches drying brown. Leafy twigs 2–6 mm thick, ± angular, sparsely brownish set(ul)ose with irritant hairs, glabrescent; periderm persistent, sometimes flaking off. Leaves spirally arranged; lamina elliptic, oblong or subobovate, 7–15 by 2.5–8 cm, coriaceous, apex short-acuminate, base subcordate to rounded (to cuneate), margin ciliate; upper surface glabrous or minutely puberulous on the midrib, lower surface glabrous or sparsely and minutely puberulous on the midrib; cystoliths on both sides; lateral veins 9–12 pairs, the basal pair ± distinct, to 1/10–1/6 the length of the lamina, (sparsely and/or faintly) branched or unbranched, 1–2(–3) pairs of smaller lateral veins below the main pair, tertiary venation reticulate to subscalariform, ± prominent beneath; waxy gland to 1 cm from the base of the midrib; petiole 1–3 cm long, 2–3 mm thick, glabrous or sparsely puberulous or setulose, drying blackish (or brown), sometimes with a waxy layer; stipules (0.5–) 1–2 cm long, brown strigose to subsericeous, caducous, often with a distinct median part. Figs axillary, in pairs (or solitary), initially enclosed by calyptrate bud covers to 1.2 cm long, sessile; basal bracts 3, ca. 2 mm long, subequal to unequal, semicircular, with a rounded apex, connate at the base, glabrous, persistent; receptacle ellipsoid to cylindrical, 1–2 cm diam. and to 4 cm long when dry, sparsely to densely brownish setose to strigose with irritant hairs (or also brown puberulous), yellow to orange-red at maturity, apex convex to protracted, ostiole ca. 3 mm diam., prominent, open, the 3 upper ostiolar bracts subequal, not fully imbricate, ± strongly thickened; wall ± shrivelled when dry; internal hairs absent. Tepals pinkish (to whitish?). Ovary partly red(dish).

Thailand.— PENINSULAR: Nakhon Si Thammarat, Narathiwat.

Distribution.— Peninsular and Bornean Malaysia (type), Indonesia (Kalimantan), Philippines.

Ecology.— Evergreen forest, at low altitudes.

URO15. *Ficus curtipes* Corner, Gard. Bull. Singapore 17: 397. 1960; Kochummen, Tree Fl. Malaya 3: 144. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 648. 2005.— *F. obtusifolia* Roxb., Fl. Ind. Ed. 1832 3: 546. 1832, non Kunth, 1817; Wight, Icon. Pl. Ind. Orient. 2: t. 662. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 263, 286. 1867; Kurz, Forest Fl. Burma 2: 443. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 42, t. 49. 1887; Ridl., Fl. Malay Penins.

3: 335. 1924; Gagnep., Fl. Indo-Chine 5: 779. 1928.— *Urostigma obtusifolium* (Roxb.) Miq., London J. Bot. 6: 569. 1847. Fig. 35J–O.

Tree to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to yellowish. *Leafy twigs* 3–7 mm thick, ± angular, glabrous or (very) minutely white puberulous; periderm persistent. *Leaves* spirally arranged; lamina (sub)obovate, oblong, elliptic or oblanceolate, 6–15(–18) by 3–6(–8.5) cm, coriaceous, apex rounded, truncate or retuse (or short-acuminate), base cuneate to rounded, margin flat or ± revolute (towards the base), ± callose (towards the base, mostly extending to the base of the lamina); both surfaces glabrous; midrib slightly prominent to flush above, lateral veins 7–10(–13) pairs, the basal pair ± (to hardly) distinct, to (1/10–)1/8–1/3 the length of the lamina, unbranched, departing the midrib 2–5(–8) mm above the base of the lamina, 0–1 small lateral veins below the main pair, tertiary venation largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.5–1.5(–2.2) cm long, 2–3 mm thick, glabrous, drying blackish to brown; stipules 1–2 cm long, glabrous or (very) minutely white puberulous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–6 mm long, (sub)equal, semicircular to broadly ovate with a rounded apex, glabrous or sparsely and minutely puberulous, persistent; receptacle (depressed-)subglobose, 0.8–1.3 cm diam. when dry, glabrous, orange (to red?) at maturity, apex slightly convex to flat (to concave?), ostiole 2–3 diam., (almost) flat, closed, the 3 upper ostiolar bracts fully imbricate, sometimes only 2 visible; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* reddish.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Lamphun; NORTH-EASTERN: Loei, Sakon Nakhon, Mukdahan, Khon Kaen; EASTERN: Chaiyaphum; SOUTH-WESTERN: Kanchanaburi, Ratchaburi, Phetchaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Surat Thani, Trang, Satun.

D i s t r i b u t i o n.— Sikkim, Bhutan, NE India, Bangladesh (type), Burma, S China, Laos, Vietnam, Cambodia, Peninsular Malaysia (Langkawi Island), Indonesia (Sumatra: Aceh, P. Bras Island).

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, often rocky areas, to 900 m.

V e r n a c u l a r.— Sai hin (ไทรหิน) (Southeastern, Nakhon Si Thammarat); hai lin ma (ไทรลิ้นหมา); hai luang (ไทรหลวง) (Chiang Mai); hai dan (ไทรदान) (Nong Khai).

N o t e.— This species is morphologically very close to *F. callophylla*, from which it differs in the apex of the lamina which is nearly always rounded to truncate (or retuse), in the shorter petiole, mostly 1–1.5 cm long, and the ostiole which is always closed; the latter features can be used if occasionally the apex of the lamina is short-acuminate. Neither distribution nor ecology provide arguments for reducing the two taxa to subspecies.

URO16. *Ficus depressa* Blume, Cat. Gew. Buitenzorg: 35. 1823; Bijdr. Fl. Ned. Ind.: 450. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; Corner, Gard. Bull. Singapore 17: 380; Kochummen, Tree Fl. Malaya 3: 145. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 246. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 650. 2005.— *Urostigma depressum* (Blume) Miq., London J. Bot. 6: 576. 1847.— *Ficus pruniformis* Blume, Bijdr. Fl. Ned. Ind.: 451. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 266, 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 24, t. 21. 1887; Ridl., Fl. Malay Penins. 3: 333. 1924; Gagnep., Fl. Indo-Chine 5: 782. 1928.— *Urostigma pruniforme* (Blume) Miq. in Zoll., Syst. Verz. 2: 91, 97. 1854. Plate LXXI: 6.

Tree to ca. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial, or climber. *Branches* drying yellowish to brown. *Leafy twigs* 2–5 mm thick, \pm angular, glabrous or sparsely brownish to whitish puberulous (mainly on the scars of the stipules). *Leaves* spirally arranged; lamina oblong to elliptic (or lanceolate), 5–16(–23) by 1.2–6.5(–8.5) cm, coriaceous, apex acuminate, base cuneate to rounded; upper surface glabrous, lower surface \pm sparsely brownish puberulous laterally on the midrib, mainly (or only) in the axils of the lateral veins (barbate) or also on the basal parts of the lateral veins, glabrescent; cystoliths on both sides; midrib slightly prominent to flush or slightly impressed towards the base, lateral veins 7–12 pairs, the basal pair slightly to hardly distinct, to $1/20$ – $1/10$ (– $1/6$) the length of the lamina, unbranched, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, slightly prominent to almost flush beneath; waxy gland at the base of the midrib; petiole 1–4 cm long, 1–2 mm thick, glabrous, drying blackish; stipules 1–2(–5) cm long, brownish puberulous to subsericeous or glabrous, caducous. *Figs* axillary, in pairs (or solitary); peduncle (0.5–)1–3.5 cm long, the apex broadened into a rim; basal bracts 3, inserted inside the rim of the peduncle, 2–3(–5) mm long, subequal, caducous at maturity; receptacle (sub)ovoid, 1.2–2 cm diam. and to 3 cm long when dry, sometimes shortly stipitate, glabrous, yellowish at maturity, apex convex, (sub)mammillate and 2–3-lobate (by prominent upper ostiolar bracts), ostiole 2–3 mm diam., prominent, open, the 3 upper ostiolar bracts unequal, slightly or not imbricate, thick; wall \pm shrivelled when dry; internal hairs absent. *Tepals* red to pinkish. *Ovary* partly reddish.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java-type, Kalimantan, Lesser Sunda Islands), Philippines.

E c o l o g y.— Evergreen forest, at low altitudes.

URO17. *Ficus drupacea* Thunb., *Ficus*: 6, 11. 1786; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 286. 1867; Corner, *Gard. Bull. Singapore* 17: 380. 1960; Corner, *Revis. Handb. Fl. Ceylon* 1, 2: 134, t. 11. 1977; Kochummen, *Tree Fl. Malaya* 3: 145. 1978; Kochummen, *Tree Fl. Sabah & Sarawak* 3: 228. 2000; C.C. Berg & Corner, *Fl. Males., Ser. 1, Spermat.* 17(2): 651. 2005.— *Urostigma drupaceum* (Thunb.) Miq., *London J. Bot.* 6: 581. 1847.— *Ficus pilosa* Reinw. ex Blume, *Bijdr. Fl. Ned. Ind.*: 446. 1825; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 260, 285. 1867; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(1): 21, t. 16. 1887; Ridl., *Fl. Malay Penins.* 3: 331. 1924; Gagnep., *Fl. Indo-Chine* 5: 758. 1928.— *Urostigma pilosum* (Blume) Miq. in Zoll., *Syst. Verz.* 2: 90. 1854.— *Ficus chrysocoma* Blume, *Bijdr. Fl. Ned. Ind.*: 443. 1825; Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 285. 1867.— *F. pilosa* Reinw. ex Blume var. *chrysocoma* (Blume) King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(1): 21. 1887.— *F. mysorensis* Heyne ex Roth in Roem. & Schult., *Syst. Veg.* 1: 508. 1817; King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(2): 20, t. 14. 1888.— *Urostigma mysorensis* (Heyne ex Roth) Miq., *London J. Bot.* 6: 574. 1847.— *Ficus mysorensis* Heyne ex Roth var. *pubescens* Roth in Roem. & Schult., *Syst. Veg.* 1: 508. 1817.— *F. drupacea* Thunb. var. *pubescens* (Roth) Corner, *Gard. Bull. Singapore* 17: 381. 1960.— *F. payapa* Blanco, *Fl. Filip.*: 683. 1837.— *Urostigma dasycarpum* Miq., *London J. Bot.* 6: 574, t. 23B. 1847.— *Ficus mysorensis* Heyne ex Roth forma *parvifolia* Miq., *Ann. Mus. Bot. Lugd.-Bat.* 3: 285. 1867.— *F. mysorensis* Heyne ex Roth var. *dasycarpa* (Miq.) M.F. Barrett, *Am. Midl. Nat.* 45: 166. 1951.— *F. mysorensis* Heyne ex Roth var. *subrepanda* Wall. ex King, *Ann. Roy. Bot. Gard. (Calcutta)* 1(1): 20, t. 15. 1887.— *F. subrepanda* (Wall. ex King) King, *Fl. Brit. India* 5: 500. 1888. Fig. 38. Plate LXXII: 1.

Tree to 25(–35) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 3–8 mm thick, ± angular, glabrous or pale to rusty brown (sub)villous; periderm persistent, sometimes flaking off. *Leaves* spirally arranged to subdistichous; lamina elliptic, oblong or obovate, (7–)10–20(–35) by (3–)4–8(–16) cm, coriaceous, apex short-acuminate (to rounded), base cordate to rounded (to obtuse); upper surface glabrous or sparsely to densely brown(ish) (woolly) tomentose to subvillous, mainly on the midrib, lower surface glabrous or sparsely to densely brown(ish) (woolly) tomentose to subvillous (and often glabrescent); cystoliths on both sides; midrib slightly prominent to flush, lateral veins (6–)8–12(–14) pairs, the basal pair distinct to hardly so, to 1/10–1/5(–1/4) the length of the lamina, departing the midrib 3–5 mm above the base of the lamina, (sparsely and/or faintly) branched or unbranched, (0–)1–3 pairs of smaller lateral veins below the main pair, tertiary venation subscalariform, ± prominent beneath; waxy gland at the base of the midrib; petiole 1–4.5 cm long, 2–3 mm thick, glabrous or sparsely to densely brownish (woolly) tomentose to subvillous, drying blackish (or brown), sometimes with a waxy layer; stipules 1–1.5(–2) cm long, whitish puberulous or brown(ish) (to yellowish) subvillous to sericeous (or glabrous), caducous, often with distinct a median part. *Figs* axillary, in pairs or solitary, sessile; basal bracts 3 or 2, on a disc, 0.5–3 mm long, unequal in size, semicircular to band-shaped, brownish puberulous (or glabrous), persistent; receptacle ellipsoid to subcylindrical (to almost globose), 1–2(–2.5) cm diam. and to 4.5 cm long when dry, rarely to 0.7 cm long stipitate, (sub)glabrous (or densely brown subvillous), yellow to orange (or dull red) at maturity, apex convex, ostiole 2–3 mm diam., ± prominent, often with a rim around the ostiole (when dry), open, the 3 upper ostiolar bracts unequal to subequal, slightly or not imbricate, rather thick; wall ± shrivelled when dry; internal hairs absent. *Tepals* pinkish (to whitish?). *Ovary* partly red(dish).

T h a i l a n d.— NORTHERN: Chiang Mai, Phayao; NORTH-EASTERN: Phetchabun, Loei; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; CENTRAL: Ang Thong; SOUTH-EASTERN: Chachoengsao, Rayong, Chanthaburi; PENINSULAR: Nakhon Si Thammarat, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, India (type), Sikkim, Bhutan, Burma, S China, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra, Java, Sulawesi, Lesser Sunda Islands, Moluccas, Papua), Philippines, Papua New Guinea, Solomon Islands, Australia.

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, to 800 m.

V e r n a c u l a r.— Krang bai khon (กร่างใบขน) (Bangkok, Ratchaburi); sai (ไทร) (Central); cha-ri (จระริ) (Khmer-Chanthaburi); lung khon (ลุงขน) (Northern, Southeastern); hai (ไผ่) (Loei); hai mi (ไผ่หมี่) (Ubon Ratchathani).

N o t e.— Densely hairy fig receptacles are uncommon in Thailand, present in *Maxwell 95-459*.

URO18. *Ficus dubia* Wall. ex King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 46, t. 56. 1887; Ridl., Fl. Malay Penins. 3: 333. 1924; Kochummen, Tree Fl. Malaya 3: 146. 1978; Tree Fl. Sabah & Sarawak 3: 233. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 653. 2005. Plate LXXII: 2.

Tree to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial, or climber (?). *Branches* drying brown to blackish. *Leafy twigs* 2–4 mm thick, ± angular (to subterete), glabrous; periderm flaking off. *Leaves* in spirals; lamina elliptic to oblong, 7–15 by 4–7 cm, coriaceous, apex short-acuminate, base rounded to obtuse; both surfaces glabrous; midrib slightly prominent to flush

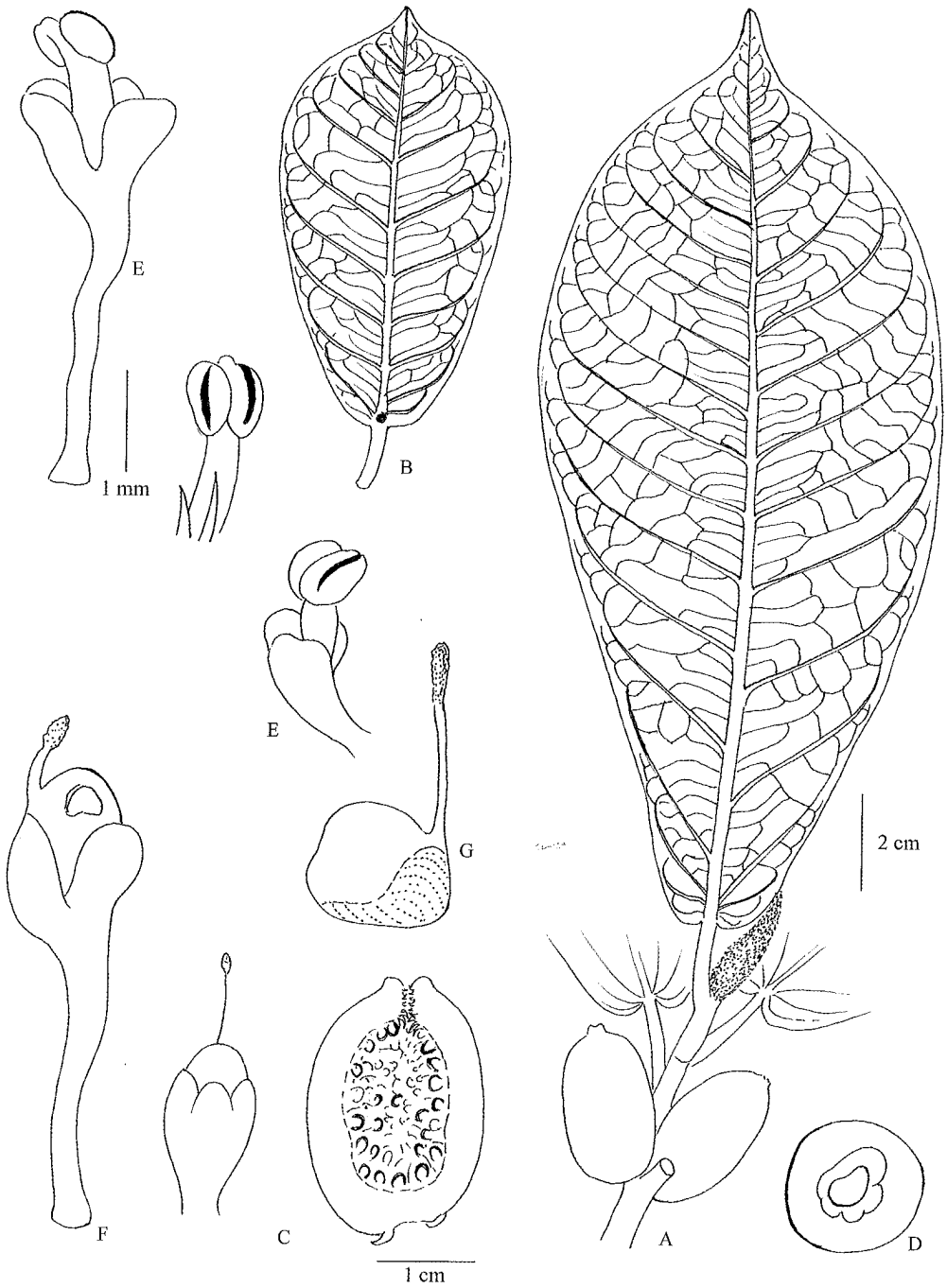


Fig. 38. *Ficus drupacea* Thunb.: A. Leafy twig with figs; B. leaf; C. fig; D. basal bracts; E. staminate flowers; F. short-styled flowers; G. long-styled flower. Courtesy of Flora Malesiana ser I, 17(2): 646., fig. 116, partly.

above, lateral veins 8–10 pairs, the basal pair \pm distinct, to $1/8$ – $1/6$ ($-1/4$) the length of the lamina, unbranched, tertiary venation largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–3.5 cm long, 1–2 mm thick, glabrous, drying blackish; stipules (0.5–)1–1.5 cm long, glabrous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1–3 mm long, unequal in size and shape, glabrous, persistent; receptacle subglobose, ovoid or ellipsoid, 1.5–2.5 (-3) cm diam. when dry, 3–4 cm diam. when fresh, 0.3–1.2 cm long stipitate, glabrous, orange-red to dark crimson at maturity, apex slightly convex to slightly concave, ostiole 2–2.5 mm diam., slightly sunken, open (?), the upper ostiolar bracts not imbricate (?); wall \pm shrivelled when dry; internal hairs absent. *Tepals* red. *Ovary* partly (dark) red.

T h a i l a n d.—PENINSULAR: Ranong, Narathiwat.

D i s t r i b u t i o n.—Peninsular (type) and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Kalimantan).

E c o l o g y.—Evergreen forest, at low altitudes.

N o t e.—This species is distinctive by its sessile, but peduncle-like stipitate fig receptacle.

URO19. *Ficus elastica* Roxb., Hort. Bengal. 65. 1814; Hornem., Hort. Bot. Hafn. Suppl.: 7. 1819; Roxb., Fl. Ind. Ed. 1832 3: 541. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 663. 1843; Griff., Icon. Pl. Asiat. 4: t. 552. 1854; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 265, 287. 1867; Kurz, Forest Fl. Burma 2: 444. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 45, t. 54. 1887; Ridl., Fl. Malay Penins. 3: 334. 1924; Gagnep., Fl. Indo-Chine 5: 777. 1928; Kochummen, Tree Fl. Malaya 3: 146. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 691. 2005.—*Visiania elastica* (Roxb.) Gasp., Giorn. Bot. Ital. 2: 216. 1844.—*Macrophthalmia elastica* (Roxb.) Gasp., Rendiconti Reale Accad. Sci. Fis. 25: 83. 1845.—*Urostigma elasticum* (Roxb.) Miq., London J. Bot. 6: 578. 1847.—*Stilpnophyllum elasticum* (Roxb.) Drury, Handb. Ind. Fl. 3: 225. 1869. Fig. 39. Plate LXXII: 3.

Tree to 30 m tall, terrestrial or hemi-epiphytic. *Leafy twigs* 3–5 mm thick, angular, glabrous or (minutely) white puberulous. *Leaves* in spirals; lamina elliptic to oblong, (6–)10–20 (-40) by (2.5–)5–10 (-22) cm, coriaceous, apex (short-)acuminate, base cuneate to obtuse (to rounded); both surfaces glabrous; cystoliths on both sides; lateral veins (10–)15–22 pairs, the basal lateral veins not or hardly distinct, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib (often faint); petiole 2.5–5 (-10) cm long, glabrous; stipules (1.5–)6–25 cm long, glabrous or white puberulous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary); peduncle 0.2–0.5 (-0.8) mm long, the apex dilated; basal bracts 3, ca. 3 mm long, cucullate, early caducous; receptacle ellipsoid to cylindrical, 0.5–0.8 cm diam. when dry, glabrous, yellow at maturity, apex slightly umbonate, ostiole circular with 3 bracts covering the entrance; inner layer of the wall thin.

T h a i l a n d.—Cultivated as an ornamental tree.

D i s t r i b u t i o n.—Nepal, Sikkim, Bhutan, NE India, Burma, Peninsular Malaysia (Perak), Indonesia (Sumatra?, Java?). The natural range of distribution is uncertain; the species is certainly natural in the foothills of the Himalayas and may be natural in Perak (Malaysia), Sumatra and Java as well; it is frequently planted in the range indicated, as well as elsewhere in the tropics (and subtropics).

V e r n a c u l a r.—Yang lop (ยางลบ) (Central); yang india (ยางอินเดีย) (Bangkok); lung (ลุง) Northern.

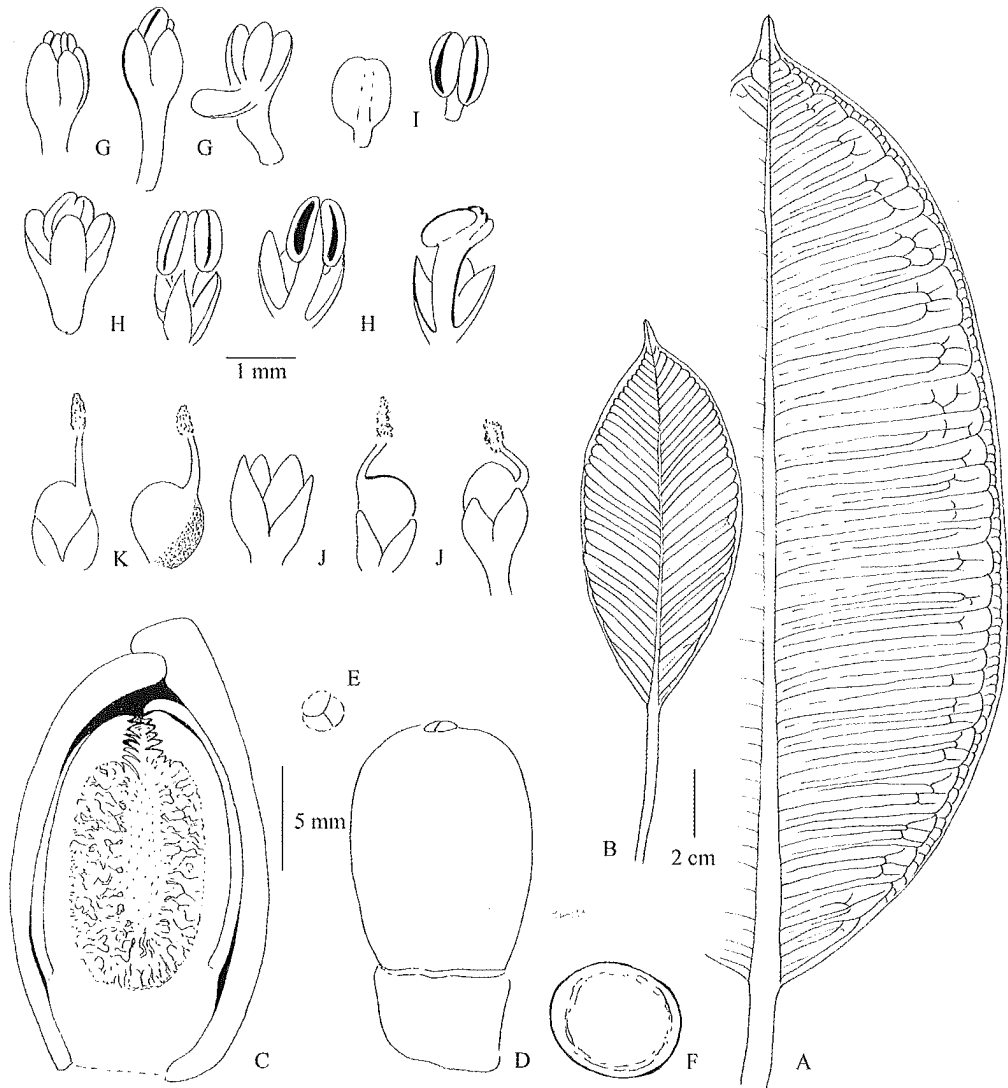


Fig. 39. *Ficus elastica* Roxb. A. leaf of sapling; B. leaf of adult; C. fig with basal bracts enclosed by calyptrate bud cover; D. fig without basal bracts; E. ostiole; F. apex of the peduncle; G. staminate flowers; H. staminate flowers; I. stamens; J. short-styled flowers and perianth; K. long-styled flowers and pistil. Courtesy of Flora Malesiana ser I, 17(2): 692, fig. 131.

URO20. *Ficus geniculata* Kurz, J. Asiat. Soc. Bengal 42(2): 105. 1873; Kurz, Forest Fl. Burma 2: 447. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 64, t. 80 and 84, X2; Gagnep., Fl. Indo-Chine 5: 761. 1928; C.C. Berg, Thai Forest Bull. (Bot.) 35: 16. 2007.—*F. geniculata* Kurz var. *abnormalis* Kurz, Forest Fl. Burma 2: 447. 1877; Corner, Gard. Bull. Singapore 21: 7. 1965.

Tree to 30(–40) m tall, hemi-epiphytic or (secondarily?) terrestrial, deciduous(?). Branches drying yellowish to brown. Leafy twigs 2–4 mm thick, ± angular, densely to sparsely brownish to

whitish puberulous or subtomentellous (sometimes only on the nodes). *Leaves* spirally arranged; lamina ovate, elliptic or oblong, (7–)10–20 by (4.5–)6–11 cm, (sub)coriaceous, apex acuminate, base rounded (and the very base often subattenuate), subcordate or cuneate; both surfaces glabrous; cystoliths absent (?); lateral veins 8–14 pairs, the basal laterals to 1/10–1/5(–1/4) the length of the lamina, branched or unbranched, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib; petiole (2.5–)4–9(–15) cm long, ca. 2 mm thick, glabrous, the epidermis persistent or flaking at the apex; stipules 0.7–0.9 cm (on opening shoots to 3.5 cm or more?) long, ± densely brownish to whitish puberulous or subtomentose, caducous. *Figs* axillary, just below the leaves, or on spurs to 1 cm long on older wood, in pairs, solitary, or (on older wood) to 3 together, sessile or to 0.1 cm long pedunculate; basal bracts 3, ca. 2 mm long, minutely puberulous outside, persistent (or caducous?); receptacle subglobose, 0.4–0.6 cm diam. when dry and the surface mostly wrinkled, glabrous, white or pink to purple or black at maturity, apex convex to flat, ostiole 1–2 mm diam., flat to ± prominent, the upper ostiolar bracts glabrous; internal hairs present, white, chaffy. *Staminate flowers* ostiolar. *Tepals* reddish. *Ovary* red-brown.

N o t e s.— This species is often difficult to distinguish from *F. virens* from which it differs in the petiole which is mostly 4–9 cm long, whereas usually not longer than 4.5 cm in *F. virens*, the tertiary venation tending to run parallel to the lateral veins rather than to be clearly reticulate, the base of lamina which is often subattenuate, the more pronounced articulation between lamina and petiole, due to which these parts are (more) frequently detached in dry material, and the smaller figs, ca. 0.5 cm diam., with the upper ostiolar bracts glabrous.

Two varieties can be recognised:

a. var. *geniculata* — *Ficus geniculata* Kurz var. *abnormalis* Kurz, Forest Fl. Burma 2: 447. 1877. Fig. 40.

Fig receptacle (sub)glabrous.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Lampang, Phrae, Phitsanulok; NORTH-EASTERN: Phetchabun, Nakhon Phanom, SOUTH-WESTERN: Uthai Thani, Kanchanaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chachoengsao, Chon Buri; PENINSULAR: Songkhla.

D i s t r i b u t i o n.— India (Peninsular, north-eastern, Andaman Islands), Bangladesh (?), Sikkim, Burma (type), S China, Indochina.

E c o l o g y.— Dry evergreen, deciduous dipterocarp and mixed deciduous forests, on limestone, at low altitudes.

V e r n a c u l a r.— Hai (ไห) (Chiang Mai); krang (กร่าง) (Ratchaburi).

b. var. *insignis* (Kurz) C.C. Berg, Thai Forest Bull. (Bot.) 35: 17. 2007.— *Ficus insignis* Kurz, J. Asiat. Soc. Bengal 42(2) 105. 1873; Kurz, Forest Fl. Br. Burma 2: 447. 1877.— *F. avium* Gagnep., Notul. Syst. (Paris) 4: 85. 1827.

Fig receptacle densely white tomentose.

T h a i l a n d.— NORTHERN: Phayao.

D i s t r i b u t i o n.— Burma (type), Vietnam, Cambodia.

E c o l o g y.— Similar to that of the typical variety (?).

V e r n a c u l a r.— Hai (ไห) (Southeastern).

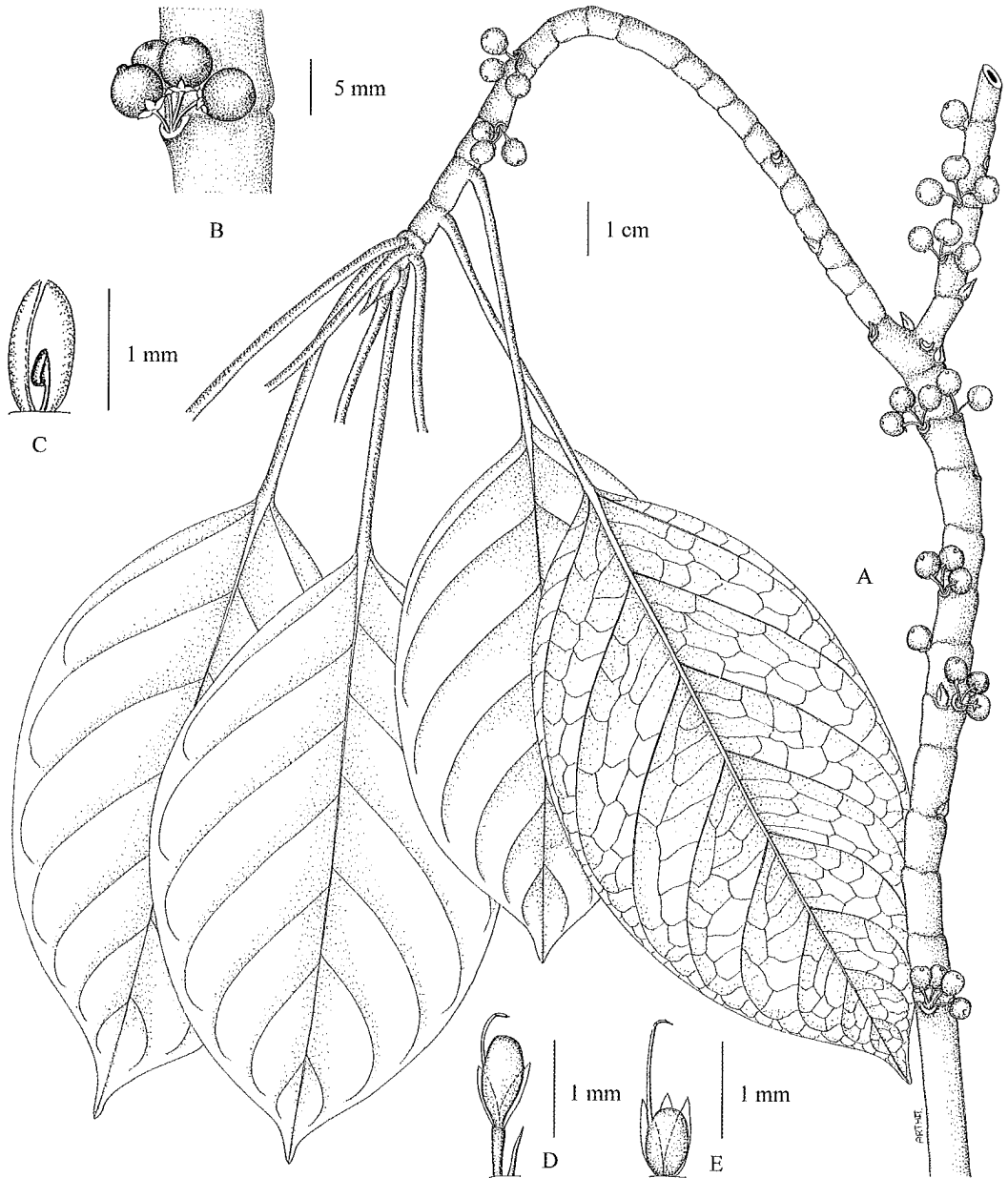


Fig. 40. *Ficus geniculata* Kurz var. *geniculata*: A. leafy twig and spurs on older wood; B. cluster of figs on older wood; C. staminate flower; D. short styled pistillate flower and interfloral bracts; E. long-styled pistillate flower (All from Chayamarit et al. 3036, BKF). Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–E).

URO21. *Ficus glaberrima* Blume, Bijdr. Fl. Ned. Ind.: 451. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 263, 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 37, t. 43. 1887; Gagnep., Fl. Indo-Chine 5: 770. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 655. 2005.—*Urostigma glaberrimum* (Blume) Miq., Fl. Ned. Ind. 1(2): 340. 1859.

Tree to 20(–30) m tall or shrub, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish or blackish (with conspicuous lenticels). *Leafy twigs* 2–5 mm thick, ± angular, glabrous, sparsely minutely whitish puberulous (or ± densely yellowish puberulous); periderm persistent (or flaking off). *Leaves* spirally arranged; lamina oblong or elliptic to broadly ovate, 6–15(–21) by 2.5–7.5(–8.5) cm, coriaceous, apex acuminate to subacute (to subcaudate), base cuneate, rounded or cordate; both surfaces glabrous; midrib slightly prominent to flush above, lateral veins 6–9(–10), the basal pair distinct, to 1/10–1/6 the length of the lamina, unbranched or branched, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1–5 cm long, 1–2 mm thick, glabrous, drying brown to blackish; stipules (0.5–)1–1.5(–4) cm long, (sub)glabrous, caducous. *Figs* axillary, paired (or solitary); peduncle 0.3–3.5 cm long; basal bracts 1–2 mm long, (usually early) caducous; receptacle subglobose, 0.5–0.7 cm diam. when dry, glabrous, yellow-orange to purple-black at maturity, apex convex, ostiole 2–2.5 mm diam., slightly prominent to flat, the 3 upper ostiolar bracts fully imbricate; wall smooth when dry; internal hairs absent. *Tepals* red(dish). *Ovary* partly red.

N o t e.— Two subspecies can be recognised.

a. subsp. *glaberrima* — *Ficus fraterna* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 217, 287. 1867.—*F. thomsonii* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 215, 286. 1867; Kurz, Forest Fl. Burma 2: 443. 1877.—*F. suberosa* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 549. 1910.—*F. feddei* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 9: 19. 1911. Plate LXXII: 5–6.

Tree to 20(–30) m tall. Lamina oblong, 6–15(–21) by 2.5–5.5(–8.5) cm, apex acuminate to subacute (to subcaudate), base cuneate to rounded; basal lateral veins unbranched; petiole 1–3(–5) cm long; stipules 1–1.5(–1.7) cm long. *Fig* peduncle 0.3–1.2 cm long.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Nan, Lampang, Uttaradit; NORTH-EASTERN: Phetchabun, Loei, Khon Kaen; SOUTH-WESTERN: Phetchaburi, Prachuap Khiri Khan; CENTRAL: Saraburi, Nakhon Nayok; SOUTH-EASTERN: Chon Buri; PENINSULAR: Surat Thani.

D i s t r i b u t i o n.— Nepal, Sikkim, Bhutan, India (NE and Andaman Islands), Burma, S China, Vietnam, Laos, Indonesia (Sumatra, Java-type, Lesser Sunda Islands: Sumbawa).

E c o l o g y.— Evergreen and dry evergreen forests, to 1,600 m.

V e r n a c u l a r.— Duea sai (เต๋อไซพร), hi (ไฮ) (Chiang Mai); sai liap (ไพรเสียบ) (Bangkok); ya khang (ยาค่าง) (Lampang).

N o t e.— The leafy twig is sometimes densely yellowish puberulous, as in *P. Srisanga* 334 from Nan.

b. subsp. *siamensis* (Corner) C.C. Berg, Thai Forest Bull. (Bot.) 35: 18. 2007.—*Ficus glaberrima* var. *siamensis* Corner, Gard. Bull. Singapore 17: 388. 1960. Plate LXXII: 4.

Shrub (sometimes creeping) or tree to 7 m tall. *Lamina* broadly ovate to elliptic, 6–10 by 4–7.5 cm, apex short-(sub)acuminate, base cordate to rounded (or obtuse); basal lateral veins mostly branched; petiole 2–5 cm long; stipules 0.5–1.5(–4) cm long. *Fig* peduncle 0.3–3.5 cm long.

Thailand (type).— NORTHERN: Nan, Nakhon Sawan; SOUTH-WESTERN: Phetchaburi, Prachuap Khiri Khan; CENTRAL: Saraburi; SOUTH-EASTERN: Chon Buri.

Distribution.— Endemic to Thailand.

Ecology.— On limestone, to 1,000 m (in Nepal to ca. 2,300 m).

Vernacular.— Pho hin (โพหิน) (Saraburi).

Note.— *Ficus arnottiana* Miq. var. *subcostata* Corner was incorrectly treated as a synonym of *Ficus glaberrima* subsp. *siamensis* by Berg, Thai Forest Bull. (Bot.) 35: 18. 2007.

In some collections, such as *Nielsen 651* and *Pooma 3872* (Nakhon Sawan), the basal bracts are subsistent (or persistent?). They match *F. glaberrima* except for the subsistent basal bracts and in this respect resemble *Ficus lawesii* King from Malesia and *F. travancorica* King from Peninsular India, see C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 664. 2005.

URO22. *Ficus globosa* Blume, Bijdr. Fl. Ned. Ind.: 449. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 262, 285. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 27, t. 25. 1887; Ridl., Fl. Malay Penins. 3: 333. 1924; Corner, Gard. Bull. Singapore 17: 380. 1960; Kochummen, Tree Fl. Malaya 3: 147. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 246. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 657. 2005.— *Urostigma globosum* (Blume) Miq., Fl. Ned. Ind. 1(2): 335. 1859.— *U. onustum* Wall. ex Miq., London J. Bot. 6: 575. 1847.— *Ficus onusta* (Miq.) Wall. ex Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 285. 1867; Kurz, Forest Fl. Burma 2: 441. 1877.— *Urostigma manok* Miq. in Zoll., Syst. Verz. 2 90, 96. 1854.— *Ficus manok* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 261, 285. 1867.— *F. globosa* Blume var. *manok* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 27. 1887. Plate LXIX: 4–5.

Climber, hemi-epiphytic shrub or treelet, or free-standing (?) tree to 20 m tall. Branches drying yellowish to brown, often with short adventitious roots. Leafy twigs 2–6(–8) mm thick, ± angular, with sparse to dense, dark brown appressed indumentum (scurfy). Leaves spirally arranged; lamina oblong to elliptic (or oblanceolate), (5–)10–20(–26) by (2–)5–9(–11) cm, coriaceous, apex acuminate, base rounded, obtuse, subcordate or cuneate; both surfaces glabrous; cystoliths on both sides; midrib flush to slightly impressed above, lateral veins 6–14 pairs, the basal pair ± distinct, to 1/8–1/6(–1/4) the length of the lamina, (faintly) branched or unbranched, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1.5–5(–8) cm long, 2–3 mm thick, glabrous, drying blackish; stipules (0.5–)1–1.5(–4) cm (on opening shoots to 10 cm) long, with sparse to dense, dark brown appressed indumentum or subglabrous, caducous. Figs axillary (or just below the leaves), in pairs (or solitary), initially enclosed in calyprate bud covers to 0.8 cm long; peduncle 0.1–0.7 cm long, the apex slightly dilated, passing into the bracts; basal bracts 3, 0.5–2 mm long, subequal, with dark brown scurfy indumentum (and whitish ciliolate), persistent; receptacle ellipsoid to subglobose, 0.8–1.2 cm diam. when dry, ca. 1.5 cm diam. when fresh, with sparse to dense, dark brown appressed indumentum (scurfy), greenish (?) at maturity, apex slightly convex to flat or concave, ostiole 2–2.5 mm diam., ± prominent, (when dry) often surrounded by a rim, ± open, the 3(–5) upper ostiolar bracts unequal, not or hardly imbricate, thick; wall slightly shrivelled when dry; internal hairs absent. Tepals reddish. Ovary partly reddish.

Thailand.— NORTHERN: Lampang; CENTRAL: Saraburi; SOUTH-EASTERN: Chachoengsao, Chanthaburi; PENINSULAR: Ranong, Surat Thani, Phangnga, Krabi, Trang, Satun, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan).

E c o l o g y.— Evergreen and dry evergreen forests, at low altitudes.

V e r n a c u l a r.— Sai (ໄທຣ) (Trang); sai luk klom (ໄທຣລູກຄລມ) (Narathiwat); yue-lai-ka-yu (ยี่อไลกาย) (Malay–Narathiwat).

URO23. *Ficus kerkhovenii* Valetton in Koord. & Valetton, Bijdr. Boomsort. Java 11: 84. 1906; Atlas Baumart. Java 4: t. 714. 1916; Kochummen, Tree Fl. Malaya 3: 149. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 659. 2005; C.C. Berg & S. Gardner, Thai Forest Bull. (Bot.) 35: 33. 2007.

Tree to 45 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown. *Leafy twigs* 2–4 mm thick, ± angular, glabrous; periderm persistent. *Leaves* in spirals; lamina oblong (to subovate), 6–18 by 2–8 cm, coriaceous, apex short-acuminate, base cuneate to rounded; both surfaces glabrous; midrib slightly prominent to flush above, lateral veins 7–12 pairs, the basal pair more weakly developed than the other lateral veins and often not opposite, to 1/20–1/10 the length of the lamina, unbranched, tertiary venation reticulate, ± prominent beneath; waxy gland at the base of the midrib; petiole 1–2.5(–3) cm long, 1.5–2.5 mm thick, glabrous, drying blackish; stipules (0.5–)1–2 cm long, glabrous, caducous. Figs axillary, paired (or solitary), sessile; basal bracts 3, 0.5–2.5 mm long, unequal in shape and size, glabrous, persistent; receptacle subglobose, 0.5–1 cm diam. when dry, glabrous, yellow to orange (to purplish-red) at maturity, apex convex to submammillate, ostiole 1.5–2 mm diam., slightly prominent, closed, the 3 upper ostiolar bracts fully imbricate; wall smooth to slightly shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— PENINSULAR: Songkhla (Khao Nam Khang National Park).

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia (Sarawak); Indonesia (Sumatra, incl. Banka and Riau, Java (type), Kalimantan), Philippines (?).

E c o l o g y.— Evergreen forest, at low altitudes.

N o t e.— This species can be readily recognised by the short and weakly developed basal lateral veins.

URO24. *Ficus kochummeniana* C.C. Berg, Blumea 39: 468. 2004; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 661. 2005.— *F. retusa* L. var. *borneensis* Corner, Gard. Bull. Singapore 17: 393. 1960; Kochummen, Tree Fl. Malaya 3: 154. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 298. 2000. Fig. 41. Plate LXXIII: 1.

Tree to 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–5(–7) mm thick, ± angular, minutely white puberulous and with dark brown appressed hairs; periderm persistent (or flaking off). *Leaves* spirally arranged; lamina subobovate to obovate (or oblanceolate, oblong or elliptic), 4–15(–18) by 1.5–6(–7.5) cm, coriaceous, apex acuminate to rounded, base cuneate to obtuse, margin ± revolute towards the base or flat; upper surface minutely white puberulous on the midrib or only with dark brown appressed hairs or glabrous (glabrescent?), lower surface minutely white puberulous on the midrib and lateral veins and with sparse to dense dark brown appressed hairs mainly on and along the veins; midrib (at least the lower part) impressed above, lateral veins (3–)5–8 pairs, often ±

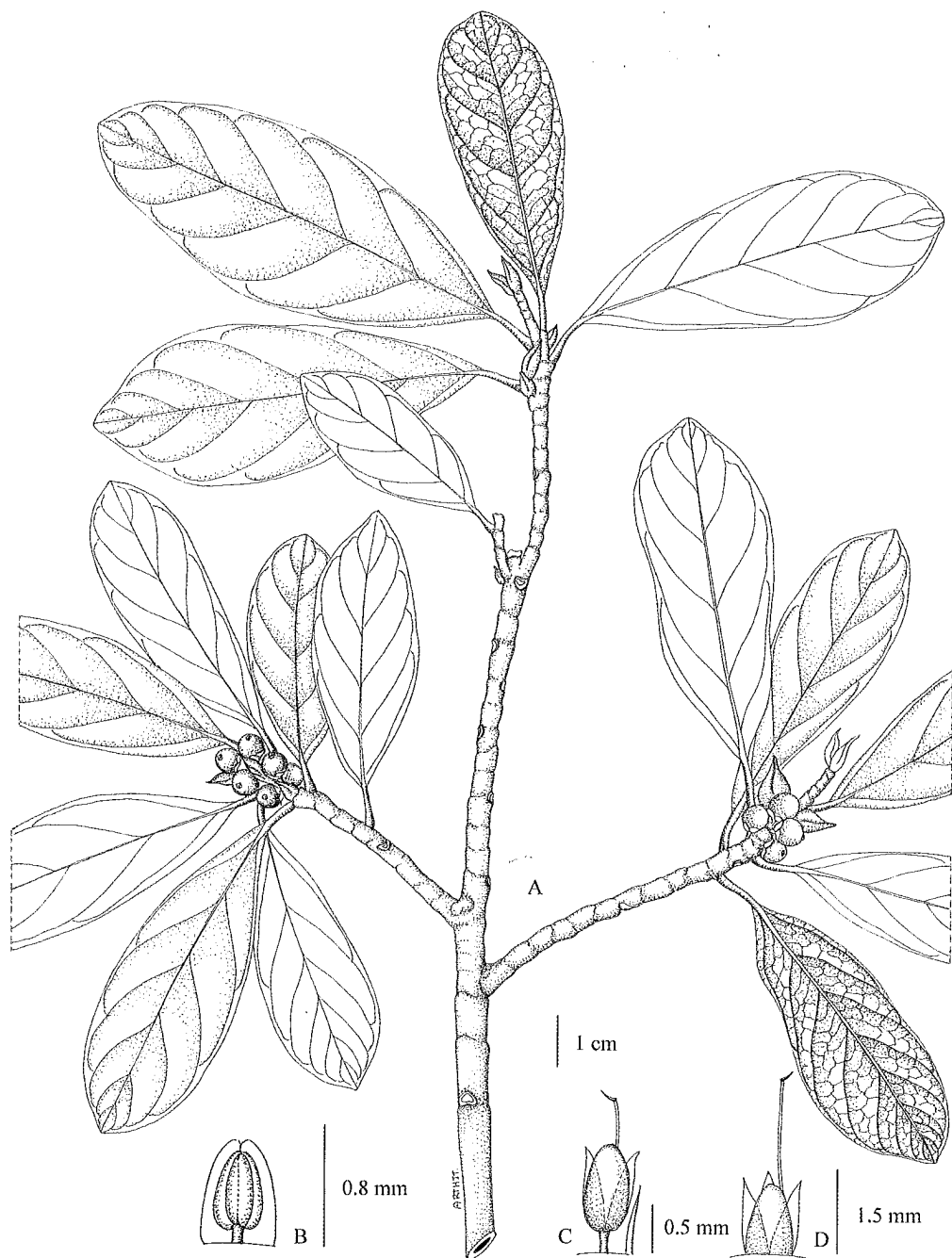


Fig. 41. *Ficus kochummeniana* C.C. Berg: A. leafy twig with figs; B. staminate flower; C. short-styled flower and interfloral bract; D. long-styled flower (A: *Smitinand 11965*, BKF; B–D: *Niyomdham 1185*, BKF). Drawn by Arthit Khamkamnoed (A) and Cornelis Berg (B–D).

impressed above, the basal pair distinct, to $1/3-1/2(-2/3)$ the length of the lamina, unbranched (or faintly branched), 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, prominent; waxy gland at the base of the midrib; petiole (0.5–)1–2.5 cm long, 1–2 mm thick, minutely white puberulous, drying brown; stipules 1–2.5 cm long, minutely white puberulous and with dark brown hairs, subsistent. *Figs* axillary, paired (or solitary), often crowded, sessile; basal bracts 3, 2–5 mm long, (sub)equal, with dark brown hairs, glabrescent, persistent; receptacle subglobose, 0.4–0.8 cm diam. when dry, minutely white puberulous or mostly only with dark brown appressed hairs (glabrescent?), orange to red at maturity, apex slightly convex to flat, ostiole 2.5–3 mm diam., flat to slightly prominent, surrounded by a rim, closed, the 3 upper ostiolar bracts fully imbricate; wall (almost) smooth when dry; internal hairs absent. *Tepals* red(dish). *Ovary* reddish to whitish.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Brunei, Indonesia (Sumatra, Kalimantan-type).

E c o l o g y.— Peat swamp forest.

N o t e.— In Thailand, the stipules are always subsistent.

URO25. *Ficus kurzii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 47, t. 57. 1887; Kochummen, Tree Fl. Malaya 3: 149. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 662. 2005.— *F. nuda* Miq. var. *macrocarpa* Kurz, Forest Fl. Burma 2: 446. 1877. Plate LXXIII: 2.

Tree to 32 m tall, hemi-epiphytic, secondarily terrestrial with copious aerial roots from the branches. *Branches* drying brown. *Leafy twigs* 2–4 mm thick, \pm angular to subterete, glabrous; periderm flaking off. *Leaves* spirally arranged; lamina elliptic to oblong, 4–10(–12) by 1.5–4.5(–5) cm, coriaceous, apex (short-)acuminate to subacute, base cuneate to rounded, margin \pm revolute towards the base; both surfaces glabrous; midrib \pm prominent above, lateral veins 8–10 pairs, the basal pair \pm distinct, to $1/8-1/5(-1/3)$ the length of the lamina, unbranched, tertiary venation largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.5–1.2(–2) cm long, 1–1.5 mm thick, glabrous, drying blackish; stipules 0.5–1(–1.2) cm long, glabrous, caducous, often with a distinct median part and the margins often curling outwards. *Figs* axillary, paired (or solitary), sessile; basal bracts 2 or 3, ca. 0.5 mm long, unequal in size and shape, glabrous, persistent (or caducous?); receptacle subglobose, 0.5–0.8 cm diam. when dry, to 0.4 mm long stipitate or non-stipitate, glabrous, \pm pustulate, dark cherry-red to crimson-purple at maturity, apex slightly convex, ostiole 1–2 mm diam., slightly prominent to flat, open, the 3 upper ostiolar bracts not fully imbricate; wall smooth (but pustulate) when dry; internal hairs absent. *Tepals* red. *Ovary* red.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai; EASTERN: Nakhon Ratchasima; CENTRAL: Saraburi, Nakhon Nayok; SOUTH-EASTERN: Chachoengsao, Chon Buri.

D i s t r i b u t i o n.— Burma (type), S. China, Peninsular Malaysia, Indonesia (Sumatra, Java).

E c o l o g y.— Mixed deciduous and dry evergreen forests, to 1,300 m.

N o t e.— This species resembles both *Ficus benjamina* and *F. stricta* and can be distinguished by the midrib of the lamina being prominent above.

URO26. *Ficus maclellandii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 52, t. 64. 1887; Kochummen, Tree Fl. Malaya 3: 150. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 665. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 29. 2007.— *Urostigma rhododendrifolium* Miq., London J. Bot. 6: 579. 1847.— *Ficus rhododendrifolia* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867, non Kunth & C.D. Bouché, 1847; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 57, t. 58. 1887.— *F. maclellandii* King var. *rhododendrifolia* (Miq.) Corner, Gard. Bull. Singapore 17: 392. 1960.— *F. thorelii* Gagnep., Notul. Syst. (Paris) 4: 97. 1927; Gagnep., Fl. Indo-Chine 5: 781. 1928. Fig. 42.

Tree to 25 m tall, hemi-epiphytic or terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 1.5–2.5 mm thick, \pm angular to subterete, densely to sparsely yellowish puberulous, tomentellous or subsericeous, sometimes only with straight yellowish hairs at the base of the stipules, persistent on the upper stipule scars, mostly conspicuously lenticellate; periderm persistent. *Leaves* spirally arranged; lamina oblong, elliptic, lanceolate or (sub)ovate, 7–13(–21) by 2–5.5 cm, coriaceous, apex acuminate (to subcaudate), base cuneate to rounded, minutely auriculate, margin revolute towards the base or flat; upper surface glabrous, lower surface glabrous or yellowish puberulous to tomentellous on the midrib; midrib (at least the lower part) \pm impressed above, lateral veins 8–14 pairs, the basal pair slightly or not distinct, to 1/20–1/6 the length of the lamina, unbranched, 0–1 pairs of smaller lateral veins below the (main) pair, tertiary venation largely parallel to the lateral veins, slightly prominent beneath; waxy gland at the base of the midrib; petiole (0.5–)1–2(–2.5) cm long, 1–2 mm thick, yellow puberulous to tomentellous or glabrous, drying blackish; stipules 0.5–1(–1.2) cm long, yellowish subsericeous, sometimes with only a few hairs at the base of the stipules (and persisting on the upper stipule scars), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 1–3 mm long, (sub) equal to \pm unequal in size and shape, appressed-puberulous or glabrous, persistent; receptacle subglobose, 0.5–1(–1.1) cm diam. when dry, (sub)glabrous or densely, minutely yellow puberulous to tomentellous, yellow to red or black at maturity, apex convex to flat, ostiole 1.5–2 mm diam., (almost) flat, open, the 3 upper ostiolar bracts not fully imbricate leaving a narrow pore showing the bracts underneath; wall smooth when dry; internal hairs present, abundant to sparse. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— NORTHERN: Chiang Mai, Phayao; SOUTH-WESTERN: Ratchaburi, Prachuap Khiri Khan; CENTRAL: Phra Nakhon Si Ayutthaya, Saraburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Ranong, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Sikkim, Bhutan, NE India, Burma (type), S China (Yunnan), Laos, Vietnam, Peninsular Malaysia (Kedah).

E c o l o g y.— Evergreen and mixed deciduous forests, secondary growth, to 1,000 m.

V e r n a c u l a r.— Sai (ไทร) (Bangkok); sai kra bueang (ไทรกระเบื้อง) (Prachuap Khiri Khan); sai yoi (ไทร้อย) (Lampang); hai tai nga (ไฮใต้ง่า) (Phetchabun).

N o t e s.— This species shows similarities to *F. benjamina* from which it differs in the yellowish indumentum on the stipules and when this indumentum is absent by straight yellowish hairs on the (upper) nodes.

The shape of the lamina and distinctness of the basal lateral veins are rather variable, varying from subovate to lanceolate and from distinct to not so (respectively). Lower branches may only have lanceolate leaves, being relatively long, thus showing a tendency towards leaf dimorphy (see Berg, Thai Forest Bull. (Bot.) 35: 29. 2007).

In young figs the three upper ostiolar bracts are just imbricate; the ostioles may be opened by pollinators as they penetrate.

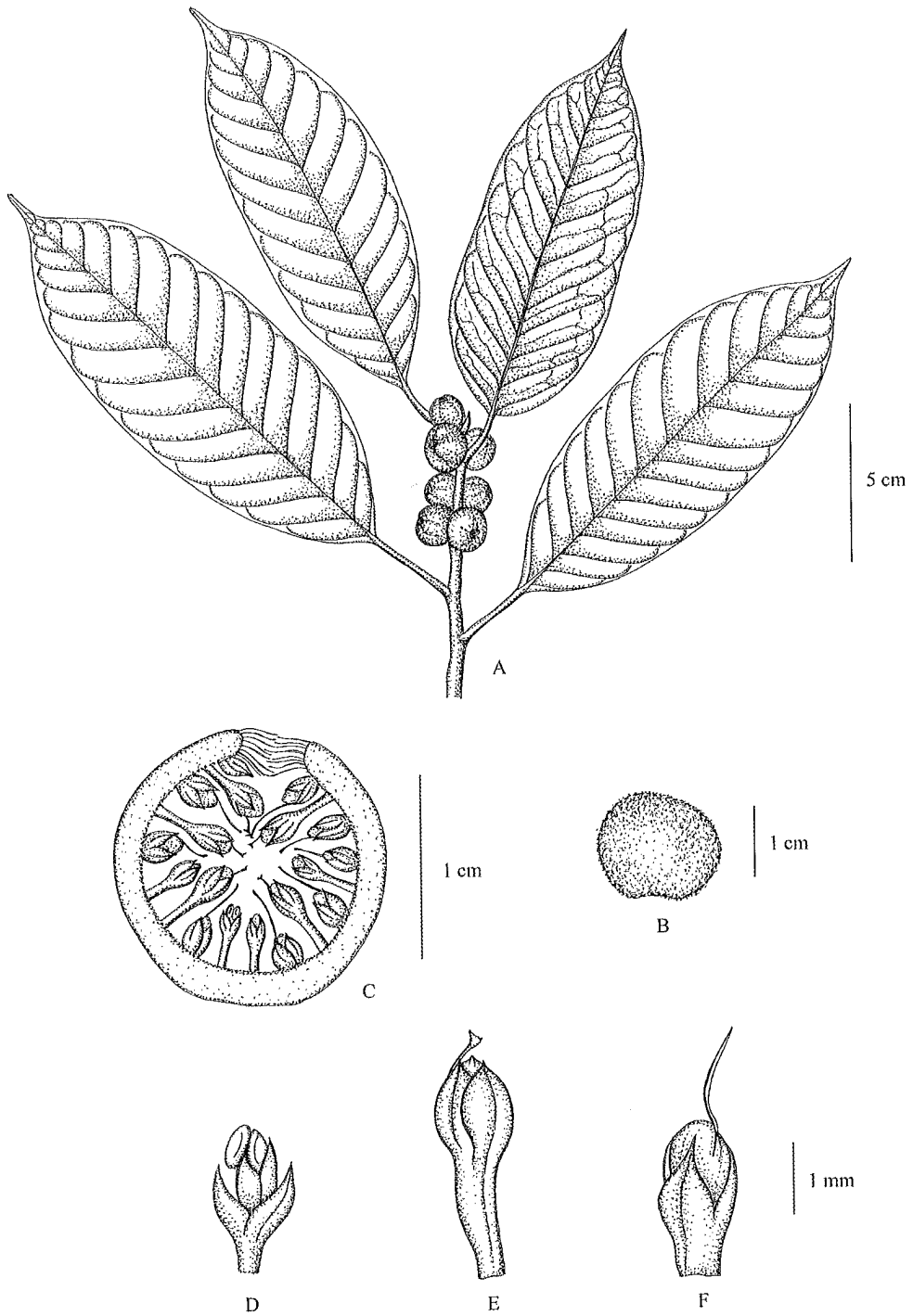


Fig. 42. *Ficus maclellandii* King: A. leafy twig with figs; B. fig; C. opened fig with flowers; D. staminate flower; E. short-styled flower; F. long-styled flower. Drawn by Wattana Tanning.

URO27. *Ficus microcarpa* L.f., Suppl. Pl.: 442. 1782; Corner, Gard. Bull. Singapore 17: 397. 1960; Corner, Revis. Handb. Fl. Ceylon 1, 2: 141, t. 16. 1977; Kochummen, Tree Fl. Malaya 3: 151. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 288. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 666. 2005.— *Urostigma microcarpum* (L.f.) Miq., London J. Bot. 6: 583. 1847.— *Ficus aggregata* Vahl, Enum. Pl. 2: 191. 1805.— *F. rubra* Roth, Nov. Pl. Sp.: 391. 1821, non Vahl, 1805.— *F. littoralis* Blume, Bijdr. Fl. Ned. Ind.: 455. 1825.— *Urostigma littorale* (Blume) Miq. in Zoll., Syst. Verz. 2: 91. 1854.— *U. amblyphyllum* Miq., London J. Bot. 6: 569. 1847.— *Ficus amblyphylla* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867.— *Urostigma pisiferum* Miq., London J. Bot. 6: 580. 1847.— *Ficus retusa* (auct. non L.) Miq. var. *pisifera* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 288. 1867.— *F. retusa* (auct. non L.) Miq., London J. Bot. 6: 582. 1847 (sub *Urostigma*); Kurz, Forest Fl. Burma 2: 444. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 50, t. 61, 62. 1887; Ridl., Fl. Malay Penins. 3: 335. 1924; Gagnep., Fl. Indo-Chine 5: 764. 1928.— *Urostigma accedens* Miq. var. *latifolia* Miq., Fl. Ned. Ind. 1(2): 347. 1859.— *Ficus dilatata* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 218, 288. 1867.— *F. microcarpa* L.f. var. *latifolia* (Miq.) Corner, Gard. Bull. Singapore 17: 398. 1960.— *F. retusiformis* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 8: 549. 1910.— *F. microcarpa* L.f. forma *pubescens* Corner, Gard. Bull. Singapore 17: 398. 1960. Plate LXXIII: 4.

Tree to 25(–30) m tall or shrub (sometimes subscaudent against rock surfaces), hemi-epiphytic (or hemi-epilithic), (secondarily?) terrestrial, with often copious aerial roots on the branches. *Branches* drying brown. *Leafy twigs* 2–3 mm thick, ± angular, glabrous (or minutely white puberulous); periderm mostly flaking off. *Leaves* spirally arranged; lamina oblong, elliptic, subobovate or suborbicular, 2–10(–14) by 1–5(–8) cm, coriaceous, apex short-acuminate (with the acumen usually obtuse), subacute, obtuse or rounded, base cuneate, obtuse or rounded (or subcordate), margin flat or ± revolute towards the base, mostly ± callose towards the base; both surfaces glabrous; midrib flush to slightly prominent or (at least the lower part) ± impressed above, lateral veins (3–)4–8(–10) pairs, the basal pair distinct, to (1/5–)1/4–1/3(–1/2) the length of the lamina, departing 1–2 mm above the base of the lamina, unbranched, straight (or, in broadly elliptic to suborbicular laminae, curved), without smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.5–1(–3) cm long, 1–1.5 mm thick, glabrous (or minutely white puberulous), drying blackish to brown; stipules 0.5–1(–1.5) cm long, often ± involute when dry, glabrous (or minutely white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 2–3 mm long, (sub)equal, glabrous (or minutely white puberulous), persistent or caducous; receptacle subglobose, 0.5–0.8(–1) cm diam. when dry, glabrous (or minutely white puberulous), pink to dark purple at maturity, apex slightly convex to flat, ostiole 1.5–2 mm diam., (almost) flat, open or closed, the 3 upper ostiolar bracts (just) not fully or just fully imbricate, on a low rim; wall smooth; internal hairs present, white, abundant to sparse or absent. *Tepals* red but white or entirely whitish (or reddish) towards the margins. *Ovary* partly (or entirely) red.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Chiang Rai, Lampang, Phitsanulok, Nakhon Sawan; NORTH-EASTERN: Phetchabun, Khon Kaen; EASTERN: Chaiyaphum; SOUTH-WESTERN: Kanchanaburi, Ratchaburi, Prachuap Khiri Khan; CENTRAL: Lop Buri, Saraburi; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Ranong, Surat Thani, Krabi, Nakhon Si Thammarat, Trang, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, India, Sikkim, Bhutan, Bangladesh, Burma, S China, Vietnam, Cambodia, S Japan, Taiwan, Peninsular and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas, Papua),

Philippines, Papua New Guinea, Solomon Islands, and Australia; also Bonin Islands, Christmas Island, Cocos Islands, Carolines (Palau and Truk Islands).

E c o l o g y.— Evergreen, dry evergreen and mixed deciduous forests, also in secondary growth, along beaches, on limestone, to 1,100 m.

V e r n a c u l a r.— Sai krang (ไทรกร่าง) (Kanchanaburi); hai hi (ไฮฮี) (Phetchabun).

N o t e.— A rare form, probably linked to exposed sites (on limestone), is described as forma *pubescens* Corner, and may represent a parallel development in *F. benjamina* (see above).

URO28. *Ficus orthoneura* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 4: 66. 1907; Corner, Gard. Bull. Singapore 21: 10. 1965.— *F. hypoleucogramma* H. Lév. & Vaniot, Feddes Repert. Spec. Nov. Regni Veg. 4: 65. 1907.— *F. caesia* Hand.-Mazz., Anz. Akad. Wiss. Wien, Math.-Nat. 59: 54. 1922.— *F. federovii* W.T. Wang, Acta Phytotax. Sin. 6: 268. 1957.— *F. imenensis* S.S. Chang, Guihaia 4: 118, t. 13. 1984. Plate LXXIII: 5.

Tree to 10(–15) m tall, hemi-epilithic, hemi-epiphytic (?) or terrestrial, deciduous (?). *Branches* drying pale red-brown to greyish. *Leafy twigs* 4–7(–10) mm thick, slightly angular to subterete, glabrous. *Leaves* spirally arranged; lamina (broadly) elliptic to oblong (or subobovate), (7–)10–24 by (4–)5–12 cm, coriaceous, apex rounded to obtuse (or very shortly acuminate with an obtuse acumen), base rounded, obtuse or subcordate, often minutely auriculate, margin \pm revolute; both surfaces glabrous, lower surface glaucous when fresh; cystoliths on both sides (sparse above); lateral veins (7–)10–13 pairs, often furcate away from the margin, the basal pair to ca. 1/10–1/5 the length of the lamina, (faintly) branched or unbranched, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib; petiole (1–)2–5(–9) cm long, 1.5–2.5(–3) mm thick, glabrous, the epidermis persistent; stipules 0.3–0.5 cm long, to 10 cm long at opening of shoots and dark pink, glabrous or minutely white puberulous, caducous. *Figs* axillary or just below the leaves and in pairs or solitary or on spurs to 0.3 cm long on the older wood; peduncle (0.1–)0.3–0.7 cm long; basal bracts 3, 1–2 mm long, glabrous, persistent; receptacle subglobose, when dry (0.6–)0.8–1.2(–1.5) cm diam. and the surface wrinkled, (sub)glabrous, greenish (?) at maturity, apex convex to \pm umbonate, ostiole 2–3 mm diam., open, the upper ostiolar bracts not or partly imbricate, unequal in size; internal hairs absent. *Staminate flowers* scattered. *Tepals* dark red. *Ovary* pale brown (with a dark brown keel).

T h a i l a n d.— NORTHERN: Chiang Mai, Tak; NORTH-EASTERN: Khon Kaen.

D i s t r i b u t i o n.— Burma, S China (type), Vietnam.

E c o l o g y.— Dry evergreen and montane forests, on limestone, to ca. 1,700 m.

V e r n a c u l a r.— Hai hin (ไฮหิน) (Khon Kaen).

N o t e s.— The identity of collection *Smitinand et al. s.n.* (BKF.47646, from Chiang Mai, 1,080 m, oak-dipterocarp forest) is somewhat uncertain, mainly because of the undulate margin of the lamina.

Ramiflory in the species is represented by collection *Suddee et al. 3300* (BKF), from Tak.

URO29. *Ficus pellucidopunctata* Griff., Not. Pl. Asiat. 4: 394. 1854; Griff., Icon. Pl. Asiat. 4: t. 554. 1854; Corner, Gard. Bull. Singapore 17: 394. 1960; Kochummen, Tree Fl. Malaya 3: 153. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 230. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 674. 2005.— *F. gelderi* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 216, 287.

1867.— *F. indica* L. var. *geldereri* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 39, t. 45. 1887; Ridl., Fl. Malay Penins. 3: 334. 1924; Gagnep., Fl. Indo-Chine 5: 778. 1928.— *F. everettii* Elmer, Leaflet. Philipp. Bot. 2: 538. 1908. Plate LXXIV: 1.

Tree to 17(–30) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–3.5 mm thick, ± angular, minutely white puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic (or lanceolate), 5–15(–19) by 1.5–7 cm, coriaceous, apex acuminate, the acumen acute, base cuneate to rounded, margin flat; upper surface glabrous, lower surface rather densely to sparsely minutely white puberulous on the midrib (or glabrous); midrib (at least the lower part) ± impressed above, lateral veins (6–)7–10 pairs, the basal pair ± to hardly distinct, to 1/10–1/4(–1/3) the length of the lamina, unbranched, departing the midrib 2–3 mm above the base of the lamina, 0–1 pairs of smaller lateral veins below the main pair, tertiary largely parallel to the lateral veins, slightly prominent to almost flush beneath; waxy gland at the base of the midrib; petiole 1–1.5 cm long, 1.5–2 mm thick, minutely white puberulous (or glabrous), drying blackish; stipules 1–2 cm long, (minutely) white puberulous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–4 mm long, (sub)equal, minutely white puberulous, persistent; receptacle ellipsoid to oblongoid, 0.6–1 cm diam. and 1–1.8 cm long when dry, glabrous, yellow to red at maturity, apex convex and submammillate, ostiole 2–3 mm diam., ± prominent (by a rim), open, the 3 upper ostiolar bracts not or partly imbricate, the lower ostiolar bracts short, not interlocked, leaving a channel to the fig cavity; wall shrivelled (or almost smooth) when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly (dark) red.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Rayong, Trat; PENINSULAR: Satun, Narathiwat.

D i s t r i b u t i o n.— NE India, Burma (type), Peninsular and Bornean Malaysia, Singapore (?), Brunei (?), Indonesia (Sumatra, Kalimantan), Philippines.

E c o l o g y.— Evergreen and peat swamp forests, at low altitudes.

V e r n a c u l a r.— Sai tok (ไทรตอก) (Narathiwat).

N o t e s.— This species shows strong affinities to *F. subgeldereri* in the hairy stipules and other parts and the ellipsoid to oblongoid fig receptacle. It differs in the ± widely open, small ostioles, the smaller basal bracts, and the usually more numerous lateral veins of the lamina. It differs from (almost) glabrous *F. sundaica* in the open ostiole, and the nearly always minutely puberulous midrib of the lamina beneath.

As the type of *Ficus pellucidopunctata* could not be traced, it is not certain whether the application of this name is correct.

URO30. *Ficus pisocarpa* Blume, Bijdr. Fl. Ned. Ind.: 454. 1825; Corner, Gard. Bull. Singapore 17: 394. 1960; Kochummen, Tree Fl. Malaya 3: 153. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 222. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 674. 2005.— *Urostigma pisocarpum* (Blume) Miq., Fl. Ned. Ind. 1(2): 344. 1859.— *U. cycloneuron* Miq., Fl. Ned. Ind., Eerste Bijv.: 438. 1861; Ann. Mus. Bot. Lugd.-Bat. 3: 264, 287. 1867 (sub *Ficus pseudorubra* Miq.).— *F. cycloneura* (Miq.) King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 31, t. 32. 1887.— *F. microstoma* Wall. ex King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 38, t. 44. 1887; Ridl., Fl. Malay Penins. 3: 334. 1924. Fig. 43. Plate LXXIV: 2.

Tree to 10–30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown

to yellowish. *Leafy twigs* 2–5 mm thick, \pm angular, glabrous (or minutely white puberulous); periderm persistent. *Leaves* spirally arranged; lamina elliptic, oblong, (sub)ovate or (sub)obovate, (3–)5–15(–19) by (1.5–)2.5–8(–9) cm, coriaceous, apex short-acuminate to rounded (to retuse), base obtuse to cuneate (or rounded), margin usually \pm revolute, glabrous (or minutely white puberulous); upper surface glabrous (or minutely white puberulous in the lower part, mainly on and along the midrib), lower surface glabrous (or minutely white puberulous on the midrib or also the lateral veins); lateral veins and midrib (at least the lower part) \pm impressed above, lateral veins (3–)4–6 pairs, the basal pair distinct, to $1/3$ – $1/2$ the length of the lamina, branched, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate or partly parallel to the lateral veins towards the midrib, slightly prominent; waxy gland at the base of the midrib; petiole 0.5–1.5(–2) cm long, 1.5–2.5 mm thick, glabrous (or minutely white puberulous), drying blackish to brown; stipules 0.5–1(–2) cm long, glabrous (or minutely white puberulous), caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–5 mm long, (sub)equal, glabrous (or minutely white puberulous), (faintly) keeled, persistent; receptacle subglobose (to ellipsoid), 0.6–1 cm diam. when dry, glabrous (or sparsely white to brownish puberulous), punctate to subpustulate, orange to red at maturity, apex convex and mammillate, ostiole 2–3 mm diam., prominent by a rim, open, the 3 upper ostiolar bracts not or partly imbricate, the lower ostiolar bracts short, not interlocked, leaving a channel to the fig cavity, the ostiole sometimes closed; wall smooth to slightly shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi; SOUTH-EASTERN: Trat; PENINSULAR: Phangnga, Phuket, Nakhon Si Thammarat, Phatthalung, Satun, Songkhla, Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore (?), Brunei, Indonesia (Sumatra, Java-type, Kalimantan), Philippines.

E c o l o g y.— Evergreen and mangrove forests, to 700 m.

URO31. *Ficus pubilimba* Merr., J. Arnold Arbor. 23: 159. 1942; Kochummen, Tree Fl. Malaya 3: 153. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 676. 2005.— *F. pubilimba* var. *ovata* Corner, Gard. Bull. Singapore 17: 384. 1960. Plate LXXIV: 3.

Tree to 20 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 2–4 mm thick, \pm angular, densely whitish puberulous, glabrescent; periderm persistent (or flaking off). *Leaves* spirally arranged; lamina oblong to elliptic, 4–15(–31) by 1.5–6(–14) cm, coriaceous, apex short-acuminate, base rounded to obtuse (or cuneate or subcordate); upper surface whitish puberulous on the midrib or also on the lateral veins, lower surface \pm densely whitish puberulous; cystoliths absent or few above; midrib (almost) flush above, lateral veins (4–)6–8(–9) pairs, the basal pair distinct, to $(1/6)$ – $1/4$ – $1/3$ the length of the lamina, faintly branched or unbranched, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, \pm prominent; waxy gland at the base of the midrib; petiole 1–2(–4.5) cm long, 1.5–2.5 mm thick, \pm densely whitish puberulous, drying brown; stipules 0.5–1.2(–2.5) cm long, whitish puberulous to subsericeous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 0.5–1.5 mm long, \pm unequal in shape, sparsely and minutely puberulous, persistent; receptacle subglobose, when dry 0.5–1 cm diam., sparsely and minutely puberulous, red to purplish at maturity, apex convex to submammillate, ostiole 1.5–2 mm diam., slightly prominent, open, the upper ostiolar bracts not or partly overlapping, leaving space showing ostiolar bracts underneath; wall smooth or ribbed towards the ostiole when dry; internal hairs absent or present (sparse). *Tepals* whitish. *Ovary* partly red.

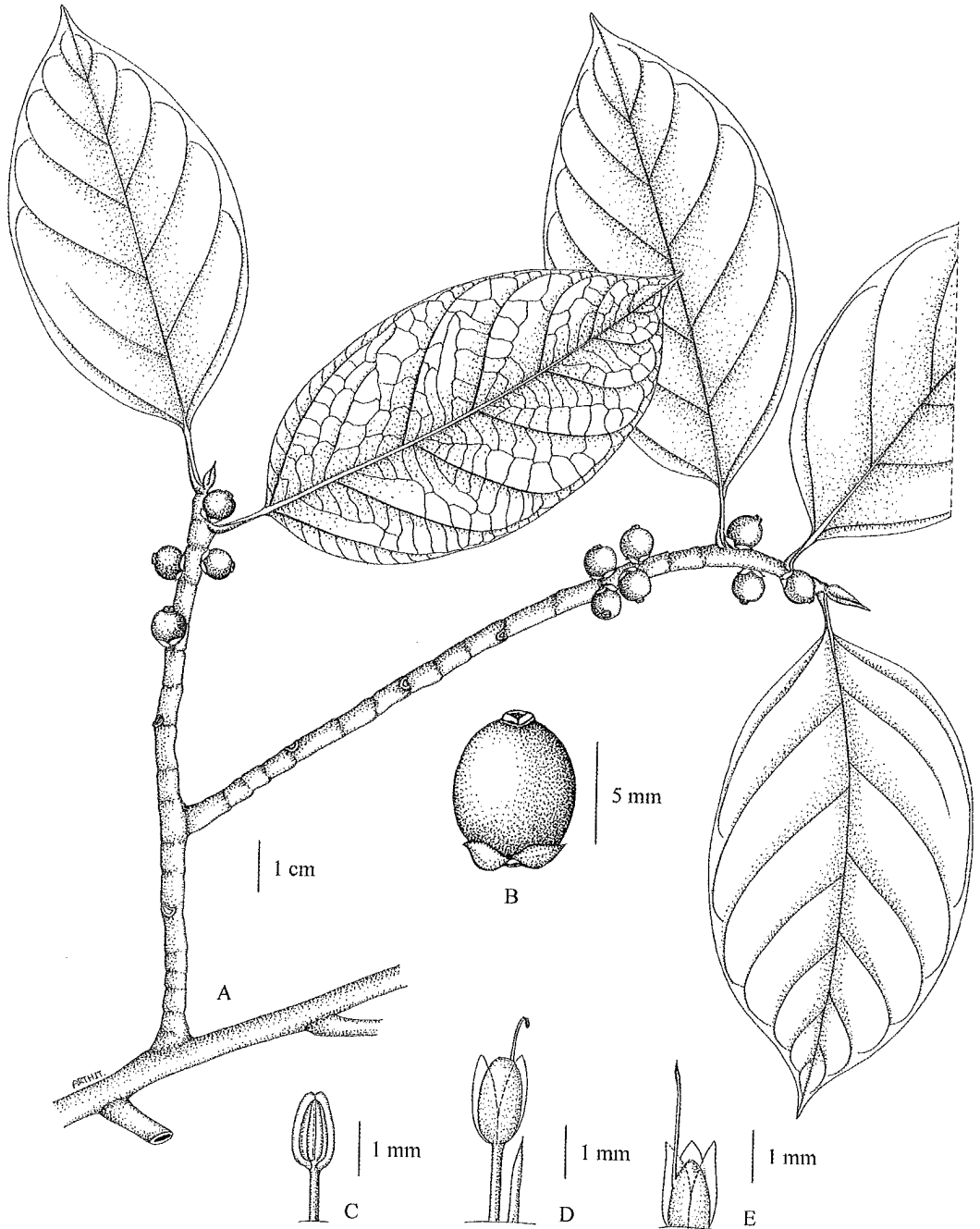


Fig. 43. *Ficus pisocarpa* Blume: A. leafy twigs with figs; B. fig; C. staminate flower; D. short-styled pistillate flowers and interfloral bract; E. long-styled pistillate flower (Nitraserirak 248, BKF). Drawn by Arthit Khamkamnoed (A–B) and Cornelis Berg (C–E).

T h a i l a n d.— NORTH-EASTERN: Phetchabun, Loei, Sakon Nakhon, Khon Kaen; EASTERN: Nakhon Ratchasima; SOUTH-EASTERN: Chon Buri, Chanthaburi; PENINSULAR: Trang, Satun, Songkhla.

D i s t r i b u t i o n.— Sri Lanka, Burma, S China (Hainan), Laos, Vietnam (type), Peninsular Malaysia.

E c o l o g y.— Dry evergreen and deciduous forests, grassland, often along streams, to 1,200 m.

V e r n a c u l a r.— Sai bai khon (ไทรใบขน) (Southern).

N o t e.— When terrestrial (as planted in Royal Forest Department compound, Bangkok), the branches may produce pillar-roots like those of *F. benghalensis*.

URO32. *Ficus religiosa* L., Sp. Pl.: 1059. 1753; Wight, Icon. Pl. Ind. Orient. 6: t. 1967. 1853; Miq., Ann. Mus. Bot. Lugd. Bat. 3: 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 55, t. 67A. 1887; Ridl., Fl. Malay Penins. 3: 337. 1924; Gagnep., Fl. Indo Chine 5: 767. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 608. 2005.— *Urostigma religiosum* (L.) Gasp., Giorn. Bot. Ital. 2: 214. 1844.— *Ficus caudata* Stokes, Bot. Mat. Med. 4: 358. 1812, non Griff., 1854.

Tree to 25(–35) m tall, hemi-epiphytic (or terrestrial as planted tree), deciduous or evergreen. *Branches* drying (reddish-)brown (to blackish). *Leafy twigs* 2–7 mm thick, slightly angular to subterete, (minutely) white puberulous to glabrous. *Leaves* spirally arranged; lamina (broadly) ovate to cordiform, (5–)10–20(–27) by (2.5–)8–13(–17) cm, (sub)coriaceous, apex caudate, the acumen sharp, base cordate to truncate; both surfaces glabrous; cystoliths only below; lateral veins (6–)7–9 pairs, the basal pair to 1/8–1/4 the length of the lamina, mostly branched, tertiary venation reticulate to subscalariform; waxy gland at the base of the midrib; petiole (2.5–)4–12 cm long, 1.5–2 mm thick, glabrous; stipules 0.5–1 cm long, ciliate or glabrous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary), sessile; basal bracts 3, 3–5 mm long, puberulous or only ciliate, often splitting into lobes, persistent; receptacle subglobose, 0.5–0.8(–1) cm diam., 1–1.5 cm diam. when fresh, glabrous, turning from pink to purple to black at maturity, apex convex to flat, ostiole 2–2.5 mm diam., prominent to flat, the upper ostiolar bracts glabrous; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* red. *Ovary* red-brown.

T h a i l a n d.— Throughout the country.

D i s t r i b u t i o n.— Pakistan, N India (type), Nepal, Sikkim, Bhutan, S China, Vietnam; elsewhere in cultivation as ornamental trees, in Asia often as temple trees.

E c o l o g y.— Mostly in cultivation as an ornamental tree in temples, becoming naturalized.

V e r n a c u l a r.— Pu (ปู) (Khmer); pho (โพ), pho si maha pho (โพศรีมหาโพ) (Central); yong (ย่อง) (Shan-Mae Hong Son); sali (สลี) (Northern); Pipal tree, Sacred fig tree.

N o t e.— The natural distribution of the species is not clear. Nearly all collections made in Thailand indicate that the species does not occur naturally in the country. The only collection somewhat doubtful in this respect is *Th. Sorensen et al.* 995 (C), Chiang Mai, Doi Suthep, deciduous forest, 300 m but the species naturalizes in many parts of the country.

URO33. *Ficus rumphii* Blume, Bijdr. Fl. Ned. Ind.: 437. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867; Kurz, Forest Fl. Burma 2: 448. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 54, t. 67B. 1887; Ridl., Fl. Malay Penins. 3: 337. 1924; Gagnep., Fl. Indo-Chine 5: 768. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 609. 2005.— *Urostigma rumphii* (Blume) Miq. in Zoll., Syst. Verz. 2: 90. 1854.— *Ficus cordifolia* Roxb., Fl. Ind. Ed. 1832 3: 548. 1832, non Blume, 1825; Wight, Icon. Pl. Ind. Orient. 2: t. 640. 1843.— *Urostigma cordifolium* (Roxb.) Miq., London J. Bot. 6: 564. 1847.— *Ficus damit* Gagnep., Notul. Syst. 4: 88. 1927; Gagnep., Fl. Indo-Chine 5: 812, f. 93. 1928. Fig. 44.

Tree to 20 m tall or shrub, hemi-epiphytic or terrestrial, deciduous. *Branches* drying brown to yellowish. *Leafy twigs* 2–5 mm thick, slightly angular to subterete, glabrous or (minutely) white puberulous (on the stipule scars and petiole bases); periderm flaking off. *Leaves* spirally arranged; lamina (broadly) ovate (to elliptic), (3–)5–16 by (3–)4–12 cm, (sub) coriaceous, apex acuminate to acute, the acumen sharp, base truncate, subcordate or broadly cuneate, often slightly decurrent; both surfaces glabrous; cystoliths only below; lateral veins 6–8 pairs, the major basal pair to 1/3–1/2 the length of the lamina, mostly branched, always with a pair of smaller basal lateral veins (unbranched or faintly branched) below the major pair, the other lateral veins sometimes forked away from the margin, tertiary venation reticulate to subscalariform; waxy gland at the base of the midrib, above the bases of the minor basal lateral veins; petiole (2.5–)4–6(–9) cm long, 1.5–2 mm thick, glabrous; stipules (0.5–)1–3.5 cm long, glabrous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary), sessile; basal bracts (2–)3, 1–2 mm long, glabrous, persistent; receptacle subglobose, 0.9–1.2(–1.5) cm diam. when dry and the surface often wrinkled, ca. 1.5–2 cm diam. when fresh, glabrous, turning from pink to purple to black at maturity, apex convex to concave, ostiole 2–2.5 mm diam., flat, the upper ostiolar bracts glabrous; internal hairs absent. *Staminate flowers* scattered. *Tepals* (dark) red. *Ovary* white.

T h a i l a n d.— NORTHERN: Mae Hong Son, Chiang Mai, Lampang; NORTH-EASTERN: Sakon Nakhon; EASTERN: Si Sa Ket; SOUTH-WESTERN: Prachuap Khiri Khan; CENTRAL: Saraburi; SOUTH-EASTERN: Chon Buri; PENINSULAR: Phangnga, Songkhla, Pattani.

D i s t r i b u t i o n.— Cocos Islands, Pakistan, Nepal, Bhutan, India (Peninsular, north-eastern, Nicobar and Andaman Islands), Bangladesh, Burma, Laos, Vietnam, Cambodia, Peninsular Malaysia, Indonesia (Java-type, Lesser Sunda Islands, Sulawesi, Moluccas).

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests; at low altitude; also planted as a temple tree (in place of *F. religiosa*).

V e r n a c u l a r.— Pho khi nok (โพขี้นก), pho tua phu (โพต้าวู้), pho prasat (โพประสาท) (Central).

URO34. *Ficus saxophila* Blume, Bijdr. Fl. Ned. Ind.: 437. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 260, 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 17, t. 12. 1887; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 610. 2005; Thai Forest Bull. (Bot.) 35: 22. 2007.— *Urostigma saxophilum* (Blume) Miq., Fl. Ned. Ind. 1(2): 333. 1859.— *Ficus cardiophylla* Merr., Univ. Calif. Publ. Bot. 13: 129. 1926; Corner, Gard. Bull. Singapore 21: 7. 1965.— *F. bonii* Gagnep., Notul. Syst. (Paris) 4: 86. 1927; Fl. Indo-Chine 5: 767. 1928.

subsp. **cardiophylla** (Merr.) C.C. Berg, Thai Forest Bull. (Bot.) 35: 23. 2007.— *Ficus cardiophylla* Merr., Univ. Calif. Publ. Bot. 13: 129. 1926; Corner, Gard. Bull. Singapore 21: 7. 1965.— *F. bonii* Gagnep., Notul. Syst. (Paris) 4: 86. 1927; Gagnep., Fl. Indo-Chine 5: 767. 1928. Plate LXXIV: 4.

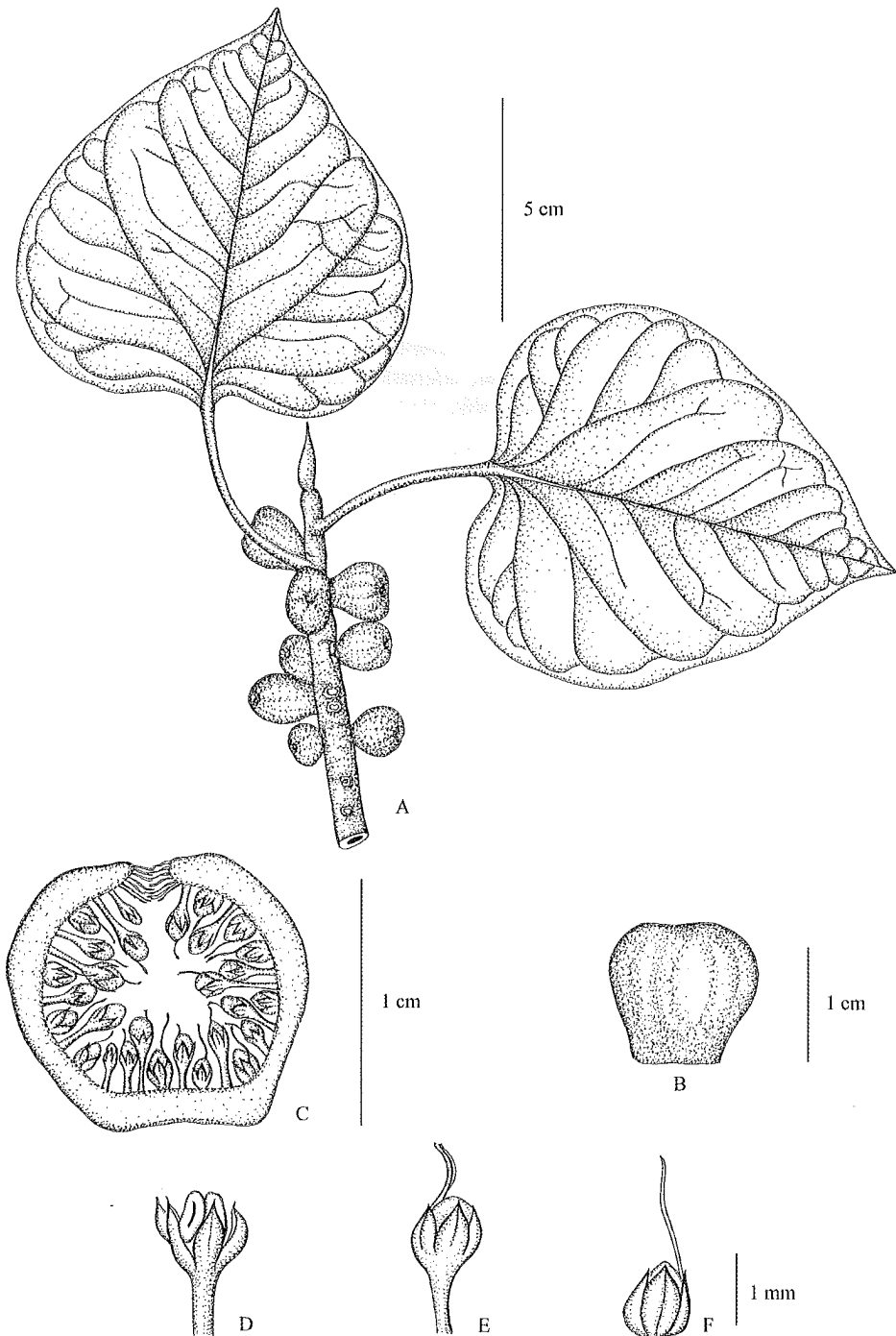


Fig. 44. *Ficus rumphii* Blume: A. leafy twig with figs; B. fig; C. opened fig with flowers; D. staminate flower; E. short-styled flower; F. long-styled flower. Drawn by Wattana Tanning.

Shrub, sometimes scandent, or tree to 6 m tall, hemi-epilithic (or hemi-epiphytic), secondarily terrestrial. *Branches* drying red-brown to blackish. *Leafy twigs* 1–3 mm thick, slightly angular to subterete, white puberulous. *Leaves* spirally arranged; lamina ovate to subovate (or elliptic or oblong), 2.5–12 by 2–7.5 cm, (sub)coriaceous, apex acuminate, the acumen acute, base cordate, cordulate or rounded; both surfaces glabrous; cystoliths only below; lateral veins 3–6 pairs, the basal pair to 1/4–1/2 the length of the lamina, branched, tertiary venation reticulate; waxy gland at the base of the midrib; petiole 1.5–4.5 cm long, ca. 1 mm thick, glabrous or sparsely minutely white puberulous, mainly at the base; stipules 0.3–1(–1.5) cm long, ± densely white puberulous, caducous. *Figs* axillary or just below the leaves, in pairs (or solitary), sessile; basal bracts 3, 1–3 mm long, white puberulous and/or ciliolate, persistent; receptacle subglobose, 0.4–0.7 cm diam. when dry, glabrous or minutely white puberulous, red at maturity, apex convex to flat, ostiole 1–1.5 mm diam., prominent, the upper ostiolar bracts (minutely white puberulous and/or) ciliolate; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* dark red. *Ovary* dark red-brown.

T h a i l a n d.— CENTRAL: Lop Buri, Saraburi; PENINSULAR: Chumphon.

D i s t r i b u t i o n.— China (Guangxi), Vietnam (type).

E c o l o g y.— Mixed deciduous forest and scrub, on limestone, at low altitudes.

N o t e s.— The typical subspecies which has a larger lamina is Malesian. The status of some collections from Vietnam with laminas of similar size, but with longer petioles is not clear.

URO35. *Ficus stricta* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 266, 288. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 44, t. 53. 1887; Gagnep., Fl. Indo-Chine 5: 758. 1928; Kochummen, Tree Fl. Malaya 3: 157. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 679. 2005.— *Urostigma strictum* Miq., Pl. Jungh. 50. 1851; Miq. in Zoll., Syst. Verz. 2: 91. 1854.— *Ficus microcarpa* L.f. var. *eubracteata* Corner, Gard. Bull. Singapore 17: 398. 1960. Plate LXXIV: 5.

Tree to 30 m tall, hemi-epiphytic (?) or (secondarily?) terrestrial. *Branches* drying brown to greyish to blackish, often distinctly lenticellate. *Leafy twigs* 2–3 mm thick, ± angular, glabrous (or minutely white puberulous); periderm often flaking off. *Leaves* subdistichous; lamina elliptic, oblong or (sub)ovate, 8–14 by 3.5–6 cm, coriaceous, apex shortly acuminate, base cuneate to rounded, margin flat, often callose towards the base; both surfaces glabrous; midrib slightly impressed, lateral veins 10–14(–16) pairs, the basal pair not or ± hardly distinct, to 1/10–1/6 the length of the lamina, unbranched, tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 0.9–1.8 cm long, ca. 2 mm thick, glabrous, drying pale brown; stipules 1.5–3 cm long, glabrous, often drying pale brown (to blackish), caducous, often involute when dry. *Figs* axillary, paired (or solitary), sessile, initially enclosed in calyptrate bud covers to 0.7 cm long; basal bracts 3, 4–6 mm long, unequal in size and shape, glabrous, persistent; receptacle subglobose, (0.8–)1–1.8 cm diam. when dry, glabrous (or sparsely minutely puberulous), yellow to orange to dark red (or pink to purple) at maturity, apex convex to slightly concave, ostiole 1.5–2 mm diam., ± prominent, ± open, the upper ostiolar bracts usually not fully imbricate, glabrous; wall ± shrivelled when dry; internal hairs absent. *Tepals* (partly) red. *Ovary* partly red to whitish.

T h a i l a n d.— NORTHERN: Chiang Mai, Lampang; CENTRAL: Nakhon Nayok; PENINSULAR: Nakhon Si Thammarat, Songkhla, Narathiwat.

D i s t r i b u t i o n.— India (Andaman Islands), S China?, Vietnam, Peninsular Malaysia, Singapore, Indonesia (Sumatra, Java-type).

E c o l o g y.— Dry evergreen and evergreen forests, on sandstone, to ca. 800 m.

N o t e s.— This species differs from *Ficus benjamina* in the size of the bracts, mostly 5–8 mm long. When sterile, it can usually be distinguished by the longer stipules, mostly 1.5–2.5 cm long.

Bänzinger 1082 (L) from Chiang Rai, S of Mae Sai, at 1,000 m, in rugged limestone terrain, is not included in the present description. It differs from other collections in the rounded to subcordate base and shortly and bluntly acuminate to rounded apex of the lamina, the small figs, 0.7–0.8 cm diam. when dry, the 3–4 mm long basal bracts, and the short, to 1 cm long, minutely white puberulous stipules.

URO36. *Ficus subcordata* Blume, Bijdr. Fl. Ned. Ind.: 440. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 184. 1887; Corner, Gard. Bull. Singapore 17: 395. 1960; Kochummen, Tree Fl. Sabah & Sarawak 3: 242. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 680. 2005.— *Urostigma subcordatum* (Blume) Miq., Fl. Ned. Ind. 1(2): 349. 1859.— *Urostigma balicum* Miq., Fl. Ned. Ind. 1(2): 348. 1859.— *Ficus balica* (Miq.) Boerl., Handl. Fl. Ned. Ind. 3: 369. 1900, non Miq., 1859.— *F. garciniifolia* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 218, 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 43, t. 51B. 1887.— *F. calophylloides* Elmer, Leafl. Philipp. Bot. 4: 1246. 1911; Gagnep., Fl. Indo-Chine 5: 765. 1928.— *F. subcordata* Blume var. *malayana* Corner, Gard. Bull. Singapore 17: 396. 1960.— *F. polygramma* Corner, Gard. Bull. Singapore 17: 399. 1960. Plate LXXIV: 6.

Tree to ca. 30 m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish (to blackish) or yellowish. *Leafy twigs* 2–4 mm thick, ± angular, minutely white puberulous to glabrous; periderm flaking off. *Leaves* spirally arranged to subdistichous; lamina elliptic to oblong, (6–)8–20 by (2.5–)3–9 cm, coriaceous, apex (short-)acuminate to rounded, base rounded to obtuse (to cuneate or subcordate), margin flat or slightly revolute towards the base, often callose (towards the base); both surfaces glabrous; midrib (almost) flush, lateral veins 8–16(–20) pairs, the basal pair ± to hardly distinct, to 1/10–1/3 the length of the lamina, unbranched tertiary venation parallel to the lateral veins; waxy gland at the base of the midrib; petiole 1.5–3(–5) cm long, (1–)2–3 mm thick, glabrous, drying brown to blackish; stipules (1–)1.5–3(–4) cm long, (minutely) white puberulous or (sub)glabrous, drying pale brown to straw-coloured or dark brown (or blackish), caducous, often involute when dry. *Figs* axillary, paired (or solitary), sessile; basal bracts 2 or 3, 2–5 mm long, unequal in size and shape to subequal, glabrous or puberulous, persistent; receptacle ellipsoid, ovoid or cylindrical, 1.2–2.5 cm diam. and to 4 cm long when dry, glabrous, yellow, red or black at maturity, apex convex, ostiole ca. 2 mm diam., prominent, open (or closed), the 3 upper ostiolar bracts partly imbricate (or fully imbricate); wall rather thick, ± shrivelled or ribbed to almost smooth when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— SOUTH-EASTERN: Chanthaburi; PENINSULAR: Surat Thani, Nakhon Si Thammarat, Narathiwat.

D i s t r i b u t i o n.— Vietnam, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Java-type, Lesser Sunda Islands, Kalimantan, Sulawesi, Papua?), Philippines, Papua New Guinea, Solomon Islands, New Hebrides.

E c o l o g y.— Evergreen forest, at low altitudes.

URO37. *Ficus subgeldereri* Corner, Gard. Bull. Singapore 17: 386. 1960; Kochummen, Tree Fl. Malaya 3: 157. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 222. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 681. 2005.

Tree to 15(–30) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying greyish to brown. *Leafy twigs* 2–4 mm thick, ± angular, (minutely) whitish puberulous; periderm persistent. *Leaves* spirally arranged; lamina oblong to elliptic (or subobovate), 4–18 by 2–8 cm, coriaceous, apex (short-)acuminate to subacuminate, the acumen (sub)acute to obtuse, base cuneate to obtuse (or rounded); upper surface minutely whitish puberulous on (the lower part of) the midrib to glabrous, lower surface (minutely) whitish puberulous on the midrib or also on the lateral veins or glabrous; cystoliths on both sides; midrib slightly impressed above (in the lower part of the lamina), lateral veins (2–)4–6(–7) pairs, the basal pair distinct, to 1/4–1/2(–2/3) the length of the lamina, (sparsely and faintly) branched or unbranched, departing the midrib 2–5 mm above the base of the lamina, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate, ± prominent beneath; waxy gland at the base of the midrib; petiole 1–2.5(–4) cm long, 2–2.5 mm thick, (sparsely) whitish puberulous or glabrous, drying blackish or brown, sometimes with a waxy layer; stipules (0.5–)1–2 cm long, densely (to rather sparsely) whitish to yellowish (sub)sericeous to (minutely) puberulous, caducous, often with a distinct median part. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, (4–)5–7 mm long, ± unequal, 1 (or 2) with a distinct median part, puberulous (on the whole outer surface or only on the median part) or glabrous, persistent; receptacle ellipsoid, ovoid or subglobose (to depressed-globose), 0.8–1.3 cm diam. when dry, glabrous or sparsely puberulous, orange to red at maturity, apex slightly convex, ostiole ca. 4 mm diam., flat, ± open, the 3 upper ostiolar bracts partly imbricate; wall (except for the apical part) ± shrivelled when dry; internal hairs absent. *Tepals* red to pinkish. *Ovary* partly red (or entirely whitish).

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular and Bornean Malaysia, Singapore (type), Brunei, Indonesia (Sumatra, Kalimantan).

E c o l o g y.— Evergreen and peat swamp forests, at low altitudes.

N o t e.— This species is closely related to *F. sumatrana*, from which it differs in the ovoid to ellipsoid fig receptacle, to *F. sundaica*, from which it differs in the presence of hairs on the stipules, basal bracts, etc., and to *F. pellucidopunctata*, from which it differs in the slightly open ostiole, the larger basal bracts and smaller number of lateral veins.

URO38. *Ficus subpisocarpa* Gagnep., Notul. Syst. 4: 95. 1927; Gagnep., Fl. Indo-Chine 5: 769. 1928; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2). 611. 2005; C.C. Berg, Thai Forest Bull. (Bot.) 35: 23. 2007. LXXV: 1–2.

Tree to 7 m tall or shrub, hemi-epilithic or terrestrial, deciduous (?). *Branches* drying (red-)brown to dark grey. *Leafy twigs* (1.5–)3–7 mm thick, subterete, subglabrous or more or less densely whitish puberulous. *Leaves* spirally arranged; lamina oblong, elliptic or (sub)ovate, (4–)6–16(–24) by (1.5–)3–9(–13) cm, (sub)coriaceous, apex (short-)acuminate, the acumen mostly blunt, base truncate to obtuse (or cuneate); both surfaces glabrous; cystoliths only below; lateral veins 7–10(–11) pairs, often forked away from the margin, the basal pair to ca. 1/10–1/4 the length of the lamina, unbranched, tertiary venation reticulate to partly parallel to the lateral veins; waxy gland at the base of the midrib, in dry material often in a groove at the base of the midrib; petiole (1.5–)2.5–5(–9) cm long, minutely puberulous at the base (or the whole petiole puberulous) or glabrous and then the epidermis often flaking off at the base of the petiole, if puberulous, then usually persistent; stipules 0.3–0.7 (on opening shoots to 5) cm long, densely (to sparsely) whitish puberulous to subtomentose, caducous or subpersistent and (usually)

forming an ovoid (to subglobose) terminal bud. *Figs* 1–3 together on curved spurs to 0.5 cm long on the older wood; peduncle 0.3–0.7(–0.9) cm long, rather sparsely minutely whitish puberulous or glabrous; basal bracts 3, 3–5 mm long, (sub)glabrous, caducous; receptacle subglobose to subpyriform, 0.5–0.8 cm diam. when dry and the surface wrinkled, (sub)glabrous, turning from white through pink and purple to black at maturity, apex convex to flat, ostiole 2–3 mm diam., ± prominent to flat, the upper ostiolar bracts glabrous; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* reddish. *Ovary* red-brown.

N o t e.— Two subspecies can be recognised on the basis of features of the base of the petiole.

a. subsp. subpisocarpa — *Ficus superba* (Miq.) Miq. var. *japonica* Miq., Prolus. Fl. Jap.: 132. 1866/67.

Leafy twigs (sub)glabrous; petiole glabrous, its epidermis flaking off at the base; stipules sparsely (to densely) whitish puberulous.

T h a i l a n d.— NORTH-EASTERN: Nakhon Phanom.

D i s t r i b u t i o n.— Southern Japan, eastern continental China, Taiwan, Vietnam (type), Cambodia, Indonesia (Moluccas: Ceram).

E c o l o g y.— Dry evergreen forest, at low altitudes.

b. subsp. pubipoda C.C. Berg, Thai Forest Bull. (Bot.) 35: 24. 2007.

Leafy twigs ± densely whitish puberulous; petiole minutely whitish puberulous at the base (or the whole petiole puberulous), the epidermis (usually) persistent; stipules ± densely puberulous.

T h a i l a n d.— NORTHERN: Chiang Mai, Tak, Lamphun, Phrae, Phitsanulok; NORTH-EASTERN: Loei, Udon Thani, Mukdahan; EASTERN: Chaiyaphum, Nakhon Ratchasima; SOUTH-WESTERN: Ratchaburi, Phetchaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chon Buri, Trat; PENINSULAR: Ranong, Surat Thani, Krabi, Satun, Songkhla.

D i s t r i b u t i o n.— Vietnam, Cambodia, Peninsular Malaysia (Kedah, Perak, Perlis).

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests, often on limestone ridges along seashore, to 1,400 m.

URO39. *Ficus sumatrana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 263, 287, t. 10B. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 40, t. 35B. 1887; Kochummen, Tree Fl. Malaya 3: 158. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 223. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 682. 2005.— (?) *Urostigma rigidum* Miq., London J. Bot. 6: 578. 1847.— *Ficus rigida* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867, non Jack, 1822, nec Blume, 1825.— *Urostigma sumatranum* Miq., Pl. Jungh.: 49. 1851.— *Urostigma zollingerianum* Miq. in Zoll., Syst. Verz. 2: 91. 1854.— *Ficus zollingeriana* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 264, 287. 1867.— *Urostigma pseudorubrum* Miq., Fl. Ned. Ind. 1(2): 343. 1849.— *Ficus pseudorubra* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 264, 287. 1867.— *Urostigma monadenum* Miq., Fl. Ned. Ind., Eerste Bijv.: 437. 1861.— *Ficus pseudoacamptophylla* Valetton in Koord. & Valetton, Bijdr. Boomsoort. Java 11: 105. 1906.— *F. rigida* (Miq.) Miq. *trichocalyx* Valetton in Koord. & Valetton, Bijdr. Boomsoort. Java 11: 100. 1906; Koord., Atlas Baumart. Java 4: t. 724. 1916.— *F. indica* L. var. *trichocalyx* (Valetton) Backer, Bekn. Fl. Java 6A: 53.

1848.— *F. sundaica* Blume var. *trichocalyx* (Valeton) Backer & Bakh.f., Fl. Java 2: 35. 1965.— *F. subsumatrana* Gagnep., Notul. Syst. (Paris) 4: 96. 1927; Gagnep., Fl. Indo-Chine 5: 818. 1928.— *F. sumatrana* (Miq.) Miq. var. *subsumatrana* (Gagnep.) Corner, Gard. Bull. Singapore 71: 390. 1960.— *F. sumatrana* (Miq.) Miq. var. *circumscissa* Corner, Gard. Bull. Singapore 17: 390. 1960; Kochummen, Tree Fl. Malaya 3: 158. 1978.— *F. sumatrana* (Miq.) Miq. var. *microsyce* Corner, Gard. Bull. Singapore 17: 390. 1960; Kochummen, Tree Fl. Malaya 3: 158. 1978.— *F. spathulifolia* Corner var. *annamensis* Corner, Gard. Bull. Singapore 17: 392. 1960.— *F. palaquifolia* Corner, Gard. Bull. Singapore 17: 399. 1960.— *F. dulitensis* Kochummen, Gard. Bull. Singapore 50: 205. 1998. Plate LXXV: 3.

Tree to 20(–)30 m tall, hemi-epiphytic, (secondarily?) terrestrial, or lianescent (?). Branches drying brown to greyish. Leafy twigs 1.5–4 mm thick, ± angular, glabrous (minutely) white puberulous; periderm persistent. Leaves spirally arranged; lamina oblong to elliptic, (2–)4–19 by 1.5–9 cm, coriaceous, apex acuminate to subacuminate, the acumen acute (or obtuse), base rounded, obtuse or cuneate, margin flat or slightly revolute towards the base; upper glabrous or minutely white puberulous on (the lower part) of the midrib, lower surface glabrous or (minutely) whitish puberulous on the midrib or also on the lateral veins; midrib ± impressed or flush above, lateral veins (2–)4–7(–9) pairs, the basal pair to 1/6–1/2(–2/3) the length of the lamina, often (faintly and) sparsely branched, departing the midrib 2–5 mm above the base of the lamina, 0–1 pairs of smaller lateral veins below the main pair, tertiary venation reticulate to largely parallel to the lateral veins, almost flush to ± prominent; waxy gland at the base of the midrib; petiole 0.8–2.5(–4) cm long, 1–2.5 mm thick, glabrous, drying blackish to brown, sometimes with a waxy layer; stipules 1–1.5(–2.2) cm long, often with a distinct median part, densely (to rather sparsely) whitish to yellowish (sub)sericeous to (minutely) puberulous (mainly on the thickened median part) or glabrous, caducous. Figs axillary, sessile; basal bracts 3, 2–5(–7) mm long, (sub) equal, often 1 (or 2) with a distinct median part or (faintly) keeled, whitish puberulous (on the whole outer surface or only on the median part) or glabrous; receptacle subglobose to depressed-globose, 0.3–0.8 or 0.8–1.3 cm diam. when dry, glabrous or minutely white puberulous, yellow to red at maturity, apex (slightly) convex, ostiole 1–4 mm diam., slightly prominent (to flat), closed, the 3 upper ostiolar bracts fully imbricate; wall smooth or ± shrivelled (except for the apical part) when dry; internal hairs absent. Tepals red to pinkish. Ovary partly red (or entirely whitish).

Thailand.—NORTHERN: Chiang Mai; SOUTH-WESTERN: Phetchaburi (Kaeng Krachan); SOUTH-EASTERN: Chachoengsao, Trat (Ko Kut); PENINSULAR: Ranong, Phangnga, Phuket, Nakhon Si Thammarat, Phatthalung, Trang, Songkhla, Narathiwat.

Distribution.—Burma, Laos, Vietnam, Cambodia, Peninsular Malaysia and Bornean Malaysia, Singapore, Bornean Malaysia (Sarawak), Indonesia (Sumatra-type, Java, Kalimantan, Sulawesi?), Philippines.

Ecology.—Evergreen and dry evergreen forests, at low altitudes.

Vernacular.—Sai krang (ไทรก๊อง) (Rayong).

Notes.—As indicated in the Flora Malesiana treatment of this species, several forms can be distinguished without clear circumscriptions due to the presence of intermediates. The distribution of the morphological groups of specimens does not help either to formalize the differences, which can be quite prominent in regions such as Thailand. The following forms can be recognised in Thailand:

a. White (minutely) puberulous to subtomentose on the stipules, and mostly also the leafy twigs, the basal bracts, or also the petiole and midrib of the lamina beneath. Lamina with 4–6(–7) pairs of lateral veins, the basal pair mostly 1/4–1/3 the length of the lamina: petiole and stipules often longer than 1.5 cm, the former to 3(–3.5) cm, the latter to 2.5 cm long. Basal bracts (4–)5–8 mm long, fig receptacle (0.6–)0.8–1(–1.3) cm diam.

This form comprises the types of *Urostigma monadenum*, *U. pseudorubrum*, *U. zollingerianum*, *Ficus rigida* (Miq.) Miq. var. *trichocalyx* Valetton, *F. pseudoacampthophylla*, and *F. sumatrana* var. *circumscissa* Corner, and also numerous specimens which have been previously identified as *F. subgelderii* Corner var. *rigida* (Miq.) Corner. It ranges from Vietnam and Laos through Thailand to the Malay Peninsula, Sumatra, Java, and Borneo (Sarawak). It is the most common form of the species in Thailand where two subforms can be distinguished:

a'. Apex of lamina acuminate and the acumen (sub)acute, in Thailand represented by *van Beusekom et al.* 718 (Phangnga), *Geesink et al.* 4902 (Ranong) and 6604 (Trat), *K. Larsen et al.* 33454 (Ranong), *Koyama et al.* T-33902 (Ranong), and *Santisuk* 1244 (Ranong).

a''. Apex of lamina shortly (sub)acuminate and the acumen obtuse, represented by *Kerr* 2743, 16558 (Nakhon Si Thammarat), 17440 (Phuket), and occurring elsewhere in the species range.

b. Glabrous in all parts, but in other features similar to a'. It is represented by the type of *F. subsumatrana* (from Vietnam) and probably also by the (unseen) type of *Urostigma rigidum* (from Peninsular Malaysia). It is known by a single Thai collection, *Parnell et al.* 95-508 (from Phetchaburi), some collections from the Malay Peninsula and N. Sumatra. This form passes more or less clearly into a northern Bornean form (in Flora Malesiana indicated as Form B).

c. Glabrous (or nearly so) in all parts and these smaller than in form b: petioles and stipules mostly to 1.5 cm long; basal bracts 3–5 mm long; fig receptacle mostly 0.3–0.8 cm diam. This form comprises *Ficus sumatrana* var. *microsyce* and *F. dulitensis*. It ranges from Vietnam and Thailand through the Malay Peninsula to Sumatra (Banka), Borneo and the Philippines. The ostiole is sometimes open in this form, but in none of the Thai collections.

Further investigation throughout the range of the species is needed to figure out whether the currently (and also for Flora Malesiana) adopted concept of the species can be maintained.

URO40. *Ficus sundaica* Blume, Bijdr. Fl. Ned. Ind.: 450. 1825; Corner, Gard. Bull. Singapore 17: 389. 1960; Kochummen, Tree Fl. Malaya 3: 158. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 225. 2000; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 684. 2005.— *F. indica* L. var. *sundaica* (Blume) Miq., Pl. Jungh.: 50. 1851; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 287. 1867.— *Urostigma sundaicum* (Blume) Miq., Fl. Ned. Ind. 1(2): 339. 1859.— *Ficus rubescens* Blume, Bijdr. Fl. Ned. Ind.: 453. 1825.— *Urostigma rubescens* (Blume) Miq., Fl. Ned. Ind. 1(2): 338. 1859.— *Ficus rubra* Blume, Bijdr. Fl. Ned. Ind.: 453. 1825, non Vahl, 1805 nec Roth, 1821.— *Urostigma pyrifolium* Miq., Fl. Ned. Ind. 1(2): 338. 1859.— *Ficus pyrifolia* (Miq.) Boerl., Handl. Fl. Ned. Ind. 3: 369. 1900, non Burm.f., 1768, nec Lam., 1788, nec Salisb., 1796.— *F. indica* (auct. non L.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 263, 287. 1867; Kurz, Forest Fl. Burma 2: 442. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 39, t. 45. 1887; Ridl., Fl. Malay Penins. 3: 334. 1924.— *F. korthalsii* Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 215, 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 33, t. 35A. 1887.— *F. korthalsii* Miq. var. *beccariana* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 33. 1887.— *F. sundaica* Blume var. *beccariana* (King) Corner, Gard. Bull. Singapore 17: 389. 1960; Kochummen, Tree Fl. Malaya 3: 158. 1978. Plate LXXV: 4.

Tree to 15(–)35 m tall, hemi-epiphytic, (secondarily?) terrestrial (or climber?). *Branches* drying brown. *Leafy twigs* (2–)3–4(–5) mm thick, \pm angular, glabrous (or minutely white puberulous); periderm persistent. *Leaves* spirally arranged; lamina elliptic, oblong or (sub)ovate, 6–20(–26) by 2–7(–10) cm, (thickly) coriaceous, apex acuminate, the acumen usually acute, base cuneate to rounded, margin flat to slightly revolute (towards the base); both surfaces glabrous; midrib slightly prominent to flush \pm impressed above, lateral veins (4–)5–8(–10) pairs, the basal pair distinct, to 1/5–1/3 the length of the lamina, unbranched or weakly branched, departing the midrib 2–5 mm above the base of the lamina, 0–1(–2) pairs of smaller lateral veins below the main pair, tertiary venation largely parallel to the lateral veins, slightly prominent to flush and then \pm obscure; waxy gland at the base of the midrib; petiole 1–3.5(–4.5) cm long, 2–3 mm thick, glabrous, drying blackish; stipules 1–2.5(–3) cm long, glabrous (or sparsely minutely white puberulous), caducous, often with a distinct median part or \pm keeled. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 4–8 mm long, (sub)equal, (broadly) ovate with an obtuse to subacute apex, often with a distinct median part or \pm keeled, not or only basally imbricate, covering 1/6–1/4 of the receptacle, glabrous, persistent; receptacle ellipsoid, ovoid, obovoid or subglobose, 0.8–1.2(–1.5) cm diam. when dry, glabrous, yellow to red at maturity, apex convex to mammillate or almost flat, ostiole 3–5 mm diam., \pm prominent to flat, closed, the 3 upper ostiolar bracts fully imbricate, only 2 visible or the third barely; wall shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* partly red.

T h a i l a n d.— EASTERN: Ubon Ratchathani; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Nakhon Nayok; SOUTH-EASTERN: Rayong, Trat; PENINSULAR: Surat Thani, Phangnga, Nakhon Si Thammarat, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Burma (?), Vietnam, Cambodia, Peninsular and Bornean Malaysia, Singapore (?), Brunei, Indonesia (Sumatra, Java-type, Kalimantan, Lesser Sunda Islands?), Philippines.

E c o l o g y.— Dry evergreen and evergreen forests, also in bamboo thickets, to 1,100 m.

N o t e s.— This species shares ellipsoid fig receptacles with *F. pellucidopunctata* and *F. subgelderii*, both of which are hairy on the stipules and have ostioles which are more or less open. In *Ficus sumdaica*, the stipules are glabrous, and the ostioles closed; the leafy twigs are sometimes minutely puberulous.

The species is rather variable in the dimensions of the lamina and the length of the petiole.

URO41. *Ficus superba* (Miq.) Miq., Ann. Mus. Bot. Lugd. Bat. 3: 264, 287. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 59, t. 72. 1887; Gagnep., Fl. Indo Chine 5: 773. 1928; Corner, Gard. Bull. Singapore 10 : 287. 1939; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 612. 2005.— *Urostigma superbum* Miq., Pl. Jungh.: 46. 1851.

Tree to 10(–)30 m tall, hemi-epiphytic, deciduous. *Branches* drying pale brown to blackish. *Leafy twigs* (3–)5–12 mm thick, subterete, minutely white puberulous to subglabrous. *Leaves* spirally arranged; lamina oblong, elliptic or (sub)ovate (to lanceolate), (4–)7–25 by (2–)3–13.5 cm, (sub)coriaceous, apex (short-)acuminate, the acumen mostly blunt, base rounded to subcordate (or obtuse to cuneate); upper surface glabrous (or whitish puberulous to subtomentellous on the midrib), lower surface glabrous (or whitish puberulous to subtomentellous on the main veins); cystoliths only below; lateral veins 7–10 pairs, often forked away from the margin, the basal pair to ca. 1/10–1/4 the length of the lamina, unbranched or branched, tertiary venation reticulate to

partly parallel to the lateral veins; waxy gland at the base of the midrib, often in a groove at the base of the midrib in dry material; petiole (2.5–)4–10(–20) cm long, ca. 1.5 mm thick, glabrous (or whitish puberulous to subtomentellous), the epidermis persistent; stipules (0.5–)0.8–1.5 (to 7 on opening shoots) cm long, densely white woolly-tomentose to -subvillous, caducous or subsistent at the apices of the twigs and forming ovoid terminal buds. *Figs* 1–5 together, on curved spurs to 1 cm long on the older wood; peduncle 0.7–1.5 cm long, densely minutely puberulous; basal bracts 3, 3–5 mm long, puberulous, caducous; receptacle subglobose to subpyriform, 0.8–1.5 cm diam. when dry and the surface wrinkled, sparsely minutely puberulous to glabrous, turning from white to pink to purple to black at maturity, apex convex to flat, ostiole 2–3 mm diam., ± prominent, the upper ostiolar bracts glabrous; internal hairs absent. *Staminate flowers* near the ostiole. *Tepals* reddish. *Ovary* red-brown.

T h a i l a n d.— NORTHERN: Nakhon Sawan; SOUTH-WESTERN: Prachuap Khiri Khan; SOUTH-EASTERN: Chon Buri, Rayong; PENINSULAR: Nakhon Si Thammarat, Satun.

D i s t r i b u t i o n.— Vietnam, Cambodia, Peninsular Malaysia, Singapore, Indonesia (Kalimantan: Anamba and Natuna Islands, Java-type, Lesser Sunda Islands, Sulawesi, Moluccas).

E c o l o g y.— Mixed deciduous and coastal forests, often in rocky places, at low altitudes.

URO42. *Ficus talbotii* King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 51, t. 63. 1887; Talbot, For. Fl. Bombay 2: 511, t. 521. 1911; Corner, Gard. Bull. Singapore 21: 19 1965; Corner, Revis. Handb. Fl. Ceylon 1(2): 139, t. 14. 1977; C.C. Berg, Thai Forest Bull. (Bot.) 35: 24. 2007.— *F. pierrei* Gagnep., Notul. Syst. (Paris) 4: 93. 1927; Gagnep., Fl. Indo-Chine 5: 763. 1928.— *F. calcicola* Corner, Gard. Bull. Singapore 17: 392. 1960; Kochummen, Tree Fl. Malaya 3: 142. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 636. 2005. Fig. 45. Plate LXXV: 5–6.

Tree to 22 m tall or shrub, mostly hemi-epilithic, sometimes hemi-epiphytic, deciduous. *Branches* drying brown to blackish. *Leafy twigs* 2–3 mm thick, slightly angular to subterete, brown subtomentose, brown floccose-tomentellous, (minutely) whitish puberulous, or subglabrous; periderm flaking off. *Leaves* spirally arranged to subdistichous; lamina oblong to elliptic, (1–)2–10(–17) by (0.5–)2–5(–9.5) cm, (sub)coriaceous, apex acuminate, base rounded to obtuse, margin flat to slightly revolute; upper surface glabrous or puberulous (or also floccose tomentellous) on the midrib, lower surface sparsely brown puberulous to subtomentose on the midrib or also the lateral veins (brown floccose tomentellous or glabrous); midrib prominent, lateral veins (3–)5–8(–11) pairs, the basal pair ± to hardly distinct, to 1/5–1/3 the length of the lamina, (faintly) branched or unbranched, tertiary venation reticulate (in large leaves to subscalariform), slightly prominent, 0–1 pairs of smaller lateral veins below the main pair; waxy gland at the base of the midrib; petiole 0.5–1.5(–2.2) cm long, 1–2 mm thick, brown puberulous to subtomentose (or brown floccose tomentellous), drying blackish; stipules 0.3–1 cm long, brown subtomentose to (sparsely) puberulous (or only ciliolate), drying brown, caducous. *Figs* axillary or just below the leaves, solitary or paired, sessile (or with a peduncle to 0.2 cm long); basal bracts 3, 1–2 mm long, subequal, puberulous, persistent; receptacle subglobose (to obovoid), 0.5–0.8 cm diam. when dry, glabrous or minutely white puberulous (or densely brown floccose tomentellous), purple at maturity, apex convex to flat, ostiole 1.5–2 mm diam., prominent, closed, the upper ostiolar bracts fully imbricate; wall smooth when dry; internal hairs absent or present, few. *Tepals* (dark) red. *Ovary* partly red.

T h a i l a n d.— NORTHERN: Chiang Mai, Nan, Lampang, Phrae, Sukhothai; NORTH-EASTERN: Khon Kaen; SOUTH-WESTERN: Uthai Thani, Kanchanaburi, Prachuap Khiri Khan;

CENTRAL: Lop Buri, Saraburi, Bangkok; SOUTH-EASTERN: Chon Buri, Trat; PENINSULAR: Phangnga, Songkhla.

D i s t r i b u t i o n.— Sri Lanka, India (type), Burma, S China (Yunnan), Laos, Vietnam, Cambodia, Peninsular Malaysia.

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests, mostly on limestone, sometimes on granite or quartzite cliffs, to 1,100 m.

V e r n a c u l a r.— Hai (ไฮ) (Chiang Mai, Lampang); khan laen (คั้นเหลน) (Trang).

N o t e s.— In Thailand, the form with the floccose tomentellous indumentum, almost the same as that found in *F. consociata*, is rather rare, represented by, e.g. *Pooma et al.* 3820 (Lop Buri). Future morphological and ecological studies of this species should pay attention to this variation in indumentum.

In most Thai specimens, the figs are sessile and the stipules hairy. Stipules which are only ciliate may only occur on opening shoots.

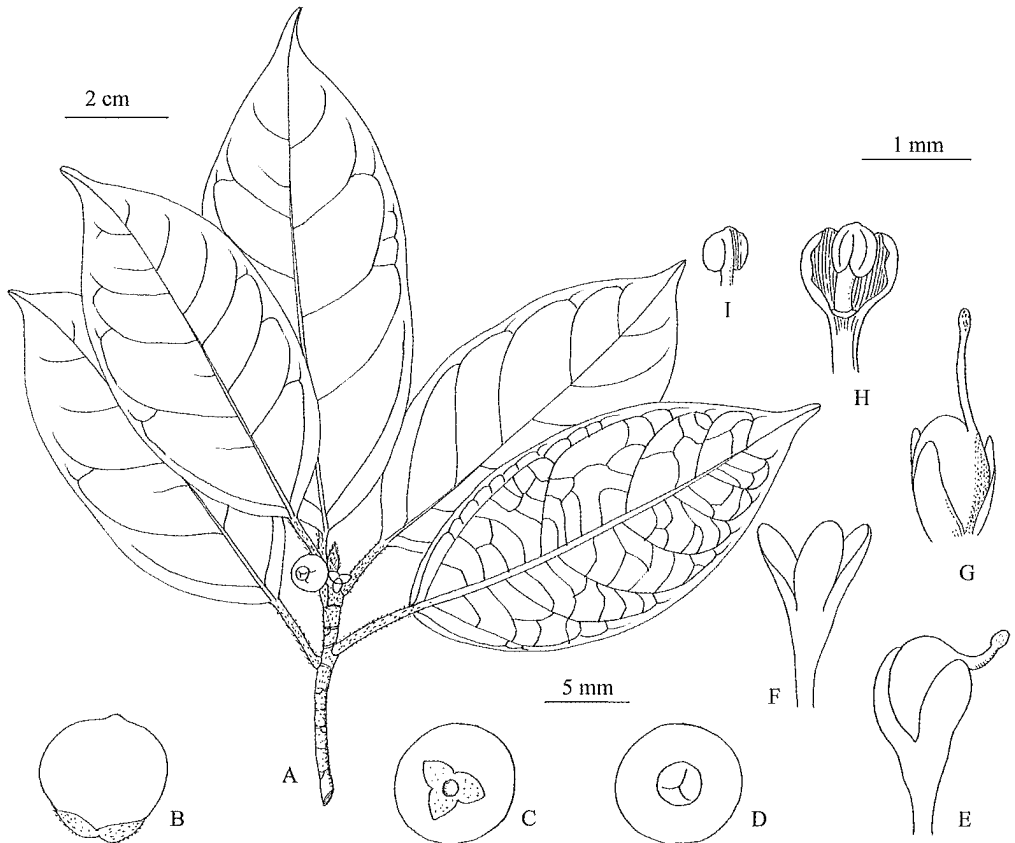


Fig. 45. *Ficus talbotii* King A. leafy twig with fig; B. fig; C. basal bracts; D. ostiole; E. short-styled flower; F. pedicel and perianth of short-styled flower; G. long-styled flower; H. staminate flower; I. stamen (A–G: *SF* 34388; H–J: *Macan* 1738). Courtesy of *Flora Malesiana* ser I, 17(2): 637, fig. 112.

URO43. *Ficus virens* Aiton, Hort. Kew. 3: 451. 1789; Corner, Gard. Bull. Singapore 17: 376. 1960; Corner, Revis. Handb. Fl. Ceylon 128, t. 7. 1977; Kochummen, Tree Fl. Malay 3: 161. 1978; C.C. Berg & Corner, Fl. Males., Ser. 1, Spermat. 17(2): 614. 2005.— *F. infectoria* Roxb., Hort. Bengal.: 66. 1814., non Willd., 1806; Roxb., Fl. Ind. Ed. 1832 3: 551. 1832; Wight, Icon. Pl. Ind. Orient. 2: t. 665. 1843; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 264. 1867; Kurz, Forest Fl. Burma 2: 446. 1877; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 60, t. 75–78. 1887; Ridl., Fl. Malay Penins. 3: 337. 1924; Gagnep., Fl. Indo-Chine 5: 760. 1928.— *Urostigma infectorium* (Roxb.) Miq., London J. Bot. 6: 566. 1847.— *Ficus glabella* Blume, Bijdr. Fl. Ned. Ind.: 452. 1825; Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 265, 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 49, t. 60. 1887; Ridl., Fl. Malay Penins. 3: 336. 1924; Gagnep., Fl. Indo-Chine 5: 759. 1928.— *Urostigma glabellum* (Blume) Miq., Fl. Ned. Ind. 1(2): 340. 1859.— *Ficus virens* Aiton var. *glabella* (Blume) Corner, Gard. Bull. Singapore 17: 377. 1960.— *F. lacor* Buch.-Ham., Trans. Linn. Soc. 15: 150. 1826; C.C. Berg, Thai Forest Bull. (Bot.) 35: 17. 2007.— *F. tenii* H. Lév., Feddes Repert. Spec. Nov. Regni Veg. 6: 112. 1908.

Tree to 10(–35) m tall, hemi-epiphytic, deciduous. *Branches* drying brown to yellowish (or reddish). *Leafy twigs* 2–5 mm thick, ± angular to subterete, glabrous or (minutely) white puberulous. *Leaves* spirally arranged; lamina subovate, oblong, ovate or elliptic (or lanceolate), (4–)8–20(–24) by 2.5–9 cm, (sub)coriaceous, apex acuminate, base rounded to cuneate or subcordate; both surfaces glabrous; cystoliths only below; lateral veins 7–14 pairs, the basal lateral pair to 1/8–1/5 the length of the lamina, unbranched or branched, tertiary venation reticulate to subscalariform; waxy gland at the base of the midrib; petiole (1–)2–4.5(–6) cm long, 1–2 mm thick, glabrous, the epidermis persistent; stipules 0.3–1.5 (to 8 on opening shoots) cm long, glabrous or sparsely to densely puberulous, caducous or subpersistent at the apex of the leafy twigs and then usually forming ovoid terminal buds. *Figs* axillary, just below the leaves, or on spurs to 0.5 cm long on older wood, in pairs, solitary, or (on older wood) to 4 together, sessile or to 0.1 cm long pedunculate; basal bracts 3, 1–3 mm long, ciliolate or not, persistent; receptacle subglobose, 0.4–1 cm diam. when dry and the surface mostly wrinkled, glabrous (or puberulous near the ostiole), turning from white to pink to purple to black at maturity, apex convex to flat, ostiole 1–2 mm diam., flat to ± prominent, the upper ostiolar bracts minutely puberulous on the whole surface or only the margins (or glabrous); internal hairs abundant, chaffy. *Staminate flowers* near the ostiole. *Tepals* reddish. *Ovary* red-brown.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Lampang, Phitsanulok; NORTH-EASTERN: Phetchabun, Loei; EASTERN: Chaiyaphum, Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chachoengsao; PENINSULAR: Phuket, Trang, Satun, Narathiwat.

D i s t r i b u t i o n.— Sri Lanka, Pakistan, India, Bangladesh (?), Nepal, Sikkim, Bhutan, S China, Burma, Laos, Vietnam, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Moluccas, Papua,) Philippines, Papua New Guinea, Caroline Islands, Solomon Islands, Australia.

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests, on limestone, to 1,200 m.

V e r n a c u l a r.— Phak hi (ผักฮี), phak hueat (ผักเหือด) (Northern); phak lueat (ผักเลียด), liap (เลียบ) (Central); phak luet (ผักเลียด) (Southeastern); krang (กร่าง) (Prachuap Khiri Khan); sai (ไทร) (Trang).

N o t e s.— This species has a short peduncle and persistent basal bracts similar to those

of *F. geniculata*, but is distinct in some features mentioned there; in Thailand it is often also distinct by the hairy upper ostiolar bracts and the more clearly acuminate apex of the lamina.

The origin of the material from which the type was grown in England is unknown.

URO44. *Ficus xylophylla* (Miq.) Miq., Ann. Mus. Bot. Lugd.-Bat. 3: 286. 1867; King, Ann. Roy. Bot. Gard. (Calcutta) 1(1): 29, t. 28. 1887; Ridl., Fl. Malay Penins. 3: 332. 1924; Kochummen, Tree Fl. Malaya 3: 162. 1978; Kochummen, Tree Fl. Sabah & Sarawak 3: 317. 2000; C.C. Berg Corner, Fl. Males., Ser. 1, Spermat. 17(2): 683. 2005.— *Urostigma zylophyllum* Wall. ex Miq., London J. Bot. 6: 577. 1847.

Tree to 8(–30) m tall, hemi-epiphytic or (secondarily?) terrestrial. *Branches* drying brown to greyish. *Leafy twigs* 5–11 mm thick, ± angular, glabrous (or sparsely minutely white puberulous, mainly on the stipule scars); periderm persistent. *Leaves* spirally arranged; lamina elliptic, oblong or (sub)obovate (to oblanceolate), 13–25(–35) by 6–13(–17) cm, (thickly) coriaceous, apex rounded to short-acuminate, base obtuse, cuneate or rounded (to subcordate); both surfaces glabrous; cystoliths on both sides; midrib ± impressed (at least the lower part) above, lateral veins 6–8 pairs, the basal pair distinct, to (1/4–)1/3–1/2 the length of the lamina, unbranched, without smaller lateral veins below the main pair, tertiary venation reticulate to subscalariform, ± prominent to flush and then often ± obscure beneath, the smaller veins usually obscure; waxy gland at the base of the midrib; petiole (2–)3–5(–6.5) cm long, 3–5 mm thick, glabrous, drying brown or blackish; stipules 2–4 cm long, ± densely whitish to brownish puberulous, caducous. *Figs* axillary, paired (or solitary), sessile; basal bracts 3, 3–10 mm long, semicircular, almost equal or ± unequal, 2 (or 1) with a distinct median part or keeled, puberulous on the median part or glabrous, persistent; receptacle ellipsoid to subovoid, 2–3.5 cm diam. and 3–5 cm long when dry, (sub)glabrous, yellow to red at maturity, apex ± convex (to submammillate), ostiole 3–4 mm diam., prominent, closed, the 3 upper ostiolar bracts fully imbricate; wall ± shrivelled when dry; internal hairs absent. *Tepals* reddish. *Ovary* red.

T h a i l a n d.—PENINSULAR: Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.—Laos, Peninsular and Bornean Malaysia, Singapore (type), Brunei, Indonesia (Sumatra, Kalimantan).

E c o l o g y.—Evergreen and peat swamp forests, at low altitudes.

V e r n a c u l a r.—Sai yai (ไทรไทรย) (Narathiwat).

Unnamed collection of subject. *Urostigma*

A sterile collection from Huai Sai, Phetchaburi, *Niyomdham 5796*, shows similarities to both *Ficus subpisocarpa* and *F. geniculata*. It differs from collections included in these two taxa in the presence of a whitish tomentose indumentum on the leafy twigs, stipules, petioles from base to apex, and on the midrib of the lamina beneath.

5. HULLETTIA

King ex Hook.f., Fl. Brit. India 5: 547. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 5: 163. 1896; Engl. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 1: 122. 1897; Ridl., Fl. Malay Penins. 3: 358. 1924; Jarrett, J. Arnold Arbor. 41: 334. 1960; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 126. 2006.

Shrubs to small trees, monoecious. *Leaves* spirally arranged; lamina pinnately veined, entire; stipules free, lateral, subulate, subpersistent. *Inflorescences* unisexual, solitary or in pairs in the leaf axils, discoid- to turbinate-capitate, pedunculate, with a row of bracts at the margin of the receptacle (interfloral bracts present in staminate and absent or rudimentary in pistillate ones?). *Staminate flowers* to ca. 30, completely fused and perianths indistinct; stamens 2, filaments partly connate. *Pistillate flowers* 2–6, completely fused and the perianths indistinct; ovaries free, stigma 1, capitate. *Infructescences* subglobose, fleshy, orange to yellow; pericarp crustaceous; seed without endosperm, embryo straight, longitudinally aligned, cotyledons equal, radicle basal, short.

The genus comprises two closely related species and ranges from Sumatra to Burma.

Notes.— Small, to ca. 1 mm long structures on the flowering face of pistillate inflorescences, which are not clearly apices of the perianths, may represent interfloral bracts.

On several parts, such as the leafy twig, petiole and lower surface of the lamina, minute dark brown ellipsoid pluricellular trichomes are abundant.

KEY TO THE SPECIES

1. Midrib of lamina prominent above
1. Midrib of lamina slightly impressed to flush

1. *H. dumosa*
2. *H. griffithiana*

1. *Hullettia dumosa* King ex Hook.f., Fl. Brit. India 5: 547. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 5: 163, t. 197. 1896; Ridl., Fl. Malay Penins. 3: 358 1924; Jarrett, J. Arnold Arbor. 40: 9, f. 2g–k. 1959; 41: 337. 1960; Kochummen, Tree Fl. Malaya 3: 162, t. 8. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 127. 2006.

Shrub or tree to 10 m tall. *Leafy twigs* (2–)3–6 mm thick, densely puberulous. *Leaves* spirally arranged; lamina subobovate to oblong (or oblanceolate), 8–30(–40) by 3–9(–12) cm, coriaceous, apex acuminate, base rounded to cuneate, margin (sub)entire; upper surface glabrous, lower surface glabrous or very sparsely minutely puberulous on the midrib, ± scabrous or smooth; midrib ± prominent above, lateral veins 8–12(–15) pairs, tertiary venation reticulate (to subscalariform); petiole 1–3.5(–5) cm long, sparsely puberulous; stipules 0.3–1(–1.5) cm long, subulate, sparsely puberulous, subpersistent. *Staminate inflorescences* axillary, solitary or paired; peduncle 1–2 cm long, puberulous; receptacle discoid, ca. 1 cm diam., puberulous outside, involucre bracts marginal, ovate, 3–4 mm long, puberulous; perianth ca. 1.5 mm long, puberulous; stamens ca. 3 mm long, filaments connate, anthers ca. 1 mm long; interfloral bracts ovate to linear, puberulous. *Pistillate inflorescences* axillary, solitary or paired; peduncle 1.5–4.5(–5.5) cm long, puberulous; receptacle discoid, ca. 1 cm diam., puberulous outside; involucre bracts ovate, 2–3 mm long, puberulous; flowers ca. 8; perianth 1–1.5 mm long, apex densely minutely puberulous; stigmas clavate, 0.5–1 mm long. *Infructescences* subglobose to discoid, to 5.5 cm diam., with 1–3 fruits, densely puberulous to hispidulous, often ± scabrous, orange at maturity.

T h a i l a n d.— PENINSULAR: Narathiwat (Waeng).

D i s t r i b u t i o n.— Peninsular Malaysia (type), Indonesia (Sumatra).

E c o l o g y.— Evergreen forest, ca. 1,000 m.

2. *Hullettia griffithiana* (Kurz) Hook.f., Fl. Brit. India 5: 547. 1988; King, Ann. Bot. Gard. Calcutta 5: 163. 1896; Jarrett, J. Arnold Arbor. 51: 338. 1960.—*Dorstenia griffithiana* Kurz, J. Asiat. Soc. Bengal 42: 104. 1873. Fig 46. Plate LXXVI: 1.

Shrub or tree to 7 m tall. *Leafy twigs* 4–6 mm thick, densely white puberulous to hispidulous. *Leaves* in spirals; lamina subobovate to oblanceolate, 12–36 by 4–11 cm, coriaceous, apex acuminate, base rounded to cordulate, margin entire, ± revolute, callose; upper surface glabrous, lower surface glabrous or sparsely to densely white puberulous to hispidulous on the veins or only on the midrib, ± scabrous; midrib flush to slightly impressed above, lateral veins 10–16 pairs, tertiary venation reticulate (to subscalariform); petiole 1–2 cm long, white puberulous; stipules 0.3–1(–1.5) cm long, subulate, white puberulous, subsistent. *Staminate inflorescences* axillary, solitary or paired; peduncle 3–4.5 cm long, white puberulous; receptacle discoid, 0.4–1 cm diam., white puberulous outside, involucre bracts marginal, lanceolate, 1.5–4 mm long, densely white puberulous; perianth ca. 1.5 mm long, puberulous; stamens ca. 2–3 mm long, filaments connate, anthers ca. 0.8 mm long; bracts ovate to linear, white puberulous. *Pistillate inflorescences* axillary, solitary or paired; peduncle 6.5–8 cm long, densely white puberulous; receptacle discoid, ca. 1 cm diam., white puberulous outside; involucre bracts lanceolate, to 1.5 cm long, densely white puberulous; flowers ca. 8; perianth ca. 1–1.5 mm long, apex densely white puberulous; stigmas clavate to subulate, 0.5–1.5 mm long. *Infructescences* subglobose to discoid, to 5.5 cm diam., with to 5 fruits, densely white puberulous to velutinous, smooth to scabridulous, orange at maturity.

T h a i l a n d.— PENINSULAR: Ranong, Surat Thani, Narathiwat.

D i s t r i b u t i o n.— Burma (type).

E c o l o g y.— Evergreen forest, at low altitudes.

6. MACLURA

Nutt., Gen. N. Amer. Pl. 2: 233. 1818, nom. cons.; Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 81. 1856; Bureau in DC. Prod. 17: 226. 1873; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1: 74. 1888; Corner, Gard. Bull. Singapore 19: 235. 1962; C.C. Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91: 243. 1986; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 35. 2006.—*Vanieria* Lour., Fl. Cochinch.: 564. 1790.—*Cudrania* Rumph. ex Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 122. 1847, nom. cons.; Bureau, Ann. Sci. Nat. Bot. Sér. 5, 11: 377. 1869; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1: 82. 1888.—*Maclura* Nutt. sect. *Cudrania* (Trécul) Corner, Gard. Bull. Singapore 19: 237. 1962.—*Plecosperrum* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 124. 1847; Corner, Gard. Bull. Singapore 19: 241. 1962.—*Maclura* Nutt. sect. *Plecosperrum* (Trécul) C.C. Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91: 245. 1986.

Climbers, trees or shrubs, dioecious, armed (sometimes only in juvenile specimens) with straight to curved, reduced branchlets ending in a spinose tip. *Leaves* distichous or spirally arranged; lamina pinnately veined; stipules free or fused, lateral to semi-amplexicaul, often very small. *Inflorescences* usually solitary, in the leaf axils or on short-shoots, often with yellow (dye-containing) glands embedded in the bracts and/or the (fruiting) perianths. *Staminate inflorescences* globose-(sub)capitate, spicate, or (sub)racemose; perianth with 4, free or basally connate tepals, decussate, imbricate in the bud; stamens 4 (or 3), straight or inflexed in the bud. *Pistillate inflorescences* globose-capitate; flowers free or connate; tepals free or connate, decussate, imbricate in the bud; ovary free or the lower part adnate to the perianth, stigmas 2, mostly clearly unequal in length, or 1. *Fruiting perianth* enlarged, more or less fleshy; fruit free

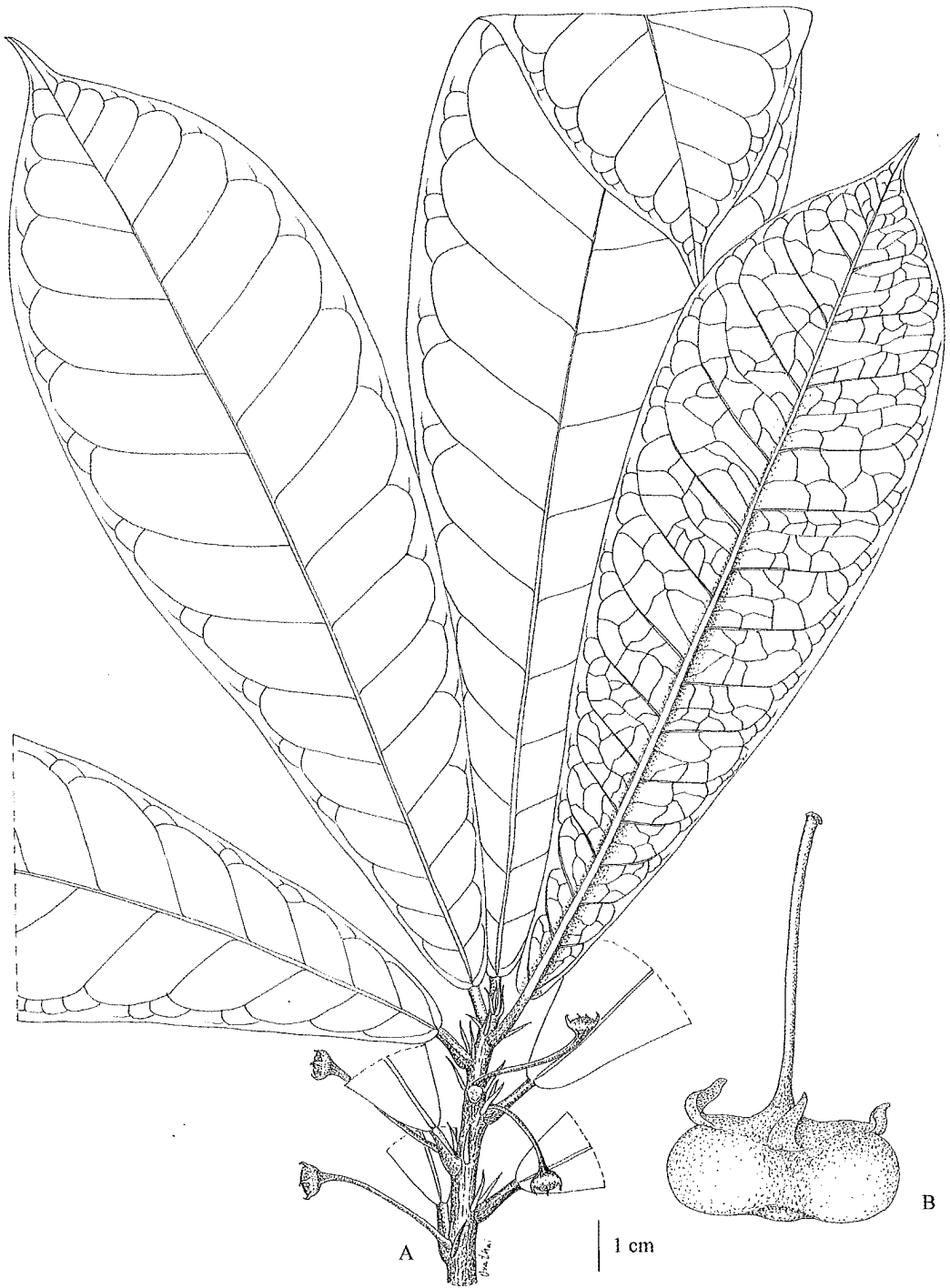


Fig. 46. *Hullettia griffithiana* (Kurz) Hook.f.: A. leafy twig with staminate inflorescences; B. infructescence (A: Niyomdham 1266, BKF; B: Wongprasert *et al.* 58, BKF). Drawn by Orathai Kerdkaew.

or adnate to the perianth, when free slightly drupaceous, endocarp crustaceous; seed small to rather large, endosperm present (but scarce) or absent, embryo various, mostly with (rather) thin, folded or flat cotyledons and a long radicle.

The genus probably comprises 10 species: six in Asia, one in Africa, two in the Neotropics, and one in North America; 3 species are indigenous to Thailand.

Subdivision.— The genus can be subdivided into five sections (Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91: 356. 1986): *Cardiogyne* (with one species in Africa and another in the Neotropics), *Chlorophora* (with one species in the Neotropics), *Cudrania* (probably with four species in Asia, of which two in Thailand), *Maclura* (with a single species in North America), and *Plecosperrum* (probably with two species in Asia, including *M. andamanica* in Thailand). The species of *Maclura* sect. *Cudrania* do not have the urticaceous type of stamen and are, therefore, exceptional in the tribe Moreae. In *Maclura* sect. *Plecosperrum* the pistillate flowers are entirely fused.

KEY TO THE SPECIES

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|--|-------------------------------------|
| 1. Tertiary venation scalariform; lateral veins usually 5–6 pairs; petiole 0.4–0.8 cm long | 3. <i>M. fruticosa</i> |
| 1. Tertiary venation reticulate to subscalariform; lateral veins usually 6–9 pairs; petiole usually 0.8–2.5 cm long | |
| 2. Apex of lamina acuminate; lower lateral veins distinctly loop-connected; stamens inflexed in the bud; pistillate flowers fused; infructescences with 1–2 fruits | 1. <i>M. andamanica</i> |
| 2. Apex of lamina rounded to subacute or, if acuminate, then the basal lateral veins usually not distinctly loop-connected; stamens straight in the bud; pistillate flowers basally connate; infructescences with more than 2 fruits | 2. <i>M. cochinchinensis</i> |

1. *Maclura andamanica* (Hook.f.) C. C. Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91: 245. 1986.— *Plecosperrum andamanicum* Hook.f., Fl. Brit. India 5: 491. 1888.— *Cudrania poilanei* Gagnep., Bull. Soc. Bot. France 72: 809. 1925; Gagnep., Fl. Indo-Chine 5: 724. 1928.

Climber with thorns to 1 cm long \pm curved and/or to 6 cm long, straight. *Leafy twigs* 1.5–2.5 mm thick, densely to (partly) sparsely brown puberulous to tomentose, usually drying pale brown to greyish with \pm conspicuous lenticels. *Leaves* laxly spirally arranged; lamina oblong, subobovate or elliptic, 10–16 by 4–5.5 cm, subcoriaceous to chartaceous, apex acuminate, base obtuse, rounded or cuneate, margin entire; upper surface glabrous, lower surface sparsely brown puberulous to tomentose on the (main) veins, glabrescent or subglabrous; midrib impressed above, lateral veins 7–8 pairs, the lower ones distinctly loop-connected, tertiary venation reticulate; petiole 1–2.5 cm long, sparsely puberulous to tomentose; stipules 0.2–0.4 cm long, brown puberulous to tomentose, subsistent (to caducous). *Staminate inflorescences*, solitary (or in pairs) on the lower part of new growth or on previous season's growth, subtended by free or partly to fully fused stipules; peduncle 1.5–3 cm long, brown puberulous to tomentose; head 0.8–1.3 cm diam.; tepals 1.5–2 mm long, brown tomentose; stamens 4, inflexed in the bud, ca. 3 mm long, anthers ca. 1.5 mm long; bracts basally attached, 0.5–1 mm long, brown tomentose. *Pistillate inflorescences* solitary (or in pairs), on the lower part of new growth or on previous season's growth, subtended by free or partly to fully fused stipules; peduncle 1–1.2 cm long, brown puberulous to tomentose; head ca. 0.5 cm diam.; flowers ca. 10–20, fully connate; perianth ca. 1 mm long, brown puberulous to tomentose; ovary ca. 1 mm long, stigma filiform, 5–10 mm long, hairy; *Infructescence* (depressed-)globose, 1–1.8 cm diam., brown velutinous; fruits 1 (or 2), ellipsoid ca. 1 cm long.

T h a i l a n d.—NORTHERN: Chiang Mai, Chiang Rai, Nan, Lampang; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Saraburi.

D i s t r i b u t i o n.—India (Andaman Islands), Laos, Vietnam.

E c o l o g y.—Mixed deciduous and dry evergreen forests, to ca. 1,000 m.

V e r n a c u l a r.—Khe ka (เขคา) (Nakhon Ratchasima).

N o t e.—This species is closely related to *Maclura spinosa* (Willd.) C.C. Berg from Sri Lanka and S India differing, for example, in the longer petioles and the rounded to short-acuminate apex of the lamina.

2. *Maclura cochinchinensis* (Lour.) Corner, Gard. Bull. Singapore 19: 239. 1962; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(2): 36. 2005.—*Vanieria cochinchinensis* Lour., Fl. Cochinch. 564. 1790.—*Procris cochinchinensis* (Lour.) Spreng., Syst. Veg. 3: 846. 1816.—*Cudrania cochinchinensis* (Lour.) Kudo & Masam., Ann. Rep. Taihoku Bot. Gard. 2: 27. 1932.—*C. pubescens* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 125. 1847; Kurz, Forest Fl. Burma 2: 435. 1877; Gagnep., Fl. Indo-Chine 5: 727. 1928.—*Vanieria pubescens* (Trécul) Chun, J. Arnold Arbor. 8: 21. 1927.—*Maclura cochinchinensis* (Lour.) Corner var. *pubescens* (Trécul) Corner, Gard. Bull. Singapore 19: 239. 1962.—*M. pubescens* (Trécul) Z.K. Zhou & M.G. Gilbert, Fl. China 5: 36. 2003.—*M. javanica* Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 83. 1856.—*Cudrania javanensis* Rumph. ex Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 123, t. 3, f. 76–85. 1847; Wight, Icon. Pl. Ind. Orient. 6: t. 1960. 1853; Bureau, Ann. Sci. Nat. Bot., Sér. 5, 11: 378. 1869; Hook.f., Fl. Brit. India 5: 538. 1888; Ridl., Fl. Malay Penins. 3: 356. 1924; Gagnep., Fl. Indo-Chine 5: 726. 1928.—*Plecosperrum spinosum* Trécul var. *javanensis* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 125. 1847.—*Cudrania javanensis* Trécul var. *indica* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 123. 1847.—*Maclura amboinensis* Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 84. 1856; Corner, Gard. Bull. Singapore 19: 239. 1962.—*Cudranus amboinensis* (Blume) Miq., Fl. Ned. Ind. 1, 2: 290. 1859; Kurz, Forest Fl. Burma 2: 434. 1877.—*Cudrania obovata* Trécul, Ann. Sci. Nat. Bot., Sér. 3, 8: 126. 1847; Gagnep., Fl. Indo-Chine 5: 730. 1928.—*C. cambodiana* Gagnep., Bull. Soc. Bot. France 72: 808. 1925; Gagnep., Fl. Indo-Chine 5: 729, t. 89: 9–14, 90: 1–3. 1928. Plate LXXVI: 2–3.

Shrub, much-branched with long scrambling sprays, or climber, with curved or straight thorns to 4 cm long. *Leafy twigs* 1.5–4 mm thick, densely brownish to whitish puberulous, subtomentose or subglabrous, drying brown to greyish, often with conspicuous lenticels. *Leaves* spirally arranged to distichous; lamina oblong, subobovate or elliptic, (0.5–)4–14 by (0.3–)1.5–5 cm, subcoriaceous to chartaceous, apex acuminate, subacute or rounded, base obtuse to rounded or cuneate, margin entire; upper surface glabrous, lower surface sparsely densely brown to whitish puberulous to subtomentose on all veins, or mainly on the midrib or glabrous; midrib impressed above, lateral veins (4–)6–9(–14) pairs, the lower ones faintly to clearly loop-connected, tertiary venation reticulate to subscalariform; petiole (0.3–)0.8–1.5(–2) cm long, densely brown to whitish to subtomentose to glabrous; stipules 0.2–0.4 cm long, (sparsely) puberulous, caducous (or subpersistent). *Staminate inflorescences* axillary, solitary or in pairs; peduncle 0.3–1 cm long, puberulous; head 0.3–1 cm diam.; tepals 1–1.5 mm long, ciliolate or puberulous to tomentellous; stamens ca. 1 mm long, anthers 0.4–0.5 mm long; bracts basally attached, 0.5–1 mm long, minutely puberulous. *Pistillate inflorescences* axillary, in pairs or solitary; peduncle 0.4–1.2 cm long, puberulous; head 0.4–0.8 cm diam.; flowers basally connate; perianth ca. 1 mm long, sparsely to densely white puberulous to tomentellous; ovary ca. 1 mm

long, style 0.5 mm long, stigmas 2–3 mm long, twisted; bracts basally attached, 0.5–1 mm long, sparsely to densely puberulous. *Infructescences* globose, 1–2 cm diam., yellow or orange to red at maturity.

T h a i l a n d.— Throughout the country.

D i s t r i b u t i o n.— Sri Lanka, India, Bhutan, Sikkim, China Japan, Taiwan, Burma, Laos, Vietnam, Cambodia, Peninsular and Bornean Malaysia, Indonesia (throughout), Philippines, Papua New Guinea, Australia, New Caledonia.

E c o l o g y.— Dry evergreen, mixed deciduous and montane forests, to 2,000 m.

V e r n a c u l a r.— Kamlang wua thalueng (กำลังวัวเถลิง) (Chumphon); kae lae (แคแล) (Chon Buri), kho sam pao (เค็ดส้มเปา) (Mae Hong Son).

U s e s.— The infructescences are edible and the wood is used for dyeing silk yellow, red or green.

N o t e.—The species as currently defined is quite variable, for example, in the presence and colour of the indumentum on various parts (such as the lower surface of the lamina) and in the shape, in particular the apex of the lamina, varying from acuminate to rounded. In laminas with acuminate apices the tertiary venation tends to subscalariform. The thorns vary from curved (and relatively short) to straight (and relatively long).

3. *Maclura fruticosa* (Roxb.) Corner, Gard. Bull. Singapore 19: 239. 1962.— *Batis fruticosa* Roxb., Fl. Ind. Ed. 1832 3: 763. 1832.— *Cudrania fruticosa* (Roxb.) Wight ex Kurz, Forest Fl. Burma 2: 434. 1877; Hook.f., Fl. Brit. India 5: 539. 1888.— *Vanieria fruticosa* (Roxb.) Chun, J. Arnold. Arbor. 8: 21. 1927. Fig 47.

Climber, treelet or shrub, much-branched with long scrambling sprays, with slightly curved to straight thorns to 2.5 cm long. *Leafy twigs* 1–3 mm thick, minutely whitish puberulous, mainly with curved hairs, usually drying pale brown to greyish with ± conspicuous lenticels. *Leaves* laxly spirally arranged; lamina oblong, subovate, elliptic, ovate or lanceolate, (3–)6–16(–20) by (1.5–)2.5–6 cm, subcoriaceous to chartaceous, apex acuminate to subcaudate, base obtuse to rounded or cuneate, margin entire; upper surface glabrous, lower surface sparsely minutely puberulous on the (main) veins; midrib impressed above, lateral veins (3–)5–6 pairs, ascending, the lower ones not distinctly loop-connected, tertiary venation scalariform; petiole 0.4–1(–2) cm long, minutely whitish puberulous, mainly on the margins of the adaxial groove; stipules 0.1–0.2 cm long, sparsely appressed puberulous, caducous. *Staminate inflorescences* solitary or in pairs, axillary; peduncle 0.2–0.6 cm long, white puberulous; head 0.3–0.4 cm diam.; tepals 1–1.2 mm long, sparsely puberulous; stamens 4 or 3, straight in the bud, ca. 1 mm long, anthers 0.2–0.3 mm long; bracts basally attached, 0.5–1 mm long, minutely puberulous. *Pistillate inflorescences* in pairs or solitary, axillary peduncle 0.3–0.4 cm long, white puberulous; head ca. 0.5 cm diam.; flowers free; perianth ca. 1 mm long, sparsely white puberulous; ovary ca. 1 mm long, style to 0.5 mm long, stigmas 2, tongue-shaped, 1–1.5 mm long, equally long, recurved; bracts basally attached, 1–1.5 mm long, minutely puberulous. *Infructescence* globose, 1–1.5 cm diam.; fruits ca. 3–10, subglobose, ca. 0.5 cm long.

T h a i l a n d.— NORTHERN: Chiang Mai, Chiang Rai, Phayao, Lampang; PENINSULAR: Phuket.

D i s t r i b u t i o n.— NE India (type), Bangladesh?, Burma, China (S Yunnan) and Vietnam.

E c o l o g y.— Evergreen, deciduous dipterocarp and montane forests, on limestone to 2,000 m.

7. MORUS

L., Sp. Pl.: 986. 1753; Bureau in DC. Prod. 17: 237. 1873; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1: 72. 1888; Gagnep., Fl. Indo-Chine 5: 706. 1928; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 23. 2006.

Trees, dioecious, unarmed, shoot apices shed, with axillary scaled resting buds. *Leaves* distichous; lamina pinnately veined or trinerved to triplinerved, cystoliths usually only above; stipules free, almost lateral. *Inflorescences* unisexual, usually solitary on the lower leafless nodes of new (short-)shoots arising from well developed scaly resting buds on wood of the previous season, ebracteate or bracteate. *Staminate inflorescences* spicate (or racemose); perianth 4-partite, segments imbricate; stamens 4, inflexed in the bud. *Pistillate inflorescences* capitate to spicate; perianth 4-partite; ovary free, style subterminal, stigmas 2. *Fruiting perianth* enlarged, more or less succulent; fruit with a broad base, exocarp thin-fleshy, thicker on the seed-bearing side, indehiscent, endocarp crustaceous with a woody plug towards the hilum; seed with endosperm, embryo curved, cotyledons equal and flat, not enclosing the long radicle.

The genus comprises ten to fifteen species, most of them in temperate to subtropical regions of the northern hemisphere, some in montane habitats in the tropics, one in the tropical lowlands of Africa. The North American *M. rubra* L. is closely related to the group of species associated with northern temperate to subtropical conditions and centred in the Himalayan and East Asian region, constituting a complex of very closely related taxa for which a recent taxonomic evaluation is still wanting; this complex comprises, e.g., *M. alba* L. and *M. nigra* L.

N o t e s.—The association with northern temperate conditions is morphologically expressed in the abscission of shoot apices, the presence of \pm well-developed scaled resting buds, and deciduousness, features which are at least partly still retained by the tropical lowland species. *Morus* shares these features with *Broussonetia*.

The genus has a very long historical association with mankind for the edible fruits of many species and for the cultivation of the silk-moth.

KEY TO THE SPECIES

1. Lower surface of the lamina barbate, hairs concentrated in the axils of lateral veins and major furcations of lateral veins; stipules 0.4–1.2 cm long; pistillate spikes to 3.5 cm long, red to black in fruit; cultivated **1. *M. alba***
1. Lower surface of the lamina not barbate, hairs \pm evenly distributed on the veins; stipules 1–2.5 cm long; pistillate spike (1–)4–8 cm long, greenish or yellowish in fruit; indigenous **2. *M. macroura***

1. *Morus alba* L., Sp. Pl.: 986. 1753; Seringe, Descr. Cult. Muriers; 19, t. 1–18. 1855; Bureau in DC., Prodr. 17: 238. 1973; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 24. 2006. Plate LXXVI: 4.

Tree to 10 (or more ?) m tall. *Leafy twigs* 2–4 mm thick, (minutely) white puberulous; resting buds ca. 0.5 cm long. *Leaves* distichous; lamina ovate or subovate (in outline), 10–20 by 6–15 cm, entire or 3–9-lobate to -fid, apex acuminate, base truncate to subcordate, margin crenate- to serrate-dentate; upper surface minutely puberulous to hispidulous, scabridulous to

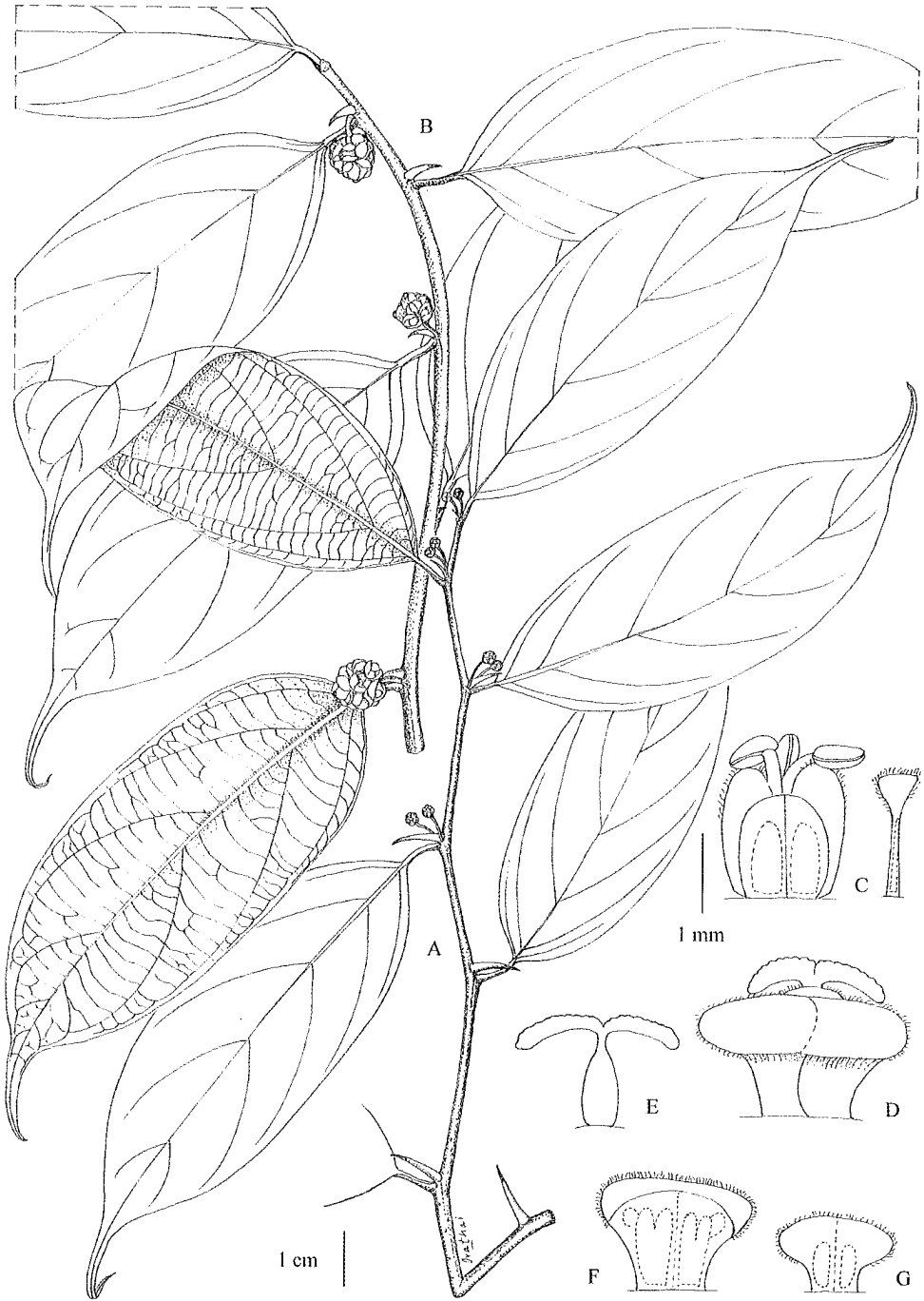


Fig. 47. *Maclura fruticosa* (Roxb.) Corner: A. staminate inflorescence; B. pistillate inflorescence; C. staminate flower; D.-G. pistillate flower (A. Tagawa et al. T-9877, BKF; B. Konta & Khao-iem 11323, BKF; C. Bunchuai 1166, L; D-G. Put 3486, L). Drawn by Orathai Kerdkaew (A-B) and Cornelis Berg (C-G).

smooth, lower surface puberulous to hispidulous on the (main) veins, with concentrations of hairs in the axils of lateral veins and furcations of lateral veins, scabridulous to smooth; lateral veins (3–)4–6(–7) pairs, the basal pair to 1/2(–2/3) the length of the lamina, branched, the other lateral veins also branched or forked away from the margin, tertiary venation loosely scalariform; petiole 1–6 cm long, 2–2.5 mm thick, minutely white puberulous; stipules 0.5–1.2 cm long, white puberulous, caducous. *Staminate inflorescences* axillary (often in the axils of scale leaves at the base of new shoots), solitary, spicate, ebracteate; peduncle 0.5–1.5 cm long, minutely white puberulous to tomentellous; spike 0.5–2 cm long; flowers ca. 5–20, sessile or to 1.5 mm long pedicellate; perianth 1–2 mm long, minutely white puberulous, stamens 3–3.5 mm long, anthers ca. 0.5 mm long. *Pistillate inflorescences* axillary (often in the axils of scale leaves at the base of new shoots), solitary (or in pairs), spicate to subcapitate, ebracteate; peduncle 0.5–1.5 cm long, white puberulous to tomentellous; spike 0.5–1.5 cm long; flowers numerous (ca. 15–50); tepals 1–1.5 mm long, sparsely white puberulous; ovary ca. 1 mm long, style 0–1.5 mm long, stigmas 1.5–3.5 mm long. *Infructescences* 0.8–3.5 cm long, 0.5–1.5 cm thick, reddish to black.

T h a i l a n d.— NORTHERN: Chiang Mai, Phitsanulok; NORTH-EASTERN: Loei (in cultivation).

D i s t r i b u t i o n.— From Afghanistan through the Himalaya region to China and Japan, wild or cultivated. Introduced worldwide in temperate to tropical regions in connection with silk and or fruit production.

V e r n a c u l a r.— Mon (หม่อน) (General).

U s e s.— This species is in cultivation for its fruits and for the silk industry.

N o t e.— Material with pistillate flowers which have long styles ca. 1–1.5 mm long, has been identified as *Morus australis* Poir. and that with short, to ca. 0.5 mm long styles as *Morus alba* but, as this weak difference cannot be correlated to clear differences in staminate flowers and vegetative parts, only *M. alba* is recognized. The long-styled form can be indicated as *M. alba* L. var. *indica* (L.) Bur., however.

For reasons of poorly understood taxonomy, the effects of cultivation over a long period of time, and nomenclatural complexity, synonymizing is not attempted in the present treatment of *M. alba*.

2. *Morus macroura* Miq., Pl. Jungh.: 42. 1851; Bureau in DC. Prod. 17: 247. 1873; Corner, Gard. Bull. Singapore 19: 215. 1962; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 26. 2006.— *M. alba* L. var. *laevigata* Wall. ex Bureau in DC. Prod. 17: 245. 1873.— *M. laevigata* (Wall. ex Bureau) Hook.f., Fl. Brit. India 5: 492. 1888; Gagnep., Fl. Indo-Chine 5: 708. 1928. Fig 48.

Tree to 20(–32) m tall, deciduous. *Leafy twigs* 1.5–3 mm thick, puberulous to hirtellous to subtomentose; resting buds 0.3–1 cm long. *Leaves* distichous; lamina ovate to subovate or (broadly) elliptic, 6–16(–23) by 4–11(–14) cm, entire (or, when juvenile, 3-lobate), chartaceous to subcoriaceous, apex acuminate to acute, base subcordate to rounded (or subcuneate), margin serrate-denticulate (to subentire); upper surface hispidulous to puberulous, chiefly on the main veins, ± scabrous to smooth, lower surface puberulous to subtomentellous on the veins; lateral veins 3–6(–8) pairs, tertiary venation scalariform; petiole 1.5–6 cm long, puberulous to hirtellous; stipules 1–1.5 cm long, sparsely to densely puberulous to hirtellous, caducous (or subpersistent). *Staminate inflorescences* axillary (often in the axils of scale leaves at the base of new shoots),

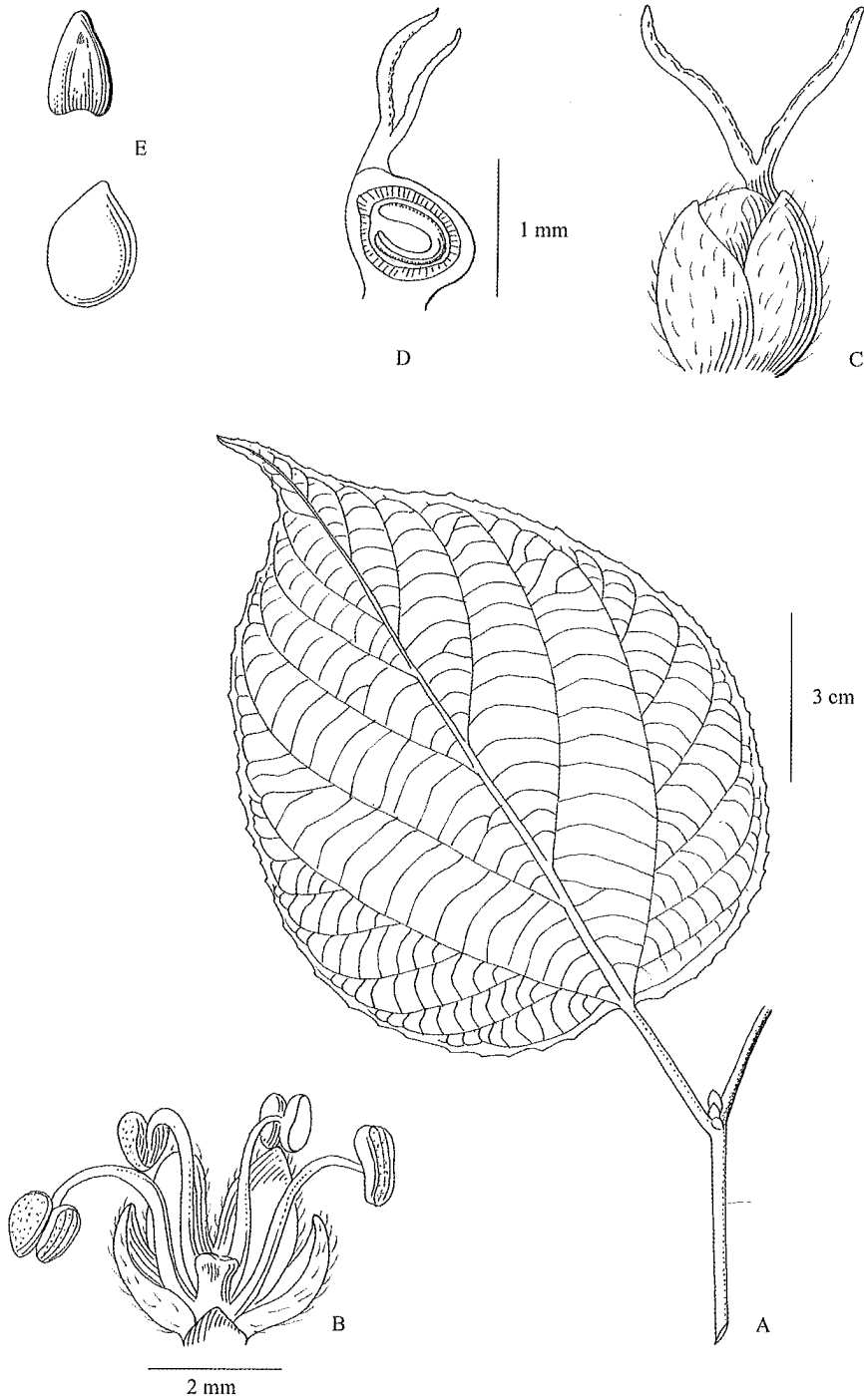


Fig. 48. *Morus macroura* Miq.: A. leafy twig with axillary resting bud; B. staminate flower; C. pistillate flower; D. fruit; D and E. endocarp bodies (A: *Raub 1*; B: *Bosscha 2A*; C: *Plasschaert s.n.*; D: *Plasschaert s.n.*). Courtesy of *Flora Malesiana ser I*, 17(1): 26, fig. 1.

solitary or in pairs, spicate (or racemose); peduncle 0.4–2 cm long, puberulous; spike (1–)4–10 cm long; flowers numerous; pedicel 0–1.5 mm long; perianth ca. 1.5 mm long, puberulous to tomentellous; stamens ca. 2.5 mm long, anthers ca. 0.8 mm long. *Pistillate inflorescences* axillary, (often in the axils of scale leaves at the base of new shoots), solitary (or in pairs), spicate, ebracteate; peduncle 0.5–1.5 cm long, puberulous; spike 6–12 cm long; flowers numerous; tepals ca. 1.5 mm long, sparsely puberulous; ovary ca. 1 mm long, style ca. 0.5 mm long, stigmas 1.5–2 mm long. *Infructescences* green to pale yellow.

T h a i l a n d.—NORTHERN: Mae Hong Son, Chiang Mai, Lampang, Phrae, Tak; EASTERN: Chaiyaphum; SOUTH-WESTERN: Kanchanaburi.

D i s t r i b u t i o n.—Bhutan, Sikkim, India (Assam), S China, Burma, Cambodia, Indonesia (Sumatra, Java-type).

E c o l o g y.—Mixed deciduous, dry evergreen and montane forests, to 1,200 m.

V e r n a c u l a r.—Mon Luang (หม่อนหลวง), mon hok (หม่อนฮอก) (Northern); Mulberry.

U s e s.—The timber is used for house construction.

8. PARARTOCARPUS

Baill., *Adansonia* 11: 294. 1875; Engl. in Engl. & Prantl, *Nat. Pflanzenfam.* 3, 1: 82. 1888; Becc., *For. Borneo*: 632. 1902; Jarrett, *J. Arnold Arbor.* 41: 320. 1960; Corner, *Gard. Bull. Singapore* 28: 183, t. 1–3. 1976; Kochummen, *Tree Fl. Malaya* 3: 162. 1978; C.C. Berg et al., *Fl. Males.*, Ser. 1, *Spermat.* 17(1): 128. 2006.—*Gymnartocarpus* Boerl., *Icon. Bogor.* 1: 73, t. 24, 25. 1897; Engl. in Engl. & Prantl, *Nat. Pflanzenfam.* 2: 17. 1900.

Trees, dioecious. *Leaves* spirally arranged; lamina pinnately veined, entire; stipules fused, semi-amplexicaul. *Inflorescences* unisexual (or rarely bisexual), solitary in the leaf axils, pedunculate, with 3–8 large basally attached bracts at the base of the head, interfloral bracts with free apices similar to the free parts of the tepals, discoid to cushion-shaped to aculeate. *Staminate inflorescences* (sub)globose or obovoid; flowers numerous, connate; perianth tubular, free parts thickened, cushion-shaped to aculeate; stamens 1–3, mostly 2, filaments free or partly connate. *Pistillate inflorescences* (sub)globose; flowers numerous, connate except for the apices, apices discoid, cushion-shaped or aculeate; ovary free, stigma 1. *Infructescences* with the indurate surface areolate or with cushion-shaped, pyramidate or spinous processes; fruit with a firm exocarp finally decaying and leaving the stony endocarp; seed with remains of endosperm present, embryo curved, cotyledons incumbent and unequal, radicle long.

The genus comprises two closely related species and ranges from Thailand to the Solomon Islands.

N o t e.—This genus differs from *Artocarpus*, e.g., in the intrapetiolar connate stipules, and the well-developed, basally attached bracts at the base of the head of the inflorescence.

KEY TO THE SPECIES

1. Hairs on the lamina beneath patent, usually dense; leafy twigs brown tomentose; stipules 0.5–1 cm long **1. P. bracteatus**
1. Hairs on the lamina beneath (±) appressed, usually sparse or absent; leafy twigs whitish to brownish, mostly appressed puberulous; stipules 0.2–0.4 cm long **2. P. venenosus**

1. *Parartocarpus bracteatus* (King) Becc., For. Borneo: 632. 1902; Jarrett, J. Arnold Arbor. 41: 324, t. 21a, d. 1960; Corner, Gard. Bull. Singapore 28: 186, t. 2a. 1976; Kochummen, Tree Fl. Malaya 3: 164, t. 9. 1978; Go, Tree Fl. Sabah and Sarawak 3: 319. 2000; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 129. 2006.— *Artocarpus bracteata* King in Hook.f., Fl. Brit. India 5: 540. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 7 (p.p. incl. t. 1B, *syncarpium solum*). 1889; Ridl., Fl. Malay Penins. 3: 352. 1924.— *A. rufescens* (non Miq.) Kurz, Forest Fl. Burma 2: 431. 1877. Fig 49A–C.

Tree to 45 m tall, with or without buttresses. *Leafy twigs* 3–8 mm thick, densely brown (sub)tomentose. *Leaves* spirally arranged; lamina elliptic, obovate, subobovate or oblong, 8–20(–28) by 4–11(–14), coriaceous, apex short-acuminate to acute (or rounded), base rounded to cordate, margin entire, revolute; upper surface puberulous, chiefly on the main veins, lower surface ± densely puberulous on the veins; midrib slightly impressed above, lateral veins 8–18 pairs, tertiary venation scalariform; petiole 2–3.5 cm long, puberulous to subtomentose; stipules 0.5–1 cm long, puberulous, caducous. *Staminate inflorescences* axillary, solitary, capitate; peduncle 2–3.5 cm long, brown tomentose to puberulous; head globose, 2.5–3.5 cm diam.; involucre bracts 3, ovate, 0.5–1 cm long, brown tomentellous to puberulous; processes aculeate (or cushion-shaped), ca. 3 mm long and often slightly curved (or cushion-shaped), (sub) glabrous; stamens 2, to 8 mm long, filaments free or connate at the base, anthers 2.5–3 mm long, apiculate. *Pistillate inflorescences* axillary, solitary, capitate; peduncle 3–5.5 cm long, brown tomentose to puberulous; head globose, 2–3.5 cm diam.; involucre bracts 2–4, ovate, 0.5–1 cm long, brown tomentellous to puberulous; flowers numerous; processes aculeate, 2–4 mm long, often ± curved, basally connate in groups of 2–4 or free, subglabrous; stigmas subulate, 1–1.5 mm long. *Infructescences* subglobose, 5–9 cm diam., ± lobed, with numerous fruits; processes conical, to 8 mm long.

Thailand.—PENINSULAR: Narathiwat (Chatwarin Waterfalls).

Distribution.—Peninsular (type) and Bornean Malaysia, Singapore, Brunei, Indonesia (Sumatra, Kalimantan).

Ecology.—Evergreen forest, at low altitudes.

Note.—The species is known from a single collection in Thailand, consisting of some staminate inflorescences: *Niyomdham 4053*.

2. *Parartocarpus venenosus* (Zoll. & Moritzi) Becc., For. Borneo: 632. 1902; Jarrett, J. Arnold Arbor. 41: 326, t. 21b, c, e–h. 1960; Kochummen, Tree Fl. Malaya 3: 165, t. 9. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 130. 2006.— *Artocarpus venenosa* Zoll. & Moritzi, Natuur- Geneesk. Arch. Ned.-Indië 2: 213. 1845.— *Gymnartocarpus venenosa* (Zoll. & Moritzi) Boerl., Icon. Bog. 1: 73, t. 24, 25. 1897.— *Artocarpus forbesii* King in Hook.f., Fl. Brit. India 5: 539. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 2: 7, t. 1A. 1889; Ridl., Fl. Malay Penins. 3: 352. 1924.— *Parartocarpus venenosus* (Zoll. & Moritzi) Becc. subsp. *forbesii* (King) Jarrett, J. Arnold Arbor. 40: 9–12, t. 2a–f, t. 3g–i, t. 4d (as *P. forbesii*) 1959 and 41: 137, 333. 1960; Corner, Gard. Bull. Singapore 28: 187, t. 2c, 3, 4c. 1976. Figs 49D–J, 50.

Tree to 35 m tall, with low buttresses, if any. *Leafy twigs* 3–7 mm thick, sparsely to rather densely whitish to brown appressed puberulous. *Leaves* spirally arranged; lamina elliptic, obovate, subobovate, oblong or oblanceolate, 4–20(–30) by 2.5–8(–10), coriaceous, apex rounded to short-acuminate, base rounded, cuneate or subcordate, margin entire, flat or

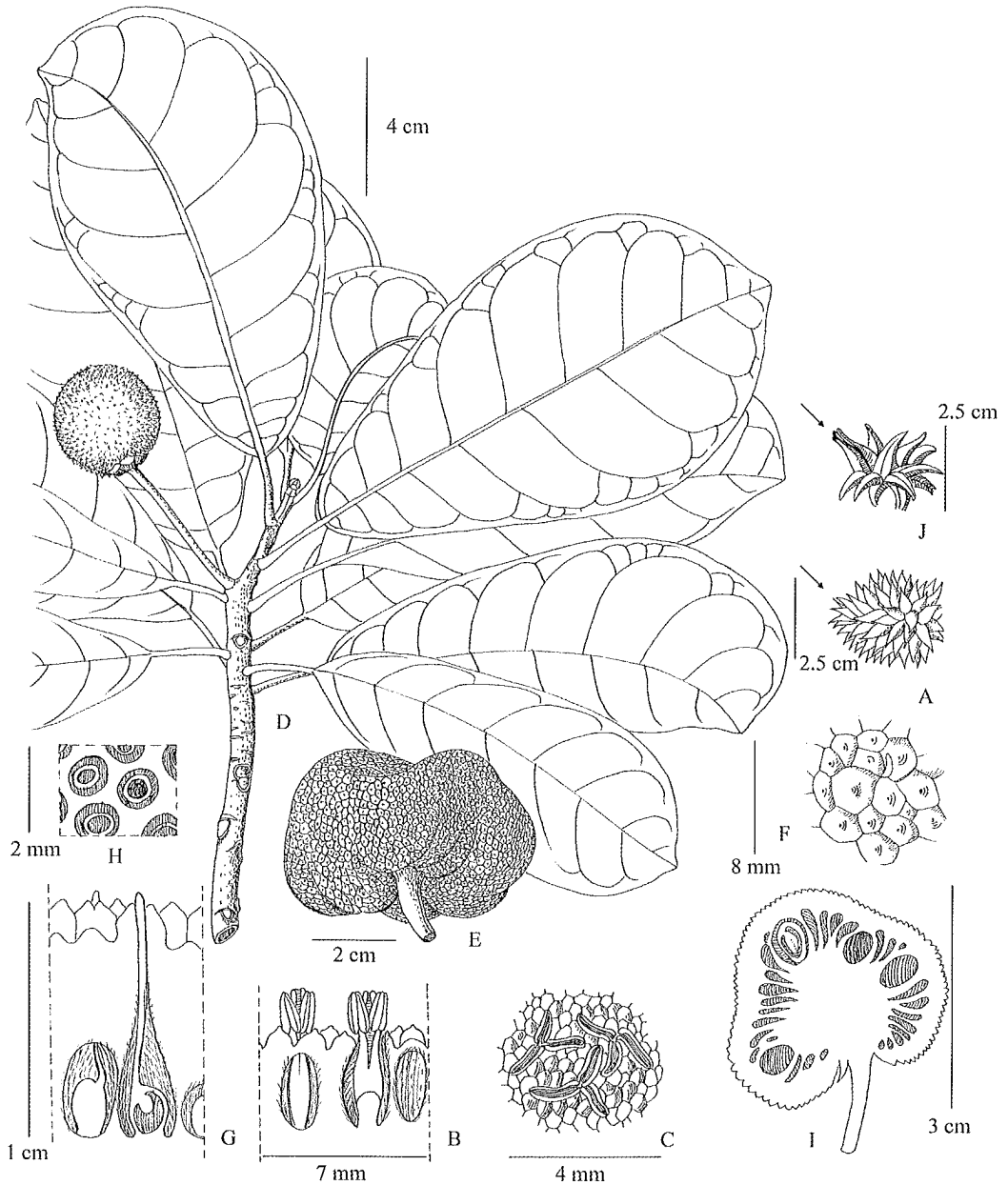


Fig. 49. *Parartocarpus bracteatus* (King.) Becc. A. surface view of pistillate inflorescence (arrow indicating stigmas) (Sinclair 39426); B. part of young staminate inflorescence at anthesis in section (Corner s.n.); C. surface view of older staminate inflorescence (with stamens exerted between processes) (Beguin 583), and *P. venosus* (Zoll. & Moritz) Becc. D. leafy twig with pistillate inflorescence (Brass 7476); E. pistillate inflorescence (Brass 7476); F. surface of pistillate inflorescence (Brass 7476); G. pistillate inflorescence in section (Corner SFN 28145); H. tangential section of pistillate inflorescence at anthesis (Corner SFN 28145); I. infructescence in section (Corner SFN 28145); J. surface view of infructescence (arrow indicating stigmas) (Krukoff 4124). From Flora Malesiana ser I, 17(1): 132.

slightly (sometimes distinctly) revolute; upper surface (sparsely) puberulous, mainly on the main veins to subglabrous, smooth (or scabrous), lower surface sparsely to rather densely whitish \pm appressed puberulous on the veins to subglabrous, smooth (or scabrous); midrib slightly impressed to flush above, lateral veins 6–16 pairs, tertiary scalariform to reticulate; petiole 1.5–5.5 cm long, sparsely to rather densely whitish puberulous; stipules 0.2–0.4 cm long, puberulous, caducous. *Staminate inflorescences* axillary, solitary, capitate; peduncle 2–5.5 cm long, sparsely whitish puberulous; head globose to obovoid, 1.5–3 cm diam.; involucre bracts 3–4(–8), ovate, 0.2–0.6 cm long, puberulous or subglabrous; processes umbonate and apiculate to conical or \pm cushion-shaped and depressed in the centre, 0.5–1.5 mm long, glabrous; stamens (1–)2(–3), 6–8 mm long, filaments partly connate or free, anthers 1.5–2.5 mm long, apiculate or not. *Pistillate inflorescences* axillary, solitary, capitate; peduncle 3–10 cm long, brown tomentose to puberulous; head globose, 2–3.5 cm diam.; involucre bracts 3–4(–8), ovate, 0.2–0.6 cm long, puberulous or subglabrous; flowers numerous; processes umbonate and apiculate to conical, 0.5–3 mm high, connate in groups of 2–4 or free, glabrous or minutely puberulous to muriculate; stigmas tongue-shaped, 1–1.5 mm long, acute. *Infructescences* subglobose, 5–18 cm diam., \pm lobed, with numerous fruits; processes conical to aculeate or cushion-shaped and apiculate or depressed in the centre to discoid, to 10 mm long.

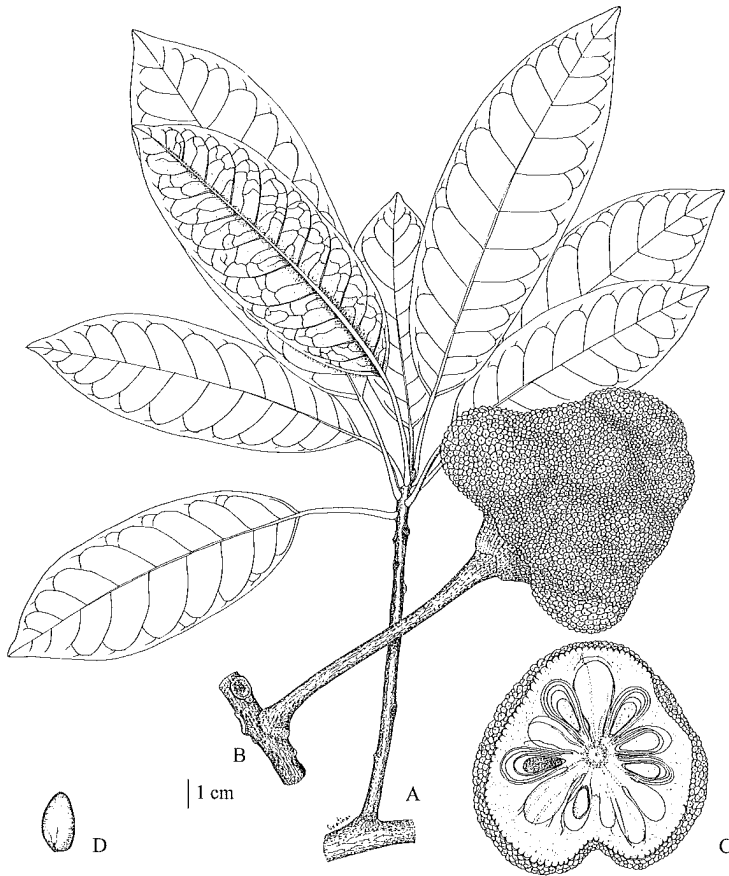


Fig. 50. *Parartocarpus venosus* (Zoll. & Mor.) Becc.: A. leafy twig; B. infructescence; C. infructescence in cross section with fruits; D. fruit. (*Niyomdham 630*, BKF). Drawn by Orathai Kerdkaw.

Thailand.—PENINSULAR: Surat Thani (Ko Phangan), Satun, Narathiwat.

Distribution.—Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java-type, Kalimantan, Sulawesi, Papua), Philippines, Papua New Guinea, Solomon Islands.

Ecology.—Evergreen forest, at low altitudes.

9. PRAINEA

King ex Hook.f., Fl. Brit. India 5: 546. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 5, 2: 162, t. 196. 1896; Engl. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 1: 122. 1897; Ridl., Fl. Malay Penins. 3: 358. 1924; Jarrett, J. Arnold Arbor. 40: 30. 1959; Corner, Gard. Bull. Singapore 19: 243. 1962; Kochummen, Tree Fl. Malaya 3: 165. 1978; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 133. 2006.—*Artocarpus* sect. *Prainea* (King) Renner, Bot. Jahrb. Syst. 39: 366. 1907.

Trees or climbers, dioecious. *Leaves* distichous; lamina pinnately veined, entire; stipules free, lateral. *Inflorescences* unisexual, solitary or in pairs in the leaf axils, globose- to obovoid-capitate, pedunculate, with peltate, subpeltate, clavate or spatulate interfloral bracts. *Staminate flowers* numerous; perianth tubular, 2-lobate to entire; stamen 1. *Pistillate flowers* numerous, free; perianth tubular; ovary free, stigmas 2. *Infructescences* with enlarged perianths of some (1–20) of the flowers, the bracts not enlarged; pericarp membranaceous; seed with the testa absorbed except the thickened saucer-shaped basal portion, endosperm absent, embryo straight, longitudinally aligned, cotyledons equal, appressed faces oblique to median plane of ovary, radicle apical, minute; interfloral bracts persistent.

This Malesian genus comprises two closely related species and ranges from Thailand to New Guinea.

Note.—The flowers and bracts of the pistillate inflorescence are free in contrast to those in the related genera *Artocarpus*, *Hullettia*, and *Parartocarpus*. Only a small number of the pistillate flowers set fruit.

Prainea scandens King ex Hook.f., Fl. Brit. India 5: 547. 1888; King, Ann. Roy. Bot. Gard. (Calcutta) 5(2): 162, t. 196. 1896; Ridl., Fl. Malay Penins. 3: 358. 1924; Jarrett, J. Arnold Arbor. 40: 32. 1959; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 136. 2006.—*Artocarpus scandens* (Hook.f.) Renner, Bot. Jahrb. Syst. 39: 367. 1907.—*Prainea frutescens* Becc., For. Borneo: 635. 1902; Jarrett, J. Arnold Arbor. 40: 33. 1959; Go, Tree Fl. Sabah and Sarawak 3: 327. 2000.—*Artocarpus frutescens* (Becc.) Renner, Bot. Jahrb. Syst. 39: 367. 1907. Fig. 51.

Tree to 30 m tall or climber. *Leafy twigs* 1.5–2.5 mm thick, sparsely and minutely puberulous, partly with uncinata hairs, or glabrous. *Leaves* distichous; lamina oblong, subobovate or elliptic, 5–16 by 3–7 cm, coriaceous, apex acuminate, base cuneate to rounded, margin entire; upper surface glabrous, lower surface glabrous or very sparsely appressed puberulous on the midrib; midrib slightly prominent above, lateral veins 6–13 pairs, tertiary venation reticulate (to subscalariform with 1–2 ± straight intercostals); petiole 0.7–1.8 cm long, sparsely and minutely puberulous to glabrous, the epidermis often flaking off; stipules ca. 0.2 cm long, glabrous, caducous. *Staminate inflorescences* axillary, solitary, capitate; peduncle 0.5–1.5 cm long, minutely puberulous; head globose to obovoid, 0.4–0.6 cm diam.; perianth ca. 0.8 mm long, densely minutely whitish puberulous at the apex; stamen ca. 1.2 mm long, anther

0.2–0.3 mm long; bracts peltate, 0.8–1 mm long, the apical part 0.2–0.5 mm diam., whitish minutely puberulous. *Pistillate inflorescences* axillary, solitary, capitate; peduncle 1–2.5 cm long, puberulous; head globose, ca. 1 cm diam.; flowers ca. 20–30; perianth 2.5–3 mm long, densely minutely whitish puberulous; stigmas tongue-shaped, 0.5–2 mm long; bracts spatulate, truncate-clavate, subulate or subpeltate, 2.5–3 mm long, the apical part 0.2–0.5 mm diam., densely whitish minutely puberulous. *Infructescences* subglobose, (1.5–)2–3(–3.5) cm diam., with 1–7 protruding fruiting perianths, these ellipsoid to ovoid, 1.5–2.5 cm long, puberulous at the apex, red at maturity.

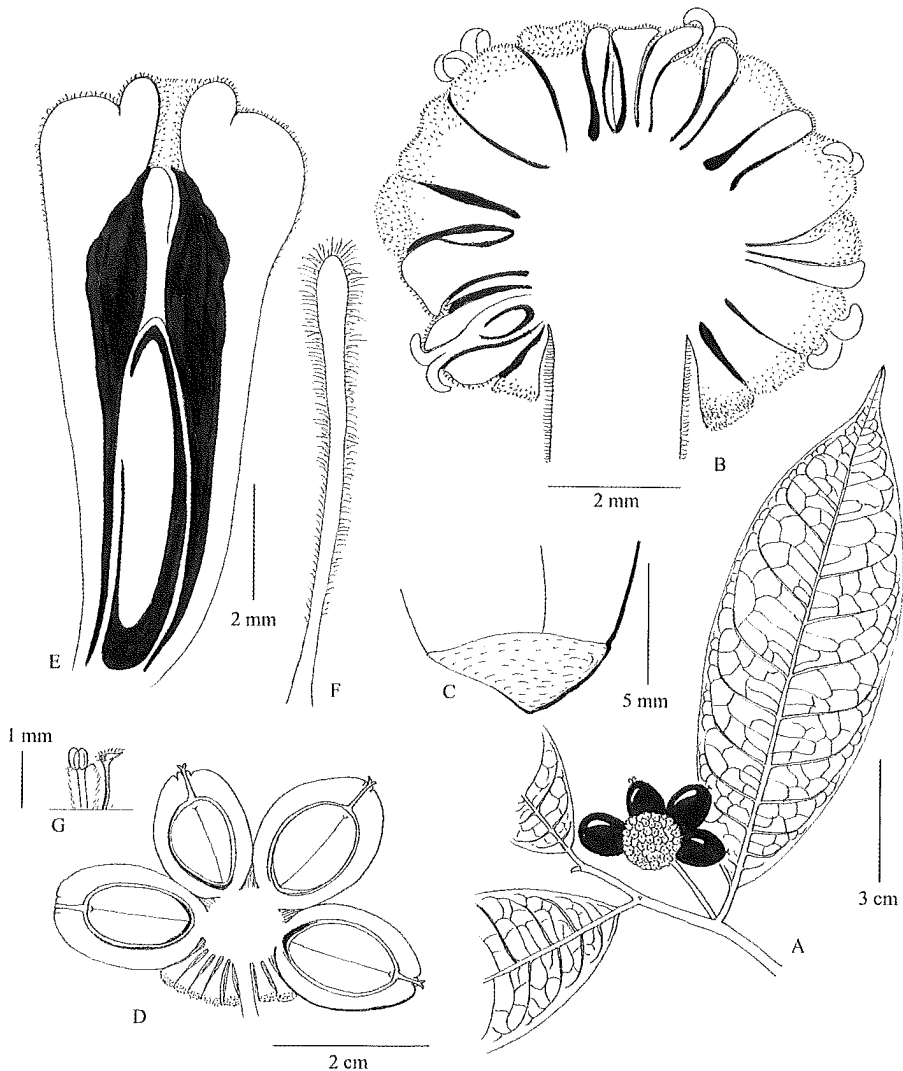


Fig. 51. *Prainea scandens* Hook.f. A. leafy twig with infructescence; B. pistillate inflorescence in section; C. base of seed with cotyledons and remains of testa; D. infructescence in length section; E. pistillate flower in length section; f. bract in infructescence (A, C, D, F: *SAN 43596*; B, E: *Haviland 3102*). Courtesy of Flora Malesiana ser I, 17(1): 137, fig. 24.

T h a i l a n d.— PENINSULAR: Narathiwat (Sirindhorn waterfalls).

D i s t r i b u t i o n.— Peninsular (type) and Bornean Malaysia.

E c o l o g y.— Evergreen and peat swamp forests, at low altitudes.

V e r n a c u l a r.— Sa wo ni lo (ชาวอนีลลอ), la mut pa (ละมุดป่า).

N o t e.— It is not clear how frequently and under what conditions the lianescent habit is developed.

10. STREBLUS

Lour., Fl. Cochinch.: 615. 1790; Bureau in DC. Prod. 17: 218. 1873; Engl. in Engl. & Prantl, Nat. Pflanzenfam. 3, 1: 78. 1888; Corner, Gard. Bull. Singapore 19: 215. 1962; Corner, Phytomorphology 25: 1: 1975; C.C. Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91; 356. 1988; Kochummen, Tree Fl. Malaya 3: 167. 1978; C.C. Berg, Blumea 50: 547. 2005; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 39. 2006.— *Epicarpurus* Blume, Bijdr. Fl. Ned. Ind.: 488. 1825.— *Taxotrophis* Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 77. 1856.— *Streblus* Lour sect. *Taxotrophis* (Blume) Corner, Gard. Bull. Singapore 19: 218. 1962.— *Phyllochlamys* Bureau in DC. Prod. 17: 217. 1873.— *Streblus* Lour sect. *Phyllochlamys* (Bureau) Corner, Gard. Bull. Singapore 19: 217. 1962.— *Pseudostreblus* Bureau in DC. Prod. 17: 219. 1873 219; Hook.f., Fl. Brit. India 5: 487. 1888.— *Streblus* Lour. sect. *Pseudostreblus* (Bureau) Corner, Gard. Bull. Singapore 19: 217. 1962; Phytomorphology 25: 6, t. 3C. 1975.— *Pseudotrophis* Warb., Bot. Jahrb. Syst. 13: 291. 1890.— *Streblus* Lour. sect. *Pseudotrophis* (Warb.) Corner, Gard. Bull. Singapore 19: 217. 1962.— *Teonongia* Stapf in Hook., Icon. Pl. 30: t. 2947. 1911; Gagnep., Fl. Indo-Chine 5: 710. 1928.— *Dimerocarpus* Gagnep., Bull. Mus. Hist. Nat. (Paris) 27: 441. 1921.

Trees or shrubs, dioecious or monoecious, unarmed or armed with thorns, uncinuate hairs often present. *Leaves* distichous or sometimes spirally arranged; lamina pinnately veined, with cystoliths above and beneath, only beneath, or absent; stipules free or sometimes fused, lateral or sometimes almost fully amplexicaul. *Inflorescences* unisexual or sometimes bisexual, racemose, spicate or subcapitate; staminate inflorescences multi- to pluriflorous; pistillate inflorescences multi- to uniflorous. *Staminate flowers* with 3, 4, or 5 tepals, imbricate or valvate in bud; stamens 3, 4 or 5, inflexed in the bud. *Pistillate flowers* tetramerous; tepals (almost) free, more or less unequal in size; ovary free, stigmas 2, equal. *Fruiting perianth* enlarged or not, not to somewhat fleshy, mostly greenish; fruit free, drupaceous, dehiscent and whitish or indehiscent and yellow, orange, red or blackish, endocarp (thinly) crustaceous; seed without endosperm, cotyledons folded or not, equal or unequal, radicle short or long.

The genus comprises 22 species in the tropics of the Old World. Six species are found in Thailand.

Subdivision.— By reduction of many former genera to sections, Corner (Gard. Bull. Singapore 19: 215. 1962) widened the circumscription of the genus considerably. While Corner (loc. cit. 1962, Phytomorphology 25: 1. 1970) recognised eight sections in the genus, a more simplified subdivision was proposed by Berg (Proc. Kon. Ned. Akad. Wetensch., C. 91; 356. 1988, Blumea 50: 547. 2005). It appears to be correct, however, to recognise, in addition to a reduced section *Streblus* comprising the non-aculeate species with mostly subcoriaceous laminas with dentate margins, and uniflorous pistillate inflorescences (incl. *S. asper*), *Streblus* section *Taxotrophis* with aculeate species, and *Streblus* section *Pseudostreblus* with non-aculeate species with coriaceous laminas and entire margins, comprising only *S. indicus* (Berg, loc. cit. 2005).

KEY TO THE SPECIES

1. Lamina \pm distinctly hairy and \pm scabrous above 1. *S. asper*
 1. Lamina glabrous or inconspicuously hairy and smooth above
 2. Margin of lamina entire; plants without spines; staminate flowers (partly) pedicellate; pistillate inflorescence usually uniflorous 3. *S. indicus*
 2. Margin of lamina crenate to (spinulose-)dentate and/or acumen spinulose or, if (sub)entire, then the plants often with spines, the flowers sessile, and/or the pistillate inflorescence with more than 1 flower
 3. Midrib of lamina prominent above; acumen of lamina spinulose with 1 or 3 "teeth" 2. *S. ilicifolius*
 3. Midrib of lamina impressed above, at least the lower part; acumen of the lamina not spinulose
 4. Plants usually with short-shoots bearing tufts of leaves and/or inflorescences; petiole 0.1–0.4(–0.6) cm long, usually hairy adaxially 6. *S. taxoides*
 4. Plants usually not with short-shoots; petiole (0.2–)0.4–0.7 cm long, often glabrous
 5. Staminate inflorescences spicate and 1.5–14 cm long; pistillate inflorescences with (1–)2–10 flowers 4. *S. macrophyllus*
 5. Staminate inflorescences capitate or spicate and to 0.8 cm long; pistillate inflorescences with 1 (or 2) flowers 5. *S. perakensis*

1. *Streblus asper* Lour., Fl. Cochinch.: 615. 1790; Hook.f., Fl. Brit. India 5: 489. 1888; Gagnep., Fl. Indo-Chine 5: 712, f. 86: 10–16, 87: 1–2. 1928; Corner, Gard. Bull. Singapore 19: 228. 1962; Phytomorphology 25: 3, t. 1B, 3D. 1975; C.C. Berg et al. Fl. Males., Ser. 1, Spermat. 17(1): 42. 2006.— *Trophis cochinchinensis* Poir., Encycl. 8: 123. 1808.— *Diplothorax tonkinensis* Gagnep., Bull. Soc. Bot. France 75: 98. 1928.

Shrub or tree to 10(–15) m tall, much-branched, branches often drooping, lower ones (often?) prostrate, monoecious or dioecious. *Leafy twigs* 1–2 mm thick, whitish puberulous. *Leaves* distichous; lamina elliptic, obovate, oblong or subobovate, 1–8(–13) by 0.5–3.5(–6.5), coriaceous to subcoriaceous, apex (sub)acuminate to acute, base rounded, subcordate or obtuse, margin crenate to dentate; upper surface sparsely hispidulous to puberulous, \pm scabrous (or almost smooth), lower surface hispidulous to puberulous, \pm scabrous; midrib \pm prominent in the lower part of the lamina, \pm impressed in the upper part, lateral veins 4–7(–8) pairs, tertiary venation reticulate (to subscalariform); petiole 0.1–0.3(–0.5) cm long, puberulous; stipules 0.3–0.5 cm long, puberulous, caducous (or subpersistent). *Staminate inflorescences* axillary, in pairs or solitary, capitate; peduncle 0.2–1.5 cm long, sparsely minutely puberulous; head 0.4–1 cm diam.; flowers 4–15; perianth 1.5–2 mm long, minutely puberulous; stamens 2–2.5 mm long, anthers ca. 1 mm long; bracts few, basally attached, 0.5–2 mm long, sparsely minutely puberulous. *Pistillate inflorescences* axillary, in pairs or solitary, uniflorous (or biflorous); peduncle 0.4–1.5(–2) cm long, minutely puberulous; tepals 2–2.5 mm long, minutely puberulous, in fruit 5–8 mm long, reflexed; ovary ca. 1 mm long, style ca. 1 mm long, elongating to 3 mm, stigmas 2–4 mm long, elongating to 12 mm; bracts few, basally attached, 0.5–2 mm long, sparsely minutely puberulous. *Drupe* (sub)globose, 0.6–0.8 cm long, indehiscent, yellow to orange at maturity.

T h a i l a n d.— Throughout the country.

D i s t r i b u t i o n.— Sri Lanka, Bhutan, India (incl. Andaman Islands, Nicobar Islands), Bangladesh, Burma, China, Vietnam (type), Laos, Cambodia, Peninsular Malaysia, Indonesia (Sumatra, Java, Sulawesi, Lesser Sunda Islands, Moluccas), Philippines.

E c o l o g y.— Mixed deciduous, dry evergreen and evergreen forests, by streams, sometimes on limestone or in open rice fields, at low altitudes.

V e r n a c u l a r.— Kak mai foi (กักไม้ฝอย) (Northern); khoi (ข่อย) (General); som pho (ส้มพ้อ) (Loei); Siamese rough bush, Tooth brush tree.

U s e s.— The fruits are edible, sweet and the leaves can be used as cattle fodder. Twigs are used for brushing teeth.

2. *Streblus ilicifolius* (S. Vidal) Corner, Gard. Bull. Singapore 19: 227. 1962; Phytomorphology 25: 5, t. 2, 3F. 1975; Keng, Mal. Seed Pl.: f. 83. 1969.— *Taxotrophis ilicifolia* S. Vidal, Revis. Pl. Vasc. Filip.: 249. 1886; Ridl., Fl. Malay Penins. 3 : 322. 1924; Corner, Gard. Bull. Singapore 10: 288. 1939; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 55. 2006.— *T. laxiflora* Hutch., Bull. Misc. Inform.: 151. 1918.— *Streblus laxiflorus* (Hutch.) Corner, Gard. Bull. Singapore 19: 229. 1962.— *Taxotrophis eberhardtii* Gagnep., Fl. Indo-Chine 5: 700. 1928; Corner, Gard. Bull. Singapore 19: 229. 1962.

Shrub or tree to 10(–20) m tall, much-branched, often with terminal or lateral thorns to 4.5 cm long, dioecious. *Leafy twigs* 1–3 mm thick, brownish to whitish puberulous, usually on one side only or more densely, (or glabrous). *Leaves* distichous; lamina oblong, elliptic, suborbicular, ovate or obovate, 4–12(–25) by 2–5(–10.5) cm, coriaceous, apex acuminate to acute, acumen spinulose, usually with 3 teeth, base rounded to cuneate, margin spinulose-dentate or entire; both surfaces glabrous; midrib prominent above, lateral veins 8–12 pairs, tertiary venation largely parallel to the lateral veins; petiole 0.2–1 cm long, puberulous adaxially (or hairy all round or glabrous); stipules 0.3–0.8 cm long, free or basally connate, (sub)glabrous, caducous; terminal bud aculeate in dry material. *Staminate inflorescences* axillary, solitary (or in pairs), spicate; peduncle ca. 0.1 cm long, sparsely minutely puberulous; spike 1–5 cm long; flowers numerous; perianth 1–1.2 mm long, minutely puberulous; stamens 2–2.5 mm long, anthers 0.6–0.8 mm long; bracts basally attached, 0.3–1.3 mm long, sparsely minutely puberulous. *Pistillate inflorescences* axillary, solitary, (sub)racemose or uniflorous; peduncle 0.3–1.5 cm long, minutely puberulous; flowers 1–3; pedicel 2–8 mm long, minutely puberulous; tepals 1–2 mm long, ciliolate, the outer ones to 3 mm long in fruit, the inner ones to 10 mm long; ovary 1–1.5 mm long, style 0.5–1 mm long, stigmas 2–3.5 mm long; bracts basally attached, 0.3–0.5 mm long, ciliolate. *Drupe* 1–1.3 cm long, dehiscent, whitish; endocarp body subglobose to ellipsoid, 0.6–0.8 cm long.

T h a i l a n d.— NORTHERN: Lampang; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi, Prachuap Khiri Khan; SOUTH-EASTERN: Chanthaburi; PENINSULAR: Surat Thani, Phang Nga, Phuket, Krabi, Nakhon Si Thammarat, Phatthalung, Trang, Satun, Songkhla, Yala, Narathiwat.

D i s t r i b u t i o n.— Bangladesh, Burma, S China, Vietnam, Laos, Peninsular and Bornean Malaysia, Indonesia (Sumatra, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas, Papua), Philippines (type).

E c o l o g y.— Evergreen and dry evergreen forests, at low altitudes.

V e r n a c u l a r.— Kra chit (กระชิต) (Peninsular); khoi nam (ข่อยหนาม) (general); nam khet (หนามเข็ด) (Prachuap Khiri Khan); ka choem (กะเซิม) (Chanthaburi).

U s e s.— The timber is valuable.

3. *Streblus indicus* (Bureau) Corner, Gard. Bull. Singapore 19: 226. 1962.— *Pseudostreblus indica* Bureau in DC., Prodr. 17: 219. 1873; Corner, Gard. Bull. Singapore 19: 226. 1962. Fig 52.

Tree to 25 m tall, monoecious. *Leafy twigs* 2–3 mm thick, sparsely white appressed puberulous. *Leaves* distichous; lamina oblong, elliptic or subobovate, (3–)6–13 by (1–)2.5–

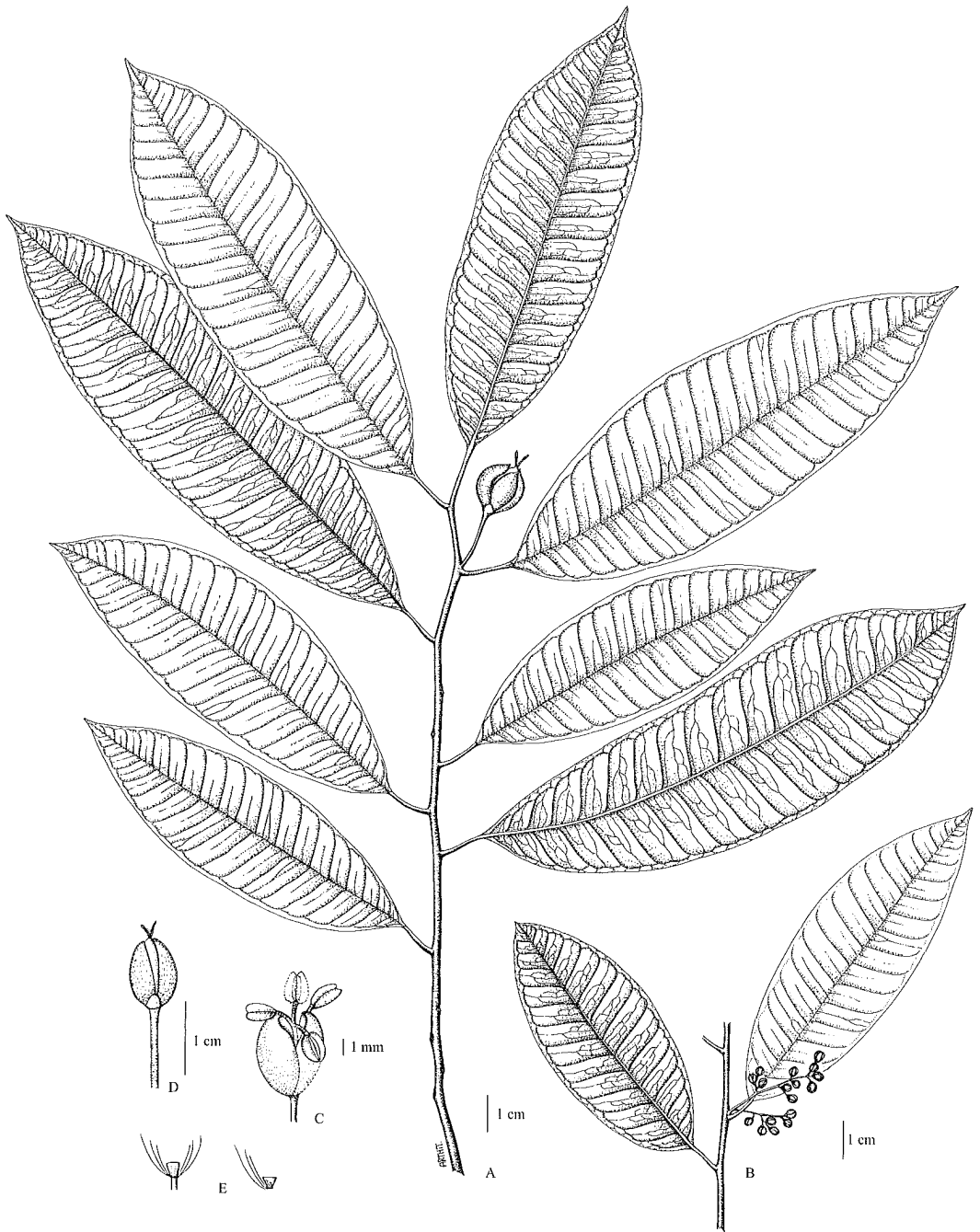


Fig. 52. *Streblus indicus* (Bureau) Corner: A. leafy twig with infructescence; B. leafy twig with staminate inflorescences; C. staminate flower; D. infructescence; E. pistillode. (A: Wongprasert 997-38; B: Maxwell 96-1612; C. Maxwell 89-1499; D. Smitinand 11798, L). Drawn by Arthit Khamkamnoed (A-B) and Cornelis Berg (C-E).

4.5 cm, (sub)coriaceous, apex acuminate, base cuneate to obtuse, margin entire, \pm revolute; upper surface glabrous, lower surface sparsely white appressed puberulous on the midrib to subglabrous, often with numerous minute red-brown pluricellular trichomes; midrib \pm impressed above, lateral veins (5–)9–18 pairs, tertiary venation largely parallel to the lateral veins; petiole 0.8–1.5 cm long, sparsely white appressed puberulous; stipules 0.2–0.3 cm long, minutely white appressed puberulous, caducous. *Staminate inflorescences* axillary, solitary or in pairs, racemose to subspicate or branched, with part of the flowers pedicellate and the others sessile, 1–3 by 1–3 cm; pedicel 1–3 mm long; peduncle 0.3–0.8 cm long, sparsely minutely white puberulous; flowers 3–ca. 25; perianth ca. 3 mm long, tepals ciliolate, inside towards the apex white arachnoid-tomentose, stamens ca. 3 mm long, anthers ca. 1.5 mm long; bracts basally attached, 1–1.5 mm long, sparsely ciliolate. *Pistillate inflorescences* axillary, solitary, uniflorous; peduncle 0.5–2.3 cm long, minutely puberulous; flower 1; tepals ca. 4 mm long, minutely white puberulous, in fruit ca. 2 cm long; ovary ca. 4 mm long, stigmas 3–4 mm long; bracts basally attached, subtending the flower, 1–2 mm long, minutely white puberulous. *Fruit* ellipsoid to ovoid, 0.8–1.2 cm, dark red to purple at maturity.

T h a i l a n d.—NORTHERN: Chiang Mai, Lampang; EASTERN: Nakhon Ratchasima; SOUTH-EASTERN: Chanthaburi.

D i s t r i b u t i o n.—NE India, S China, Laos.

E c o l o g y.—Dry evergreen forest, to 1,300 m.

4. *Streblus macrophyllus* Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 80. 1856; Corner, Gard. Bull. Singapore 19: 227. 1962; Phytomorphology 25: 5, t. 2, 3G. 1975; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 56. 2006.—*Diplocos ? macrophyllus* (Blume) Bureau in DC. Prod. 17: 216. 1873.—*Taxotrophis macrophylla* (Blume) Boerl., Handl. Fl. Ned. Ind. 3: 359. 1900.—*T. balsamiae* Hutch., Bull. Misc. Inform.: 151. 1918.—*Dimerocarpus brenieri* Gagnep., Bull. Mus. Hist. Nat. Paris 27: 441. 1921; Gagnep., Fl. Indo-Chine 5: 704, f. 84. 1928. Fig. 53.

Tree to 12 m tall, rarely with axillary thorns to 0.5 cm long, dioecious or sometimes monoecious. *Leafy twigs* 1–2.5 mm thick, brownish minutely puberulous, mostly on one side only, or glabrous, young parts often \pm compressed (often drying yellowish). *Leaves* distichous; lamina oblong, elliptic, subovate, subobovate or lanceolate, 6–22 by 2–7.5 cm, often \pm asymmetric, subcoriaceous, apex acuminate to subcaudate, acumen acute, base rounded, obtuse or cuneate, margin subentire, crenate-dentate or denticulate; upper surface glabrous, lower surface glabrous or appressed-puberulous on the midrib; midrib \pm impressed above, lateral veins 6–10 pairs, tertiary venation subscalariform to reticulate; petiole 0.2–0.8 cm long, glabrous or minutely puberulous, often more densely adaxially; stipules 0.2–1 cm long, subglabrous or appressed-puberulous, subpersistent or caducous, terminal bud slender, \pm aculeate when dry. *Staminate inflorescences* axillary, solitary, spicate; peduncle 0.2–0.4 cm long, minutely puberulous; spike 1.5–14 cm long; flowers numerous; perianth 1–1.2 mm long, minutely puberulous; stamens ca. 2 mm long, anthers 0.6–0.8 mm long; bracts basally attached, 0.3–0.8 mm long, sparsely minutely puberulous. *Pistillate inflorescences* axillary, solitary, racemose (or uniflorous); peduncle 0.2–1 cm long, minutely puberulous; flowers (1–)2–10; pedicel 0.5–10 mm long, minutely puberulous; tepals 1–2 mm long, minutely puberulous, the outer ones 2–4 mm long in fruit, the inner ones 7–10 mm long; ovary ca. 1 mm long, style ca. 1 mm long, stigmas 1.5–3 mm long; bracts basally attached, 0.3–1 mm long, minutely puberulous. *Drupe* 1–1.4 cm long, dehiscent, whitish; endocarp body 0.8–1 cm long.

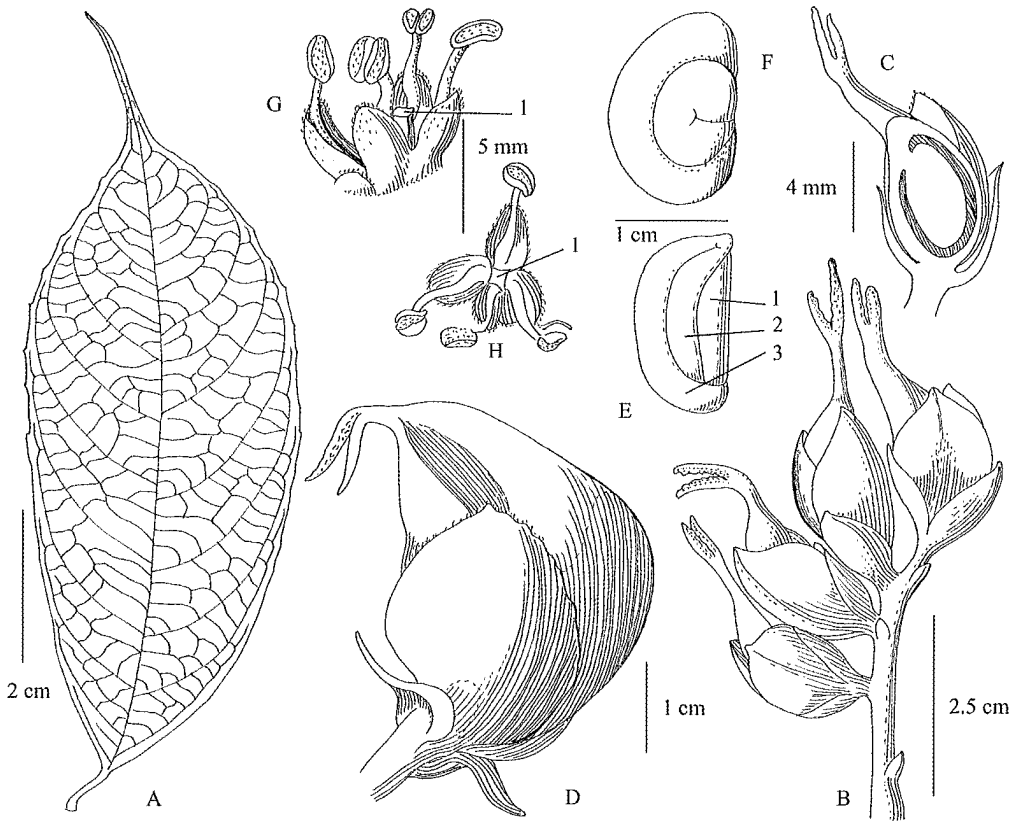


Fig. 53. *Streblus macrophyllus* Blume: A. leaf; B. pistillate inflorescence; C. pistillate flower in section (A–C: *Jaheri 1234*); D. dehiscent fruit (*Endert 3068*), E and F. embryo in transverse and longitudinal section (*Santos 4215*); G and H. staminate flowers and 1 pistillode (*Bur. Sci 15485*). Courtesy of Flora Malesiana ser I, 17(1): 57, fig. 11.

T h a i l a n d.— SOUTH-WESTERN: Kanchanaburi, Phetchaburi, Prachuap Khiri Khan.

D i s t r i b u t i o n.— Vietnam, Peninsular and Bornean Malaysia: Sabah; Indonesia (Kalimantan, Sulawesi-type), Philippines.

E c o l o g y.— Mixed deciduous and evergreen forests, on limestone, at low altitudes.

N o t e.— The endocarp is ejected as far as 10 m away (D.J. Middleton, pers. comm.).

5. *Streblus perakensis* Corner, Gard. Bull. Singapore 19: 223, t. 11. 1962; Phytomorphology 25: 3. 1975; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 58. 2006.

Shrub or tree to 10 m tall, sometimes with lateral or terminal, often \pm curved thorns to 1 cm long, dioecious; often with concentrations of persistent stipules (or scale-leaves) and lenticels at branching points. *Leafy twigs* 1.5–3 mm thick, glabrous or sparsely minutely puberulous, on one side only or more densely; often with straight or curved thorns to 1 cm long terminating

twigs. *Leaves* distichous; lamina oblong to subobovate, (2.5–)5–12(–16) by (1–)2–5(–7) cm, often \pm asymmetric, subcoriaceous to coriaceous, apex acuminate, acumen obtuse to subacute, base rounded to cordulate, margin irregularly dentate to denticulate or subentire; upper surface glabrous, lower surface glabrous or sparsely puberulous on the midrib; midrib \pm impressed above, lateral veins 6–8 pairs, tertiary venation reticulate; petiole (0.2–)0.4–0.7 cm long, glabrous or minutely puberulous adaxially; stipules 0.1–0.3 cm long, appressed-puberulous, (sub)persistent. *Staminate inflorescences* axillary, solitary or in pairs, spicate (or racemose), subsessile; spike (or raceme) 0.3–0.8 cm long; flowers 5–20, sessile (or to 1 mm long pedicellate); perianth ca. 1.5 mm long, minutely puberulous; stamens ca. 3 mm long, anthers ca. 0.8 mm long; bracts basally attached, few, 0.2–0.5 mm long, sparsely puberulous. *Pistillate inflorescences* axillary, solitary or in pairs, uniflorous, sessile or pedunculate; peduncle to 0.4 cm long, subglabrous; tepals 2–3 mm long, minutely puberulous, the outer ones 3–4 mm long in fruit, the inner ones 10–12 mm long, suborbicular; ovary ca. 1.5 mm long, style ca. 1 mm long, stigmas 3–5 mm long; bracts basally attached, 2, ca. 0.3–1 mm long, minutely puberulous or subglabrous. *Drupe* subglobose, 1–1.2 cm long, dehiscent, whitish; endocarp body subglobose, ca. 0.7 cm long.

T h a i l a n d.— PENINSULAR: Narathiwat.

D i s t r i b u t i o n.— Peninsular Malaysia (type).

E c o l o g y.— Evergreen forest, at low altitudes.

N o t e.— In the very short and almost sessile staminate inflorescences this species matches *Streblus taxoides* from which it can be distinguished by somewhat longer petioles and the absence of short-shoots bearing tufts of leaves and/or inflorescences. Moreover, the shape of the tepals of the pistillate flower is distinctly different. The pistillate inflorescences are often sessile at anthesis. Spines are formed but, apparently, not as frequently and consistently as in *Streblus taxoides*. Concentrations of persistent scales and lenticels can often be found on branching points.

6. *Streblus taxoides* (Heyne ex Roth) Kurz, Forest Fl. Burma 2: 465. 1877; Corner, Gard. Bull. Singapore 19: 225. 1962; Corner, Phytomorphology 25: 3, t. 1C, 2, 3A. 1975; C.C. Berg et al., Fl. Males., Ser. 1, Spermat. 17(1): 59. 2006.— *Trophis taxoides* Heyne ex Roth, Nov. Pl. Ind. Orient.: 368. 1821.— *Phyllochlamys taxoides* (Heyne ex Roth) Koord., Exk. Fl. Java 2: 89. 1912.— *Trophis spinosa* Roxb., Fl. Ind. Ed. 1832 3: 762. 1832, non Willd. 1806, nec Blume 1826.— *Epicarpurus spinosus* (Roxb.) Wight, Icon. Pl. Ind. Orient. 6: 7, t. 1962, p.p. 1853.— *Phyllochlamys spinosa* (Roxb.) Bureau in DC. Prodr. 17: 218. 1873; Hook.f., Fl. Brit. India 5: 488. 1888; Ridl., Fl. Malay Penins. 3: 323. 1924.— *Epicarpurus zeylanicus* Thwaites, Hooker's J. Bot. Kew Gard. Misc. 4: 1. 1852, 3: t. 11. 1851.— *Streblus zeylanicus* (Thwaites) Kurz, Forest Fl. Burma 2: 464. 1877; Corner, Gard. Bull. Singapore 19: 229. 1962; Phytomorphology 25: 5, t. 1A. 1975.— *Diplocos zeylanicus* (Thwaites) Bureau in DC., Prodr. 17: 215. 1873.— *Streblus microphyllus* Kurz, Prel. Rep. For. Pegu App. A, cxviii; App. B, 84. 1875; Kurz, Forest Fl. Burma 2: 464. 1877.— *S. taxoides* (Roth) Kurz var. *microphylla* (Kurz) Kurz, Forest Fl. Burma 2: 465. 1877.— *Phyllochlamys wallichii* King ex Hook.f., Fl. Brit. India 5: 489. 1888; Ridl., Fl. Malay Penins. 3: 322. 1924.— *P. tridentata* Gagnep., Fl. Indo-Chine 5: 714. 1928.— *Taxotrophis poilanei* Gagnep., Fl. Indo-Chine 5: 701. 1928.— *T. crenata* Gagnep., Fl. Indo-Chine 5: 702, t. 82. 1928.— *Streblus crenatus* (Gagnep.) Corner, Gard. Bull. Singapore 19: 226. 1962.

Shrub or treelet to 5 m tall, much-branched, with thorns to 1.5 cm long, mostly terminating (short) leafy twigs, dioecious; short-shoots often present, bearing (clusters of) leaves and/or

inflorescences. *Leafy twigs* 1–2.5 mm thick, brown to whitish puberulous, on one side only or more densely (or glabrous). *Leaves* distichous; lamina oblong, elliptic, lanceolate or (sub) obovate, (1–)2–10(–18) by (0.5–)1–4.5(–6.5) cm, subcoriaceous to coriaceous, apex acuminate to acute (or rounded), acumen acute to obtuse, base obtuse to rounded (or cordulate), margin dentate to denticulate (or crenate), mainly in the upper part of the lamina; both surfaces glabrous and smooth; midrib impressed above, lateral veins 6–12 pairs, tertiary venation reticulate; petiole 0.1–0.4(–0.6) cm long, brown to whitish puberulous, adaxially only (or more densely); stipules 0.2–0.5 cm long, ciliolate, subpersistent. *Staminate inflorescences* axillary, 1–4 on short-shoots, short-spicate to (sub)capitate (or racemose), (sub)sessile; spike (or raceme) 0.4–0.8 cm long; flowers 8–14, (sub)sessile (or to 1 mm long pedicellate); perianth ca. 1.5 mm long, subglabrous or minutely puberulous; stamens 2–2.5 mm long, anthers 0.6–0.8 mm long; bracts basally attached, 0.2–0.6 mm long, minutely puberulous. *Pistillate inflorescences* axillary, solitary (sometimes clustered on short-shoots), uniflorous; peduncle 0.3–0.6 cm long, subglabrous; tepals ovate (or lanceolate), 2–5 mm long, glabrous, to 2 cm long in fruit; ovary ca. 1.5 mm long, style ca. 1 mm long, stigmas 0.5–3 mm long; bracts usually 2, ovate to lanceolate, ca. 1.5 mm long, subglabrous. *Drupe* ellipsoid, 0.5–1 cm long, dehiscent (?), whitish.

T h a i l a n d.—NORTHERN: Lampang; NORTH-EASTERN: Nakhon Phanom; EASTERN: Nakhon Ratchasima; SOUTH-WESTERN: Kanchanaburi; CENTRAL: Saraburi; SOUTH-EASTERN: Prachin Buri, Chon Buri; PENINSULAR: Chumphon, Surat Thani, Phangnga, Phuket, Nakhon Si Thammarat, Satun, Songkhla, Pattani, Yala, Narathiwat.

D i s t r i b u t i o n.—Sri Lanka, India (type), Bhutan, Burma, S China, Vietnam, Laos, Cambodia, Peninsular Malaysia, Indonesia (Java, Sulawesi, Lesser Sunda Islands), Philippines.

E c o l o g y.—Mixed deciduous, dry evergreen and evergreen forests, also on limestone and open scrub, at low altitudes.

V e r n a c u l a r.—Katae mai (กะแตไม้) (Pattani); khi nam (ชอยหนาม) (General); khi raet (ชี้แรด), nam khi raet (หนามชี้แรด) (Peninsular).

11. TROPHIS

P. Browne, *Hist. Jamaica* 357. 1756, nom. cons.; Trécul, *Ann. Sci. Nat. Bot.*, Sér. 3., 8: 146. 1847; Bureau in DC. *Prod.* 17: 251. 1873; Engl. & Prantl, *Nat. Pflanzenfam.* 3, 1: 73. 1888; Burger, *Ann. Missouri Bot. Gard.* 49: 6. 1962; Corner, *Gard. Bull. Singapore* 19: 230. 1962; C.C. Berg, *Proc. Kon. Ned. Akad. Wetensch.*, C. 91: 352. 1988; C.C. Berg et al., *Fl. Males.*, Ser. 1, *Spermat.* 17(1): 61. 2006.—*Malaisia* Blanco, *Fl. Filip.*: 789. (1837) 789; Bureau in DC. *Prod.* 17: 221. 1873; Corner, *Gard. Bull. Singapore* 19: 240. 1962.—*Trophis* P. Browne sect. *Malaisia* (Blanco) C.C. Berg, *Proc. Kon. Ned. Akad. Wetensch.*, Ser. C, 91: 354. 1988.—*Dumartroya* Gaudich., *Bot. Voy. Bonite*: 165, t. 97. 1844.—*Cephalotrophis* Blume, *Ann. Mus. Bot. Lugd.-Bat.* 2: 75. 1856.—*Calpidochlamys* Diels, *Bot. Jahrb. Syst.* 67: 172. 1935.—*Trophis* P. Browne sect. *Calpidochlamys* (Diels) Corner, *Gard. Bull. Singapore* 19: 230. 1962.

Trees, shrubs or climbers, dioecious, unarmed, uncinuate hairs absent or present. *Leaves* distichous; lamina pinnately veined; stipules free, lateral. Inflorescences unisexual, racemose, spicate, subcapitate, or discoid-capitate and involucrate. *Staminate inflorescences* multi- to pluriflorous; pistillate inflorescences multi- to uniflorous; flowers with 3 or 4 tepals, valvate or imbricate in the bud; stamens 3 or 4, inflexed in the bud. *Pistillate inflorescences* multi- to uniflorous; flowers with 4, connate tepals, equal in size and forming a tubular or a collar-shaped perianth; ovary free or adnate to the perianth; stigmas 2, equal. *Fruiting perianth* enlarged,

fleshy, orange or red, enclosing the free and indehiscent or adnate fruit, endocarp crustaceous to woody; seed without endosperm, embryo with thick, flat, equal or (very) unequal cotyledons, radicle short or rather long.

The genus comprises nine species in the Old World (not on the African continent) and the New World.

Subdivision. The genus can be subdivided into six sections (Berg, 1988) of which only the monotypic *Trophis* sect. *Malaisia* is represented in Thailand.

Trophis scandens (Lour.) Hook. & Arn., Bot. Beechey Voy.: 214. 1837; C.C. Berg, Proc. Kon. Ned. Akad. Wetensch., C. 91: 354. 1988; C.C. Berg, Fl. Males., Ser. 1, Spermat. 17(1): 65. 2006.—*Caturus scandens* Lour., Fl. Cochinch.: 612. 1790.—*Malaisia scandens* (Lour.) Planch., Ann. Sci. Nat. Bot. Sér. 4, 3: 293. 1855.—*Alchornea scandens* (Lour.) Müll. Arg., Linnaea 34: 170. 1865.—*Malaisia tortuosa* Blanco var. *scandens* (Lour.) Bureau in DC. Prod. 17: 222. 1873.—*Morus javanica* Blume, Bijdr. Fl. Ned. Ind.: 488. 1825.—*Cephalotrophis javanica* (Blume) Blume, Ann. Mus. Bot. Lugd.-Bat. 2: 76, t. 27. 1856.—*Malaisia tortuosa* Blanco, Fl. Filip.: 789. 1837; Bureau in DC., Prod. 17: 221. 1873; Ridl., Fl. Malay Penins. 3: 325. 1924; Gagnep., Fl. Indo-Chine 5: 696. (sub var. *scandens*), t. 83: 1–4. 1928.—*Dumartroya fagifolia* Gaudich., Bot. Voy. Bonite: 165, t. 97. 1844.

Climber or shrub with climbing branches, these with long internodes and rudimentary leaves, evergreen. *Leafy twigs* 1.5–2.5 mm thick, brownish to whitish puberulous, partly with uncinat hairs, mostly drying dark brown with conspicuous lenticels. *Leaves* distichous; lamina oblong (to elliptic or lanceolate), 4–16(–20) by 1.5–6.5(–8), usually \pm asymmetric, subcoriaceous, apex acuminate, base rounded to subcordate (or subcuneate), margin entire or denticulate to dentate towards the apex, often \pm revolute, at least towards the base; upper surface minutely puberulous on (the lower part of) the midrib, lower surface sparsely puberulous on the (main) veins; midrib prominent above, lateral veins 7–12 pairs, tertiary venation (sub)scalariform; petiole 0.3–1(–1.5) cm long, (sparsely) puberulous; stipules 0.1–0.5 cm long, sparsely appressed-puberulous, caducous or subsistent. *Staminate inflorescences* axillary, solitary, in pairs or to 6 together on short-shoots, spicate; peduncle 0.5–1.5 cm long, puberulous to tomentellous; spike 0.5–3.5(–5) cm long, often interrupted; perianth ca. 1.5 mm long, minutely puberulous; stamens ca. 2.5 mm long, anthers ca. 0.8 mm long; bracts basally attached, ovate to lanceolate, 0.5–1 mm long, minutely puberulous. *Pistillate inflorescences* axillary, solitary, in pairs or to 6 together on short-shoots, capitate to short-spicate (or uniflorous); peduncle 0.4–2 cm long, puberulous to tomentellous; head 0.3–0.5 cm diam., spike to 1.5 cm long; flowers 1–8; perianth 1–1.5 mm long, glabrous except for the densely white puberulous apex, faintly 4-dentate to subentire; ovary ca. 1 mm long, style 1–2 mm long, stigmas 5–15 mm long; bracts basally attached, ovate to subulate, 0.5–1 mm long, densely white puberulous to subtomentellous. *Fruiting perianth* ellipsoid, 0.6–0.8 cm long when dry, dark pink to red at maturity.

T h a i l a n d.—PENINSULAR: Surat Thani, Phuket, Nakhon Si Thammarat, Songkhla.

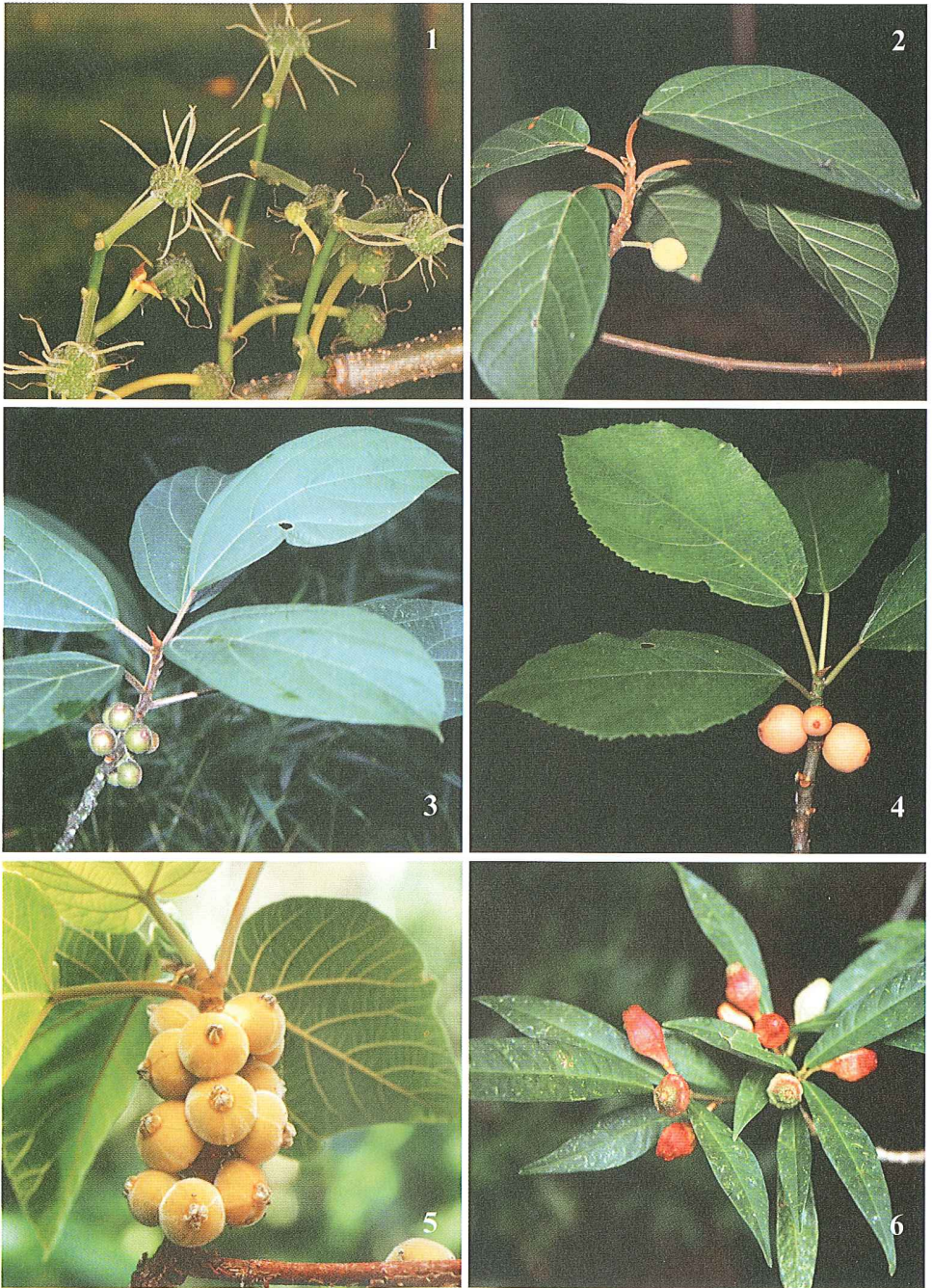
D i s t r i b u t i o n.—Burma, S China (type), Taiwan, Vietnam, Peninsular and Bornean Malaysia, Singapore, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Lesser Sunda Islands, Moluccas, Papua), Philippines, Papua New Guinea, Australia, Pacific (New Caledonia, Lord How Island, Vanuatu, and Fiji).

E c o l o g y.—Evergreen forest, on limestone, at low altitudes.

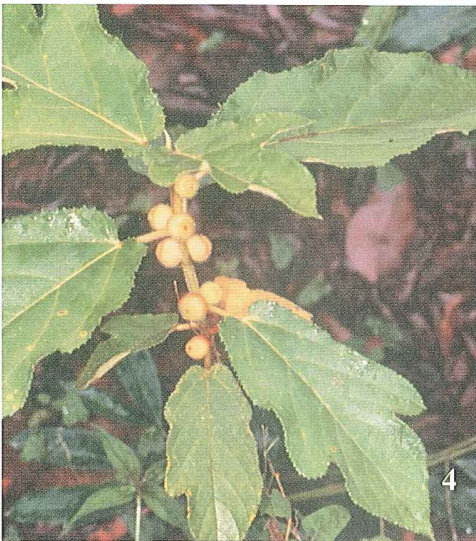
V e r n a c u l a r.—Khoi yan (ข่อยย่าน) (General).



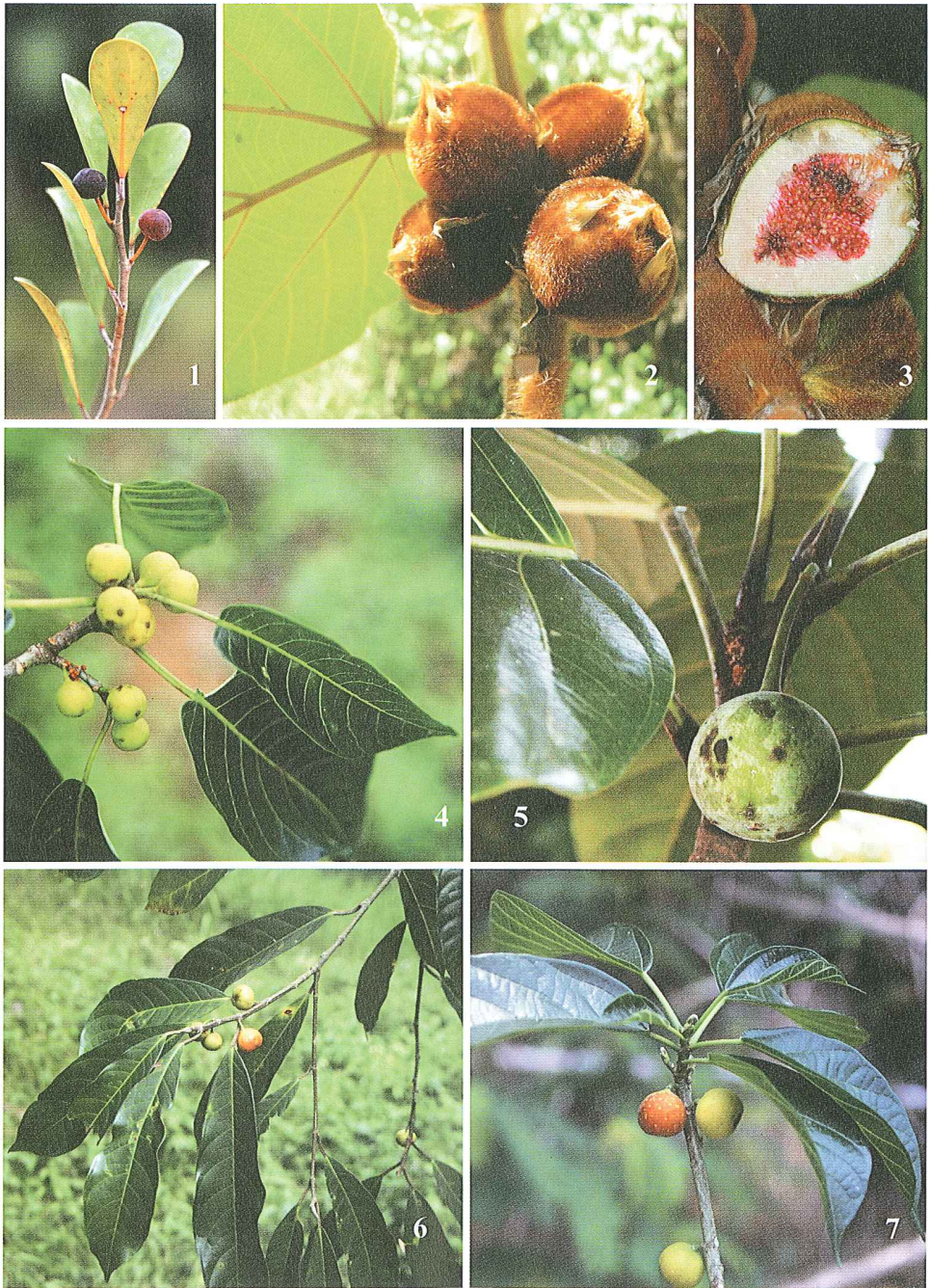
1. *Poikilospermum naucleiflorum* (Roxb.) Chew; 2. *Artocarpus altilis* (Parkinson) Fosberg; 3. *A. kemando* Miq.; 4. *A. rigidus* Blume; 5.-6. *A. thailandicus* C.C. Berg. Photographed by R. Pooma (1-2, 4-6); M. Poopath (3).



1. *Broussonetia kurzii* (Hook.f.) Corner; 2. *Ficus glandulifera* (Wall. ex Miq.) King; 3. *F. cambodica* Gagnep.; 4. *F. grossularioides* Burm.f.; 5. *F. fulva* Reinw. ex Blume; 6. *F. ischnopoda* Miq. Photographed by R. Pooma (1, 5); P. Chantarasuwan (2-4, 6).



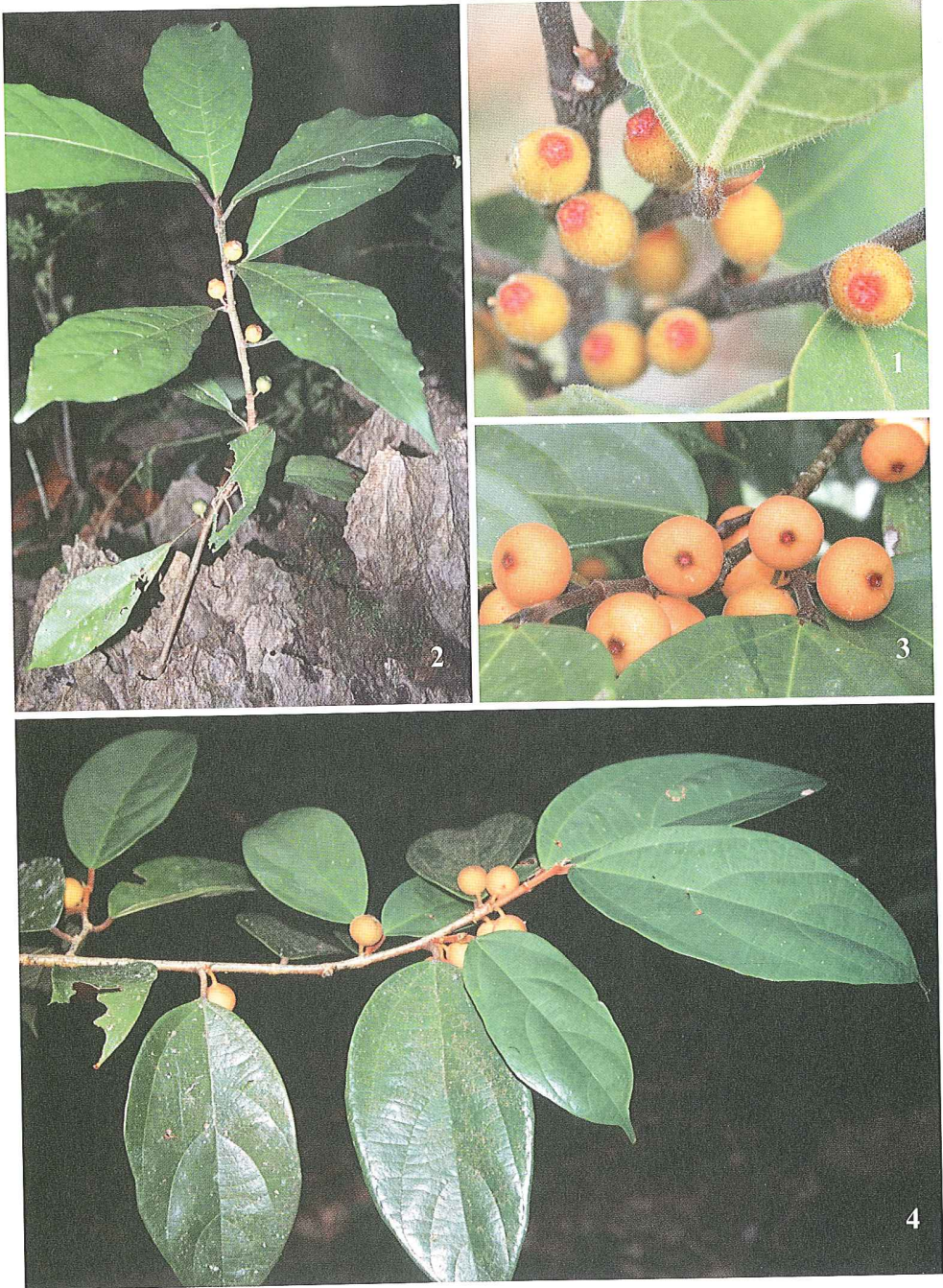
1-2. *Ficus chartacea* (Wall. ex Kurz) King; 3. *F. lamponga* Miq.; 4-5. *F. hirta* Vahl. Photographed by P. Chantarasuwan (1); A. Mauric (2, 4); R. Pooma (3, 5).



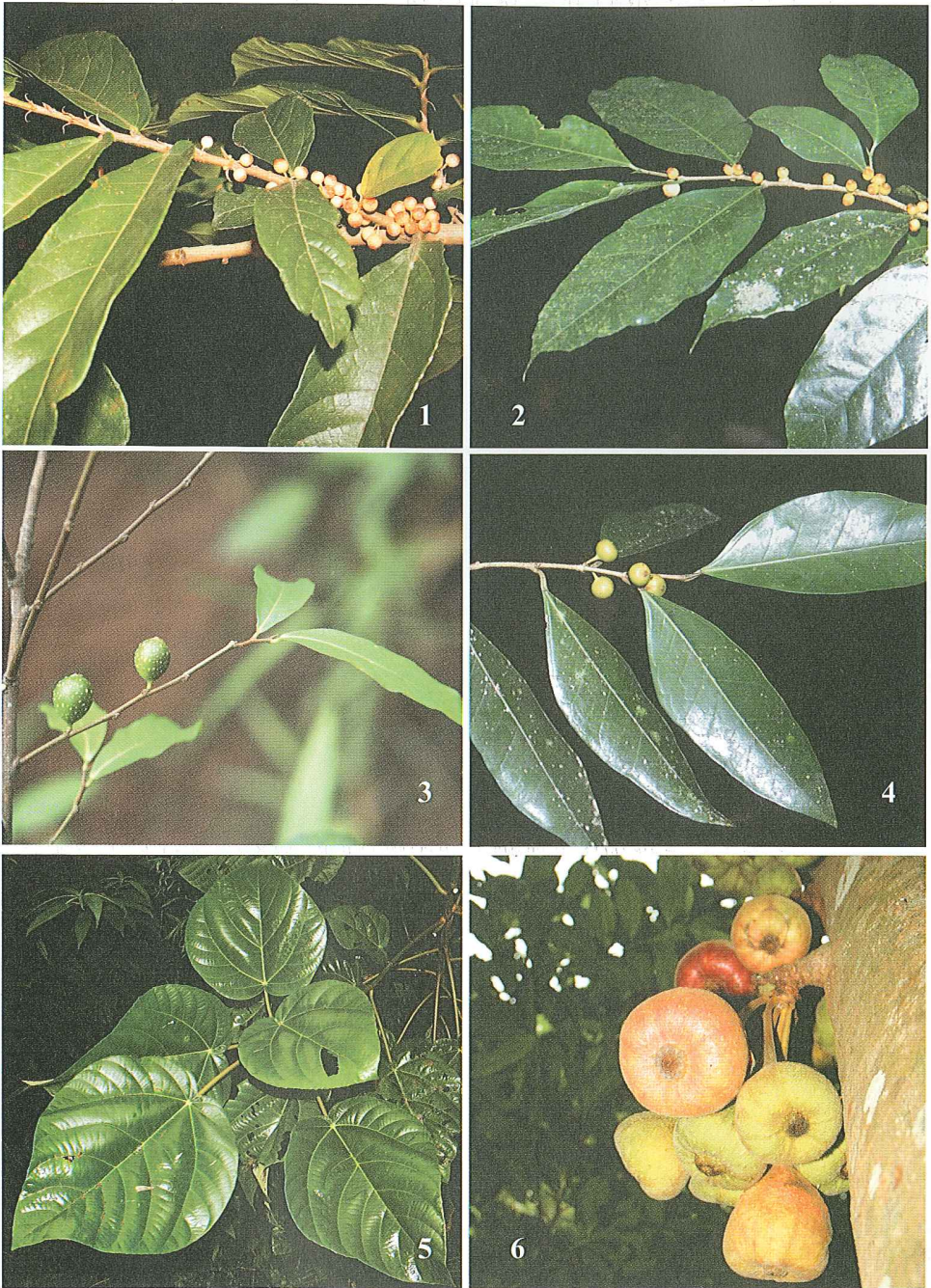
1. *Ficus deltoidea* Jack; 2-3. *F. triloba* Buch.-Ham. ex Voigt subsp. *triloba*; 4. *F. albipila* (Miq.) King; 5. *F. callosa* Willd.; 6. *F. nervosa* Heyne ex Roth subsp. *nervosa*; 7. *F. capillipes* Gagnep. Photographed by P. Chantarasuwan (1, 4, 6-7); P. Karaket (2-3); R. Pooma (5).



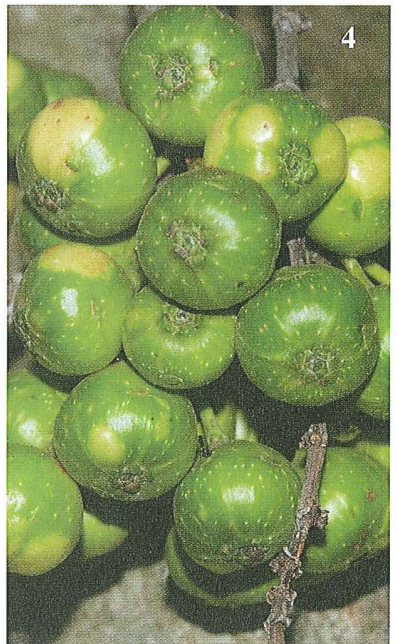
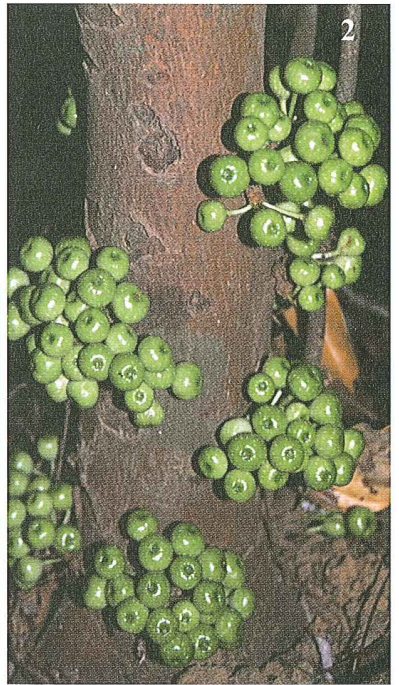
1. *Ficus thailandica* C.C. Berg & S. Gardner; 2. *F. vasculosa* Wall. ex Miq.; 3-4. *F. heterophylla* L.f. Photographed by S. Gardner (1); R. Pooma (2-4).



1. *Ficus anastomosans* Wall. ex Kurz; 2. *F. montana* Burm.f.; 3-4. *F. parietalis* Blume. Photographed by R. Pooma (1, 3); P. Chantarasuwan (2, 4).



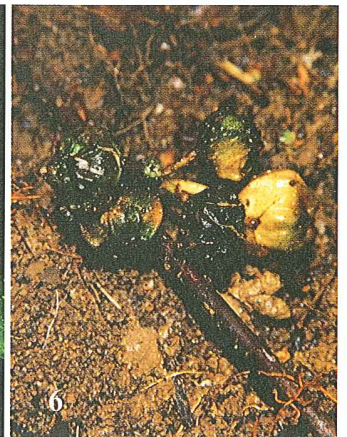
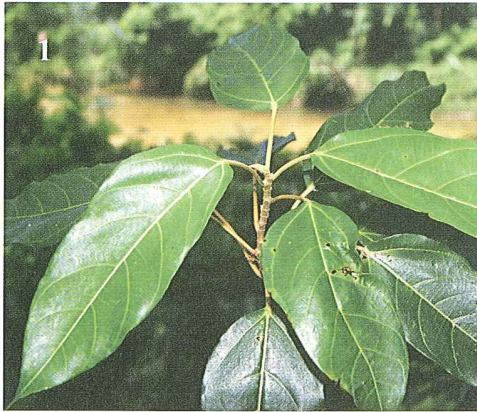
1. *Ficus scaberrima* Blume; 2. *F. sinuata* Thunb.; 3. *F. subincisa* Sm.; 4. *F. tinctoria* G. Forst. subsp. *gibbosa* (Blume) Corner; 5-6. *F. auriculata* Lour. Photographed by P. Chantarasuwan.



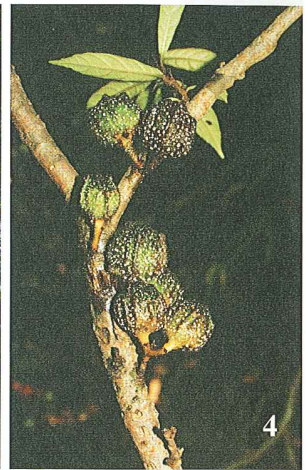
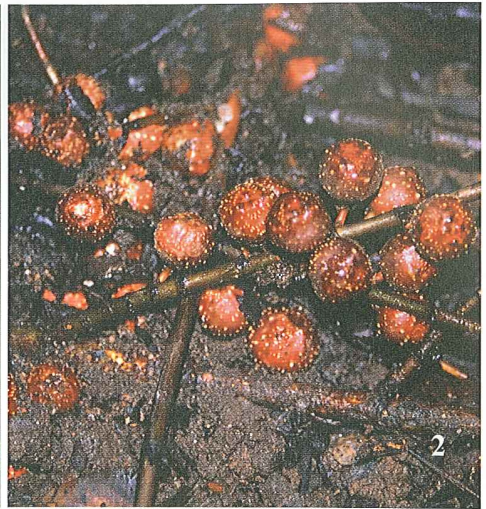
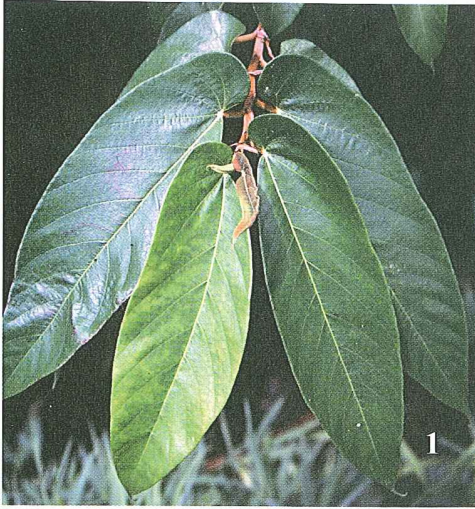
1-2. *Ficus fistulosa* Reinw. ex Blume; 3-4. *F. hispida* L.f; Photographed by P. Chantarasuwan (1-3); P. Karaket (4).



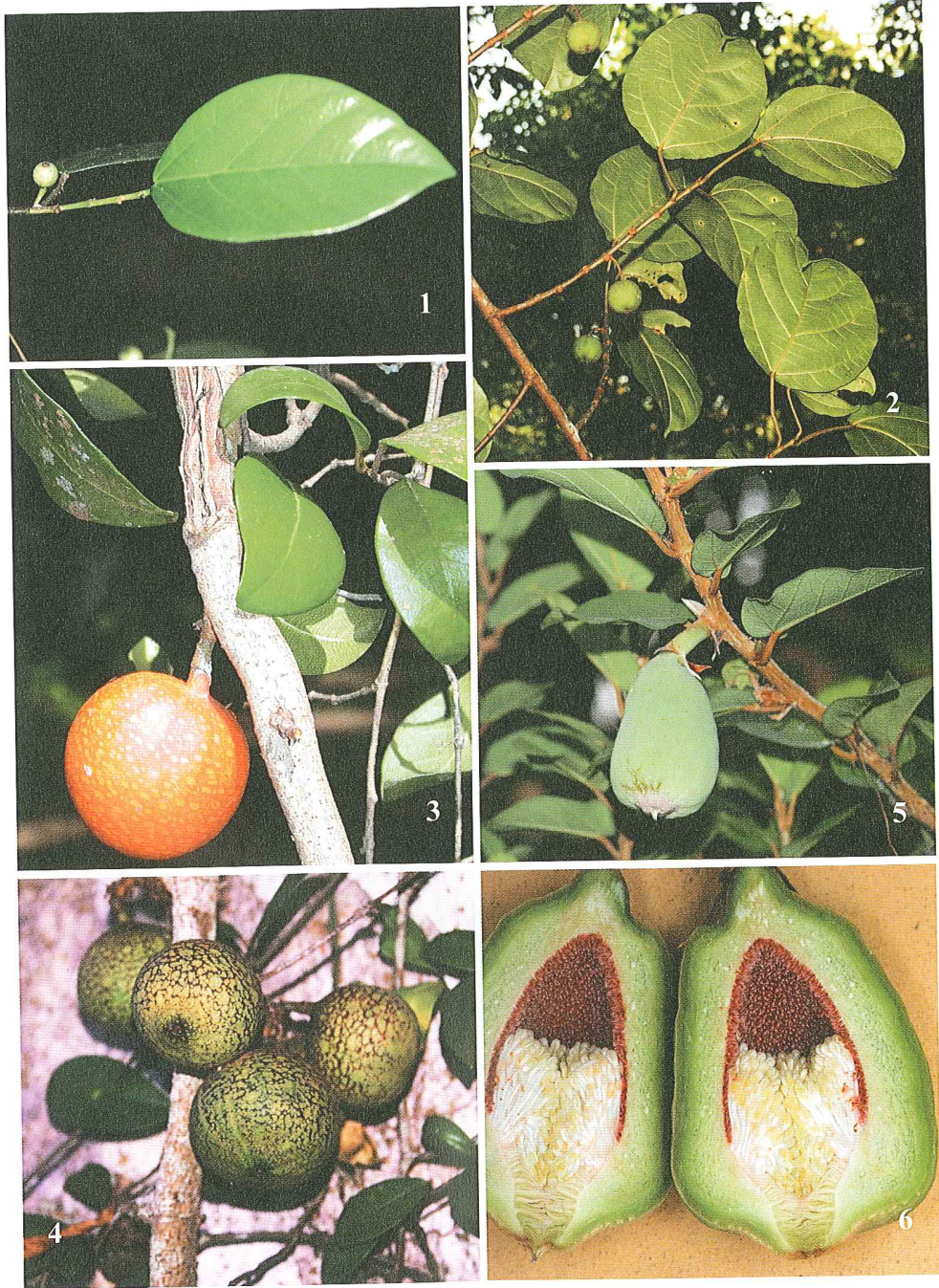
1. *Ficus lepicarpa* Blume; 2. *F. variegata* Blume; 3-4. *F. malayana* C.C. Berg & Chantarasuwan; 5-6. *F. obpyramidata* King. Photographed by P. Chantarasuwan.



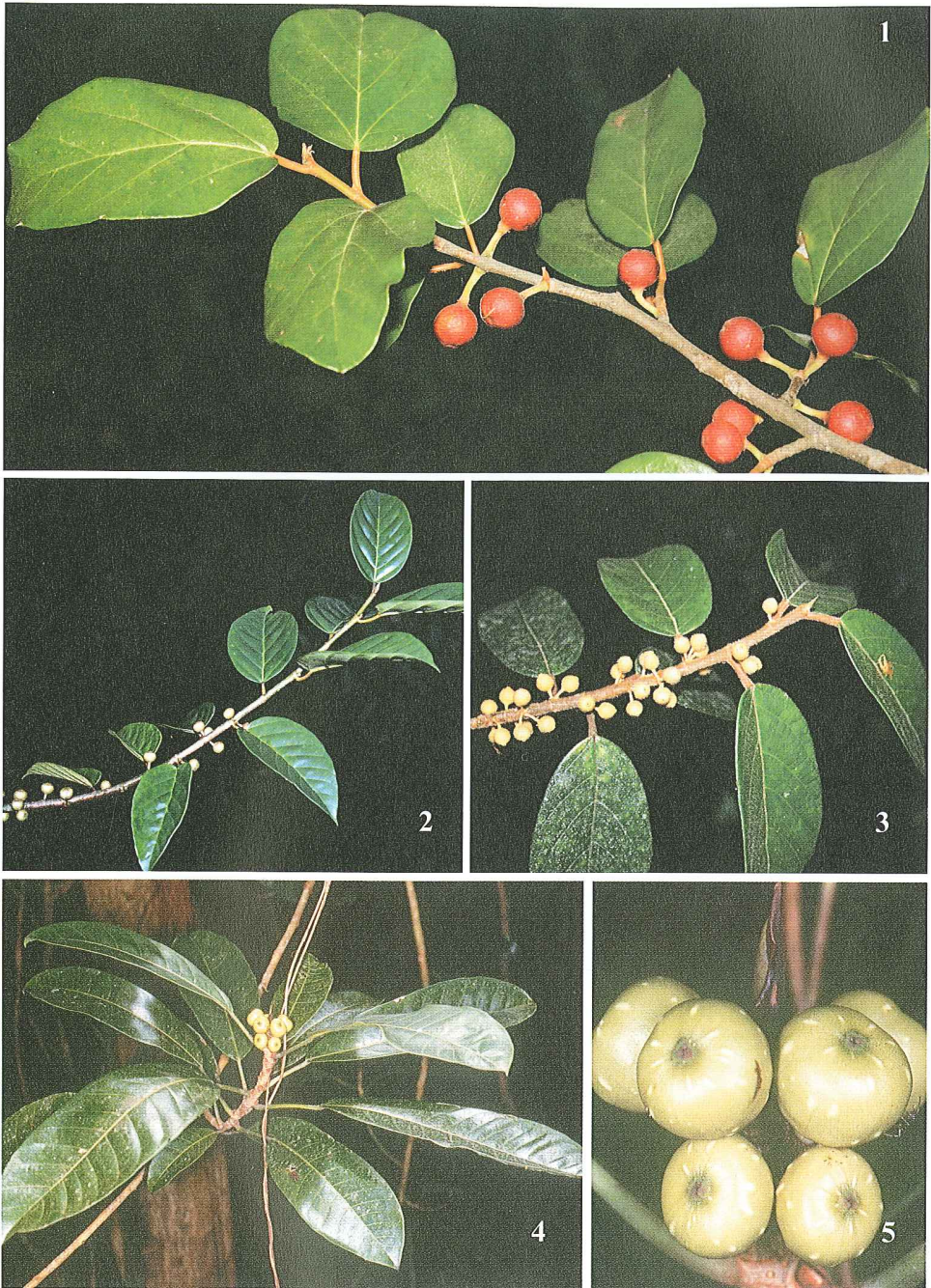
1-2. *Ficus racemosa* L.; 3-4. *F. ribes* Reinw. ex Blume; 5-6. *F. ridleyana* C.C. Berg & Chantarasuwan. Photographed by P. Chantarasuwan (1, 3-6), R. Pooma (2).



1-2. *Ficus semicordata* Buch.-Ham. ex Sm.; 3-4. *F. squamosa* Roxb.; 5. *F. apiocarpa* (Miq.) Miq.; 6. *F. araneosa* King. Photographed by P. Chantarasuwan.



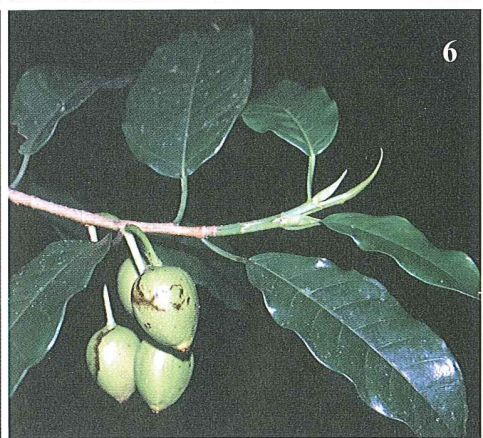
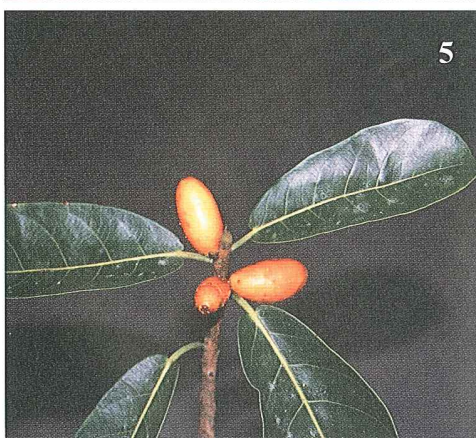
1. *Ficus hederacea* Roxb.; 2. *F. laevis* Blume; 3-4. *F. punctata* Thunb.; 5-6. *F. pumila* L. Photographed by P. Chantarasuwan (1-2, 4); R. Pooma (3, 5-6).



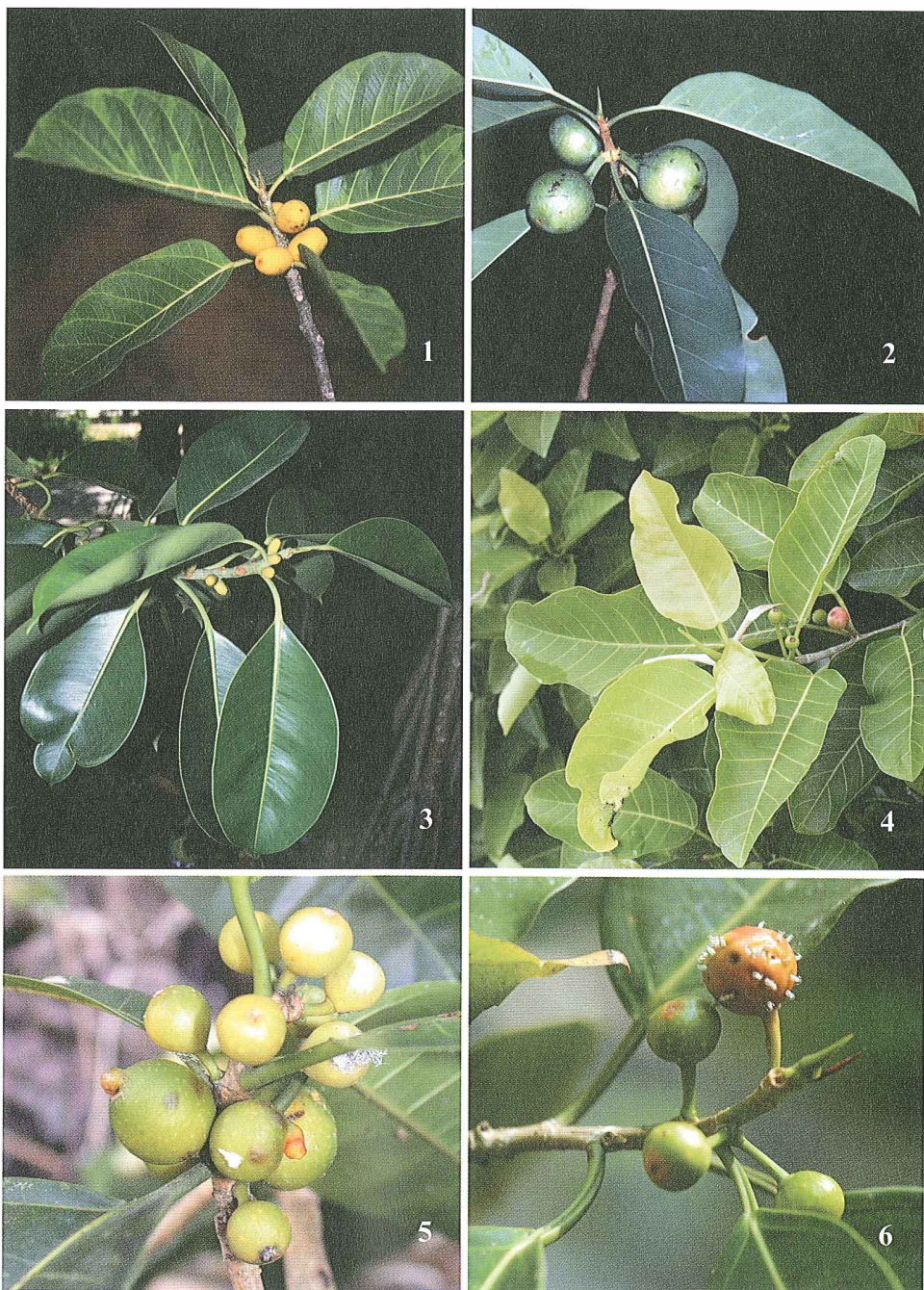
1. *Ficus trichocarpa* Blume; 2. *F. sagittata* J. Koenig ex Vahl; 3. *F. villosa* Blume; 4-5. *F. globosa* Blume.
 Photographed by P. Chantarasuwan (1-3); A. Mauric (4-5).



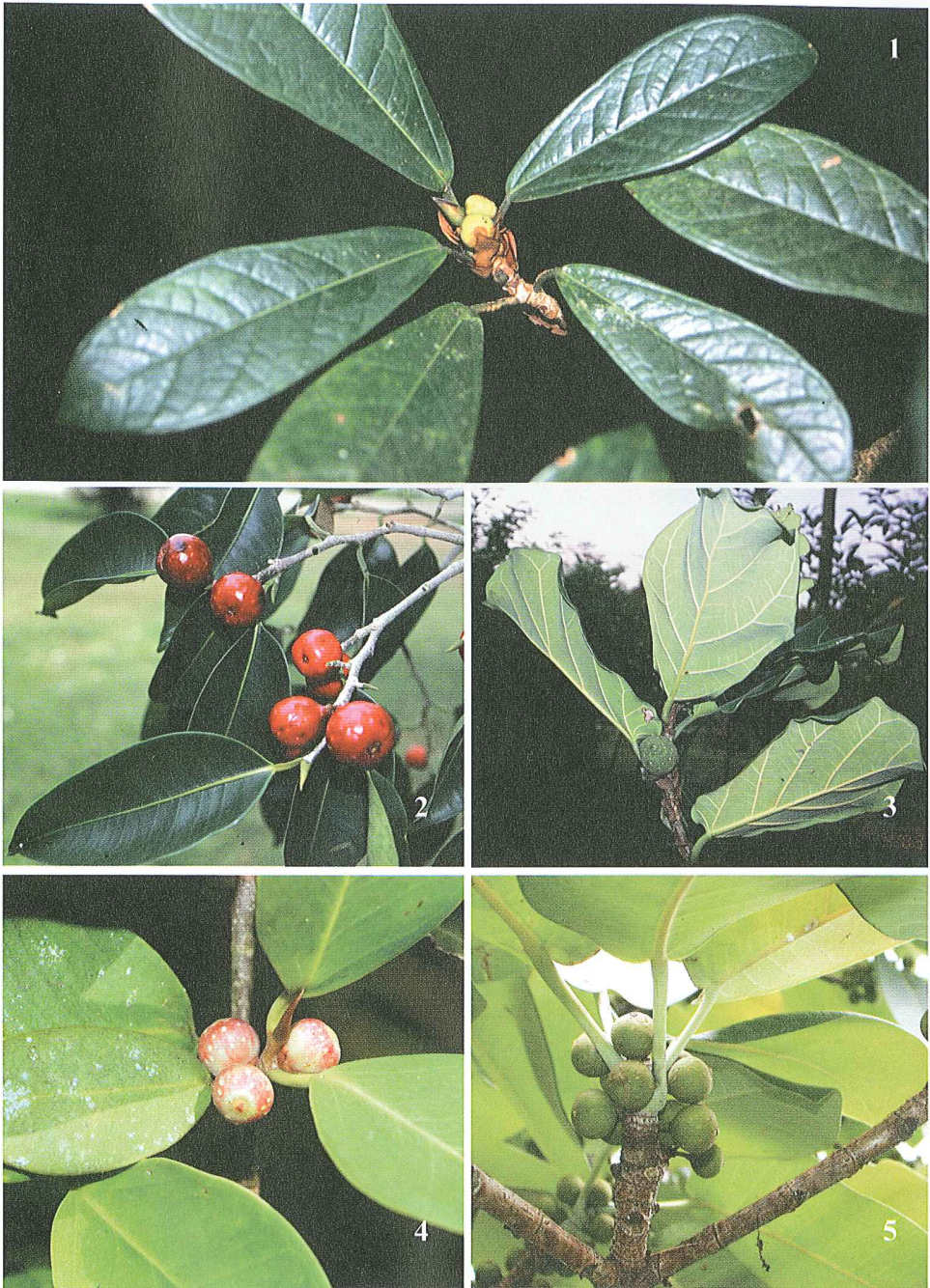
1. *Ficus altissima* Blume; 2. *F. annulata* Blume; 3. *F. benjamina* L.; 4. *F. binnendijkii* (Miq.) Miq.; 5. *F. bracteata* (Miq.) Miq.; 6. *F. callophylla* Blume. Photographed by P. Chantarasuwan (1, 4-6); P. Karaket (2); R. Pooma (3).



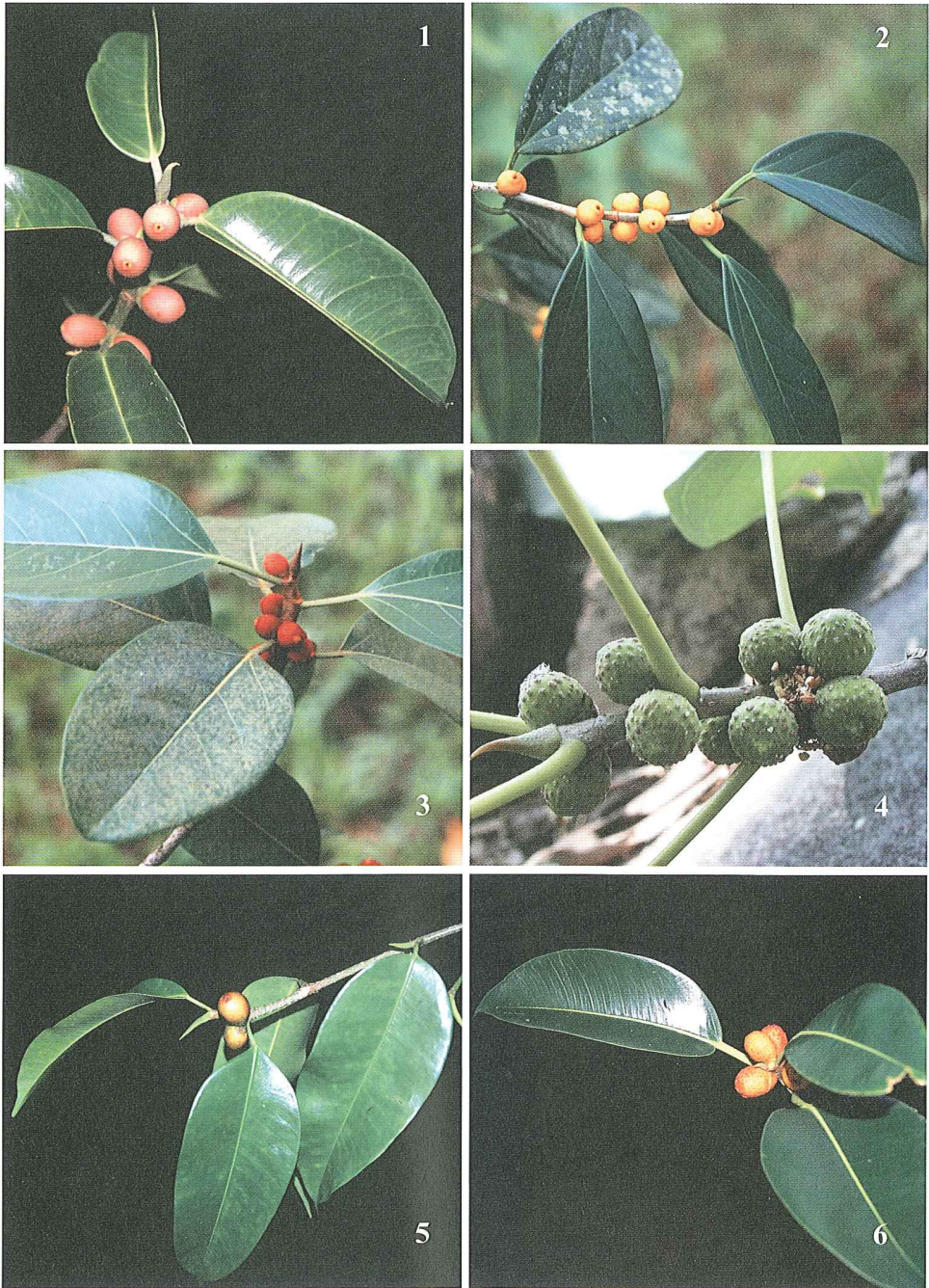
1-2. *Ficus concinna* (Miq.) Miq.; 3. *F. consociata* Blume; 4. *F. crassiramea* (Miq.) Miq. subsp. *crassiramea*; 5. *F. cucurbitina* King; 6. *F. depressa* Blume. Photographed by P. Karaket (1-2); P. Chantarasuwan (3-6).



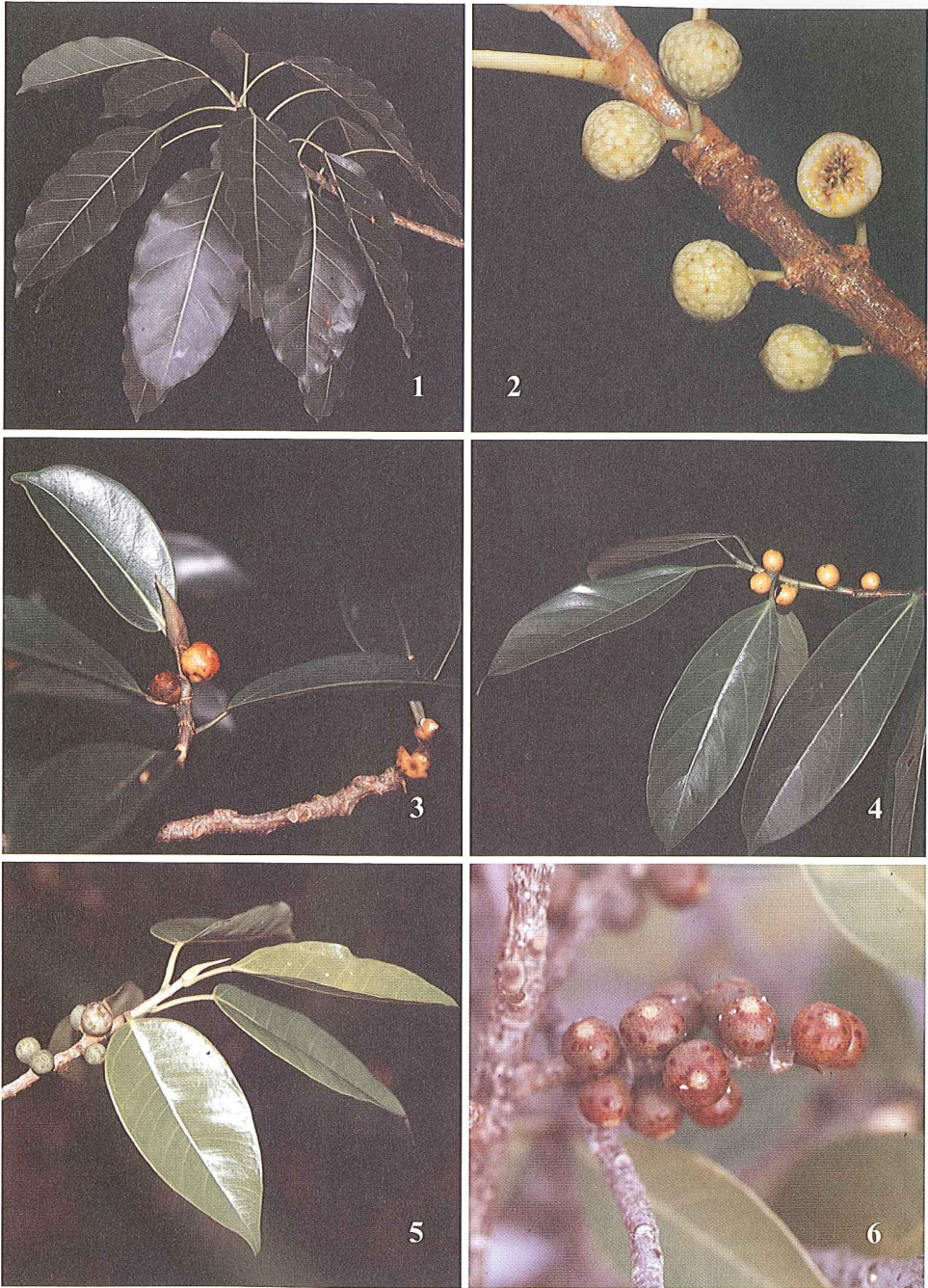
1. *Ficus drupacea* Thunb.; 2. *F. dubia* Wall. ex King; 3. *F. elastica* Roxb.; 4. *F. glaberrima* Blume subsp. *siamensis* (Corner) C.C. Berg; 5-6. *F. glaberrima* Blume subsp. subsp. *glaberrima*. Photographed by P. Chantarasuwan (1-4); R. Pooma (5-6).



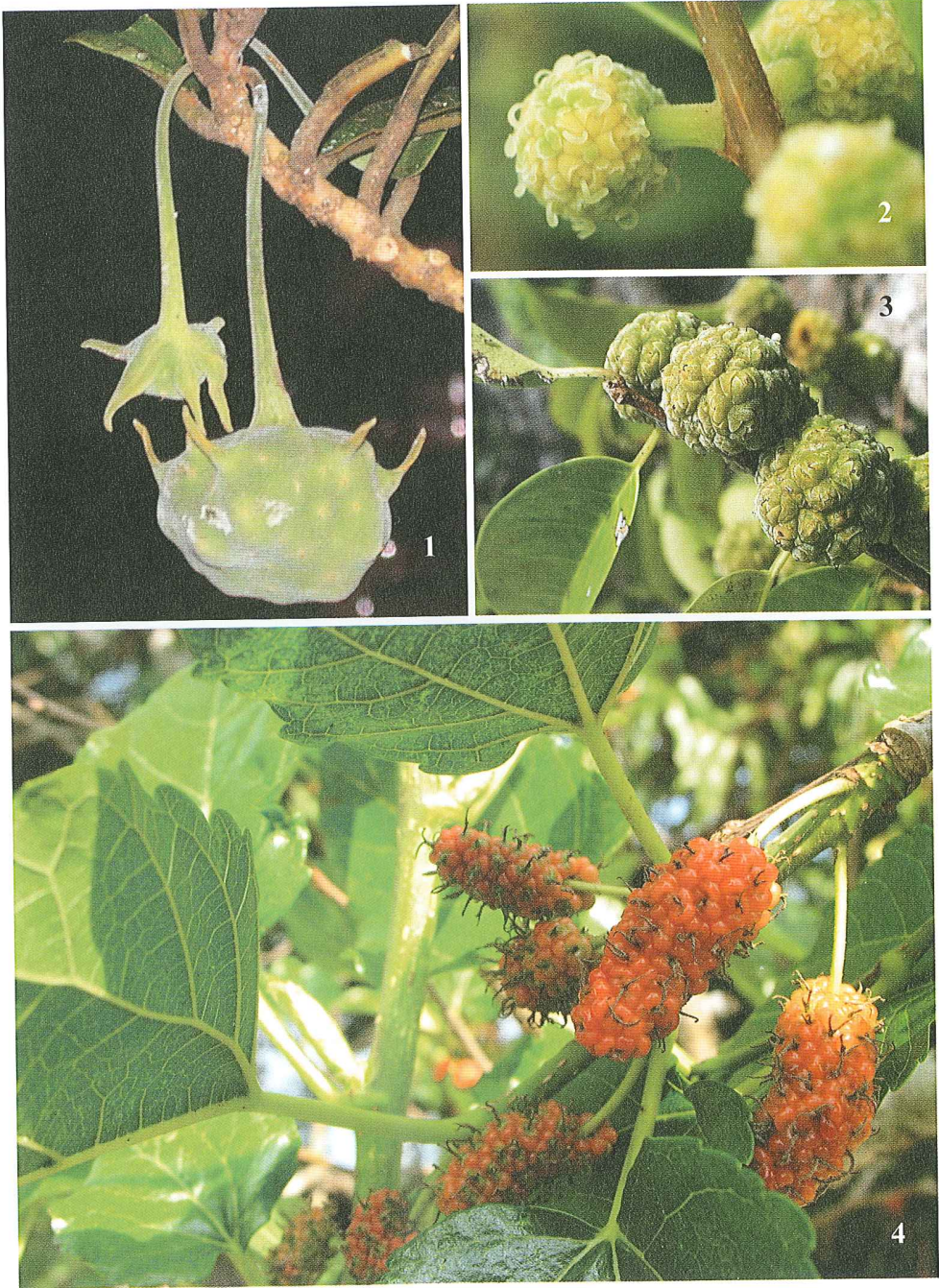
1. *Ficus kochummeniana* C.C. Berg; 2. *F. kurzii* King; 3. *F. lyrata* Warb.; 4. *F. microcarpa* L.f.; 5. *F. orthoneura* H. Lév. & Vaniot. Photographed by P. Chantarasuwan (1-3); P. Karaket (4); R. Pooma (5).



1. *Ficus pellucidopunctata* Griff.; 2. *F. pisocarpa* Blume; 3. *F. pubilimba* Merr.; 4. *F. saxophila* Blume subsp. *cardiophylla* (Merr.) C.C. Berg; 5. *F. stricta* (Miq.) Miq.; 6. *F. subcordata* Blume. Photographed by P. Chantarasuwan (1-3, 5-6); R. Pooma (4).



1-2. *Ficus subpisocarpa* Gagnep.; 3. *F. sumatrana* (Miq.) Miq.; 4. *F. sumatrana* Blume; 5-6. *F. talbotii* King. Photographed by P. Chantarasuwan (1, 3-5); P. Karaket (2); N. Pattharahirantricin (6).



1. *Hullettia griffithiana* (Kurz) Hook.f.; 2-3. *Maclura cochinchinensis* (Lour.) Corner; 4. *Morus alba* L. Photographed by R. Pooma (1-3); S. Sirimongkol (4).

I N D E X
 FLORA OF THAILAND VOLUME 10 PART 4
 (Synonyms in italics)

<i>Alchornea scandens</i> (Lour.) Müll. Arg.	675	<i>Artocarpus lanceifolius</i> Roxb.	480, 481, 491
<i>Allaeanthus</i> Thwaites	495, 497	<i>A. lingnanensis</i> Merr.	492
<i>A. kurzii</i> Hook.f.	497	<i>A. maingayi</i> King	488
ANTIARIS	476, 477, 479	<i>A. melinoxylus</i> Gagnep. subsp. <i>melinoxylus</i>	484
<i>Antiaris toxicaria</i> Lesch. subsp. <i>toxicaria</i>	478 , 479	<i>A. nitidus</i> Trécul	480, 481, 486, 492
ARTOCARPUS	476, 477, 480	subsp. <i>borneensis</i> (Merr.) Jarrett	492
<i>Artocarpus altilis</i> (Parkinson) Fosberg	480, 481	subsp. <i>griffithii</i> (King) Jarrett	492
<i>A. altissimus</i> (Miq.) J.J. Sm.	480, 482	subsp. <i>lingnanensis</i> (Merr.) Jarrett	492
<i>A. antiarifolia</i> Becc.	492	<i>A. ovatus</i> Blanco	489
<i>A. asperulus</i> Gagnep.		<i>A. parva</i> Gagnep.	492
subsp. <i>asperulus</i> (Gagnep.) Jarrett	483	<i>A. peduncularis</i> Kurz	493
var. <i>hirta</i> Gagnep.	483	<i>A. peltatus</i> Merr.	489
<i>A. borneensis</i> Merr.	492	<i>A. refracta</i> Becc.	489
<i>A. bracteata</i> King	662	<i>A. rigidus</i> Blume	477, 480, 481, 493
<i>A. calophyllus</i> Kurz	483	subsp. <i>asperulus</i> (Gagnep.) Jarrett	483
<i>A. chama</i> Buch.-Ham.	480, 481, 483 , 484	<i>A. rufescens</i> (non Miq.) Kurz	662
<i>A. chaplasha</i> Roxb.	483, 484	<i>A. sampor</i> Gagnep.	492
<i>A. communis</i> J.R. & G. Forst.	481	<i>A. scandens</i> (Hook.f.) Renner	665
<i>A. cumingiana</i> Trécul	489	<i>A. scortechinii</i> King	484
<i>A. cumingiana</i> Trécul var. <i>stenophylla</i> Diels	489	<i>A. styracifolius</i> Pierre	495
<i>A. dadah</i> Miq.	489	<i>A. sumatranus</i> Jarrett	488
<i>A. eberhardtii</i> Gagnep.	492	<i>A. teijsmannii</i> Miq. subsp. <i>teijsmannii</i>	480, 481, 493
var. <i>poilaneii</i> Gagnep.	492	subsp. <i>subglabrus</i> C.C. Berg	494
<i>A. elasticus</i> Blume	477, 480, 481, 484 , 485	<i>A. thailandicus</i> C.C. Berg	480, 481, 494 , 496
<i>A. ficifolia</i> W. T. Wang	489	<i>A. venosa</i> Zoll. & Moritzi	662
<i>A. forbesii</i> King	662	<i>A. vrieseanus</i> Miq. var. <i>papillosus</i> Jarrett	489
<i>A. fretessii</i> Teijsm. & Binn.	489	var. <i>refractus</i> (Becc.) Jarrett	489
<i>A. frutescens</i> (Becc.) Renner	665	var. <i>subsessilis</i> Jarrett	492
<i>A. glaucus</i> Blume	495	<i>A. xanthocarpus</i> Merr.	492
<i>A. gomezianus</i> Wall. ex Trécul	480, 481, 486	<i>A. yunnanensis</i> H.H. Hu	489
var. <i>griffithii</i> King	492	<i>Balansaephytum</i> Drake	470
<i>A. griffithii</i> (King) Merr.	492	<i>B. tonkinense</i> Drake	473
<i>A. heterophyllus</i> Lam.	476, 480, 481, 486	<i>B. tonkinense</i> Drake	473
<i>A. hypargyreus</i> Hance	495	<i>Batis fruticosa</i> Roxb.	656
<i>A. incisus</i> (Thunb.) L.f.	481	BROUSSONETIA	475, 476, 477, 495 , 497, 657
<i>A. integer</i> (Thunb.) Merr.	480, 481, 487	<i>B. kurzii</i> (Hook.f.) Corner	476, 477, 497
<i>A. integrifolia</i> L.f.	487	<i>B. papyrifera</i> (L.) Vent.	477, 497 , 498
<i>A. kemando</i> Miq.	480, 481, 488	<i>Calpidochlamys</i> Diels	674
<i>A. kunstleri</i> King	484	<i>Cardiogyne</i>	654
<i>A. lacucha</i> Buch.-Ham.	480, 481, 489 , 490, 495	<i>Caturus scandens</i> Lour.	675
<i>A. lakoocha</i> Roxb.	489	CECROPIACEAE	469
<i>A. lakoocha</i> Roxb. var. <i>malayana</i> King	489	<i>Cephalotrophis</i> Blume	673

(2)

<i>Cephalotrophis javanica</i> (Blume) Blume	675	<i>Dumartroya</i> Gaudich.	673
Chlorophora	654	<i>D. fagifolia</i> Gaudich.	673, 674
<i>Conocephalus</i> Blume	470	<i>Epicarporus</i> Blume	667
<i>C. cordifolius</i> Barg.-Petr	470	<i>E. spinosus</i> (Roxb.) Wight	672
<i>C. ellipticus</i> Trécul	473	<i>E. zeylanicus</i> Thwaites	667, 672
<i>C. lanceolatus</i> Trécul	471	Eriosyce	507
<i>C. microstachys</i> Barg.-Petr.	472	<i>Erythrogynne lutescens</i> (Desf.) Vis. ex Gasp.	513
<i>C. mollis</i> Gagnep.	473	FICUS	499
<i>C. nucleiflorus</i> Roxb. apud. Lindl	472	<i>Ficus abelii</i> Miq.	507, 508, 509, 510, 522, 530
<i>C. oblanceolatus</i> Ridl.	473	<i>F. acidula</i> King	570
<i>C. roxburghii</i> Trécul	472	<i>F. acuminata</i> Roxb.	553
<i>C. sinensis</i> Wright	473	<i>F. adhaerens</i> Miq.	590
<i>C. suaveolens</i> Blume	473	<i>F. affinis</i> Kurz	612
<i>C. tonkinensis</i> (Drake) Renner	473	<i>F. aggregata</i> Vahl	632
<i>Conosycea</i>	596, 597	<i>F. alba</i> Reinw. ex Blume	518
<i>Coussapoa</i>	469	<i>F. albipila</i> (Miq.) King	532, 533
<i>Covellia albipila</i> Miq.	532	<i>F. alongensis</i> Gagnep.	596, 598, 601
<i>C. courtallensis</i> Miq.	566	<i>F. altissima</i> Blume	597, 600, 601, 605
<i>C. cumia</i> (Buch.-Ham. ex Roxb.) Miq.	574	<i>F. amblyphylla</i> (Miq.) Miq.	632
<i>C. cystophylla</i> Wall. ex Miq.	544	<i>F. ampelas</i> Burm.f. var. <i>hispidula</i> Corner	539
<i>C. daemonum</i> (J. Koenig ex Vahl) Miq.	566	<i>F. anastomosans</i> Wall. ex Kurz	538, 539, 540, 557
<i>C. glomerata</i> (Roxb.) Miq.	569	<i>F. anastomosans</i> (Wall. ex Kurz) Corner	538, 539, 557
<i>C. griffithii</i> Miq.	564	<i>F. angustifolia</i> Blume	541
<i>C. hispida</i> (L.f.) Miq.	566	<i>F. angustifolia</i> Roxb.	535
<i>C. inaequiloba</i> Miq.	574	<i>F. annamensis</i> Gagnep.	510
<i>C. lanceolata</i> (Buch.-Ham. ex Roxb.) Miq.	569	<i>F. annulata</i> Blume	599, 603
<i>C. lepicarpa</i> (Blume) Miq.	567	<i>F. annulata</i> (Blume) Miq.	603
<i>C. macrophylla</i> (Roxb. ex Sm.) Miq.	559	var. <i>biverrucella</i> (Miq.) Miq.	603
<i>C. mollis</i> Miq.	569	var. <i>elliptica</i> Miq.	603
<i>C. paniculata</i> Miq.	569	var. <i>flavescens</i> (Blume) King	603
<i>C. ribes</i> (Reinw. ex Blume) Miq.	570	var. <i>valida</i> (Blume) King	603
<i>Cudrania</i> (Trece) Conner	653, 654	<i>F. anserina</i> (Corner) C.C. Berg	579, 580
<i>Cudrania</i> Rumph. ex Trécul	653, 654	<i>F. apiocarpa</i> (Miq.) Miq.	578, 581
<i>C. cambodiana</i> Gagnep.	655	<i>F. araneosa</i> King	579, 582
<i>C. cochinchinensis</i> (Lour.) Kudo & Masam.	655	<i>F. arfakensis</i> King	572
<i>C. fruticosa</i> (Roxb.) Wight ex Kurz	656	<i>F. arnottiana</i> (Miq.) Miq.	596, 598, 604
<i>C. javanensis</i> Trécul	655	var. <i>courtallensis</i> (Miq.) Miq.	604
var. <i>indica</i> Trécul	655	<i>F. arnottiana</i> Miq. var. <i>subcostata</i> Corner	626
<i>C. obovata</i> Trécul	655	<i>F. assamica</i> Miq.	538, 539, 542, 564
<i>C. poilanei</i> Gagnep.	654	<i>F. asymmetrica</i> H. Lévl. & Vaniot	544, 564
<i>Cudranus amboinensis</i> (Blume) Miq.	655	<i>F. aurantiaca</i> (Miq.) Miq.	516
<i>Dimerocarpus</i> Gagnep.	667	<i>F. aurantiacea</i> Griff.	588
<i>D. brenieri</i> Gagnep.	667, 670	var. <i>angustifolia</i> (Corner) Corner	588
<i>Diplocos zeylanicus</i> (Thwaites) Bureau in DC. 670, 672		var. <i>parvifolia</i> (Corner) Corner	588
<i>Diplothorax tonkinensis</i> Gagnep.	668	<i>F. auriculata</i> Lour.	558, 559, 560
<i>Dorstenia griffithiana</i> Kurz	653	<i>F. avium</i> Gagnep.	624

<i>Ficus balansae</i> Gagnep.	524	<i>Ficus clavata</i> Wall. ex Miq.	551
<i>F. balica</i> (Miq.) Boerl.	559, 641	<i>F. clusioides</i> (Miq.) Miq.	609
<i>F. barbata</i> Wall. ex Miq.	594	<i>F. colossea</i> F. Muell. ex Benth.	532
<i>F. basidentula</i> Miq.	533	<i>F. comata</i> Hand.-Mazz.	509
<i>F. beccarii</i> King	501, 558, 562	<i>F. comosa</i> Roxb.	606
<i>F. benghalensis</i> L.	500, 600, 605 , 637	<i>F. compressicaulis</i> Blume	590
<i>F. benjamina</i> L.	597, 599, 605 , 606, 607, 629, 631, 633, 641	<i>F. concinna</i> (Miq.) Miq.	596, 598, 599, 601, 611 , 612
var. <i>comosa</i> (Roxb.) Kurz	606	var. <i>subsessilis</i> Corner	601, 611
var. <i>nuda</i> (Miq.) M.F. Barrett	606	<i>F. congesta</i> H. Lév.	509
<i>F. binnendijkii</i> (Miq.) Miq.	597, 600, 608 , 614, 640, 662	<i>F. consociata</i> Blume var. <i>murtonii</i> King	612
<i>F. bistipulata</i> Griff.	507, 509 , 510	<i>F. consociata</i> Blume	597, 599, 609, 613 , 648
<i>F. blinii</i> H. Lév. & Vaniot	535	<i>F. cordata</i> Ridl.	530
<i>F. bonii</i> Gagnep.	639	<i>F. cordifolia</i> Blume	576
<i>F. botryocarpa</i> Miq.	573	<i>F. cordifolia</i> Roxb.	639
<i>F. bracteata</i> (Miq.) Miq.	597, 599, 608 , 614	<i>F. cotoneifolia</i> Vahl	605
<i>F. caesia</i> Hand.-Mazz.	633	<i>F. crassiramea</i> (Miq.) Miq. subsp. <i>crassiramea</i>	597, 600, 614 , 615
<i>F. calcicola</i> Corner	647	subsp. <i>stupenda</i> (Miq.) C.C. Berg	616
<i>F. callicarpa</i> Miq. (<i>kallicarpa</i>)	588	<i>F. crininervia</i> Miq.	590
var. <i>angustifolia</i> Corner	588	<i>F. cucurbitina</i> King	597, 616
var. <i>parvifolia</i> Corner	588	<i>F. cunia</i> Buch.-Ham. ex Roxb.	574
<i>F. callicarpides</i> Corner	582	<i>F. curtipes</i> Corner	597, 600, 610, 611, 617
<i>F. callophylla</i> Blume	597, 600, 609 , 610, 611, 617	<i>F. cuspidata</i> Reinw. ex Blume	538, 541 , 543, 550
var. <i>malayana</i> Corner	609	var. <i>angustifolia</i> (Blume) Miq.	541
<i>F. callosa</i> Willd.	532, 533	var. <i>sinuata</i> King	550
<i>F. calophylloides</i> Elmer	641	<i>F. cuspidifera</i> Miq.	555
<i>F. cambodica</i> Gagnep.	507, 508, 510 , 511, 529	<i>F. cyanus</i> H. Lév. & Vaniot	509
<i>F. cannabina</i> Lour.	544	<i>F. cyathistipula</i> Warb.	500, 598
<i>F. capillipes</i> Gagnep.	532, 534	<i>F. cycloneura</i> (Miq.) King,	634
<i>F. cardiophylla</i> Merr.	639	<i>F. cyrtophylla</i> (Wall. ex Miq.) Miq.	500, 538, 544
<i>F. carica</i> L.	500, 507, 508, 511	<i>F. daemonum</i> J. König ex Vahl	566
<i>F. caudata</i> Griff.	551	<i>F. damit</i> Gagnep.	639
<i>F. caudata</i> Stokes	637	<i>F. delavayi</i> Gagnep.	522
<i>F. caudata</i> Wall. ex Miq.	551	<i>F. deltoidea</i> Jack	476, 504, 505, 507, 508, 513 , 515
<i>F. caulocarpa</i> (Miq.) Miq.	596, 598, 611	subsp. <i>deltoidea</i>	508, 513 , 514
<i>F. celebica</i> Blume var. <i>kunstleri</i> King	549	var. <i>angustifolia</i> (Miq.) Corner	515
<i>F. championi</i> Benth.	536	var. <i>kunstleri</i> (King) Corner	515
<i>F. chartacea</i> (Wall. ex Kurz) King	507, 508, 512 , 530	var. <i>borneensis</i> Corner	513
var. <i>lanceolata</i> Corner	512	var. <i>kinabaluensis</i> (Stapf) Corner	527
var. <i>torulosa</i> King	512	var. <i>lutescens</i> (Desf.) Corner	513
<i>F. chincha</i> Roxb.	551	<i>F. depressa</i> Blume	599, 618
<i>F. chittagonga</i> Miq.	570	<i>F. dilatata</i> Miq.	632
<i>F. chlorocarpa</i> Benth.	576	<i>Ficus disticha</i> Blume	579, 582
<i>F. chloroleuca</i> Miq.	518	subsp. <i>disticha</i>	582
<i>F. chrysocarpa</i> Reinw. ex Blume		<i>F. diversifolia</i> Blume var. <i>deltoidea</i> (Jack) Ridl.	513
var. <i>flavidula</i> (Miq.) Miq.	515	var. <i>kunstleri</i> King	515
<i>F. chrysocoma</i> Blume	618	var. <i>lutescens</i> (Desf.) King	513

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<i>Ficus drupacea</i> Thunb.	597, 599, 618 , 620	<i>Ficus geocarpa</i>	568
var. <i>pubescens</i> (Roth) Corner	618	<i>F. gibbosa</i> Blume	554
<i>F. dubia</i> Wall. ex King	599, 619	var. <i>cuspidifera</i> (Miq.) King	555
<i>F. dulitensis</i> Kochummen	644, 645	var. <i>parasitica</i> (Willd.) King	555
<i>F. dumosa</i>	522	var. <i>tuberculata</i> (Roxb.) King	555
<i>F. elastica</i> Roxb.	500, 598, 621 , 622	<i>F. glabella</i> Blume	611, 649
<i>F. elliptica</i> Miq.	588	var. <i>concima</i> (Miq.) King	611
<i>F. elliptifolia</i> Merr.	616	<i>F. glaberrima</i> Blume	510, 597, 599, 625 , 626
<i>F. emodi</i> (Wall. ex Miq.) Miq.	585	subsp. <i>glaberrima</i>	625
<i>F. erecta</i> Thunb.	587	subsp. <i>siamensis</i> (Corner) C.C. Berg	625 , 626
var. <i>khasiana</i> (Miq.) Miq.	587	<i>F. glandulifera</i> (Wall. ex Miq.) King	505, 507, 508, 516
<i>F. esquiroliana</i>	530	<i>F. globosa</i> Blume	476, 597, 599, 625, 626
<i>F. esquirolii</i> H. Lév. & Vaniot	510	var. <i>manok</i> (Miq.) King	626
<i>F. everetti</i> Elmer	634	<i>F. glomerata</i> Roxb.	569, 570
<i>F. falcata</i> Thunb.	588	var. <i>chittagonga</i> (Miq.) King	570
<i>F. fasciculata</i> King	572	var. <i>elongata</i> King	570
<i>F. fecundissima</i> H. Lév. & Vaniot,	611	var. <i>miqueli</i> King	570
<i>F. feddei</i> H. Lév. & Vaniot	625	var. <i>mollis</i> (Miq.) King	570
<i>F. federovii</i> W.T. Wang	633	<i>F. gossypina</i> Wall. ex Miq.	518
<i>F. fieldingii</i> Miq.	526	<i>F. griffithii</i> (Miq.) Miq.	476, 564 , 565
<i>F. filiformis</i> Blume	591	<i>F. grossivenis</i> Miq.	594
<i>F. fistulosa</i> Reinw. ex Blume	558, 562 , 563	<i>F. grossularioides</i> Burm.f.	518 , 519
var. <i>angustifolia</i> Miq.	563	forma <i>assamica</i> (Miq.) Kuntze	539
var. <i>fistulosa</i>	563	<i>F. hainanensis</i> Merr. & Chun	559
var. <i>tengerensis</i> (Miq.) Kuntze	563	<i>F. hapalophylla</i> Kurz	574
<i>F. flavescens</i> Blume Bijdr.	603	<i>F. harlandii</i> Benth.	563
<i>F. flavidula</i> Miq.	515	<i>F. hasskarlii</i> Merr.	517
<i>F. forma assamica</i> (Miq.) Kuntze	539	<i>F. hederacea</i> Roxb.	578, 579, 583 , 584
<i>F. fraterna</i> Miq.	625	<i>F. henrici</i> King	570
<i>F. fruticosa</i> Roxb.	583	<i>F. henschelii</i> Merr.	516
<i>F. fulva</i> Reinw. ex Blume	507, 508, 511, 515 , 516	<i>F. heterophylla</i> L.f.	538, 544 , 564
var. <i>chrysocarpa</i> (Reinw. ex Blume) Koord.	515	var. <i>assamica</i> (Miq.) Corner	539, 545
var. <i>minor</i> King	515	var. <i>repens</i> (Roxb. ex Willd.) King	539
var. <i>orbicularis</i> Miq.	515	var. <i>scabrella</i> (Roxb.) King	544
<i>F. garciniifolia</i> Miq.	641	<i>F. heterophylla</i> Lam.	519
<i>F. gasparriniana</i> Miq.	510	<i>F. heteropleura</i> Blume	538, 545 , 551
var. <i>esquirolii</i> (H. Lév. & Vaniot) Corner	510	<i>F. heterostyla</i> Merr.	558, 564 , 566
var. <i>laceratifolia</i> (H. Lév. & Vaniot) Corner	510	<i>F. hibiscifolia</i> Champ. ex Benth.	519
<i>F. gasparriniana</i> Miq.		<i>F. hirsuta</i> Roxb.	530
var. <i>viridescens</i> (H. Lév. & Vaniot) Corner	509, 510	<i>F. hirsuta</i> Wall. ex Miq.	594
<i>F. gelderi</i> Miq.	633	<i>F. hirta</i> Roxb.	530
<i>F. gemella</i> Wall. ex Miq.	526	subsp. <i>roxburghii</i> (King) C.C. Berg	530
<i>F. geniculata</i> Kurz	596, 599, 622 , 650	var. <i>roxburghii</i> (King) C.C. Berg	530
var. <i>abnormalis</i> Kurz	622, 623	<i>F. hirta</i> Vahl	507, 508, 511, 519 , 520, 521, 522, 530
var. <i>geniculata</i>	623	var. <i>appressa</i> Corner	519, 521, 522
var. <i>insignis</i> (Kurz) C.C. Berg	623	var. <i>brevipila</i> Corner	511

<i>Ficus hirta</i> Vahl		<i>Ficus lawesii</i> King	626
var. <i>hibiscifolia</i> (Champ. ex Benth.) Chun	519	<i>F. leekensis</i> Drake	509
var. <i>imberbis</i> Gagnep.	522	<i>F. lepicalpa</i> Blume	558, 567
var. <i>integrifolia</i> Miq.	519	var. <i>pedunculata</i> Corner	567
var. <i>malayana</i> Corner	531	<i>F. lepidosa</i> Wall. ex Kurz var. <i>martabanica</i> King	524
var. <i>setosa</i> (Blume) Miq.	519	<i>F. leptocarpa</i> Steud. var. <i>adhaerens</i> (Miq.) Miq.	590
var. <i>squamosa</i> Corner	531	<i>F. leucoxyton</i> Miq.	549
var. <i>triloba</i> (Buch.-Ham.) Kuntze	530	<i>F. littoralis</i> Blume	632
<i>F. hispida</i> L.f.	558, 564, 566	<i>F. lobata</i> W. Hunter ex Ridl.	518
var. <i>badiostriosa</i> Corner	564	<i>F. lucescens</i> Blume	569
var. <i>rubra</i>	566	<i>F. lutescens</i> Desf.	513
<i>F. howii</i> Merr. & Chun	587	<i>F. lyrata</i>	500, 598
<i>F. humilis</i> Roxb.	546	<i>F. maclellandii</i> King	597, 599, 600, 629 , 630, 631
<i>F. hunteri</i> Miq.	518	var. <i>rhododendrifolia</i> (Miq.) Corner	630
<i>F. hypoleucogramma</i> H. Lév. & Vaniot	633	<i>F. macrocarpa</i> Blume	588
<i>F. imenensis</i> S.S. Chang	633	<i>F. macrophylla</i> Roxb. & Buch.-Ham. ex Sm.	559
<i>F. indica</i> (auct. non L.) Miq.	645	<i>F. madurensis</i> Miq.	546
<i>F. indica</i> L.	605, 633, 644, 645	<i>F. malayana</i> C.C. Berg & Chantarasuwan	558, 568
var. <i>gelderii</i> (Miq.) King	634	<i>F. manok</i> (Miq.) Miq.	568
var. <i>sundaica</i> (Blume) Miq.	645	<i>F. mappan</i> Miq.	518
var. <i>trichocalyx</i> (Valeton) Backer	643	<i>F. megacarpa</i> Merr.	588, 589
<i>F. infectoria</i> Roxb.	649	<i>F. microcarpa</i> L.f.	597, 600, 632 , 640
var. <i>caulocarpa</i> (Miq.) King	611	var. <i>eubracteata</i> Corner	640
<i>F. insignis</i> Kurz	624	var. <i>latifolia</i> (Miq.) Corner	632
<i>F. intermedia</i> Griff.	545	forma <i>pubescens</i> Corner	597, 600, 632
<i>F. ischnopoda</i> Miq.	476, 507, 508, 509, 522, 523, 529, 530, 576	<i>F. microstoma</i> Wall. ex King	634
var. <i>subcylindrica</i> Corner	522	<i>F. microsyce</i> Ridl.	549
<i>F. jamini</i> H. Lév. & Vaniot	585	<i>F. microtus</i> Miq. var. <i>tondana</i> (Miq.) Miq.	549
<i>F. kerkhovenii</i> Valeton	600, 627	<i>F. milletii</i> Miq.	529
<i>F. kinabaluensis</i> Stapf	527	<i>F. miquelii</i> King (= <i>F. botryocarpa</i> Miq.); Ridl.	573
<i>F. kochummeniana</i> C.C. Berg	597, 627 , 628	<i>F. mollis</i> Miq.	532
<i>F. korthalsii</i> Miq.	645	var. <i>albipila</i> (Miq.) Miq.	532
var. <i>beccariana</i> King	645	<i>F. mollis</i> (Miq.) Miq.	524, 532, 569
<i>F. kurzii</i> King	597, 599, 629	<i>F. mollissima</i> Ridl.	507, 524
<i>F. laccifera</i> Roxb.	601	<i>F. montana</i> Burm.f.	538, 546 , 564
<i>F. laceratifolia</i> H. Lév. & Vaniot	510	var. <i>purpurascens</i> (Blume) Corner	546
<i>F. lacor</i> Buch.-Ham.	649	<i>F. morifolia</i> Vahl	544
<i>F. laevis</i> Blume var. <i>assamica</i> (Miq.) Miq.	585	<i>F. mysorensis</i> Heyne ex Roth var. <i>dasycarpa</i> (Miq.) M.F. Barrett	618
var. <i>dasyphylla</i> (Miq.) King	585	<i>F. mysorensis</i> Heyne ex Roth var. <i>pubescens</i> Roth	618
var. <i>tomentosa</i> King	585	var. <i>subrepanda</i> Wall. ex King	618
<i>F. lamponga</i> Miq.	524, 525	forma <i>parvifolia</i> Miq.	618
var. <i>chartacea</i> Wall. ex Kurz	512	<i>F. natalensis</i> Hochst. subsp. <i>leprieurii</i> (Miq.) C.C. Berg	500, 598
var. <i>martabanica</i> (King) Basu	524	<i>F. nemoralis</i> Wall. ex Miq.	526
<i>F. lanceolata</i> Buch.-Ham. ex Roxb.	569		
<i>F. laus-esquiroltii</i> H. Lév.	519		

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<i>Ficus nemoralis</i> Miq. var. <i>fieldingii</i> (Miq.) King	526	<i>Ficus pedunculosa</i> Miq. var. <i>velutina</i> Corner	522
var. <i>gemella</i> (Miq.) King	526	<i>F. pellucidopunctata</i> Griff.	597, 600, 633 , 642, 646
var. <i>trilepis</i> (Miq.) King	526	<i>F. petelotii</i> Merr.	522
<i>F. neoesquirolii</i> H. Lév.	519	<i>F. phaepoda</i> (Miq.) Miq.	591
<i>F. neriifolia</i> Sm.	500, 507, 508, 510, 526	<i>F. phanrangensis</i> Gagnep.	610
var. <i>fieldingii</i> (Miq.) Corner	526	<i>F. pierrei</i> Gagnep.	647
var. <i>nemoralis</i> (Miq.) Corner	526	<i>F. pilosa</i> Reinw. ex Blume	
var. <i>trilepis</i> (Miq.) Corner	526	var. <i>chrysocoma</i> (Blume) King	618
<i>F. nervosa</i> Heyne ex Roth subsp. <i>nervosa</i>	532, 535	<i>F. piperifolia</i> (Miq.) Miq.	591
subsp. <i>minor</i> (King) C.C. Berg	536	<i>F. pisifera</i> Wall. ex Voigt	549
subsp. <i>pubinervis</i> (Blume) C.C. Berg	536	var. <i>scaberrima</i> (Blume) Valetton	549
<i>F. ngii</i> Kochummen	608	var. <i>microtus</i> (Miq.) Kuntze	549
<i>F. nitida</i> Thunb.	605	<i>F. pisocarpa</i> Blume	597, 600, 634 , 636
<i>F. nivea</i> Blume	518	<i>F. poilanei</i> Gagnep.	566
<i>F. nuda</i> (Miq.) Miq.	606	<i>F. polygramma</i> Corner	641
<i>F. nuda</i> Miq. var. <i>macrocarpa</i> Kurz	629	<i>F. polysyce</i> Ridl.	563
<i>F. obpyramidata</i> King	558, 569	<i>F. pomifera</i> Kurz var. <i>oviformis</i> Kurz	588
<i>F. obscura</i> Blume var. <i>kunstleri</i> (King) Corner	549	<i>F. pomifera</i> Wall. ex King	559
var. <i>leucoxydon</i> Miq.	549	<i>F. porteana</i> Regel	533
var. <i>scaberrima</i> (Blume) Miq.	549	<i>F. porteri</i> H. Lév. & Vaniot	519
<i>F. obtusa</i> Hassk.	591	<i>F. praetermissa</i> Corner	538, 548
var. <i>piperifolia</i> (Miq.) Koord. & Valetton	591	<i>F. procera</i> Reinw. ex Blume	614
<i>F. obtusifolia</i> Roxb.	616	<i>F. pruniformis</i> Blume	618
<i>F. oleifolia</i> King subsp. <i>intermedia</i> (Corner) C.C. Berg	507, 508, 527	<i>F. pseudoacantophylla</i> Valetton	643, 645
var. <i>intermedia</i> Corner	527	<i>F. pseudoreligiosa</i> H. Lév.	611
<i>F. oligodon</i> Miq.	559	<i>F. pseudorubra</i> (Miq.) Miq.	634, 643
<i>F. oligosperma</i> Miq.	590	<i>F. pubigera</i> (Miq.) Wall.	579, 581, 585
<i>F. onusta</i> (Miq.) Wall. ex Miq.	626	<i>F. pubigera</i> (Miq.) Wall. ex Brandis var. <i>anserina</i>	
<i>F. oppositifolia</i> Roxb.	566	Corner	579
<i>F. oreophila</i> Ridl.	500, 507, 508, 511, 527 , 528	<i>F. pubilimba</i> Merr.	597, 600, 635
<i>F. orthoneura</i> H. Lév. & Vaniot	596, 598, 633	var. <i>ovata</i> Corner	635
<i>F. ovoidea</i> Jack var. <i>lutescens</i> (Desf.) Kuntze	513	<i>F. pumila</i> L.	500, 578, 579, 587
<i>F. palaquifolia</i> Corner	644	<i>F. punctata</i> Thunb.	500, 578, 579, 588
<i>F. palmata</i> Roxb.	518	<i>F. purpurascens</i> Blume	546
<i>F. palmatiloba</i>	522	<i>F. pyrifolia</i> (Miq.) Boerl.	645
<i>F. papyrifera</i> Griff.	606	<i>F. pyriformis</i> Hook. & Arn.	508, 509, 529 , 530
<i>F. paradoxa</i> Blume	555	var. <i>abelii</i> (Miq.) King	508
<i>F. parasitica</i> J. Koenig ex. Willd.	554	var. <i>angustifolia</i> Ridl.	522
<i>F. parietalis</i> Blume	538, 547	var. <i>hirtinervis</i> S.S. Chang	529
var. <i>angustifolia</i> Miq.	547	var. <i>ischnopoda</i> (Miq.) King	522
var. <i>ovalis</i> Blume	547	var. <i>subpyriformis</i> (Miq.) King	508
var. <i>rufipila</i> (Miq.) Miq.	547	<i>F. pyrrocarpa</i> Kurz	576
var. <i>tabing</i> (Miq.) Miq.	547	<i>F. quercifolia</i> Roxb. var. <i>humilis</i> (Roxb.) King	546
<i>F. parvifolia</i> (Miq.) Miq.	611	<i>F. racemosa</i> L.	504, 506, 558, 559, 569 , 570, 571
<i>F. patens</i> Ridl.	514	var. <i>elongata</i> (King) M.F. Barrett	570
<i>F. payapa</i> Blanco	619	var. <i>miquelii</i> (King) Corner	570
		var. <i>mollis</i> (Miq.) M.F. Barrett	570

<i>Ficus radicans</i> Roxb.	545	<i>Ficus scabrella</i> Roxb.	544
<i>F. ramentacea</i> Roxb.	590	<i>F. scandens</i> Lam.	587
var. <i>urnigera</i> (Miq.) Backer	593	<i>F. scandens</i> Roxb.	583, 587
<i>F. rectinervia</i> Merr.	529	<i>F. schinzii</i> H. Lév. & Vaniot	508
<i>F. recurva</i> Blume	579, 589	<i>F. sclerocarpa</i> Griff.	559
var. <i>ribesioides</i> (Wall. ex Miq.) King	579, 589	<i>F. sclerocoma</i> Miq.	546
var. <i>bridelioides</i> Corner	589	<i>F. scleroptera</i> Miq.	533
var. <i>urnigera</i> (Miq.) King	593	<i>F. scortechinii</i> King	570
<i>F. regia</i> Miq.	559	<i>F. semicordata</i> Buch.-Ham. ex Sm.	558, 574 , 575
<i>F. religiosa</i> L.	500, 596, 598, 637 , 640	<i>F. setifera</i> Steud.	519
<i>F. renitens</i> Miq.	536	<i>F. setosa</i> Blume	519
<i>F. repens</i> Rottl.	544	<i>F. setosa</i> Hook. & Arn.	519
<i>F. repens</i> Roxb. ex Willd. var. <i>assamica</i> (Miq.) Miq.	539	<i>F. sideroxyliifolia</i> Griff.	515
<i>F. retusa</i> (auct. non L.) Miq.	632	<i>F. silhetensis</i> Miq.	509, 510, 553
var. <i>pisifera</i> (Miq.) Miq.	632	var. <i>annamica</i> Gagnep.	510
<i>F. retusa</i> L. var. <i>borneensis</i> Corner	627	<i>F. simplicissima</i>	522
var. <i>nitida</i> (Thunb.) Miq.	606	<i>F. sinuata</i> Thunb.	538, 541, 550
var. <i>ovoidea</i> (Jack) Miq.	513	subsp. <i>cuspidata</i> (Reinw. ex Blume) Corner	541
<i>F. retusifolmis</i> H. Lév. & Vaniot	632	var. <i>oblonga</i> Corner	550
<i>F. rhododendrifolia</i> (Miq.) Miq.	631	<i>F. spathulata</i> Miq.	515
<i>F. ribes</i> Reinw. ex Blume	558, 570 , 572, 589	<i>F. spathulifolia</i> Corner var. <i>annamensis</i> Corner	644
<i>F. ribesioides</i> (Miq.) Wall. ex Miq.	589	<i>F. squamosa</i> Roxb.	476, 500, 558, 566, 576 , 577
<i>F. ridleyana</i> C.C. Berg & Chantarasuwan	558, 573	<i>F. staphylosyce</i> Ridl.	572
<i>F. rigescens</i> Miq.	590	<i>F. stipulata</i> Thunb.	587
<i>F. rigida</i> (Miq.) Miq. trichocalyx Valetton	643, 645	<i>F. stipulosa</i> (Miq.) Miq.	611
<i>F. rostrata</i> Lam.	550	<i>F. stricta</i> (Miq.) Miq.	597, 599, 629, 640
<i>F. rosulata</i> C.C. Berg	558, 573	<i>F. stupenda</i> Miq. var. <i>minor</i> Corner	614
<i>F. rotundifolia</i> Roxb.	559	<i>F. subcordata</i> Blume	597, 641
<i>F. roxburghii</i> Miq.	559	var. <i>malayana</i> Corner	641
<i>F. roxburghii</i> Wall.	559	<i>F. suberosa</i> H. Lév. & Vaniot	625
<i>F. rubescens</i> Blume	645	<i>F. subgelderi</i> Corner	597, 600, 634, 641 , 645, 646
<i>F. rubifolia</i> Griff.	539	var. <i>rigida</i> (Miq.) Corner	645
<i>F. rubra</i> Blume	645	<i>F. subincisa</i> Sm.	538, 551
<i>F. rubra</i> Roth	632	var. <i>paucidentata</i> (Miq.) Corner	551
<i>F. rufipila</i> Miq.	547	var. <i>trachycarpa</i> (Miq.) Corner	551
<i>F. rumphii</i> Blume	596, 598, 637, 638	<i>F. subpedunculata</i> Miq.	611
<i>F. saemocarpa</i> Miq.	576	<i>F. subpisocarpa</i> Gagnep.	596, 642 , 650
<i>F. sagittata</i> J. Koenig ex Vahl	579, 590	subsp. <i>subpisocarpa</i>	643
<i>F. sagittata</i> Vahl var. <i>adhaerens</i> (Miq.) Corner	590	subsp. <i>pubipoda</i> C.C. Berg	643
var. <i>minor</i> Corner	590	<i>F. subpyrifolmis</i> Miq.	508
var. <i>oligosperma</i> (Miq.) Corner	590	<i>F. subracemosa</i> Blume	576
<i>F. sanhdai</i> Gagnep.	553	<i>F. subrepanda</i> (Wall. ex King) King	618
<i>F. saxophila</i> Blume	596, 598, 638	<i>F. subsubulata</i> Miq.	557
subsp. <i>cardiophylla</i> (Merr.) C.C. Berg	638	<i>F. subsumatrana</i> Gagnep.	644, 645
<i>F. scaberrima</i> Blume	538, 544, 549	<i>F. subtecta</i> Corner	614
var. <i>pisifera</i> (Wall. ex Voigt) Hochr.	549	<i>F. subulata</i> Blume	476, 538, 551 , 554

<i>Ficus sum</i> Gagnep.	576, 597, 600, 642, 644, 645	<i>Ficus uniglandulosa</i> Wall. ex Miq.	538, 557
<i>F. sumatrana</i> (Miq.) Miq.	597, 600, 642, 643 , 644, 645	var. <i>laticor</i> Miq.	557
var. <i>circumscissa</i> Corner	644, 645	var. <i>parvifolia</i> Miq.	557
var. <i>microsyce</i> Corner	644, 645	<i>F. urnigera</i> Miq.	579, 593
var. <i>subsumatrana</i> (Gagnep.) Corner	644	<i>F. urophylla</i> Wall. ex Miq.	545
<i>F. sundaica</i> Blume	597, 600, 634, 642, 645	<i>F. vagans</i> Roxb.	585
var. <i>beccariana</i> (King) Corner	645	<i>F. valida</i> Blume	603
var. <i>trichocalyx</i> (Valeton) Backer & Bakh.f.	644	<i>F. vaniotii</i> H. Lév.	509
<i>F. superba</i> (Miq.) Miq.	596, 598, 646	<i>F. variabilis</i> Miq.	536
var. <i>alongensis</i> (Gagnep.) Corner	601	var. <i>integrifolia</i> Miq.	536
var. <i>japonica</i> Miq.	643	<i>F. variegata</i> Blume	576
<i>F. sycomoroides</i> Miq.	576	var. <i>chlorocarpa</i> (Benth.) King	576
<i>F. tabing</i> Miq.	547	var. <i>sycomoroides</i> (Miq.) Corner	576
<i>F. talbotii</i> King	597, 599, 600, 647 , 648	<i>F. vasculosa</i> Wall. ex Miq.	532, 536 , 537
<i>F. tenerensis</i> Miq.	563	var. <i>acuminata</i> Miq.	536
<i>F. tenii</i> H. Lév.	649	<i>F. verrucosa</i> (Miq.) Miq.	587
<i>F. tetangis</i> Miq.	581	<i>F. villosa</i> Blume	579, 594 , 595
<i>F. thailandica</i> C.C. Berg & S. Gardner	507, 508, 530	var. <i>appressa</i> Corner	594
<i>F. thomsonii</i> Miq.	625	var. <i>subglobosa</i> Corner	594
<i>F. thorelii</i> Gagnep.	631	var. <i>tonsa</i> Corner	594
<i>F. tinctoria</i> G. Forst.	538, 554 , 555, 556, 557	<i>F. virens</i> Aiton	596, 599, 613, 624, 649
subsp. <i>gibbosa</i> (Blume) Corner	538, 554 , 556, 557	var. <i>glabella</i> (Blume) Corner	649
subsp. <i>parasitica</i> (Miq.) Corner	555	<i>F. viridicarpa</i> Corner	578
var. <i>anastomosans</i> (Wall. ex Kurz) Corner	539	<i>F. volubilis</i> (Dalzell) King	555
<i>F. tondana</i> Miq.	549	<i>F. vrieseana</i> Miq. forma <i>obliqua</i> Corner	573
<i>F. trachycarpa</i> Miq.	551	<i>F. wardii</i> C.E.C. Fischer	526
var. <i>paucidentata</i> Miq.	551	<i>F. xylophylla</i> (Miq.) Miq.	597, 599, 650
<i>F. travancorica</i> King	626	<i>F. zollingeriana</i> (Miq.) Miq.	643
<i>F. trichocarpa</i> Blume	579, 569, 591 , 592	<i>Frutescentiae</i>	507
var. <i>pipertifolia</i> (Miq.) Corner	591	Galoglygia	598
<i>F. trichocarpa</i> Decne.	569	<i>Glandulosae</i>	532
<i>F. tricolor</i> Miq. var. <i>robusta</i> (Corner) Corner ex C.C. Berg	519	<i>Gonusuke daemonum</i> (J. Koenig ex Vahl) Raf.	566
<i>F. tridactyles</i>	522	<i>Gonusuke hispida</i> (L.f.) Raf.	566
<i>F. triplepis</i> Miq.	526	<i>Gymnartocarpus</i> Boerl.	661
<i>F. triloba</i> Buch.-Ham. ex Voigt	530	<i>G. venenosa</i> (Zoll. & Moritzi) Boerl.	661, 662
subsp. <i>triloba</i>	507, 508, 526, 530	HULLETTIA	475, 476, 477, 650 , 655
subsp. <i>quangtrienensis</i> (Gagnep.) C.C. Berg	530	<i>H. dumosa</i> King ex Hook.f.	651
<i>F. tuberculata</i> Roxb.	555	<i>H. griffithiana</i> (Kurz) Hook.f.	651, 652 , 653
<i>F. tuphapensis</i> Drake	510	<i>Kissosycea</i>	578
var. <i>annamensis</i> (Gagnep.) Corner	510	<i>Ligulistigma</i>	470
<i>F. uncinata</i> (King) Becc. var. <i>subbeccarii</i> Corner	568	MACLURA	475, 476, 477, 652 , 654
var. <i>truncata</i> Corner	568	<i>M. amboinensis</i> Blume	655
var. <i>strigosa</i> Corner	568	<i>M. andamanica</i> (Hook.f.) C. C. Berg	654
<i>F. undulata</i> Buch.-Ham	535	<i>M. cochinchinensis</i> (Lour.) Corner	654, 655
		var. <i>pubescens</i> (Trécul) Corner	655

<i>Maclura fruticosa</i> (Roxb.) Corner	654, 656 , 658	<i>Plecosperrum andamanicum</i> Hook.f.	654
<i>M. javanica</i> Blume	655	<i>P. spinosum</i> Trécul var. <i>javanensis</i> Trécul	655
<i>M. laevigata</i> (Wall. ex Bureau) Hook.f.	659	<i>Pogonotrophe</i> Miq.	499
<i>M. pubescens</i> (Trécul) Z.K. Zhou & M.G. Gilbert	655	<i>P. assamica</i> Miq.	585
<i>M. spinosa</i> (Willd.) C.C. Berg	655	<i>P. aurantiaca</i> Miq.	517
<i>Macrophthalmia elastica</i> (Roxb.) Gasp.	621	<i>P. dasyphylla</i> Miq.	585
<i>Malaisia</i> Blanco	674, 675	<i>P. emodi</i> Wall. ex Miq.	585
<i>Malaisia</i> (Blanco) C.C. Berg	674	<i>P. flavidula</i> Miq.	515
<i>M. scandens</i> (Lour.) Planch.	675	<i>P. glandulifera</i> Wall. ex Miq.	517
<i>M. tortuosa</i> Blanco	675	<i>P. laevis</i> (Blume) Miq.	585
var. <i>scandens</i> (Lour.) Bureau	675	<i>P. phaeopoda</i> Miq.	591
MORACEAE	475	<i>P. piperifolia</i> Miq.	591
MORUS	475, 476, 477, 657	<i>P. pubigera</i> Wall. ex Miq.	585
<i>Morus</i> ? <i>altissima</i> Miq.	482	<i>P. ribesoides</i> Wall. ex Miq.	589
<i>M. alba</i> L.	657 , 659	<i>P. rigida</i> Miq.	590
var. <i>indica</i> (L.) Bur.	659	<i>P. sumatrana</i> Miq.	517
var. <i>laevigata</i> Wall. ex Bureau	659	<i>P. vagans</i> (Roxb.) Miq.	585
<i>M. australis</i> Poir.	659	<i>P. verrucosa</i> Miq.	585
<i>M. javanica</i> Blume	675	<i>P. wightiana</i> Miq.	585
<i>M. laevigata</i> (Wall. ex Bureau) Hook.f.	659	POIKILOSPERMUM	469, 470
<i>M. leucophylla</i> Miq.	532	<i>P. cordifolium</i> (Barg.-Petr.) Merr.	470
<i>M. macroura</i> Miq.	657, 659 , 660	<i>P. gagnepainii</i> Merr.	473
<i>M. nigra</i> L.	657	<i>P. lanceolatum</i> (Trécul) Merr.	470, 471
<i>M. papyrifera</i> L.	497	<i>P. microstachys</i> (Barg.-Petr.) Merr.	470, 472
<i>M. rubra</i> L.	657	<i>P. naucleiflorum</i> (Roxb.) Chew	470, 472
<i>Neomorphe</i>	558	<i>P. oblanceolatum</i> (Ridl.) Merr.	473
<i>Oreosycea</i>	532	<i>P. sinense</i> (Wright) Merr.	473
<i>Palaeomorphe</i>	469, 500, 538	<i>P. suaveolens</i> (Blume) Merr.	470, 473 , 474
<i>Papyrius</i> Lam.	495	<i>P. tonkinense</i> (Drake) Merr.	473
PARARTOCARPUS	476, 477, 661 , 665	<i>Polyphema</i> Lour.	480
<i>P. bracteatus</i> (King) Becc.	661, 662 , 663	PRAINEA	475, 476, 477, 665
<i>P. venenosus</i> (Zoll. & Moritzi) Becc.	661, 662 , 663, 664	<i>P. frutescens</i> Becc.	665
subsp. <i>forbesii</i> (King) Jarrett	662	<i>P. scandens</i> King ex Hook.f.	665
<i>Pedunculatae</i>	532	<i>Procris cochinchinensis</i> (Lour.) Spreng.	655
<i>Perula benghalensis</i> (L.) Raf.	605	<i>Pseudojaca</i>	477, 480
Pharmacosycea Miq. 499, 501, 504, 506, 507, 531, 532		<i>Pseudostreblus</i> Bureau	667
<i>Phyllochlamys</i> (Bureau) Corner	667	<i>Pseudostreblus</i> (Bureau) Corner	667
<i>Phyllochlamys</i> Bureau	667	<i>Pseudostreblus indica</i> Bureau	669
<i>P. spinosa</i> (Roxb.) Bureau	673	<i>Pseudotrophis</i> Warb.	667
<i>P. taxoides</i> (Heyne ex Roth) Koord.	673	<i>Pseudotrophis</i> (Warb.) Corner	667
<i>P. tridentata</i> Gagnep.	673	<i>Punctuliifoliae</i>	579
<i>Phyllochlamys wallichii</i> King ex Hook.f.	673	<i>Rade(r)machia</i> Thunb.	480
<i>Plagiostigma</i>	579	<i>R. incisa</i> Thunb.	481
<i>Plecosperrum</i> Trécul	652	<i>R. integra</i> Thunb.	487
<i>Plecosperrum</i> (Trécul) C.C. Berg	652	<i>Rhizocladus</i>	579

<i>Sitodium</i> Banks & Solander ex Parkinson	480, 481	<i>Trophis spinosa</i> Roxb.	673
<i>S. altile</i> Banks & Sol. ex Parkinson	481	<i>T. taxoides</i> Heyne ex Roth	673
<i>S. incisum</i> (Thunb.) Thunb.	481	<i>Urostigma</i>	469, 499
<i>Smithiodendron</i> Hu	496, 497	<i>U. accedens</i> Miq. var. <i>latifolia</i> Miq.	632
<i>Smithiodendron artocarpoideum</i> Hu	497	<i>Urostigma altissimum</i> (Blume) Miq.	601
<i>Stilpnophyllum</i>	598	<i>U. amblyphyllum</i> Miq.	632
<i>Stilpnophyllum elasticum</i> (Roxb.) Drury	621	<i>U. annulatum</i> (Blume) Miq.	603
STREBLUS	475, 476, 667	<i>U. apiocarpum</i> Miq.	581
<i>S. asper</i> Lour.	667, 668	<i>U. arnottianum</i> Miq.	604
<i>S. crenatus</i> (Gagnep.) Corner	673	<i>U. balicum</i> Miq.	641
<i>S. ilicifolius</i> (S. Vidal) Corner	668, 669	<i>U. benghalense</i> (L.) Gasp.	605
<i>S. indicus</i> (Bureau) Corner	667, 668, 669	<i>U. benjaminum</i> (L.) Miq.	605
<i>S. laxiflorus</i> (Hutch.) Corner	669	<i>U. benjaminum</i> (L.) Miq. var. <i>nudum</i> Miq.	606
<i>S. macrophyllum</i> Blume	476, 668, 671 , 672	<i>U. bimmendijkii</i> Miq.	608
<i>S. microphyllum</i> Kurz	673	<i>U. biverrucellum</i> Miq.	603
<i>S. perakensis</i> Corner	668, 672	<i>U. bracteatum</i> Wall. ex Miq.	608
<i>S. taxoides</i> (Heyne ex Roth) Kurz	668, 673	<i>U. callophyllum</i> (Blume) Miq.	609
<i>S. taxoides</i> (Roth) Kurz		<i>U. caulocarpum</i> Miq.	611
var. <i>microphylla</i> (Kurz) Kurz	673	<i>U. clusoides</i> Miq.	609
<i>S. zeylanicus</i> (Thwaites) Kurz	673	<i>U. concimum</i> Miq.	611
<i>Sycidium</i>	469	<i>U. consociatum</i> (Blume) Miq.	613
<i>Sycocarpus</i>	504, 505, 558	<i>U. cordifolium</i> (Roxb.) Miq.	639
<i>Sycomorpha roxburghii</i> Miq.	566	<i>U. courtallense</i> Miq.	604
<i>Sycomorus</i>	501, 504, 506, 507, 558	<i>U. crassirameum</i> Miq.	614
<i>Synoecia</i>	499, 501, 506, 507, 578, 579	<i>U. cycloneuron</i> Miq.	634
<i>S. diversifolia</i> (Blume) Miq.	513, 514	<i>U. dasycarpum</i> Miq.	619
var. <i>angustifolia</i> (Miq.) Miq.	515	<i>U. depressum</i> (Blume) Miq.	618
forma <i>angustifolia</i> Miq.	515	<i>U. drupaceum</i> (Thunb.) Miq.	618
<i>S. falcata</i> (Thunb.) Miq.	588	<i>U. elasticum</i> (Roxb.) Miq.	621
<i>S. serpens</i> Miq.	588	<i>U. excelsum</i> Miq.	555
<i>S. sumatrana</i> Miq.	588	<i>U. flavescens</i> (Blume) Miq.	603
<i>Taxotrophis</i> Blume	667	<i>U. glabellum</i> (Blume) Miq.	649
<i>Taxotrophis</i> (Blume) Corner	667	<i>U. glaberrimum</i> (Blume) Miq.	625
<i>T. balansae</i> Hutch.	671	<i>U. globosum</i> (Blume) Miq.	626
<i>T. crenata</i> Gagnep.	673	<i>U. infectorium</i> Roxb.	649
<i>T. eberhardtii</i> Gagnep.	669	<i>U. lacciferum</i> (Roxb.) Miq.	601
<i>T. ilicifolia</i> S. Vidal	669	<i>U. littorale</i> (Blume) Miq.	632
<i>T. laxiflora</i> Hutch.	669	<i>U. lucescens</i> (Blume) Miq.	569
<i>T. macrophylla</i> (Blume) Boerl.	671	<i>U. manok</i> Miq.	626
<i>T. poilanei</i> Gagnep.	673	<i>U. microcarpum</i> (L.f.) Miq.	632
<i>Tenorea heterophylla</i> Gasp.	587	<i>U. modestum</i> Miq.	535
<i>Teonongia</i> Stapf	667	<i>U. monadenum</i> Miq.	643, 645
<i>Tremotis cordata</i> Raf.	559	<i>U. mysorense</i> (Heyne ex Roth) Miq.	618
TROPHIS	475, 674	<i>U. nervosum</i> (Roth) Miq.	535
<i>T. cochinchinensis</i> Poir.	668	<i>U. nitidum</i> (Thunb.) Miq.	605
<i>T. scandens</i> (Lour.) Hook. & Arn.	476, 477, 675	<i>U. nudum</i> Miq.,	607

<i>Urostigma obtusifolium</i> (Roxb.) Miq.	617
<i>U. onustum</i> Wall. ex Miq.	626
<i>U. ovoideum</i> (Jack) Miq.	513
<i>U. parvifolium</i> Miq.	611
<i>U. pilosum</i> (Blume) Miq.	618
<i>U. pisiferum</i> Miq.	632
<i>U. pisocarpum</i> (Blume) Miq.	634
<i>U. procerum</i> (Blume) Miq.	614
<i>U. pruniforme</i> (Blume) Miq.	618
<i>U. pseudorubrum</i> Miq	643, 645
<i>U. pyriforme</i> Miq.	645
<i>U. religiosum</i> (L.) Gasp.	637
<i>U. rhododendrifolium</i> Miq.	629
<i>U. rigidum</i> Miq.	643, 645
<i>U. rubescens</i> (Blume) Miq.	645
<i>U. rumphii</i> (Blume) Miq.	639
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- I. *N* (NORTHERN)
1. Mae Hong Son
 2. Chiang Mai
 3. Chiang Rai
 4. Phayao
 5. Nan
 6. Lamphun
 7. Lampang
 8. Phrae
 9. Uttaradit
 10. Tak
 11. Sukhothai
 12. Phitsanulok
 13. Kamphaeng Phet
 14. Phichit
 15. Nakhon Sawan
- II. *NE* (NORTH-EASTERN)
16. Phetchabun
 17. Loei
 18. Nong Bua Lam Phu
 19. Udon Thani
 20. Nong Khai
 21. Sakon Nakhon
 22. Nakhon Phanom
 23. Mukdahan
 24. Kalasin
 25. Maha Sarakham
 26. Khon Kaen
- III. *E* (EASTERN)
27. Chaiyaphum
 28. Nakhon Ratchasima
 29. Buri Ram
 30. Surin
 31. Roi Et
 32. Yasothon
 33. Amnat Charoen
 34. Si Sa Ket
 35. Ubon Ratchathani
- IV. *SW* (SOUTH-WESTERN)
36. Uthai Thani
 37. Kanchanaburi
 38. Ratchaburi
 39. Phetchaburi
 40. Prachuap Khiri Khan
- V. *C* (CENTRAL)
41. Chai Nat
 42. Sing Buri
 43. Lop Buri
 44. Suphan Buri
 45. Ang Thong
 46. Phra Nakhon Si Ayutthaya
 47. Saraburi
 48. Nakhon Pathom
 49. Pathum Thani
 50. Nakhon Nayok
 51. Nonthaburi
 52. Krung Thep Maha Nakhon
(Bangkok)
 53. Samut Prakan
 54. Samut Songkhram
 55. Samut Sakhon
- VI. *SE* (SOUTH-EASTERN)
56. Sa Kaeo
 57. Prachin Buri
 58. Chachoengsao
 59. Chon Buri
 60. Rayong
 61. Chanthaburi
 62. Trat
- VII. *PEN* (PENINSULAR)
63. Chumphon
 64. Ranong
 65. Surat Thani
 66. Phangnga
 67. Phuket
 68. Krabi
 69. Nakhon Si Thammarat
 70. Phatthalung
 71. Trang
 72. Satun
 73. Songkhla
 74. Pattani
 75. Yala
 76. Narathiwat



THAILAND
 FLORISTIC REGIONS



ไทรใบขน

Ficus fulva Reinw. ex Blume